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HW 23140-DEL

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HANFORD WORKS MONTHLY REPORT

727828

REPOSITORY DNL

FOR

COLLECTION Atmospheric Releases DECEMBER 1951

HANFORD

BOX No. N/A

42847

FOLDER N/A

Compiled By
Department Managers

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WITH DELETIONS

Classification Cancelled (Changed) to

By Authority of RLO Cls-4
DS Lewis 3/16/92
By DJ Rusnak 3/26/92
PM Ect 3-26-92

January 22, 1952

Classification reviewed for declassification but left unchanged by JPD for JKB

Date 5-15-93

HANFORD WORKS

RICHLAND, WASHINGTON

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

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DECLASSIFIED

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HANFORD WORKS MONTHLY REPORT
DECEMBER 1951
GENERAL SUMMARY

Production Operations

All but one production forecasts were met or exceeded during the month, and a new high power level of the reactors was attained. The forecast not met was in separations, the output being but 96% owing to holdup of material for the Redox plant.

Although the number of ruptured slugs increased to 21 from 17 last month, the outage time for removal was decreased. Improvements in the method of handling these faults during the past several months has reduced the outage time per fault from the order of 50 hours to less than 10 hours.

Cold uranium has now been completely processed through the Redox plant and sent to the UO_3 plant. A daily capacity of about three tons is indicated.

Extensive water leaks at F pile required a shut-down of eight days duration.

Engineering and Technology

Exceptionally high rates of extraction of tritium were achieved in the metal line and accessories, indicating an early conclusion of the P-10 Project.

A total of 42,450 service analyses represented a new high 2-year record, indicating the increase in control required for the growing variety of plant processes.

Extensive calculations of the rate of exposures of slugs are being made for correlation of failures and power.

Expansion and Construction

Serious delays in construction occasioned by recent shortages of certain crafts are being alleviated by a more plentiful supply of these crafts.

Indicative of the expansion of activities is the all time high peak demand for process electric power which was reached on December 26, 1951.

Construction of two laboratory buildings has been suspended temporarily while awaiting delivery of steel.

Personnel and Services

A review of the budget was made during the month, and a revised 1952 budget was submitted to the Commission.

There are 624 applications for housing pending.

Hanford Works achieved another "first" award of the No-Accident Safety Award Plan. This is the third such "first" award won by Hanford works.

The plant roll increased to 9,104 during the month in face of a slightly higher turnover rate of 1.41%.

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STAFF

General Manager	G. R. Prout
Manager, Schenectady Office	B. R. Prentice
Assistant General Manager	W. E. Johnson
Assistant to the General Manager, General Administration	G. G. Lail
Assistant to the General Manager, Technical	W. I. Patnode
Assistant to the General Manager, Salary Administration	J. R. Rue
Counsel	G. C. Butler
Manager, Finance	W. W. Smith
Manager, Employee and Public Relations	H. E. Callahan
Director, Radiological Sciences	H. M. Parker
Director, Medical	W. D. Norwood
Manager, Engineering	A. B. Greninger
Manager, Manufacturing	C. N. Gross
Manager, Utilities and General Services	F. E. Baker
Manager, Community Real Estate and Services	L. F. Huck

[redacted]

FORCE REPORT [redacted] DECEMBER 1951

	NON EXEMPT		TOTAL			
	11-30-51	12-29-51	11-30-51	12-29-51	11-30-51	12-29-51
GENERAL	24	24	34	36	58	60
LAW	2	2	17	14	19	16
ENGR. DEPT.						
General	2	2	1	1	3	3
Design & Const. Sect.						
Const.	13	13	26	27	39	40
Design	221	218	418	416	639	634
No. Richland Realty	18	18	114	111	132	129
Proj. Engr.	76	76	1	1	77	77
Technical Section						
Administrative	7	7	3	3	10	10
Pile Tech.	166	170	176	176	342	346
Separations Tech.	109	109	66	65	175	174
Technical Services	39	39	151	158	190	197
Analytical	113	114	260	259	373	373
MANUFACTURING DEPT.						
General	31	23	12	12	43	35
Reactor	188	192	897	908	1085	1100
Metal Prep.Section	67	70	358	369	425	439
Separations	240	249	1206	1213	1446	1462
MEDICAL	41	40	234	233	275	273
RADIOLOGICAL SCIENCES						
General	3	3	2	2	5	5
Records & Standards	25	24	139	140	164	164
Biophysics	44	44	70	70	114	114
Biology	35	35	46	45	81	80
FINANCIAL DEPT.						
Engr. Acctg.	14	15	85	79	99	94
Mfg. Acctg.	7	7	56	56	63	63
Gen. Acctg.(Inc.Med.)	26	28	113	111	139	139
Gen. Acctg. Payroll	11	10	115	109	126	119
Comm. Acctg.	6	5	20	23	26	28
EMPLOY. & PUBLIC RELATIONS	38	38	73	73	111	111
UTILITIES & GEN. SERV.						
General	16	16	13	13	29	29
Elect. Dist. & Telephone	29	29	149	148	178	177
Transportation	39	39	470	476	509	515
Plant Sec. & Serv.						
Patrol & Sec.	57	57	600	602	657	659
Safety & Fire	41	41	109	110	150	151
Office Services	26	28	278	278	304	306
Purchasing & Stores	83	87	339	345	422	432
COMM.REAL ESTATE & SERV.	190	187	372	363	562	550
TOTAL	2047	2059	7023	7045	9070	9104

INCLUDES 56 Firemen

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PERSONNEL DISTRIBUTION - DECEMBER 1951

	100-B Area	100-D Area	100-F Area	100-H Area	101 Area	200-E Area	200-W Area	300 Area	Plant General	3000 Area	700-1100 Area	Total
GENERAL												
Exempt Personnel	-	-	-	-	-	-	-	-	-	-	24	24
Cler.&Other NonExempt	-	-	-	-	-	-	-	-	-	-	36	36
Total	-	-	-	-	-	-	-	-	-	-	60	60
LAW												
Exempt Personnel	-	-	-	-	-	-	-	-	-	-	2	2
Clerical	-	-	-	-	-	-	-	-	-	-	14	14
Total	-	-	-	-	-	-	-	-	-	-	16	16
ENGR. DEPT.												
GENERAL												
Supv.	-	-	-	-	-	-	-	-	-	-	2	2
Clerical	-	-	-	-	-	-	-	-	-	-	1	1
Total	-	-	-	-	-	-	-	-	-	-	3	3
DESIGN & CONST.												
CONSTRUCTION												
Supervisors	-	-	-	-	-	-	-	-	-	-	8	8
Inspectors & Analyst	-	-	-	-	-	-	-	-	-	-	5	5
Clerical	-	-	-	-	-	-	-	-	-	-	27	27
Total	-	-	-	-	-	-	-	-	-	-	40	40
DESIGN												
Supervisors	23	1	-	3	12	1	-	2	-	-	38	80
Other Exempt	11	7	-	8	11	-	30	4	-	13	54	138
Draftsmen & Designers	-	-	-	-	-	-	3	-	-	13	104	120
Clerical	36	-	-	2	-	-	4	-	-	12	114	168
Others	24	-	1	2	15	1	13	6	-	6	60	128
Total	94	8	1	15	38	2	50	12	-	44	370	634

1224824

	100-B Area	100-D Area	100-F Area	100-H Area	101 Area	200-E Area	200-W Area	300 Area	Plant General	3000 Area	700-1100 Area	Total
NO. RICHLAND REALTY												
Supervisors	-	-	-	-	-	-	-	-	-	18	-	18
Janitors	-	-	-	-	-	-	-	-	-	13	-	13
Clerical	-	-	-	-	-	-	-	-	-	60	-	60
Others	-	-	-	-	-	-	-	-	-	38	-	38
Total	-	-	-	-	-	-	-	-	-	129	-	129
PROJ. ENGR.												
Supervisors	-	-	-	-	-	-	-	-	-	-	36	36
Engineers	-	-	-	-	-	-	-	-	-	-	40	40
Others	-	-	-	-	-	-	-	-	-	-	1	1
Total	-	-	-	-	-	-	-	-	-	-	77	77
TECHNICAL SECTION												
GENERAL												
Supervisors	-	-	-	-	-	-	-	-	-	-	7	7
Clerical	-	-	-	-	-	-	-	-	-	-	3	3
Total	-	-	-	-	-	-	-	-	-	-	10	10
PILE TECH.												
Supv.	1	-	-	-	-	-	-	5	-	-	-	6
Metallurgists & Engrs.	15	6	1	5	21	-	3	41	-	-	2	94
Physicists	-	4	1	4	-	-	-	16	-	-	-	25
Engr. Assts.	15	3	2	4	8	-	-	13	-	-	-	45
Tech. Grads.	14	5	2	8	7	-	3	30	-	-	-	69
Technologists	11	1	1	3	-	-	-	1	-	-	-	17
Laboratory Assts.	19	12	-	6	-	-	1	18	-	-	-	56
Clerical	6	2	-	4	3	-	-	16	-	-	-	31
Engr. Assts.	-	2	-	-	-	-	-	1	-	-	-	3
Total	81	35	7	34	39	-	7	141	-	-	2	346

	100-B Area	100-D Area	100-F Area	100-H Area	101 Area	200-E Area	200-W Area	300 Area	Plant General	3000 Area	700-1100 Area	Total
SEPARATIONS TECH.												
Supv.	-	-	-	-	-	-	7	13	-	-	-	20
Chemists & Engr.	-	-	-	-	-	2	43	44	-	-	-	89
Tech. Grads.	-	-	-	-	-	-	10	18	-	-	-	28
Clerical	-	-	-	-	-	-	5	12	-	-	-	17
Lab. Assts.& Tech.	-	-	-	-	-	-	8	8	-	-	-	16
Other non exempt	-	-	-	-	-	-	1	3	-	-	-	4
Total	-	-	-	-	-	2	74	98	-	-	-	174
TECH. SERVICES												
Supervisors	-	2	-	-	-	-	1	8	-	-	4	15
Other Exempt	-	5	-	-	-	-	3	13	-	3	-	24
Technologists, Tech.Grads.	-	7	-	-	-	-	-	14	-	-	-	21
Lab. Assts.	-	-	-	-	-	-	10	-	-	-	-	10
Clerical	-	4	1	-	-	-	4	40	-	1	43	93
Others	4	2	1	-	-	-	5	21	-	-	1	34
Total	4	20	2	-	-	-	23	96	-	4	48	197
ANALYTICAL TECH.												
Supervisors	1	-	-	2	-	6	26	14	-	-	-	49
Chemists & Engrs.	6	1	1	-	-	-	13	44	-	-	-	62
Technologists, Tech.Grads	2	-	-	2	-	9	54	13	-	-	-	79
Laboratory Assts.	6	-	-	6	-	24	92	37	-	-	-	165
Clerical	-	-	-	1	-	2	5	7	-	-	-	15
Total	15	1	1	11	-	41	189	115	-	-	-	373
MANUFACTURING DEPT.												
GENERAL											15	15
Supv.	-	-	-	-	-	-	-	-	-	-	7	8
Other Exempt	-	-	-	-	-	-	-	-	1	-	12	12
Clerical	-	-	-	-	-	-	-	-	-	-	34	35
Total	-	-	-	-	-	-	-	-	1	-		

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	100-B Area	100-D Area	100-F Area	100-H Area	101 Area	200-E Area	200-W Area	300 Area	Plant General	3000 Area	700-1100 Area	Total
REACTOR												
Supv.	27	46	35	32	-	-	-	-	-	-	-	140
Other Exempt	14	8	7	18	-	-	-	-	-	-	5	52
Supv. in Training	1	1	1	1	-	-	-	-	-	-	-	4
Operators	35	59	34	35	-	-	-	-	-	-	-	163
Craftsmen	136	213	156	127	-	-	-	1	-	-	-	632
Inspectors & Lab. Assts.	6	12	6	6	-	-	-	-	-	-	2	31
Clerical	7	11	8	15	-	-	-	-	-	-	-	43
Others	3	4	2	3	-	-	-	-	-	-	-	12
Tech. Grads.	7	8	3	5	-	-	-	-	-	-	-	23
Total	236	362	252	242	-	-	-	1	-	-	7	1100
METAL PREPARATIONS												
Supv.	-	2	-	-	-	-	-	39	-	-	1	42
Other Exempt	-	1	-	-	-	-	-	27	-	-	-	28
Supv. in Training	-	-	-	-	-	-	-	4	-	-	-	4
Operators	-	-	-	-	-	-	-	180	-	-	-	180
Craftsmen	-	27	-	-	-	-	-	110	-	-	10	147
Clerical	-	1	-	-	-	-	-	23	-	-	-	24
Others	-	2	-	-	-	-	-	8	-	-	-	10
Inspectors & Lab. Assts.	-	-	-	-	-	-	-	1	-	-	-	1
Tech. Grads.	-	1	-	-	-	-	-	2	-	-	-	3
Total	-	34	-	-	-	-	-	394	-	-	11	439
SEPARATIONS												
Supv.	-	-	-	-	-	31	141	-	-	-	-	172
Other Exempt	-	-	-	-	-	6	71	-	-	-	-	77
Operators	-	-	-	-	-	190	550	-	-	-	-	740
Craftsmen	-	-	-	-	-	60	273	-	-	-	-	333
Inspectors & Lab. Assts.	-	-	-	-	-	10	35	-	-	-	-	45
Clerical	-	-	-	-	-	7	50	-	-	-	-	57
Others	-	-	-	-	-	3	10	-	-	-	-	13
Supv. in Training	-	-	-	-	-	1	8	-	-	-	-	9
Tech. Grads.	-	-	-	-	-	2	14	-	-	-	-	16
Total	-	-	-	-	-	310	1152	-	-	-	-	1462

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	100-B Area	100-D Area	100-F Area	100-H Area	101 Area	200-E Area	200-W Area	300 Area	Plant General	3000 Area	700-1100 Area	Total
MEDICAL												
Supervisors	-	-	-	-	-	-	-	-	-	-	22	22
Physicians	-	-	-		-	-	-	-	1	3	8	12
Other Exempt	-		-		-	-	-	-	-	-	6	6
Technicians	-	-	-	-	-	-	-	-	1	3	16	17
Nurses	6	4	4	1	1	4	7	2	-	3	65	97
Clerical	1	-	-	-	-	-	-	-	2	7	38	48
Others	-	-	-	-	-	-	-	-	-	1	70	71
Total	7	4	4	1	1	4	7	2	4	17	222	273
RADIOLOGICAL SCIENCES DEPT.												
STAFF												
Supv.	-	-	-	-	-	-	-	-	-	-	2	2
Other Exempt	-	-	-	-	-	-	-	-	-	-	1	1
Clerical	-	-	-	-	-	-	-	-	-	-	2	2
Total	-	-	-	-	-	-	-	-	-	-	5	5
RECORDS & STANDARDS												
Supervisors	-	-	-	-	-	-	-	10	-	-	3	13
Other Exempt	1	-	1	-	-	-	2	2	-	-	5	11
Clerical	-	-	-	-	-	-	-	2	-	-	1	3
Others	14	4	7	3	-	13	29	51	5	-	11	137
Total	15	4	8	3	-	13	31	65	5	-	20	164
BIOPHYSICS												
Supervisors	-	-	-	-	-	1	6	1	-	-	-	8
Other Exempt	-	-	-	-	-	3	18	14	-	1	-	36
Clerical	-	-	-	-	-	1	2	2	-	-	-	5
Other non exempt	-	-	-	-	-	4	42	19	-	-	-	65
Total	-	-	-	-	-	9	68	36	-	1	-	114

1224828

	100-B Area	100-D Area	100-F Area	100-H Area	101 Area	200-E Area	200-W Area	300 Area	Plant General	3000 Area	700-1100 Area	Total
BIOLOGY	-	-	4	-	-	-	-	-	-	-	-	4
Supv.	-	-	31	-	-	-	-	-	-	-	-	31
Other Exempt	-	-	5	-	-	-	-	-	-	-	-	5
Clerical	-	-	40	-	-	-	-	-	-	-	-	40
Others	-	-	80	-	-	-	-	-	-	-	-	80
Total												
FINANCIAL DEPT.										19	46	65
Supv.	-	-	-	-	-	-	-	-	4	100	274	378
Clerical	-	-	-	-	-	-	-	-	4	119	320	443
Total	-	-	-	-	-	-	-	-				
EMPLOYEE & PUBLIC RELATION DEPT.											24	24
Supervisors	-	-	-	-	-	-	-	-	-	-	2	2
Empl. Rel. Counselors	-	-	-	-	-	-	-	-	-	-	12	12
Other Exempt	-	-	-	-	-	-	-	-	-	-	60	60
Clerical	-	-	-	-	-	-	-	-	-	-	13	13
Others	-	-	-	-	-	-	-	-	-	-	111	111
Total	-	-	-	-	-	-	-	-	-	-		
UTILITIES & GEN. SERVICES.											16	16
GENERAL	-	-	-	-	-	-	-	-	-	-	13	13
Supv.	-	-	-	-	-	-	-	-	-	-	29	29
Clerical	-	-	-	-	-	-	-	-	-	-		
Total	-	-	-	-	-	-	-	-	-	-		
PLANT SEC. & SERVICES												
SECURITY & PATROL											4	53
Supervisors	6	6	6	5	-	5	8	7	6	-	-	4
Other exempt	-	-	-	-	-	-	-	-	4	-	27	580
Patrolmen	87	48	66	47	-	74	151	78	2	-	1	19
Clerical	-	-	-	-	-	-	-	-	18	-	-	2
Seamstress	-	-	-	-	-	-	-	-	2	-	-	1
Tech. Grad.	-	-	-	-	-	-	-	-	1	-	-	
Total	93	54	72	52	-	79	159	85	33	-	32	659

1224829

	100-B Area	100-D Area	100-F Area	100-H Area	101 Area	200-E Area	200-W Area	300 Area	Plant General	3000 Area	700-1100 Area	Total
SAFETY & FIRE												
Supervisors	14	-	-	-	4	-	4	4	7	-	-	33
Engineers	-	1	1	-	-	2	-	2	1	-	1	8
Fireman	56	-	-	-	8	-	16	16	9	-	-	105
Clerical	-	1	1	-	-	-	-	1	-	-	2	5
Total	70	2	2	-	12	2	20	23	17	-	3	151
OFFICE SERVICES												
Supv.	-	-	1	-	-	1	3	1	1	-	19	26
Procedures Analysts	-	-	-	-	-	-	-	-	-	-	2	2
Ldry Operators	-	-	-	-	-	-	2	-	-	-	1	3
Janitors & Servicemen	8	6	7	6	-	5	25	14	-	-	42	113
Clerical	-	-	-	-	-	-	1	-	-	-	41	42
Others	-	-	-	-	-	-	43	-	-	-	77	120
Total	8	6	8	6	-	6	4	15	1	-	182	306
PURCHASING & STORES												
Supervisors	1	-	-	-	-	-	-	-	-	3	28	32
Other Exempt	-	-	-	-	-	-	-	-	26	-	29	55
Clerical	12	-	-	-	-	-	-	-	-	29	150	191
Others	21	-	3	-	-	-	3	1	-	30	80	138
Rotational Trainees	-	-	-	-	-	-	-	-	15	-	1	16
Total	34	-	3	-	-	-	3	1	41	62	288	432
ELECT. DISTRIBUTION & TELEPHONE												
Supv.	-	-	-	-	-	9	-	-	2	-	11	22
Other Exempt	-	-	-	-	-	3	-	-	-	-	4	7
Craftsmen	-	-	-	-	-	28	-	-	11	-	52	91
Clerical	-	-	-	-	-	3	-	-	-	-	24	27
Operators	4	4	4	4	-	-	-	-	12	-	-	28
Others	-	-	-	-	-	2	-	-	-	-	-	2
Total	4	4	4	4	-	45	-	-	25	-	91	177

1224830

	100-B Area	100-D Area	100-F Area	100-H Area	101 Area	200-E Area	200-W Area	300 Area	Plant General	3000 Area	700-1100 Area	Total
TRANSPORTATION												
Supv.	2	-	3	2	-	1	1	-	3	-	25	37
Other Exempt	-	-	-	-	-	-	-	-	-	-	2	2
Bus Drivers	-	-	-	-	-	-	-	-	-	-	168	168
Journeymen	4	1	1	7	-	-	3	-	6	-	66	88
Trainmen	-	-	-	-	-	-	-	-	26	-	-	26
Servicemen	6	-	2	-	-	-	-	-	1	-	26	35
Equip. Oper.	7	-	12	-	-	1	-	-	-	-	27	47
Clerical	-	-	1	-	-	-	-	-	-	-	27	28
Others	9	-	10	13	-	11	3	1	1	-	36	84
Total	28	1	29	22	-	13	7	1	37	-	377	515
COMM. REAL ESTATE & SERV. DEPT.												
Supervisors	-	-	-	-	-	-	-	-	-	14	107	121
Other Exempt	-	-	-	-	-	-	-	-	-	-	10	10
Firemen	-	-	-	-	-	-	-	-	-	24	32	56
Patrolmen	-	-	-	-	-	-	-	-	-	16	23	39
Journeymen	-	-	-	-	-	-	-	-	-	-	143	143
Servicemen	-	-	-	-	-	-	-	-	-	-	20	20
Truck Drivers	-	-	-	-	-	-	-	-	-	-	24	24
Power Operators	-	-	-	-	-	-	-	-	-	-	32	32
Clerical	-	-	-	-	-	-	-	-	-	-	65	65
Others	-	-	-	-	-	-	-	-	-	-	40	40
Total	-	-	-	-	-	-	-	-	-	54	496	550
GRAND TOTAL	689	535	473	390	90	526	1864	1085	168	430	2854	9104

MANUFACTURING DEPARTMENT

DECEMBER 1951

METAL PREPARATION SECTION

The forecasted total of 125 tons of acceptable canned pieces was exceeded by 5.0 percent resulting in 131 tons produced. An increase of 1.4 percent over the previous month in the machining yield to 74.6 percent was attributed to the improved surface quality of the rods. The machining yield for the year was 76.4 percent, indicating substantial improvement in rod quality is still anticipated. The defects consist primarily of rough ends, irregular surfaces, seams and cracks in the rods.

The canning yield was 75.6 percent, a decrease of 1.8 percent. This decrease was attributed to the use of inferior cans, and the training of new personnel.

The Melt Plant produced 34 tons of billets at a yield of 84.5 percent and a solid yield of 92.1 percent. The reduction in the billet yield was a result of more stringent interpretation of the physical specifications in an attempt to produce the best possible quality of rolled rods.

REACTOR SECTION

Total maximum reactor operating levels were 30 MW above the previous high of last month. A total of 125.5 tons of metal was discharged containing 104.5 percent of the output plutonium forecast, which is a new record. The input was 101.0 percent of forecast. Operating efficiency was 82.5 percent indicating a substantial reduction which was attributed to an extensive tube checking program at the F reactor, and an electrical outage caused by a pole fire on the 230 KVA system. Seven tubes of the 100-F reactor indicated possible water leaks, and were isolated from operation. Extensive investigation is being done on the possible cause and correction of this problem.

There were 21 Uranium jacket failures during December which required 162 hours of outage time for removal operation, or an average of 7.7 hours per rupture. This reduction in outage time was attributed to 14 of the 21 instances being discharged within the scram recovery time, or a savings of approximately 350 hours of potential outage time.

SEPARATIONS SECTION

A total of 144 runs and 3 acid washes was started in the Separation Canyon Building, and was 96 percent of the amount forecasted. The lower percentage was due to the hold-up of material for the Redox Plant. A total of 151 runs and 2 acid washes was completed in the Concentration Buildings, and was 100.7 percent of the forecast. The 80 runs in the T Plant represents a new record for an individual building performance. A total of 147 runs and 4 acid washes was processed in the Isolation Building which was 107 percent of the forecast.

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SEPARATIONS SECTION (Cont'd.)

The average cooling time was 48 days with a minimum of 40 days being used. The average purity of the completed charges was 99.0 percent.

Single cycle and multicycle runs were made with "cold" uranium at Redox. Evaluation indicated that a plant uranium throughput of approximately 3 tons per day could be attained. Approximately 7,200 pounds of UNH was transferred into the 203-S system and sent to the UO_3 plant. The introduction of irradiated pieces into the dissolvers was completed, and the material will be used for the tracer runs to begin in January, 1952.

GENERAL

Organization

Effective December 1, nomenclature of the Plant Engineering Unit was changed to Power and Maintenance Unit in each of the three sections. Concurrently, a Plant Engineering Services Unit was established in each section.

Personnel

W. A. Blanton was appointed Superintendent - Plant Engineering Services in the Metal Preparation Section effective December 1, 1951.

C. P. Cabell was appointed Superintendent - Plant Engineering Services in the Separations Section effective December 1, 1951.

C. N. GROSS, MANAGER
MANUFACTURING DEPARTMENT

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MANUFACTURING DEPARTMENT

PATENT REPORT SUMMARY
FOR
MONTH OF DECEMBER, 1951

Richland, Washington
January 9, 1952

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

INVENTOR	TITLE
NONE	NONE

C. N. GROSS, MANAGER

MANUFACTURING DEPARTMENT

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for C. S. Shattuck Jr
V. D. Donihee
Accountability Representative

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MANUFACTURING DEPARTMENT
METAL PREPARATION SECTION
DECEMBER 1951

I. RESPONSIBILITY

The Plant Engineering Services Unit was established on December 1, 1951, incorporating the engineering functions, project administration and cost analysis services previously assigned to other units.

The Purchasing and Stores Section assumed full responsibility for stores stock material in Building 3717. Previously personnel of this group were responsible for dispersing material, with the Power and Maintenance Unit responsible for inventory.

II. ACHIEVEMENT

Operating Experience

1. Statistics

	November	December	To Date
Billets Produced (Tons)	35	34	297
Bare Pieces Machined (Tons 4")	122	153	1141
Briquettes Produced (Tons)	19	10	158
Oxide Burned (Weight Out Tons)	3	4	38
Acceptable Pieces Canned (Tons, 4")	113	131	1156
Acceptable Pieces Canned (% Forecast)	102.7	104.8	-
Melt Plant Billet Yield (%)	90.8	84.5	88.8
Melt Plant Solid Yield (%)	94.5	92.1	94.2

Statistics (Cont'd.)	November	December	To Date
Machining Yield (%)	73.2	74.6	76.4
Chip Recovery Yield (%)	86.2	90.2	87.9
Canning Yield (%)	77.4	75.6	79.7
Autoclave Frequency (No./M)	.02	.09	.08
Maximum steam generated (lb./hr.)	31,000	37,000	
Total steam generated (lbs.)	17,056,000	21,101,757	
Steam generated (average rate lb./hr.)	23,690	28,363	
Coal consumed (Total tons)	1,004	1,329	
Sanitary water from 3000 Area (gals.)	23,205,600	23,309,100	
Well water pumped (Total gal. to construction)	24,000	36,000	
Total water (average rate, gpm)	537	522	
Chlorine residual (ppm)	.49	.50	

Machine Shop Backlog	Man Hours	Man Weeks*
Instrument Machine Shop	3139	6
Electronic Fabrication Shop	2798	10
Mechanical Development Shop	2600	3

*Based on 40 hour work week

2. Activities

The lower production of briquettes during the month resulted from a two weeks outage of the chip recovery press for major repair, backlogging approximately 12 tons of chips. The decreased solid yield is attributed to this situation. The lower billet yield was due principally to increased billet cropping and surface machining as a result of more stringent interpretation of physical specifications for Hanford billets as described in document HW-23076, "Billet Specifications", dated 12-20-51. The lower to-date billet yield was the result of re-cropping and machining 24 tons of billets from storage to conform to the above specifications.

Approximately 80% of the uranium machined during the month was from virgin type material which was rolled during September, October and November. The higher yield resulted from improvement in the surface quality of the October and November rolled rods. Despite this significant improvement, defects consisting of rough ends, irregular surfaces, seams and cracks continue to exist, although to a lesser degree. Approximately 31 tons of eight-inch bare slugs were machined without incident. The decreased canning yield resulted chiefly from the difficulty associated with the use of Victor cans and the training of a large number of new men.

None of the slugs tested for penetration during the month were found to be penetrated to within .015" of the outer surface of the can wall.

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Analysis of the five autoclave failures which occured during the month indicated three to be the result of defective cans or caps and two attributable to operating techniques.

3. Special Operations

During the month 1008 man hours were utilized in canning 3131 pieces of poison, 6677 "B" pieces and 470 pieces of chemical 10-66. In addition, 709 man hours were required in the preparation of other special request materials. Approximately 2 tons of eight inch slugs were canned on a limited basis to test equipment performance, operating techniques and procedures. At the 305 test pile, 103 routine and 70 special tests were performed.

4. Schedule Variance

The production of machined bare slugs was 117.7 percent of tonnage forecast. This was the result of the effective utilization of trained manpower in the machining operation which was available during the shutdown of the briquetting press.

The canning production was 104.8 percent of the tonnage forecast, resulting from the procurement of additional manpower.

B. EQUIPMENT EXPERIENCE

The chip recovery briquetting press failed on November 28, 1951 as a result of a cracked master cylinder sleeve. Previously a mild steel sleeve was used on the piston. This was removed and a steel sleeve installed in the cylinder, providing a steel to cast iron contact which is expected to give longer life.

C. IMPROVEMENTS

1. Adoptions

The installation of ventilating ducts to remove chloride fumes from the bronze furnaces have reduced element failures and it is estimated that a savings of approximately $8500 per year in furnace repair costs will result.

A conveyor was installed on the rod straightener in building 314 to prevent pile-up of rods beyond the straightening rolls a cause of frequent breakdowns. This also reduces physical effort in material handling.

Welding head nozzles of refractory material were installed on the can welders in 313 building, extending their useful life considerably.

2. Inventions and Discoveries

Personnel in the Metal Preparation Section engaged in work which might be expected to result in inventions or discoveries have reported no inventions or discoveries for the period covered by this report.

[redacted]

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D. PLANT DEVELOPMENT AND EXPANSION

1. Project Status

Project C-199 - 300 Area Sewage Disposal System. The contract was let to L. H. Hoffman.

Project C-433 - Additions to 300 Area Power House and Pumping Station Facilities. Actual construction has not started to date.

Project C-481 - Equipment for 8" Slug Manufacture. Project authorized on December 5, 1951; Work Release was issued with starting date of December 17, 1951 for design, procurement of material and fabrication of equipment.

2. Manufacturing Engineering

The development of cost information and preparation of cost standards were the major activities during the month. Cost standards were issued for the following:

Process Labor - 8" Slug Machining - HW-22854
Process Labor - 4" Slug Machining - HW-22855
Process Material - Aluminum Silicon - HW-22946

Tentative standards were prepared for the consumption of tin, copper, bronze and flux; formal standards for these materials to be issued next month.

Test results for increasing feed rates on the roller-turner lathes were issued in Document No. HW-23017. This increase will result in an annual saving of approximately $6300 for machining 4" slugs.

E. REPORTS ISSUED

Number	Title	Author	Date
HW-22873	Monthly Report-Chemical 68-56 Month Ending 11-30-51	J. S. Shipp,	12-3-51
HW-22944	Production and Manpower Forecast December 1951-Operations Unit, Metal Preparation Section	W. Windsheimer	12-10-51
HW-23076	Billet Specifications	W. Windsheimer	12-20-51
HW-22874	Essential Material Requirements, Operations Unit, Metal Preparation Section - 300 Area	W. Windsheimer	12-3-51
HW-22897	Instrument Application and Design Group Monthly Report for November, 1951	M. T. Slind	12-4-51

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III. PERSONNEL

A. Organization Changes

Effective December 1, 1951 in accordance with establishment of the Plant Engineering Services Unit, Metal Preparation Section, W. A. Blanton was appointed Superintendent, Plant Engineering Services.

B. Force Changes

	Monthly	Weekly	Total
Beginning of Month	69	351	420
End of Month	72	370	442
Net Increase	3	19	22

C. Safety Experience

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

D. Radiation Exposure

A weekly badge reading of 655 mrep was investigated in conjunction with the Radiological Sciences Department. The badge had been defective during the period and some doubt exists as to whether the metal worker received the indicated exposure.

W. M. Mathis
Manager
Metal Preparation Section

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MANUFACTURING DEPARTMENT
REACTOR SECTION
DECEMBER, 1951

I. RESPONSIBILITY

Assigned responsibilities of the Reactor Section were not changed during the month of December. Effective December 1, the name of the Plant Engineering Unit was changed to Power and Maintenance Unit. Simultaneously, the Plant Engineering Services Unit was officially established; at month end, the unit is in the process of being organized.

II. ACHIEVEMENT

Operating Experience

The reactor input production was 101.0% of forecast, but was 3.1% less than the total production for November. Principal reasons for this decrease were a process tube leak testing program at F Reactor and an electrical power interruption due to a pole fire on the 230 KVA system.

The reactor output production was 104.5% of forecast. A total increase of 30 MW over previously established maximum operating levels was achieved during the month, due primarily to improved temperature distribution control techniques, continued annealing of the graphite, and an increase at D Reactor in process water pressure from 395 to 400 psi. The increased pressure makes possible an increased allowable heat input per tube.

There were 21 uranium slug jacket failures during December, 14 of which were discharged within the scram recovery time limitation. It is estimated that these "fast" discharges made it possible to avoid approximately 350 hours of potential outage time. The average outage time required per ruptured slug removal during December was 7.7 hours, representing the most effective removal operations thus far achieved.

Production summary:

	B	D	DR	H	F	Total or Average
Reactor Time Operated Efficiency (%)	85.8	93.8	85.8	92.3	53.6	82.5
Reactor Outage Time (Hrs.)						
Plutonium Production	70.2	16.0	84.0	33.9	315.2	519.3
Production Tests	2.0	14.3	-	1.5	-	17.8
Electrical Power Interruption	25.9	16.1	22.0	22.1	30.0	116.1
Total	98.1	46.4	106.0	57.5	345.2	653.2

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Manufacturing Department
Reactor Section
December, 1951

Production summary: (Continued)

	B	D	DR	H	F	Total or Average
Reactor Unscheduled Outage Time (Hrs.)	73.1	12.1	86.4	39.8	257.1	475.5
Metal Discharged (Tons)	30.48	23.59	21.32	20.57	29.59	125.55
Water Pumped - Bldg. 181 (GPM Average)	41,441	92,378		49,977	32,299	216,095
Steam Generated (M lbs.)	130,441	215.992		108,826	106,399	561,658
Coal Consumed (Tons)	9,043	15,245		7,454	7,995	39,737

A new problem in scram recovery was brought into focus at 100-H Reactor during the month when excessively high delta tube temperatures were experienced for a brief period during reactor startup following the "fast" discharge of a ruptured slug. This is due to the fact that the rods, which are normally in this section of the pile for flattening, are removed to provide necessary reactivity.

The high temperatures experienced are of a very transient nature and, because of rapid movements of pile flux during startup, are difficult to pinpoint. To assure optimum treatment of this problem, training meetings on the subject are planned for Operations personnel.

On December 17, it became necessary to employ an Auto-Crane at 100-D Area to facilitate the unloading of frozen coal from the railroad cars.

Due to increased steam loads in 100-D Area, a steam driven condenser water pump was placed in service at 182-D Building on December 26, 1951. This action was taken to preclude the possibility of vacuum loss on the Building 190 steam driven equipment in the event of an electrical power failure. A loss of vacuum on the turbines coincident with a power failure would result in emergency steam requirements that could exceed the capacity of the boilers in service. It is more economical to operate the steam pump than to put another boiler on the line.

A Critical "Y" power condition on December 14, caused by a pole fire on the 230 KVA electrical distribution system, resulted in 115.2 hours of reactor outage. The pole was replaced by Electrical Distribution forces.

Equipment Experience

At D Reactor on December 30, an outage of 0.5 hours was required to discharge a ruptured slug. Shortly following startup, a scram occurred due to low water pressure when a process water pump at the 190 Building was removed from service because of a hot bearing. Resumption of operation was impossible because of transient poison considerations. An outage of 27.3 hours followed which was used for metal discharge.

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Manuracturing Department
Reactor Section
December, 1951

Equipment Experience (Continued)

Two emergency shutdowns of the reactors were directly caused by failures of reactor facility equipment during December which resulted in a total outage time of 1 hour. Another emergency shutdown of 0.5 hour occurred due to failure of P-13 equipment at H Reactor.

Considerable emphasis was placed on the location and correction of process tube water leaks at F Reactor during December. A total outage time of 252.1 hours was devoted to this work, seven leaking process tubes being found and isolated. At month end, there is no positive evidence of water leakage.

Repairs were initiated on two horizontal rod facilities at F Reactor during December. Binding of "B" rod was corrected by installation of new graphite track and the rod was returned to operation. Removal of a leaking No. 7 rod thimble was started. However, separation of the thimble made it necessary to discontinue the work until a later shutdown when special extraction tools will be available. No. 7 horizontal rod at B Reactor was returned to service on December 1 following completion of the repairs indicated in the November, 1951, report.

The Fire and Sanitary elevated water storage tank at 100-D Area was isolated from the system and drained on December 26 to eliminate dangerous icicle hazards caused by excessive water leakage. The tank will be returned to service as soon as weather permits.

Inspection and repairs to five 190-DR turbines were completed during the month by the Worthington Pump and Machinery Company's service engineer. Nine turbines remain to be inspected.

Extensive repairs to the F Reactor effluent downcomer were completed during an extended outage on December 4 - 6, 1951. A subsequent inspection made on December 14, 1951, revealed no further damage.

Improvements

Considerable improvement was made in the technique of testing reactor process tubes during the leak testing program at 100-F Area.

An expanding rubber insert and a modified nozzle cap which would withstand 1000 psi pressure were developed. This made it possible to test approximately 40 tubes per hour as compared to 9 tubes per hour using previous methods.

The addition of sand and Antrafilt material to the filters in the Water Filtration Plants in order to improve their performance was completed during December. Details concerning this program are given in a report by W. R. Conley entitled "Evaluation of Filter Materials", dated July 16, 1951.

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Manufacturing Department
Reactor Section
December, 1951

Improvements (Continued)

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

Plant Development and Expansion

Projects in which the Reactor Section had a significant part during the month were:

C-431 (100-C Plant)
The design of the 100-C Plant is approximately 93% complete. The construction of the Water Plant is approximately 16% complete compared to a scheduled 37% at month end. Construction of the reactor is 23% complete compared to a scheduled 26%. Installation of the bottom row of outlet "B" blocks of the reactor was completed during the month.

C-438 (Ball 3X Facilities for B, D, DR, H and F Piles)
Directive No. HW-230, Mod. No. 3, dated December 5, 1951, has been received from the Atomic Energy Commission authorizing expenditures up to $2,200,000 for this project. Of this amount, $125,000 was designated for design-engineering and $2,075,000 for procurement of materials.

Because of manpower procurement problems and other reasons, it was decided to have construction forces accomplish the installation rather than Reactor Section forces.

C-475 (Crossheader Pressure Monitoring - 105-B, D, F, DR and H Reactors)
A work release was issued by the Process Unit on December 18, 1951. Installation work awaits completion of design and procurement of materials.

RDA-DC-3 (Improved Reactor Design)
The first Working Committee meeting was held December 13, 1951. This group recommended that the work on this RDA program should continue as described in HDC-2413 and that the scope described in HDC-2413 be used as the basis for design and construction of any new Hanford-type reactors required of the General Electric Company in the near future.

Process design has been divided into 10 categories as follows:

1. Process Piping
2. Process Tube Assembly
3. Effluent Water - Downcomer
4. Thermal Shielding
5. Graphite Packing

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Manufacturing Department
Reactor Section
December, 1951

Plant Development and Expansion

RDA-DC-3 (Improved Reactor Design) (Continued)

6. Biological Shielding
7. Primary Control - HS Rods
8. Secondary Control - VS Rods and/or Ball 3X
9. Ink System
10. Experimental Test Facilities

It is planned that a document will be prepared for approval by the Working and Scop Comm ttee for each system and will include a description of the system and of the system's requirements. The Contact Engineering group is reviewing the above requirements with the responsible engineer to insure that operating requirements are met.

RDA-DC-6 (Improved Water Plant Design)
The Design Committee and the Working Committee held a joint meeting on December 20, 1951, to discuss the basic information for scope of a new water plant. The minutes of this meeting and additional information are documented in HW-23079.

Development studies by Reactor Section personnel during December included work directed toward improved equipment and/or methods for controlling the reactors, removing stuck slugs from reactor tubes, lubricating process tubes during discharge, reducing reactor shutdown time under "critical power" conditions, reducing reactor gas losses, improving decontamination, improving reactor tube leak detection, and improving boiler efficiency of the power plants. Further details regarding these studies are contained in Document HW-23150.

Production tests having major plant development significance are as follows:

PT-105-473P (Use of Commercial Aluminum Sulfate for 100 Area Process Water Coagulation).
This test to use aluminum sulfate coagulation at the 100-F Area Filtration Plant was completed satisfactorily during the month. No appreciable change was noted in the effluent water as the area continued this method of water treatment for the second month. Test results are to be reported by the Engineering Department.

PT-105-503E (Use of Activated Silica as a Coagulation Aid for Aluminum Sulfate)
The installation of equipment for activated silica feed in conjunction with aluminum sulfate at the 100-F Area Filtration Plant, as outlined in this test,

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Manufacturing Department
Reactor Section
December, 1951

Plant Development and Expansion

PT-105-503E (Continued)

is approximately 95% complete. Activated silica addition to the water was started on December 28. No conclusive results were available at month end.

Reports Issued

Significant reports issued in the Reactor Section during December were:

"Monthly Report, Reactor Section - Operations, November, 1951" - HW-22894.

"Monthly Report, Reactor Section - Process Unit, November, 1951" - HW-22893.

"Reactor Section - Radiation Monitoring Technical Report for November, 1951", - HW-22983.

"Reactor Effluent Water Temperatures Exceeding 80°C" - HW-22974.

"Desirability of Charging Reactors During Operation" - HW-22510.

"Trip Report" - C. W. Botsford - HW-23106.

"Radiation Incident Investigation, Class I, Incident No. X-3" - HW-23081.

"Radiation Incident Investigation, Class I, Incident No. X-2" - L. V. Barker to File, dated 12-17-51.

"Radiation Incident Investigation, Class II, Incident No. X-3" - HW-23095.

A description of slug failures experienced during December will be contained in Document HW-23144 to be issued early in January.

III. PERSONNEL

Organization Changes

There were no appointments made in the Reactor Section organization during December.

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Manufacturing Department
Reactor Section
December, 1951

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Force Changes

	Section General	Power & Maintenance	Operations	Radiation Monitoring	Process	Section Total
Beginning of Month	3	773	235	51	28	1090
End of Month	3	783	237	52	30	1105
Net Change	0	+10	+ 2	+1	+2	+15

The changes during the month consisted of 4 terminations, 11 new hires, 3 deactivations, 3 reactivations, 13 transfers into and 5 transfers out of the Section.

Safety Experience

No major or sub-major injuries were sustained by Reactor Section personnel during December.

Radiation Exposure

No employee of the Reactor Section received a known radiation exposure in excess of 300 mrem/week during the month. Removal of ruptured slugs from the reactors was accomplished without overexposure of personnel or spread of contamination beyond established radiation danger zones.

Three Radiation Incident Investigations were conducted within the Reactor Section during the month. One incident involved exposure of several people to high neutron flux densities and gamma radiation at the front of an inadequately shielded process tube. Another involved high level contamination found on perforated aluminum dummies sorted for re-use. The other concerned the spontaneous closing of a retention basin inlet gate allowing effluent water to go directly to the river without normal retention.

Training

Activities directed toward obtaining and training qualified engineering and supervisory personnel to meet future requirements were continued during December. At month end, 26 individuals are receiving on-the-job training. This number includes 7 technical graduates on assignment under the Rotational Pool Program.

Of particular note was a two week training conference for supervisory trainees which was conducted by the Operations Unit. Leadership for the meetings was supplied by members of all Reactor Section Units. Certain lectures were made available to representatives of all Section Units on an optional basis.

E. P. Lee
Manager
REACTOR SECTION

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Richland, Washington
January 4, 1952

MANUFACTURING DEPARTMENT

SEPARATIONS SECTION

DECEMBER, 1951

I. RESPONSIBILITY

Final acceptance of the 200-East Area Waste Evaporation Facilities, Project C-423, was effected on December 8, 1951, with further work on the manifold of BX and BY tank farms as an exception. The new facility was placed in operation December 14, 1951 and is functioning satisfactorily.

Effective December 1, 1951, the Plant Engineering Services Unit was established as a part of the Separations Section organization. The Unit was assigned responsibility for:

1. Management of Separations Section projects for which the Manufacturing Department is assigned Management responsibility.

2. Contact engineering and liaison responsibilities for all projects for which the Separations Section is assigned Using Department responsibility, with the exception of the Redox, TBP and UO_3 projects.

3. The application of Manufacturing engineering principles and the forwarding of such studies required to establish and improve operating standards, reduce operating costs, develop new methods and establish justification for new work.

4. Preparation of budgets and budget reviews as required to maintain budgetary control of the Separations Section.

5. Review of operating costs of all phases of Separations Section operations and preparation of recommendations or explanation of excessive costs.

II. ACHIEVEMENT

A. Operating Experience

1. Production Statistics

a. Operations

	B Plant		T Plant		Combined	
	Normal	Acid Wash	Normal	Acid Wash	Normal	Acid Wash
Charges started in Canyon Bldgs.	71	2	73	1	144	3
Charges completed in Conc. Bldgs.	71	1	80	1	151	2
Special charges - Conc. Bldgs.	-		-		-	
Charges completed-Isolation Bldg.	71	2	76	2	147	4
Average Waste Losses	2.7		2.7		2.7	
Average MWD/Ton	572		580			
Special charges-Isolation Bldg.					6	
Average purity completed charges					99	
Material balance thru Isolation					99.6	
Yield through process					95.4	
Average cooling time (days)					48	
Minimum cooling time (days)					40	

b. Power

	November	December
Raw water pumped, gpm	6,541	6,654
Filtered water pumped, gpm	1,118	1,242
Steam generated, lbs/hr	149,034	198,739
Maximum steam generated, lbs/hr	197,000	265,000
Total steam generated, M lbs.	107,305	147,902
Coal consumed, tons (est.)	6,264	8,135
Lbs. steam per lb. of coal	8.57	9.09

c. Waste Evaporation

	December	To Date
Gallons Processed, 200-W	469,079	3,698,260
Percent Volume Reduction	71.9	73.3
Gallons processed, 200-E	280,500	280,500
Percent Volume Reduction	74.3	74.3

Separations Section

d. Waste Storage

	Batches
Metal Waste reserve storage capacity - T Plant	392
1st Cycle reserve storage capacity - T Plant	1372
Metal Waste reserve storage capacity - B Plant	802
1st Cycle reserve storage capacity - B Plant	300

2. Activities

a. Rework of High Waste Solution - Run T-11-11-DR-76

The processing of this run through the first decontamination cycle in Section 16 yielded, for reasons unknown, a high by-product waste loss of 8.41 percent. The waste was reworked with a final product loss of 2.64 percent and the product cake resulting from the rework was combined with the acid wash run in Section 17.

b. Redox Extraction

Introduction of cold uranium feed solution to the extraction batteries took place during December. One single cycle run (S-1) and three multicycle runs (S-2 through S-4) were completed by month end. Evaluation of the multicycle run results is being carried out by the Separations Technology Unit. A portion of the uranium introduced to the system was used to supply the necessary operating heels in uranium concentrators, a second portion of the material was recycled through the plant for further cold runs, and approximately 7,200 lbs. were transferred to 203-S for subsequent movement to the UO_3 Plant. During capacity tests carried out in conjunction with the cold runs, it was determined that a plant uranium thruput (3U, 3Pu Cycles) of approximately three tons/day could be attained with difficulty, the G-3 still pot and O-3-P-1 and P-2 organic pumps being limiting. Work is now under way to evaluate these limitations and increase plant capacity through equipment alterations and improved operating techniques.

Operation of the HR cage equipment was continued during the month on water and on synthetic third cycle final product solutions for instrument check out and operator training purposes. No plutonium was processed during December but is scheduled early in January, 1952.

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3. Special Operations

a. Acid Washes

Data are tabulated below which indicate the percentage of product recovered from the completed acid washes in terms of a standard charge:

Run	Extraction	Section 12 and First Cycle	2nd Cycle	Total 221 Bldg.	Total thru Process	Preflush B,E & F Cells
T-11-11-AW1	3.0	14.1	-5.3*	11.8	31.5	36.3
B-11-12-AW1	3.3	9.9	10.8	24.0	38.8	17.9

*Questionable results on 19-4P.

b. Americium Recovery

One special batch of dissolved button material from the 234-5 operation was processed in the Isolation Building for Americium recovery for off-site shipment. The material, which was shipped on December 10, 1951, contained 24.9 mg. of Americium and 6,704.8 mg. of Plutonium.

c. Uncontrolled Chemical Reaction During Make-up Operations - Redox

During the preparation of cake dissolving solution for run H-7 (ferrous ammonium sulfate, ferrous sulfamate, nitric acid, water), a fume-off occurred in the H-2-B weigh tank, throwing approximately one-half of the solution onto the floor and filling the South operating gallery with chemical fumes. No one was injured. Cake dissolution mixtures for succeeding runs were modified to eliminate a recurrence.

4. Schedule Variance

Actual production of regular material through the Isolation Building was 107 percent of the forecasted amount. Material actually started in the Canyon Buildings was 96% of the amount forecasted. All available material was placed in process, however, due to the necessity of holding back some material for longer lag storage for Redox, less material was available for the $BiPO_4$ plants than was originally scheduled.

B. Equipment Experience

1. Operating Continuity

a. Separations Section facilities were placed in standby status on the Christmas holiday.

b. On December 24, 1951 an emergency shutdown of the raw water supply system was necessary in order to make repairs on a line near the 200-W Powerhouse. The shutdown resulted in the loss of approximately 10 hours' production time in T Plant. No process abnormalities resulted in that there was sufficient warning to facilitate an orderly shutdown.

c. Failure of the 18-2 centrifuge in B Plant on December 28, 1951 resulted in approximately forty-eight hours downtime in the Canyon Building.

d. During the Christmas shutdown, freezing of condensate and waste effluent in lines resulted in considerable delay in starting up the 200-W Waste Evaporator. Thawing of lines and making minor repairs were required. Operation was resumed at 6:00 p.m. on 12-26-51. No heating system exists in either the hot or cold cell of the waste evaporator. Plans are underway to prevent a recurrence.

e. On December 1, 1951, a pole fire on the 230 KV loop between 251 Substation and 100-F resulted in an electrical power outage from 6:39 a.m. to 8:20 a.m. All emergency equipment functioned except the #1 emergency generator in west area powerhouse, which developed a defective oil circuit breaker. This condition has been corrected.

2. Inspection, Maintenance and Replacement

a. Centrifuge Replacement

The 18-2 centrifuge in B Plant failed on December 28th during cake washing and cake removal. The difficulty was first believed to be caused by a bent dip tube and attempts were made to remove the defective tubes. After twenty-four hours were spent in this effort, it was found that the trouble was in the lower motor bearing. At this point steps were begun immediately to replace the defective machine. The change was completed by month-end and operations were resumed.

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b. N-2 Filter Block Replacements

The N-2 filter blocks in Cells 2, 3 and 4 in the Isolation Building were replaced during the month due to slow filtration time through these units. Replacements were completed without incident and the units are now functioning satisfactorily.

c. Coil Replacement - B Plant

It was necessary to fabricate and install a complete set of steam coils in caustic tank #145SQ adjacent to the B Area canyon building. The failure of the original coils was caused by normal chemical action over a five year service period. Accelerated corrosion occurs at the caustic liquid level on the steam inlet line. A procedure was put into practice in April 1950, which increases the life of the coils considerably by alternating the steam intake and discharge lines.

C. Improvements

1. Adoptions

a. Run Make-up Procedure

In order to shorten the time cycle in the extraction step of the process, the 6-3 tank run make-up procedure in the $BiPO_4$ Plants was revised to permit the addition of the bulk of the dilution water to the 6-3 tank instead of the 7-1 or 8-1 tanks, as was the former procedure. The time cycle in the extraction step was reduced approximately thirty minutes by this change.

2. Inventions or Discoveries

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

D. Plant Development and Experience

1. Project Status

a. Redox

1) Dissolution and Metal Solution Preparation

All of the 300 Area cold uranium (21.6 Tons) brought into the building for cold and tracer run purposes has now been charged to the dissolvers and a portion

has been processed through the building. In addition, 815 lbs. of low level Clinton slugs and 1½ buckets of full level Hanford slugs have been charged and are being held in the dissolvers as tracer run stock material.

2) Plugging of Instrument Dip Tubes

During cold run S-3, the first salt crystal plugging of an instrument dip tube in the extraction battery developed in the 1-A column. The difficulty was corrected by a water flush of the tube. Following this, three other such plugs occurred in rapid succession and were corrected by a similar means. Since there have been evidences of similar plugging in other locations in the building despite "humidified" inert gas and air feed to the tubes, arrangements are now being made to bleed a small amount of steam directly into the critical instrument tubes along with the gas purge to avoid salt crystal formation. This arrangement, previously tested in the building, should cure the plugging ailment and should also reduce the amount of rust being forced into instrument flowrators from the humidified gas headers.

3) Column Hydraulic Tests

Column hydraulic tests carried out on the 1S, 1A, 2D, and 3D columns in conjunction with cold runs indicated that because of the head of heavy liquid in the columns, the level of organic in the gravity feed hexone line is higher than expected, and there is danger of hexone backup into the nitric acid injection units. To correct this situation, it will be necessary to move the mixing tee assemblies and their appurtenances to the 8th floor level. This alteration will extend organic feed and supply lines, nitric acid injection lines, and electrical conduit through holes drilled in the 8th level concrete floor.

4) Organic Feed Lines

Evidence gathered during cold runs S1 and S2 indicated that air slugs were being aspirated into the 1S, 1A, 2D, and 3D columns by entrainment in the incoming hexone; this condition causing the column differential pressures to vary widely, the interfaces to vary, and the let-down valves to adjust continuously as compensation for the difficulty. Such surging makes the

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differential pressure instrument on the columns practically useless for their intended purpose and creates a general instability in the extraction batteries which can also be noted somewhat in the uranium concentrators. As a temporary cure for this condition the organic feed line vents were blanked during run S-2, however, this arrangement caused difficulty due to air binding during the startup of run S-4. It is expected that a combination of blanks and bleed valves will be installed on the columns in question to permit venting during startup and subsequent operation with a closed system.

5) Plant Electrical Outage Test

Shortly after the start of cold run S-3 a planned emergency shutdown was carried out (simulated electrical failure) and power for the building was drawn from the emergency generator at the power house. The extraction battery and associated equipment were shutdown successfully and started again without difficulty some 20 minutes later. All building equipment powered through the emergency busses was checked and found to be properly connected; however, a burned out solenoid coil in a key breaker of the South substation prevented automatic switch over of the power for the entire South half of the building. Emergency lighting in this portion of the building was non-existent, and critical power operations (including all compressors and inert gas generators) were at a standstill. Some slight alterations to the building electrical system are expected to prevent future difficulty of this type.

6) Jetting of UNH Solution

On 12-22-51, the first attempt was made to transfer UNH solution from the E-12 tank via the steam jet to the 203-S uranium storage tanks. On the initial jetting only 300 gallons of the solution were transferred before liquid movement ceased entirely and it was only after much difficulty that the E-12 tank was jetted to a non-standard 6" heel. Gassing of the jet during this time was sufficient to force entrained UNH solution through the 203-S tank vent filters and onto the tank top. It has now been definitely determined that the jet design is not sufficient to meet the operating conditions in a normal manner and that the jet is functioning at or above the upper limit of its characteristics. Jet dilutions were abnormally high at 13 to 15%.

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The Penberthy Injector Company was consulted concerning operation of two jets in series, and their recommendations, received some 24 hours later, were carried out with no improvement noted in the transfer. Accordingly, operational spare pump #P-114, a high capacity pump expected to deliver approximately 45 gallons per minute under the conditions to be encountered, is being fitted into E-12 tank along with the necessary jumpers to convert the previous jet transfer to a pump transfer. The 203-S tank filter will be removed, back flushed, dried, and replaced, adding at the same time a copper heating coil and lagging to prevent blinding due to freezing weather with accompanying back pressure buildup in the tank.

7) Plow Installation

During the processing of head end cold runs, considerable difficulty has been experienced in forming consistently a MnO_2 precipitate structure which is amenable to washing in the centrifuge; the brown rubber-like cakes sometimes obtained showing resistance to the action of bowl sprays during washing with subsequent high uranium losses. As an aid in removing the cake from the bowl side, a fluorothene tipped plow was installed in the spare centrifuge and the unit placed in the cell. The plastic tips of the plow are designed to contact the bowl side and exert a scraping action on the MnO_2 slime. The initial use of the plow on cold run H-12 indicated that very satisfactory cake removal was effected, although the technique of plowing remains to be further developed. A Revatrol unit will be installed in the centrifuge electrical system to provide a constant 10 RPM speed during plowing operations since it is now very difficult to maintain the proper bowl speed while the plows are in use. One factor in the formation of the rubber-like cakes is now thought to be acid deficiency of the dissolver solution where excess acid is supposed to be present. Dissolver operating procedures are being revised to correct the acid concentrations.

8) As-built Drawings

During jumper design work associated with the installation of a transfer pump in place of a steam jet on the E12 tank, several errors in "as-built" dimensions were discovered on the pump drawings. Further checking of pump and agitator drawings against related "as-built"

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jumper prints has shown that multiple errors exist, with inconsistencies noted on the same drawing, between related "as-built" drawings, and with certified vendors drawings. This condition has been called to the attention of the Design Section, however, it is not known at this time what corrective measures will be taken. As they now stand, the as-built drawings form a questionable basis for continued successful remote maintenance of the plant.

b. TBP - Project C-362

1) Project Schedule

A management review meeting was held December 10, 1951 to review the schedule issued November 19. The target date of January 19, 1952 for beneficial occupancy of the 221-U Canyon has not been changed, however, the required manpower to meet this date has not been obtained and late delivery and modifications to equipment are delaying some phases of the work. The Atkinson and Jones Company expects to meet the scheduled March 1, 1952 date for the completion of the facilities required for full scale production.

2) Bronze Operating Nuts on the Phase I and II Connectors

As previously discussed in the last month's report, several of the cast manganese-bronze operating nuts on the subject connectors have failed in service. This matter was investigated by the Crane Company who, after considerable testing both at the Crane's Chicago Plant and at Hanford have concluded that it is possible to determine the soundness of casting by the surface hardness. The Design, Metallurgical, and Manufacturing personnel of the General Electric Company concurred in this conclusion, and similar tests conducted by the Vitro Corporation substantiated this decision.

Testing with a Rockwell Hardness Tester of all bronze operating nuts which have been received at Hanford was undertaken primarily to obtain sufficient good nuts for the operation of the first cascade of U-Farm. The U farm unit was equipped with acceptable nuts on December 21, 1951. Testing of the remaining nuts is continuing to determine which nuts are good and how many have to be replaced. The following table shows the test results up to month end.

	2" Connectors	3" Connectors	4" Connectors
Maximum acceptable Hardness (Rockwell "B")	84	87	88
No. of available acceptable connectors	38	36	241
No. of unacceptable connectors	147	111	163

3) Metal Waste Storage Tank Temperature

The contents of some of the underground storage tanks receiving metal waste have either reached or are approaching the boiling temperatures of these waste solutions. The present 105-TX tank temperature is 238°F in the sludge level and 210° in the supernate level. By-pass lines have been installed in the metal waste tank cascades in both the East and West areas in order to reduce from four to two the number of tanks which cascade in series, thereby reducing the sludge level and temperature rise in the first tank of a cascade. However, the existing temperatures of current waste definitely exceed the temperatures used as a basis for design of the waste removal units.

The Plant Assistance Group of the Separations Technology Unit has been requested to compile existing data of metal waste temperatures and to forecast the tank temperatures for the next several years so that a review can be made and required action taken to offset this high temperature condition by the time that the particular waste solution is to be processed. Heat exchange thimbles have been fabricated for installation in the tanks requiring cooling. Three of the sludge pumps are being fabricated with class H insulation and special bearings in order to withstand the operations at high temperatures. After the above review is made, the number of special pumps required may have to be increased.

4) Inadvertent Waste Tank Filling

On 11-20-51 water inadvertently seeped into the 106-C Metal Waste Storage Tank from a hose which had been left running to prevent freezing of the water line. After extensive checking it was determined that the liquid level in the tank had raised approximately

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8½ inches and had reached the level of the stubbed inlet lines. All survey work showed no indications of tank overflow and the level of the tank has remained constant for the past four weeks. Corrective measures have been instituted to prevent a similar occurrence.

c. UO_3 Project C-361

1) General

Directive HW-158, Modification No. 10, was issued December 3, 1951 approving Part II, Revision II of the C-361 Project Proposal. The directive authorized the following:

1. A reduction in total project funds to $1,952,000.
2. The General Electric Company to incur costs not to exceed $1,658,000. for construction accomplished before October 1, 1951 and for assigned A.E.M. functions.
3. A transfer of capital property having an estimated book value of $16,000.

2) Start-up Runs

A total of 27 full pot charges were calcined this month using 321 Building UNH stand-in material. All 321 material has been calcined to date and a separate accountability established prior to receipt of the first Redox material on December 22, 1951. For purposes of additional run data some of the 321 material was returned from drums to the pots and recalcined. Several partial pots were calcined in connection with clean-up of the 321 material from C-1 tank and the clean-up of pots.

3) Radiation Levels from Redox UNH due to U-237

During the irradiation of uranium a short-lived isotope of uranium, U-237, is formed in appreciable quantities. Due to this formation, a definite radiation hazard would exist in the UO_3 facilities if the UNH solution received from the Redox Plant and cooled to less than 80 days were immediately processed. This problem is currently under consideration and proposals are being made for lag storage facilities of the Redox UNH solution for an additional 30 to 40 days prior to use

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as feed for the UO_3 Plant. These proposals include the erection of a shielding wall around the X-1 and X-2 tank for immediate lag storage usage and the construction of a permanent lag storage facility. The location and tank requirements for the permanent facility are currently under study.

4) UNH Transfer Line

During the week of December 23, the Redox UNH transfer line was calibrated by pumping water from Redox tanks 151-S and 152-S (203-S tank farm) to the C-1, X-1, and X-2 tanks at the UO_3 Plant. The data obtained indicated a line holdup of 694 gallons after pumping and a net holdup of 57 gallons after blowing the line to C-1 tank. Studies on system hydraulics indicate no back flow to 203-S with a full line and an 8 gallon drainage to the UO_3 areas. The pumping rate from 203-S to C-1 tank varied from 24 to 30 gallons per minute.

On December 22, 1116 gallons of UNH were received in the C-1 tank by pumping and blowing from the Redox 203-S tanks.

d. Addition of Fifth Boiler, 200-W - Project C-477

Preparation of a Revised Project Proposal C-477-R1, to cover Addition of Fifth Boiler to the 200-West Area Power House, is completed. Approved Specification No. HW-4839, to cover work on this project, has been forwarded to the Atomic Energy Commission.

A review of the design scope of work on Project C-477 resulted in a decision to issue specifications covering installation of a new 80,000#/hr. boiler equipped with an air preheater and traveling grates. However, alternate bids will be requested for installation of a boiler similar to the existing boilers. The addition of an air preheater and traveling grate may be eliminated if economic or procurement factors should prove unfavorable.

E. Pertinent Reports Issued

Document	Title	Author
Unclassified	December Monthly Report-Separations, Power and Maintenance	R. T. Jessen
Unclassified	December Monthly Report-Separations, Plant Engineering Services	C. P. Cabell
HW-23125	December Monthly Report-Separations, 234-5 Building, Operations	V. R. Chapman

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Document	Title	Author
HW-23124	December Monthly Report-Separations, Operations	V. R. Chapman
HW-23156	December Monthly Report-Separations, Radiation Monitoring	A. R. Keene

III. PERSONNEL

A. Organization Changes

Effective December 1, 1951, coincident with the establishment of the Plant Engineering Services Unit in the Separations Section, C. P. Cabell was appointed Acting Superintendent of the new unit.

B. Force Changes

1. Number of employees on roll

	Monthly Roll	Weekly Roll	Total
Beginning of month	260	1191	1451
End of month	260	1209	1469
Net Increase	-	+18	+18

2. Personnel Changes

	Monthly Roll	Weekly Roll	Total
Transfers in	0	+21	+21
Reduction in Force	0	0	0
Transfers out	0	-11	-11
Reactivates	0	+1	+1
New Hires	0	+15	+15
Terminations	-2	-4	-6
Weekly to monthly	+2	-2	0
Removed from Payroll	0	-2	-2
Net Increase	0	+18	+18

3. Work Schedule

The Instrument Sub-Unit of the Power and Maintenance Unit went almost entirely off a planned overtime basis during December, with other Units working overtime as required by construction and start-up of new facilities.

C. Safety Experience

1. Fractured Toe

On December 7, 1951, a heavy truck driver sustained a fracture of his left great toe while handling empty nitrogen cylinders. In moving the cylinders, a fork lift truck was being utilized by stacking the cylinders on the fork by hand. One of the cylinders slipped off the truck and fell on the injured's toe.

2. Safety Record Achievement

On December 28, 1951 the 200 East Area completed the third consecutive year (3½ million man-hours) or a total of six one year periods without a lost time accident.

D. Radiation Exposure

1. I^{131} Emission

Stack emission of I^{131} from T and B facilities continued at a total average rate of approximately 3.5 curies/day.

2. There were no Class I or Class II Radiation Incidents during December. Three Informal Radiation Hazard Investigations were held by the Separations Section.

3. Dusty UO_3 Condition

On December 13 the cyclone separator hold-up tank outlet became plugged. Repeated hammering on the line to dislodge the plugged material was ineffective. Since the design of this equipment did not provide clean-out entry at this point, the line was broken to correct the stoppage. In the course of this action a supervisor, two operators and a maintenance man were exposed to dusty UO_3 conditions when UO_3 fell freely from the hold-up tank into a catch drum provided. An informal investigation of this incident was made. Two subsequent plug-ups occurred, with one unloosened by dismantling the same equipment using blanks at break points in the equipment removals. The other was dislodged by tapping on the equipment. On December 26, when this equipment had been cleaned following completion of Redox material runs, a clean-out leg was installed above the star valve in the spool piece which had previously required removal.

Manager
Separations Section

RS Bell:OVS:mvk

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TECHNICAL SECTION

1/10/52

DECEMBER 1950

SUMMARY

Pile Technology Unit

The total force in Pile Technology decreased from 345 in November to 337 in December. This is in part due to the completion of the P-10 Development program and rotation of technical graduates.

A fire, probably resulting from spontaneous combustion of contaminated waste, caused gross contamination of the building housing the Critical Mass studies. Since the project was essentially finished, a final report will be written and the building will be decontaminated to such an extent that it can be abandoned.

The calibrations of the test piles which have been completed include a measurement of the strength of the horizontal control rods and vertical safety rods. An attempt will be made to use these techniques for measurements of the 100-Area Piles.

Further calculations on the characteristics of the "criss-cross" lattice and the increase of buckling with graphite density have been made. Theoretical calculations of the graphite temperature-reactivity coefficient for the 7.5 inch lattice indicate a loss in hot reactivity may be expected for this lattice at normal operating levels. Experimental equipment including the beam catcher and the apparatus for the xenon experiment is either completed or under construction.

Some recommendations have been made for the shielding of C and X Piles. The changes which have been considered include the use of Brookhaven concrete and additional shielding of the rear face and effluent water. Heat transfer calculations indicate that at a power level of 1200 MW with slight front to rear enrichment the maximum concrete temperature would be about 120°C.

A program to develop and test techniques for handling various heavy concrete aggregates has been started by the Mechanical Development group. Studies of the charging and discharging machines, horizontal control rods, and safety systems are continuing.

Studies of the rates of reaction and thermodynamics of systems comprising graphite, carbon monoxide, carbon dioxide, hydrogen, and water are continuing. X-ray studies indicate some recovery of graphite damage in the central region of F Pile attributable to the CO_2 pile atmosphere, but no such recovery is evident in the fringe regions.

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Recommendations for a time delay after a Panellit alarm have been issued. It is felt that the recommended time delays will reduce the possibility of melting the slug jackets following complete water stoppage. An automatic system for shutting down the pile using time delay relays has been installed at B Pile; it is now by-passed but will be put in service after a suitable testing period.

The piles maintained average operating conditions or attained new maximum power levels during the month. The operation of F Pile was discontinued for eight days in an attempt to find all the water leaks. Twenty-one ruptures occurred during the month, 15 being removed without difficulty and six requiring from 18 to 30 hours for removal. An apparatus for the detection of tube leaks was constructed and tested with satisfactory results.

Visual inspection of discharged slugs and Panellit readings indicate that the use of aluminum sulfate for coagulation of the F Pile cooling water has removed the film which had been formed on the slugs by the Ferrifloc-treated water. Accelerated corrosion studies of aluminum alloys in both types of water indicated significantly lower rates of corrosion of 2S and 72S in the alum-treated water. Other corrosion studies including tests of stainless and low carbon steels are continuing.

An evaluation of the feasibility of using 63S, a commercial aluminum alloy, for tubes and jacket material has been started; the indications are that it will have superior mechanical and corrosion resistant properties. Tensile measurements have shown that the tubes in current use at Hanford are much harder than given in specifications; this has been evidenced by cracking during the flanging operation.

No satisfactory procedure for frost testing the eight-inch canned slug has been found. Work on a modified frost test and other methods is continuing.

Measurements of the ductility, density, reactivity, and chemical composition of the Sylvania slugs have been made and compared with those obtained for alpha-rolled uranium. Several uranium slugs have been canned in air using the hot pressing technique developed by Sylvania. It was found that under the conditions employed the aluminum diffused into the uranium forming a bond between the two metals.

Construction work and operating tests for the plutonium metallurgy laboratory are almost complete.

Routine operation was experienced in most of the special irradiations including the high pressure water channel and the measurements of electrical resistivity and thermal conductivity of various alloys. The creep test of the Knolls Atomic Power Laboratory fuel pin and the fission chamber life test have been scheduled for January.

The stripper addendum has been installed and was used successfully for processing by-product fractions as well as regular production runs. Since no more air-contaminated product will be processed in the glass equipment, one of the glass lines will be dismantled. Studies on adsorption and desorption of gases have shown that palladium sponge may be reactivated by a simple rapid treatment.

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Separations Technology Unit

There were no significant changes in $BiPO_4$ process or operation during the month. Iodine in ventilation air continues low as a result of mercuric ion complexing. The waste evaporator at B plant started up successfully. Reduction of Isolation Building time cycles appears possible as a result of Production Test 231-13. All pieces produced in Fabrication were machined to final shape during the month with only one void being encountered. Shakedown tests with stand-in materials are continuing in the RMA line.

In the Redox plant, three "cold" solvent extraction runs have been completed with uranium process solutions. Losses have been below flowsheet values and potential capacity bottlenecks have been detected and remedied. Cake removal procedures for head-end processing have proved inadequate and at month-end, a Teflon tipped plow was installed in the centrifuge to accelerate cake removal. Runs at 5 percent of HW radiation level are planned for early January with the possibility of full level studies being started about January 21.

In the Metal Recovery plant, shakedown of the UNH-UO_3 conversion equipment is proceeding in an attempt to determine the optimum time-temperature conditions for producing product of acceptable purity. At short cooling times, the presence of U_{237} in Redox UNH creates a potential radiation hazard in the UO_3 conversion equipment. Means are being studied to provide greater cooling between Redox and conversion. Revisions to Metal Recovery operating procedures are under way prior to comment by Manufacturing.

Redox development activities have continued in the support of Recuplex engineering specifications for solvent extraction contactors. The corrosiveness of various slag and crucible dissolving conditions are being tested with various stainless steels and it appears that satisfactory dissolver life will be attained. Magnetic induction flowmeters, designed and fabricated by the Vitro Corporation are currently under test. The Hot Semiworks was carried to 55 percent completion.

In the research laboratory, significant reductions have been made in stage heights for Recuplex in a one-inch pulse column. The continuous crossover for Purex application appears feasible based on laboratory studies. The decontamination of Redox condensate overheads by ion exchange methods has yielded decontamination factors of greater than 2000.

In the 234-5 laboratory, exploratory studies indicate the plutonium IV oxalate precipitation from AT solutions to be feasible with satisfactory losses and precipitation densities. Laboratory reduction yields have been lower than expected (80-93 percent).

Attempts will continue to reduce crucible diameter so as to effect less wastage during direct machining.

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Analytical Unit

During the month, bugs in analytical methods and equipment disclosed during the cold Redox start-up runs were corrected and the remaining methods and special equipment needed for the hot runs early in January were supplied. In respect to methods development, a chromatographic procedure for separation of fission products from interfering uranium-237 and uranium daughters prior to the evaluation of fission product beta and gamma activities was further improved to yield a 90% recovery of the latter and was approved for control laboratory use. Also, studies were conducted on a direct mount radiochemical procedure allowing rapid determination of plutonium in the presence of uranium and aluminum, and with a laboratory model chain hydrometer permitting rapid determination of the concentration of aluminum nitrate solution with adequate precision. Methods firmed up or proven under control laboratory conditions were the measurement of solids in process feed make-up solution; the evaluation of acidity by both pH and volumetric techniques; the x-ray determination of uranium; colorimetric determinations of dichromate, permanganate, tetravalent plutonium, and iron; the flame photometric determination of sodium; analyses for americium-curium, ruthenium, aluminum, and sulfamate; and the assay of various feed solutions. For quality control, a program was initiated for submission of blind standard samples to the control laboratory via the process operating personnel.

Various difficulties encountered with analytical methods employed in support of UO_3 process shakedown runs appear to have been brought under control. The volumetric determination of water in oxide product gives sharp, stable endpoints that indicate complete recovery of water from the solid; however, this will be checked further by comparison with a more laborious method to be employed at Site K-25. A method for nitrate determination, involving dissolution of oxide in phosphoric acid, vacuum distillation, and titration of the distillate, was found to work well on oxide produced in the plant. Less favorable results had been obtained during method development because of the use of a coarser, less readily soluble oxide. The determination of tetravalent uranium in oxide was modified. A change in the standard A.S.T.M. bulk density method was effected because the oxide is not free flowing. Surface area measurement on the initial oxide samples was made by research personnel, but at month's end control personnel had been trained in conduct of the procedure on duplicate equipment. The decision to substitute a qualitative tungsten determination for the elaborate quantitative determination appeared to be justified because no tungsten was detected in the initial group of oxide samples analyzed. The mass spectrometer to be employed for measurement of uranium isotopic composition was received on plant site and will be installed shortly.

The General Electric mass spectrometer for the analysis of P-10 samples met the acceptance test and has received limited control use. Introduction of a new source head and a higher speed diffusion pump by the General Engineering Laboratory eliminated previous difficulties. The instrument is adequately sensitive, resolves the He^4 and HT peaks, shows good stability, and exhibits a satisfactory degree of linearity between response and sample pressure.

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A further step was made in the program to substitute disposable stainless steel discs for platinum discs in the radiochemical determination of plutonium; it was found that pretreatment of the discs in concentrated nitric acid saturated with dichromate passivated the steel and prevented the strong corrosive action of fluoride present in some samples. As a result, it is now possible to effect complete introduction of stainless discs for all process samples.

The number of analytical service determinations reported during December totaled 42,450. This is a new high, at least for the past two years.

Continued effort to improve the accuracy and precision of the very exacting chemical assay of metal casting samples has yielded the desired results. Differences in cuttings, possibly due to segregation, now appear to be limiting, rather than the precision of replicate titrations of a given cutting.

Technical Services Unit

Maximum effort of Laboratory Equipment Design was expended toward completion and installation of laboratory equipment for the Redox Analytical and Plant Assistance Laboratory, Bldg. 222-S. One "analytical line" was sufficiently complete at month end to permit chemical trial runs. Development of basic equipment for the multicurie hot cells continued, as well as assistance to Separations Technology personnel on the installation of in-cell chemical equipment for head end treatment and column studies.

Preliminary construction work has started on Phase II of the Redox Analytical and Plant Assistance Laboratory. The Atkinson-Jones Company is the CPFF contractor for this additional work.

The subcontract for A-E services covering Phase II of the Mechanical Development Bldg. in the Works Laboratory Area received final AEC approval on December 28. Under the terms of this subcontract (No. G-416) the Dix Steel Building Co. is allowed four months to complete all work and services after formal notice to proceed.

Construction work on the Radiochemistry Bldg. in the Works Laboratory Area has been temporarily suspended pending the arrival of structural steel. The steel is in the process of fabrication and January shipment is anticipated.

Excavation has been started on the Retention Neutralization plant for the Works Laboratory Area and on the trenches leading to this facility. This work is a portion of the Plot Plan and Utilities contract awarded to the L. H. Hoffman Construction Co. on November 26. Construction of the Badge House for the Works Laboratory Area is progressing rapidly with the outside wooden sheathing being virtually complete.

The concrete column footings supporting the canyon floor of the Radiometallurgy Bldg. have been completed and the reinforced concrete columns are nearing completion. Footings have also been completed for the Pile Technology Bldg. and forming of the basement walls is in progress. The L. H. Hoffman Construction Co. has the contract for construction of both of these Works Laboratory Area Buildings.

Construction of the Library and Files Bldg. is temporarily delayed pending receipt of structural steel. All concrete work on the building footings has been completed and the files storage vault has been poured.

Laboratory services operations continued routinely during the month. Additional personnel were assigned to Bldg. 222-S and are being trained in decontamination procedures in preparation for shift operation of the decontamination room.

The statistical investigation to determine the causes for large variation in the quality of uranium rods received at Hanford Works was continued. In conjunction with this investigation, a method of controlling the dimensional stability of incoming uranium rods was set up for the Metal Preparation Section of the Manufacturing Department.

The experiment designed by the statistics group to determine what effect varying the inner distance between the aluminum can and sleeves would have upon the production of aluminum-silicon rejects and other rejects related to sleeve sizes was completed by the Metal Separations Section. The results of the experiment indicated that a control of can and sleeve dimensions should be maintained to keep rejects at a minimum. A method to facilitate that control was recommended.

Assistance was rendered to the Pile Technology Unit in designing an experiment to compare material produced by the Sylvania Process with that produced by the Hanford Works process. Numerous equations concerning coefficients of thermal expansion of uranium powder compacts were derived for the Pile Technology Unit.

Analysis of Pu distribution data relating to Recuplex studies was continued for Chemical Research, Separations Technology Unit. A special summary of comparisons of gms PU/MWD as observed at extraction versus theoretical values of this ratio from Document HW-12163 was prepared at the request of the Separations Technology Unit.

For the Analytical Unit, calculation of precisions of certain mass spectrometer determinations on P-10 by-product samples was completed and reported. Also, data on specific gravity, AT, and purity determinations were collected from the 231 Bldg. control laboratory for the purpose of establishing checking limits. Checking limits for plutonium radioassays of 231 Bldg. laboratory sump samples was completed. A curve relating grams plutonium per ton to MWD per ton was fitted to data collected by Analytical Research.

A slug exposure rate history is being prepared to use in correlating slug rupture and slug power. Slug power distribution will be calculated from about 30 temperature traverses to obtain back histroy, and one or two traverses will be processed monthly for each pile to keep the accumulation current.

A very complicated calculation of the gamma flux distribution in a laminated shield has been completed. A similar calcuation for a Brookhaven concrete shield is being undertaken.

The first of an anticipated series of papers dealing with parameter and distribution free techniques of wide application was completed. The problem considered was one frequently encountered in quality control work dealing with specification limits.

O. H. Greager

MANAGER, TECHNICAL

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January 7, 1952

PILE TECHNOLOGY UNIT

DECEMBER, 1951

VISITORS AND BUSINESS TRIPS

Visitor	Date	Address	Purpose
R. M. Haag F. K. Heumann	12-11/15-51	KAPL	P-10 Consultation

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Name	Date	Place Visited	Purpose
J. J. Cadwell	12-1-51	Univ. of Wisconsin	Consultation regarding elasticity problems
J. M. Atwood	12-1-51	Exposition of Chemical Industries, NY	Attend exposition
	12-2/5-51	A.I.Che.E. Annual Meeting	Attend meeting
S.S. Jones	12-5/12-51	KAPL & GEL	Check on heater design and special material machine
R. B. Socky F. B. Quinlan	12-7-51	Univ. of Illinois	Consultation on non-destructive testing techniques.
	12-4/6-51	ANL	Consultation on non-destructive testing techniques.
J. H. Bach	12-12-51	Aluminum Co. of America	Metallurgical Consultations
	12-13/15-51	Sylvania Electric Products Co.	
	12-17/18-51	AEC:Wash. D.C. Oper. Office	
	12-18-51	Aluminum Co. of America, Edgewater	
J. B. Cole	12-13/14-51	Sylvania Electric Products Co.	Metallurgical Consultations
G.E. McCullough	12-1 -51	Ames Laboratory	Discuss metal fabrication
	12-13/14-51	New York	General Advisory Meeting
	12-17-51	Mass. Inst. of Tech.	Discuss metal fabrication.
	12-14-51	Sylvania Electric Productus Co.	Discuss metal fabrication.
W. A. Clark	12-27/28-51	Berkeley, Calif.	Attend American Physical Society Meeting

ORGANIZATION AND PERSONNEL

	November	December
Physics	45	43
Pile Engineering	77	76
Metallurgy	64	67
Pile Applications	71	71
P-10	74	66
Administrative	14	14
	345	337

Physics: A physicist transferred to Pile Applications; two technical graduates transferred in, as engineer assistants, one from P-10 and one from Pile Applications, two technical graduates transferred to Pile Applications; one laboratory assistant terminated, two transferred to Design and Construction Management Section, and one transferred in from Pile Applications; a steno-typist transferred in from Project Engineering Unit.

Pile Engineering: A physicist terminated; one technical graduate transferred to Design and Construction Management Section and one to Technical Services Unit; two laboratory assistants were hired and one transferred in from Public Works Unit; an engineer assistant transferred to Design and Construction Management Section, one to Metallurgy, and one transferred in from P-10.

Metallurgy: A metallurgist was hired; an engineer assistant transferred in from Pile Engineering; a technical graduate transferred to Reactor Section, Operations Unit, and one transferred in from Radiological Sciences; and a laboratory assistant was hired.

Pile Applications: A physicist transferred in from Physics; an engineer transferred in from P-10; two technical graduates transferred in from Physics, one transferred to Physics, one transferred to Radiological Sciences, one to Separations Technology Unit, and one to Design and Construction Management Section; a laboratory assistant transferred to Physics; and a steno-typist was re-activated.

P-10: The supervisor in-charge of P-10 transferred to Technical-General; a chemical engineer terminated and one transferred to Pile Applications; two technical graduates transferred to Separations Section, Operations Unit, one transferred in from Separations Technology Unit; one laboratory assistant terminated; one engineer assistant transferred to Physics and one to Pile Engineering.

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Administrative: A general clerk terminated and one transferred in from Transportation Section.

CRITICAL MASS

Critical mass data for which complete analytical results have been received are listed below:

16" Stainless Steel Sphere, Untamped
34.151 liters, 573 MWD/t, 75° F

Critical Mass	Total NO_3/liter	Total H/liter	Total Σ_a (cm^{-1})
1194	104.4	107.3	0.02239
1303	180.0	104.7	0.02320
1483	281.8	100.5	0.02400

Analytical results have been received for the fuels which were used in determining criticality for sulphate ion additions, but the results do not agree with calculated values. Efforts are being made to resolve these discrepancies.

A fire broke out in the room used for storage of contaminated waste and equipment in the laboratory building on December 4. The cause of the fire is not definitely known, but it is believed to have been the result of spontaneous combustion within contaminated waste storage cartons. The fire spread to the cutting room and building ventilation system before it was brought under control, resulting in gross contamination of the entire building, and extensive damage to facilities. It is felt that the small amount of experimental work still to be done does not justify the expense of restoring the equipment to operable condition. Work is now in progress to complete the removal of recoverable product and usable equipment and to clean up the building so that it can be abandoned without further hazard. A final report on all technical work accomplished during the course of the experimental program is being prepared.

IMPROVED PILE STRUCTURE

Exponential Pile Experiments

The major portion of December was spent reassembling the laboratory equipment and erecting the standard pile and 7.5 inch lattice assembly in their new location in the 189-D Building. Standardization of counting equipment is being held up pending installation of the necessary electrical lines. Offices for the group have been set up in the vault of the 1704-D Building.

Calculation of the diffusion length of the Savannah River graphite has been completed for the first source position. The calculated value of 62 cm. is in good agreement with that obtained by the Theoretical Physics

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group using image theory but not with Sigma pile measurements. Investigation of both calculations is continuing.

General Lattice Design

The apparatus for the small scale production of Xe^{135} in the Test Pile has been assembled in the 305 Building. Tests in accordance with Production Test 305-15-P will begin next month. A new generator slug is being fabricated for comparison with the present slug during the Test Pile operation.

All equipment components necessary for counting of the xenon in the Test Pile experiment are on hand or under construction. The thermal neutron flux at the Standard position in hole number 26 of the Test Pile was measured as $(4.26 \pm 0.2) \times 10^7$ nv/cm^2/sec. for a 480 cm. galvanometer deflection. A two-inch diameter by three-inch high NaI crystal has been prepared for use in absolute gamma counting.

The permanent beam catcher for the crystal diffraction neutron spectrometer has now been completed. The design of a new collimator and collimator shield has been completed and turned over to Project Engineering. More accurate measurements of the neutron flux from the "Y" Test Hole at DR Pile were made, giving $(5.7 \pm 1.4) \times 10^6$ nv/cm^2/sec. from the rectangular collimator and $(7.3 \pm 1.1) \times 10^6$ nv/cm^2/sec. from the tapered collimator.

Progress is being made on the magnetic spectrometer project. The main components of the magnetic field measuring system are now being built or are on order. Forms for the Helmholtz coils to be used are being fabricated and preparations have been made for winding these coils on a lathe. The mercury contact assembly for the rotary coils is being fabricated. In support of this design, tests were made to determine the head of mercury that could be supported by different annular clearances. It was found that an annular space of 0.005 inches would support from 0.5 to 0.6 inch of mercury and one of 0.003 inch would support from 2.0 to 2.2 inches of mercury.

Preliminary calculations on the characteristics of a "criss-cross" lattice obtained by rotating every other process tube layer through ninety degrees in a horizontal plane indicate a thermal utilization about three per cent lower than the standard lattice.

Calculation of the effect of graphite density in a lattice indicates that the buckling increases almost linearly with graphite density with a slope of about 60 microbucks for each gm/cm^3 density change.

Large Scale Pile Structure

Work has continued on the control requirements for new piles including investigation of modified rod sizes for both horizontal and vertical control systems. Results will be reported next month.

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Consideration has been given to the factors contributing to the graphite temperature-reactivity coefficient in the present piles and an estimate made of the effect to be expected in a 7.5 inch lattice. The calculated coefficient for the wet 7.5 inch lattice is about half the value observed in the present lattice. This would mean a loss of 100 to 200 inhours hot reactivity at normal operating levels.

SHIELDING STUDIES

Calculation from theoretical considerations of the gamma flux in the Hanford shield is now complete and that for the Brookhaven shield is nearing completion. The results of this calculation will be compared with the experimental measurements now being made to determine the validity of the calculation methods employed.

Numerous shielding calculations are in progress for components of C and X Piles. For example, the higher power levels anticipated for X Pile will require additional shielding throughout the rear face and the effluent water system.

Use of the Brookhaven concrete shield has been recommended for X Pile. A compendium of data pertaining to this material has been prepared to assist in the solution of problems where this type of shielding will be employed. A nominal biological shield thickness of 63 inches has been recommended for X Pile, assuming a concrete density of 4.3. Cooling coils have been recommended for the top, side, and rear face shield as the result of joint study of the problem by members of Engineering and Physics Sub-unit. Studies and tests to determine the most desirable gun-barrel design for use with concrete shielding are continuing.

OPERATIONAL PILE PHYSICS

Enrichment Studies

A column containing fifteen aluminum-uranium alloy slugs centered by standard uranium slugs was charged in Tube 0674-H on Production Test 105-502A. Each alloy slug was eight inches in length and contained four per cent, by weight, U^{235}. The reactivity gain from this charge was about 8.5 ih which is equivalent to approximately 27 ih in the center of an unflattened Hanford pile. Power output per unit length of enriched column was six per cent less than that of regular metal.

Long Term Gains Study

The study of H-Pile reactivity gains from start up to first discharge is continuing with the current effort directed toward comparing the calculated Sm^{149} build-up rates with the observed rates obtained from data evaluation. Theoretical and experimental evidence of the samarium effect at saturation are in agreement.

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Instrument Development

Ion Chamber Test: Saturation curves run on the Knolls Atomic Power Laboratory high temperature ionization chamber indicate continued satisfactory performance of this equipment. The total exposure to date is about 2×10^{19} neutrons cm^2.

Scintillating Crystal Gamma Ray Spectrometer: Most of the performance testing and calibration work on this equipment is finished. Two major points which require further investigation are: (1) improvement of the pulse-height calibration precision, and (2) correction of a tendency for the gain of the A-1 amplifier to vary with counting rate. The gamma ray spectrum of Na^{24} was measured using a thallium-activated sodium-iodide crystal with results comparing favorably with accepted literature values. However, a measurement of the N^{16} gamma ray spectrum yielded values about five per cent lower in energy than those quoted in the literature. This apparent discrepancy will be investigated further.

Ruptured Slug Detection: Arrangements are being made to set up a water line in the near sample room at H-Pile to test the performance of the scintillating crystal gamma ray spectrometer on the slug rupture detection problem. Earlier duPont data were inadequate to establish the feasibility of this technique. Calculations have been made which establish correction factors to be applied in extrapolating from an uranyl nitrate test to an actual rupture. This work indicates that the delayed neutron system may not be as sensitive as was previously thought; as a result, the approach to this problem is being rescoped.

Temperature Monitoring Facilities: The IBM at DR Pile operated with a minimum of maintenance during the month. Good data coverage was obtained, with data of specific interest provided for several special studies.

Flexowriter Installation: An appropriation request was submitted to the A and E Committee to obtain funds for the Flexowriter installation at B Pile. The design of this installation has been completed.

Test Pile Calibration: The horizontal control rod has been calibrated over the range of 90 to 120 inches and was found to have a strength of -0.909 ih/inch. From this the total rod strength is calculated to be 0.214 per cent k.

The vertical safety rod strength was measured by analysis of the power level transient following rapid insertion and was found to be 0.65 per cent k. Efforts to extend these techniques to the 100 Area Piles have begun.

The effect of atmospheric pressure on pile reactivity was remeasured and the coefficient found to be -0.220 ih/mm Hg from the change in control rod position necessary to maintain pile at critical. An independent measurement of the coefficient by means of pile periods at a fixed rod position yields

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the value - 0.236 ± 0.020 ih/mm. The coefficient is found to be constant over the range of 723 to 768 mm Hg.

A recheck of the galvanometer system shows it to be linear over its normally-used range. An apparent time delay of response found in the microbarometer is being investigated. The Thermohm and associated equipment are undergoing recalibration by the standards group.

The Logarithmic Beckman Amplifier used in conjunction with a fast recorder was demonstrated to be quite valuable in measuring rapid power-level transients.

The reactivity effect of a neutron absorber in the graphite stringer has been remeasured using cadmium wires but analysis of the data is not yet complete. The effect of total sample mass upon the absorption per unit mass has been investigated for aluminum. These data indicate that the macroscopic cross-section is only slightly sensitive to the total mass of aluminum in the sample masses of the order of several grams. Efforts are being made to generalize this investigation.

GRAPHITE STUDIES

Pile Graphite - Sampling

A series of measurements and sample collections was completed for six process tube channels at the H and F Piles during the month. Tube block bore diameter traverses continue to show distortions in the graphite channel which are many times greater than original machining tolerances. Regions along the length of a channel are found to be much larger in diameter than original dimensions, while other regions of the same channel frequently are smaller than the original dimensions. Although the majority of distortion is enlargement of the bore, diameters as small as the external dimensions of the aluminum process tubes have been observed; this may be a contributing factor to the sticking of process tubes. Sufficient data will be taken to allow interpretations to be made and to assign the reasons for the erratic dimensional changes.

Careful efforts to produce co e saws hard enough to cut the hard, abrasive, damaged tube block graphite have not been too successful. Inquiries concerning the use of carboloy cutting teeth have been discouraging. A few cores have been removed from the old piles using a cyanide hardened steel cutter; valuable data from these and from a considerable number of cores from the lesser damaged H Pile, incite sufficient interest to continue the improvement of the core cutter as a sampling instrument.

Spectrographic analysis of graphite powder samples mined from process tube bore positions adjacent to leaking process tubes at the F Pile showed some increase in impurity concentrations over similar samples taken from a dry channel. Principal impurity increases noted were of calcium, aluminum and iron; however, concentrations were less than one per cent. The porous nature of the graphite makes it appear unlikely that impurities could be removed readily.

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Pile Graphite - X-ray Diffraction Studies

Improved techniques and the considerably superior resolving power of the recently installed North American Phillips spectrometer have been responsible for refinements which indicate that the former interpretation of structural changes in graphite caused by irradiation damage may require revision. One conclusion from the new data is that the mode of damage to graphite in a test hole is different from graphite damage produced in the tube blocks. Although these discoveries do not materially alter previous conclusions and correlations, they do require a more elegant explanation of pile conditions and they may point to reasons for some anomalies which are known to exist when Co spacing is used as a damage criterion.

The crystal lattice spacing observed for a series of mined graphite powders removed from a central process tube channel at the F Pile, when compared with a similar survey made in July, 1950, shows an expected recovery in graphite damage throughout the central region of the pile. This effect has been observed at the other old piles and may be attributed to annealing effects caused by higher operating temperatures since the addition of a carbon dioxide atmosphere. The fringe regions of graphite, on the contrary, continue to show expansion with little or no effect attributable to the transition of a helium to a carbon dioxide atmosphere.

A correlation of these results with observations made at the B Pile and reported last month would lead to the conclusion that little more graphite annealing can be expected in the central tube blocks of the F Pile.

Pile Graphite - Stored Energy

The stored energy values determined by the National Bureau of Standards on graphite samples mined from a standard channel and from overbored process tube channels at the DR Pile correlate well with crystal expansion measurements made and reported earlier. The results show that graphite damage in the bore of the overbored channel is materially less than in similar locations in a standard channel with the exception that the extreme fringe positions show comparable damage. As discussed in previous reports, it is believed that properly designed bore enlargement will greatly reduce graphite damage throughout the fringe region.

Controlled Temperature Exposure of Graphite

Graphite samples irradiated at the B Pile through a range of temperature operated at an average of 212° C., 176° C., 164° C., and 124° C. for the month. Individual temperatures varied by as much as 15° C.

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Surface Studies of Graphite

The low temperature adsorption-desorption characteristics of a graphite sample which had been exposed in the F Pile in an atmosphere of carbon monoxide were found to be distinctly different from a virgin sample of the same graphite or irradiated samples which had been exposed to other gases. These data are in concurrence with other observations which indicate that a surface film builds up on graphite when it is exposed in carbon monoxide. It may be possible, through these studies, to identify the physical nature of the film which is considerably different from a graphite surface. Such information is very pertinent to the graphite burnout problem.

Micro pore size distribution has been determined for WSF graphite and was found to be quite similar to the KC and CS graphites studied earlier. The uniformity of the physical surface area throughout any single bar is being investigated. The first two determinations gave 0.75 and 0.76 m^2/g for a parallel and transverse sample from a WSF bar.

Thermal Conductivity Measurements

Considerable difficulty has been encountered in attempts to use the graphite core disc apparatus to obtain thermal conductivity data as a function of temperature. Modifications to obtain these data are being implemented.

The apparatus designed to obtain the thermal conductivity of gases and gas mixtures from 20 - 400° C. is in the final stages of assembly.

Chemical Studies

A laboratory apparatus to study the chemical reactions between graphite and various gases has been completed and calibrated. An initial experiment using carbon monoxide in the presence of graphite at 200° C. showed that no reaction occurred. The tests will be repeated at higher temperature intervals to determine if graphite catalyzes the reaction:

$$2\,CO \rightarrow C + CO_2$$

Graphite Burnout

A laboratory determination of the rate of reaction between virgin graphite and carbon dioxide has indicated that the reaction between 800 and 1,000° C. is:

$$C + CO_2 \rightarrow 2CO$$

with an activation energy of 76 kilocalories per gram mole. Reaction rates extrapolated to 400° C. from these laboratory studies are several orders

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of magnitude less than the observed in-pile rates; it is questionable whether similar laboratory rates using irradiated graphite can account for this inconsistency. This observation is encouraging because of the possibility that reaction rates in the pile are determined by factors other than the conventional chemical kinetics, for example, the rate of ionization of the gases present. If this is the case, the weight losses in graphite may be far less sensitive to temperature increases than has been previously supposed. This possibility is being actively investigated by means of experiments now in progress.

Thermodynamic Studies

Equilibrium calculations have been completed for a system comprising graphite, carbon dioxide, carbon monoxide, hydrogen, and water with concentrations similar to those occurring in the pile. The objective of the study was to determine the effect of increases in water vapor concentrations on the chemical reactions involving graphite. The principal conclusions is that water vapor concentrations up to 2.3 per cent (saturation at 20° C.) have negligible effect on any reactions involving graphite.

Thermal Expansion Studies

Thermal expanison coefficients for CSF, CSGPF, KC, KS, WSF, Lampblack, and natural graphites between 25° C. and 700° C. have been measured and tabulated.

New Graphites

Samples of special TS grade graphite have been received from National Carbon Company and are being prepared for tests of irradiation stability. This new material is made from Texas coke and Standard pitch and corresponds to the type of graphite which most likely will be made for future pile construction.

HEAT STUDIES

Automatic Time-Delay for Panellit System Alarm

Document No. HW-22870, "Recommendations for Time Delay after a Panellit Alarm", R. G. Vanderwater and W. D. Gilbert is being issued. The material in this document cites the need for a rapid pile power reduction following the occurrence of any of several abnormal tube conditions. To avoid excessive slug and tube temperatures in case of a partial or complete water flow stoppage in a tube, the following recommendations were made:

(1) The permissible time delay between occurrence of a Panellit alarm and the time the pile is shut-down should be less than five seconds for 500 MW pile operation and three seconds for 600 MW operation.

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(2) The No. I Safety Circuit should be used to shut down the pile following a Panellit alarm. The No. I circuit utilizes the Vertical Safety Rods while the No. II Circuit, which is presently used, utilizes only the Horizontal Safety Rods.

(3) A time-delay relay or other suitable means should be provided at each pile to eliminate unnecessary scrams resulting from momentary pressure fluctuations.

It is not certain that the recommended time delays will prevent melting of the aluminum slug-jackets following complete water stoppage in the hottest tube, but they will greatly reduce this possibility.

Tests are continuing at the B Pile, under Production Test No. 105-502-E, to determine the feasibility of using time delay relays for scramming the pile in case of a Panellit trip. Over a 41-day test period only one scram would have resulted from use of the automatic system and this occurred during a ten-day test period with the delay set at only two seconds. During test periods of 15 and 16 days when ten and three second delays were used, no scrams would have occurred. Two time-delay relays have been installed in parallel in the No. II circuit at B Pile with a delay setting of three seconds. These are now by-passed but will be put into service as soon as they have been suitably tested.

New Pile Design Studies

If slug specific power is a limitation on power level, higher levels may be obtained by utilizing longer metal charges. However, the annulus size and water plant capacity must be changed accordingly. As an aid to the design of new piles, calculations have been made of slug surface temperatures for a 28-foot active metal length with various tube powers, tube flow rates, annulus sizes, and tube inlet pressures. The calculations and resulting curves are being issued in Document HW-23065.

Shielding of New Piles

The possible use of concrete biological shields on the front and rear faces of new piles has been considered from the heat transfer viewpoint. For one proposed design, a one-inch steel plate would be placed at the inner side of the shield in close contact with the shield. Calculations based on the best available heat generation values indicate that the maximum concrete temperature in a rear shield would be about 120° C. This value is based on the assumption of a 1200 MW power level with slight front to rear enrichment. The temperatures in the front shield would be below those in the rear. The calculated temperatures do not take into consideration any heat loss along the gun barrels.

In order to keep the loss of moisture from the concrete to a minimum, it might be desirable to cool the rear shields. This cooling could be accomplished by attaching cooling tubes, spaced about three feet apart, to the inner steel plate.

Experimental Slug Stress Work

Work is being done to simulate the stresses present in slugs in the pile by heating the slugs electrically. Preliminary tests to determine the apparent electrical resistivity of uranium and the apparent electrical resistance of the metallurgical bond between the uranium slug and the end caps have been performed. Analysis of the data has not been completed.

WATER STUDIES

Water Quality Experimental Facility

Construction of the water quality experimental facility has proceeded to a point where operational testing is being carried on concurrently with completion of the installation. Although there is considerable work to be done before the facility is complete, it is estimated that the first water quality test will begin about January 15, 1952.

Sodium Dichromate Elimination Tests

The sodium dichromate elimination tests, Production Test 105-453-P, operated satisfactorily during the month. Because of the very fine mesh screens which are used in the system, there is a tendency for the strainers to plug during purging. This difficulty is not serious and is taken care of easily by following closely the purging operation.

Process Water Recirculation

Document No. HW-23101, "A Survey of the Problems Associated with Pile Cooling by the Recirculation of Process Water", outlining the major problems of recirculation and proposing an experimental program has been published. The equipment for carrying out these experiments is being constructed in in 100-F Laboratory. Progress this month was only slight as a result of extraordinarily heavy maintenance load in the 100-F Area.

Aluminum Sulfate Coagulant Process Water

Production Test 105-473-P, "The Use of Commercial Aluminum Sulfate for 100 Areas' Process Water Coagulation", was continued during the past month. No significant changes in tube pressure drops or effluent water activity have been found. The rate of decrease of the process tube Panellit pressures has leveled off somewhat indicating the film which was formed with Ferrifloc

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treated water has been almost completely removed. A visual inspection of slugs discharged for F Pile tends to confirm this. The residual aluminum concentration in the water has been higher than expected, but the favorable results which have been obtained to date from the test indicate that this higher concentration, 0.20 ppm, is satisfactory. The production test for the use of alum was terminated on December 28, 1951, at which time Production Test 105-503-E, "The Use of Activated Silica as a Coagulation Aid for Aluminum Sulfate", was initiated, A final report on Production Test 105-473-P will be issued shortly. Production Test 105-503-E will operate under the same limits as Production Test 105-473-P, but will determine if the use of activated silica as a coagulation aid will increase filter plant capacity.

105-F Flow Laboratory

The slug jacket abrasion test was continued during the past month. However, few significant data were obtained because of the extended pile outage at the 100-F Area.

The can difference test has been terminated and the report was issued as Document HW-23102, "The Effect of Process Water on Three Types of 2S Aluminum Jackets", N. R. Miller to Files, December 27, 1951.

Corrosion

The high temperature corrosion test has been underway for about 30 days and the results to date tend to indicate that the corrosion rate decreases between 118° C. and 135° C. This decrease in corrosion rate is thought due to the difference in film formation rates at these two temperatures.

It was found impossible to run corrosion test at 150° C. because of tube fouling. At this temperature the film formation rate was excessive and the film was of a different type than those encountered at lower temperatures. The 150° C. film is composed almost entirely of calcium carbonate.

The short-tube corrosion apparatus is now operating in the 185-D Laboratory. In this test, water at different velocities is supplied to two-foot lengths of process tube in groups of three tubes each. One section of tube in each group is empty, the second contains aluminum dummy slugs, and the third contains magnesium dummy slugs. It is hoped that by being able to weigh the tubes more comprehensive data on tube corrosion rates will be obtained.

The installation of the induction heating facility for corrosion studies was completed on December 15, 1951. Preliminary shake-down tests indicate that heat loads and temperature distribution similar to those encountered in an operating pile tube may be obtained in this facility. Actual corrosion tests will be started during the coming month.

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Construction work on the 50-tube mock-up corrosion facility was resumed on December 17, 1951. Construction is scheduled for completion by February 1, 1952.

MECHANICAL DEVELOPMENT

Charging and Discharging Program

A study and preliminary layout of a proposed new method of charge-discharge while operating are underway. This system will differ from that which has been recently tested in that backseating of slugs will not be required. A Collins type seal will be used at the outlet nozzle and the slugs will make their own water seal. Approximately 1500 slugs of various types have been passed through a seal of this type. Although some of the slugs used had rough surfaces, the rubber still formed a good seal at the end of the test.

Horizontal Control Rods

Endurance testing has continued on the C Pile gland seal which incorporates a graphite gland collar, rubber "O" rings, and water lubrication against a cylindrical, 61S aluminum rod. The tests have been satisfactory except for a small amount of chattering of the front "O" ring which is being studied further. The erection of the full-scale horizontal rod mock-up has been postponed for a month owing to other priority construction work and the fact that delivery of prototype parts for these tests is still further in the future. An agreement was reached on the disposition of the contaminated rod drive unit which is to be removed from 105-B at the expense of this project. It will be returned to the spare parts warehouse.

A study has been made of possible methods of providing better horizontal rods for the old piles. The following possibilities appear feasible depending on the amount of graphite distortion present:

(1) Utilize old thimbles with a cut-down graphite track and improved rod design.

(2) Adopt new C Pile rod design by removing the thimble and using a gland seal.

(3) Place a thimble externally between the pile and the barricade wall with the rod seal at the wall.

Vertical Safety Rods and Third Safety System

Tests are nearly completed with the modified (weighted) DR rod and C Pile hydraulic shock absorbers. Sufficient drop-test data have been collected so that an orifice diameter can be tentatively specified. Deceleration

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factors and stresses will be calculated as soon as the displacement-time curves have been analyzed.

During an effort to test "Molykote" as a lubricant for the No. 20 VSR at 100-D, the rod picked up portions of the old, hardened grease which prevented its slipping through the seal. This situation will be corrected by a complete cleaning of the rod, seal, and step plug at the next shutdown.

Slug Damage Studies

The in-pile slug rib damage tests under Production Test 105-468-P have been 75 per cent completed, with only three tubes of slugs remaining to be charged through 100-F Pile. Some discrepancy has been noted between the depth of scratch in these tests, by microscopic measurement, and the scratch depth obtained by production means in the 300 Area with a Starrett depth gage. It is hoped that these differences will be resolved by further comparisons on the remaining three tubes at 100-F.

Process Tubes, Gun Barrels, Nozzle Connectors, and Strainers

An extensive study is in progress to investigate the nature of operational difficulties caused by graphite growth in the old piles and to devise and test corrective measures. Problems associated with charging of metal and replacement of process tubes and gun barrels at the upper levels of B, D, and F will be simulated. This will be done first with the single tube mock-up in the 189-D Laboratory, for preliminary information, and later in the 305-A nine-tube mock-up.

A gun barrel deflection test is underway on the proposed taper-bore assembly for Research and Development Authorization - TP #3. These tests will parallel those which were recently completed on the C Pile flexible barrels.

Concrete Shielding

An extensive program is being undertaken to develop, test, and study handling techniques with various heavy aggregate concretes. An outline of physical testing which will be done by the Mechanical Development group has been prepared. Steps have been taken to prepare the 186-D Building for a concrete test laboratory wherein it will be possible to mix and prepare batches, pour samples, and carry out the actual physical testing of concrete specimens.

Other Tests and Programs

The test memorandum for the rear-face television installation has been issued and one complete closed circuit system, plus one added viewer, has been requisitioned. Design and drafting work for both the pile installation and mock-up are approximately one-half completed.

A cost estimate of $70,000 has been received to cover requirements of equipment and labor for the P-13 Pressure Assembly removal. Since full agreement on the method of removal has been reached among all parties concerned, a Project Proposal is being prepared to authorize the required expenditures.

Preliminary designs have been made on several possible systems for improvement in air weighing of irradiated slugs. These will be developed further and reviewed with Pile Applications personnel who will be responsible for actual operation of the new equipment. Design and drafting for a new water-cooled test hole facility for the Graphite Studies group have been nearly completed.

METALLURGY OF URANIUM

Fabrication

The fine-grained randomly-oriented uranium slugs prepared by powder metallurgy techniques at the Sylvania Electric Products Company were harder and less ductile than alpha-rolled uranium. The density, reactivity, and chemical composition of the pressed and alpha-rolled uranium are comparable. A production test was written to cover the irradiation of slugs produced by powder metallurgy.

The laboratory evaluation of conditions for satisfactory beta heat treatment of uranium rods in a salt bath was completed. Arrangements are being made for off-site heat treatment of some alpha-phase uranium rods rolled at Simonds Saw and Steel Company.

A program initiated jointly by the Atomic Energy Commission, New York Operations Office, and Hanford Works personnel has resulted in a great improvement in uranium billet and rod quality. This improvement is reflected in an increase in rod to slug yield from about 71 to 79 per cent for August and October, respectively. Steps were taken to improve both billet surface quality and control of rod temperatures during rolling and to establish close inspection of the finished rod.

Physical Measurements

The use of the General Electric Metals Comparator to detect the degree of transformation of uranium is being further investigated. The completely transformed slugs from different rods were re-heat-treated at 710° C. The slugs showed a definite decrease in impedance values with a corresponding decrease in the range of values obtained. A group of slugs from the 246X lot (machined prior to finish rolling), and a group of slugs with surface cracks, both transformed at 710° C., gave impedance values in the same range as those above. Comparator evaluation appears more feasible for slugs beta heat-treated at 710° C. than for slugs heat-treated at 683° C. The studies indicate that slight surface cracks have little effect on impedance readings at the lower frequencies.

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METALLURGY OF PLUTONIUM

Construction work under Project C-198 is nearing completion. Operating tests preliminary to final acceptance of the laboratory have been completed for all metallurgical laboratory equipment except for the hoods and the instrument panel.

Design of a thermal analysis furnace of low heat capacity to operate under vacuum or in an inert atmosphere has been completed and construction of the furnace is underway. Diffraction values have been calculated from data found in the literature for a large number of plutonium compounds.

METALLURGY OF HANFORD STRUCTURAL MATERIALS

Pile Process Tubing

Future piles may require longer process tubes which may need to withstand greater hydrostatic pressures than those used in the present operating piles. The present vendor of process tubes can produce 2S-72S clad tubes as long as 50 feet, but an increase in temper from one-half-hard to full-hard will necessarily result from this change. Reduced ductility and difficulty in flanging of such tubes would be the disadvantages resulting from such a change in temper. A study has been initiated to determine the mechanical properties of the process tubing in current use at Hanford. Tensile measurements indicate that the tempers of the present process tubes range from greater than three-fourths hard to greater than full-hard. The effect of the reduced ductility of these tubes is reflected in the cracking which occasionally occurs during the flanging operation. An adequate prior annealing procedure and different method of flanging are being studied at this time.

A commercial aluminum alloy, 63S, is being considered for use as a process tube and slug jacket material. When compared with 2S aluminum, 63S in the heat-treated condition has superior mechanical properties and corrosion resistance in the present pile process water. In order to evaluate the feasibility of the use of heat-treated 63S aluminum in the piles, a limited quantity of 63S aluminum has been received and fabricated into suitable shapes for reactivity and special "in-pile" tests. Because 63S is an age hardenable alloy, the effects of irradiation on the alloy after various heat treatments are to be studied.

Information received from Aluminum Company of America indicate that process tubing and slug jackets of 63S are feasible but that the fabrication characteristics of 2S and 63S differ. Steps have been taken to initiate the commercial development programs necessary before process tubes, slug jackets, and caps of 63S can be made available to Hanford.

CORROSION

100-Areas Corrosion

A program was initiated to establish the corrosion characteristics of 63S aluminum in several temper conditions. Solution potential measurements, type-of-attack tests, weight loss, and galvanic couple tests are planned.

Water treatment at 100-F Area differs from the other 100 Areas in that alum rather than "Ferrifloc" is employed as the coagulant. Analysis of alum-treated pile coolant reveals that the iron content is decreased by a factor of two and that the aluminum content has increased from not detectable to 0.05 ppm. Concentrations of other components remained essentially unchanged. An accelerated corrosion study was made by immersing samples of aluminum alloys, 2S and 72S, in boiling water from 100-F Area (alum-treated) and from 100-D Area ("Ferrifloc" treated) for a period of 288 hours. The corrosion rates of both the 2S and the 72S were significantly less in the alum-treated water.

200-Areas Corrosion

The corrosion testing of straight chromium stainless steel in selected Redox process streams was continued. This program is curtailed while awaiting a decision whether the Redox or Purex process will be used in the next Separations plant. Solutions common to both processes are being used at present.

Valves of type 316 stainless steel are to be installed on the solution transfer lines of the UO_3 plant. Rate of attack of concentrated uranyl nitrate solutions on heat-treated samples of this steel were measured, and it was found that some intergranular attack had occurred during the tests. Samples from two cast "melt" pots were tested in this solution and also were found to exhibit intergranular attack.

Corrosion tests of various stainless steels in CX and CP Recuplex streams continued during the month. Preliminary thermal and galvanic couple tests using low carbon steels in 50 per cent sodium hydroxide solutions were continued in order to establish the suitability of low carbon steel for sodium hydroxide solution storage.

Values of pH of synthetic 200 Area waste storage solutions were found to vary with time. These measurements are a part of the test to evaluate the use of low carbon steel for 200 Area wastes if the present pH ranges are lowered.

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CANNING DEVELOPMENT

Eight-Inch Canned Slug

Of the 109 eight-inch slugs canned in November, 32 pieces with 1.331 inch nominal bare diameter have been transferred to the Metal Preparation Section for pile loading.

Frost Test Calibration for Eight-Inch Slugs in Thick-Walled Cans

The eight-inch slugs behaved normally in all the standard inspections except frost test. During the frost testing operation, between 50 and 90 per cent of the slugs developed melted areas. The appearance of the melted areas, together with data from destructive examination of some of the rejected pieces, demonstrated that melted areas were produced on acceptable slugs.

New Fuel Element Development

The program which Knolls Atomic Power Laboratory has agreed to undertake to investigate the application of elemental metals and uranium alloys to uranium slugs as a means of developing new slug jacketing systems was confirmed in Document HW-23004. Document HW-23147 presenting a program to develop new Hanford fuel elements for pile use at power levels 50 to 100 per cent higher than present fuel elements permit has been issued. In this document, assistance from other sites was recommended and is essential to early successful completion of the program. Specific topics for investigation at nine Atomic Energy Commission sites were suggested. The initial hypothesis of this program is that some inherent weakness in the present aluminum-silicon bonded, aluminum jacketed slugs is the principal cause contributing to slug rupture. Therefore, work is to be undertaken to develop new jacketing systems to provide corrosion protection for uranium metal. Concurrently, the contribution of other failure mechanisms to slug rupturing is to be investigated at Hanford.

Hot Pressed Slugs

Several attempts were made to form a protective oxide coating on uranium by the anodizing process. The treatment produced a clean, bright surface on the uranium samples but no detectable film was formed and the samples discolored on exposure to air.

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Omission of Vertical Agitation in the Bronze Bath

The production test on the omission of vertical agitation in the bronze bath has been approved and will be run using four-inch slugs.

Gases in the Al-Si Canning Bath

Zero blanks for both hydrogen and other gases at 700° C. have been obtained on the Al-Si gas analysis line. Chemical cleaning of 2S aluminum samples with a chromic-phosphoric acid mixture does not appreciably effect the gas analysis results.

Welding Studies

Approximately 400 slugs were welded at currents between 90 and 180 amperes in the initial phase of an investigation of welding slugs at high amperages.

Arrangements have been made for use of a General Electric Fillerweld at the Hanford Works for a three-month trial period.

The results produced by an Aircomatic welder are not promising because the weld beads were large and rough and the process is difficult to control.

Canning Process Mechanization

During the first trial run of the prototype canning machine, the high operation temperatures caused seizure of the lower main shaft bearing. This bearing will be replaced by one designed to operate at a higher temperature.

RADIOMETALLURGY

Irradiated Slug Studies

Slugs which were discharged along with a rupture in Tube 4374-3 were examined through the basin periscope. Of these slugs, most of which were canned on December 15, 1950, ten per cent were found to have rippled surfaces. This frequency is considerably lower than has been previously recorded for rippling in the December 15, 1950, canned slugs. The tube power generation assigned to 4374-3 is 168 KW, a figure somewhat lower than the generation in other December 15, 1950, material examined.

An interim report on examination of normally discharged uranium was issued as Document HW-22644.

Process Tube Studies

Five process tubes removed from the portion of the F Pile affected by water leaks are being examined. The flanges of these tubes exhibited both cracks

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and pit penetration to a depth of at least 80 per cent of the wall thickness. Short sections of two of the tubes exhibited annealed conditions. No leaks have been found in the central portion of the tubes although pits 0.5 mm deep have been found in the outside wall.

Equipment

The 108-B metallurgy laboratory, which has been reassigned from P-10 alloy metallurgy to Radiometallurgy, is being equipped as a metallographic laboratory.

Installation of the air exhaust system in the slug examination room of 111-B Building is now essentially complete.

TRITIUM PRODUCTION

Operational checks and synthetic runs were continued on the metal line stripper addendum early in December. This work was followed by runs which stripped the product fraction from batches of by-product fraction containing relatively large amounts of tritium. The stripper addendum performed satisfactorily during these runs as well as in regular production runs which followed. Because of its flexibility, the stripper can be used as a chemical pump, a reservoir, and/or a device for reprocessing air contaminated product, thereby making possible a more efficient operation of the metal facility.

Considerable difficulty was experienced with the operating contact, sensing coil, and the service leg assembly of one of the metal line toepler pumps during the first part of the month. The operation of both glass and metal extraction systems was hampered by trouble caused by mercury loss from pump reservoirs to other parts of the system and embrittlement of neoprene O-rings on valves and check valves.

The chrome-plated carbon steel balls in the toepler pump ball check assemblies were replaced with stainless steel balls. The plating had deteriorated in service, resulting in failure of the ball check function.

The establishment of an identifying grid system on cell floors and equipment and the concurrent application of revised decontamination and contamination control procedures resulted in the reduction of surface contamination to background or near background levels in hot cells.

A blurp occurred in a glass line furnace tube during the extraction step of a run; some of the molten metal was deposited in the furnace cap necessitating its replacement.

A metal support was fabricated and installed to prevent movement and vibration of the magnetic switch on the metal teepler pumps. In the past, movement and/or vibration of this switch caused malfunctioning of the pumps.

It is planned that all future batches of air contaminated product will be processed on the metal equipment; consequently, glass line 2, which was used previously to reprocess air contaminated product, will be dismantled.

During December, no P-10 personnel, nor other personnel working in the 108-B Exclusion Area, exceeded the working limit for internal tritium contamination.

Three of the four instruments used to monitor surfaces for tritium contamination were in operation at the end of the month and three of the five instruments originally used as portable air contamination monitors are being converted to surface monitors.

The new bomb-resistant tritium storage building, 104-B-2, was accepted and is now being used.

Project C-412 - Construction Status

It is reported that Project C-412 construction is 94 per cent complete at month end.

Metallurgical Development

Results of gas analyses on the duPont ten per cent Li-Al slugs indicate that most of the adsorbed and absorbed gases present, both hydrogen and non-hydrogen, are located at or near the exposed ends of the slugs. These analyses are in agreement with the analyses on similar material reported by C. D. Smith in Document DPW-2911.

Samples of irradiated 3.5 per cent Li-Al alloy in the solution heat-treated and as-extruded condition have been polished and examined microscopically and macroscopically. No significant change could be detected as a result of irradiation.

TRITIUM DEVELOPMENT

The development of stripper addendum technology, and the application of the addendum to production activity proceeded as planned during the month.

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Neoprene rubber samples stored in tritium atmospheres for six weeks have begun to show some signs of deterioration while silicone samples under the same conditions apparently are unaffected.

Water vapor-palladium black isochors and isotherms have been completed.

SPECIAL IRRADIATIONS

Gamma Irradiation of Non-Metallic Materials - Production Test 105-246-P

Non-metallic materials are being irradiated by the fission product gammas from exposed uranium pieces. The uranium pieces were replaced on December 15.

Fission Chamber Life Test - DPWM-101

A life test under pile conditions is planned to evaluate the possibilities of using fission chambers for monitoring pile neutron flux. Special process tube nozzles have been fabricated and a tentative charging schedule for late January or February has been arranged.

Creep Test of Fuel Pins, KAPL-M-105 - Production Test 105-400-P

The third Knolls Atomic Power Laboratory fuel pin creep assembly has been received and is undergoing extensive precharging tests. Operating difficulties have postponed the scheduled charging from December to January.

Electrical Resistivity Measurements of Cu-Au, HAPD-M-112 - Production Test 105-513-SR

The electrical resistivity of ordered and disordered copper-gold specimens is being investigated as a measure of the effect of pile radiation on lattice spacing.

The slug assembly which was charged on November 28 has been performing satisfactorily.

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Thermal Conductivity of U-Zr Alloys, ANL-M-172 - Production Test 105-432-P

A continuous measurement of thermal conductivity of uranium-zirconium alloys is to be made under pile irradiation.

The slug assembly was received but had been damaged during shipment. Repairs have been made and the charging which was originally planned for December has been rescheduled for January.

Heater Test for Graphite Thermal Conductivity Determination - KAPL-M-109

This test will check the performance of two types of heaters which have been proposed for use in a test for the continuous determination of graphite conductivity under pile irradiation. The slug assembly and associated equipment have been received and tested and a production test authorizing charging is being prepared.

Controlled Temperature Exposure of Graphite - Production Test 105-403-P

Graphite samples are being exposed to pile radiation under controlled temperatures in a cooled tube which consists of a smaller aluminum tube inside and concentric with a process tube. Water passing between the inner and outer tube provides cooling for the central tube which is dry. A Production Test Supplement has been issued authorizing charging from front and rear and permitting doubled usage of the previously approved second annulus tube.

Pile Gas Reaction Studies

At the request of the Graphite group, a study has been initiated of methods of irradiating graphite samples in sealed ampoules containing various compositions of pile gas. It is planned to utilize a water-cooled annulus tube for the initial low temperature tests. Design work for a controlled high temperature facility for future irradiations is being undertaken.

Process Tube Mock-Up

The process tube mock-up for testing charging and discharging procedures of process tube in-pile experiments has been installed in the 189-D Laboratory and is ready for use.

In-Pile Calibration of Thermocouples

As a means of in-pile calibration of thermocouples, a stainless steel slug containing a lead-tin alloy of eutectic composition has been fabricated. The melting point has been checked over a three-week period to investigate possible effects of solubility of the stainless steel at 325° C. No change has been observed and the tests will be continued.

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Measurement of Slug Operating Temperature - Production Test 105-111-P

The work on the fabrication of three thermocouple slug assemblies for measuring uranium slug temperatures is being expedited and completion of the first assembly is expected in January. The thermocouple slug and annulus slugs have been canned and all parts except the electrical connectors are on hand. Although a slug with both central and surface thermocouples is desired, the first units will contain only central couples while development work continues on the fabrication of a surface couple.

Controlled Gas Atmosphere Experiment, Project C-110

Most of the equipment for measuring the equilibrium composition of various gases exposed to graphite samples at a controlled temperature within the pile is on site. The C Test Hole heater facility was received from the General Engineering Laboratory and showed the #1 heater to be shorted to ground and the insulation resistance of the #2 heater to be 1500 ohms instead of the required 100,000. The shock recording instrument shipped with the heater failed to function after the first eight hours of transit.

Work on the gas analysis equipment was kept at a minimum during the month pending the completion of a revised cost estimate for the project. The allowable leakage rate, based upon the sensitivity of the gas analysis equipment, was re-evaluated to be 1 x 10^{-4} cc per second.

Status of Special Irradiations

Monthly statistics on the Special Request Program are tabulated below:

P-10-A pieces charged	140*
P-10-A pieces discharged	253
P-10-A pieces being irradiated	318
Special Request Samples charged	88
Special Request Samples discharged	9
Samples on hand awaiting charging	191
Samples now being irradiated	480
Samples awaiting shipment	18
Samples shipped during December	18

"B" Hole Test Facility Reactivation - 100-H Area

Plans have been made and fabrication started on tools to remove the stuck samples in the "B" hole test facility in the H Pile. If the removal is successful, the tube involved will be sealed off and operation continued on the remaining six tubes. In the event that the slugs cannot be removed, the complete assembly will be replaced.

* Includes 125 recharged pieces.

PROCESS CONTROL

Pile Operations

New maximum levels were achieved at D and H Piles. DR and B Piles maintained average operating conditions. F Pile reached a maximum on December 13, 1951, before shutting down for eight days in an attempt to find all the water leaks in the pile. Flattening efficiency better than 87 per cent was maintained in all cases.

Transient operation was aggravated at B and F Piles during the month by one of the horizontal rods being out of service. Startup after a minimum down-time with this condition requires a cutback to approximately 125 MW, severly delaying the return to equilibrium conditions.

The water collected from the F Pile increased to 318 gallons in one day on November 30, 1951. One leaking tube was found during the shutdown of December 1, 1951, three during the shutdown of December 3, 1951, to December 7, 1951, and ten more leaking tubes were found during the shutdown of December 13, 1951, to December 21, 1951. Most of the leaking tubes were in the bottom far corner of the pile where the reactivity effect from abandoning the tubes and from water in the pile is relatively small. Following the startup on December 21, 1951, the rate of water collection from the drier climbed to a plateau of approximately 60 gallons per day where it remained until the unscheduled outage of December 27, 1951.

All piles were down on December 1, 1951, because of a critical power condition. B and D Piles were operating at non-equilibrium conditions previous to the outage and required temporary poison column startups.

Of 21 ruptures which occurred this month, 14 pushed easily making scram recovery possible, one pushed easily but exceeded the time available and six were stuck. Regular charge-discharge shut-downs were necessitated by two simultaneously stuck slugs at DR on December 23, 1951, and by one stuck slug at H on December 26, 1951. A special shut-down was necessary at F on December 27, 1951. (See Table, page 28).

Thorium Program: Essentially saturation conditions of thorium have been achieved with a total of 1217 pieces in all the piles on December 26, 1951. Any additional inventory of thorium would seriously affect the small amount of poison adjustment flexibility currently carried in P-10 material.

During the December 1, 1951, critical Y power condition, the 200 available canned thorium pieces were charged into the piles. During this report period, 75 additional pieces were charged and 123 discharged. Flux distortions associated with the changeover from the H-10 loading back to regular metal have been compensated so that H Pile is now available for thorium loadings and presently carries 100 pieces.

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RUPTURED SLUGS

Tube No.	Date of Failure	Days in Pile	Slug Power KW	Canning Date	Down Time KW	Type of Failure
2873-D	12-3-51	194	*	4-26-51	0.8	Cap
1565-DR	12-5-51	239	7.7	3-6-51	0.6	Bottom
3286-DR	12-6-51	241	5.5	3-6-51	0.8	Side
2963-B	12-7-51	248	3.6	3-16-51	18.5	Side
1081-H	12-10-51	250	8.4	3-22-51	0.5	Side
2977-B	12-11-51	209	2.0	4-30-51	0.5	Side
2765-B	12-13-51	254	5.4	2-23-51	0.4	Cap
1777-D	12-14-51	303	**	1-12-51	0.5	Cap
2869-D	12-21-51	289	**	2-9-51	0.5	Cap
2963-DR	12-23-51	257	**	**	19.4	**
1180-DR	12-23-51	257	**	**	20.6	**
0956-B	12-24-51	446	4.2	8-24-50	27.0	Cap
0964-D	12-26-51	344	**	12-19-50	0.5	Cap
3762-H	12-26-51	266	**	3-20-51	0.7	Cap
2771-H	12-26-51	218	**	11-2-50	15.5	Side
2878-F	12-27-51	103	2.8	**	30.0	**
3965-DR	12-27-51	223	**	**	0.6	**
2260-DR	12-28-51	234	**	**	0.4	**
4178-H	12-30-51	270	**	3-7-51	0.5	Cap
2777-DR	12-30-51	207	**	**	22.1	**
1658-D	12-30-51	221	**	4-25-51	0.8	Cap

Slug positions are not reported because the slug positions estimated from weasel data have been found to be in error as much as 20 slug lengths as a result of distortions of the axial distribution caused by the control rods.

Previously reported data on estimated slug positions and local H_2O temperatures may also be in error 30 per cent.

* Data unavailable
** Data unavailable at this time, possibly will be included in next month's report.

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Most of the thorium material now in the piles will be discharged during January and February to meet the initial requirement of about 1500 units.

Reactivity Status: A representative summary of the reactivity status of each of the operating piles during the last equilibrium period of the month is given below:

Pile	B	D	DR	F	H	Totals
Control Rod Excess	97 ih	124 ih	164 ih	132 ih	180 ih	
Xenon	684	660	692	692	710	
	(303)*	(290)*	(280)*	(244)*	(100)*	(1217)*
SR	43	40	20	41	62	206
Plant Assistance	20	4	6	13	27	70
"P" Columns	0	0	0	0	0	
Hot Reactivity	1286	1362	1344	1316	1303	
Co Allowance	-371	-416	-212	-464	-228	
Cold, Clean Reactivity	915	946	1132	852	1075	

H and DR Piles both gained from being in the light phase of the metal pushing cycle during the month whereas B and D Piles were losing reactivity from heavy discharges. F Pile reactivity stayed approximately constant with a probable 30 to 50 ih still attributable to water in the pile.

The excess reactivity held in dummy columns has increased by 54 ih during the past month, 15 ih of which is attributable to blanked off leaking tubes at F Pile and 39 ih attributable to an increased inventory of dummy tubes awaiting replacement following ruptures.

Lattice Conductances: No significant changes from previously reported trends were noted this month. Some increases in temperature rise limits based on graphite temperature were possible as a result of lower river temperatures.

Preliminary results of a study of the effect of control rod position on graphite temperatures show that rod location changes can cause variations in maximum measured temperatures of as much as 30° C. with constant power generation in the tubes surrounding a string of thermocouples. Since, at present, lattice conductances are calculated on the basis of an assumed cosine power distribution along the tube, it is apparent that much of the dispersion in conductance values may be due to rod position. It is anticipated that this study will lead to a method of correcting the axial power distribution curves for the effect of rods.

* Pieces

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A stringer of graphite blocks bearing 24 thermocouples was charged into tube position 2167-F under Production Test 105-470-P. After five days operation the 20-gauge Chromel-Alumel and Iron-Constantan thermocouples were indicating temperatures up to 100° C. above those indicated by 30-gauge Chromel-Alumel at nearly the same locations. With the pile shut down but the graphite still hot, it was found that the 20-gauge couples still read up to 70° C. higherthan the 30-gauge couples at the same locations.

Tube Leak Detection: An apparatus for the detection of tube leaks was designed, constructed, and tested in the flow laboratory. This apparatus, which removes the water by vacuum and then detects the presence of CO_2, is designed to be usable when header valve leaks prohibit the use of pressure testing equipment. In the flow laboratory test, the device proved able to empty a tube of water and show a positive indication of CO_2 within five minutes after being attached to a tube with a prototype leak.

Test Pile

Regular metal testing proceeded routinely during the month.

The TDS value for uranium egg samples continues to be high. Four lots yielded a TDS of 17, one of 18, and one of 19. Both lots with TDS values about 17 will be analyzed in more detail.

Metal Preparation

Additional aluminum cans from Alcoa, Victor, and Scovill were examined to compare metallurgical properties of these materials. Victor cans were found to vary in response to annealing heat treatment but this possibly can be attributed to variation in material for the impact extrusion blanks. The surface hardness of as-extruded Victor cans was as high as that for Alcoa cans but Victor material softened more than either Scovill or Alcoa cans after annealing.

PLANT SERVICE WORK

To assist in the establishment of adequate 100 Area specifications, process tubing was tested in compression and under hydrostatic pressure. Compression tests were made on slugs of uranium, perforated aluminum, lead, B metal, P-10 alloy, and thorium.

Six Huey corrosion tests were completed on material submitted from the Hot-Semi Works and WJ-4 construction areas.

Spectrochemical analyses of disk samples taken from both the Al-Si dip bath and canning bath have shown the segregation of the silicon constituent frequently causes inconsistent results on individual samples. Samples of Al-Si were cast in the laboratory with the mold temperature varying from

-10 to + 500° C. to determine the effect of mold temperature on the degree of segregation in the disk. Casting of the Al-Si with the mold held at room temperature produced a sound sample with less segregation than was produced when the mold was heated prior to casting.

Some of the cast manganese-bronze nuts which are a part of a remotely operated pipe connecting assembly in use throughout the tank farms at MJ-4 failed in place after assembly. Mechanical property tests and microstructure studies showed that hardness measurements could be used as a means of segregating the good from the bad quality nuts. Maximum hardness values were established with Design and Construction personnel to serve as acceptance criteria.

INVENTIONS

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

Signed: _____
G. E. McCullough
Head, Pile Technology

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January 5, 1952

SEPARATIONS TECHNOLOGY UNIT

MONTHLY REPORT
DECEMBER, 1951

VISITORS AND BUSINESS TRIPS

J. O. Morrison, duPont, visited Hanford December 3-20 to observe Redox head-end operation.

R. M. Haag and F. K. Heumann, Knolls Atomic Power Laboratory, visited here December 11-15 to inspect the Redox Plant.

G. C. Oberg attended the Chemical Industry Exposition in New York City November 30 through December 1.

M. J. Szulinski, G. C. Oberg and G. Sege attended the A.I.Ch.E. convention in Atlantic City December 2-5.

R. B. Richards and V. R. Cooper visited Knolls Atomic Power Laboratory and General Engineering Laboratory December 17-19 to inspect facilities and discuss Purex Program.

ORGANIZATION AND PERSONNEL:

Personnel totals are as follows:

	November	December
Administration	2	2
Special Assignment	4	4
Research	43	43
Chemical Development	83	86
Process	46	43
	178	178

[redacted]

Separations Technology Unit

Development: One Tech. Grad. was transferred from Process and one Tech. Grad was transferred from Tech. Services. One Lab. Asst. B. was transferred from Finance-General Accounting.

Process: One Tech. Grad. was transferred from Pile Technology, one Tech. Grad. was transferred from Design and Development, and one Tech. Grad. was transferred from Technical Services. Two Tech. Grads. transferred to Design and Development and Pile Technology; 2 Tech. Grads. transferred to Separations Unit-Manufacturing. One Steno Typist B was de-activated.

BISMUTH PHOSPHATE PLANT ASSISTANCE

Canyon Buildings - 221

There were no significant changes in process at T or B Plants during the month. The total waste loss has shown a gradual increase approximating 0.75 per cent of a batch in the last several months. This is attributed to the following factors: 1) Volume Reduction - 0.30%, 2) Process changes to improve decontamination - 0.35%, 3) Relaxation of rework limits to permit maximum throughput as required by production commitments - 0.10%.

Ventilation air - The concentration of mercuric ion in the dissolver solution was reduced to 5×10^{-4} molar at T Plant, in conformance with the concentration at B Plant. The preliminary results indicate 0.8 curies of I^{131} per day released downstream of the sand filter and 1.2 curies per day in the stack gas at T Plant. The respective values at B Plant were 1.1 and 1.4 curies of I^{131} per day. In both plants the average I^{131} content of the dissolver charges was 1320 curies per day. The relative humidity of the ventilation air downstream of the sand filter at T Plant increased to 100 per cent. It was determined that leaking valves in the steam line to the water seal jets were responsible. Following correction by the installation of two new valves in series the condition returned to normal, i.e., 70 to 80 per cent humidity. There is no evidence of any damage to the sand filter.

Americium and curium assays - The assay procedure was refined at B Plant starting with Push 9-25 H (Run B-11-11-H-25). The results of assays obtained since the refinement indicate that although the discrepancy between the areas may have been reduced the average americium and curium content remains higher at B Plant. The average americium and curium content of sixteen different pushes or mixtures of pushes processed partly at B Plant and partly at T Plant, June through mid November, 1951, averaged approximately 3.6 per cent at B Plant and 3.2 per cent at B Plant. The average extraction losses for this period were not significantly different at the two plants. This slight difference in americium and curium content was sufficient to require approximately twice the number of extraction reworks at T Plant than at B Plant. For the period of mid-November through mid-December following the assay procedure refinement at B Plant, the americium and curium content at B Plant averaged approximately 4.3 per cent compared to 4.1 per cent at T Plant. The approximate average extraction losses were 4.56 per cent and 4.50 per cent respectively.

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Second cycle waste and cell drainage - B and T Plants - The beta radioactivity concentration of waste cribbed from 112 B and 112 T Tanks increased during the month of November but again decreased in December. The combination of cell drainage with second cycle waste has caused no significant change in the beta activity concentration going to the ground since this practice was started on approximately July 1, 1951.

Metal waste storage temperatures - Due to the high and still rising temperatures in 105 TX Tank, 105 and 106 TX Tanks were by-passed on November 16, 1951. Metal waste at T Plant is now flowing directly into 107 TX. The temperature in 105 TX was 230°F maintained from December 4 through December 21. The above temperatures are read from a thermohm 14 inches from the bottom of the tank.

Waste Evaporator - 242 - The waste evaporator at T Plant operated routinely for the month. Runs T-11-11-W-31 through T-11-12-W-25 gave an overall reduction of 75.2 per cent with the log Beta D.F. remaining at approximately 4.0. The sludge volume remaining in the evaporator showed no appreciable increase above the 1400 gallons that were present at the start of this period.

The waste evaporator at B Plant was started on hot feed 12-13-51. All the equipment is functioning properly except for the pump from the underground feed tank and the sp. gr. indicator. These two malfunctions are being remedied. 217,340 gallons of feed have been separated into 47,928 gallons of concentrate and 169,412 gallons of condensate which gives an overall reduction ratio of 77.9 per cent. All condensate was sent to the crib and all concentrate dumped into the 108 B Tank. Several foam-overs were indicated by the foam alarm and high catch tank analysis. In every case the addition of Nonesol at a concentration of approximately 20 ppm has corrected the situation. No steam consumption figures can be made until part of the steam measuring gauge arrives on the site. It is felt that all the high condensate analysis are not due to foam-overs, but partially to faulty lab analysis.

Concentration Buildings - 224

Production Test 224-B-6 - B and T Plants - Testing under the production test was completed during the month except for a series of control runs now in process at B Plant in which the barium sulfate addition to the bismuth phosphate by-product cell is omitted. At B Plant 70 runs had an average activity reading on the bottom of the FR can of 72 mr/hr and an average log gamma decontamination factor of 7.29. The same data averaged 61 mr/hr and 7.35 for 75 runs at T Plant. The majority of runs received a barium sulfate addition in A Cell and a double precipitation and centrifugation in the lanthanum fluoride by-product cell. A series of 15 runs at B Plant and 6 runs at T Plant testing a single precipitation and centrifugation in D Cell with barium sulfate in A Cell resulted in average maximum FR can readings of 143 and 154 mr/hr respectively and final LDF's of 6.70 and 6.68 respectively.

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Product cake removal, lanthanum fluoride product cells - A revised cake removal procedure for the lanthanum fluoride product precipitate has become standard as a result of further testing at B and T Plants during the month. A reduction in the time for cake removal from 1.7 to 1 hour has been accomplished by the new procedure. This results in a savings of approximately 20 minutes in the effective time cycle for two cells in parallel operation.

Isolation Building - 231

Production Test 231-13 - time cycle reduction - Runs are being processed through the Isolation Building under Production Test 231-13 omitting the digestion period following the peroxide precipitation and with settling times prior to decanting shortened to the following times:

	First Cycle	Second Cycle
After precipitation	30 min.	30 min.
After first wash	15	15
After second wash	15	15
After third wash	15	30

Under the Production Test conditions in both cycles, the product recycled from B Plant runs (Cell 3) increased from 3.9 per cent, average of 13 runs, to to 4.2 per cent average of 11 runs. Product recycled from T Plant runs (Cell 2) increased from 3.7 per cent, average of 16 runs to 4.7 per cent, average of 11 runs. It is indicated, however, that the amount of product recycled may be lowered by more closely controlled conditions during precipitation.

N-2 Filters - The time required to filter a run through the N-2 filter increased from less than 20 minutes to approximately 60 minutes in Cell 2, 40 minutes in Cell 3, and 210 minutes in Cell 4. Although the increase in Cell 3 was not excessive, the N-2 filters were replaced on 11/30/51, 12/4/51 and 12/5/51 in Cells 2, 3, and 4 respectively. Filtering times after filter replacement have remained less than 20 minutes per run. The cause of the filter plugging has not been established. It is possible, however, that leak through of barium may have been responsible since some difficulty in completely dissolving sodium sulfate was experienced in the Concentration Building during this period. Although no obvious precipitation of barium in the P-1 Tanks has been observed some grey white colored "crud" has deposited in the CT-1 Tank of all cells.

Americium recovery - Approximately 25 mg of americium were recovered from aged 234-5 button material dissolver by the Development group. The americium was recovered by processing the plutonium through two peroxide cycles. The supernatant solutions containing the americium were shipped without further concentration after thermal decomposition of the hydrogen peroxide.

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PURIFICATION AND FABRICATION BUILDING PLANT ASSISTANCE

RG Line

Purification - Hydriodic acid was inadvertently added to the oxalate slurry of batch X-11-12-29. At the same time some of the slurry was drawn into the transfer-flask vacuum line trap. The slurry was returned to the purification vessel and washed to remove the hydriodic acid. The tetrafluoride produced from this material was normal in appearance but 32 grams low in weight.

Reduction - Yields for the first 53 reductions during December averaged 90.8 per cent excluding Y-11-12-52 to which insufficient calcium was added. The latter reduction yield was 72.3 per cent.

Miscellaneous - The rate of pressure increase in a tightly sealed standard sample can containing 160 grams of plutonium as AT solution has been under observation for 24 days. The total pressure is now 29 lbs/sq.in.ga. with a detectable decrease in the rate of pressure increase vs. time. Fabrication of a RM Line type filter boat entirely from Inconel is now in progress.

RM Line

Several gaskets and gasketing arrangements are being tried in an attempt

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discharge various fractions of the powder charge from the mixer have been determined on stand-in material. Complete discharge can be attained in one minute.

Coating calibration runs to establish temperature distribution, heating cycles and power inputs were started during the latter part of December. Both hoods 25 and 27 may be operated through a coating cycle simultaneously with adequate temperature controls.

Determinations of important temperature - time cycle - power input relationships are being determined for the RMA Line casting furnaces. Double stacking of casting crucibles cannot be accomplished with the present furnace bottoms. It is expected that runs will be repeated when furnaces are supplied in which double castings can be made, however, interpolation with the data obtained to date would allow close approximation of the actual temperatures. Separate reports will be written on all RM Line calibration work.

Process Recovery

Sixty-eight lots of concentrated (SN-3) solutions were processed by the addition of 165 grams of sodium bromate per inch of water insoluble solids in the SN-3 container, the blending of two lots of SN-3 material to a batch of SN-2 solution, and the addition of 2.3 liters of 50 per cent hydrogen peroxide to the composite solution prior to evaporation. The concentrated

solutions were routinely processed through the lanthanum fluoride by-product and all normal subsequent operations in the Concentration Building in combination with a normal batch for product recovery.

REDOX PLANT ASSISTANCE

A total of nine "cold" 3-1/8 ton head-end scavenging-centrifugation metal feed preparation runs was made to define: (a) the extent of $KMnO_4$ reduction during oxidation, (b) the cake volume, and (c) the optimum centrifuge feed rate. The $KMnO_4$ reduction in the oxidizer during the oxidation and simulated ruthenium volitilization steps has ranged between 35 and 65 per cent. Completion of the $KMnO_4$ reduction in the oxidizer before centrifugation has been accomplished by the addition of either chromic nitrate or manganous nitrate, or a combination of both. The technique employed to complete the $KMnO_4$ reduction has had no apparent influence on the centrifugability of the slurry, since effluent clarities have been acceptable at centrifuge hold-up times as low as 11 minutes. Cake volumes have been determined to be about 20 gallons for each 3-1/8 ton feed batch. All centrifuge cakes formed, regardless of $KMnO_4$ reduction techniques, have been extremely difficult to remove from the centrifuge wall by bowl spray methods. This has resulted in inadequate elutriation of uranium from the cake during the washing step, and has led to difficulties in cake dissolution; particularly when a hydrogen peroxide-nitric acid solvent is employed. Uranium cake losses for the runs have not averaged below 0.5 per cent of the feed uranium. Fluorothene-tipped plows are presently being installed in the centrifuge in an attempt to improve the extent of cake removal, and thus effect better washing and subsequent dissolution.

A total of three solvent-extraction runs employing "cold" uranium solutions was completed with no serious operational or equipment difficulties. These runs, of short (2- to 5-day) duration, were intended primarily for instrument calibration, operations training, and equipment performance testing. A fourth run, currently in progress and of longer duration, is intended to define the extraction performance and equipment capacity limitations. Accumulative uranium waste losses to date, as determined from the waste sampler analyses, indicate a 0.5 per cent loss from the processing of 14 tons of metal through the solvent extraction equipment.

URANIUM RECOVERY PLANT ASSISTANCE

A total of 27 UNH calcination charges was processed in 224-U Building at various temperature conditions in order to define the optimum heat cycle consistent with UO_3 powder specifications. The product obtained from Redox UNH under the conditions of medium furnace heat (approximately 450° C.) during decomposition and plastic stages, with a higher heat (approximately 600°C.) during the drying stage, conformed to specifications with the exception of bulk density. Additional investigation into the calcining conditions for Redox material is planned for possible improvement in powder density.

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During the irradiation of uranium, a short-lived (6.8-day half life) isotope of uranium, U^{237}, is formed in appreciable quantities. This isotope is a beta-gamma emitter and, being chemically identical with the uranium product, is not removed by the decontamination process. This activity can potentially cause an increased radiation hazard in processes handling uranium by contact methods, and might dictate a minimum "aging" period for irradiated uranium prior to processing in the calcination facilities.

A study of the radiation hazards involved in processing uranium in the 224-U calcining facilities as a function of the uranium "age" since pile discharge was published during the month as HW-23090, by G. Asanovich and R.E.Tomlinson. Consideration of this problem is continuing in collaboration with the Manufacturing Department, with the objective of recommending equipment and operating modifications for the Calcination Plant which will permit the Redox plant to process 50-day old slugs, but will prevent over-exposure of 224-U personnel when calcining this Redox recovered uranium.

Revisions to 221-U Building operating procedures were completed and data sheets were prepared. Comment issues of these procedures will be transmitted at an early date. In addition, calculations for a proposed series of nitric acid salting shakedown runs have been completed.

REDOX AND METAL RECOVERY DEVELOPMENT

Process Studies

A technical and economic evaluation of the Purex process was published during the month as HW-22888, by R. E. Tomlinson. It was recommended that the design of a new separations plant (if required) for Hanford Works be based on the Purex process. The Purex process is considered to be adequately developed to permit an early scope completion, and the processing of 200 tons of uranium per month by Purex would cost about two and one-half million dollars per month less than by the Redox process as currently conceived.

Liaison with the Design and Construction Section has continued during the month on design studies RDA-DC 4 and 7. This has taken the form of collaborating in establishing pertinent technical, equipment, and time-cycle requirements for the scoping of a hypothetical new Purex facility.

Chemical Engineering Development

Recuplex Solvent-Extraction Studies - During the month twelve Recuplex-process solvent-extraction studies, with CCl_4 as the diluent and with uranium as a stand-in for plutonium, were carried out in a simple 3-inch-diameter glass pulse column in 321 Building. These included five "A" Column extraction section, one "A" Column scrub section, and two "C" Column H.T.U. determinations; and three "A" Column extraction section and one "C" Column flooding studies. The results of these studies indicate that the pulse columns tentatively specified for the Recuplex Plant (Document HW-22734) will function satisfactorily under Recuplex HW #1 Flowsheet conditions, as well as under the HW #2 Flowsheet conditions found feasible in the studies reported last month.

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The 20-stage, Fenske Stacked Extractor was disassembled and inspected during the month. It was found that the light-phase sampler tubes at the 3rd, 4th, and 11th stages from the bottom were curved horizontally, instead of upward, which is their normal orientation. The light-phase sampler tubes at each stage are used to bleed out any air that might accumulate in the high points of the baffled light-phase riser passages. The misorientation of the three sampler tubes made it possible for air to accumulate in the light-phase riser high points at the affected stages to a sufficient extent to obstruct completely the flow of the light phase through the risers. At the month's end the extractor was reassembled, with the incorrectly oriented sampler tubes properly adjusted. Further tests of this extractor are planned during January.

Mechanical Development

Corrosion Studies (Recuplex Process) - Type 309 SCb, 304 ELC, and 347 stainless steel Pyrex, Cobalt, and Vycor glass, and Teflon and fluorothene plastic sheet, have been evaluated for resistance to exposure to both liquid and vapors of boiling slag and crucible dissolver solution (Recuplex process) containing approximately 0.25 M HF, 3.8 M HNO_3, and dissolved Mg, Fe, and Ca salts. Corrosion rates for the metal samples exposed six hours to boiling HF-containing solutions followed by approximately 18 hours exposure to HF-free solution ranged from 0.0022 to 0.0158 inch/month based on 10 exposure cycles. Teflon and fluorothene sheet were unaffected. Pyrex and cobalt glass were severely etched. Vycor glass was unaffected with the exception of a small lightly etched area on the vapor sample.

Vitro Magnetic-Induction Flowmeter #5, (nominal range of 0.4 to 3 gal/min) developed by the Vitro Corporation of America (formerly Kellex Corporation) has been calibrated using water as a test fluid. From 15 to 92 per cent of the chart, a linear relation between flow rate and chart reading was obtained. At no flow, a zero shift from 0 to 8 per cent of the chart was observed. Vitro engineers who visited Hanford during the month to observe the test of the meter attributed the zero shift to stray currents in the test stand pipe loops. Additional ground connections have been installed and other adjustments have been made to the meter to correct this condition.

Vitro Magnetic Induction Flowmeter #9, (nominal range of 20 to 200 ml/min), identical except for size to the #5 meter described above, has been received for testing.

Potter Electronic Flowmeter, (nominal range of 0.3 to 3 gal/min) has been obtained on a loan basis from Tower Equipment Company, Seattle, for experimentation and testing. The meter consists of a dynamically balanced rotor supported on bearings (type currently unknown) within a 1/2 inch diameter flow tube. An Alnico permanent magnet encased in the rotor completes the sensitive element. Rotation of the rotor (and magnet) resulting from fluid flowing through the tube is detected by a pick-up coil

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mounted on the side of the flow tube. The signal is amplified and transmitted to a recorder or an indicator. The meter has been installed in a test stand in series with the Vitro meter.

Pump Development

Peerless 4"-LA-No.2, a four stage deepwell turbine pump equipped with Graphitar #2 process solution lubricated sleeve bearings and a Type 347 stainless steel shaft has been operating in clear simulated RAW (less UNH) to evaluate Graphitar as a bearing material in deepwell turbine pumps. All but 22 canyon pumps (TBP Process) are equipped with Graphitar bearings. The pump was dismantled after 1255 hours (52 days) operation at a speed of 1750 rev/min, and a discharge flow rate of 45 gal/min. Operation was smooth and uneventful over the test period. No change in pump characteristics were observed. Of the six process lubricated bearings, maximum wear occurred at the top bearing and was 2.9 mils on the journal and 5.5 mils on the bushing. All other journals wore less than 0.5 mils. Average wear of the other 5 bushings was 2.7 mils. No further evaluation of this pump is contemplated.

General Engineering Laboratories Motor-Pump, a 5-horsepower stainless steel encased electric motor close-coupled to a Peerless regenerative turbine pump was dismantled for inspection after operating a total of 1528 hours (64 days), first in water (701 hours) and then in simulated Redox 2AF, hexone free, (827 hours), at a speed of 1720 rev/min. No significant wear was found on either the top stellite journal, the lower Type 347 journal, or the two Graphitar #2 bushings. The top stellite journal deposit was found to be loose on the shaft in a manner similar to that previously found and reported for the lower bearing journal. The motor was repaired by turning off the stellite deposit and press fitting a Type 347 stainless steel sleeve over the shaft. Evaluation will be continued by operating the motor (1) surrounded by air instead of liquid, and (2) as a driving unit for an agitator.

Materials Testing - A table listing the chemical resistance, method of application, cost per square foot, and the vendor of 30 materials of construction (coatings, sheathings, liners, and pipe substitutes) has been prepared in connection with the development of information for Project Y. A series of materials has been evaluated for resistance to 15 per cent TBP in CCl_4 at room temperature in order to round out information which has been lacking concerning the resistance to this solvent. After seven days exposure, Epon RN-34, Mirawal, Duralon 36, modified Phenoline #3, Homalite CR-39 and 100, Alsynite, and Amercoat 1574 were unaffected. Corrosite and U.S. Royalguard failed in four days. Tygon, Koroseal, and Amercoat 93-Y failed in one day, and neoprene paint failed in less than one hour.

Hot Semiworks

Construction of the Hot Semiworks is 55 per cent complete. In the Hot Process Building, all forms and shoring have been removed from the cells,

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flame spraying of the walls and ceiling with polyethylene has been started, and the steel and transite structures have been erected over the galleries. Steel framing for the Aquecus Building has been completed. Tanks and instrument panels are being placed in this building. In the Solvent Building plastering has been completed and tanks have been placed. The stainless steel lining for the waste storage tank has been fabricated and placed in position.

SEPARATIONS PROCESS RESEARCH

Recuplex Column Research

Recuplex extraction and stripping runs with uranium according to flowsheet 12A (HW-22409) were made with the one inch diameter x sixty-five inch pulse column for the purpose of evaluating optimum plate design. The best performance has been shown by the double-faced plates in which a 0.003 inch thick layer of fluorothene was formed on one side of a stainless steel perforated plate by the use of Kel-F dispersion. The fluorothene film adherence to these plates was tested under Recuplex "A" column conditions by continuously pulsing for 500 hours. No loosening of the film nor change in wetting characteristics was observed. On the other hand, the coating on the plates used in the column for about this same period of time has separated. Further studies will include surface conditioning.

Recuplex "A" column operating with the 0.050 inch diameter hole, 23 per cent open area, coated plates gave 1.5 to 2.0 feet HETS at 800 gal/(hr)(sq ft) throughput with aqueous or organic continuous phase which corresponds to HTU values of 0.7 to 0.9 feet, and flooding was not apparent at 1000 gal/(hr)(sq ft). Previously reported HTU values for double plate design are slightly higher and flooding was reached at lower throughputs with the double plates.

Recuplex "C" column runs with 0.027 inch and 0.050 inch diameter hole coated plates and continuous aqueous phase gave a stage height that was only slightly dependent on volume velocity. The HETS for the 0.027 inch holes ranged from 1.4 to 1.8 feet for 100 to 1415 gal/(hr)(sq ft) volume velocity. The 0.050 inch hole plates had HETS values from 1.8 to 2.7 feet for 300 to 1200 gal/(hr)(sq ft).

These data indicate that the one inch diameter x twelve feet alpha glove box column being set up in the 222-S Multicurie Laboratories may be sufficiently high to demonstrate flowsheet recoveries and probably have full plant scale capacity.

Pulse Column Glove Box Program

The construction of the pulse column for use in Redox and Recuplex alpha studies is approximately 50 per cent complete. The column itself, its water jacket and heaters, glove box, tanks, pulser, and control panel have

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been completed and installed. The water jacket is of lucite and may be used up to 60°C. The wiring of the Skinner solenoid valves and piping of the tanks are being undertaken at present. The fluorothene valve seats of the Skinner valves are being altered to furnish more positive and dependable action. The choice of a constant flow positive displacement pump for multi-curie cell operation has been pending results of tests on pumps and evaluation of different feed systems. Malcomized 18-8 stainless steel gears in a Maisch gear pump failed in a matter of minutes due to corrosion when in contact with nitric acid. However, plain 18-8 stainless gears in the Maisch pump operated sufficiently well to warrant its use in the alpha column installation.

Solvent Extraction Applied to Bismuth Phosphate Streams

Two possible methods of increasing plutonium separations capacity at Hanford are (1) construction of new plants such as Redox or Purex and (2) modification of existing $BiPO_4$ facilities to permit the use of more efficient processes, thus allowing a higher plutonium throughput.

A suggested scheme for increasing processing rate through canyon facilities includes: (1) a precipitation step to effect separation of plutonium from uranium, (2) a decontamination cycle employing precipitations and (3) one "Recuplex" type solvent extraction cycle to effect final decontamination, purification and concentration. Since this scheme utilizes only one precipitation cycle, the cells now used for second cycles could be used for extraction and first decontamination cycles. This parallel operation would permit greatly increased throughput.

The solvent extraction process would replace the LaF_3 cycle in the 224 Building. Since the feed for the extraction cycle is a product cake solution, the plutonium concentration is relatively high (ca. 0.5 g/l). Thus the feed volume would be ca. 140 gal per 300 g batch of plutonium. This feed rate would require a relatively small sized extraction unit. The product from this unit would be plutonium nitrate at 60 g/l. This would be transported to 234-5 Building for final purification and metal fabrication.

Preliminary investigations on the above process have tested the recovery of plutonium from a $BiPO_4$ product cake solution by a countercurrent solvent extraction process. The feed stream was 19-4P solution salted to 0.6 g/l Pu, 0.6 M $Al(NO_3)_3$ and 7 M HNO_3. This feed was extracted countercurrently in separatory funnels with 15 per cent TBP in carbontetrachloride. The organic was scrubbed with water and stripped into 0.5 M $(NH_4)_2SO_4$. Volume ratios employed were feed:extractant:scrub:strip:: 100:20:5:2. Six extraction stages, one scrub stage and four strip stages were employed. The loss to the waste aqueous was 0.4 per cent and to the waste organic <0.01 per cent. The aqueous product obtained in this experiment analyzed 40 g/l Pu. These results indicate that the plutonium can also be recovered from the 14-4P by a relatively simple solvent extraction process.

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The gamma decontamination factor obtained in the above experiment (using 19-4P) was only 60. Although this factor is far below the goal of ca. 10^4 when using 14-4P as feed, it is believed that considerable improvement may be possible on changing the conditions of the process, in particular the number of scrub stages. The effects of flow ratios, scrubbing, solution composition, etc., on decontamination is now underway using 14-4P.

Continuous Cross-Over Oxidation of Plutonium in the Purex Process

Data obtained by distribution measurements into 30 per cent by weight TBP-CCl_4 or 30 per cent by weight TBP-AMSCO solutions indicate that the oxidation of plutonium(III) to plutonium(IV) by 0.1 M $NaNO_2$ in the acidified (6 M HNO_3) Purex IBP stream is essentially complete within five minutes. During the first 3-5 minutes considerable gas evolution occurred due to the sulfamate-nitrite reaction and within this time the E_H^0 value for plutonium had reached a constant value. Thus, the design of a continuous cross-over oxidation step in the Purex Process appears to be completely feasible.

Ion Exchange Decontamination of Redox Concentrator Distillates

The over-all beta decontamination factor obtained when a solution simulating the feed to the Redox condensate evaporator (pH 4.5) is passed serially through an hydrogen-form Dowex-50 column followed by an equal-volume, hydroxyl-form IRA-400 column continues to be about 2000.

To date, 9400 gallons of solution per cubic foot of resin have been passed through the Dowex-50 column without breakthrough of activity. Breakthrough did occur in the IRA-400 column, however, at about 6100 gallons per cubic foot.

In an experiment like the above, except that the feed was adjusted to a pH of 2, similar decontamination factors are still being obtained. To date, 3300 gallons of solution per cubic foot of resin have been passed through the cation exchanger (Dowex-50) without increase in effluent activity. However, as reported earlier, breakthrough occurred in the anion exchanger (IRA-400) at 1000 gallons per cubic foot. Exhaustive regeneration of the anion exchanger with NaOH and $NaNO_3$ removed only 60 per cent of the activity. On again passing effluent from the Dowex-50 through this column, breakthrough occurred at only 750 gallons per cubic foot of resin.

A column of steel wool proved much less effective than the IRA-400 in removing activity from the Dowex-50 effluent.

Decontamination of Bismuth Phosphate Process Second Cycle Waste

Precipitation of CuS from second cycle waste at pH 2 is the most effective means of removing ruthenium so far found, decontamination factors of about 700 being obtained when 0.03 M Cu^{++} is precipitated by the addition of H_2S gas. Addition of Na_2S instead of H_2S resulted in somewhat lower decontamination factors.

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Addition of both $Ca(NO_3)_2$ and $Cu(NO_3)_2$ to acidic second cycle waste followed by precipitation of the Cu^{++} at pH 2 with H_2S, neutralization to pH 7 and digestion for two hours at 80°C. produces beta and gamma decontamination factors in excess of 2000 as compared to 25 obtained in laboratory tests simulating present plant procedures. Preliminary settling data indicate that the settled volume of solids under this procedure is little if any greater than that when the waste is neutralized without added carriers.

Decontamination of Metal Recovery Aqueous Waste

Studies of the scavenging of Sr^{90} by ferric phosphate showed the following trends.

1. Decontamination varies with pH, giving the best results in the range 7 to 8.5.

2. Equilibrium is reached in a relatively short time; little change in decontamination occurs after 10 minutes contact time.

3. Digestion at elevated temperature favors decontamination.

4. Decontamination decreases slightly with increasing $NaNO_3$ concentration but markedly with increasing Na_2SO_4 concentration.

Similar studies of strontium removal by calcium oxalate showed:

1. Optimum pH for strontium removal is in the range 6 to 10.

2. Carrying decreases significantly with increase in either $NaNO_3$ or Na_2SO_4 concentration.

3. Carrying is markedly decreased by digestion at elevated temperature.

4. Carrying is better when oxalate rather than calcium is in excess. Precipitation of calcium oxalate in a simulated RAW waste improves strontium decontamination by a factor of about 3.

Replacement of Hydrofluoric Acid by Freon in 234-5 Operations

The first experiment in which plutonium(III) oxalate was fluorinated by use of Freon-12 has been completed. The plutonium(III) oxalate was dried for two hours at 105°C. in Argon and vacuum dried for three hours at 225°C. Freon-12 was admitted to the reaction tube for 2.75 hours at 375°C. and 3.5 hours at 500°C. The resulting product appeared to be plutonium(III) fluoride. Attempts to convert the trifluoride to the tetrafluoride by bleeding in oxygen with the Freon-12 at a volume ratio of 20 to 80 (O_2 to Freon) produced plutonium dioxide. Treatment of the plutonium dioxide with a gas stream having a Freon to oxygen ratio of 90 to 10 also failed to produce the tetrafluoride. Further efforts to convert this plutonium oxide to the plutonium(III) fluoride by treatment with pure Freon-12 were unsuccessful.

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Decontamination of Uranium Solutions by Ion Exchange

Study of the application of ion exchange techniques to the decontamination of uranium solutions from fission products is in progress. In the initial experiment, simulated Purex ICU (0.2 M UNH, 0.05 M HNO_3, spiked with 0.01 per cent by volume dissolver solution) was passed successively through a Dowex-50 cation exchange and then an Amberlite IRA-400 anion exchange resin bed. A gross beta decontamination factor of 7 was achieved by the cation bed with no additional decontamination on passage through the anion bed. Bed capacity, uranium holdup, and specific fission product decontamination are now under investigation, the latter to obtain some indication of decontamination from those fission products which are most likely to be limiting, e.g., ruthenium and zirconium.

Valve-Actuated Column

The entire apparatus is undergoing modification, the most important of which are a new column jacket and a new electrical system. Previous to shutdown, Kel-F coated plates were tried and found to give good coalescence of the organic and aqueous phases and excellent operating characteristics. New sets of plates are being prepared using this coating. These include plates with 0.020 inch diameter holes and plates with 0.014 inch x 5/16 inch slots.

Solvent Studies

Three new phosphonates of somewhat different structure have been synthesized and are being tested as extractants. Diethyl hydrogenphosphonate was found to be miscible with water and showed no tendency to form an extractable complex with uranyl nitrate. Diethyl benzoyl phosphonate was only a fair extractant and diethyl trichloromethane phosphonate proved to be very poor.

Attempted correlation of the infrared data on the P-O stretching frequency with UNH extraction has shown differences between classes of compounds such as phosphates, phosphonates and phosphine oxides but the further correlation within a class of compounds has been unsuccessful. The phosphinates, which should be intermediate in properties between the phosphine oxides and phosphonates are currently under consideration. One compound in this series has been prepared.

Ruthenium Chemistry

Charcoal which is a catalyst for the formation of $Ru(IV)\text{-}Cl^-$ complexes causes the production of nitrite ion in $Ru(IV)\text{-}NO_3^-$ systems at room temperature resulting in a solution whose composition is not known. The presence of charcoal and/or the nitrite ion formed profoundly affect the absorption spectra of Ru(IV) solutions. The 500 mu peak disappears, and new peaks at 380, 370, 360 and 340 mu appear. These latter peaks are not due to nitrite ion alone. Thus, charcoal cannot be used as a catalyst for the formation of $Ru(IV)\text{-}NO_3^-$ complexes.

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Separations Technology Unit

234-5 PROCESS DEVELOPMENT

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Plutonium Peroxide Process

Bulk density variations - Precipitation of 2.5 to 7.5 gram quantities of plutonium as the peroxide has shown that a strike at 15°C from a solution containing 20 g/l Pu and 1.55 M HNO_3 may be expected to produce a filter cake with a bulk density of 0.43 g/ml Pu (or greater) if the cake depth, in a cylindrical funnel, is not greater than 1.7 inches. If a bulk density of 0.43 can be achieved by filtration in the RMA filter boats, a 350 gram batch will have a cake depth of 1.2 - 1.3 inches, leaving a free-board of about 0.6 inch and a free volume of approximately 0.75 liter. Precipitation at temperatures below 12 - 13°C results in even greater bulk densities but produces solids which are difficult to filter.

Redox Coupling - Complete spectrochemical analyses of buttons made from synthetic IIBP solutions (refer - November Monthly Report for details) show all buttons to be of sufficient purity with respect to gross and light element impurities whether obtained from single or double-cycle peroxides.

Reaction of peroxide supernatants with alcohols - In comparing the rates of reaction of a synthetic plutonium peroxide supernatant solution with different alcohols, it was found that ethanol and isopropanol reacted less vigorously than methanol and left detectable quantities of organic reducing agents in the solution, but that after passing the threshold temperature (40 - 50°C) that all three exothermic reactions brought the solutions to a boil before they subsided.

Plutonium - lanthanum separation by plutonium peroxide precipitation - Eleven precipitations of plutonium peroxide from synthetic P-1 or P-2 solution, made to determine the effect of fluoride, sulfate, and phosphate on the separation from lanthanum, have given no conclusive data but indicate that none of the three anions listed is responsible for the extremely poor separation produced by the P-1 strike. Presence of small but variable concentrations of fluoride or phosphate may be responsible for variability in the lanthanum removal in the second cycle.

Plutonium(IV) Oxalate - Exploratory studies indicate the possibility of precipitating plutonium(IV) oxalate from Redox product solutions without prior reduction in the acidity. Plutonium losses of about one per cent resulted when the strike was made from a stock solution containing 10 g/l Pu and 5 g/l H+.

Laboratory work on the precipitation of Pu(IV) oxalate from AT solution has demonstrated the possibility of precipitating a 231 Building size batch in present 234-5 equipment, at room temperature, with high yields and satisfactory purity. Application of the present dry chemistry cycle (used for direct hydrofluorination of Pu(III) oxalate) gave fluoride bulk densities of only 0.94 - 0.96 g/cc PuF_4, but a slight modification of the cycle (which should also be applicable to the Pu(III) oxalate) gave densities of 1.4 - 1.6 g/cc PuF_4. Reduction yields were lower than expected (80 - 93 per cent),

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but this is believed to have been caused by equipment failures.

A plutonium(IV) oxalate process for the RM Line would permit the use of a 231 Building batch size in Task I. No overloading of the filter boats would be necessary, and a dense free-flowing fluoride would result. The alcohol problems associated with a peroxide process would be eliminated.

Virtually complete destruction of the oxalate present in the supernatant solution from a plutonium(IV) oxalate precipitation may be achieved by evaporation to ten per cent of the original volume.

Recuplex process - Fresh slag and crucible solution has been found to contain approximately 80 per cent Pu(IV). After filtration of duplicate samples, with and without filter aid, the residues were found to contain 0.54 and 0.31 per cent of the recovered plutonium, respectively. Data are not yet complete on the effect of the Pu IV oxidation on the product in the residue.

Disengaging times from contacting 15 per cent TBP - CCl_4 with various samples of slag and crucible solution varied from 1.3 to 3.6 minutes, with the average about 2 minutes. Aliquots of one sample were contacted at various times over a period of two weeks, and the disengaging times varied from 1.5 to 3.9 minutes in that time. A recuplex feed sample was made up with slag and crucible solution; its disengaging time was measured as 1.4 minutes.

Two methods of clarifying F-10-P solution, filtration and a pre-contact with CCl_4, have been examined for possible use in Recuplex. Both methods left an unknown substance in the F-10-P which caused formation of slowly breaking bubbles in the TBP - CCl_4 layer, but the disengaging times for contact of successive samples of the treated F-10-P with the same sample of solvent either decreased from 0.5 to 0.3 minute (filtration) or increased to a maximum value of 0.6 minute (precontact with CCl_4). The pink residue obtained by filtration of a sample of F-10-P was found to contain approximately ten per cent of the plutonium in the sample.

First Cycle Waste Evaporation - A volume reduction of 4:1 by evaporation of a cold, synthetic $BiPO_4$ first cycle waste supernatant resulted in the formation of 130 g of solids per liter of concentrate. The character of the residue was not noticeably affected by addition of 5 g/l Calgon to the supernatant solution. The crystals contained Bi^{+++}, Na^{+}, $PO_4^{\equiv}$ and slight Al^{+3} and proved to be soluble in HCL, concentrated HNO_3 and citric acid but not in H_2O, caustic or dilute HNO_3.

Crucible Shop - The crucible shop was withdrawn from construction temporarily during the month

The operation proceeded satisfactorily in all respects. It was necessary to consolidate the capacitators from both induction furnaces into one unit in order to get unity power factor. The principal work to be completed relates to the Globar furnace, employed in carbon burnoff operations.

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Separations Technology Unit

INVENTIONS

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

R. B. Richards

R. B. Richards, Head
Separations Technology Unit

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ANALYTICAL UNIT

DECEMBER 1952

January 8, 1952

VISITORS AND BUSINESS TRIPS

A. F. Wells of the General Electric Company, Schnectady, spent December 1-16 at the Hanford Works servicing a new mass spectrometer.

G. A. Clarke, G. A. Huff, E. G. Bianco and P. Goris of American Cyanamid Company, Arco, Idaho, spent December 5-15 here studying analytical methods.

J. G. Hutton and C. A. Evans of KAPL visited the Hanford Works December 12-13 and December 10-13, respectively, for discussions and inspection of mass spectrometers and other instruments.

H. R. Schmidt spent December 10-15 at Northwestern University and Illinois Institute of Technology, Chicago, recruiting technical personnel.

ORGANIZATION AND PERSONNEL

Personnel totals in the subdivisions are summarized as follows:

	November 30	December 31
Analytical Service	326	326
Analytical Research	38	40
Administrative	3	3
Unit Totals	367	369

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Analytical Unit

ANALYTICAL RESEARCH

Redox Process

A large part of the analytical research effort during the month was spent in assistance to Redox analytical control start-up.

The automatic coulometer for the titration of uranium was placed in service in the control laboratory, and personnel were trained in its operation. It has worked accurately, precisely, and rapidly and has proved itself capable of analyzing mainline analytical streams, including several cases for which the less precise fluorimetric method was originally proposed. Control operators have obtained only slightly poorer precision than the ± 1.5% obtained by the chemist who developed the instrument. During the initial control analyses it was observed that the excess hydrobromic acid liberated during destruction of nitrate prior to titration was causing a serious corrosion problem in the titration hood. To avoid this difficulty, an absorber system was installed on the gloved box outlet.

A breadboard model automatic coulometer was constructed to study the titration of plutonium. The method under investigation consists of reducing the iron, which serves as a stand-in for plutonium, with excess chromous ion and then back-titrating the sample with the automatic coulometer. The system thus requires the automatic detection of an initial and final endpoint. By this means several milligrams of iron have been titrated with excellent precision but a + 3% bias of unknown cause is observed. Difficulties encountered with iron impurity in the reagents were overcome by locating a source of supply of pure material.

The chromatographic procedure for separating fission products from uranium and uranium daughters was improved to effect a recovery of 90% of the fission products. A somewhat longer column was placed in use and the composition of the acetone-ether developing solution was modified to obtain optimum results. It was noted that if the acetone content were increased from 35 to 40%, considerable zirconium was lost, whereas if it were decreased to 30%, appreciable quantities of uranium daughters remained with the fission products. Individual studies with active ruthenium and zirconium showed that the recovery of the former according to the method was 95%, and that the recovery of the latter was 88%. Contrary to preliminary observation, it was found that no ruthenium is lost when the fission product residue is dried on the counting disc. Studies with the newly received gamma scintillation counter show that there is no attenuation of gamma radiation when one gram of UO_3 is subjected to counting; consequently, to obtain greater precision, it was decided to measure the reference gamma radiation from equilibrium UO_3 on a sample of this size. Research personnel moved the fission product determination equipment to the Redox control laboratory and have trained control personnel in conduct of the method. It was considered advisable to introduce the method at this time in order to allow determination of true Redox beta and gamma decontamination factors during start-up hot runs by a procedure that avoids the interference resulting from the presence of variable quantities of U-237 and uranium daughters in uranium product.

A careful consideration of the fission products expected to track through the Redox Process indicates that the gamma decontamination will be controlling. As

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a consequence, techniques using absorbers are being considered to allow the rapid determination of gamma radiation from Redox uranium product.

Since considerable difficulty was encountered in the control laboratory in applying the volumetric procedure for determination of acid in Redox streams, the so-called pH method was introduced. According to this procedure, the sample pH is measured and is converted to acid content by means of previously determined calibration curves. It is a considerably more rapid procedure and appeared to give satisfactory results during the initial field test.

Other Redox methods assistance comprised introduction of the x-ray photometric uranium procedure; assistance with the americium-curium determination; elimination of several difficulties encountered in the ruthenium determination; assistance in introducing colorimetric procedures for dichromate, permanganate, tetravalent plutonium, and iron; modification of the flame photometer to be used for sodium determinations by elimination of the contamination problem resulting from condensation in the gloved box; and assistance with the sulfamate determination, aluminum determination, and the analysis of various process reagent solutions. A program was initiated whereby blind standard samples are submitted to the control laboratory through the operating engineers; control analyses of a limited number of such samples showed density determinations to be accurate but revealed some lack of precision in the chromate and nitric acid determinations.

Promising results were obtained in studies designed to allow the direct mount radiochemical determination of plutonium in various Redox streams. It was found, as expected, that the presence of aluminum introduces some attenuation of alpha particles, but the results indicate that by use of relatively small sample sizes true results may be obtained. Although the request for determination of neptunium in Redox solutions has been withdrawn, it was considered advisable to test the procedure developed at KAPL to have it available for miscellaneous determinations; poor results were obtained initially, indicating that some modification of the procedure is necessary.

A laboratory model chain hydrometer was constructed and tested for the determination of density of aluminum solutions. The unit operates in the density range 1.26 to 1.31, corresponding to 625 to 750 g./l. ANN. It allows measurement of density to 0.001 which corresponds to 3 g./l. ANN. Since this is well within the required range, it is planned to introduce the technique to the control laboratory.

Metal Recovery Process

Several difficulties with analytical methods employed in connection with shakedown runs of the UO_3 process were eliminated. As described previously, the Karl Fischer method was employed for the determination of water in UO_3 product even though there was some concern as to whether the reagent would completely remove occluded water from the sample. Although sharp endpoints that are free from drift are obtained, it is proposed to make some comparisons of this procedure versus a more elaborate procedure that involves ignition of the sample and collection of the liberated water. This comparison is of particular concern because the K-25 Laboratory has advised that they propose to use the latter routinely.

During development studies the determination of nitric acid in UO_3 proved to be particularly troublesome because of the slow solubility of the solid. Because the UO_3 Process product was considerably finer than material used in development studies this difficulty has disappeared in routine practice. The method employed involves dissolving the sample in phosphoric acid, conducting a vacuum distillation, and titrating the liberated nitric acid. The method finally selected for determination of tetravalent uranium in oxide involves dissolution of the sample in hydrochloric acid, filtering off the insoluble U_3O_8, and making a uranium determination on the dissolved residue. Several control laboratory determinations of the loss on ignition of the oxide show that this loss compared favorably with the determined water plus nitric acid plus calculated oxygen loss.

The determination of surface area of UO_3 product from shakedown runs was made in the Analytical Research laboratories. Fourteen such samples were analyzed. The procedure requires that the sample be evacuated under moderate heat until gases are no longer evolved. Because of the high water and nitric acid content of the samples, as much as twenty-four hours evacuation was required on many of the samples, and as a consequence, the determinations were slow and tedious. Although it is expected that this difficulty will be less pronounced after satisfactory process operating procedures have been established, an attempt has been made to shorten the method. Analyses were made in several cases after evacuating the sample for a period of only two hours, and it was observed that the results obtained were 10% low. Apparatus for conduct of the determination has been erected in the Redox laboratory, and control personnel are presently conducting the analyses. Further attention is being given to a shorter method, previously reported, to determine if it will give suitable precision and accuracy.

As previously proposed, a qualitative determination for tungsten in UO_3 product was substituted for the laborious quantitative determination, and analyses of initial oxide products have shown that tungsten is not detected. Difficulties were encountered with the bulk density determination according to the standard ASTM procedure. These followed from the fact that the oxide tended to agglomerate and was thus not free flowing. The standard procedure was modified by using a funnel of larger opening so that the material could be transferred to the standard cup for weighing. The Consolidated mass spectrometer was received on plant site at the end of the month and is being installed in the Redox laboratory in preparation for the determination of the isotopic composition of uranium product.

P-10 Process

The General Electric mass spectrometer, installed for the analysis of P-10 samples, has been operating according to specifications. Additions of a new, high speed, diffusion pump and a new source unit of somewhat different geometry, together with a complete tune-up of the electronic system, eliminated the difficulties previously observed. A six component mixture was analyzed repeatedly on the instrument and yielded results meeting the acceptance test. The instrument is adequately sensitive and provides good resolution between the He^4 and the HT peaks. The stability of factors has been very good over a one week period, and the linearity of response with sample pressure was acceptable. The unit was placed in limited control use; comparison of results with those obtained on the Consolidated instrument shows the latter to be somewhat higher for the major sample components. An automatic focusing unit was developed and constructed at the General Engineering Laboratory and is ready for installation on the new instrument.

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Analytical Unit

General

Experiments have been carried out to evaluate the effect of beta radiation on the determination of alpha counting rate in the standard ASP counter. A pulse generator which allows the introduction of pulses of fixed magnitude was employed to simulate the alpha pulses with and without the presence of a beta disc in the counting chamber. Initial results have yielded the surprising and unexplained observation that the presence of beta particles tends to lower the counting rate produced by the pulse generator, particularly if the latter yields pulses just above the threshold value. If further evidence supports this conclusion, it will suggest that the present radiassay procedure for plutonium in dissolver solution may be subject to an error of -0.5 to -1%, which would be consistent with the slightly high material balances currently obtained in the Separations Process.

The spontaneous fission rate of Pu-240 obtained on a standard plutonium source received from Argonne National Laboratory does not agree with the reported value. As a consequence, no confidence can be placed in the results obtained with pile-produced plutonium until an additional standard, which has been shipped from UCRL, has been received and evaluated. Two reports have been prepared and are ready for issue at month's end. The first describes the operation and calibration of the spontaneous fission counter, and the second reports the analyses obtained to date.

Further study of the application of the americium-curium procedure to various Bismuth Phosphate Process streams has effected several improvements in the results. These were accomplished by destroying nitrite with heat prior to analysis and by making a double precipitation of americium-curium to effect more complete separation from plutonium. It is expected that these improvements will eliminate the analytical inconsistencies observed in the determination of the distribution of the material in the various process streams.

Although the use of stainless steel discs in place of platinum discs offers several advantages for the radiodetermination of plutonium, it has not been possible to employ the former with all samples because of the strong corrosive action of fluorides on the stainless discs. This difficulty was eliminated by developing a pretreatment of the disc in concentrated nitric acid saturated with dichromate that serves to passivate the steel. Using discs treated in this manner, acceptable results were obtained so that stainless discs may now be used for all process determinations.

The electrodeposition procedure for plating thin, uniform plutonium films for counting studies requires preliminary oxidation of the plutonium with ozone, which has proven to be an inconvenient operation that tends to spread contamination. A substitute oxidation-extraction procedure in an H-tube has yielded approximately 98% recovery of hexavalent plutonium. The sample, free from chloride, is oxidized with dichromate in one leg of the tube and is extracted through a pure ether layer to water in the other leg of the tube. Interference resulting from transfer of chromium was eliminated through removal of all chloride from the initial sample. Quantities of plutonium in the range 2 to 100 ug. are conveniently handled by the procedure.

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Analytical Unit

A survey of the requirements and analytical procedures for water analyses in the 100 Area showed that considerable improvements with respect to precision, accuracy, and analytical time can be effected through use of various spectrochemical procedures. The recently investigated porous cup procedure can be employed to advantage for the determination of a large number of impurity elements thereby eliminating many individual determinations presently performed. Similarly, the flame photometer offers promise for reducing analytical time in several respects.

In connection with developing techniques for providing automatic dilution of samples for possible in-line applications, several mini-pumps have been received and tested. Exceptionally close control and uniformity of operation were demonstrated in one experiment in which the pumps were arranged so that one introduced dilute nitric acid and the other dilute sodium hydroxide at a rate of several milliliters per hour into a chamber containing a glass electrode. It was found that the pumping rates could be adjusted so that the pH of the mixture could be held between 6 and 8 for a period of at least one hour.

ANALYTICAL SERVICE

Work Volume Statistics

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

	November		December	
	Samples	Determinations	Samples	Determinations
Process Control - B, T & Z Plants	5,854	14,606	5,841	13,824
Process Control - Metal Preparation	805	1,718	665	934
Water Control - 100, 700	1,033	4,056	965	4,147
Research and Dev. Programs	2,054	3,502	2,059	4,258
P-10 Control	376	3,759	491	4,894
Redox and UO_3 Plant Control	--	--	620	1,723
Process Reagents	2,548	3,319	2,941	3,847
Essential Materials	480	1,066	1,335	1,979
Special Samples	518	6,712	363	6,844
Totals	13,668	38,738	21,280	42,450

Included for the first time are data on the Redox and UO_3 Plant control analyses which assumed significant proportions this month.

100 Areas Control

With certain minor exceptions, the water and P-10 control program continued on a routine basis. At the request of the Water Quality group of the Pile Technology Unit preparations are being made to analyze water samples for normal constituents in support of the film formation studies. In addition samples of actual film will be analyzed for all suspected cations and anions. Whenever possible analysis will be accomplished by spectrographic means with the remainder being analyzed by wet chemical methods.

Analytical Unit

The Naval Reactor Unit was shut down during the month due to a recirculating water pump failure. Operations and analytical control will be resumed as soon as a replacement pump is installed and a normal pile shutdown occurs. The G.E. Mass Spectrometer calibration was completed and the instrument placed in routine P-10 service this month.

200 Areas Control (Precipitation and Metal Fabrication Processes)

One americium recovery run was processed by the Separations Section in the 231 Bldg. this month. Analytical service for both plutonium and americium analyses was requested on the usual three process stream samples taken from the run: P-1, CTLR, and AT. Some analytical difficulty was encountered with the high level plutonium solutions (P-1 and AT), alpha energy analysis indicating 5-20% of the activity in the separated americium fraction to be plutonium. Approximately 25 mg. of americium were isolated in this run with a material balance of 114.7%.

Additional analytical service was requested by the Plant Assistance group, Separations Technology Unit, in their investigation of high lanthanum impurity in the process. The supposition was made that the molecular ratios of Pu/SO_4 in the first and second cycle precipitation steps might have some correlation with the amount of lanthanum being carried in the Isolation Process. Accordingly, samples of the starting solution (P-2), final cake solution, and of the $(NH_4)_2SO_3$ used in the pre-reduction step, were taken and analyzed for Pu, La, and SO_4 ion, the results being forwarded to the Plant Assistance group for evaluation.

Production Test 231-13, Time Cycle Reduction, was initiated on November 27 in the 231 Bldg. The objective of this test was to demonstrate the feasibility of a process time cycle of 6.25 hours per run to be attained by peroxide precipitation without digestion and separation of supernatant solutions from the precipitate after shorter settling periods. The previous time cycle was eight hours. The initial bases of this production test have been completed and all three operating cells are now on a 6.25 hour cycle. Analytical requirements for the faster cycle necessitate completion of each AT analysis in a maximum time of 1.5 hours. While this has been possible in the majority of cases, continuous production control for three operating cells will require the addition of three more chemical assay set-ups to ensure that time requirements are met.

Effective December 11 and starting with Runs Z-11-12-21 and Y-11-12-40, iron concentrations in plutonium metal samples are being determined by a new spectrographic technique employing an internal (cobalt) standard in the carrier concentration procedure and evaluating the spectrum lines densitometrically instead of by visual comparison. The accuracy has been increased from ± a factor of two to about ± 15% of the true value. Although the increased analytical time will approximate 50 man-hours/month, the increased accuracy is essential for reliable chemical assays of metal casting samples, which must be corrected for iron. A detailed report of this work has been issued as Document HW-23080.

Twelve UO_3 samples were received and spectrographically analyzed at the 234-5 Laboratory during the month. High impurity content, especially sodium, was noted in all samples submitted. This service has been set up on a routine basis as a part of the UO_3 specification analyses.

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Analytical Unit

After changing the air filters which service Rooms #143 and 144 of the 234-5 Bldg. Laboratory, the air flow through hoods in Room #144 was balanced prior to installing analytical equipment for the 70-58 and plutonium assay procedures. This arrangement permits immediate realization of part of the plan to increase laboratory efficiency by centralizing the wet chemical work in one small area as well as the sample preparation work (weighing, dissolving, etc.) in another laboratory room.

A tabulation of 100 consecutive chemical assay determinations on metal casting samples revealed that the rerun frequency was 24%, representing a significant and favorable decrease from the 200-300% which was experienced several months previously. Statistical evaluation of these same data also revealed the following noteworthy information:

1. Average value of summation = 99.91%
2. Precision on summation = ± 0.42%
3. Precision on titration = ± 0.15%

In view of the improved precision of the chemical assay procedure, it may now be possible to reduce the number of titrations per sample and yet maintain adequate control of the analysis. This possibility is being investigated.

200 Areas Control (Extraction Processes)

In the 202-S Building, six Redox head-end treatment studies using unirradiated uranium were completed and three others are in process. One single cycle and two multicycle cold runs were also processed during the month. The frequency of sampling was such that the laboratory could not keep up with the workload at all times; this was particularly true in regard to low uranium and nitric acid determinations.

The UO_3 Plant Cold Shakedown Run C-1 was completed during the month. A much greater sampling frequency than had been previously estimated, combined with equipment and methods start-up difficulties, since rectified, caused a number of delays in service. The lengthy time requirements for a complete UO_3 analysis indicates that a minimum of nine analytical personnel will be required to adequately service the UO_3 Plant, even on a routine sampling basis.

Installation of all necessary analytical equipment was completed or scheduled for completion prior to the start of tracer level runs in the Redox Plant (scheduled for January 6). However, the continued shortage of plant sampling equipment is a matter of great concern. None of the Redox bayonets or "A" type doorstops have been received as yet, and during the Redox cold run sampling, it has been necessary to transfer the sample to another vessel upon receipt in the laboratory in order to have equipment available for taking other samples. It is quite easy for samples to lose their identity when using such procedures, and sampling cups have been broken and samples spilled all too frequently. Such procedures would be intolerable for tracer level or full level Redox runs.

300 Area Control and Special Services

Metal Preparation Process control continued on a routine basis during the month. Preliminary attempts to reduce the limits of detection of rare earths in uranium

by spectrographic means appear promising. A few analyses have been made on Al-Si, bronze, tin, uranium, etc. to assist in the broad program of determining raw material consumption.

Several interesting special service problems were completed. Animal feed samples, submitted by the Radiological Sciences Department, were analyzed for iodine content in connection with studies being made on active iodine metabolism. Similarly, algae samples were analyzed for carbon and hydrogen as an analytical aid in tritium metabolism studies. Results were satisfactory for the evaluation of the experiments. The Metallurgy Research group of the Pile Technology Unit requested that a study be made to determine the percentage by weight of iron and uranium in solutions which contained a known volume of their basic precipitates. This study was made in order to place a quantitative value on tests run in the 314 Building and necessitated laboratory duplication of process conditions. Distillation tests were run on alcohol-water samples from the canning operation in order to determine the economic feasibility of recovering methanol. A group of aqueous salt solutions were received from the Redox Plant Assistance group for viscosity determination. Two ingot samples and a cathode plate deposit sample from the tin reclaiming operation at the Bureau of Mines, Albany, Oregon were analyzed for tin, copper, iron, sulfur, uranium, cadmium and general spectrographic impurities as a check on their analysis and also to compare the purity of the two ingots. A film deposit sample was submitted by the Water Quality group of the Pile Technology Unit. This was analyzed for calcium, chromium, aluminum, iron, magnesium, carbonate, and sulfate; the results indicated that the sample was primarily calcium carbonate.

Studies on the Winter-Willard Method for determining fluoride content of cerium fluoride solids have given reproducible, although not stoichiometric results. It was found that CeF_4 samples could be dissolved in concentrated nitric acid in four to five hours at approximately 117°C. With standard samples, subsequent steam distillation or distillation at a constant volume from sulfuric or perchloric acid in any of the four possible combinations gave the same straight line function of fluoride used versus the volume of $Th(NO_3)_4$ used in titration over the range of 0.5 - 1.6 mg. F^-. Critical to the analysis was the volume of the distillate taken for titration, which must be less than 10 ml., and the adjustment of the pH to 3.4 with 50% NaOH immediately prior to titration, both points being necessary to achieve distinct end points. The most notable uncertainty in the method is the siliceous residue which collects on the cooler portions of the flask during sample dissolution. The residue is known to contain silica and therefore is likely to contain fluoride ion although the subsequent steam distillation may remove the fluoride from the material. For CeF_3 samples run so far, duplicate results show 21.6 - 22.9% fluoride compared to a theoretical value of 29% F. However, the samples are known to contain a few per cent chloride ion.

Methods Control

The following table summarizes the results of the routine geometry determinations made on all of the ASP and IDL counters in the area control laboratories. These geometries are based on plutonium mounted on platinum discs which were calibrated with the ASVP chambers used prior to May, 1951, using the "pie plate" technique. With these discs the accepted value for the ASP units is 50.5 ± 0.15%.

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Analytical Unit

The IDL instruments are maintained at a geometry which will give stable operating characteristics.

Summary of Routine Geometry Determinations

Laboratory	Type Instrument	Av. Geometry	No. Tests	No. Out 99%	Times Instr. Out of Operation
3706	ASP	50.45	97	6	0
231	ASP	50.52	53	6	2
222-B	ASP	50.50	106	2	3
222-T	ASP	50.50	105	3	2
222-S	ASP	50.54	77	12	1
234-5	ASP	50.51	23	0	3
234-5	IDL #2	51.07	2	0	1
	IDL #3	51.08	16	0	1

Document HW-23100, "Revised Isotope Correction", was issued during the month. The new isotope correction factors were based on experimental results obtained over a wider range of MWD values than were considered in preparing earlier isotope correction factors, thus eliminating the need for extrapolations. The revised factors also reflect use of improved disintegration rate data, obtained by means of the changes listed below which have been discussed in detail in previous reports of this series.

1. The geometry of the ASP instruments was revised to take into account the use of stainless steel as a sample mounting medium and an improved ASVP vacuum attachment and is 50.0%.

2. The use of 1.364×10^{11} d/m/gram as the specific activity of Pu-239 to replace 1.37×10^{11}.

3. The introduction of radioassay calibration factors of 1.008 for the 222-T, 222-B, and 222-S Laboratories, and of 1.014 for the 231 Laboratory.

A comparison of the isotope correction factors in use during December (unrevised) with those computed from radiochemical and chemical assays of the AT solution during the month are given below:

Run Series	B-11-11	T-11-11	B + T-11-11
No. Determinations	73	80	153
Av. % Difference*	2.37%	2.11%	2.23%
% Precision Individual	± 5.18%	± 5.21%	± 5.19%
% Precision Average	± 0.61%	± 0.58%	± 0.42%

* Per cent difference of factor calculated from AT assay - factor used.

Twenty-four stainless steel geometry discs were prepared and calibrated. Ten of these were distributed to the area laboratories for use to control the instruments to 50.0 ± 0.15% geometry.

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Analytical Unit

The vacuum attachement for the second ASVP instrument in 231 Building was checked and found to agree with the other three instruments within 0.1%. To aid in the prevention of spread of contamination when handling high level discs prepared for counting with the ASVP instrument, it was found five times as much collodion solution as used at present has no effect on the counting rate with this instrument.

A statistical review was made of the analysis of the latest forty-seven plutonium metal castings. The present precision and summation results for analysis of a cutting are compared with previous data below:

	Past	Present
Average Pu Content	98.89%	98.77%
Prec. of 4 Titrations	± 0.47%	± 0.16%
Av. Sum of Elements	100.003%	99.91%
Precision of Summation	± 0.57%	± 0.41%

An analysis of variance indicated that the major source of variation is between cuttings from the same piece. The source of this variation is not known; it may be due to segregation of the impurities resulting in poor sampling or to analytical variations in the dissolving and weighing steps in the analysis. Since the precision of the answer reported for a piece is primarily dependent upon the difference between cuttings, it has been recommended that two instead of four titrations be made on each cutting, and the following system used for reruns:

1. The upper limit for the duplicate titrations to be a range of 0.34% (95% limit). If the range is above this value one more titration is to be made. If the three titrations agree within the 99% range limit of 0.51%, report average of the three. If the three results are outside the above limit, report the average of the two that are within the range limit of 0.34%. If this limit is not met, redissolve and rerun.

2. The upper limit for the difference between the results for the MC-1 and MC-2 is 0.58% (95% limit). If outside this limit, redissolve and assay the sample with the summation farthest from 100%. If still outside the limit redissolve the other sample. If the two samples do not agree within the limit, but the redissolvings agree with the original dissolving, average and report.

3. No change to be made in the summation limit.

Work continued on replacing the methyl borate distillation procedure with the faster Los Alamos Method employing the use of oxalate to precipitate plutonium from a chloride solution of the metal with subsequent colorimetric analysis of the supernate for boron content. To date the primary complication appears to be the criticality of the H+ and oxalate concentration on color development. These difficulties are expected to be circumvented shortly and it is hoped to place the procedure in operation during January.

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Analytical Unit

Safety and Special Hazards Control

Data on laboratory surveys and contamination are presented below:

	222-B	222-T	231	234-5	R & D
No. Days on N.C.W.	49	48	16	42	0
% No Contamination Work	6.4	5.9	2.7	4.2	0
Survey Work (hours)	180	177	60	111	40
Non-Regulated Items Contaminated	232	124	140	106	0
No. Cases Floor Contamination	40	21	24	11	1
Air Contamination - No. Above Tolerance					
Alpha	5	5	0	1	1
Beta	0	0	0	0	0

Explanation of the most significant cases of air contamination follows: Gross alpha contamination occurred in the sample storage room at the 222-T Building Laboratory on December 1, resulting in air contamination and necessitating the wearing of assault masks for a 24 hour period. Floor decontamination and regular laboratory work was carried forward with approximately 60 man-hours being spent in clean-up work. The contamination was apparently caused by sampling equipment which had not been properly decontaminated. Intensive re-training is being continued to prevent similar incidents.

During a routine survey in the 231 Building Laboratory on December 20, 1951 an area of approximately 2 square feet on a laboratory bench in the testing room was found contaminated up to 80,000 d/m. Immediate survey by laboratory personnel revealed six-contaminated floor spots (maximum 20,000 d/m) and one pair of hot shoes. No personnel contamination resulted and all contamination was easily cleaned. The source of the contamination is unknown but since the contaminated area was in the vicinity of the BGO Counting Instrument, several prepared gamma plates were suspected. However, survey of the prepared plates revealed no contamination.

Gross plutonium contamination (greater than 4,000,000 d/m) was discovered in sample vault #3 at the 234-5 Building Laboratory, presumably caused from a P-11 sample spill. Since all contamination was confined to the inside of the vault and since a negative air flow through the vault was maintained at all times, the possibility of plutonium inhalation was considered improbable. In addition, air samples taken prior to discovery of the incident were below tolerance. Since clean-up of the equipment was conducted with respiratory protection and proceeded without incident, no significance was attached to the special air sample (8.9×10^{-11} ug. pu/cc) which was taken during the decontamination work.

In the Research and Development Service Laboratory, special precautions were taken to minimize the possibility of plutonium spread during the course of a fluorimetric uranium determination on a high level plutonium solution. Preceding the final reading it was necessary to transfer the platinum dishes containing a fused melt of the sample across a three-foot aisleway to the fluorimeter, during which time apparently chips of the salt dropped to the floor contaminating it up to 20,000 d/m in four spots. Air samples taken right at the small hood opening during the laboratory operation showed twice tolerance levels, while one taken

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during clean-up work showed below tolerance activity, indicating, little, if any, possibility of personal exposure through inhalation. A Petri dish will be used as a transfer vessel in the future. An isolated spot of 10^6 d/m subsequently found in the same room could not be associated with this spill or other previous laboratory operations, its source being unknown.

On December 21 at 1:40 A.M. in the 222-S Building Laboratory a small explosion and fire occurred in hood 4-A-8, which housed the auto-titrator, when a short circuit developed in the hood electrical outlet and ignited propane gas which had leaked into the hood. The gas valve was found about one quarter turn open and had evidently been bumped by an employee's knee and accidentally opened. The total estimated loss was $100, and this included repairs to the gloved box, hood electrical outlet, and readying the auto-titrator for use. To prevent recurrence, all propane valves have been turned off at the pipe chase except for one hood where discs are flamed. A scrubbing train has been installed on the auto-titrator to trap the HBr fumes and prevent them from condensing in the hood. Apparently it was condensate present on the electrical outlet that had caused the short circuit.

There were sixteen minor injuries incurred in all of the control groups in the period covered by this report.

INVENTIONS

All Analytical Unit personnel engaged in work that might reasonably be expected to result in inventions or discoveries advise that, to the best of their knowledge and belief, no inventions or discoveries were made in the course of their work during December 1951 except as listed below. Such persons further advise that, for the period therein covered by this report, notebook records, if any, kept in the course of their work have been examined for possible inventions or discoveries.

Inventor(s)	Title
None	

Signed: F. W. Albaugh
F. W. Albaugh, Unit Head

FWA:ltc

TECHNICAL SERVICES UNIT

DECEMBER 1951

VISITORS & BUSINESS TRIPS 1-10-52

There were no off-site visitors sponsored by the Technical Services Unit during the month.

Business trips of Technical Services personnel were as follows:

P. F. X. Dunigan spent December 3-4 at Argonne National Laboratory, Chicago, inspecting new laboratory buildings.

Ezra Hollister spent December 2 in New York attending the Annual Chemical Industries Show; and December 3 in Pittsburgh at the Firth Sterling Steel Co. investigating the spark method of metal cutting.

C. G. Stevenson spent December 3-5 at KAPL discussing the organization of metallurgical literature.

R. F. Cell attended the Economics and Allied Social Sciences Convention in Boston, Mass., on December 26-29.

ORGANIZATION AND PERSONNEL

Personnel totals in the several subdivisions are summarized as follows:

	November 30	December 31
Engineering	69	73
Technical Information	87	86
Mathematics	30	29
Administrative	4	4
Unit Totals	190	192

ENGINEERING SERVICES

Mechanical Shops (Bldgs. 1717-D, 3706 and 222-S)

Work volume statistics for the Mechanical Shops are as follows;

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	Customer Unit or Program	November No. of Jobs	November Man-Hours	December No. of Jobs	December Man-Hours
Work Done on Jobs Completed	P-10	9	186	6	174
	Pile Tech. (Incl. P-12) (a)	17	322	31	544
	Separations Tech.	23	548	16	578
	Analytical	12	183	13	460
	Technical Services	12	296	20	653
	Others	5	105	9	109
	Sub-Totals	78	1,640	95	2,518
Work Done on Jobs Not Completed	P-10	4	282	2	164
	Pile Tech. (Incl. P-12)	9	680	9	190
	Separations Tech.	8	134	9	144
	Analytical	4	219	6	317
	Technical Services	9	519	10	558
	Others	3	478	3	26
	Sub-Totals	37	2,312	39	1,399
Total Work Done			3,952		3,917
Work Backlog:					Man-Hours to Complete
Jobs Started	P-10	4	225	2	27
	Pile Tech. (Incl. P-12)	9	399	9	299
	Separations Tech.	8	257	9	96
	Analytical	4	81	6	461
	Technical Services	9	451	10	604
	Others	3	25	3	31
	Sub-Totals	37	1,438	39	1,518
Jobs Not Yet Started	P-10	1	40	1	12
	Pile Tech. (Incl. P-12)	4	236	12	486
	Separations Tech.	3	73	0	0
	Analytical	4	456	5	59
	Technical Services	7	265	6	275
	Others	3	155	0	0
	Sub-Totals	22	1,255	24	832
Total Backlog			2,693		2,350 (b)

(a) P-12 designates the Exponential Pile Project.
(b) Does not include 478 man-hours cross-ordered to other shops.

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On December 19 the shop workload had decreased to a point where a 6-day work week schedule was no longer necessary. Accordingly, the Metal Preparation Section which is responsible for the craft personnel assigned to the Technical Shop was requested to discontinue the 6-day work week for all of their personnel.

The following work was completed for the Technical Units as indicated:

Pile Technology

Additional special leak-proof containers for the "in-pile" atmosphere experiment have been fabricated. These containers, described in a previous report, require fabrication techniques available only in the Mechanical Development Shops.

Eight hydraulic heads for the 189-D Bldg. 9-tube mock-up were cross-ordered to the 200-W Maintenance Shops. Some reworking by 200-W Maintenance was required before these heads passed final inspection. Approximately 260 man-hours were required for initial fabrication and rework.

Fabrication of a thermal conductivity-apparatus bath estimated to require 320 man-hours was cross-ordered to 100-F Maintenance. Fabrication has been temporarily delayed pending the receipt of component parts from off-plant vendors.

The chemical slug stripper apparatus described in the October report has been completed and delivered. Considerable delay was experienced in obtaining special stainless steel gears, sprockets and other hardware.

Fabrication of the Uniscan unit was cross-ordered to the 100-F Maintenance Shops. This device will be used for drawing and forming thin walled tubing from heavy walled stock, and is designed to handle tubes ranging from 1" to 2" outside diameter. The device maintains a constant inside diameter while the wall thickness can be drawn from as much as 0.25" original thickness to 0.20" final thickness.

The valve and electrode assembly, which utilizesthe metal electrode seals and which was described in the November report is 96% complete. This work covered by this order includes replacement and spare parts for similar assemblies previously fabricated in the shops.

Two orders were received and completed for a modification of skinner valves to permit pneumatic operation. The fabrication of a 6-foot graphite reflector for P-11 was cancelled with approximately 320 man-hours remaining of the original 400 man-hour estimate. This unit, described in the November report, will not be required until some later date.

Analytical Unit

The fabrication of a second primary sampler for Bldg. 222-S has been started and is approximately 40% complete. This unit differs slightly from the previous model in the design of the rotating turret. Also, the lead screw mechanism used in the original model is being replaced with a special ball-

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bearing screw mechanism. This sampler, to be installed in the "analytical line," incorporates several design features of interest including automatic positioning, friction free bearings and automatic inter-locks.

Separations Technology Unit

The fabrication of the sample blister described in the November report has been completed and the unit has been delivered to Bldg. 222-S.

A Homalite window for the 9-foot gloved box installed in Bldg. 3706 was completed and delivered. Homalite is very unusual in several respects; it is highly resistant to chemical actions and maintains its clarity even under severe corrosive conditions. However, it is subject to residual stresses much the same as plate glass, consequently, machining operations required the use of very sharp cutters, high cutter speeds and light feeds. The material was buffed and polished after machining and its original clarity restored. A new resin, "Epon," was used for cementing the various pieces. The machining and cementing operations apparently were highly successful.

Six stainless steel tanks cross-ordered to 200-W Maintenance were completed. The fabrication and installation of gauge glasses, gaskets and fittings for these tanks will be completed by the Mechanical Development Shops.

A miniature slug-chute for Bldg. 222-S multicurie cell installation was completed. The work was done on a high priority basis to permit use in connection with 222-S start-up.

Technical Services Unit

Mechanical Development Shops personnel, in conjunction with Laboratory Equipment Design, have fabricated a small peristaltic pump. This original model is a modification of the original ANL design. The mechanism is an adjustable speed, positive displacement pump for handling highly corrosive or highly radioactive liquids.

Work on a pulse free pump has been temporarily suspended pending the revision of mechanical details.

Some experimental work was performed in cutting of stainless steel with 0.016" thick slitting saws. Studies were made to determine the length of time required for cutting, the wear of the cutter, and contamination control. The results of these studies will be of value in the design of remote cutting equipment.

Two service panels were completed for the 222-S multicurie cell. The first or lower panel consists of a bank of 6 stainless steel tubes equipped with remote control connections, six manipulator rod holes and six spiral stainless steel tubes for the introduction of flexible or copper tubing. The second or upper panel consists of six copper spiral tubes terminating in flush-mounted female pipe threads. Twenty 1/4" stainless steel tubes and five 1" diameter stainless steel tubes were also included in this panel. Both of these panels are lead filled steel frames and are inter-changeable with the modular locks used in the multicurie cells.

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Additional work on the Teflon jointing program has been done. The special heating shoes have been fabricated and some studies made of Teflon deformation under load and cold flow resistance have been completed. This work was done in conjunction with the P-10 program interest in Teflon as a possible replacement material for the neoprene gaskets presently used in Skinner valves.

The active material hydrides required and a few machinable ceramic samples have been received for use in the investigation of metal to ceramic brazing techniques. Inert gas and high vacuum atmospheres, as well as various types of solders, are currently being investigated.

A new Browne & Sharpe universal milling machine was received by the shops on December 11 and was installed and in operation on December 12.

Glass Shop (Bldg. 3706)

Work volume statistics for the Glass Shop (exclusive of P-10 services) are as follows:

	November	December
Jobs Completed		
New	108	70
Repairs	14	21
Revisions	40	4
Total	162	95

Six of the above jobs required quartz fabrication. At the present time the shop has a backlog of 18 jobs which will require approximately 95 man-hours for completion. This constitutes an approximate 12 day backlog.

A 15-foot pulse column was fabricated and installed in Bldg. 222-S. A second unit is being fabricated for installation at a later date.

Completion of the quartz room in Bldg. 3706 glass shop is still awaiting the delivery of the new glass lathe. This lathe is currently scheduled for February delivery.

Equipment Design

Work volume statistics for Laboratory Equipment Design, expressed in man-hours, are summarized as follows:

	November		December	
Pile Technology	Engineering	Drafting* & Misc.	Engineering	Drafting** & Misc.
Engineering	32	234	34	311
Metallurgy	32	307	17	203
P-10	8	38	-	-
Pile Applications	8	116	-	-

	November		December	
	Engineering	Drafting* & Misc.	Engineering	Drafting** & Misc.
Separations Technology				
Development	76	24	36	8
Research	40	433	61	377
Analytical				
Service	128	713	126	993
Research	8	16	8	34
Technical Services				
Engineering	-	-	-	-
Laboratory Equipment Development (RDA PTC-5)	724	452	670	599
Totals	1,056	2,333	952	2,525

* Includes 1,050 hours of drafting time.
** Includes 1,163 hours of drafting time.

Relatively high work loads continued in connection with design and scoring of equipment for the analytical laboratories and multicurie cells of Bldg. 222-S.

The following work was done for the various customer groups, as indicated:

Pile Engineering

Engineering assistance was given on drafting of the thermo-conductivity apparatus, discharging system redesign, papoose sample holder, and various graphs and curves.

Metallurgy

Assistance was given on drafting of the metallurgical manipulator, uniscan machine, transfer cask, and various graphs.

Chemical Development

Continued assistance was given on outfitting the multicurie cells at Bldg. 222-S and preparation of equipment for decontamination studies in a junior cave.

Chemical Research

Work continued on the alpha pulse column and allied equipment. Assistance was given on the design of inconel reaction tubes, lead box shield for mini, dry gloved box, and hydraulic remote control tongs. Engineering assistance was given on the drafting of the constant flow pump, sample blister, and batch extractor.

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Analytical Services

Work continued on outfitting of the gloved boxes and the analytical line for Bldg. 222-S. Assistance was given on the drafting of the oil displacement sampler, dual titrator, total nitrate still, cold spot dryer, pellet maker, fluorometer dish tray, glass reactor, electrode holder for remote micro-titrator, and special Glas-Col mantle.

Analytical Research

Assistance was given on the outfitting of two gloved boxes.

Laboratory Equipment Development (RDA #TC-5)

Development of Bldg. 222-S multicurie cell equipment and the slave type manipulator continued. Work continued on the equipment decontamination facilities also for Bldg. 222-S. One engineer each continued under this RDA in the development of remote-control radiochemical equipment for Chemical Research, Chemical Development, and Analytical Services. In all, a total of 6 persons were engaged in equipment development work in progress under this RDA.

New Laboratory Planning

Lists of the "uninstalled" equipment required for the Works Laboratory Area were revised and forwarded to the project engineer to be used in the project proposals being prepared to cover the necessary expenditures.

The location of clock outlets was reviewed and a standard plan was developed which will be used in all buildings.

Redox Analytical and Plant Assistance Laboratory, Proj. C-187-E, Phase II

Initial construction work on Phase II is under way. The Atkinson-Jones Company is the CPFF contractor for this additional construction.

Mechanical Development Bldg., Proj. C-406

Subcontract No. G-416 with the Dix Steel Building Co. of Spokane, Washington, for the design of the interior (Phase II) of the Mechanical Development Bldg. was approved by the AEC on December 28. Under the terms of this contract the Dix Company is allowed four months to complete all work and services after receipt of formal notice to proceed.

Radiochemistry Bldg., Proj. C-381

Construction work has been suspended awaiting the arrival of structural steel. The design of the downdraft hoods to be installed in this building were modified slightly to include an exhaust intake at the bottom of the rear baffle.

Plot Plan and Utilities, Proj. C-394

Excavation has been started on the Retention Neutralization Plant and on

the trenches leading to it. The Badge House is progressing rapidly with the outside wooden sheathing being almost complete.

Radiometallurgy Bldg., Proj. C-385

The concrete column footings supporting the canyon floor of Radiometallurgy Bldg. are completed; and the reinforced concrete columns are nearing completion. Check prints submitted by the Farrel Birmingham Co. were reviewed and the comments submitted to the project engineer for re-transmittal to the equipment fabricators.

Pile Technology Bldg., Proj. C-414

The reinforced concrete footings have been completed and forming of the basement walls is continuing.

Library and Files Bldg., Proj. C-421

The concrete work is essentially completed and work has slowed almost to a stop awaiting structural steel. The floor tile pattern to be used in this building is undergoing review. Sample tiles in a variety of colors have been ordered to facilitate design mock-ups. The use of Hauserman "Koreweld" partitions in this building was approved. This partition is different from the standard in that the panel is fabricated of a non-metallic material.

Building Services

Bldg. 3706

Normal Bldg. 3706 services continued routinely. Material control, stockroom, work order and miscellaneous services activity is summarized as follows:

	November	December
Purchase Requisitions		
Total number processed	79	71
Number requiring special expediting	63	12
Number requiring emergency	9	5
Stores Stock Requests Processed	8	3
Store Orders		
Total number processed	999	990
Number requiring emergency pick-up and delivery	15	13
Work Orders Processed	91	57
Miscellaneous Services		
Office furniture requests		8
Precious metal transactions		7
Office machine repairs		9

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Bldg. 222-S

Two shift operation of the decontamination room was started with initial assignments on C and D shifts. The other shifts will be covered as personnel receive the necessary training.

The decontamination group has experienced difficulty in decontaminating platinum fluorimeter dishes used by Analytical Service; different methods and reagents have been used with steady improvement and at the present time boiling in saturated citric acid solution and careful rinsing is giving most satisfactory results. The problem is being checked by Analytical Services to eliminate possible faults in handling the dishes during and after decontamination by both Analytical Services and Laboratory Services personnel.

A fire in one of the hoods enclosing a gloved box resulted when a short circuit at the plug of the gloved box power supply line ignited propane gas at the hood supply stub-out. The hood unit's propane valve had been accidentally opened 1/4" to 1/2", which was unnoticed due to the location of the stub-out and continuous exhaust of the gas and odor. The blaze was easily controlled with the laboratory's portable CO_2 extinguisher, and damage was limited to the back surface of the gloved box. To prevent a recurrence of the accidental leak of propane the main valves were closed and tagged in each pipe chase servicing sections not presently requiring propane. In those lines serving laboratories where propane is now required the main valves will remain open but the self-sealing connection at the side of the unused units will be broken.

The eight 3' test squares of white rubber floor tile, which were laid in Room 1-D of Bldg. 222-S as part of the investigation of the yellow discoloration experienced in the rest of the building, continue to show no discoloration after 15 weeks. These test squares were laid by A & J personnel using the same materials and procedures used in laying the original building floor, and the time of the test now exceeds the elapsed time between initial laying of the building tile and first appearance of discoloration. No conclusions can be reached on the basis of this test, unless it is assumed that volatile matter in the sealer escaped around the edges of the test squares instead of penetrating the tile. The test will be concluded as soon as construction work is started for Phase II of the Project C-187-E.

Notification has been received by letter from the Separations Section, Plant Engineering Unit, that a study will be made of the retention waste problem reported last month. To date analyses of liquid waste from the building "storage" waste have shown only traces of alpha and zero beta or gamma contamination; this probably results from the extensive dilution and low level contamination of equipment and present operation samples.

The replacement pulleys for the exhaust fan shafts have been received. The installation of the new pulleys and dynamic balancing of the exhaust fans will now be possible and this work will be completed by 200 Areas

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Maintenance and Instrument personnel as soon as it can be economically scheduled.

All other work continued on a routine basis. The Bldg. 222-S Stockroom dispensed $2,028 in materials to customer groups during December. A total of 35 work orders were issued and processed for customer groups.

MATHEMATICAL SERVICES

Statistical Services

The investigation to determine the causes for large variation in the quality of uranium rods received at Hanford Works was continued. In conjunction with this investigation, a method of controlling the dimensional stability of incoming uranium rods was set up for the Metal Preparation Section of the Manufacturing Department.

The experiment, to determine the effect of varying the inner distance between the aluminum can and sleeves upon the production of aluminum-silicon rejects and other rejects related to sleeve sizes, was completed by the Metal Separations Section. The experiment indicated that a control of can and sleeve dimensions should be maintained to keep rejects at a minimum. A method to facilitate that control was recommended.

A study was made for the Metal Preparation Section to determine by means of specially designed experiments and subsequent analysis, the amount of copper, tin, and uranium resulting from ingots salvaged from one of the canning process baths. Due to the heterogeneous nature of the material being sampled, a new statistical technique had to be developed to solve the problem. A preliminary sampling is now being conducted to gain information relative to the distribution of the constituents in the material.

Statistical controls were reported on Metal Preparation Section results from Machining, Pickling, Canning and Autoclave, Test Pile, and Melt Plant.

An estimate of the accuracy that can be assigned to the number of pounds of normal uranium charged into the 305 Test Pile when constructed was completed for the Pile Technology Unit. Also, a comparison made of the reactivity obtained from testing canned uranium pieces in the 305 Test Pile by taking only one two minute drift per test, instead of the present two drifts per test, revealed that testing time can be reduced appreciably without a statistically significant change in the monthly results.

Assistance was rendered to the Pile Technology Unit in designing an experiment to compare material produced by the Sylvania Process with that produced by the Hanford Works process. Numerous equations concerning coefficients of thermal expansion of uranium powder compacts were derived for the Pile Technology Unit.

Further analysis was made of slug rupture data for the Pile Technology Unit. Curves were fitted to slug corrosion data in an attempt to find a relationship between corrosion and ruptures. Analysis of the relationships between

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thermocouples in 100 Area piles was continued at the request of the Pile Technology Unit. Correlations were computed and prediction equations set up where practical.

Analysis of Pu distribution data relating to Recuplex studies was continued for Chemical Research, Separations Technology Unit. A special summary of comparisons of gms PU/MWD as observed at extraction versus theoretical values of this ratio from Document HW-12163 was prepared at the request of the Separations Technology Unit.

For the Analytical Unit, calculation of precisions of certain mass spectrometer determinations on P-10 by-product samples was completed and reported. Also, data on specific gravity, AT, and purity determinations were collected from the 231 Bldg. control laboratory for the purpose of establishing checking limits. Checking limits for plutonium radioassays of 231 Bldg. laboratory sump samples was completed. A curve relating grams plutonium per ton to MWD per ton was fitted to data collected by Analytical Research.

The regular semi-monthly reports of certain Kr 85 computations were completed and forwarded to the A.E.C.

For the Aquatic Biology Unit, analysis was made of data on counts of various plant populations on a certain hillside, in connection with studies of similar population in the Columbia River.

For the Employee and Community Relations Department, analysis was performed to test the usefulness of personnel testing in the selection of patrolmen. Regression techniques were employed in measuring the relationship between scores on tests and ratings by supervisors. Assistance was rendered the same department in designing an experiment to study the problem of labor turnover in the 300 Area production shops. Study was continued on the general topic of inventory control.

Computing Services

Routine maps are being prepared on equilibrium temperature traverses from DR data with temperature differences corrected to the central zone. These will be used to facilitate investigation of flattening, for the Pile Technology Unit.

A slug exposure rate history is being prepared to use in correlating slug rupture and slug power. Slug power distribution will be calculated from about 30 temperature traverses to obtain back history, and one or two traverses will be processed monthly for each pile to keep the accumulation current.

On the basis of at least three different empirical formulae, water flow per tube of 100-H as a function of header and panellit pressure will be computed. The results will be summed over the pile and the sum compared with the observed total flow to determine the best formula for water flow per tube.

Work is continuing on the buckling of a cube in an infinite reflector. Solutions are now being obtained involving integral equations that may lead to an analytical solution. This is a very difficult problem but of fundamental

importance.

Analytical work has been completed on the perturbation created by a missing slug in the pile tube. The investigation was based on transport theory and ran into many difficulties but a suitable solution was finally found that agrees well with experimental results. A document is being prepared of the results of this investigation. Numerical solutions of two cases involving 20 x 20 determinants were solved this month.

Programming for the calculation of "Center of Activity" has been completed but the series used to approximate the integrals involved converge too slowly for pratical purposes. Additional information will be supplied by the customer to make a more efficient solution possible.

A problem on Water Gas Reaction was completed.

3100 solutions have been computed for the Thermal Utilization and Resonance Escape Probability equations. The solutions will be used in search of the optimum combination of materials and dimensions which will give the greatest value of the pile multiplication constant.

Programming for numerical integration of $\frac{F(x)}{a + F(x)}\,dx$

with various values of "a" has been completed for the functions sine (x) and $J_o(x)$.

A very complicated calculation of the gamma flux distribution in a laminated shield has been completed. A similar calculation for a Brookhaven concrete shield is being undertaken.

Routine calculations on special request exposures for H were completed. In addition D and DR special request exposures were calculated this month and, in the future, these calculations will be done for all piles. Data is being taken at all piles on standardized forms.

An integration of the Xenon equation over the volume of the pile is in progress. Slug skin and jacket temperature calculations for a variety of conditions (e.g., header pressure, length of tube, fouled or clean tube, orifice size, both existing and proposed) have been programmed. A program of calculation for the Reactor Unit, as a guide to new pile design is under way. Approximately 600 cases have been processed to date.

Calculation for the Radiological Sciences Department on a backlog of data on the new wind direction problem has begun. Wind direction frequency distributions and average velocities by hour of day for each station are computed and listed.

A summary of sheep thyroid calculations was made by listing all data to date by group, sheep and date, and checking for and correcting errors. Total average dosages, both by ion chamber and counter measurements, were calculated and listed for each group of sheep in 30 day intervals.

Routine work was completed on aquatic biology, thyroid and sheep radioanalysis,

[redacted]

and synoptic meteorology.

Routine calculations were made on Project Debasset, for the Financial Department. Weekly and monthly reports were made on the cost distribution classification analysis of Technical Section weekly salary figures.

Mathematical Technique Development (TC-6)

The research file containing abstracts of research articles in mathematical statistics was kept current.

Research was conducted for various members of the statistics organization relative to statistical problems not readily analysed by one of the more familiar techniques. Statistical problems encountered in the field of slug canning, metal preparation, separations, and ecology were considered.

The first of an anticipated series of papers dealing with parameter and distribution free techniques of wide application was completed. The problem considered was one frequently encountered in quality control work dealing with specification limits.

A method has been devised for obtaining roots, and the maximum and minimum points of functions. It is a variation of Newton's basic method devised for machine calculation. Differences are used instead of derivatives in the extrapolation process. Derivatives are frequently difficult to obtain and program.

TECHNICAL INFORMATION SERVICES

Plant Library

Library work volume and book statistics were as follows:

	November	December
Number of books on order received	204	116
Number of books fully cataloged	224	105
Number of bound periodicals processed but not fully cataloged	73	10
Pamphlets added to the pamphlet file	27	0
Miscellaneous material received, processed and routed (Including reprints)	40	16
Books and periodicals circulated	4,363	3,655
Unclassified reports processed	191	360
Unclassified reports circulated	380	331
Reference services rendered	1,482	1,336
Inter-library loans	23	25
Photostats from offsite	16	17
New periodical titles added to Kardex	13	9

	Mail Library	W-10 Library	108-F Library	Total
Number of books	8,215	3,694	434	12,343
Number of bound periodicals	5,003	0	632	5,635
Totals	13,218	3,694	1,066	17,978

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Circulation, acquisitions-cataloging and reference work proceeded routinely during the month. A representative sampling of reference questions handled follows:

Details for drawing Feather plot.
Purification of air and gases by ultrasonics.
Portable units for underwater lighting.
Magnetic properties of Co, Ni, Fe.
Effects of impurities, such as Lanthanum, on potentiometric titration of Plutonium.
Heat generation in slugs after pile shutdown.
Reasons for down-comers in pile.
Biological effects of Cesium.
Effects of irradiation on magnetic properties of metals.
Machinability and corrosion resistance of Hafnium free Zirconium.
Electric circuit diagram of the 49 panelboard.
Construction of TV transmission tubes.
Load carrying ability of bolts under stresses.
Literature survey on ternary systems containing Al.
Temperatures at which concrete spalls.
Population analysis of Washington cities by age groups.
Specifications for concrete finishes.
Boiling point of potassium tetraborate.
Decomposition temperature of lithium carbonate and oxide.
Kanthal patent on electric furnace electrodes.
Design of settling tanks.
Leakage of gases through labyrinth seals.
Emissivity of uranium.

Two translations were made during the month as follows:

Obtaining pure oxides by electrolysis - Annales de Chimie.
Automatic gravimetric recording of dust contents - Chemie-Ingenieur-Technik.

A revision of the present "Request for Library Procurement" card (Form No. O-1364-DS) has been worked out. The re-arrangement will group the information essential to the Library in one corner of the card and will improve its usability for the Library clerical staff. The revised form has been referred to Procedures Analysis for final design.

A proposed procedure for use when Hanford personnel apply for membership in trade and professional associations was developed, together with the necessary form, and is being reviewed. The tentative procedure will route all applications for membership through the Plant Library which will be charged with obtaining the necessary approvals and initiating the requisition. The Plant Library will also maintain a central file of membership information showing all memberships held by the Plant, the name of the Hanford Works member or representative and the publications available on the membership. Holders of memberships will be notified by the Library in advance of the expiration date so that the necessary approvals may be secured in time to place renewals when desired.

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In a further effort to reduce the number of requisitions required for inexpensive publications, a procedure using a petty cash fund is being explored. The Plant Library presently has a small petty cash fund which is used for postal charges on books borrowed from other libraries. All library requisitions issued during 1951 are being reviewed to collect data on the number of inexpensive items being ordered. If this review indicates that the number of such items is large approval will be sought to expand the use of the petty cash fund to include minor purchases.

Classified Files

Work volume statistics for the Classified Files were as follows:

	November	December
Documents Routed	16,626	13,568
Documents issued	7,426	6,516
Reference services rendered	4,850	4,900
Registered packages prepared for offsite	321	295
Inter-area mail sent via transmittal	34,104	26,938
Holders of Classified documents whose files were inventoried:		
(a) Because of normal perpetual inventory procedure	20	37
(b) Because of transfer of work assignment	1	2
(c) Because of termination	5	2
Inventory reductions:		
Copies of documents destroyed	4,985	2,291
Copies of documents downgraded	41	504
Copies of documents declassified	47	396
Classified documents located which were unaccounted for in previous inventory	30	4
Standard storage cartons of material retired to the Records Center		
Unclassified and Official Use Only	0	0
Classified	3	0

The work of the Audit and Inventory Unit is proceeding as scheduled. During the month the summary of the GEH document series was completed and the 7 series is well under way. Present indications are that approximately 18 documents will be missing from the GEH series of approximately 13,000 documents, and 89 missing from the HW-series of approximately 75,000 documents. Most of these have already been reported to Security from the field inventories. A final check is being made before the summary report is prepared for the A.E.C. As the summary nears completion, the field work of the Unit has received more attention, as indicated by the increased number of individuals holdings inventoried.

The "Record of Action" form developed for use by the Non-Technical Document Review Board has been revised and re-issued as form C-2553-D. The revised form is a 5 x 8 size in contrast to the previous 8½ x 11.

An improved procedure for the handling of teletypes was developed and issued

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as OPG 15.13. The new procedure will reduce the number of copies and save paper. Under the previous procedure three copies of each classified teletype were prepared. One went to the A.E.C. Teletype Room, the second was retained in Files and the third provided the Yellow File copy. After the teletype had been sent, two or three copies of Series B of the teletype were routinely returned to Files. Under the new procedure, one copy of the classified teletype will be prepared and sent to the Teletype Room. Series B copies when returned will supply the necessary additional file copies.

A manual on the preparation and care of classified documents was completed and sent to the Public Relations Section for re-write and illustrating. The Manual is intended to expand and replace Section 7 of the present Stenographic Manual which is inadequate for the needs of those preparing classified reports. Whether the new manual will be included in the present Stenographic Manual, or issued separately, will be decided when the re-write has been completed.

Document HW-22777 covering basic principles in the organization of manuals of procedures was issued. The initial response to the document has been excellent, and additional copies may be prepared. It is anticipated that it will supply answers to the routine questions which are asked of the Classified Files regarding sound practices in the organization and format of this type of manual.

It became necessary during the month to clarify the approval procedure regarding offsite distribution of Hanford originated classified documents. A procedure covering the normal operating problems was developed and copies distributed to Department Heads requiring this information. It is anticipated that any special approval requirements of Departments may be added to the basic routine as required.

A proposal to extend the responsibility of the Reproduction Section to include the issuance and control of all classified drawings, graphs, charts, flow sheets, engineering drawings, etc., used in technical reports was prepared. Exceptions would be those drawings prepared directly on ditto masters, mimeograph stencils or paper plates, used in the multilith process. The proposal setsforth the difficulties involved in controlling original drawings in the Classified Files and the advantages to be gained by centralizing this control in a unit specifically designed to handle it. It is also felt that the proposal if accepted would greatly improve the quality of the drawings going into the technical reports. A meeting was held with the representatives of the Reproduction Section, Classified Files and Security at which the problem was explored.

A training film, one of a series prepared jointly by the Isotopes Division of the A.E.C. and the Army Institute of Pathology, was previewed by the Radiological Sciences Department. It is agreed that the films will be valuable here and it is planned to have them available through Classified Files as soon as the series is completed.

The Head, Technical Information, spent December 4, 5, and 6 in Schenectady attending a meeting of an ad hoc committee concerned with the problems of the organization of the metallurgical literature. In addition, a number of conferences were held with personnel at the Research Laboratory, the General

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Engineering Laboratory and the Knolls Atomic Power Laboratory.

As a result of the Committee meeting it was decided that the present reports index would not adequately meet the special needs of the metallurgists for a compilation of specific items of metallurgical information. For this reason, it was decided to undertake a cooperative program using punch cards. The American Society for Metals - Special Libraries system and a subject breakdown developed by Mrs. P. B. Dearnley of Knolls Atomic Power Laboratory will be reviewed so that a satisfactory punch-card may be designed. Individual sites will supply abstracts to the Technical Information Service, A.E.C. for the metallurgical reports which they originate. These abstracts will be written by the metallurgists and will indicate the detailed metallurgical information to be recorded on the punch cards. These will be prepared and distributed by Technical Information Service, Oak Ridge. All A.E.C. installations will be asked to participate in this cooperative program.

The trip also supplied an opportunity to visit the new Document Control Center being established at the General Engineering Laboratory. Organization of this unit has been urged by Hanford for approximately a year and a half in order to firm up accountability for Hanford documents transmitted to personnel at the General Engineering Laboratory. The Center will act as a central receiving and issuing point for all classified documents. The Schenectady Operations Office has formally designated the unit as a document accountability and transfer station and Washington approval of this is expected shortly. The Center has a staff of five clericals and is presently establishing basic records on the classified documents held in the files of the Laboratory personnel. Consideration was given to sending personnel from Hanford to inventory classified documents transmitted from this site to personnel at the General Engineering Laboratory. However, this was found impractical, and a list of documents will be sent instead. A transfer of document accountability from Hanford to the General Engineering Laboratory Document Control Center will be worked out for all documents previously transmitted directly to personnel at the General Engineering Laboratory. These documents were principally from the Design and Construction Files. The remaining documents were originally transmitted to the General Engineering Laboratory through the Knolls Atomic Power Laboratory. It seems reasonable, therefore, that any further transfer of document accountability for this remainder should be made between the Knolls Atomic Power Laboratory and the General Engineering Laboratory.

Central Reporting and Abstracting

Work volume statistics for this service were as follows:

	November	December
Ditto masters run	887	547
Mimeograph stencils run	1,163	993
Ditto masters prepared	29,916	20,311
Mimeograph copies prepared	98,205	54,406
Multilith masters typed	343	311
Multilithed copies handled	36,666	26,661

	November	December
Formal Research and Development Reports issued	15	7
Formal Reports in Process	5	7
Reports abstracted	286	322
Volume of unclassified mail handled by the 300 Area Mail Room	31,171	29,846

A request was received from Technical Information Service at Oak Ridge for a set of subject headings to be used in the analysis of the documents on the Recuplex process. Fortunately, the need for this had been anticipated and headings were immediately available. With minor changes they have proved acceptable and will be incorporated in Ca-1927.

On the recent trip to Knolls Atomic Power Laboratory the procedures of the Technical Publications unit were studied and particularly the work done by the editorial assistants. The method of operation has resulted in a high quality report with only a single recall in some four years of operation. It would appear advisable to attempt to model the Hanford Central Reporting Service along the same lines. To this end, information on the job descriptions and grades for the editorial assistants has been requested.

INVENTIONS

All Technical Services Unit personnel engaged in work that might reasonably be expected to result in inventions or discoveries advise that, to the best of their knowledge and belief, no inventions or discoveries were made in the course of their work during December 1951 except as listed below. Such persons further advise that, for the period therein covered by this report, notebook records, if any, kept in the course of their work have been examined for possible inventions or discoveries.

Inventor(s)	Title
J. F. Gifford R. E. Jolly	Rotating Swivel Jaw Tongs

Signed J. W. Underwood
J. W. Underwood, Unit Head

JWU:mcs

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MONTHLY NARRATIVE REPORT

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December 1951

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DESIGN AND CONSTRUCTION MANAGEMENT SECTION

I. SUMMARY

A. ORGANIZATION

After the transfer of certain contract functions to the Commission, the remaining contract services were assigned as a staff activity of the Engineering Department and in turn to the Contract group attached to the staff of the Manager, Design and Construction Management Section.

B. SCOPE OF ACTIVITIES

Major projects which were active during the month attained construction completion status as follows: C-349 - Hot Semi-Works, 61%; C-361 - Metal Conversion Facilities, 97%; C-362 - Waste Metal Recovery (TBP), 65%; C-413 - Expansion of 234-5 Capacity, 63%; C-431-A - New Production Facility (100-C Water Works), 30% and C-431-B - New Production Facility (Production), 24%.

As of December 31, 1951, the Design and Construction Management Section was engaged in a total of 72 projects of which 65 have authorized funds in excess of $20,000. In addition, preliminary work was being performed on 24 proposed construction projects of which 22 are estimated to exceed $20,000. Five Research and Development studies were in progress.

C. MATERIAL PROCUREMENT

Requests for directive assistance were received from Atkinson-Jones covering four orders for black seamless pipe for process lines in 105-C Area and from the Radiochemistry Building lump sum contractor covering orders for stainless steel tubes and fittings. Information in support of these requests has been developed and they are in process of preparation.

The August request for directive assistance for procurement of the Library and Files Building structural steel received favorable action in December. The NPA directive calls for January rolling of the entire order.

D. CRAFT LABOR

Voluntary terminations of CPFF construction contractors' personnel averaged 2.65% as compared to 2.9% in November. This continues a downward trend from the 5.3% reported for the month of October.

A net gain of 62 plumber-steamfitters and welders was made during the month. There remained 187 on requisition, of which 99 were welders. The mechanical subcontractor reported production improving and that the shortage of plumber-steamfitters and welders is affecting progress to a considerably lessened degree.

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D. CRAFT LABOR (Continued)

An isolation pay increase of 62½ cents per day was recommended by the Construction Industry Stabilization Commission to the Wage Stabilization Board. General Electric and the Commission have urged that the recommendation be protested.

The carpenters submitted a notice indicating a desire to negotiate amendments and wage scale adjustments in their Schedule "A". At a negotiation meeting on December 4, the Union presented their demands which included a nine cents per hour across-the-board increase effective January 1, 1952, through December 31, 1952. The Union representatives were informed on December 18 that the nine cents per hour increase recently granted in Spokane and the Tri-Cities would be protested. Subsequently, it was announced that the Construction Industry Stabilization Commission had recommended approval of the nine cents per hour increase for approximately 15,000 carpenters in this state. No agreement has been reached on the project.

The machinists' wage dispute continued, the Union requesting 10 cents per hour in addition to the employer's offer of $2.58½. A statement of the employer's position was forwarded to the Davis Panel who have jurisdiction of the dispute.

On December 19, the ironworkers served notice of desire to open their Schedule "A" for wage negotiations with specific consideration to be given to increases in the reinforcing and structural ironworkers' rates.

The December 27th letter from the Wage Stabilization Board included a recommendation of the Construction Industry Stabilization Commission granting the sheet-metal workers an increase to $2.52 per hour. This rate exceeds the present maximum allowable under existing regulations and will be protested.

The application for approval of recently negotiated wage increases for the Technical Engineers was rejected by the Wage Stabilization Board. The rejection was based on the treatment of the $5 wage adjustment of 1950 as a general increase instead of as a merit increase.

The Operating Engineers' Union requested a nine cent per hour increase during negotiations held in Spokane and Portland. Both chapters of the Associated General Contractors rejected this and held the Union to a firm agreement negotiated last year to become effective January 1, 1952 which permits an increase of five cents. Commission approval of the five cent increase for this project has been requested.

A work stoppage occurred in the White Bluffs machine shop on December 21. This stoppage of 8/10-hour duration involved the temporary use of tools by a foreman. It was resolved upon a showing that such practice was in accord with the union agreement.

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D. CRAFT LABOR (Continued)

A jurisdictional dispute was threatened December 18 in regard to the installation of adapter rings in the TBP Tank Farm. The work had been assigned to the steamfitters; the boilermakers and ironworkers threatened a walkout unless reassignment was made. As a result of discussions with the Union business representatives, the boilermakers and ironworkers relinquished claim to the work on December 21.

The General Organizer of the ironworkers advised of a petition to the International by a group of Hanford employees seeking the establishment of a new Local for Hanford Works only. He indicated opposition to this proposal.

E. SAFETY AND SECURITY

Injuries reported among construction contractors' personnel during the month consisted of 10 major (33% decrease), 15 sub-major (6% decrease), and 854 minor (10.5% increase over those reported for previous month).

The increase in minor injuries can in part be attributed to cold weather. There were five automotive vehicle accidents reported during the month with an estimated total damage of $545. This represents a 45% decrease over that reported for the previous month and may be attributed to increased attention given to the subject by supervision. Eleven fires with an estimated loss of $500 were reported.

Five hundred and one security meetings were attended by a total of 5,270 construction contractor personnel.

F. HIGHLIGHTS OF UNIT ACTIVITIES

Management - Contract Group

Negotiations were concluded with Vitro Corporation for contract modifications to cover studies for new work contemplated. Similar negotiations with National Carbon Company are being continued.

Design and Construction Services Unit

The first draft of a history of North Richland was completed and submitted for review. Methods of improving the maintenance of heavy construction equipment have been studied.

The drafting workload continued heavy during the month while reproduction output decreased slightly.

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F. HIGHLIGHTS OF UNIT ACTIVITIES (Continued)

Design and Development Unit

The work of the Design and Development Unit during December consisted of activities under RDA-DC-3, 4, 5, 6, and 7, and rendering of consultation and advisory services to other Units.

Approval of the design criteria for a slug assembly and quench machine was received from the Design Committee. Assistance from General Engineering Laboratories was requested, and the technical representative from General Engineering Laboratories visited Hanford to review design instructions.

Principal Engineers assisted in design development on all RDAs including heavy aggregate concrete, housing program layout, corrosion tests, and components of the Ball Third Safety System.

Members of this Unit and a representative of the Hanford Operations Office of the Atomic Energy Commission visited the Nevada test site, Los Alamos, and the Sandia Corporation for observation of tests and test results and for consultation on atomic bomb blast effects on structures.

Minor Construction Management Unit

Five work orders and Project C-416 were completed during the month. New work authorized to the Unit during December consisted of 13 assignments amounting to $48,491.

The change house at 241-T farm was made ready for use when construction begins in January.

Requests for 20 job estimates were received and 18 estimates made for a total of $60,854.

Stores sales for the month amounted to $49,551, which is a turnover of 13.5% of the inventory.

Timekeeping responsibilities were transferred to the construction contractor at an expected saving of $45,000 per year for present number of personnel.

Power and Mechanical Unit

One project, C-295, was completed during December. Exceptions have been cleared. The continued shortage of qualified welders and postponement of deliveries are retarding work on C-431-A. Intensive expediting and issuance of directives have helped procurement; but certain critical materials, particularly structural steel and stabilized stainless steel, are slow. About 65% of all concrete required for Project C-431-A has been poured.

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F. HIGHLIGHTS OF UNIT ACTIVITIES (Continued)

Power and Mechanical Unit (Continued)

The construction completion status for Hanford Works Laboratory Area projects on December 31, 1951 was as follows:

a. C-187-E, Conversion of Unassigned Space for Radiochemistry Laboratory, 5% complete.
b. C-199, Expansion of 300 Area Sewage Disposal, 0% complete.
c. C-257, Biophysics Laboratory, 73% complete
d. C-364 - Aquatic Biology Laboratory, 29% complete.
e. C-381 - Radiochemistry Building, 5% complete.
f. C-385 - Radiometallurgy Building, 3% complete.
g. C-394 - Badge House, 25% complete.
h. C-394 - Outside Utilities and Facilities, 3% complete.
i. C-406 - Mechanical Development Building, Phase II, (neither design nor construction begun).
j. C-414 - Pile Technology Building, 4% complete.
k. C-421 - Library and Files Building, 11% complete.
l. C-433 - 384 Steam Plant Addition, not started (design 75% complete).

Project Engineering Unit

Work progressed on 69 active project items and seven informal requests representing a total of $21,200,300.

Five new project proposals and one revised proposal were transmitted in final form to sponsoring organizations. Four of the new project proposals and the revised proposal were approved by the A & B Committee and sent to the Atomic Energy Commission.

Authorizations were granted by the Atomic Energy Commission for one project as a formal directive. A substantial additional authorization was made for another project.

Important jobs now in progress include the Ball Third Safety System, the P-10 Program, Water Quality Experimental Facilities, Activated Silica Addition Facilities, Pile and Pile Water Plant Improvements, Front Tube Corrosion Facilities, a 5th Boiler to be installed in 200-W Area and the 313 Mechanization Program.

Construction on C-349, Hot Semi-works, was advanced 11% to a total of 61%. The contractor has requested a time extension of 60 days. A study of justification is being made. Seven requests for priority assistance are filed with the Atomic Energy Commission.

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F. HIGHLIGHTS OF UNIT ACTIVITIES (Continued)

Reactor Unit

C-431-B:

Design work by General Electric was advanced 3% to a total of 88%. Design work by Vitro Corporation was advanced 2% to a total of 98%. Construction progressed 6% to a total of 24%. To date about 19,450 yards of concrete have been placed. All major lifts were topped out December 15. Erection of structural steel for the work and process areas began the week of December 10. Outlet base "B" blocks have been set, and the right and left "T" sections were set and aligned.

Procurement of materials and equipment for C-431-B is about 95% complete. All required materials are either in stock or satisfactorily promised. Enough special hollow mills have been received to permit fabrication to proceed. Two diamond grinding wheels were received on December 29 and seven on December 31.

Basic Definitive scope of the RDA-DC-3 program is essentially complete. Water plant studies are based on almost doubled capacity, 100,000 gpm installed capacity and 140,000 gpm ultimate capacity. Basic architectural drawings of floor level plans and sections have been completed.

Three test models for the Ball 3X return system, each operating on different electrical principles, have been tested by General Engineering Laboratories. The equipment employing a series of solenoid coils mounted along the length of a vertical tube operated successfully. Work on design is proceeding. A full scale model will be built at General Engineering Laboratories and sent to Hanford for testing.

Basic moderator arrangement drawings have been completed on the basis of seven and one-half inch lattice spacing. Graphite requirements have been calculated to be 4400 tons based on material sized for the proposed spacing.

Separations Unit

The efforts of the Separations Unit were concentrated on the completion of C-187-D, Redox Production Plant, and construction of four other projects:

1. C-361, Metal Conversion Facilities, was advanced .6% to a total of 97.1%. Project funds were reduced to $1,952,000.
2. C-362, Waste Metal Removal and Recovery Facilities, was advanced 7.9% to a total of 65.3%. The lack of welders continues to be a limiting factor.
3. C-413, Expansion of 234-5 Facilities, was advanced 4% to a total of 63%. The construction contractor's report shows a decrease of $38,000 from the November estimate.
4. C-418, Additional Waste Storage Facilities, 241-TY, was advanced 10.7% to a total of 94.8%

Separations Unit Control processed 23 original requisitions and 18 alterations. Major work to be completed by the Control group includes projects unitization reports for C-187-D, C-361, C-362 and C-413.

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G. MONTHLY REPORT OF INVENTIONS AND DISCOVERIES

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

J. S. McMahon, Manager
Design and Construction Management Section

Date: December 31, 1951

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II. STATISTICAL AND GENERAL

A. SIGNIFICANT ASSIGNMENTS

1. Initial Reporting

C-455 - Replace Two Elevated Water Storage Tanks in 200-E Area

Design work is complete; construction has not begun.

Project authorization has been received. Specifications are being prepared for construction by a lump sum contract which will be managed by the A.E.C.

C-489 - Positive Ion Accelerator

Design work was advanced to 10%; construction has not begun.

This project proposal was approved at the December meeting of the A & B Committee, and has been forwarded to the Atomic Energy Commission for authorization of expenditure of approximately $252,000.

C-490 - Soil Science Laboratory

The initial 10% of design work was accomplished; construction has not begun.

Preliminary designs and estimates were completed for the proposed addition to Building 329. At its December meeting the A & B Committee reviewed but did not approve the project proposal, since they did not have a master plan of 300 Area. The project will be held until re-submission is requested by the User Department.

2. Final Reporting

C-187-D - Redox Production Plant

The Construction Completion Statement issued during the month was recalled and reissued at the end of the month. Reissue was made necessary by the rescheduling of the 241-S test well job and receipt of claims. Crane Company has presented a claim of approximately $180,000 for extras on the pipe and electrical connector orders for Redox. Claim for approximately $40,000 has been entered by Fred J. Early, Jr. Company, Inc., for escalation on overtime for 241-S. A claim is also expected from Southwest Welding Company.

C-416 - Part II - White Bluffs Shops (Minor Construction)

Both design and construction work are completed.

The construction work authorized for Part II (as reduced in scope by the Atomic Energy Commission) consisted of winterizing the Minor Construction White Bluffs Shops.

C-295 - 251 Substation

Design had been previously completed; construction was advanced 12% to a total of 99%. Phase II was finally inspected on December 26, 1951, and exceptions have been cleared.

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3. Current Projects

(Hanford Works Laboratory Area)

C-199 - Expansion of 300 Area Sewage Disposal

Completion status remains as it was in November, 1951: Design 100%, construction 0%.

C-257 - Biophysics Laboratory

Design had been previously completed; construction was advanced 11% to a total of 73%.

Installation of interior wall panels was substantially completed during December. Most laboratory furniture has been received as well as a few remaining items of construction material and equipment. Completion of the building depends solely on the number of craftsmen who can be economically employed in installation of building services and equipment.

C-381 - Radiochemistry Building

Design had been completed previously; construction was advanced 1% to a total of 5%.

Construction work has been virtually suspended since early November awaiting the arrival of structural steel promised by late January.

C-385 - Radiometallurgy Building

Design had been completed previously; construction was advanced 2.5% to a total of 3%.

Excavation was completed in December, and the pouring of concrete walls and footings was begun.

C-394 - Plot Plan and Utilities

Design had been completed previously; construction on this portion was estimated at 3%.

Excavation of the 14" water line to North Richland grid is complete, also laying of sanitary sewer lines in various locations.

C-394 - Badge House

Design had been completed previously; construction was advanced 14% to a total of 23%.

Exterior of the building has been completely sheathed and is awaiting shingles and asbestos siding. Work is proceeding on interior services.

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C-406 - Mechanical Development Building (Phase II)

Neither design nor construction has begun. Contract for design of Phase II has been sent to Dix Steel Building Company and the Notice to Proceed issued.

C-414 - Pile Technology Building

Design had been completed previously; construction was advanced 3.6% to a total of 4%.

Excavation is substantially complete, and pouring of foundation walls and footings is proceeding.

C-421 - Library and Files Building

Design had been completed previously; construction was advanced 7% to a total of 11%.

Construction during the month consisted of pouring concrete walls and installation of plumbing and electrical services underneath floor slab.

C-433 - 384 Steam Plant Addition

Design work was advanced 6% to a total of 75%. Construction has not begun.

(End Hanford Works Laboratory Projects)

C-361 - Metal Conversion Facilities

Part B construction was 32.5% complete which corresponds to a total Part A and Part B construction completion of 97.1%. This project is on schedule.

The project proposal, Part II, Revision II, was approved by the Atomic Energy Commission which issued Directive No. HW-158, Modification No. 10, authorizing the following:

1. A reduction in total project funds to $1,952,000.
2. The General Electric Company to incur costs not to exceed $1,658,000 for construction accomplished before October 1, 1951 and for assigned A.E.M. functions.
3. A transfer of capital property having an estimated book value of $16,000.

C-362 - Waste Metal Removal and Recovery Facilities (TBP)

Design work had been completed previously; construction was advanced 7.9% to a total of 65.3%. Because of a lack of welders and other skilled craftsmen this project is 12% behind schedule.

Work to be performed by General Electric on Phase I is 86.7% complete compared with 100% scheduled completion. Phase II is 28.8% complete compared with 44% scheduled completion.

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C-413 - Expansion of 234-5 Facilities

Of the portion of this work being done locally, overall design work was advanced 3% to a total of 84%; construction was advanced 4% to a total of 63%. The project is 6% behind scheduled completion.

The RMB Line fabrication being performed by General Elgineering Laboratories advanced as follows: design 4% to a total of 84%--assembly 4% to a total of 92%.

An RDA proposal for improved metal purification and fabrication equipment was resubmitted to the Design Committee.

As a result of a review of their estimated costs to complete, the construction contractor's indicated cost report shows a decrease of $38,000 from the November estimate.

C-431-A - 100-C Water Works Facility

Design work was advanced 6% to completion; construction was advanced 5% to a total of 30%.

The river pump house structure is poured to within seven feet of the operating floor level, which is well above high water level. The two 54" river outfall lines were successfully placed and anchored. Removal of the working jetty has been started. About 65% of all concrete required for the project has been poured.

Procurement of all construction material and equipment is substantially complete. Difficulties resulting from postponed deliveries have been offset by intensive expediting and by the issuance of directives so that delivery of equipment has been delayed by about the same amount that general construction has been.

Present and possible future shortage of qualified welders is so acute that the project completion date must be rescheduled.

C-431-B - Production Facility

Design work by General Electric was advanced 3% to a total of 88% (scheduled 95%). Design work by Vitro Corporation was advanced 2% to a total of 98% (scheduled 100%). Construction was advanced 6% to a total of 24% (scheduled 29%).

To date about 19,450 yards of concrete have been placed. All major lifts were topped out December 15. Erection of structural steel for the work and process areas was started the week of December 10. Outlet base "B" blocks have been set, and the right and left "T" sections were set and aligned. Procurement has been initiated on 95% of all required materials and equipment.

All crafts are well balanced except for the continuing extreme shortage of pipe fitters. Unless this situation is relieved, the overall completion schedule for the 105-C facility will be seriously affected. Both weather conditions and absenteeism during the holiday period slowed down all phases of work.

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4. Research and Development Studies

RDA-DC-3 - Engineering Development Studies to Improve Design Bases for Future 100 Area Production Facilities

Basic definitive scope for the new 3220 tubes, 1300 MW reactor is essentially complete. An interim report will be issued during January. Lattice spacing, number of tubes, over-all reactor dimensions, control system, process piping, process tube assembly, elevator locations and requirements, building arrangement, structural features, ventilation requirements, electrical system, and piping systems are fixed. Calculations to establish the horizontal rod pattern are 85% complete, and for the vertical rod pattern 50% complete. (The rod arrangements are being worked out jointly by the Reactor Unit and the Technical Section.) A design analysis to determine the most desirable annulus size is 70% complete. Preliminary reactor water requirements of 100,000 gpm installed capacity and 140,000 gpm ultimate capacity have been established. Calculations are in progress which will confirm or provide a basis for revision of these values. Basic architectural drawings of floor level plans and sections have been completed. The architectural key plan and a basic architectural description of the building have been completed.

RDA-DC-4 - Engineering Development Studies to Improve Design Bases for Future Separations Facilities

Three instrumentation engineering studies, numbers 7, 11, and 12, have been completed. A process flow diagram is being prepared which will include all instruments for process control as preparatory study for making a model graphic panel. Assignment of a man from the Architectural, Civil and Structural group continued through December.

For Engineering Study No. 3 pertinent drawings and documents were studied; inspections were made of existing process buildings; and contacts regarding fiber glass filters were made with Technical Separations personnel. This study has been delayed temporarily by assignment of personnel to higher priority work.

RDA-DC-5 - Design Development, Mechanization of the 300 Area Slug and Component Preparation Facilities

Authorization to spend $45,000 on this revised RDA was received on December 7. Work to be accomplished will include preliminary engineering design, design verification tests, and estimates of construction costs and work schedules. Approval of the design criteria for a slug assembly and quench machine was received from the Design Committee December 6. Mechanization of only the operations within the Al-Si bath and quench station will be engineered now. Operations and steps now employed will be used as bases for engineering. In an effort to promote wetting, studies will be made of mechanical abrading of caps and cans, mechanical wiping, and ultrasonic vibration.

General Engineering Laboratories were authorized to incur expenses not to exceed $30,000 in accomplishing preliminary design of a mechanized canning and quench machine. Information was exchanged between Hanford personnel and a GEL technical representative to enable the Laboratory to proceed immediately. Preliminary engineering is to be accomplished in such a way that any special organization can complete final design and fabrication.

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RDA-DC-6 - Process Water Cooling System Including Retention Basin, Design Development

The assignment of two Architectural, Civil and Structural men to this study continued through December. Field surveys were also undertaken, as requested. Completion of the study of transformation indicates that the double transformation system is the most economical. A study of expansion of the 151 station favors the use of outdoor switchgear instead of expansion of the existing control house. In the first week of December, mechanical design studies were concentrated on a 100 Area Water Plant facility designated as 100 HX. Studies now in progress include:

1. Completion of a 100 HX Area design criteria.
2. Remote operation of the 181 HX Building pumps and valves.
3. 100 HX water plant area arrangement.
4. 100 HX water plant process flow diagram.

Studies completed include:

1. Pump economics for the 181 Building.
2. Cost analysis on a 181 pump house located above a Coulee Dam disaster flood level.
3. Cost differential on various sizes of clearwells and retention basins.
4. Preliminary estimates on savings resulting from the consolidation of the water filter plant, process pump house, (190 Building) and the reactor building (105 Building).

RDA-DC-7 - Separations Process Engineering, Expansion and Improvement

Equipment design studies continued on the two uranium concentrators and waste concentrators for increased capacity of Building 202-S. Currently, the metal preparation section appears to present the greatest problem in attaining the desired capacity increase for Building 202-S.

Study continued on the problems of: 1. Improved Redox; 2. Alternate Separations Process - Purex; and 3. Improved Waste Treatment of Disposal Facilities.

B. OTHER ASSIGNMENTS

C-187-E - Conversion of Unassigned Space for Radiochemistry Laboratory

Completion status remains as it was in November: design 100%, construction 5%.

C-192 - Biology Laboratory 108-F

Completion status remains as it was November 30: design 98%, construction 88%. Formal bid advertising is scheduled for January, 1952 on the lump sum construction features of Part III of this project. The revised project proposal, which includes the X-ray machine and other miscellaneous items, will be submitted in January.

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C-289-R - 200-W Laundry Addition

Design had been completed previously; construction was advanced 33% to a total of 38%.

Construction is progressing as well as weather conditions will permit.

C-349 - Hot Semi-Works

Design had been completed previously; construction was advanced 11% to a total of 61%.

The contractor has presented a revised schedule requesting approximately 60 days extension. It is clear that at least 30 days extension must be granted. A study of justification for the full 60-day extension is being made. Seven requests for priority assistance are filed with the Commission, and more may be processed. Some assistance has been obtained from these requests, and indications for further help are good.

Process piping, process equipment, and instrumentation are now being installed in the solvent and aqueous buildings. The interior walls of the hot cells are being coated with polythene.

C-364 - Aquatic Biology Laboratory

Design had been completed previously; construction was advanced 16% to a total of 29%. Building walls, interior and exterior, are complete and structure is under roof. Work is proceeding with the installation of interior building services.

C-380-R - Electricity Metering - Village of Richland

Design had been completed previously; construction was advanced 2% to a total of 93%. Final acceptance for residential metering was completed December 20. Metering for commercial facilities will be hindered by delayed delivery of certain materials.

C-403 - New Fences for Distribution and 230 KV Substation - Part I

Part I had been completed previously. No further work on the submission of Part II has been accomplished, pending a firm work determination.

C-404 - Primary Power Lines for Hanford Works Laboratory

Design work was advanced 5% to completion; construction was advanced 2% to a total of 79%. The aerial feeder is complete; the underground feeder will be delayed until work on Project C-451 is completed.

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C-409 - Riverland Elevated Water Tank

Design had been completed previously; construction was advanced 4% to a total of 99%. The remaining construction consists of replacing a thermostat which was found to be faulty. The subcontractor has ordered a replacement which is expected to be installed by January 15, 1952. This facility has been turned over to the User Unit.

C-410 - In-Pile Controlled Atmosphere Experiment

Design status remained at 95%; construction was advanced 1% to a total of 79%. The heater has been received from General Engineering Labaratories; however, extensive repairs are required because low resistance to ground have been found on certain heater lead wires.

Transfer of the gas circulating and analyzing equipment from the shop to 105-DR Building has been further delayed because of work planned soon on some of the experimental holes in the X-1 level.

A request for an extension of five months and for an overrun of $10,000 is now in process.

C-412 - P-10-X - Extraction Facilities

Design had been completed previously; construction was advanced 10% to a total of 95%. Beneficial use of the product storage building was received during the month. The only significant construction work remaining at this site is on the hot metallurgical facility. Delivery of the cave crane and viewing windows has been delayed until January. This facility should be ready for equipment run-in during early February.

The user sponsorship for the hot metallurgical installation has passed from the P-10 group to the Radiometallurgy group of the Pile Technology Unit. Possible release of the second metal line to some other interested group at other sites is being considered.

C-418 - Additional Waste Storage Facilities - 241-TY

Design had been completed previously; construction was advanced 10.7% to a total of 94.8%. The project is 4% behind scheduled completion. Fred J. Early, Jr. Company will complete their portion of project ahead of schedule.

A new item; pump and sluice jet cover slabs, was added during December.

C-419 - Induction Heating Unit - Building 3732

Completion status remains as it was November 30: design 100%, construction 0%. Delivery of equipment will not be made until May or June 1952.

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C-423 - Additional Waste Evaporation Facilities - 200 East

Design had been completed previously; construction was advanced 7% to a total of 98%. The lump sum phases have been completed. Minor construction phases in B & C tank farms also have been completed. These provide ample capacity for operations until late spring or early summer of 1952.

Work on BX and BY farms has been stopped pending clarification of certain financial items. Available funds do not appear adequate for completion of all phases; however, any work not completed should be minor compared to the magnitude of the job. Work will be resumed soon and performed to the extent of available funds.

C-424 - Water Quality Experimental Facilities

Design status remained at 90%; construction was advanced 20% to a total of 95%. Pile Technology received beneficial use of the Part I facilities late in December. Certain phases such as insulation and painting of piping remain to be done. The work release for Part II of the project has been issued. This latter phase of the work is to be performed by plant forces.

C-430-R - Revision 2 - Improved Lighting - 703 Building

Design had been completed previously, construction has not begun. Revision 2 for this project, covering 85 additional rooms in the relighting program of the 703 Building, is now being prepared for distribution. Total project cost is $47,000. Construction work is to begin soon after January 1, 1952.

C-432 - Air Raid Warning System

Completion status remained at: design 95%, construction 83%. Part II of this project is awaiting approval of the Atomic Energy Commission. Moving of the No. 1 tower is being considered, since it interferes with a new housing area.

C-434-R - New Bio-Assay Laboratory

Design completion status remains at 90%, construction has not begun. At its December meeting, the A & B Committee returned the revised project proposal for a review of the estimate and design requirements. The User Department will join a complete review of the design criteria before the project is re-estimated and re-submitted.

C-438 - Ball Third Safety System

Design completion status remains at 95%, construction has not begun. After reviewing the manpower requirements for installing the 3-X system in B and D areas, Maintenance has indicated that their work force is not sufficient. Minor Construction will be assigned the installation work for all areas. An additional $1,000,000 has been authorized for material procurement. The order for the hopper and steel plug units has been placed. Bids are being requested for the lead and polythene shielding.

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C-438 - Ball Third Safety System (Continued)

The Electric Steel Foundry is producing at a satisfactory rate. The boron stainless pipes are being forwarded to Western Gear Company. The ball fabricator is having difficulty in meeting required production. It may be necessary to have another vendor produce one-half the balls.

C-441 - Solvent Building

Design completion status remains at 95%; construction has not begun. A revised project proposal is being submitted to the A & B Committee in January. An additional $35,000 - $40,000 will be required to design and construct this facility as scoped in the project.

C-442 - X-ray Machine - 3745-A

Design completion status remains at 95%; construction was advanced 5% to a total of 10%. The electrostatic generator was delivered December 13. Material procurement for General Electric supplied items is being expedited. Assembly, installation and testing of the unit will begin about February 1, 1952.

C-445 - BY Telephone Exchange Additions and Changes

Design had been completed previously; construction was advanced 20% to a total of 23%. Weather conditions have retarded normal speed of work.

C-447 - Portable Meteorological Mast

Design work was advanced 5% to a total of 55%; there will be no construction, as such. Bid award has been made for construction of the special truck van body and the light weight portable mast. Special instrumentation required for this facility is being developed and materials are being purchased.

C-451 - Extension of 300 Areas Underground Electrical Power Distribution System

Design had been completed previously; construction has not begun. The project is approved for lump-sum contract. Specifications in final form are being prepared.

C-452 - Meteorology Tower Elevator

Design had been completed previously; construction has not begun. A review of objections by the Atomic Energy Commission Contract group to special provisions has been made and an agreement reached. Formal bid advertising for the design, fabrication, and installation of this elevator is scheduled for early January.

C-454 - Spectrometer Shielding

Design completion status remains at 90%; construction was advanced 40% to a total of 65%. The beam catcher has been completed except for its supporting structure. Design is progressing on the step plug and columnator.

[redacted]

C-456 - Additional 13-Quad Telephone Cable BY to Point I

Design had been completed previously; construction was advanced 18% to a total of 61%. Minor Construction will require until March 30, 1952, to complete, based on scheduled delivery of loading coils.

C-457 - Pile Technology Office Building

Design had been completed previously; construction was advanced 10% to a total of 15%. Construction has been progressing satisfactorily and is scheduled for completion April 15, 1952.

C-460 - Installation of Asbestos Cement Siding and Painting Wood Trim of 272-E and 272-W

Design work was advanced 5% to completion; construction has not begun. Lump sum bid assemblies have been completed, and formal advertising is scheduled for early January.

C-461 - Maintenance Hot Machine Shop

Design work was advanced 25% to a total of 95%; construction has not begun. Final design drawings are essentially complete. Construction work is expected to begin during January. Purchase orders have been placed for a dust collector, bench grinder, and work benches.

C-468 - Horizontal Rod Mock-Up

Design had been completed previously; construction was advanced 5% to a total of 45%. Construction work has been stopped until the electric horizontal rod drive control can be removed from the 105-B Building. The control should be available by the second week in January. The drive to be removed at the same time will be stored in the 100-B Spare Parts Warehouse, and the new drive purchased earlier from Stores will be used for the project.

C-469 - Front-Tube Corrosion Mock-Up

Design had been completed previously, construction was advanced 1% to a total of 51%. The flowmeters have been received, and work is proceeding. It is expected that Pile Technology will have beneficial use of this equipment in January.

C-470-R - 200-W Badge House Remodeling

Design work was advanced 10% to a total of 35%; construction has not begun. Design work is progressing on the remodeling and installation of the new type badge racks.

C-473-R - 100-B Automatic Dial Telephone Exchange

Completion status remains as it was November 30, 1951: design 75%, construction 0%. The resubmitted project proposal is awaiting approval of the A & B Committee.

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C-474 - Relocation of Exponential Facilities

Design had been completed previously; construction was advanced 5% to a total of 75%. Approval of the project has been received from the Atomic Energy Commission and all remaining work has been released. Pile Technology has had beneficial use of some of the facilities.

C-477 - Building 284-W - Fifth Boiler Addition

Design work was advanced 1% to a total of 10%; construction has not begun. All requirements for a bid assembly, including specification, drawings, and contract data, were submitted to the Atomic Energy Commission by December 15. A Part II of the project proposal is being prepared to secure funds to complete detailed design, procurement, and construction.

Present thinking, however, is that only very drastic conditions would justify the movement of an East area boiler.

It has been determined that General Electric will handle project management of this work.

C-478 - Area Fence and Minor Repairs - Excess Material Warehouse, North Richland

All preliminary design work is complete. Other design work is 25% complete; construction has not begun. Design work is progressing for performance of this work on a lump sum basis.

C-479 - Replacement of Docks and Stairs to 700 Area Permanent Buildings

Completion status remains at: design 50%, construction 0%. No authorization has been received from the Atomic Energy Commission.

C-480 - Remodeling 722-C Building for Office Equipment Repair

Design work was advanced 10% to a total of 30%; construction has not begun. Atomic Energy Commission authorization was received November 28, 1951. Design work is progressing as scoped in the original project proposal.

C-482 - Pile and Pile Water Plant Improvements

There has been no design or construction work on this project. The Atomic Energy Commission has issued a directive authorizing $628,000 for procurement of critical materials and engineering. The A & B Committee has released a directive authorizing $50,000 for engineering, but is holding the funds for material procurement pending clarification of General Electric's position regarding the construction rider to the Appropriations Act for Fiscal Year 1952.

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C-483 - Downcomer Repairs in 100 B, D, DR and H and Replacement in 100-F

The initial 5% of Design work was accomplished; construction has not begun. The Atomic Energy Commission is reviewing the project proposal. It has been agreed to replace the 105-F downcomer with a cascade type similar to those in service at 105-DR and H. The replacement downcomer will be made of stainless steel.

C-484 - 300 Area Administration Building

The initial 10% of design work was accomplished, construction has not begun. This project was returned for additional supporting data and information. This should be compiled and the project resubmitted to the A & B Committee in January.

C-485 - Revised - Experimental Activated Silica Addition Equipment, Part I, Building 183-F

Design work was advanced 15% to a total of 90%; construction was advanced 7.9% to a total of 99%. The Minor Construction Management Unit has stopped work pending issuance of an Atomic Energy Commission directive for the revised project proposal and the subsequent Project Engineering Work Release.

Construction work has remained within the original schedule, and the work should be completed by January 15. The silica system has been completed. Only work on the acid system and cleanup remains.

A review of finances indicated an overrun of more than 10%. A revised project proposal with an estimated total cost of $49,700 was approved by the A & B Committee. An Atomic Energy Commission directive is forthcoming.

The customer has taken advantage of the construction layoffs to check out the facilities and proceed with the operating experiment.

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The following studies and engineering requests, involving preparatory work and scoping of future projects, were active during the month:

A-662 - Reinforce and Increase Capacity of Cask Cars

Project was cancelled during November.

A-663 - Pile Technology Test and Storage Building

Ready for project proposal in January.

A-692 - Rest Room Alterations - 716 Building

To be incorporated with similar work into one project proposal.

A-693 - Installation of Gutters on 700 Area Buildings

Approved by the A & B Committee; forwarded to the Atomic Energy Commission.

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A-696 - Metallurgy Laboratory - 300 Area

Project proposal submitted to A & B Committee.

A-701 - White Bluffs Steam Plant - Automatic Firing

Preliminary design work is progressing.

A-704 - Kadlec Hospital Addition - About 8500 Sq. Ft.

Preliminary scoping and design work is progressing.

A-1171 - Earthquake Detector

Project proposal being prepared in final form.

A-1172 - Experimental One Tube Ink Facility

Design 85% complete. Project proposal submitted to Manufacturing Department for approval.

A-1176 - Temperature Monitor Thermocouple Replacements for 100 B, D and F Areas

Proposal rescoped to include 200 spare thermocouples in ducts at top of each pile.

A-1177 - Additional Indication of Moderator Temperatures B, D, F and DR Areas

Proposal to provide supplementary indication of pile moderator temperatures by installing stringers of thermocouple-bearing graphite in blank process channels.

A-1178 - Experimental Activated Silica Addition Equipment Part II, Building 190-H

Design 65% complete; rough draft of project proposal being circulated for comments.

ER-E-466 - 700 Area Permanent Buildings - Lighting Lead Study

Design 90% complete, final report being prepared.

ER-E-471 - Study and Recommendation for Lighting - 760 Drafting Room

Design is completed; study and recommendations have been completed and forwarded to user.

ER-2596 - Remodel Former Laundry Building for Engineering Offices

Design 10% complete; project request reactivated to provide additional office space in 200-W Area.

ER-2600 - Duct Level Safety Showers - Building 234-5

Design complete; project proposal ready for signatures.

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ER-2710 - Start-up Studies - RMA Line - Building 234-5

Design advanced 10% to a total of 85%. Remaining funds to be used in review of operational procedures.

ER-2711 - Building 224 - Waste Diversion 200-E and W

Design completed; informal request circulated to approving groups.

ER-2712 - Pile Technology Metallurgical Laboratory Alteration - Building 234-5

Initial 5% of design accomplished. This will provide facilities for plutonium metallurgy studies.

ER-A 3094 - Building 313 Mechanization

Information reported in RDA-DC-5.

ER-6010 - Plant Manpower Forecast Including Program X

A new personnel forecast was made to be used as a guide in determining future requirements for technical personnel and housing.

ER-6011 - 700 Area Steam Study - MWI 35

Began study of overall 700 Area steam system emphasizing adequacy of present plant to handle future loads, analysis of underground vs. overhead supply lines, plans and recommendations.

C. RELATED SERVICES

1. Design

Seven histories were completed and issued during the month.

The drafting work load continued heavy with the addition of scope drawings for RDA-DC-4, 6 and 7 and the expansion of scope drawings for RDA-DC-3. The assigned drafting on Projects C-431-B and C-438 is essentially complete. Drafting production averaged 12.1 mandays per drawing on a total of 159 new drawings, 108 charts and graphs, and 184 revisions.

Reproduction output decreased slightly from the previous month, the total being 461,187 square feet of prints. The largest single order was 7,656 prints for C-431-B.

Directive assistance was requested for black seamless pipe, and stainless steel tubing and fittings. A directive was issued by N.P.A. which calls for January rolling of all steel for the Library and Files Building. A list of Design and Construction Management Section orders for material handling equipment was developed and submitted.

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Arrangements were made to turn over the operations, functions, and most of the personnel of Project Cost and Progress Analysis to the proposed Project Information group.

2. Construction

The population of North Richland decreased by 79 during the month leaving a total of 6,235, exclusive of Army personnel. The history of North Richland has been completed in rough draft and forwarded for review.

Painting of the North Richland Administration buildings is progressing on schedule.

There were 18 safety meetings attended by Design and Construction Management Section personnel. Five hundred one security meetings were conducted for contractor personnel.

In a program to improve maintenance of heavy equipment, several joint meetings were held with representatives of Atkinson-Jones, the Atomic Energy Commission and General Electric Company.

3. Contracts

Modification No. 7 of the Vitro contract, providing for studies of proposed work was approved by the Atomic Energy Commission.

Negotiations are being continued with National Carbon Company for proposed work.

The Contract group completed studies of the Fred J. Early, Jr. Company claim for escalation against Contract G-302, Redox Waste Disposal Facilities. As a result of this study $31,903 was allowed. An additional claim amounting to $8,990 was declared in dispute and is going to a hearing before the Atomic Energy Commission.

Liaison regarding transfer of work to the Atomic Energy Commission was conducted throughout the month. The duplicating of contract files and preparation for storage was continued.

III. ORGANIZATION AND PERSONNEL

Effective December 3, W. H. Clymer was assigned Supervisor - Contracts, reporting directly to the Manager, Design and Construction Management Section.

A physical move consolidating Design and Development Unit personnel was effected on December 1. This relocated the Instrument group from Building 762 to Building 761.

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Personnel data for Design and Construction Management Section, December, 1951 was as follows:

	Beginning of Month	End of Month	Net Change
Employees on Payroll	853	853	0
Technical Graduates-Rotational	18	22	+ 4
Business Graduates-Rotational	2	3	+ 1
Employees on Loan to Section	5	5	0

The status indicated above involved these changes:

Payroll additions	13
Terminations	15
Transfers to Section	6
Transfers from Section	4
Transfers within Section	23

MEDICAL DEPARTMENT

DECEMBER 1951

General

Personnel Changes

Medical Department personnel decreased from 275 to 273. In conjunction with the Training Section of the Employee and Public Relations Department, a 12-minute film has been produced depicting some of the major activities of the Medical Department.

Industrial

Employee physical examinations changed little from 1705 to 1633. Dispensary treatments increased slightly from 10,099 to 10,393.

The health topic of the month "Your Aching Back", offers helpful suggestions to minimize this serious problem.

No G.E. employees and eight contractor employees were treated for major injuries. Two G.E. employees and fourteen contractor employees were treated for sub-major injuries.

The rate of sickness absenteeism for November was 1.85%, while the total absenteeism was 2.57%, which represents very little change from the previous month.

Kadlec Hospital

The average daily census decreased from 105.5 to 95.6 (82.5 adults, 13.1 newborn). The census was 90.3 a year ago.

Contract was awarded to lump sum contractor to add six patient rooms to Kadlec Hospital. The completion date is July 1, 1952.

The occupancy rate for mixed services (all services except obstetrics) was 81.8.

Nursing hours per patient day were 3.49 for the mixed services and 3.73 for obstetrics.

Public Health

There was a 60% rise in communicable diseases reported. The rise was largely due to german measles and chickenpox. Public Health nursing field trips increased by 50% due to the rise in communicable disease, maternal and infant visits.

A dental work-shop held for the Richland School District, was attended by 275 teachers.

Frequency of dog bites has been reduced to a minimum by the addition of a dog warden to the community.

Costs (November)

Medical Department costs, before assessments to other departments were as follows:

	October	November	November Budget
Industrial Medicine (Oper.)	$ 35,268	$ 31,872	$ 37,479
Public Health (Oper.)	9,901	9,622	10,853
Kadlec Hospital (Net)	22,999	25,289	32,533
Hospital Expense Credits	3,751	2,872	2,472
Subtotal-Medical Dept.(Operations)	71,919	69,655	83,337
Construction Medical (Industrial and Public Health)	16,822	16,439	18,567
Total Operations and Construction	88,741	86,094	101,904

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General

Costs (Continued)

The net cost of operating the Medical Department before assessments to other departments was $86,094, a decrease of $2,647 and $15,810 below the budget. While Kadlec Hospital revenue was increased by $1,255, this was more than offset by a $2,669 increase in costs largely due to increased invoices for food in November.

The decrease of $3,817 in Industrial Operations costs was due to decreased salaries for the shorter month, decreased charges for transportation and maintenance and reduced charges for supplies.

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MEDICAL DEPARTMENT

DECEMBER 1951

Industrial Medical Section

General

The number of examinations decreased from 1705 to 1633 due chiefly to a drop in contractor examinations. The total number of dispensary treatments increased from 10,099 to 10,393. Due to the volume of patients being seen in the 100-C construction area, plans were completed for more space in that area station which will provide more room for treatment and space for x-ray facilities. During the month General Electric employees sustained 2 sub-major injuries but no major injuries. Contractor employees received 8 major injuries and 14 sub-major injuries.

During the month a case came to a jury trial in the Benton County Superior Court where it was alleged that a sprained ankle resulted, some 3 years later, in varicose veins and thrombophlebitis. Testimony was required from 2 industrial physicians since the accident had occurred to a contractor employee while at work and the original injury was treated by these physicians. The case came to civil suit since no report had been made to the Washington State Department of Labor within the 1 year period as required by law. Although, in our opinion the case had no merit whatever from the medical standpoint, the jury awarded a verdict in the sum of $15,000 to the plaintiff. The case will be appealed to the State Supreme Court. This was the first case coming to jury trial in over 7 years of operation.

The Chemical Hazards Committee met on December 21st and discussed the problems involved in ventilation in a large drafting room and acid fumes originating from electric furnaces in the 300 Area. Both problems had been sources of grievance.

The Health Activities Committee met on December 20th. The health topic on "Your Aching Back" was presented and material on this subject was prepared for discussion and distribution throughout the plant.

The combined sickness absenteeism for both weekly and monthly employees was 1.85% for November.

The net cost of operations for December as compared with November, showed a decrease of $3,259.

	Increase of (Decrease) over Previous Month	November	October	November Budget
Administration	46	5868	5822	6807
Household & Property	(1649)	4305	5954	6012
Professional Services	(2214)	22586	24800	25660
Total Direct Expense	(3817)	32759	36576	38479
Less: Revenue	(421)	887	1308	1000
Expense Credits	(137)	4043	4180	4050
Net Cost of Operations	(3259)	27829	31088	33429

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Industrial Medical Section (Continued)

Costs (Continued)

The decrease of $1,521 in salaries is due to a shorter work month.

Utilities, Transportation and Maintenance charges decreased $1,243 due to (1) decreased charge for water softening resulting from downward revision of rates, (2) reduced charge for rental and maintenance of transportation equipment due to decreased usage and (3) reduced building and equipment maintenance and grounds maintenance required.

Supply and Other Costs decreased $908 due to reduced travel costs, a reduction in purchases of household and property supply items, and reduced purchases of medical supplies.

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Industrial Medical Section (Continued)	November	December	Year to Date
Physical Examinations			
Operations			
Pre-employment	170	135	3195
Rehire	20	17	513
Annual	17	193	2168
Interval	89	135	2874
Visitor	3	0	17
A. E. C.	26	10	194
Re-examination and rechecks	81	59	1467
Termination	131	98	1932
Sub-total	537	647	12360
Contractors			
Pre-employment	298	159	4415
Rehire	302	129	4225
Recheck	106	82	1220
Termination & Transfer	462	616	7561
Sub-total	1168	986	17421
Total Physical Examinations	1705	1633	29781
Laboratory Examinations			
Clinical Laboratory			
Government	147	60	908
Pre-employment, termination, transfer	4360	2841	77664
Annual	89	1142	11506
Recheck (Area)	489	645	14916
First Aid	17	32	251
Clinic	819	567	16586
Hospital	4566	3940	52317
Public Health	24	27	299
Total	11011	9254	174447
X-Ray			
Government	26	10	136
Pre-employment, Termination, Transfer	800	429	12365
Annual	17	199	2175
First Aid	188	289	2561
Clinic	567	305	4326
Hospital	322	275	3516
Public Health	2	10	74
Total	1922	1517	25153
Electrocardiographs			
Industrial	16	22	209
Clinic	33	7	98
Hospital	24	34	386
Total	73	63	693
Allergy			
Skin Tests	0	0	17

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MEDICAL DEPARTMENT

DECEMBER 1951

Industrial Medical Section (Continued)	November	December	Year To Date
First Aid Treatments			
Operations			
New Occupational Cases	361	385	4509
Occupational Case Retreatments	1175	1134	13082
Non-occupational Treatments	2917	2680	34071
Sub-total	4453	4199	51662
Construction			
New Occupational Cases	984	958	11766
Occupational Case Retreatments	3492	4064	41844
Non-occupational Treatments	1104	1144	12939
Sub-total	5580	6166	66549
Facility Operators	66	28	532
Total First Aid Treatments	10099	10393	118743
Major Injuries			
General Electric	0	0	4
Contractors	12	8	53
Total	12	8	57
Sub-major Injuries			
General Electric	1	2	20
Contractors	12	14	141
Total	13	16	161
Absenteeism Investigation			
Total No. calls requested	8	25	158
Total No. calls made	8	25	158
No. absent due to illness in family	1	0	1
No. not at home when call was made	3	5	34

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MEDICAL DEPARTMENT

DECEMBER 1951

Hospital Section

General

The Medical Department's roll decreased from 275 to 273.

The average daily adult census decreased from 92.9 to 82.5, as compared to 77.7 a year ago. This represents an occupancy percentage of 80.1% broken down as follows: Mixed Service (Medical, Surgical, Pediatrics) 81.8%; Obstetrical Service, 73%. The minimum and maximum daily census during the month ranged as follows:

	Minimum	Maximum
Mixed Service	35	92
Obstetrical Service	8	19
Total Adult	44	105

The large variation on the Mixed Service is due to the low census which prevailed at Christmastime, and is not an unexpected variation.

The average daily newborn census increased from 12.6 to 13.1, which is exactly the same figure as a year ago.

Nursing hours per patient per day:

Medical, Surgical, Pediatrics	3.49
Obstetrical	3.73

The ratio of in-patient hospital employees to patients (excluding newborn) for the month of November was 1.84. When newborn infants are included, the ratio is 1.62

The net expense for the operation of Kadlec Hospital for November, 1951, was $25,289, as compared to $22,999 for October. Summary is as follows:

Kadlec Hospital net expense $25,289.
This is an increase of approximately $2,300 due to the following:
Gross costs increased about $2,600, due to net increase of one employee and holiday premium time; expense credits decreased about $900; and although revenue increased approximately $1,200, it was not sufficient to offset the cost increases.

During the month of December the Kadlec Auxiliary decorated the hospital for the Christmas holidays, including trees and trimmings. The added holiday atmosphere was greatly appreciated by patients and personnel alike.

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Hospital Section (Continued)	November	December	Year to Date
Kadlec Hospital			
Average Daily Adult Census	92.9	82.5	84.5
Medical	29.4	30.0	26.8
Surgical	33.5	26.1	30.6
Pediatrics	16.6	11.8	14.3
Obstetrical	13.4	14.6	12.8
Average Daily Newborn Census	12.6	13.1	12.4
Maximum Daily Census:			
Mixed Services	96	92	
Obstetrical Service	18	19	
Total Adult Census	111	105	
Minimum Daily Census:			
Mixed Services	57	35	
Obstetrical Service	8	8	
Total Adult Census	68	44	
Admissions: Adults	547	504	6242
Discharges: Adults	556	522	6240
Newborn	79	89	918
Patient Days: Adult	2787	2556	30841
Newborn	378	407	4530
Total	3165	2963	35371
Average Length of Stay: Adults	5.4	4.9	4.9
Newborn	4.8	4.6	4.9
Occupancy Percentage: Adults	90.2	80.1	82.0
Newborn	90.0	93.6	88.6
(Occupancy Percentage based on 103 adult beds and 14 bassinets.)			
Avg. Nursing Hours per Patient Day:			
Medical, Surgical, Pediatrics	3.22		
Obstetrics	4.37		
Avg. No. Employees per Patient (excluding newborn)	1.84		
Operations: Major	74	50	896
Minor	77	52	990
E.E.N.T.	105	82	884
Dental	1	1	35
Births: Live	76	87	908
Still	1	3	7
Deaths	4	2	54
Hospital Net Death Rate	.31	0	.35
Net Autopsy Rate	75.	50.	44.4
Discharged against advise	1	0	12
One Day Cases	136	110	1331
Admission Sources:			
Richland	72.9	73.8	74.4
North Richland	12.1	12.9	11.9
Other	15.0	13.3	13.7

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MEDICAL DEPARTMENT

DECEMBER 1951

Kadlec Hospital (Continued)	November	December	Year To Date
Admissions by Employment:			
General Electric	70.5	70.2	71.5
Government	2.4	2.0	2.3
Facility	5.0	4.8	4.6
Contractors	19.0	15.5	16.4
Schools	.6	2.2	1.3
Military	.7	1.4	1.7
Others	1.8	3.9	2.2
Hospital Outpatients Treated	399	474	5530
Physical Therapy Treatments			
Clinic	200	134	1691
Hospital	193	79	1174
Industrial: Plant	84	140	1517
Personal	10	3	198
Total	487	356	4580
Pharmacy			
No. of Prescriptions Filled	3359	3119	37716
No. of Store Orders Filled	752	734	8479
Patient Meals			
Regulars	4775	4567	51580
Specials	1579	1593	15798
Lights	0	2	114
Softs	1024	701	13931
Tonsils	191	181	1825
Liquids	188	225	2710
Surgical Liquids	72	95	951
Total	7829	7364	86909
Cafeteria Meals			
Noon	1786	1646	18786
Night	261	283	2940
Total	2047	1929	21726

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MEDICAL DEPARTMENT

DECEMBER 1951

Public Health Section

General

There was a 60% rise in the communicable diseases reported. This was primarily due to a substantial increase in the number of german measles and chickenpox cases. Other communicatle diseases such as scarlet fever remain at the same level.

The public health nursing field visits increased by 50%. This was due to the rise in communicable diseases, maternal and infant visits. The level of illness remained about the same.

A dental work-shop was held for the Richland School District. There were 275 teachers in attendance. The institute was held by Dr. O. Hoffman, State Department of Health Dental Consultant, Miss Mary Marshal, Oral Hygienist, State Department of Health, and Miss May Haller, Health Educator, Washington Dairy Council. The program was stimulating and undoubtedly dental health education programs will be started in the school system in the very near future.

Richland Public School cafeterias were inspected during the month. Inspections indicate that they are doing an acceptable job insofar as sanitation is concerned. Most other restaurants showed improvement. However, one establishment was degraded for failure to meet required standards. The recent food handlers' training course seems to have stimulated interest in some of the restaurant operators to do a better job.

One dairy farm was approved for shipping Grade A milk. Laboratory results of tests made on milk and milk products were satisfactory. Two milk producers were degraded for failure to meet minimum bacteriological standards. Forty dairy farms were inspected during the month.

Bacteriological samples of water from Jason Lee Elementary School were satisfactory. Sewage samples also indicated a very low B-Coli count.

Two citations were sent out for improper disposal of garbage and refuse.

With the addition of a dog warden to the village, frequency of dog bites has been at a minimum.

A meeting was held with Community Public Works Section regarding establishment of a weed control program. A proposal was made that in the spring of the year some of the new weed-killing chemicals be used in an attempt to cut down the incidence of noxious weeds in Richland. It is hoped that by so-doing, the patients who are sensitive to the offending weeds will be benefited. This is becoming more and more a serious problem as indicated by the reports received from the practicing physicians.

Again this year the Social Service Counselors assisted various community service clubs to coordinate their Christmas giving. Rather than presenting Christmas baskets to needy families, these clubs contributed money which the counselors made available to families known to be in need. The families were thus enabled to make such purchases as best suited their individual circumstances.

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MEDICAL DEPARTMENT

DECEMBER 1951

Public Health Section (Continued)	November	December	Year to Date
Education			
Pamphlets distributed	11000	15094	128230
News Releases	0	1	1
Staff Meetings	2	2	17
Classes	9	5	45
Attendance	546	404	1661
Lectures & Talks	5	9	70
Attendance	149	857	2904
Films Shown	1	31	63
Attendance	15	4739	6113
Community Conferences	47	42	454
Radio Broadcasts	0	0	0
Immunizations			
Diphtheria	63	7	225
Diphtheria Booster	0	142	606
Tetanus	83	7	737
Tetanus Booster	0	210	841
Pertussis	61	7	135
Pertussis Booster	0	27	371
Rocky Mountain Spotted Fever	0	0	8
Rocky Mountain Spotted Fever Booster	0	0	2
Typhoid	0	0	17
Typhoid Booster	0	0	0
Smallpox	17	17	295
Smallpox Revaccination	0	195	472
Tuberculin Test	1	0	42
Social Service			
Cases carried over	67	65	936
Cases admitted	11	9	193
Cases closed	13	4	203
Remaining case load	65	70	926
Activities:			
Home Visits	4	8	237
Office Interviews	224	207	2549
Conferences	49	57	766
Meetings	8	5	139
Sanitation			
Inspections made	139	115	1590
Conferences held	23	38	182
Bacteriological Laboratory			
Treated water samples	233	153	2523
Milk samples (inc. cream & ice cream)	19	9	149
Other bacteriological tests	263	227	2945
Total	515	389	5617

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MEDICAL DEPARTMENT

DECEMBER 1951

Public Health Section (Continued)	November	December	Year to Date
Communicable Diseases			
Amoebic Dysentery	0	0	1
Chickenpox	3	17	401
Erysipelas	0	0	7
German Measles	10	59	165
Gonorrhea	0	1	2
Histoplasmosis	0	0	1
Impetigo	2	1	11
Infectious Mononucleosis	0	1	1
Influenza (Upper Respiratory Infection)	0	0	3092
Malaria	0	0	3
Measles	0	0	1115
Meningitis	0	0	2
Mumps	0	0	24
Salmonellosis	0	0	2
Pinkeye	2	3	19
Poliomyelitis	4	0	6
Rheumatic Fever	2	0	5
Ringworm	1	10	37
Roseola	0	2	17
Scabies	0	0	4
Scarlet Fever	4	5	61
Syphilis	0	0	21
Tuberculosis	1	0	10
Vincent's Infection	0	0	2
Whooping Cough	0	0	8
Total	29	99	5017
Total No. Nursing Field Visits	618	943	9336
Total No. Nursing Office Visits	233	264	1793

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MEDICAL DEPARTMENT'S PERSONNEL SUMMARY

December 31, 1951

		Physicians	Nurses	Anesthetists	Nurse Aides	Orderly & Am.Dr.	Technicians - Clin.Laboratory	Tech.- X-Ray	Tech.-Bac.Lab.	Tech.-Phy.Ther.	Secretary	Steno - Typist -	Office Mach.Opr.	Telephone Opr.	General Clerk	Pharmacist	Dietitian	Cook	Kitchen Worker	Soc.Serv.Couns.	Sanitarian	Health Educator	Janitors	Records Supv.	Adm.& Assistant	Others	Total
1100 Area	Department Admin.	2	2								2	1		3	4									1	2	1	18.0
	Industrial	3	7		1							2	1		8.0							4.4				1	27.4
	Hospital	2	62	2	24	3	8.4	4	1	1		3			10.5	4	2	5	12			8.0				6	157.9
	Public Health	1	7		1							2			1.1					2	2	1	.6				17.7
	Industrial	2.7	1				2	1							7.4								.7				14.8
	Public Health		2																				.3				2.3
	M.J.-4		1																								1.0
	100-B	.1	1				.2								.2												1.5
	100-D	.1	4				.2								.3												4.6
	100-F	.1	4												.2												4.3
	100-H	.1	1				.2								.3												1.6
	241-TY		1																								1.0
	200-E	.2	4				.2								.3												4.7
	200-W	.3	5				.6								.3												6.2
	300	.2	2				.2								.4												2.8
	100-C	.2	4												1.0												5.2
	White Bluffs		1																								1.0
	101		1																								1.0
	T O T A L	12	110	2	26	3	12	5	1	1	2	8	1	3	34	4	2	5	12	2	2	1	14	1	2	8	273

* 4 part-time and temporary nurses included

Number of employees on roll:

Beginning of month	275
End of month	273
Net decrease	2

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RADIOLOGICAL SCIENCES DEPARTMENT

DECEMBER 1951

Summary

Two Class II and one Class I radiation hazards incident investigations were reported. One of these occurred to a Radiological Sciences Department employee while assisting another site. None involved exposure deemed to be of any consequence.

There was no finding in control or research activities worthy of special mention in summary.

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Radiological Sciences Department

RADIOLOGICAL SCIENCES DEPARTMENT

DECEMBER 1951

Organization

The composition and distribution of the force as of 12/31/51 was as follows:

	100-B	100-D	100-F	100-H	200-E	200-W	300	700	P.G.	Total
Supervisors	0	0	4	0	1	6	11	5	0	27
Engineers *	1	0	32	0	3	22	17	5	0	80
Clerical	0	0	5	0	1	2	4	4	0	16
Others	14	4	47	3	16	70	69	10	5	238
Total	15	4	88	3	21	100	101	24	5	361

*includes chemists, biologists, etc.

Number of employees on Payroll	December 1951
Beginning of month	364
End of month	361
Net decrease	3

Added to the roll were 3 inspectors, 2 technical graduates, a technologist, 3 laboratory assistants, a personnel meters clerk, and a steno-typist. Removals included 3 technical graduates, an inspector, a technologist, 5 laboratory assistants, 2 field clerks, and 2 personnel meters clerks.

General

Iodine emission from the separations plant stacks was controlled to limits that appear to be satisfactory, in the light of present knowledge.

Discussions took place towards clarification of responsibilities for radiation monitoring in tank farms and the like, which were expected to lead to more rigorous control in these phases.

The incidence of overexposures fell to a more nearly normal value, considering the general pressure of work throughout the division. Only one overexposure ascribable to the Hanford Works was reported.

The following trips were reported:

P.L. Eisenacher - IRE-AIEE meeting, BNL
M.L. Mickelson - Recruiting for Technical Personnel Office
R.H. Whittaker - Western Society of Naturalists, Claremont, California.

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

Inventor	Title
G.R. Quimby	Vegetation Cutter
H.J. Carter	Heat Conductivity Meter or Fluid Level Gauge.

RADIOLOGICAL RECORDS AND STANDARDS SECTION

1. Radiation Monitoring Services

General Statistics

	November	December	1951 Total
Special Work Permits	694	671	6,643
Routine and Special Surveys	1,542	1,482	11,998
Air Samples	1,422	1,207	6,995
Skin Contamination Cases	179	69	372

During a fire at the critical mass laboratory, several grams of plutonium were spread through the reactor building and to the ground outside. Two other incidents of plutonium spread occurred in control laboratories.

In control laboratories, 568 non-regulated items and 140 floor locations were found contaminated.

2. Standards

Two Class II incidents and one Class I incident were investigated. One Class II incident (#26) involved a possible overexposure during inspection of machined uranium in the Metal Preparation Area. The other Class II incident (#27) involved the overexposure of a Hanford employee participating in the atomic tests in Nevada.

The Class I incident (#187) involved spread and possible inhalation of plutonium at the 222-T laboratory.

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3. Exposure Records

Personnel Meters, and Records and Photometry

Pencils

Area	Single Readings 100-280 mr	Paired Readings 100-280 mr	Single Readings Over 280 mr	Paired Readings Over 280 mr	Lost Readings	Pencils Read
100-B	23	1	38	1	5	14,618
100-D	25	1	81	1	1	13,331
100-F	11	0	30	0	2	12,440
100-H	4	0	9	0	1	6,330
200-E&N	18	0	87	0	0	29,160
200-W Const.	12	0	71	1	0	13,684
200-W	42	0	105	0	3	33,481
Redox	4	0	8	0	0	3,858
300	31	0	42	1	0	24,667
Total	170	2	471	4	12	151,569
1951 Total	2,363	72	4,234	60	83	1,954,787

Of the 6 significant pencil readings, none were confirmed by badge results.

Badges

Area	Number Readings 100-300 mrep	Number Readings 300-500 mrep	Number Readings 500-1000 mrep	Number Readings Over 1000 mrep	Lost Readings	Badges Processed
100-B	16	0	0	0	6	3,274
100-D	16	0	0	0	0	3,540
100-F P-11,101	90	0	0	0	2	3,187
100-H	1	0	0	0	4	2,368
200-E	41	0	0	0	1	2,517
200-N,R.R.T.	0	0	0	0	0	592
200-W	80	1	1	0	2	5,337
Redox	0	0	0	0	2	2,144
300	170	1	1	0	2	7,703
224-U	0	0	0	0	0	869
Total	414	2	2	0	19	31,531
1951 Total	5,438	334	93	21	139	319,530

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Badges - Continued

Of the 4 readings above 300 mrep, only one constituted an overexposure. (See Standards report)

Lost readings were accounted for as follows:

Contaminated badge	1
Packet lost in area	1
Light struck	3
Wet packet	1
Badge lost in area	5
Not packaged	7
Lost in processing	1
Total	19

Of the 12 lost pencil readings and the 19 lost badge readings, other personnel meters results were reported in 8 and 15 cases, respectively, and indicated no significant exposure. Investigation of the remaining cases is still in process.

Badge Resume - Construction Areas

Area	Number Readings 100-300 mrep	Number Readings 300-500 mrep	Number Readings 500-1000 mrep	Number Readings Over 1000 mrep	Lost Readings	Badges Processed
100-C	0	0	0	0	1	2,260
200-E	0	0	0	0	4	3,758
200-W	2	0	0	0	0	4,766
Total	2	0	0	0	5	10,784
1951 Total	242	30	14	2	46	104,601

Total badges processed 1951,	Operation	319,530
	Construction	104,601
	Total	424,131

In addition to the badge program, a total of 1,273 items of a non-routine nature were processed during the month.

Slow Neutron Pencil Summary	100-B	100-D & 100-DR	100-F	100-H	Total	1951 Total
Number of pairs issued	16	38	55	5	114	4,472
Number of significant readings	0	4	5	5	14	297
Number of significant readings (above 50 mrem)	0	0	2	0	2	14

The two exposures above 50 mrem occurred as a result of a poorly shielded tube at the front face of the pile.

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Neutron Film

Badges Processed	100-B	100-D	100-F	100-H	200-W	300	Total	1951 Total
Personnel	7	81	47	152	84	2	373	3,895
Special	0	0	5	0	10	2	17	299

Bioassay

Plutonium analyses:
- Number of samples - 468
- Spikes and blanks - 106
- High reading - 0.46 d/m
- Resample from last month - < 0.33 d/m

Fission product analyses:
- Number of samples - 499
- Spikes and blanks - 70
- High readings - none > 10 c/m

Uranium analyses:

Results of 350 routine urine samples were as follows:

Job Description	Metal Preparation (300 Area) End 4th Day Exposure μg/liter Maximum	Average	Number Samples	End 1 Day No Exposure μg/liter Maximum	Average	Number Samples
Canning	6	3	33	8	2	23
Machining	25	8	37	24	7	29
Melt Plant	74	10	30	21	8	35
Material Handling	29	13	8	28	14	6
Inspection	14	9	6	5	4	4
305 Bldg.	0	0	0	< 1	< 1	1
Clerical	0	0	0	0	0	0
Coverage	15	7	6	10	4	7
Car Unloading	38	10	20	2	< 1	19
Random	--	--	--	1	< 1	13
Uranium Oxide Plant (224-U Bldg.)						
Cyclone and Pulv.	114	27	6	3	2	6
All Other Samples	5	1	23	1	< 1	24
Redox (202-S Bldg.)						
All Samples	2	1	5	2	< 1	9

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Tritium Analyses:

	Activity Density (μc/cc x 10^3)							
	<2	2-5	5-10	10-20	20-35	35-65	>65	Total
No.Samples-Operating Personnel	529	122	49	37	2	0	0	739
No. personnel involved	107	25	13	6	2	0	0	153
No.Samples-Construction Personnel	118	0	0	0	0	0	0	118
No. personnel involved	40	0	0	0	0	0	0	40

Thyroid Checks

All thyroid checks were below the warning level.

Hand Score Summary

There were 52,312 alpha and 73,032 beta hand scores reported. About 0.1% of the alpha and 0.05% of the beta scores were high. There was no attempt made to reduce 24 of the high alpha scores and 1 of the high beta scores. Where decontamination was attempted, it was successful.

4. Calibrations

	Number of Routine Calibrations		
	November	December	1951 Total
Fixed Instruments (Gamma)	231	230	2,958
Portable Instruments			
Alpha	215	194	3,285
Beta	441	388	6,782
Gamma (Radium)	878	790	13,297
X-ray Scanning	7	2	67
Special X-ray	8	-	8
Neutron	7	14	47
Total	1,556	1,388	23,486
Personnel Meters			
Beta	798	998	9,803
Gamma (Radium)	5,611	6,869	77,181
X-ray	7,032	6,910	58,492
Neutron	546	44	1,583
Total	13,987	14,821	147,059
GRAND TOTAL.....	15,774	16,439	173,503

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Radiological Sciences Department

BIOPHYSICS SECTION

CONTROL UNIT

Regional Survey

The general findings are summarized in the following table:

SAMPLE TYPE AND LOCATIONS	Activity Type	Average Activity Density µc/cc
Drinking Water		
Benton City Water Company Well	alpha	1.0×10^{-8}
Richland, N.Richland, Benton City Wells	alpha	$1.0 - 7.0 \times 10^{-9}$
100 Areas	beta	$8\text{-}42 \times 10^{-8}$
Pasco, Kennewick, McNary Dam	beta	$1\text{-}3 \times 10^{-7}$
Backwash Solids - Pasco Filter Plant	beta	2.5×10^{-2} (µc/gm)
Backwash Liquids -Pasco Filter Plant	beta	3.3×10^{-6}
Sand Filter - Pasco Filter Plant	beta	1.2×10^{-5} (µc/gm)
Anthracite Filter-Pasco Filter Plant	beta	1.4×10^{-4} (µc/gm)
Other Waters		
300 Area Wells #1, 2, and 3	alpha	2×10^{-8}
300 Area Well #4	alpha	2.6×10^{-7}
Well #4 measured as uranium	U	2×10^{-7}
48 Wells on the reservation	beta	$< 5 \times 10^{-8}$
Columbia River-Hanford Ferry	beta	5.5×10^{-6}
Columbia River-Patterson to McNary	beta	$3\text{-}7 \times 10^{-7}$
Columbia River-Shore mud	beta	$1\text{-}8 \times 10^{-5}$ (µc/gm)
Raw water - operating areas	beta	$2\text{-}12 \times 10^{-7}$
Pile effluent retention basins	beta	$1\text{-}1.7 \times 10^{-3}$
Pile effluent retention basins	alpha	$< 5 \times 10^{-9}$
I^{131} in farm wastes	I^{131}	3×10^{-6}
I^{131} in Columbia River-Hanford	I^{131}	2.3×10^{-7}
Atmospheric Pollution		
Gross alpha emitters	alpha	Trace to 4×10^{-15}
Gross dose rate - Separations areas	beta-gamma	1-2 mrep/day
Gross dose rate - residential areas	beta-gamma	0.3-1 mrep/day
Filterable beta - Separations areas	beta	$1\text{-}1.5 \times 10^{-12}$
I^{131} - Separations areas	I^{131}	$1.3\text{-}3.0 \times 10^{-12}$
I^{131} from Separations stacks	I^{131}	1-6 c/day
Active particles - Wash., Ore., Idaho,Mont.	--	0.2-1.3 ptles/meter^3
Active particles - Hanford Works	--	0.2-0.5 ptles/meter^3
Tritium (as oxides) -Riverland to Hanford	T	$4\text{-}21 \times 10^{-9}$
Tritium (as oxides) -Reactor stacks	T	3.5×10^{-8}

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Vegetation	Activity type	Average Activity Density μc/gm
Environs of Separations areas	I^{131}	$8\text{-}13 \times 10^{-5}$
Residential areas	I^{131}	$3\text{-}6 \times 10^{-6}$
Prosser - Patterson & vicinity	I^{131}	$<3 \times 10^{-6}$
Non-volatile beta emitters-Separations areas	beta	$5\text{-}11 \times 10^{-5}$
Non-volatile beta emitters-Residential areas	beta	Trace to 7×10^{-5}
Alpha-emitters - Separations areas	alpha	Trace to 3×10^{-7}

Analytical Control Laboratory

Routine analyses were carried out as follows:

Laboratory

Type Sample	Analyses Completed December 1951	1951 to Date
Vegetation	1366	19,735
Water	2136	23,439
Solids	348	3,931
Air samples	365	4,589
Fluorophotometer	298	6,360
Special survey samples (RMJ)	22	347
AEC Fall Out Samples	226	938
Dow background study (vegetation alpha)	0	130
Total	4761	59,469

Counting Room

Beta measurements (recounts included)	5761	65,985
Alpha measurements (recounts included)	3655	43,262
Control points (beta and alpha)	2777	30,444
Decay curve points	3700	35,776
Absorption curve points	75	2,777
Total	15968	178,244

Six samples of water from the 107 basins were also analyzed during the month. Results of radioautographs of filters through which had passed 500 ml of pile waste effluent indicated the possible presence in such water of particulate matter which tends to act as a center of activity. The source of such matter and its identity are not yet established.

A revised ether extraction procedure for the determination of uranium and plutonium in water samples, which involves the circulation of ether through the water by means of roto pumps, has shown encouraging results.

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Radiological Sciences Department

Data Analysis

A nomograph for use in calculation of results from the fluorophotometer was constructed. Additional work included calculations and plotting of the data from the A.E.C. fall-out program, calculations of results from the third river survey, and continuation of the correlation analysis of power level vs. activity densities at selected locations in the Columbia River. A contour map of the Columbia River for the entire area was prepared showing the increased activity at the traverses. Computations were begun on the complete analysis of the beta activity in water from the 107 basins.

Synoptic Meteorology

December 1951

Forecasts	Number made	Percent Reliability
Production	93	76.6
24-hour	62	78.8
Special	21	85.7

Meteorological conditions during the past month were featured by a low monthly average temperature of 27.4°(4.9° below normal), and a new low barometric pressure reading of 28.86 inches, reduced to sea level, on the evening of the 4th. A notable feature of the low pressure was the relatively light wind associated with this drop. Gusts of only 47 miles per hour were recorded at the station with a peak hourly average of 33 miles per hour.

Precipitation during the past month totaled 0.70 inches, slightly below the normal of 0.84 inches. Unmelted snow totaled 4.4 inches which is equal to the normal.

ENVIRONMENTAL HAZARDS AND GENERAL STUDIES UNIT

1. Experimental Meteorology

Two field tests were conducted during the month to determine crosswind distribution of oil fog and widths of the cloud by several different observing techniques and to compare the efficiencies of various sampling devices. The data so obtained do not fit the theoretical calculations of either Sutton or Roberts.

Calculations of the trajectories of hypothetical emission clouds and studies of the data from the network of outlying meteorological stations were continued during the month.

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Radiological Sciences Department

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2. Geology-Hydrology

Ground water contamination levels in the 361-B Area remained at previously established levels. Further analyses for the nitrate ion in these samples showed a very good correlation with the radioactive contamination. Samples obtained from well 241-T-15, located 90 feet south of the 224-T crib and 65 feet north of the second cycle crib, which was reopened and extended to the water table in November, were slightly positive for radioactive contamination and definitely positive for nitrate ion indicating some seepage to the water table from the crib wastes in this area. Well 224-T-10 recently completed about 220 feet southwest of the second cycle crib has not had any positive results as yet. Alpha contamination was found in well 241-T-15 at a depth 84 feet directly above the silt-clay bed that underlies the 200 West Area and above which the radioactive wastes are now moving.

Beta activity in the 108-B wells is dropping as the river level continues to decline. No significant amount of tritium was detectable. The springs in the 181-C building excavation were sampled and those which were clearly river water were found not contaminated, but those on the area side of the excavation were definitely beta active and are presumably caused by seepage from the 107-B retention basin.

Contamination levels in the 300 Area wells did not change appreciably.

3. Soil Science

Forty-two particle size distribution analyses of soil samples from the 219-S-2 and 361-T-15 wells were completed. The clay content was generally less than 5%, the silt content varied from 5% to 20%, and the remaining 75% to 90% was made up of sand and small amounts of gravel.

About 75 nitrate analyses were completed in conjunction with the studies of ground water contamination by the Geology-Hydrology group.

The possibility of using a paper chromatographic technique for the separation and semi-quantitative analysis of radioactive isotopes in waste effluents is currently being investigated.

4. Industrial Hygiene

Electron micrographs have been prepared of samples collected recently by thermal precipitation technique at the Nevada tests. The samples were observed both with and without metal shadowing and practically all specimens collected, at a distance of 15 to 20 miles from the test site, were observed to be spherical and very similar to those obtained at ground zero.

Studies of non-radioactive hazards were made for Industrial Medical on atmospheres in the 313 building, in the 242-B building, in the Redox building during cold runs, and near the 200 Area process stacks.

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5. Methods

Work was continued on the plating of plutonium on small areas. Results to date indicated that good yields on areas smaller than 10 square millimeters should be obtainable when a reliable method of defining the plating area is obtained. Preliminary tests on the contamination by radium in the electrodeposition step indicated that about 50% of the radium present is deposited.

Thirteen runs on the evolution of I^{131} from the 200-West stack indicated total daily evolutions of 0.7 to 6 curies. The revision of the stack monitoring building is in process.

Five additional traverses of the Columbia River have been made during the month. An attempt to correlate the average activity in a given cross-section with the total power levels of the piles above the section has indicated a very reasonable straight line relationship.

Attempts to dissolve ruthenium from vegetation with a sodium hydroxide-sodium hypochlorite solution followed by precipitation of ruthenium dioxide have been unsuccessful due to the presence of large amounts of organic material in the solution. Removal of this organic material by co-precipitation with aluminum hydroxide has led to losses in ruthenium. Preliminary results on the precipitation of ruthenium sulfide from the caustic solution, followed by solution and electrodeposition, were promising.

Attempts to obtain consistent results with internal proportional counters for the measurement of thoron in the thorium analysis and for the measurement of xenon in the 107 retention basin water have been unsuccessful.

The work on the extraction of plutonium from vegetation continued to give low yields in spite of attempts to oxidize the plutonium before extraction. A self-absorption curve for plutonium alpha particles in aluminum nitrate was obtained to correct values from samples having carry-over of the aluminum nitrate in the extraction step.

6. Radiochemical Standards

Hydrogen was generated from water containing tritium by reaction with magnesium metal in a closed, evacuated tube. The reaction was forced to completion by muffling for a long period at about 500°C. Since the only products of this reaction are hydrogen and magnesium oxide, all of the tritium should have appeared in the gas evolved. Upon counting an aliquot in the internal counter, it was found that the counting rate was 84% of the theoretical disintegration rate. The counter performance was checked using CO_2 containing a known amount of C^{14}, and a counting efficiency of 99% was

obtained. Experiments performed to establish whether hydrogen and tritium were adsorbing on the center wire showed that the ratio of observed counting rate to theoretical disintegration rate was independent of partial pressure of the hydrogen to partial pressures as low as 0.38 mm. If adsorption were playing a part and was a function of the partial pressures of hydrogen, the counting rate to disintegration rate ratio should have more nearly approached unity at lower pressures.

One G.M. tube showing a peculiar characteristic of counting higher with each subsequent count for sources of 1 Mev maximum energy or greater was tested using the pulse interval analyzer. There was no indication that the interval distribution was different from the statistical distribution predicted.

Sources prepared from P^{32} calibrated by the United States Bureau of Standards were re-evaluated on the mica window sets. Those sources mounted on thin film checked within $\pm$ 3.5% of the value quoted by the Bureau of Standards.

RADIATION MEASUREMENTS

1. Physics

The special film badges designed for the 234-5 building have been given limited testing and seem satisfactory. On these badges high energy gamma radiation is measured under the silver shield, beta radiation under a 1 mil gold shield, and low energy X-rays on the open window -- in each case allowance being made for density due to other radiations that will penetrate the given shield. It was found that the high energy gamma rays at 234-5 are not absorbed in the same way as radium gamma rays. If allowance is not made for this fact, density under the gold shield may erroneously be ascribed to beta radiation.

The neutron scintillation counter was used with both Po-B and Ra-Be sources and had about the same sensitivity to both; namely, 0.4 counts per minute per neutron/cm^2/sec. When very close to the Ra-Be source the sensitivity dropped considerably. This was presumably due to a paralyzing effect of the gamma rays. The scintillation counter was used for source asymmetry and floor scattering measurements. The results for the asymmetry of Po-B were the same as those obtained with a moderated BF_3. This is of interest because supposedly these two instruments have quite different energy response.

Using standard theory, a value of the slow neutron intensity in one of the exposure positions of the sigma pile was calculated to be 332 neutrons/cm^2/sec. The value now being used is 250. This is a difference of about 30%. A single brief note in the literature indicates the Argonne standard pile was once this much low. It seems quite possible that the local pile was once made to agree with the Argonne pile, and then not changed when it

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should have been. The correct values of the flux are being determined.

Two geiger tubes are being given life tests with capacitive loadings differing by an order of magnitude. The heavily loaded tube began to show changes in characteristics almost immediately.

Instrument Development

Two alpha scintillation counters for survey work were completed and used with "poppies" altered according to a scheme for improving those instruments in a stepwise manner. Exploratory work to determine the optimum dimensions of oil and lucite light pipes was started and a transmission line for a scintillation well monitor was worked out. Some exploratory work was done with a sodium iodide counter for Biology.

The sample changer was placed in service in the Control counting room, where it appeared to operate satisfactorily.

A C.P. type instrument equipped with a special ion chamber, shaped like a truncated cone which was designed to give a nearly 1:1 ratio of beta to gamma response, was placed in experimental field service. This instrument is preferable (at least in some respects) to the thin wall chamber type which was placed in use last month. A survey instrument approved for use in Class I Group D atmospheres was obtained from KAPL; it is now being checked in the laboratory prior to calibration.

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Radiological Sciences Department

BIOLOGY SECTION

AQUATIC BIOLOGY UNIT

Biological Chains

1. Algae-Trout Relationships

Adult trout held in 5% pile effluent and fed a diet containing algae cultured in the effluent water developed satisfactorily without indication of deleterious effect. Extended shutdowns of the 100-F pile resulted in atypical activity densities in these fish.

2. Retention Basin Algae Control

Test patches of anti-fouling paint applied to a wall in the 107-F basin in November were exposed to the atmosphere during the first half of the month while the Reactor Section held the west side out of operation.

Ecology

1. Survey of the Columbia River

Ideal hydrographic conditions for shore collecting continued during the month. Major repairs to the boat engine continued to disrupt the plankton sampling schedule, however. Activity densities of most lower forms, including plankton and bottom algae, declined about one-third from the high values observed last month; fish were only about one-third as radioactive as during November. Reduced activity densities in the organisms reflect the lower metabolic rate associated with colder temperatures since the activity density of the river water increased during the month. Average values observed at Hanford were: plankton, 11 x 10^{-3} $\mu c/g$; bottom algae, 3.5 x 10^{-3} $\mu c/g$; caddis fly larvae, 3.2 x 10^{-3} $\mu c/g$; small fish, 0.43 x 10^{-3} $\mu c/g$. With the cold weather fish are becoming increasingly more difficult to obtain and no large specimen was captured.

Effluent Monitoring

1. Effect of Pile Effluent on Silver Salmon

Monitoring of the area effluent with silver salmon eggs continued without unusual result, although extended shutdowns of the 100-F pile eliminated the factors of temperature and radioactivity during a major part of the month. Eggs in the 10% area effluent developed to hatching but suffered a significantly higher mortality. A slight increase in mortality was also evident among the eggs held in the 5% area effluent.

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2. Effect of Pile Effluent Retention Time on Activity Densities in Aquatic Organisms

In order to compare the activity density of aquatic organisms subjected to pile effluent water which has not been retained with that of organisms subjected to the normally retained effluent, ponds receiving water from the two sources have been set up.

BIOLOGICAL SERVICES UNIT

Biological Monitoring

1. Waterfowl

Random sampling of waterfowl during the month disclosed background levels of radioactivity in all sampled tissues of migrant ducks and geese. Positive counts as high as 125 d/m/g were observed in tissues of resident forms with the exception of thyroid densities of ducks taken near 200-East Area. Maximum thyroid activity density detected in this area was 0.083 μc/g.

The fecal study of Canada geese was continued and excellent correlation with last month's results obtained. Thirty-five percent of all samples were grouped in the 200 - 300 d/m/g range as compared to 34% in the same range in November. Maximum value detected during this month was 790 d/m/g.

2. Upland Wildlife

Thyroid activity densities of assayed specimens from various locations are tabulated below:

Locality	Specimen	Maximum (μc/g)	Average (μc/g)
Meteorology Tower	Jack rabbit (2)	0.13	0.11
200-East Area	Jack rabbit (4)	0.12	0.10
Prosser Barricade	Jack rabbit (5)	0.10	0.09
4S-2S Intersection	Jack rabbit (1)	0.06	--
	Horse (1)	0.02	--
100-F Area	House cat (1)	0.001	--
Yakima Barricade	N.W. Horned Owl (1)	0.001	--

Clinical Laboratory

Seven hundred and seventy-eight determinations.

Microscopy

Routine histological preparations.

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Radiochemistry Laboratory

1. Radioactivity in Carcasses

This problem is temporarily inactive due to the pressure of analytical services, particularly plutonium analyses.

2. Analytical Services

Twenty eight ether or TTA extractions for plutonium were performed on biological specimens submitted. Thirty-eight radioisotope solutions were prepared or calibrated for plant and animal administration, and approximately 3,300 alpha and beta counts were completed.

3. Analytical Techniques

Improved geometry correction factors for 108-F laboratory beta counters were obtained. Cellophane alpha particle absorbers previously placed in contact with sources are now adjacent to the mica window of the G.M. tube, resulting in the expected decrease in scatter.

METABOLISM UNIT

Animal Metabolism

1. Low-Level Chronic Plutonium Absorption in the Rat

All animals were sacrificed, except for 30 in the group receiving the highest level of plutonium, which will be sacrificed at intervals to determine the biological half-life of the deposited plutonium.

2. Percutaneous Absorption of Plutonium

No report.

3. Therapy for Internally Deposited Plutonium

No report.

4. Distribution and Retention of Tritium in the Rat. II. Compound Separation

Analyses were completed on the residual carcass and abdominal fat fractions from the first group of rats killed approximately 4 months after injection of 0.1 curie tritium oxide per rat. Bound tritium content ranged from 0.34 μc/g in the non-lipid fraction of abdominal fat to 1.3 μc/g in the 6% saline-soluble protein fraction from the residual carcass. It is apparent that the firmly bound tritium remaining 4 months after tritium oxide administration is rather uniformly distributed among the various fractions thus far investigated.

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5. Distribution and Retention of Tritium in the Rat. III. Effect of Growth

This experiment was concluded with the completion of analyses on samples from rats killed 84 days following tritium oxide injection. An effect of growth on tritium binding was apparent in abdominal fat, pelt, muscle, and bone samples, where animals an an ad lib diet (rapidly growing) bound 1½ to 3 times as much tritium as animals on a restricted diet (little or no growth). No effect of growth on tritium binding was noted for the large intestine and brain.

6. Distribution and Retention of Tritium in the Sheep

In cooperation with the experimental animal farm, a ram injected with 820 mc of tritium oxide was used for extrapolation of tritium metabolism results obtained from small animals. Over a 30-day period, the biological half-life for body water was 5.2 days. Red cell protein, plasma albumin, and plasma globulin analyses for bound tritium were completed through the seventh day, at which time the concentration of bound tritium was still increasing in all fractions.

7. Percutaneous Absorption of Tritium Gas

For 17 rats, the average rate of uptake and retention of activity, when exposed to an atmosphere containing tritium gas, was $6.8 (\pm 1.7) \times 10^{-5}$ $\mu c/cm^2$ skin exposed/minute/μc tritium gas/cc atmosphere. For 18 mice, the corresponding figure was $16.6 (\pm 4.3) \times 10^{-5}$. Indications were that the retained tritium was largely present as the oxide.

Microbiology

1. Determination of RBE's by Microbiological Methods

Improvement in the method of determining radiation dosimetry by the production of phenols from benzoic acid was accomplished by using freshly redistilled water saturated with oxygen for preparing solutions and keeping these solutions in an atmosphere of oxygen. Using this procedure, the phenol production in solutions containing H^3, P^{32}, and S^{35} was compared.

The isotope solutions so calibrated were used to irradiate growing cultures of Lactobacillus casei in the manner described for tritium last month.

2. Tritium Fixation by Bacteria

This problem was completed and the data prepared for open publication. Certain bacteria, common to soil, air, and the G.I. tract of man, were found to fix tritium rapidly, the resulting product being primarily tritium oxide. With bacterial suspensions, the rate of fixation of tritium and hydrogen decreased with time. The initial rate was restored by addition of glucose.

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3. Tritium Fixation by Mammalian Tissues

No report.

Plant Nutrition

1. Absorption and Translocation of Fission Product and Pile Effluent Radioactivities

The experiment on absorption and retention of strontium by red kidney bean plants over periods approximating the life of the plant was completed. It was found that inactive strontium at a level of 1.0 ppm caused a decreased growth rate and an early senescence. Strontium in the various plant parts attained a maximum concentration characteristic of the tissue involved, and was not available for retranslocation within the plant.

2. I^{131} Vapor Absorption and Translocation

Two exposures of tomato plants to I^{131} gas were made in an attempt to improve the experimental method. Satisfactory material balances were not obtained.

3. Absorption and Metabolism of Tritium Oxide by Vascular Plants

Data from the experiment described in last month's report were complete, with the exception of bound tritium determination in stem tissue. Multiple exponential loss of bound tritium was observed for all tissues except the second trifoliate leaves which emerged during the latter part of the exposure period. These exhibited single exponential loss of bound tritium over the experimental period.

Plant Metabolism

1. Radiation Damage to Plants. I. Algae

Algae were grown in culture media containing 1.4 μc/ml of an equilibrium mixture of Sr^{90} and Y^{90}. The following variables were investigated:

(1) the age or growth phase of the inoculum employed
(2) the number of cells in the inoculum
(3) previous exposure of inoculum to Sr^{90} and Y^{90}
(4) specific activity
(5) the previous growth of algae in the medium employed.

The rate of growth of the algae was significantly affected by all of these variables, except the specific activity. The results were interpreted to indicate that the action of ionizing radiations of Sr^{90} and Y^{90} on algae cells is indirect, and that the growing algae cells synthesize a substance or substances which protects them from radiation damage.

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2. Metabolism of Tritium Oxide by Algae

Further interpretation of results reported last month indicated that after 4 generations, the bound hydrogen of the algae cell is 59% as active as the hydrogen of the water in which it is grown.

TOXICOLOGY UNIT

Experimental Animal Farm (Toxicology of I^{131})

1. Low-Level Chronic Effects

Thyroid function, as indicated by external monitoring, in sheep on daily feedings of I^{131} from 0.15 to 135 μc/day, showed no significant variation from controls.

2. Thyroid Regeneration

Seven ewes formerly subjected to a regimen of 240 μc/day of I^{131} for 450 days have been returned to the Animal Farm from the Off-project control station. As these animals exhibited a considerable weight loss and extreme sensitivity to cold, it became evident that the rigors of winter would seriously deplete the flock. Those animals are scheduled to lamb in February.

3. Effects of Inert Iodine and Desiccated Thyroid

One animal that previously received 480 μc I^{131} without any augmentation exhibited a considerable weight loss and general alopecia. One animal that was on a similar I^{131} regimen but received desiccated thyroid displayed a similar weight loss. Both animals exhibited extreme sensitivity to cold.

4. Effect of Route of Administration on Thyroid Metabolism

No progress.

5. Effect on Gonadal Function in the Ram

A preliminary study was made on semen utilizing the electron microscope.

Physiology

1. Toxicology of Active Particles

The strain A mouse colony increased to 292 individuals.

Radiological Sciences Department

2. Plutonium Toxicology

Seven 5 gm carp received intraperitoneally via the dorsal musculature 0.1 ml of plutonium solution containing 4,200 d/m. All expired within the first few hours. Prior to plutonium administration, it had been determined that the route and volume administered are compatible with life. In cooperation with Aquatic Biology, investigations are continuing in order to determine the toxic principle involved.

3. Therapeutics in Plutonium Poisoning

One 14 Kg animal received 0.025 μg Pu^{239}/g body weight, and was then subjected to the following treatment:

(1) Previously preserved frozen normal animal plasma was administered intravenously over a period of three weeks time in amounts of 200, 200, 250, 300, 450 and 650 ml. No increase in activity density of the excreta was noted.

(2) Zr citrate dissolved in plasma resulted in the following plutonium excretion in the urine.

Days following Pu Administration	Treatment	% Adm. dose Excreted in Urine
24	None	0.03
25	50 mg/kg Zr citrate	0.018
26	None	0.70
27	None	0.014
28	43 mg/kg Zr citrate	0.048
29	None	0.28
30	None	0.16
31	Animal sacrificed - no analysis as yet	

First and second zirconium treatments gave, respectively, about 40- and 6-fold increases in plutonium excretions. This may be taken as presumptive evidence of the importance of early treatment, although the effect on the total body burden (unknown at the time of this report) was apparently small.

At time of sacrifice the skin presented two eroded areas up to 2 cm diameter at the sites of injection. There was also some involvement of the subcutaneous tissues. The toxic properties of Zr or other factors leading to the observed tissue damage are being investigated for local and general systemic effects.

4. Pulmonary Absorption of Tritium

No result.

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FINANCIAL DEPARTMENT MONTHLY REPORT
DECEMBER, 1951

Budget data prepared for the mid-year review of the FY 1952 budget were submitted to the Appropriations and Budget Committee on December 7. After review and revision by the Committee the budget estimates were submitted to the Hanford Operations Office of the Atomic Energy Commission on December 21.

A refund of $188,320 of amounts formerly paid by the Government for administrative and general expenses for calendar year 1950 was made during the month by the General Office at Schenectady. This refund was in addition to a refund of $1,400,000 for the same period, made in September, 1951, and was based on audited costs for calendar year 1950 as determined by Peat, Marwick, Mitchell and Company. The refund check was payable to General Electric Company, Nucleonics Division, and was deposited in the contract bank account in lieu of a cash advance in that amount which otherwise would have been made by the Commission.

A summary of cash disbursements and receipts (excluding advances from AEC) for the months of December and November, 1951 is shown below:

	December	November
Disbursements		
Payrolls	$ 2 483 573	$ 2 859 128
Material and Freight	2 370 425	3 090 934
Payroll Tax	484 163	507 908
Payments to Subcontractors	220 619	205 143
U. S. Savings Bonds	113 288	217 234
Other	306 616	445 344
Total	5 978 684	7 325 691
Receipts		
Rents	140 561	142 315
Hospital	50 532	62 445
Sales to AEC Cost-Type Contractors	38 933	168 042
Scrap Sales	21 854	3 136
Telephone	15 240	17 173
Bus Fares	9 879	10 433
Refunds from Vendors	4 360	2 703
Other	18 315	13 962
Total	299 674	420 209
Net Disbursements	$ 5 679 010	$ 6 905 482

Advances from AEC decreased from $5,000,000 as of November 30, 1951 to $4,000,000 as of December 31, 1951 and may be summarized as follows:

	December	November
Cash in Bank - Contract Accounts	$ 3 034 310	$ 4 035 799
Cash in Bank - Salary Accounts	50 000	50 000
Cash in Transit	490 690	489 201
Advances to Subcontractors	300 000	300 000
Travel Advance Funds	125 000	125 000
Total	$ 4 000 000	$ 5 000 000

A summary of personnel changes in the Financial Department during the month of December is shown below:

Personnel at November 30, 1951	454
Acquisitions	7
Terminations and transfers out	(16)
Personnel at December 31, 1951	445

The monthly reports of the four sections of the Financial Department, as listed below, are shown on the following pages.

General Accounting Section
Manufacturing Accounting Section
Engineering Accounting Section
Community Accounting Section

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GENERAL ACCOUNTING SECTION
MONTHLY REPORT

December, 1951

All accounts receivable work, with the exception of that in connection with North Richland (handled by Engineering Accounting), was transferred to a newly established sub-unit in the General Accounting Section, effective December 1, 1951.

Work in connection with the FY 1952 midyear budget review was completed early in the month, and by the end of the month budgets for each section and unit had been detailed by quarter and were ready for transmittal to respective department and section managers.

Summaries of total operating costs and product cost were prepared, segregating Product Cost by element of cost and by function. Quarterly product cost budgets were prepared, based on approved operating costs, and cost bogeys for the next five months were developed. Letter was issued to the General Manager detailing total costs segregated by process and product. This letter explained reasons for major variances in costs as compared with the previous month.

In September, 1951, a partial refund amounting to $1 400 000 was received from Schenectady, representing the excess of funds provided over actual administrative overhead costs for calendar year 1950. This month the final refund in the amount of $188 320 was received. Expenses charged to administrative overhead and audited by Peat, Marwick, Mitchell & Company amounted to $811 680.

Internal Auditors began an audit of payroll procedures concerning reconciliation of weekly payroll bank accounts and began an investigation into the use of official telephone lines to Pasco and Kennewick for non-official business. Studies and surveys completed during the month included: report on routines followed at two G. E. Works relative to procurement and control of materials, and review of stores routines in connection with maintenance of inventory records.

Considerable overtime was worked in Payroll Unit as a result of changes in working schedules for the last week in December and the first week in January, which were made in order that day workers on a five-day schedule would not have to work on the Monday preceding the two holidays, but would work the following Saturdays. These changes required rescheduling of payroll work, the issuance of instructions to supervisors, etc.

Calculations were completed and retroactive payments made to 702 employees in the amount of $89 752, covering construction work performed during the period from September 1, 1946, to September 30, 1951.

STATISTICS

Employees and Payroll

	Total	Monthly Payroll	Weekly Payroll
Employees on payroll at beginning of month	9 047	2 081	6 966
Additions and transfers in	163	6	157
Removals and transfers out	(108)	(20)	(88)
Transfers from weekly to monthly payroll	-	20	(20)
Transfers from monthly to weekly payroll	-	-	-
Employees on payroll at end of month	9 102	2 087	7 015

Number of Employees

	December	November
Bargaining group - HAMTC	3 437	3 434
Bargaining group - Building Services	68	70
- Two Platoon Firemen	56	55
- Hanford Guards	621	617
Other weekly - non-bargaining	2 889	2 845
Executive, administrative and operating	1 488	1 474
Professional	520	529
Other monthly	23	23
Total	9 102	9 047

Number of Employees

Engineering	1 963	1 956
Manufacturing	3 046	3 000
Utilities and General Services	2 276	2 252
Community	218	224
Real Estate & Services	332	333
Financial	445	454
Employee and Public Relations	110	112
Radiological Sciences	364	364
Medical Services	273	276
General	24	22
Law	17	20
Accountability	23	21
Technical Personnel	11	13
Total	9 102	9 047

Overtime Payments

Weekly paid employees	$ 168 195	$ 146 475
Monthly paid employees	51 156(1)	49 948(2)
Total	$ 219 351	$ 196 423

Number of Changes in Salary Rates and Job Classifications

	1 674	1 128

(1) Payments cover period December 1 through December 31, 1951, except in the case of patrolmen in the Plant Security and Services Section of the Utilities and General Services Department who were paid for the period November 1 through November 30, 1951.

(2) Payments cover period November 1 through November 30, 1951, except in the case of patrolmen in the Plant Security and Services Section of the Utilities and General Services Department who were paid for the period October 1 through October 31, 1951.

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General Accounting Section

Gross Amount of Payroll	December	November
Engineering	$ 902 980	$ 798 127
Manufacturing	1 512 898	1 185 489
Utilities and General Services	952 949	766 341
Community Real Estate and Services	240 929	207 278
Other	527 273	451 938
Total	$ 4 137 029(1)	$ 3 409 173(2)
Annual Going Rate of Payroll		
Base	$39 743 593	$39 455 993
Overtime	2 485 353	2 461 879
Isolation Pay	1 277 023	1 267 969
Shift Differential	495 512	495 724
Other	54 144	84 089
Total	$44 055 625	$43 765 654
Average Hourly Base Rates		
Bargaining group - HAMTC	$ 1.998	$ 2.000
- Building Services	1.564	1.564
- Two Platoon Firemen	1.980	1.990
- Hanford Guards	1.745	1.742
Other weekly - non-bargaining	1.709	1.694
Executive, administrative and operating	2.926	2.927
Professional	2.948	2.948
Other monthly	2.340	2.353
Total	$ 2.093	$ 2.090

Average Earnings Rate Per Hour (3)	December			November		
	Weekly	Monthly	Total	Weekly	Monthly	Total
Engineering	$1.824	$2.936	$2.242	$1.805	$2.942	$2.242
Manufacturing	2.196	3.002	2.334	2.195	3.016	2.336
Utilities and General Services	1.913	2.718	2.014	1.912	2.716	2.011
Community Real Estate and Services	1.952	2.465	2.124	1.951	2.445	2.115
Other	1.716	3.076	1.994	1.707	3.067	1.981
Total	$1.972	$2.900	$2.174	$1.967	$2.901	$2.171

% Absenteeism	December	November
Weekly - Men	2.38	2.38
Weekly - Women	4.44	4.22
Total Weekly	2.93	2.88
Monthly	1.46	1.61
Grand Total	2.64	2.57

(1) Includes payments for five-week period ended December 23, 1951 in the case of weekly paid employees. Also includes $89 752 retroactive payments to Construction Workers for periods of employment between September 1, 1946 and September 30, 1951.

(2) Includes payments for four-week period ended November 18, 1951 in the case of weekly paid employees.

(3) Includes shift differential and isolation pay. Excludes overtime premiums, commissions, suggestion awards, etc.

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General Accounting Section

Employee Benefit Plans

Pension Plan

	December	November
Number participating at beginning of month	6 441	6 416
New participants and transfers in	84	60
Removals and transfers out	(48)	(35)
Number participating at end of month	6 477	6 441
% of eligible employees participating	94.4%	95.6%

Employees Retired	December	Total to Date
Number	1	197-a)
Aggregate Annual Pensions Including Supplemental Payments	$123	$42 373-b)
Amount contributed by employees retired	$308	$36 267

(a - Includes 7 employees who died after reaching optional retirement age but before actual retirement. Lump sum settlements of death benefits were paid to beneficiaries in these cases.

(b - Amount before commutation of pensions in those cases of employees who received lump sum settlement.

Insurance Plan (1)

Personal Coverage

	December	November
Number participating at beginning of month	9 028	8 967
New participants and transfers in	156	140
Cancellations	(17)	(19)
Removals and transfers out	(67)	(60)
Number participating at end of month	9 100	9 028
% of eligible employees participating	98.2%	97.9%

Dependent Coverage

Number participating at beginning of month	5 487	5 379
Additions and transfers in	93	151
Cancellations	(2)	(7)
Removals and transfers out	(28)	(36)
Number participating at end of month	5 550	5 487

Claims - Disability Benefits (2)

Number of claims paid by insurance company:		
Employee Benefits		
Weekly Sickness and Accident	128	137
Daily Hospital Expense Benefits	153	152
Special Hospital Services	165	162
Surgical Operations Benefits	120	121
Dependent Benefits		
Daily Hospital Expense Benefits	281	202
Special Hospital Services	324	259
Surgical Operations Benefits	267	227
Amount of claims paid by insurance company:		
Employee Benefits	$35 302	$34 347
Dependent Benefits	35 394	28 010
Total	$70 696	$62 357

(1) The new Insurance Plan was made effective on December 1, 1950.
(2) Statistics cover only claims paid and not all claims incurred during the month.

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ployee Benefit Plans (continued)

Claims - Death Benefits (1)	December	Total to Date
Number	1	72
Amount	$6 500	$391 500

Group Life Insurance

The Group Life Insurance Plan was discontinued November 30, 1950. As of December 31, 1951, 4 employees who are absent due to total disability are still participating in the Group Life Insurance Plan. They were not actively at work December 1, 1950, and therefore were not eligible to participate in the new Insurance Plan. However, they will become eligible upon their return to work.

Vacation Plan

Number of employees granted permission to defer one week of their 1951 vacation to 1952

	December			Total to Date		
	Weekly	Monthly	Total	Weekly	Monthly	Total
Engineering	6	15	23	43	95	138
Manufacturing	3	6	9	126	72	198-a)
Utilities and General Services	4	7	11	96	49	145-b)
Community Real Estate and Services	2	1	3	31	25	56
Financial	1	3	4	16	7	23
Employee and Public Relations	0	1	1	4	5	9
Radiological Sciences	0	1	1	4	8	12
Medical	1	5	6	14	6	20
General	0	0	0	2	3	5
Total	19	39	58	336	270	606

(a - Manufacturing Department total-to-date decreased by one cancellation.
(b - Utilities and General Services Department total-to-date decreased by two cancellations.

U. S. Savings Bonds	Engineering	Mfg.	Utilities and General Services	Community Real Estate and Services	Other	Total
Number participating at beginning of month	1 028	1 444	1 012	282	586	4 352
New authorizations	15	17	17	-0-	8	57
Voluntary cancellations	(12)	(16)	(11)	(1)	(8)	(48)
Removals and transfers out	(9)	(6)	(10)	(7)	(6)	(38)
Transfers in	7	11	3	-0-	6	27
Number participating at end of month	1 029	1 450	1 011	274	586	4 350

(1) Total to date includes all claims under the old and new Insurance Plans and three deaths on which accidental death benefits were paid.

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Employee Benefit Plans (continued)

U. S. Savings Bonds (cont.)	Engineering	Mfg.	Utilities and General Services	Community Real Estate and Services	Other	Total
Percentage of participation						
G.E. Employees Savings and Stock Bonus Plan	47.9	42.5	38.5	44.5	42.0	42.7
G.E. Savings Plan	8.2	11.1	10.1	10.9	9.2	9.9
Both Plans	52.4	47.6	44.4	49.8	46.2	47.8
Bonds issued-						
Maturity value	$62 575	$99 325	$61 750	$15 975	$35 025	$274 650
Number	1 152	1 814	1 157	297	682	5 102
Refund issued	19	15	14	2	19	69
Revisions in authorizations	13	17	10	5	6	51
Annual going rate of deductions						
G.E. Employees Savings and Stock Bonus Plan	$382 256	$600 257	$382 149	$ 88 265	$220 913	$1 673 840
G.E. Savings Plan	80 412	177 562	114 088	27 965	48 265	448 292
Total	$462 668	$777 819	$496 237	$116 230	$269 178	$2 122 132

Withdrawal of U. S. Savings Bonds from G. E. Employees Savings and Stock Bonus Plan	December	November
Number of participants withdrawing Bonds	100	105
Maturity value of U. S. Savings Bonds withdrawn	$32 575	$33 925

Check-off of Union Dues

	Number of New Payroll Deduction Authorizations Submitted in December	
Hanford Atomic Metal Trades Council		
International Chemical Workers Union, #369	17	
International Association of Machinists, Local 1951	1	
International Brotherhood of Teamsters, Warehousemen, Garage Employees & Helpers, Local 839	5	
United Brotherhood of Carpenters & Joiners of America, Local Union No. 2403	6	
International Union of Operating Engineers, Stationary Local 280	10	
Instrument Craftsmen's Guild	15	
United Association of Journeymen & Apprentices of the Plumbing & Pipe Fitting Industry of the United States and Canada, Local 598	3	
International Association of Fire Fighters, Local 1052	2	
Total submitted by H.A.M.T.C.		59
Hanford Guards Union, Local 21		11
Grand Total		70

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Check-off of Union Dues (cont.)

	Number of Authorizations in Effect	
	12-31-51	11-30-51
Hanford Atomic Metal Trades Council	1 060	1 009
Building Service Employees International Union, Local 201 (Medical Department Employees)	24	25
Hanford Guards Union, Local 21	184	173
Total	1 268	1 207

Employees Who Have Entered Military Service

	Total to Date		
	Called to Duty	Volunteered for Duty	Total
Reserve Officers	18	3	21
Enlisted Reserve	50	6	56
National Guard	6	-0-	6
Selective Service	37	-0-	37
Voluntary Enlistments	-0-	71	71
Total	111	80	191

Number of Rent, Telephone and Hospital Deductions from Salaries

	December	November
House Rent	4 976	4 991
Dormitory Rent	889	872
Barracks Rent	197	208
Trailer Space Rent	140	147
Telephone Accounts	3 644	3 623
Hospital Accounts	458	540
Total	10 304	10 381

Annuity Certificates (For duPont Service)

	December	Total to Date
Number issued	-0-	83

Suggestion Awards

Number of awards	64	1 284
Total amount of awards	$2 645	$23 055

Employee Sales Plan

	December		
	Major Appliances	Traffic Appliances	Total
Certificates issued	28	610	638
Certificates voided	-0-	13	13

Salary Checks Deposited

	December		November	
	Weekly	Monthly	Weekly	Monthly
Richland Branch - Seattle-First National Bank	751	857	772	854
North Richland Area Office - Seattle-First National Bank	11	6	8	7
Richland Branch - National Bank of Commerce	392	267	368	260
Out of state banks (Schenectady staff)	-0-	1	-0-	1
Total	1 154*	1 131	1 148**	1 122

*Week ended 12-23-51
**Week ended 11-18-51

Special Absence Allowance Requests	December	November
Number submitted to Pension Board	2	4

PERSONNEL AND ORGANIZATION

Number of Employees		
On payroll at beginning of month	261	268
Removals and transfers out	(11)	(11)
Additions and transfers in	11	4
Number at end of month	261	261
Net increase (or decrease) during month	-0-	(7)
% of terminations and transfers out	4.2%	4.1%
% of absenteeism	5.0%	3.07%

Changes by unit in number of Accounting Section employees during December were as follows:

	Name
General: No change	
Accounts Payable: Decrease of one employee	
One transfer to Community Accounting	Dorothy R. Hansen
Cost: No change	
General Accounts: No change	
One transfer from Rotational Training Program	F. W. Gates
One resignation	G. W. Talbot
Plant Accounting: No change	
Weekly Payroll: Decrease of two employees	
One new hire	Johanna C. Mauk
One deactivation	Lovejoy O. Morey
One transfer to General Administrative	G. C. Swanson
One resignation	Dorena D. Crosby
Monthly Payroll: No change	
Two transfers to General Administrative	Carol A. Hoover Eileen B. Callies
Two transfers from Special Assignments	Betty C. Faust Myrtle T. Francis
Special Assignments: Decrease of six employees	
One transfer to Accounts Receivable	W. W. Kiester
One transfer to Engineering Department	Mary S. Doyle
One transfer to Engineering Accounting	Martha H. Holt
Two transfers to Monthly Payroll	Bettie C. Faust Myrtle T. Francis
One transfer to Manufacturing Department	Betty S. Brown
Budgets: No change	

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PERSONNEL AND ORGANIZATION (continued)

	Name
Internal Audit: Increase of one employee	
One reactivation	G. C. Myers
Rotational Training Program: Decrease of three employees	
One transfer to General Accounts	F. W. Gates
One transfer to Accounts Receivable	L. W. Shiels, Jr.
One transfer to Engineering Accounting	W. S. Richards
Medical Accounting: No change	
Accounts Receivable: Increase of eleven employees	
Nine transfers from Community Accounting	E. S. Lewis
	J. Z. Burnham
	M. P. Whittle
	B. R. Smith
	M. J. Thacker
	R. J. Wilson
	D. B. Halteman
	S. R. Myers
	F. S. Robinson
One transfer from Special Assignments	W. W. Kiester
One transfer from Rotational Training Program	L. W. Shiels, Jr.

Injuries	December	November
Major	0	0
Sub-Major	0	0
Minor	2	2

Number of Accounting Section employees as of December 31, 1951 were as follows:

	Number of Employees		
	Non-Exempt	Exempt	Total
General	3	7	10
Accounts Payable	24	2	26
Cost	16	3	19
General Accounts	20	1	21
Plant Accounting	24	2	26
Weekly Payroll	68	5	73
Monthly Payroll	19	2	21
Special Assignments	20	3	23
Budgets	3	1	4
Internal Audit	4	7	11
Rotational Training Program	6	-0-	6
Medical Accounting	8	2	10
Accounts Receivable	9	2	11
Total	224	37	261

Non-exempt employees may be summarized as follows:

	Number as of	
Classification	12-31-51	11-30-51
Accounting A	1	2
Accounting B	4	3
Accounting C	6	6
Accounting D	10	10
Business Graduate	21	21
Clerical Working Leader	8	8
Cost Clerk A	2	2
Cost Clerk B	1	1
Cost Clerk C	4	4
Cost Clerk D	3	3
Field Clerk B	-0-	-0-
Field Clerk C	4	3

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General Accounting Section

PERSONNEL AND ORGANIZATION (continued)

Classification	Number as of 12-31-51	11-30-51
General Clerk A	29	30
General Clerk B	51	43
General Clerk C	40	47
General Clerk D	6	6
General Clerk E	1	1
Office Machine Operator A	10	10
Office Machine Operator B	6	6
Secretary B	1	1
Steno-Typist A	2	2
Steno-Typist B	5	6
Steno-Typist C	6	6
Steno-Typist D	-0-	1
Field Clerk A	3	3
Total	224	225

Open employment requests as of December 31, 1951 were as follows:

Steno-Typist C	1
Steno-Typist B	1

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General Accounting Section

	December	November
Accounts Payable		
Balance at Beginning of Month	$ 196 369	$ 280 855
Vouchers Entered	1 739 148	1 941 980
Cash Disbursements	1 698 820 DR	2 027 948 DR
Cash Receipts	4 210	1 482
Balance at End of Month	$ 240 907	$ 196 369
Number of Vouchers Entered	2 539	2 723
Number of Checks Issued	1 516	1 509
Number of Freight Bills Paid	1 288	1 594
Amount of Freight Bills Paid	$ 328 778	$ 396 270
Number of Purchase Orders Received	1 418	1 397
Value of Purchase Orders Received	$ 476 512	$ 632 674
Cash Disbursements		
Engineering	$1 683 003	$2 221 381
General	4 295 681	5 104 310
Total	$5 978 684	$7 325 691
Material and Freight	$2 370 425	$3 090 934
Lump Sum and Unit Price Subcontracts	17 246	818
CPFF Subcontracts		
Labor	168 854	105 372
Others	34 519	98 953
Payrolls (Net)	2 483 573	2 859 128
Payroll Taxes	484 163	507 908
U. S. Savings Bonds	113 288	217 234
All Other	306 616	445 344
Total	$5 978 684	$7 325 691
Cash Receipts		
Engineering	$ 55 632	$ 102 899
General	4 921 569	7 916 078
Total	$4 977 201	$8 018 977

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General Accounting Section

	December	November
Accounts Receivable		
A. E. C. Cost-type Contractors	$177 911	$168 447
Hospital	138 458	135 870
Rents	77 350	61 290
Equipment Sales to Facilities	46 288	36 294
Miscellaneous Services	20 358	15 355
Telephone	15 448	12 343
Utilities	6 093	3 185
Safety Shoes	457	536
Subtotal	482 363	433 320
Reserve for Bad Debts	41 554 CR	41 114 CR
General Ledger Balance	$440 809	$392 206
Hospital		
Out-Patient Invoices Issued	1 966	2 325
Operating Revenue	$ 57 505	$ 66 525
Houses		
New Leases	208	287
Lease Modifications	15	18
Lease Cancellations	146	203
Total Active Leases	5 966	5 904
Operating Revenue:		
Basic Rent	$213 002	$209 700
Electricity	50 957	50 549
Water	8 507	8 404
Total	$272 466	$268 653
Dormitories		
New Assignments	90	73
Removals	86	80
Total Occupancy	1 082	1 078
Operating Revenue	$ 15 055	$ 15 166
Facilities		
Total Facilities	119	120
Operating Revenue	$ 52 605	$ 53 880
Telephones		
Working Telephones	5 268	5 228
Telephone Work Orders Processed	425	414
Operating Revenue	$ 22 645	$ 19 732
Other		
Invoices Issued	567	448
Operating Revenue	$ 26 539	$164 839

NOTE: Operating Revenue represents amount charged to Accounts Receivable and credited to Operating Costs.

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General Accounting Section

	December	November
Detail of Cash Receipts		
Advances from AEC	$4 489 201	$3 682 487
Rents	140 561	141 820
Hospital	50 532	62 340
Telephone	15 240	17 168
Scrap Sales	21 854	3 136
Bus Fares	9 879	10 433
Miscellaneous Accounts Receivable	16 278	8 086
Sales to AEC Cost-type Contractors	38 933	168 842
Refunds from Vendors	4 360	2 703
Employee Sales	253	575
Educational Program	46	180
Refund of Special Funds	188 320	3 916 281
All Other	1 744	5 726
Total	$4 977 201	$8 018 977
Number of Checks Written		
Engineering	980	1 081
General	1 516	1 509
Total	2 496	2 590
Bank Balances At End Of Month		
Chemical Bank & Trust Company - New York		
Contract Account	$ 707 563	$1 026 216
Seattle First National Bank - Richland		
Contract Account	1 507 074	2 220 760
U. S. Savings Bond Account	157 869	243 601
Salary Account No. 1	20 000	20 000
Salary Account No. 2	30 000	30 000
Travel Advance Account	60 826	51 305
Seattle First National Bank - Seattle		
Escrow Account	31 685	31 685
National Bank of Commerce - Richland		
Contract Account	819 673	788 822
Total	$3 334 690	$4 412 389
Travel Advances and Expense Accounts		
Cash Advance balance at end of month (1)	$ 25 802	$ 29 271
Cash Advance balance outstanding over one month (1)	4 955	380
Traveling and Living Expenses - All Departments		
Paid Employees	28 997	34 953
Billed to Government	27 753	33 185
Balance in Variation Account at end of month	16 390 DR	15 146 DR

(1) General Accounting Only.

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Uncollectible Accounts - As of 12-31-51

	Number	Amount
Accounts Forwarded to Collection Agencies	324	$36 547
Accounts Returned as Uncollectible	77	12 135
Collections	105*	4 550
Balance at Collection Agencies	169	$19 862

* Includes 78 accounts collected in full and 27 accounts partially collected.

	December	Total to Date
Scrap Sales		
Number of Sales	13	436
Revenue (excluding Sales Tax):		
Scrap Sales	$ 20 300	$ 407 084
Tract House Sales		
Revenue to AEC	-0-	33 449
Revenue to GE	-0-	14 498
Total	$ 20 300	$ 455 031

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General Accounting Section

ACCOUNTS PAYABLE

As of September 30, 1951 prior to the consolidation of Accounts Payable work of the Community, General, and Manufacturing Accounting Divisions, the number of personnel in these divisions totaled 30. As of December 31, after three months operating experience as a consolidated group, the number of personnel has been reduced to 25. This reduction in personnel of 17% was effected by combining certain functions of other Sections with those which were already established in the General Accounting Section.

Volume of work during December decreased slightly in comparison with that of November; 2539 A.P.V.'s amounting to $1,739,148 were booked and 1288 freight bills amounting to $328,778 were processed. Purchase Orders plus alterations received during the month numbered 1567 and amounted to $476,511.

Accounts Payable balance at the end of the month was $240,907 and represented almost entirely current vouchers which are not yet due for payment. Work is on a current basis as there are only four vouchers on hand which were paid prior to 90 days ago and which have not been fully documented for final A.E.C. approval.

ACCOUNTS RECEIVABLE

Effective December 1, 1951, all accounts receivable work handled by Community, Manufacturing, Medical and General Accounting was consolidated and that work is now handled in a newly established sub-unit in the General Accounting Section. The supervision of this new sub-unit is responsible for all Nucleonics Division accounts receivable work except that in connection with the Construction Camp, which is currently handled by the Engineering Accounting Section. This work comprises:

Rental charges applied to all income producing real estate.

Rental charges applied to Richland commercial facilities.

Charges for telephone service to houses and commercial facilities.

Services rendered tenants and facilities covering damages, repairs, replacements, etc.

Medical services rendered by Kadlec Hospital.

Transfer of material and equipment to, or for services performed for other A.E.C. cost-type contractors.

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General Accounting Section

BUDGETS

During the forepart of the month work was completed on the FY 1952 midyear budget review.

The balance of the month was devoted to making certain revisions in department costs, as requested by department managers and the Appropriations and Budget Committee in their review of the budget, and in detailing section and unit costs by quarters so that respective section heads could be advised as to their specific budget.

COST

Cost reports for Utilities and General Services Department and Staff Departments (excluding Medical) for the month of November were issued on December 19, 1952.

Summaries of Operating Costs for Nucleonics Division including Product Cost and detailed summaries of Protection of Plant & Personnel and General & Administrative Expenses were issued on December 18, 1952. Supplementing these reports, a letter was prepared for the signature of the Manager-Finance addressed to the General Manager outlining Product Cost for November segregated by processes and products and by element of cost, and affording a comparison to similar costs incurred in the previous month with a brief explanation of the major variances incurred.

As in previous months, letters were issued to the Manager-Finance, the Manager, Utilities and General Services and the Director, Radiological Sciences detailing Protection of Plant & Personnel and General & Administrative Expenses allocated to Product Cost, and explaining major variances from similar allocations made in the previous month.

Considerable work was done in preparing cost estimates for future months and schedules were submitted detailing cost "bogeys" for the months of December through April, segregated by processes, products and elements of cost including both total and unit cost estimates.

Work by Cost in connection with the mid-year budget review was completed during December. Based on the revised budget totals as approved by the A and B Committee, estimates were prepared by quarter of total Product Cost and unit costs for Plutonium only.

GENERAL ACCOUNTS

The final refund from Schenectady amounting to $188,320 was received this month representing the excess of funds provided over audited actual administrative overhead costs for the year 1950. In September, 1951, a partial refund of $1,400,000 was received.

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GENERAL ACCOUNTS (CONTINUED)

Advances from the Atomic Energy Commission at December 31, 1951, amounted to $4,000,000, representing a decrease of $1,000,000 from the amount at the beginning of the month. The current balance of $4,000,000 in the advance account has been applied in the following manner:

Cash in Bank - Contract Accounts	$3 034 310
Cash in Bank - Salary Accounts	50 000
Cash in Transit	490 690
Advances to Subcontractors	300 000
Travel Advance Funds	125 000
	$4 000 000

Consolidated trial balance was issued on December 14, 1951, for the month of November, and Nucleonics Division and Nucleonics Project financial statements were issued on December 17 and December 19 respectively.

Work in connection with revising and improving financial reports continued this month, and changes in the Inventories Report and Construction Work in Progress Report were made.

One person spent full time reviewing and analyzing balances in general ledger accounts. As a result of this review, certain accounts which could be eliminated were closed, others were combined and in certain instances old balances were closed out.

Number of travel expense reports decreased from last month by approximately 20% (from 166 to 133). Current month charges to the Travel and Living Expense Variation account, including Engineering Department, totaled $1 244, a decrease of $523 from November. These charges represented entertainment expense of $703 and the excess of amount reimbursed employees over amount billed to the Atomic Energy Commission of $541.

INTERNAL AUDIT UNIT

An audit was begun of the procedure and routines followed by Payroll Unit in preparing reconciliations of the Weekly Payroll Bank Account, including the confirmation of outstanding pay checks issued to employees. Purposes of this audit are to determine the adequacy of the procedure and routines and to test the accuracy of the reconciliations prepared by Payroll Unit.

During the month, an analysis was undertaken of telephone calls made from official telephones over leased lines to Pasco and Kennewick for a period of one week. This analysis will determine

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INTERNAL AUDIT UNIT (CONTINUED)

whether leased telephone lines are being used for personal calls. Based on the results of this analysis, recommendations will be offered to effect any additional control over calls that may be deemed necessary.

A number of studies and surveys were completed which included the following:

1. General Accounts personnel were assisted in devising the form of a monthly inventory report which will replace several separate monthly inventory reports issued by Nucleonics Division.

2. A report was issued concerning routines followed at General Electric's Ontario Works and Oakland Works in procuring and controlling materials and supplies.

3. Accounting procedures were studied and defined, relative to unused stainless steel shipped to Hanford Works by vendors upon completion of fabrication orders.

4. A report was prepared covering the clerical routines followed by Stores Unit personnel in maintaining stock records for spare parts and general maintenance inventories.

5. A study was made of plans formulated by Stores Unit to maintain a storekeeper in the Hanford High School Gymnasium for the purpose of controlling and issuing engineered items procured by Project Engineering Unit.

6. At the request of Engineering Accounting Section, cost investigations were made to determine the propriety of charges assessed Atkinson and Jones Construction Company for the movement of railroad cars over the Hanford Works Railroad and for the repair of office machines by the Office Services Unit.

Recently, written comments were received from department managers relative to recommendations made as a result of an audit, and related studies, of plant timekeeping practices. These comments were summarized, together with statements concerning action being taken, or proposed to be taken, with respect to the timekeeping recommendations.

As a result of an internal audit of controls over personal-type property, Procedure Analysis personnel of Office Services Unit have begun a study of the procedure and have consulted with Internal Audit Unit personnel concerning the problems involved and the feasibility of integrating departmental control of personal-type property with tool crib operations.

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General Accounting Section

INTERNAL AUDIT UNIT (CONTINUED)

Work was continued on several audits which were in process throughout the month and, in addition, programs for several future audits were completed.

PLANT ACCOUNTING

The account Production Facilities was reviewed this month and, based on information received from Radiological Sciences Department and Technical Section, items designated as Research Facilities valued at $1,585,300 were transferred from the Production Facilities account to the Research Facilities account. An increase of $4,000 in monthly reserve accruals for Research Facilities will result from this transfer.

Field inventory of plant assets continued during the month. A recheck of the 300 Area Billet and Rod Fabrication Equipment disclosed that equipment valued at approximately $255,000 should be transferred to the account Plant and Equipment Held For Future Use. Plant Accounting records are being adjusted to reflect this change.

All work orders issued are continuing to be audited for correct coding as to investment or expense accounts.

A man was assigned from Plant Accounting to expedite and/or assist other departments in the issuance of project completion and unitization reports covering completed projects held in the account Unclassified Property.

The account Pipe Lines - Outdoor was completely closed out during the month. Equipment held in this account consisted mainly of piping and valves and was transferred to the related systems, such as water systems, steam systems, etc. Total balance transferred from this account was approximately $25,000,000.

1225031

General Accounting Section

PAYROLLS

During the month of December there were 163 additions to the payroll including 22 employees reengaged with continuous service and one transfer from another division of the Company. Removals from the payroll during the month totaled 108 which includes 6 leaves of absence and one transfer to another division of the Company. These additions and removals resulted in a net increase of 55 employees during the month.

Department Managers were furnished with lists showing the names of employees and the number of days of 1951 vacation which had not been taken as of November 30, 1951.

Vacation Notice Cards submitted to Payroll indicate that 268 weekly paid employees were scheduled to begin their 1951 vacations in December. Department Managers approved deferment of one week of the 1951 vacation to 1952 for 19 weekly paid and 39 monthly paid employees. To date, approval has been given to deferment of 1951 vacations to 1952 for 336 weekly paid employees and 270 monthly paid employees, or a total of 606.

Vacation request cards for the year 1952 for weekly paid employees were prepared and distributed to the Departments during the month.

During December payment of Military Duty Allowance equivalent to one month's pay was made to one employee who had entered military service. To date, 73 employees have been paid Military Duty Allowances amounting to $23 678.

Due to transfer or reclassification of employees in December, three preferential rates of weekly paid employees were eliminated. There were approximately 900 employees on preferential rates at December 31, 1951.

Payroll deductions for subscriptions to the 1951 Community Chest amounted to $2 010 in December.

Payroll deductions covering cost of safety shoes were authorized by 162 employees in December. At December 31, 1951, there were 86 outstanding accounts.

Total number of Payroll Deduction Authorizations in effect for check-off of union dues for members of all unions was 1 268 at December 31, 1951, which is 61 more than at the end of November.

Under the General Electric Pension Plan, 69 employees who became eligible for participation in December were canvassed for enrollment in the Plan. Of these, 49 employees enrolled in the Plan, 18 employees elected not to participate, and 2 employees had not replied at the end of the month.

In December the periodic recanvass was made of 413 eligible employees who are not participating in the G. E. Pension Plan. A tabulation of the result of this recanvass will be made in January, 1952.

A total of 713 claims for Weekly Sickness and Accident Benefits and Hospital Benefits under the Insurance Plan were forwarded to Metropolitan Life Insurance Company during December. These claims may be segregated as follows:

Hospital Benefits			
Kadlec Hospital	446		
Other Hospitals	123		569
Weekly Sickness and Accident Benefits			144
Total Number of Claims			713

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1225032

General Accounting Section

PAYROLLS (Continued)

The Metropolitan Life Insurance Company forwarded 1 183 checks to us in December in the amount of $70 696 covering benefits on 938 claims. These checks were forwarded to employees or to hospitals and surgeons, as authorized by the employees.

During the period December 1, 1950, effective date of the new Insurance Plan, to December 31, 1951, benefits have been paid to Nucleonics Division employees under the Health Insurance portion of the Plan amounting to a total of $657 488, and a total of $120 000 has been paid to beneficiaries of deceased employees under the Life Insurance portion of the Plan.

At December 31, 1951 there were 3 557 employees participating in the G. E. Savings Plans, which is an increase of 793 over the number of participants at December 31, 1950.

Tuesday, Christmas Day, December 25, 1951, was an observed holiday at Hanford Works. Weekly salary checks covering the week ending December 23, 1951 for employees in the outer areas were delivered to patrolmen at the area gate houses on Thursday, December 27, 1951 between the hours of 8:00 p.m. and 11:00 p.m.. There was no change in distribution of salary checks to employees in the 700, 1100, 3000 Areas, and Pasco. Checks for these employees were distributed to Department representatives on Friday, December 28, 1951.

A total of 436 time cards were received late in Payroll during the month. This large number of late time cards was due to the fact that the Departments did not, in all cases, submit time cards for the weeks ending December 23, 1951 and December 30, 1951 in accordance with the schedule contained in Office Letter No. 138.

The Company was served with four garnishments during December involving Hanford Works employees. Three of these garnishments were released without payment to the court. Three garnishments were pending at December 31, 1951 and includes two from the previous month.

At the request of Departments, approximately 500 salary checks were held in Payroll during December for distribution direct to employees whose days of rest occurred on Thursday and/or Friday. Approximately 75 salary checks were delivered to a representative of Employee Services Unit of the Employee and Public Relations Department for delivery to employees absent due to illness.

As of December 31, 1951, approximately 98% of the Employees Withholding Exemption Certificates, Form W-4, which were distributed to employees through supervision, had been returned to Payroll. The Departments are being followed for return of the certificates still outstanding.

In addition to year-end and routine payroll work, approximately 143 000 items were addressographed for other departments in December. This is an increase of 40 000 over the number addressographed for other Departments in December, 1950.

Calculations were completed and retroactive payments made to 702 employees in the amount of $89 752, covering construction work performed during the period from September 1, 1946 to September 30, 1951.

1225033

General Accounting Section

PAYROLLS (Continued)

A list of all exempt monthly paid employees was prepared for the Salary Administrator. The list indicated for each employee the job classification, area, non-area location, salary plan, and the employee's classification under the Fair Labor Standards Act of 1938.

Beginning with the month of December, two Platoon Firemen are being paid on a semi-monthly basis. Salary checks for two Platoon Firemen were issued on December 14, 1951 and December 31, 1951.

Bank reconciliations completed in December were as follows:

Weekly Salary through #275, week ended December 2, 1951.
Weekly Salary Vacation through #275, week ended December 2, 1951.
Bond Account - November, 1951.
Monthly Payroll #63, November, 1951.

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1225034

MANUFACTURING ACCOUNTING
December, 1951

BUDGETS

Much work was done during the month on necessary revisions to the budget submitted in November.

Preliminary work has been started on the Operating Budget for FY 1954 and revision for FY 1953.

A review of jobs and work load in the Budget Group has resulted in assignment of responsibility according to the Section set-up in the Manufacturing Department organization. This conforms with the sectional responsibility arrangements made at the working level in the Reports Group.

SPECIAL REQUESTS

A review of activity discloses that during the first six months of FY 1952 a total of $157,000 was billed. Direct billing to off plant customers on the Special Irradiations program amounted to $119,000. Transfers to Hanford AEC in connection with other Special Requests were made in the amount of $38,000. Through the mutual efforts of Manufacturing Accounting and Technical in the 300 Area, new type forms were designed which should be of considerable help in making estimates in the future.

ANALYSIS AND REPORTS

Work was started on a Unit Cost Report recommended by the Separations Section which will be reviewed with them in January. This report shows great detail on the unit costs of all components. Considerable work was done in compiling detail of costs fiscal year to date in connection with compiling historical data which will be utilized by the Budget Group in preparing the Budget for FY 1954 and Revision for FY 1953.

At the monthly meeting of this group, detail of compiling IBM reports was reviewed and explained by the Supervisor of the Statistical Group. This sort of review has been found of great benefit to the new employees, as well as a refresher for the older employees.

WORK ORDER CONTROL

Revision of Work Order Authorization lists were submitted to department managers for approval in December. Nearly all have been returned to Manufacturing Accounting. It is anticipated that this can be completed in January.

The routine for issuing special reports of overruns on all Work Orders is being investigated. Arrangements have been made for IBM to furnish a run each month showing the comparison of actual vs. estimated cost by uncompleted Work Order. To date we have not been requested to furnish this information but want to be prepared to render this service.

Contact between field and Work Order Control is still progressing on reducing the balance of Unmatched Detail. Much further improvement is necessary and it is being followed closely.

1.

ORGANIZATION AND PERSONNEL

Beginning of Month	62
Acquisitions	1
Transfers Out	2
End of Month	61
December Forecast	62

Terminations, one Steno-typist to accompany husband returning to college and one General Clerk due to pregnancy (temporarily employed to assist with Debaset). The acquisition was a Steno-typist to fill the job left vacant by the termination.

PRODUCTION AND INVENTORY STATEMENTS

Preliminary inventory and Manufacturing statements for FY 1951, prepared in accordance with the tentative statement of policy on production cost accounting principles prepared by Lindsley H. Noble, was completed after more than 2 months work in reconciling and redistributing quantities as reported on formal accountability statements.

Accountability has cooperated fully and has agreed to certain changes in their statements which will make it easier to identify the required data. The statement for the quarter ending September 30, 1951 was substantially completed with some changes from the previous statement and is now ready for submission to the Commission. There are still some differences of opinion between the Commission and Manufacturing Accounting as to the application of some of the principles. These are gradually being reconciled and we expect that Hanford Operations Office and Manufacturing Accounting will shortly be in complete agreement.

We have begun work on statements for the quarter ended December 31, 1951 and expect to issue monthly statements thereafter. Classification and distribution of these statements is a problem which has not been completely resolved.

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122503b

ENGINEERING ACCOUNTING SECTION
MONTHLY REPORT FOR DECEMBER, 1951

At the close of business in December, $1,303,074 had been liquidated from the account Work In Process - Fabrication Vendors and charged to project cost on C-187-D and E. The open commitment balance at the close of the month will represent the present purchase order price of items not yet paid or received plus claims received from Crane Company and Southwest Welding in the respective amounts, determined as applying to this project, $180,000 and $127,327.

A very substantial reduction of the account Work in Process - Fabrication Vendors will be realized during the ensuing month as regards project TBP.

It is expected that final disposition of the bulk steel accounts approximating $200,000 will be accomplished during January with a resulting credit to this inventory account and a charge to the projects for which the material was originally procured.

There were 1351 vouchers processed by accounts payable during the period totalling $1,214,680 as compared to November volume of 1620 for a total of $2,057,848 again reflecting a sharp drop in dollar volume.

Listed below is a brief summary of disbursements during December:

Material and Freight	$ 1 464 696
CPFF Labor	173 898
CPFF Other	29 475
Miscellaneous	13 488
Lump Sum Subcontracts	1 446
	$ 1 683 003

Audit functions performed for the Atomic Energy Commission follow:

Atkinson-Jones Labor	$ 4 030 295
Atkinson-Jones Material, Services	641 284
Atkinson-Jones Travel	1 376
Atkinson-Jones Fees	41 311
Lump Sum Partial Estimates	745 341
	$ 5 459 607

Financial Closing Statements were issued on five projects during the month.

The following is a detail of cash advances for the month of December as compared with November, 1951.

	DECEMBER		NOVEMBER	
	No. of Accts.	Amount	No. of Accts.	Amount
Beginning Balance	113	$29 279	101	$27 555
Cash advances made		10 224		19 044
Cash receipts & expense reports processed		17 521 Cr.		17 366 Cr.
Transferred Accounts				46
Balance at end of month	76	$21 982	113	$29 279
Travel expenses billed to AEC during December amounted to		9 326		
Actual Amount paid to employees		9 888		
Charges to Travel & Living Variation Account		562		

Of the above balance of $21 982, accounts over 30 days old amounted to $9 744.

SUBCONTRACTOR PAYROLL STATISTICS

Payrolls	December	November
Average number of employees reported by CPFF Subcontractors (including Service Contract)	7 064	7 055
CPFF Construction Subcontractor Payrolls (including Service Contract)	$4 251 895-a)	$3 102 956-b)
CPFF Architect Engineer Payrolls	166 491	100 998
Total CPFF Payrolls	$4 418 386	$3 203 954
Average per week (excluding Architect Engineer Payrolls)	$ 850 379	$ 775 739
Average weekly earnings	120.38	109.95

(a - Five week period.
(b - Four week period.

Forces

The number of workers employed on projects in December as compared with a similar date in November is shown below:

		December 20	November 21
Atkinson-Jones			
C-187-D	Redox	14	13
C-361	Metal Conversion Facilities	5	20
C-362	T B P	1 648	1 633
C-413	Expansion of 234-5 Capacity	116	149
C-431	(Production Facility	3 302	3 425
	(101 Area	254	263
	Minor Construction	724	739
	Total Direct	6 063	6 242
Atkinson-Jones Indirect		600	559
Minor Construction Indirect		16	19
General Electric Design and Construction		880	876
	Total number of workers	7 559	7 696

Lump Sum and Unit Price Subcontractor forces are not included in this report.

Personnel of the Engineering Accounting Section decreased from 98 at the end of November to 96 at the end of December. This decrease resulted from three employees transferred in, one employee reactivated, five terminations and one employee transferred to another Department.

COMMUNITY REAL ESTATE AND SERVICES
ACCOUNTING SECTION
MONTHLY REPORT FOR DECEMBER, 1951

ORGANIZATION

Employees Beginning of Month	25	Exempt	4	Male	5
Transfers In	3	Non-exempt	15	Female	14
Transfers Out	9		19		19
New Hires	0				
Terminations	0				
Total End of Month	19				

REPORTS

The November Operating Report was issued December 17, 1951. The Expenditures on Appropriations was issued on the same date.

BUDGET

The detailed quarterly breakdown of the FY 1952 Mid-year Budget Review has been completed in scroll.

WORK ORDERS

	October	November	December
Active Routine	254	238	223
Active Normal	1,275	1,798	1,056
	1,529	2,036	1,279
W. O. Received	1,343	997	1,032
W. O. Completed	1,810	490	1,789
	+ 467	- 507	+ 757

SERVICE ORDER

Service Order costing was discontinued December 1, 1951.

ACTIVE SUBCONTRACTS

Subcontracts-assigned to AEC-Incomplete

Subcontractor	Sub. Cont. No.	Amount Awarded	Booked for Payment This Month	Cost To Date
Edmund P. Erwin	G-334	$ 16,775.00	$ -0-	$ 15,200.00
D & H Paving Company	G-390	224,472.95	76,512.94	234,867.26
Weston Plumbing Company	G-405	9,226.00	9,226.00	9,226.00
Seattle Chain Link Fence	G-410	5,088.00	966.90	5,088.00
		$255,561.95	$86,705.84	$264,381.26

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PLANT SECURITY AND SERVICES SECTION

MONTHLY REPORT - DECEMBER 1951

SUMMARY

There were no major injuries in December. The year was completed with a total of five major injuries as compared with nine for the year 1950. The frequency rate was slightly less than half of the 1950 rate because of the substantial increase in exposure hours in 1951. This performance is the best ever achieved at Hanford Works.

On December 12, 1951, the "first" award of the No-Accident Safety Award Plan was achieved. This is the third time this award has been won at Hanford Works, and the second time under General Electric operation.

There were ten fires in the industrial areas during the month with losses totaling $8,450. A fire in the 120 Building of the P-11 Project accounted for $7,170 of the total.

There was a substantial increase in the 200-W Area laundry volume. Much of this is attributed to the practice of employees wearing two or more uniforms at one time when engaged in outdoor work during very cold weather.

Mail volume was up more than 10% in December due primarily to the Christmas season.

Procedures Analysis activities resulted in a savings of $1,495, of which $929 is annually recurring. Annual savings resulting from recommendations and studies made by this group since January 1, 1951 amount to approximately $285,594. Additional savings may be expected from the recommendation concerning consolidation of tabulating equipment and will be estimated at a future date.

New type badge racks have been placed in 100-B, 100-D, 100-F, 200-E, 200-E Construction, 200-W, 224-U and 202-S badge houses. The new system has resulted in a great improvement over the former one in conservation of space, patrol manpower, and speeding up entrance of employees into the area during rush periods.

The Security Field Inspection group has started contacting representatives of interested departments in preparation for assembling a comprehensive classification guide. This guide will be distributed to all units concerned with the problem of document classification.

Arrangements are being made by the Army to test fire all anti-aircraft guns in the outer area within the near future. An official notification of this program will be received from the Atomic Energy Commission.

1225041

PLANT SECURITY AND SERVICES SECTION

MONTHLY REPORT - DECEMBER 1951

ORGANIZATION AND PERSONNEL:

Number of employees on payroll:

	Beginning of Month	End of Month	Increase	Decrease
Staff	6	6		
Patrol and Security	660	661	1 (a)	
Safety and Fire Protection	150	151	1 (b)	
Office Services (Building and Laundry Service, Clerical Services, Records Control and Procedures Analysis)	303	308	5 (c)	
TOTALS	1,119	1,126	7	

NET INCREASE: 7

(a) - Patrol and Security

7 - New Hires
2 - Reactivated
2 - Transferred to other Departments
2 - Deactivated
4 - Terminations

(b) - Safety & Fire Protection

3 - New Hires
1 - Deactivated
1 - Termination

(c) - Building and Laundry Service

6 - New Hires
2 - Reactivated
1 - Transferred from another Department
1 - Transferred to another Department
2 - Deactivated
1 - Termination

Clerical Services

5 - New Hires
3 - Transferred from another Department
5 - Transferred to other Departments
3 - Terminations

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1225042

Plant Security and Services Section

SAFETY AND FIRE PROTECTION

Injury Statistics

	November	December	Year To Date	Comparative Period - 1950
Major Injuries	0	0	5	9
Sub-Major Injuries	1	2	20	26
Minor Injuries	336	348	3,792	3,680
Exposure Hours	1,524,587	1,488,536	17,382,567	15,125,954
Major Injury Frequency Rate	0.0	0.0	0.29	0.60
Major Injury Severity Rate	0.0	0.0	0.027	0.014
Penalty Days	0	0	450	0
Actual days Lost	0	0	56	215
Minor Injury F/R	2.20	2.34	2.18	2.43
Estimated Medical Treatment Time Required	1,352 hrs.	1,392 hrs.	15,765 hrs.	

Industrial Fires

Department	Area	No. Fires	Cause	Loss
Utilities & Gen. Serv.	Outer	1	Current Leakage	$ 600.00
Utilities & Gen. Serv.	101	1	Battery Short	None
Technical	Outer	1	Spontaneous Ignition	7170.00
Utilities & Gen. Serv.	Outer	1	Gasoline Leakage	25.00
Technical	300	1	Backfiring of burner	5.00
Technical	200-W	1	Short Circuit	100.00
Radiological Sciences	200-W	1	Electric arc	None
Separations	200-W	1	Heat from light bulb	375.00
Separations	200-W	1	Hot slag from welding	15.00
Reactor	100-F	1	Hot sparks	160.00
TOTAL FIRES		10	TOTAL LOSS	$8450.00

Activities

The safety book match program was placed in effect and distribution will continue on a monthly basis throughout 1952.

On December 28, the 200-E Area completed three consecutive years without a lost time injury, making a total of six injury free years since startup. The 100-D Area completed the fourth year on December 4 and 100-F the second consecutive year on December 20.

A Safety Program Committee of the Separations Section has been formed with a publicity sub-committee in the 200 Areas. While this group has been functioning only a short time, it is evident that is activity in accident prevention is producing some excellent results.

1225043

Plant Security and Services Section

On December 12, the first award was attained under the No-Accident Safety Award Plan. This is the second time this award has been won since the company assumed operational responsibility.

During 1951 the plant frequency reached an all time new record. Over 17,380,000 exposure hours were accumulated with only five industrial lost time injuries reported. The frequency rate for 1951 is 0.286.

Notable improvement in the method of handling injury and accident investigations has been observed. It has resulted in the elimination of one committee, the Accident Investigating Committee, which consisted of five to six members.

Two major fires occurred during the month. One was a pole fire on the 230 KV power line and the other in the 120 Building of the P-11 Project. Charges for the replacement of the pole structure were over $3,000. The work was done on an emergency basis. The value of the structure before the fire was estimated to be $600. The $600 was used as the fire loss figure. The AEC Safety & Fire Protection office is carrying the higher figure as the fire loss. Clarification of this matter is needed.

The fire loss in the 120 Building was $7,170. This was the first major fire in a highly contaminated area. Procedures for the area were satisfactorily carried out.

Fire Protection Surveys were completed in Buildings 222-T, 200-W Area, and 1719-D.

Additional tests were conducted on the Automatic Dry Chemical fire extinguisher of our own making. The results were very satisfactory.

Twelve new trash wagons were ordered for the 300 Area. Their use will improve the trash disposal in this Area.

The sprinkler system in the paint spray booth in 222-S Building was given its acceptance test and operated satisfactorily.

The new high tank was put into service at Riverland Yard. Some trouble was experienced from surges on the water lines tripping the sprinkler system in the Round House. This condition has been corrected.

OFFICE SERVICES

	November	December
Plant Laundry (200-W)		
Pounds Delivered	174,616	197,806
Pounds Rewash	31,381	40,252
Total Dry Weight	205,997	238,058

1225044

Plant Security and Services Section

Richland Laundry (700 Area)	November	December
Flatwork - Pounds	73,736	61,515
Rough Dry - Pounds	30,987	32,672
Finished - Pounds	2,359	2,436
Estimated Pieces	140,277	126,576
Total Dry Weight - Lbs.	107,082	96,623
Monitoring Section (200-W Laundry)		
Poppy Check - Pieces	123,155	149,730
Scaler Check - Pieces	133,655	162,330
Total Pieces	256,810	312,060

Clerical Services

New pricing schedules are to be used starting January 2 in Printing, Duplicating and Office Equipment Repair as a result of a mutual agreement arrived at in a meeting with Accounting personnel. These schedules will be based on standard commercial rates used throughout the Printing and Equipment Repair industry.

Central Mail

Arrangements were made to handle the distribution of 1952 telephone directories during the latter part of this month. New calendars, log books and pocket notebooks also were distributed, along with a heavy volume of mail due to the Christmas season. Total mail, store orders, and teletypes for the month showed an increase over the previous month. This additional work was handled efficiently despite the large number of changes in addresses caused by extensive moves.

Types and Pieces of Mail Handled	November	December
Internal	829,016	922,946
Postal	81,410	74,419
Registered	1,279	1,261
Insured	374	347
Special Delivery	221	269
Total Mail Handled	912,300	999,542
Total Postage Used	$2,335.77	$2,117.11
Total Teletypes Handled	6,220	6,850
Total Store Orders Handled	419	456

Plant Security and Services Section

Office Equipment

First shipments of office machines procured for FY 1952 arrived during the month, including Marchant and Frieden calculators, Royal and Remington-Rand typewriters. These machines are being checked by vendor servicemen and placed in use in accordance with budgeted requirements. The first shipment of file cabinets from the Federal Bureau of Supply, replacing defective cabinets originally furnished, were also received.

A form letter was issued to all Department Heads requesting their cooperation in conducting a survey of office machines currently in use by each Department so that Office Equipment records will be up to date.

An Appropriation Request covering additional office equipment requirements is being prepared for submission to the A & B Committee.

Machine Repair	November	December
Office Machines repaired in shop	251	197
Office Machine service calls	500	640
Total Machines Serviced	751	837

Furniture and Moves		
Office Moves	97	69
Pickups for Records Center	72	71
Store Orders Filled	237	284
Pieces of furniture delivered	389	434
Property Transfers completed	26	21

Central Printing

The volume of printing continues to increase each succeeding month. Effective January 1, 1952, a new control system is being placed in effect which will indicate exact production trends in terms of units of copy, rather than number of orders completed.

A vacuum printing frame was received and installed during December and the way has been cleared for making building alterations to accomodate our new process camera.

Multilith Orders	November	December
Received	465	450
Completed	438	449
On Hand	149	139
Cancelled	2	11

Stenographic Services

An organized program has been formulated to provide new employees with minimum instructions in General Electric Company procedures and practices. Each new employee is also given an opportunity to work with the various types of office machines normally used for stenographic services.

1225046

Plant Security and Services Section

Stenographic Services (Con't.)

A large job was performed for Purchasing and Stores Section consisting of 237 pages of excess material history.

Breakdown of Hours	November	December
Machine Transcription	6:00	17:00
Letters	45:30	48:45
Rough Drafts	123:00	69:00
Stencils, Dittos, Duplimats	435:30	538:00
Miscellaneous	524:00	792:30
Meeting Time	21:30	5:00
Training	571:30	212:00
Holiday and Vacation	144:00	136:00
Unassigned Time	32:00	22:45
Total	1903:00	1841:00
Employees Loaned to Other Departments	1028:30	842:15
Total Hours Available	2931:30	2683:15

Area Mail and Duplicating Services

The first shipment of Offset Presses, consisting of seven Model 80 Multigraphs, was received the latter part of the month. These machines are being checked by the vendor prior to being placed in service. Training of personnel is progressing nicely and arrangements are rapidly nearing completion for moving equipment to the outer areas.

Stencil and Fluid Duplicating	November	December
Orders received	839	821
Orders completed	834	813
Orders on hand	7	15
Number of Stencils	1,816	1,738
Number of Copies	269,670	280,582
Number of Dittos	1,499	1,918
Number of Copies	67,894	70,479
Collated Orders	54	70
Collated Copies	114,835	81,242

Records Control

Quantity of records received, processed and stored:

Community Real Estate & Services Department	10	Standard	Storage	Cartons
Employee & Public Relations Department	2	"	"	"
Engineering Department	58	"	"	"
Financial Department	98	"	"	"
General Administrative Department	2	"	"	"
Legal Department	1	"	"	"
Manufacturing Department	38	"	"	"
Medical Department	13	"	"	"

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Plant Security and Services Section

Radiological Sciences Department	13	Standard	Storage	Cartons
Sub-Contractors:				
Hanley & Company	3	"	"	"
Vitro Corporation	3	"	"	"
Utilities & General Services Department	27	"	"	"
TOTAL	268	Standard	Storage	Cartons

Records service provided: 590 persons. In addition to the individual services, 18 manhours were expended providing service for the Financial Department.

Records Cartons issued: 117

Filing service provided: 51 manhours were expended filing records in with those already in storage.

Percentage of the Records Service Center vault occupied by records is 83.5% excluding Civilian Defense portion.

Uniform filing was established in 31 offices during December, and six call backs to offices were made during the month.

Procedures Analysis

	November	December
Printing orders received	445	364
Printing orders cancelled	24	20
New numbers assigned	129	77
Forms designed	75	71

A major portion of the annual savings derived from Forms Control can be contributed to the revision of the Monthly Safety Report. The annual labor and material cost of printing was $830, using seven sheets of mimeograph paper per report. By having this report reproduced on both sides of a single 8½" x 11" sheet, utilizing the offset printing process, the annual cost for labor and material is $385. Hence, a savings of $445 is realized. An additional annual savings of $129 is also included because of reduced amount of paper consumed. The total savings from this revision amounts to $574.

A procedure survey concerning roster list applications has been completed (Report P.A. 22) and recommendation for application of Linedex equipment has been made for the following groups:

Separation Section - For monthly preparation of personnel list. All of the equipment has been received and the procedure has been installed.

Employment - Seniority list previously prepared on mimeograph has been changed over to the new method with satisfactory results.

Plant Security and Services Section

Procedures Analysis (Con't.)

Security Patrol - Equipment has been received and will be put into use when the field duplicating stations are set up. The main operation will be the preparation of monthly mobilization rosters.

Parks and Recreation - To be used to establish a control of the system for booking facilities to community organizations and also for the publication of the weekly activity schedule. Linedex equipment has been ordered, but not received.

General Accounting Section - To publish "Property Record Unit Catalog" required by A.E.C. Linedex equipment order has been placed.

Other groups have shown interest in the equipment and have a genuine need for it, however, no orders have been placed. It is estimated that utilization of this equipment on these projects will result in an annual savings of approximately $6000. These savings are not included in this report as evaluation will be calculated and presented next month.

A formal request for the complete analysis of Receiving and Stores procedures (Purchasing and Stores Section) has been received via letter dated 12-20-51 from the Assistant Manager of that Section. The originator of this letter has been set up as contact for the Procedures Analysis group. Preliminary planning and scoping are in progress at the present time. Initial steps in this survey indicate that it will be the largest project undertaken by this group to date. Steps are now being taken to complete, as rapidly as possible, all pending surveys so the major portion of the analysts can be utilized in the Receiving and Stores project.

A concentrated effort will be made to complete four projects during the month of January. These projects are listed as follows:

1. Forms and Procedures Survey for Recreation and Civic Affairs Unit.
2. Forms and Procedures Survey for Public Library Section.
3. Forms and Procedures Survey - Security.
4. Termination Clearance Procedure - Employment.

Savings realized for month of December:

	One Time Savings	Annual Recurring Savings
Forms Control	$ 566	$ 929
Procedures Analysis	- - -	- - -
TOTAL	$ 566	$ 929

Total Savings for December: $1495

Accumulated Savings since January 1, 1951: $285,594.

1225049

Plant Security and Services Section

SECURITY AND PATROL

Document Report

Number of technical and scientific documents reported unaccounted for December 1, 1951:	357
Documents (technical and scientific) reported unaccounted for during December, 1951:	3
Documents (technical and scientific) reported found during December, 1951:	6
Documents (technical and scientific) declassified during December, 1951:	20
Number of technical and scientific documents unaccounted for December 31, 1951:	334
Number of non-technical documents unaccounted for December 1, 1951:	60
Documents (non-technical) reported unaccounted for during December, 1951:	3
Documents (non-technical) reported found during December, 1951:	1
Documents (non-technical) declassified during December, 1951:	1
Number of non-technical documents unaccounted for December 31, 1951:	61
Total of technical and scientific and non-technical documents unaccounted for December 31, 1951:	395

Non-Technical Document Review Board activities:

Following is a summary of the month's activities of the board completed during its one meeting:

82 documents were reviewed of which
45 were downgraded to "Restricted"
30 were declassified and
7 had classification retained.

Security Education

Two-hundred and seventy-three security meetings were held and attended by 4,388 General Electric employees.

Four items appeared in the Works NEWS concerning the subject of Security.

A representative of the Security group showed the film entitled "The Case of the Smokeless Chimney" at 18 meetings with an average attendance of about twenty employees or a total attendance of 360 employees; and the film entitled "The Man on the Left" at 35 meetings with an average attendance of twenty employees at each meeting or a total attendance of 700 employees.

1225050

Plant Security and Services Section

SECURITY & PATROL (Con't.)

Three-thousand, five hundred copies of the "A-B-C" security pamphlet with the slogan "Just What I Wanted - A Map of the Area" were distributed to offices throughout the plant on December 3.

Eight thousand copies of the "A-B-C" security pamphlet with the slogan "Oh, Just Get My Anything" were distributed to the residences on December 10.

Security Bulletin No. 63 entitled "Additional Revision to Document Classification and Storage Regulations" was issued December 18.

Four-hundred and ninety-seven employees of the General Electric Company received "Q" security orientation talks from a representative of the Security group during the month of December, 1951. The reason for this large number of security orientations during the month of December is due to the new program of presenting security orientations in the various plant areas instead of conducting all of them in Richland. This program will cause considerable savings in travel time from the areas to Richland. A considerable backlog of persons scheduled for orientation was created during the conversion to this new program. In the future, Area Patrol Captains will schedule and conduct these meetings.

There were 2,176 badge transactions made during the month of December by the Security group.

There were 2,176 badge transactions completed during the month of December.

The security education plans for January through April, 1952, have been developed to include the following:

1. Desk calendars.
2. Small sticker posters for the faces of clocks at public locations.
3. Three sets of posters and bus signs entitled:

   "Loose Talk Tells the Saboteur What to Strike"
   "Loose Talk Tells the Saboteur Where to Strike"
   "Loose Talk Tells the Saboteur When to Strike"

   Appropriate cartoons will be shown with these slogans.

4. Four sets of "A-B-C" security pamphlets will be distributed to each work place. In the interest of paper conservation, this is a change from the past policy of issuing these pamphlets to each employee.

5. Two sets of different "A-B-C" pamphlets will be mailed to the Richland residences during this four month period.

6. Beginning February 1, work will commence on the next security film entitled "Only the River". This film will depict the various methods by which loose talk can pinpoint places for the saboteur to strike.

1225051

Plant Security and Services Section

SECURITY & PATROL (Con't)

General

On November 27, 1951, three revisions to Section 15 of the Organization and Policy Guide concerning Project Security regulations were issued, entitled as follows:

15.03 "Revised Procedure - Security Clearance Requirements for Project Work - Removal from Payroll for Lack of Clearance"

15.12 "Revised Procedure - for Transmitting Classified Documents and Material"

15.13 "Revised Procedure for Sending Classified Teletypes and Telegrams"

On December 1, a new procedure involving the issuance of pencil meters was established in all of the outer areas except the 300 Area. On this date, pencil supplies were moved from the main badge houses to the exclusion area badge houses. This procedure facilitated traffic through the main badge houses.

Procedure Memorandum No. 31, Revision 2, on the 1952 Security Patrol Safety Program was issued December 5, outlining the new safety program to be utilized by Security Patrol during the year 1952. Area Shift Lieutenants will be responsible for the preparation and direction of this program which will be conducted daily at the Training School.

Machine guns formerly used on the M-8 armored cars were cleaned and treated for storage and then placed in the arsenal on December 7.

Operations Order No. I-274, Revision 2, was issued December 10 providing that a report be made immediately to the Emergency Officer of any accident, fire or incident of an unusual nature which is discovered by Patrol, also any evidence of a fire or accident which is discovered after it has occurred will be reported to the Emergency Officer immediately.

On December 10, the new type horizontal badge racks were installed in the 300 Area Main Badge House making it possible to have three lines of incoming traffic.

The horizontal badge racks were also placed in operation in the 100-B Area on December 7, 100-D on December 6, 100-F on December 11, 200-E Operations on November 30, 200-E Construction Badge House on December 18, 200-W, 224-U, on November 19 and 202-S Badge House on November 5. This new system has proven to be a great improvement over the vertical type badge rack, both in the conservation of space, patrol manpower and speeding up entrance time into the area during rush periods.

Effective December 10, a new post (Construction) was established on the No. 2 shift at Gate No. 2, 100-B Area, for the purpose of hauling rack from Riverland to 100-B Area.

On December 14, the post requirements at the P-11 Area were reduced from two men per shift to one man since all process material had been removed from the area.

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Plant Security and Services Section

SECURITY & PATROL (Con't.)

The 105-DR Badge House, 100-D Area, was placed on limited operation beginning December 17. This badge house will be open at shift change time only on all shifts.

Effective December 20, the issuance of health badges and pencils was discontinued at the P-11 Area.

On December 21, a procedure was established for the issuance of a laminated photo identification type pass to employees having only an interim "P" clearance. The order was placed for this pass on December 22, and it will be placed in use when received from the printer.

On December 30, the 105-D Shift Supervisor, 100-D Area, notified Patrol at 3:15 P.M. stating that there seemed to be a discrepancy in the Metal Storage count, and to initiate a thorough search of all personnel and vehicles leaving the area. He again called at 4:30 stating that the count was in order and the search was called off.

The training courses received during the month of December by 288 Security Patrolmen at the Training School were as follows:

Pistol	1 1/2 hours
Sub Machine Gun	1 1/2 "
Health	3/4 hour
Security	1/2 "
Accident Investigation	2 hours
Security Patrol Automotive Nomenclature	1 hour
Safety	3/4 "

Security Field Inspection Activities:

Contacts made for unaccounted for documents	31
Searches conducted for unaccounted for documents	12
Classified documents located	7
Combinations changed on file cabinets	12
Searches conducted in assisting terminating personnel to locate unaccounted for documents charged to their custody	6

On December 26, members of the Security Field Inspection group started contacting representatives of the various Manufacturing, Technical and Design and Construction groups in an effort to compile a comprehensive classification guide. This guide will then be distributed to all units concerned with the problem of document classification.

A new procedure was established in order to reduce the amount of telephone traffic between the Security Office and the Area Badge Houses. In the past, all badge authorizations were telephoned to the various badge houses, confirmed by return telephone call and a telephone log. The new procedure provides the telephoning of only those badges of persons requiring immediate entrance into a particular area. All other badge information is transcribed on telephone logs and delivered to the respective badge houses each night by the outer area cruiser car.

Plant Security and Services Section

SECURITY & PATROL (Con't.)

Arrangements have been made with the Army and the Atomic Energy Commission for the establishment of road blocks during the test firing of anti-aircraft guns in the outer area within the near future. Approximately 36 guns on the plant side of the Columbia River and 24 guns across the river will be tested. The firing on the plant side of the river will be conducted between the hours of 5:30 P.M. and 10:30 P.M. when traffic on the plant highways is at a minimum. An official notification of this program will be received from the Atomic Energy Commission.

Traffic conditions on the plant highways, particularly at shift change time, have become progressively worse due to the large amount of construction traffic from 100-C Area intermingling with the Operations traffic. In order to alleviate it satisfactorily, the Security Patrol Unit has assigned eight traffic cars, one from each major area to lead this traffic along the plant highways between 4:15 and 5:15 P.M. Leading traffic seems to be the only safe solution to this problem since serious accidents might result from utilizing the standard method of individual enforcement on the highways. This procedure has, of course, reduced the security protection potential in the areas during this period, but it has slowed traffic in most cases.

Security Patrol Activities:

Citation tickets issued	9
Warning tickets issued	2
Verbal warnings	1
Buildings and doors opened	197
Railroad gates opened	17
Master System keys issued	42
Emergency Operation gas pumps	11.7 times
Fire Escorts	12

Security Patrol Arrest Report:

Violation	Number of Violations	Cont. Cases from Nov. '51	Cases Cleared	Pending	Fined
Speeding	6	1	6	1	6
Illegal Parking	2	0	2	0	2
TOTALS	8	1	8	1	8

Classified File Cabinets Left Open:

Date	HW No.	Department	Investigation
November 6	409999	Tech. Services	No classified documents missing
8	412905	Pile Technology	" " " "
8	353088	Design	" " " "
15	360801	Analytical (Tech.)	" " " "
19	408898	Mfg., Reactor	" " " "
20	349644	Project Eng.	" " " "
24	382205	Design	" " " "
26	30124	Purchasing	" " " "

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Plant Security and Services Section

SECURITY & PATROL (Con't.)

Date	HW No.	Department	Investigation
November 27	406199	Mfg., Separations	No classified documents missing
28	360809	Design	" " " "
29	408940	Mfg., Separations	" " " "
29	331020	Design	" " " "
December 1	360848	Mfg. Instrument	" " " "
3	21342	Design	" " " "
4	408483	Pile Technology	" " " "
4	353073	Safety & Fire	" " " "
4	349651	Accounting	" " " "
5	35827	Mfg., Reactor	" " " "
8	408935	Design	" " " "
8	396256	N.R. Realty	" " " "
11	19391	Design	" " " "
12	411624	Mfg. Staff	" " " "
12	408482	Purchasing	" " " "
12	21397	Design	" " " "
12	396405	Project Eng.	" " " "
14	353082	Design	" " " "
15	398386	Design	" " " "
18	379208	Design	" " " "
19	400688	Design	" " " "
19	379453	Design	" " " "

During the month of December, 1951, nine combination lock file cabinets assigned to the Atomic Energy Commission were found open and unattended.

General Electric estimated security clearance requirements for January, 1952:

100 "FP" clearances
377 "Q" clearances

The names of 46 employees were submitted to the Atomic Energy Commission for emergency clearance processing during December, 1951.

Statistical Report of Security Patrol Activities:

	100-B	100-D	100-F	100-H	200-E	200-W	300
Pat Searches	93	93	93	40	104	143	1
Escorts	16	9	23	60	119	130	50
Ambulance Runs	3	4	4	2	3	3	1
Passes Issued:							
One day temporary	105	16	22	5	18	45	0
Travel	28	0	0	0	0	0	59
Red Tag	205	243	327	39	28	1,084	161
Telephonic	6	2	0	0	0	0	18
Supervisors' post contacts	402	443	459	373	417	1,686	854

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HANFORD WORKS
General Electric Company
Richland, Washington

REPORT OF VISITORS FOR PERIOD ENDING DECEMBER 31, 1951

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass	Areas
DESIGN AND CONSTRUCTION SECTION							
I. Visitors to this Works							
A. A. Batza General Engineering Laboratory Schenectady, New York	Consultation and installation of equipment on 432 Project	W. P. Ingalls	4-2-51	7-1-52	X		200-W 234, 235 234-5 Const
W. C. Bellows General Engineering Laboratory Schenectady, New York	Consultation and installation of equipment on 432 Project	W. P. Ingalls	9-7-51	7-1-52	X		200-W 234, 235 234-5 Const
E. P. Diehl General Engineering Laboratory Schenectady, New York	Consultation and installation of equipment on 432 Project	W. P. Ingalls	11-5-51	7-1-52	X		200-W 234, 235 234-5 Const
J. Di Pietro General Engineering Laboratory Schenectady, New York	Consultation and installation of equipment on 432 Project	W. P. Ingalls	11-12-51	12-15-51	X		200-W 234, 235 234-5 Const
H. A. Hadley Hadley Associates Burlington, Vermont	Consultation and installation of equipment on 432 Project	W. P. Ingalls	12-3-51	12-14-51	X		200-W 234, 235 234-5 Const
K. E. Gilbert General Engineering Laboratory Schenectady, New York	Consultation and installation of equipment on 432 Project	W. P. Ingalls	12-12-51	1-2-52	X		200-W 234, 235 234-5Const

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass	Areas
E. J. Hatfield General Engineering Laboratory Schenectady, New York	Consultation and installation of equipment on 432 Project	W. P. Ingalls	11-26-51	12-14-51	X		200-W 234, 235 234-5 Const
E. Long General Engineering Laboratory Schenectady, New York	Consultation and installation of equipment on 432 Project	W. P. Ingalls	6-26-51	7-1-52	X		200-W 234, 235 234-5 Const
W. W. Moles General Engineering Laboratory Schenectady, New York	Consultation and installation of equipment on 432 Project	W. P. Ingalls	10-15-51	12-15-51	X		200-W 234, 235 234-5 Const
R. N. Poole General Engineering Laboratory Schenectady, New York	Consultation and installation of equipment on 432 Project	W. P. Ingalls	10-1-51	7-1-52	X		200-W 234, 235 234-5 Const
C. P. Sherman General Engineering Laboratory Schenectady, New York	Consultation and installation of equipment on 432 Project	W. P. Ingalls	10-17-51	7-1-52	X		200-W 234, 235 234-5 Const
R. Siftar General Engineering Laboratory Schenectady, New York	Consultation and installation of equipment on 432 Project	W. P. Ingalls	10-1-51	7-1-52	X		200-W 234, 235 234-5 Const
L. D. Singleton Hadley Associates Burlington, Vermont	Consultation and installation of equipment on 432 Project	W. P. Ingalls	10-22-51	12-14-51	X		200-W 234, 235 234-5 Const
M. W. Vittum General Engineering Laboratory Schenectady, New York	Consultation and installation of equipment on 432 Project	W. P. Ingalls	10-30-51	12-14-51	X		200-W 234, 235 234-5 Const
N. H. Wood General Engineering Laboratory Schenectady, New York	Consultation and installation of equipment on 432 Project	W. P. Ingalls	10-15-51	12-14-51	X		200-W 234, 235

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass	Areas
K. E. Gilbert General Engineering Laboratory Schenectady, New York	313 Building mechanization and canning process	W. A. Blanton P. J. O'Neil H. P. Shaw E. A. Smith	12-12-51 12-14-51	12-14-51 12-21-51	X		300-313
R. W. Buntenbach Vitro Corporation of America New York, New York	Inspection and installation of Job 24 flow meters	J. C. Tourek (Vitro)	12-17-51	12-19-51	X		200-W Const 241-U Redox, 221-U 300 303
A. W. Speyers Vitro Corporation of America New York, New York	Inspection and installation of Job 24 flow meters	J. C. Tourek (Vitro)	12-17-51	12-19-51	X		200-W Const 241-U Redox, 221-U 300 303
P. M. Weiss Crane Company Chicago, Illinois	Inspect connectors furnished by his firm	J. M. Frame	12-21-51	12-21-51	X		Redox 221-U and 202-S
I. A. Young Crane Company Chicago, Illinois	Inspection of installed Crane Co. connectors	J. A. Larkin	12-10-51	12-13-51		X	200-W Cons.
II. Visits to other Installations							
F. H. Ames, Jr. to: General Engineering Lab. Schenectady, New York	Inspection of equipment under test and consult on test procedures-234-5 Bldg. Program	J. E. Brown	12-3-51	12-15-51	X		
J. W. Brands to: General Engineering Lab. Schenectady, New York	Fabrication and testing of metal line for P-10 Project and 313 Building mechanization	C. W. George E. S. Baker	12-5-51	12-6-51	X		
J. W. Brands to: Knolls Atomic Power Lab. Schenectady, New York	Fabrication and testing of metal line for P-10 Project-Hot Shops [redacted]	H. E. Scott	12-6-51	12-6-51	X		

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass	Areas
E. P. Peabody to: General Engineering Lab. Schenectady, New York	Discuss equipment being built for RDA-DC-3	D. H. Marquis M. Kronick	12-10-51	12-14-51	X		
E. P. Peabody to: General Electric Company Nela Park, Ohio	Consultation on lighting systems	E. A. Kindsey	12-14-51	12-14-51		X	
G. L. Bowman to: National Tool Company Cleveland, Ohio	Assist vendor in fabricating methods for special drills	Mr. Ecbing	12-1-51	12-5-51		X	
L. R. Pierce to: Cutler Hammer Company San Francisco, California	Review and approve design on control cabinets on C-431-B	MaAllister	12-2-51	12-6-51		X	
R. F. Klein to: Precision Spinning Co. Tacoma, Washington	Inspect horizontal rod lines and inspect gate valves and gland seals	S. Stephanis	12-4-51	12-6-51		X	
C. W. Harrison to: Puget Sound Navy Shipyard Bremerton, Washington	Consult on HS-47	S. L. Allison	12-12-51	12-14-51	X		
G. H. Hill to: General Electric Company Schenectady, New York	Drafting Sub-Development Committee Meeting	A. H. Rau	12-3-51	12-8-51		X	

RADIOLOGICAL SCIENCES DEPARTMENT

I. Visitors to this Works

A. T. Rossano, Jr. Harvard School of Public Health Cambridge, Massachusetts	Consultation on air cleaning equipment	C. C. Gamertsfelder	12-7-51	12-8-51	X		

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass	Areas
H. Sautor RCA Service Company, Inc. San Francisco, California	Service electron microscope in 108-F Building	H. A. Kornberg	12-3-51	12-7-51		X	100-F 108
II. Visits to other Installations							
P. L. Eisenacher to: Brookhaven National Lab Upton, Long Island, New York	Instrument conference	J. B. H. Cooper	12-3-51	12-5-51	X		
P. L. Eisenacher to: Knolls Atomic Power Lab. Schenectady, New York	Instrument conference	L. L. Gorman	12-6-51	12-6-51	X		
P. L. Eisenacher to: General Electric Company Schenectady, New York	Instrument conference	G. W. Dunlap	12-6-51	12-6-51	X		
H. M. Parker to: Argonne National Lab. Chicago, Illinois	Discuss radiation protection problems	J. E. Rose F. R. Shonka	12-4-51	12-7-51	X		
R. H. Whittaker to: Atomic Energy Project University of California Los Angeles, California	Inspect laboratories and discuss current investigations	T. J. Haley	12-29-51	12-29-51	X		
A. J. Stevens to: Seattle, Washington	Pick up AEC instrument kits	- -	12-11-51	12-12-51		X	
L. V. Zuerner to: Seattle, Washington	Pick up AEC instrument kits	- -	12-11-51	12-12-51		X	
M. L. Mickelson to: Denver, Colorado	Recruitment of personnel		12-3-51	12-7-51		X	

MANAGEMENT

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass	Areas
I. Visitors to this Works							
B. A. Case Management Consultation Serv. General Electric Co. Division Schenectady, New York	Discuss salaries and wage policies	G. R. Prout J. R. Rue	12-3-51	12-8-51	X		
A. R. Doas General Electric Company Lockland, Ohio	Inspect equipment and facilities	D. W. McLenegan H. A. Moulthrop	12-10-51	12-10-51	X		200-W XXX
A. R. Lee Public and Technical Information Atomic Energy Commission Arco, Idaho	Discuss educational program	D. W. McLenegan	12-11-51	12-12-51	X		
II. Visits to other Installations							
R. J. Schier to: Argonne National Laboratory Chicago, Illinois	Discuss metal fabrication	F. Foote	12-11-51	12-11-51	X		
R. J. Schier to: Knolls Atomic Power Lab. Schenectady, New York	Discuss metal fabrication and assistance to Hanford	K. H. Kingdon J. P. Howe	12-12-51	12-12-51	X		
R. J. Schier to: General Engineering Lab. Schenectady, New York	Discuss metal fabrication and assistance to Hanford	J. Marsden	12-12-51	12-12-51	X		
R. J. Schier to: Massachusetts Inst. Tech. Cambridge, Massachusetts	Discuss metal fabrication	A. Kauffman	12-13-51	12-13-51	X		
R. J. Schier to: Sylvania Electric Prod. Company Bayside, New York	Discuss metal fabrication	H. Hausner	12-14-51	12-14-51	X		

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass	Areas
MANUFACTURING DEPARTMENT							
I. Visitors to this Works							
A. E. Boas Worthington Pump & Machinery Spokane, Washington	Service equipment installed by his firm	J. F. Hoberer	11-27-51	12-8-51		X	100-F 190 100-DR 190 DR
T. D. Martin Worthington Pump & Machinery Spokane, Washington	Service equipment installed by his firm	J. F. Hoberer J. H. Black	12-3-51	1-31-52		X	100-F 190 100-DR 190 DR
C. D. Cummins Worthington Pump & Machinery Spokane, Washington	Service equipment installed by his firm	J. F. Hoberer	12-4-51	12-4-51		X	100-DR 190 DR
H. W. Long N.W. G. E. Welding Corporation Seattle, Washington	Assist in selection and procurement of welding devices in Metal Preparation Unit	J. W. Lingafelter	12-13-51	12-13-51	X		300 313
M. E. Norby International Business Machines Richland, Washington	Service IBM equipment	J. H. Warren L. T. Hagie	12-21-51	12-21-51		X	100-H 105
J. W. McCaslin Phillips Petroleum Company Arco, Idaho	Inspection of radiation facilities	P. C. Jorman M. M. Cox D. P. Schively	12-5-51	12-6-51	X		100-F 105 100-H 105
E. Fast Phillips Petroleum Company Arco, Idaho	Inspection of radiation facilities	P. C. Jorman	12-5-51	12-6-51	X		100-F 105 100-H 105
II. Visits to other Installations							
J. G. Attanas to: General Engineering Lab Schenectady, New York	Follow testing of RMB line equipment	J. E. Brown	12-3-51	12-7-51	X		

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass	Restricted Data Areas
I. M. Jacobs to: ANL-ETR Site Idaho Falls, Idaho	Install equipment requested by C. A. Hanson, KAPL	H. V. Lichtenberger	12-15-51	12-20-51	X		
TECHNICAL SECTION							
I. Visitors to this Works							
E. G. Bianco American Cyanamid Company Idaho Falls, Idaho	Survey of computing methods	A. H. Bushoy H. A. Paulson L. M. Knights	12-5-51	12-15-51	X		100-H 105 200-E 221-B 200-W 221-T, 231 Redox 300 XXX
G. A. Clarke American Cyanamid Company Idaho Falls, Idaho	Survey of computing methods	A. H. Bushoy H. A. Paulson L. M. Knights	12-5-51	12-15-51	X		100-H 105 200-E 221-B 200-W 221-T, 231 Redox 300 XXX
D. E. Crumb International Business Machines Richland, Washington	Service IBM equipment in 3707-C Instrument and 3703 Building	P. M. Thompson	12-1-51	1-1-52		X	300 XXX
C. A. Evans General Engineering Laboratory Schenectady, New York	Installation of mass spectrometer and P-10 analytical problems	R. J. Brouns	12-10-51	12-14-51	X		300 XXX 100-B 108-B
P. Goris American Cyanamid Company Idaho Falls, Idaho	Survey of computing methods	A. H. Bushoy H. A. Paulson L. M. Knights	12-5-51	12-15-51	X		100-H 105 200-E 221-B 200-W 221-T, 231 Redox 300 XXX

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Unclass Areas
R. M. Haag Knolls Atomic Power Laboratory Schenectady, New York	P-10 and Redox consultation	H.F. Zuhr R.B. Richards	12-11-51	12-15-51	X	100-B 108-B Redox 300 XXX
F. K. Houmann Knolls Atomic Power Laboratory Schenectady, New York	P-10 and Redox consultation	H.F. Zuhr R.B. Richards	12-11-51	12-15-51	X	100-B 108-B Redox 300 XXX
G. A. Huff American Cyanamid Company Idaho Falls, Idaho	Survey of computing methods	A. H. Pushoy H. A. Paulson L. M. Knights	12-5-51	12-15-51	X	100-H 105 200-E 221-B 200-W 221-T, 231 Redox 300
J. G. Hutton General Engineering Laboratory Schenectady, New York	Discussions on mass spectrometers and radiation instruments	R. J. Brouns	12-11-51	12-15-51	X	100-B 108-B 300 XXX
C. G. Kruse International Business Machines Richland, Washington	Service IBM equipment	P. M. Thompson	12-1-51	1-1-52	X	300 3707-C 3703
M. E. Norby International Business Machines Richland, Washington	Service IBM equipment	P. M. Thompson	12-1-51	1-1-52	X	300 3707-C 3703
J. C. Morrison E. I. du Pont de Nemours & Co. Wilmington, Delaware	Observe Redox head-end operation and survey of computing methods	R. E. Smith P. M. Thompson B. F. Butler	12-3-51	12-20-51	X	300 XXX Redox
G. E. McMillan E. I. du Pont de Nemours & Co. Wilmington, Delaware	Survey of computing methods	P. M. Thompson B. F. Butler	12-3-51	12-20-51	X	300 XXX
W. E. Winter E. I. du Pont de Nemours & Co. Wilmington, Delaware	Survey of computing methods	P. M. Thompson B. F. Butler	12-3-51	12-20-51	X	300 XXX

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass	Areas
A. E. Hoerl E. I. du Pont de Nemours & Co. Wilmington, Delaware	Survey of computing methods	P. M. Thompson B. F. Butler	12-3-51	12-20-51		X	300 XXX
A. F. Wells General Electric Company Schenectady, New York	Service mass spectrometer	R. J. Brouns G. J. Alkire	11-26-51	12-15-51	X		100-B 108 300 XXX
II. Visits to other Installations							
J. H. Bach to: Sylvania Electric Products Co. Bayside, New York	Metallurgical consultations	H. H. Hausner	12-13-51	12-15-51	X		
J. H. Bach to: U.S. Atomic Energy Comm. Washington, D. C.	Metallurgical consultations	R. C. Dalzell	12-17-51	12-18-51	X		
J. B. Cole to: Sylvania Electric Products Co. Bayside, New York	Metallurgical consultations	H. H. Hausner	12-13-51	12-14-51	X		
V. R. Cooper Knolls Atomic Power Laboratory Schenectady, New York	Inspect facilities and discuss Darex program	J. Marsden	12-17-51	12-19-51	X		
P. F. X. Dunigan to: Argonne National Laboratory Chicago, Illinois	Inspect laboratory construction design	J. P. Fitzpatrick R. E. Meintz J. Hood	12-3-51	12-6-51	X		
S. S. Jones to: Knolls Atomic Power Lab. Schenectady, New York	Check on heater design and special material machine	E. Brundige	12-5-51	12-12-51	X		
S. S. Jones to: General Engineering Lab. Schenectady, New York	Check on heater design and special material machine	D. J. DeMichele	12-5-51	12-12-51	X		

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass	Areas
G. E. McCullough to: Ames Laboratory Ames, Iowa	Discuss metal fabrication	F. Spedding	12-10-51	12-10-51	X		
F. B. Quinlan to: Argonne National Lab. Chicago, Illinois	Consultations on non-destructive testing techniques	H. Wahl	12-4-51	12-6-51	X		
F. B. Quinlan to: University of Illinois Urbana, Illinois	Consultations on non-destructive testing techniques	F. Seitz	12-7-51	12-7-51	X		
R. B. Richards to: Knolls Atomic Power Lab. Schenectady, New York	Inspect facilities and discuss Purex program	J. Marsden	12-17-51	12-19-51	X		
R. B. Socky to: Argonne National Lab. Chicago, Illinois	Consultations on non-destructive testing techniques	H. Wahl	12-4-51	12-6-51	X		
R. B. Socky to: University of Illinois Urbana, Illinois	Consultations on non-destructive testing techniques	F. Seitz	12-7-51	12-7-51	X		
C. G. Stevenson to: Knolls Atomic Power Lab. Schenectady, New York	Indexing, abstracting and organization of project metallurgical literature	P. B. Dearnley	12-2-51	12-8-51	X		
W. T. Kattner to: Alloghany Ludlum Watervliet, New York	Consultation on metal fabrication	Mill Supt.	12-15-51	12-15-51	X		
W. T. Kattner to: Bethlehem Steel Lackawanna, New York	Consultation on metal fabrication	Mr. Henderson	12-16-51	12-16-51	X		

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Unclass	Areas
W. T. Kattner to: Simonds Saw & Steel Lockport, New York	Consultation on metal fabrication	A. D. Potts	12-17-51	12-17-51	X		
W. T. Kattner to: U.S. Atomic Energy Comm. New York, New York	Consultation on metal fabrication	R. J. Smith F. G. Stroko R. E. L. Stanford	12-18-51	12-18-51	X		
G. E. McCullough to; Massachusetts Inst. Tech. Cambridge, Massachusetts	Discuss metal fabrication	A. Kauffman	12-17-51	12-17-51	X		
G. E. McCullough to: Ames Laboratory Ames, Iowa	Discuss metal fabrication	F. Spedding H. Wilhelm	12-10-51	12-10-51	X		
E. Hollister to: Firth Sterling Steel Co. Pittsburgh, Pennsylvania	Discuss spark method of metal cutting	Mr. Boller	12-3-51	12-5-51		X	
H. R. Schmidt to: Northwestern University Chicago, Illinois	Recruit personnel	- -	12-10-51	12-15-51		X	
PURCHASING AND STORES SECTION							
I. Visitors to this Works							
J. T. Holman West Coast Fast Freight Konnewick, Washington	Deliver material on order 83029-M	W.H. Sutton	12-6-51	12-6-51		X	100-B 105
	Deliver material on order 83029-M	W.H. Sutton	12-13-51	12-13-51		X	100-F 105
	Deliver material on order 83029-M	W.H. Sutton	12-18-51	12-18-51		X	100-D 105
	Deliver material on order	W.H. Sutton	12-27-51	12-27-51		X	100-B 189

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass	Restricted Data Areas
J. Holdon West Coast Fast Freight Kennewick, Washington	Deliver material on order HW 83029-M	W. H. Sutton	12-11-51	12-11-51		X	100-D 105 100-B 105
G. Zank Lee and Estes Kennewick, Washington	Deliver material on order HW 13651	W. H. Sutton	12-13-51	12-13-51		X	300 303-J
H. Halverson United Truck Lines Kennewick, Washington	Deliver material on order AEC 58113	W. H. Sutton	12-18-51	12-18-51		X	300 303-J
A. Schumann United Truck Lines Kennewick, Washington	Deliver material on order AEC 56911	W. H. Sutton	12-17-51	12-17-51		X	300 303-J
R. Bagby West Coast Fast Freight Kennewick, Washington	Deliver material on order	W. H. Sutton	12-26-51	12-26-51		X	100-D 189
	Deliver material on order	W. H. Sutton	12-27-51	12-27-51		X	100-D 189
H. Riggs West Coast Fast Freight Kennewick, Washington	Deliver material on order 91760	W. H. Sutton	12-28-51	12-28-51		X	200-W XXX
F. Colbert United Truck Lines Kennewick, Washington	Deliver material on order 83029-M	W. H. Sutton	12-28-51	12-28-51		X	100-B 105
	Deliver material on order 91746	W. H. Sutton	12-28-51	12-28-51		X	100-H 1717
II. Visits to other Installations							
C. P. Fleming to: Ladish Company Cudahy, Wisconsin	Expedite material on order	D. Schimpff	12-17-51	12-18-51		X	

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass	Areas
C. P. Fleming to: Whiting Corporation Harvey, Illinois	Expedite material on order	E. Lunn	12-19-51	12-21-51		X	
C. P. Lawson to: Hammel Dahl Company Providence, Rhode Island	Expedite material on order	D. Glenor	12-10-51 12-15-51	12-10-51 12-15-51		X X	
C. P. Lawson to: Builders Providence, Rhode Island	Expedite material on order	A. H. Tillinghast	12-11-51	12-11-51		X	
C. P. Lawson to: Chapman Valve Springfield, Rhode Island	Expedite material on order	D. McIntosh	12-12-51	12-12-51		X	
L. G. Jones to: E. W. Bliss Canton, Ohio	Expedite material on order	Mr. Moss	11-27-51 12-7-51	12-5-51 12-7-51		X X	
L. G. Jones to: American Machine & Foundry Buffalo, New York	Expedite material on order	Mr. Wilson	12-6-51	12-6-51		X	

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PURCHASING AND STORES SECTION
UTILITIES AND GENERAL SERVICES DEPARTMENT
SUMMARY - DECEMBER 1951

Personnel of the Purchasing and Stores Section showed a net increase of nine as noted below:

TOTAL PERSONNEL

	11-30-51	12-31-51	Net Change
Exempt	87	87	0
Non-Exempt	335	344	+9
	422	431	+9

The Washington, D.C. representative, added to the Priorities group, has improved the timing and receipt of up-to-date information in special assistance cases, and has been particularly effective in expediting the more critical requirements.

Special requirement studies submitted to AEC included special "B" Products forecasts, Research and Reactor materials forecast, and special Production Expansion Study.

The Crane Company submitted a summary of costs incurred in manufacturing the pipe and electrical connectors for Projects C-187-D and C-362 and requested payment of costs plus 10% gross profits. The total request exceeded the sum of the purchase order prices by about $500,000.00. An agreement was reached to tentatively accept Crane's proposal and to negotiate final settlement following a joint General Electric - AEC audit of Crane's records.

Operations in the 101 Building at Hanford were threatened due to failure to receive diamond grinding wheels as promised. A work stoppage was prevented by purchasing two wheels from stock in Chicago and arranging for 9 wheels on a loan basis from two cooperative vendors who had the wheels on hand for their own use.

Difficulties due to meeting specifications for diluent have been overcome. Orders for this material will be placed in January thereby completing the essential material requirements for MJ-4.

Shipments of nitric acid and caustic soda have had to be curtailed due to lack of storage facilities caused by delay in set-up dates for TBP and Redox. It is anticipated that normal shipments will be resumed within the next three months.

Difficulties in foundry practices in production of outlet nozzle castings for Project C 431-B have caused a 71% rejection rate. Production has been shut down until a sound casting technique is developed. Production is expected to start again during the first week of January.

PURCHASING AND STORES SECTION
SUMMARY

Although a definite production schedule on balls for the 3X Safety Systems for Reactors is expected by January 4, indications are that the producer will be unable to meet our requirements. This condition is due to lack of a common understanding of problems between ball manufacturer and steel producer.

Shipment of gun barrels for Project C 431-B began December 30. However, the latest production schedule received indicates that a directive will be required to effect our delivery requirements.

Welding problems have made special liners the limiting item on horizontal safety rods for Project C 431-B. After extensive efforts, including consultation with Atkinson and Jones Company, a successful welding method was developed. It is expected that adequate liners for one rod can be produced in time to meet the required date. Vertical safety rods are coming more in line with our requirements, and it is not contemplated that another source of supply will be necessary.

Control valves, critically needed for the TBP Project, are being received.

2115 purchase requisitions were processed through screening and 786 items were furnished from plant sources. 16 items of stainless steel not immediately aveilable on the open market were furnished to fabricaters from plant inventories.

A.E.C. Surplus and Salvage sales amounted to $39,394.44 in December.

As a result of rate reductions obtained from carriers, a savings in freight charges of $11,810.36 was realized in December. This makes a total savings from September 1946, to date of $1,672,882.37.

1225071

PURCHASING AND STORES SECTION
GENERAL
DECEMBER 1951

The volume of work in the clerical group continues at a high level due to the large load carried by Operations Procurement during the 3 preceding months. This month shows slowing up of requisitions received, placed and on hand at end of month compared to preceding months.

Due to increased personnel and the gaining in experience of both old and new employees, the entire clerical group is operating on a current basis.

The processing of claims on 15 orders was completed during the month with a recovery of approximately $2,356.00.

The reconciliation and final report of Automotive Parts Inventory, Caption 903-11, has been completed.

Chaindex Cards for Captions 903-12 and 903-26 were installed in Kardex. These captions are among the first to be set up on Chaindex Cards for inventory control of Area Stores stocks.

The addition of a representative in Washington, D. C. has improved the timing and receipt of up-to-date information concerning developments in our special assistance cases. This representative is being promptly informed of all coming assistance requests, and has been particularly effective in expediting the more critical requirements. Exceptional performance was effected in two cases during the month; the first being our critical need of assistance in obtaining replacement stock for the C-431 gun barrel tubing. The second was that of our urgently needed boron carbide bearings for agitator drives in MJ-1.

A request was made to the Commission to reopen the proposal made earlier this year regarding warehouse stocking by the Commission of stainless steel tubing and billets for fabrication by such firms as Tube Turns, Tri-Clover and Ladish, of our requirements of stainless steel pipe fittings and flanges.

Fourteen requests for NPA Directive or DX action were received during December.

Eighteen requests for assistance were submitted to AEC for directive or DX rating.

Analysis was made and report prepared and forwarded to the Commission on one V-Loan case.

Supplemental allotments of controlled materials requested and received in December are as follows:

Alloy Steel	-	3 Tons
Copper	-	45,000 Pounds
Aluminum	-	155,000 Pounds

1225072

PURCHASING AND STORES SECTION
GENERAL

Special requirement studies requested by and submitted to the AEC included special "B" Products forecast, Research and Reactor materials forecast, and special Production Expansion Study.

PERSONNEL

	As of 11-30-51			As of 12-31-51			Net Change		
	Ex.	Non-Ex.	Total	Ex.	Non-Ex.	Total	Ex.	Non-Ex.	Total
Staff	4	2	6	2	1	3	-2	-1	-3
General				2	1	3	+2	+1	+3
Priorities & Allocations	1	12	13	2	12	14	+1	0	+1
Inventory Audits	2	11	13	2	11	13	0	0	0
Office Services	2	32	34	2	37	39	0	+5	+5
	9	57	66	10	62	72	+1	+5	+6

SAFETY AND SECURITY

Safety and Security Meetings Scheduled	1
Number of Employees Attending	63

The following schedule reflects total allotments received from the AEC and allotments used and extended to suppliers and contractors through November. Top figures under each item number indicate allotment received from AEC. Lower figure under each item number reflect material allotment used or allotted for the quarter indicated.

CONSTRUCTION

Controlled Material	Unit Measure	4Q51	1Q52	2Q52	3Q52
Carbon Steel Plate	Short Tons	8110.00 7916.62	1000.00 493.01	90.00 .13	8.00 .05
Carbon Steel Structural Shapes	Short Tons	1832.00 1692.24	1240.00 611.40	163.00 .13	5.00 .05
Other Carbon Steel	Short Tons	3131.00 2980.74	1800.00 1513.92	565.00 553.08	125.00 .05
Alloy Steel (excluding Stainless Steel)	Short Tons	16.00 11.25	9.00 8.51	3.00 .05	3.00 .05
Stainless Steel	Lbs.	384438 351623	270000 147953	44995 35740	2000 2000
Copper & Copper Base Alloy Brass Mill Products	Lbs.	30025 9484	39914 29394	2000 300	1000 200

1225073

PURCHASING AND STORES SECTION
GENERAL

CONSTRUCTION

Controlled Material Unit Measure		4Q51	1Q52	2Q52	3Q52
		110680	111796	27448	10884
Copper Wire Mill Products	Lbs.	96790	99868	25787	200
Copper & Copper Base Alloy		4400	4000	None	None
Foundry Products & Powder	Lbs.	1411	2838		
		122000	22800	5000	200
Aluminum	Lbs.	121461	20060	200	200

OPERATIONS

Controlled Material Unit Measure		4Q51	1Q52	2Q52	3Q52
Carbon Steel (including Wrought Iron	Short Tons	103.00 100.92	277.00 20.25	145.00 .45	100.00 0
Alloy Steel (Excluding Stainless Steel)	Short Tons	2.00 .93	2.00 1.33	2.00 0	2.00 0
		12862	66000	40000	46000
Stainless Steel	Lbs.	5553	6410	4074	0
Copper & Copper Base Alloy		10993	10000	6878	6990
Brass Mill Products	Lbs.	6673	6674	0	0
		9646	15646	10000	7858
Copper Wire Mill Products	Lbs.	6312	5108	886	0
Copper & Copper Base Alloy		480	8100	8000	2700
Foundry Products & Powder	Lbs.	0	0	0	0
		302800	314200	209000	175108
Aluminum	Lbs.	289520	291546	192562	92519

STATISTICS	G	D	TOTAL
Requisitions on Hand 12-1-51 (Includes 212 Assigned to Gov't.)	942	436	1378
Requisitions Assigned During December	1852	712	2564
Requisitions Placed During December	1970	769	2739
Requisitions on Hand 12-31-51 (Includes 106 Assigned to Gov't.)	824	379	1203

	NUMBER	VALUE
H.W. Orders Placed	1341	$613,253.97
H.W. Alterations Placed	116	1,568.20
TOTAL	1457	$614,822.17

1225074

PURCHASING AND STORES SECTION
GENERAL

	NUMBER	VALUE
H. M. C. Orders Placed	611	$ 668,533.72
H. M. C. Alterations Placed	91	40,824.53 CR
TOTAL	702	$ 627,709.19
A. E. C. Orders Placed	187	$ 416,849.23
D. C. Orders Placed	67	51,936.40

	CR	CMC
Gov't. Transfers	0	3

	NUMBER
Return Orders Issued	103

259

1225075

PURCHASING AND STORES SECTION
CONSTRUCTION PROCUREMENT UNIT
DECEMBER 1951

The work load of the Construction Procurement Unit continued at approximately the same level as during November. The work load was equalized by the transferring of all "D" Requisitions except "D Operation" requisitions, which had formally been processed by the Operations Procurement Unit, to the Construction Procurement Unit.

As of December 31, 1951 there were 71 open requisitions in the Unit for Project C-431-B material and 19 open requisitions for Project C-431-A material. The balance of the open requisitions originated from minor construction and other miscellaneous requirements.

The Crane Company submitted a summary of costs incurred in manufacturing the pipe and electrical connectors for Projects C-187-D and C-362 and requested payment of costs plus 10% gross profit. The total request exceeded the sum of the purchase order prices by approximately $500,000. An agreement was reached to tentatively accept Crane's proposal and to negotiate final settlement following a joint General Electric - A.E.C. audit of Crane's records.

Two sales of scrap located at vendors' plants were completed during December. 4910 pounds of stainless steel scrap were sold at O.P.S. ceiling price, netting $272.50.

With the cooperation of the A.E.C. and the York Naval Ordnance Depot, arrangements were made to have a Mr. C. C. Landis of the York Naval Ordnance to assist the E. W. Bliss Company in overcoming production difficulties being experienced in the manufacture of gun barrels for the C-431-B project. Mr. Landis had previously been in charge of the gun barrels production at York Naval Ordnance Depot when the barrels for DR & H were produced. Payment for Mr. Landis's services is to be made by the A.E.C. and charged to the project.

Operations in the 101 Building at Hanford were threatened due to failure to receive diamond grinding wheels as promised. A work stoppage was prevented by purchasing two wheels from stock in Chicago and arranging for nine wheels on a loan basis from two cooperative vendors who had the wheels on hand for their own use.

PERSONNEL

As of 11-30-51			As of 12-31-51			Net Change		
Ex.	Non-Ex.	Total	Ex.	Non-Ex.	Total	Ex.	Non-Ex.	Total
9	9	18	9	9	18	0	0	0

SAFETY AND SECURITY

Safety and Security Meetings - 1

Number of employees attending - 15

260

1225076

PURCHASING AND STORES SECTION
-- OPERATIONS PROCUREMENT UNIT

DECEMBER - 1951

No new contracts for Essential Materials were negotiated during the month.

The Aluminum Can program is progressing on schedule. Shipments of both sizes have been received on the plant.

Shipments of Nitric Acid and Caustic Soda have had to be curtailed, due to lack of storage facilities, caused by the delay in set-up dates for TBP and Redox. It is anticipated that normal shipments may be resumed within the next three months.

With regard to the Essential Material item of Diluent, mentioned in last month's report, the difficulties have been resolved and new bids have been requested. This material will be placed on order during the month of January.

Personnel

As of 11-30-51			As of 12-31-51			Net Change		
Ex.	Non-Ex.	Total	Ex.	Non-Ex.	Total	Ex.	Non-Ex.	Total
8	16	24	8	16	24	0	0	0

Safety and Security

Safety and Security Meetings scheduled - 1
Number of employees attending -24

1225077

PURCHASING AND STORES SECTION
INSPECTION AND EXPEDITING UNIT
DECEMBER 1951

Difficulties have been encountered in foundry practices that have caused a 71% rejection rate of outlet nozzle castings for Project C-431-B. This high rejection rate has caused the producer to shut down operations until a sound casting technique can be developed. It is expected that production will be resumed the first week in January. Bellows assemblies on which machine work has been sub-let to several firms in California are also a critical item for this Project. Concentrated efforts have been placed on the prime and sub-vendors to deliver this job at the required date.

To date Industrial Tectonics have not been able to satisfactorily produce any quantity of balls for the 3X Safety Systems for Reactors. Their ability to produce 260,000 pounds of balls in time to meet our requirements is questionable. Considerable effort has been spent in trying to get a common understanding of problems between ball manufacturer and steel producer. A definite production schedule is expected by January 4, but indications at this time are that this producer will be unable to produce in time to meet our requirements.

Some progress has been made on gun barrel production for Project C-431-B. 204 barrels were shipped December 30, and another 375 are ready for final inspection. This is considerably less than the vendor's commitment. Indications are that a manpower directive may be required to meet our delivery requirements.

The horizontal safety rod job is still somewhat an unsolved problem since the greatest difficulties will be encountered in assembly. Assembly operations are scheduled to begin on January 15. The limiting item is the special liners. The vendor produced several hundred liners before meeting with success and had "farmed" the welding problem out to Boeing and Sand Point Naval Air Station among others. Arrangements were made by Inspection Unit to have 2 cans welded by Maintenance Forces in 200-W to work out a successful technique. The Atkinson and Jones Welding Superintendent also was consulted before a successful technique was developed. It is now expected that the 64 liners necessary for one rod can be produced in time to meet the January 15 date.

Vertical safety rods for Project C-431-B appear to be coming more in line with our requirements, and it is not contemplated that another source of supply will be necessary.

The Inspection Supervisor attended 2 meetings with Stores Unit personnel in order to insure full understanding by all concerned of the reasons behind the decision to bring stainless steel remnants to Project Site. A proposed procedure for handling the remnants for maximum effective usage was covered in detail so that warehousing could be accomplished to facilitate this usage.

The Supervisor of Expediting completed a one-week tour of the East. Vendors holding critical orders were visited, accompanied by the Inspectors assigned to these orders. This tour resulted in numerous clarifications and development of firm schedules.

The workload during the month of December increased about 33% on Operations purchase orders. If this trend continues, it may be necessary to put additional help on this phase of the work. The Construction workload remained at approximately the same level as it has been for the past three months. The extremely heavy workload in Seattle necessitated the transfer of an inspector from Denver.

1225078

PURCHASING AND STORES SECTION
INSPECTION AND EXPEDITING UNIT
DECEMBER 1951

Control valves which are critically needed for the TBP Project, are starting to arrive on the Project. 16 have been shipped to date and there is no apparent hold-up on the TBP Project from outside materials.

Stearns-Roger connectors for the TBP Project are completed with the exception of a few scattered minor items.

Shipment of the remaining operational pump for the TBP Project is promised the week of January 5.

During the visit of the Supervisor of Expediting to Chapman Valve Company, it was determined that equipment for the Roberts Filter order for Project C-431-A is not promised in line with our requirements and additional information is being developed so that priority assistance can be requested.

PERSONNEL

	As of 11-30-51			As of 12-31-51			Net Change		
	Ex.	Non-Ex.	Total	Ex.	Non-Ex.	Total	Ex.	Non-Ex.	Total
Inspection	31½	20	51½	29½	20	49½	-2	0	-2
Expediting	13½	10	23½	14½	10	24½	+1	0	+1
	45	30	75	44	30	74	-1	0	-1

SAFETY AND SECURITY

Safety and Security Meetings Scheduled	1
Number of Employees Attending Each Meeting	32

STATISTICS

Inspection

Number of open orders requiring inspection	276
Number of open orders being inspected	261
Number of new orders requiring inspection	18
Number of open requisitions requiring inspection	53
Number of completed orders (cancelled, waived)	34
Number of open orders requiring inspection - sub-vendor	36
Number of open orders being inspected - sub-vendor	34
Number of completed orders - sub-vendor	3

Expediting

HW Orders expedited in December (active)	495
HW Orders expedited in December (routine)	1543
HWC Orders expedited in December	1318
Sub-vendor orders expedited in December	2200*
HW Orders completed in December	957
HWC Orders completed in December	601

263

* Estimated

1225079

PURCHASING AND STORES SECTION
STORES UNIT
DECEMBER, 1951

GENERAL

The establishment of Area Stores is proceeding on schedule. The first Area Store was placed in operation in the 100-F Area on January 2, 1952 and work has started in 200-W and 100-B. The Instrument Tool Crib and stock in the 300 Area has been taken over by Stores and a Stores' employee has been placed in charge. Custodial responsibility for limited class of engineered items warehoused at Hanford School has been assumed by the Stores Unit at the request of the Engineering Department and a Stores' employee has been placed in charge as of January 1, 1952.

This month's report has been expanded to include more detail on the status of the formal excess lists.

During the past calendar year the total value of the excess materials inventories has been reduced in the amount of $5,700,000. The total book value of the 10.10 and 10.20 inventories is now $9,447.746 and $3,175,000 of this amount is now on formal excess lists which have been forwarded to the Commission.

2115 purchase requisitions were processed through screening and 786 items were furnished from plant sources. 16 items of stainless steel not immediately available on the open market were furnished to fabricators from plant inventories.

Maintenance materials and supplies disbursed from Operations inventories were valued at $240,406.35. Receiving reports issued during the month totaled 4707.

Materials and equipment valued at $110,514.79 from 17 captions in the 10.20 Account (Construction Materials Held for Future Use) were disbursed to construction forces during the month. In addition to the foregoing, materials valued at $3,663.65 were withdrawn by Operations forces and materials valued at $7,227.34 were shipped as directed by the Commission. Materials declared excess from the above account totaled $137,875.36.

Materials and equipment valued at $30,407.02 were withdrawn from the 10.10 Account (Excess) for use on the project. Of this amount, construction forces' withdrawals were valued at $28,473.55.

During the month 15 formal excess lists, totaling $209,766.18, were submitted to the Commission for disposition. Excess materials and equipment valued at $232,915.30 were shipped from the project as directed by the Commission.

106 representatives of government and private businesses were escorted through our warehouses and yards for the purpose of negotiating the sale of scrap and transfer of excess property.

During the month seven scrap sales were completed for a revenue of $22,596.79, bringing the total scrap sales revenue for 1951 to $115,367.61

1225080

PURCHASING AND STORES SECTION
STORES UNIT

GENERAL (Continued)

A.E.C. Surplus and Salvage Sales, conducted by our personnel during December, amounted to $39,394.44 with total sales of $108,718.16 since the inception of this program in July of this year.

PERSONNEL

	As of 11-30-51			As of 12-31-51			Net Change		
	Ex.	Non-Ex.	Total	Ex.	Non-Ex.	Total	Ex.	Non-Ex.	Total
Administrative	6		6	6		6			
Construction Materials	1	29	30	1	29	30			
Operations Materials	4	122	126	4	120	124		-2	-2
Surplus, Salvage & Scrap Materials	3	64	67	3	69	72		+5	+5
TOTALS	14	215	229	14	218	232		+3	+3

SAFETY AND SECURITY

Safety and Security Meetings Scheduled	13
Number of Employees Attending	207
Minor Injuries	3

STATISTICS

Construction Materials Held for Future Use

Items in Stores Stock	40,386	
Items Added to Stock	498	
Items Completely Liquidated from Stock	1,019	
Store Orders Posted (Items)	2,315	
Number of Requisitions Screened - A.J.	465	
Number of Take-Offs Screened - G.E. (Minor Construction)	78	
Number of Items Screened	4,476	
Number of Items Furnished from Stock	432	
Value of Disbursements		$ 121,405.78*
Inventory Value at Month End - Materials		4,807,612.95
Value of Materials Received		910.95
Value of Materials Declared Excess		137,875.36

*Includes $110,514.79 disbursed to Construction and C.P.F.F. Sub-contractors
3,663.65 disbursed to Operations forces
7,227.34 shipped at the Commission's Direction

Value of Materials Held at Request of Commission	none
Value of Materials Held at Request of Operating Dept.	none
Value of Materials Held at Request of Eng. Dept.	none

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PURCHASING AND STORES SECTION
STORES UNIT

STATISTICS (Continued)

Operations Materials			
Number of Items Added to Stores Stock	312		
Number of Items Deleted from Stores Stock	0		
Items in Stores Stock at Month End	51,690		
Store Orders Posted	22,335		
Number of Requisitions Screened this Month - G.E.	1,572		
Number of Items Furnished from Plant Sources this Month	354		
Number of Requisitions Screened-other A.E.C. Installations	6		
Number of Items Furnished other A.E.C. Installations	8		
Number of Items of Stainless Steel Furnished to Fabricators	16		
Inventory Valuation at Month End (903 all captions, 906 & 912)			$1,513,571.68
Inventory Valuation at Month End (Spare Parts)			1,466,920.55
Inventory Valuation at Month End (Spare Equipment Held in Storage)			240,792.67
Total Value Inventory Accounts			3,221.284.90
Value of Disbursements (903 All Captions, 906 & 912)			202,278.30
Value of Disbursements (Spare Parts)			33,250.49
Value of Disbursements (Spare Equipment Held in Storage)			2,906.07
Value of Cash Sales			303.30
Value of Sales, Payroll Deduction			1,659.09
Total Value of Disbursements			240,406.35*
Value of Materials Declared Excess			43.78
Value of Materials Returned to Stores Stock for Credit			9,424.04
*Includes $52,221.61 Disbursed to Eng. Dept. & C.P.F.F. Sub-contractors			
Surplus Salvage & Scrap Materials			
Balance of Account 10.10 as of 11-30-51			$4,699,419.91
Receipts 11-30-51 to 12-31-51			
Material and Supplies	232,609.12		
Miscellaneous Equipment	20,299.39		
Office Furniture & Equipment	466.17		
Automotive Equipment	56,843.85		310,218.53
Adjustments - Classes and Current Market Prices			Cr.105,227.72
			4,904,410.72
Disbursements 11-30-51 to 12-31-51			
On Project			
Lumber	3,913.14		
Machine Tools & Equipment	1,743.04		
Office Furniture	23.00		
Material & Supplies	22,061.07		
Miscellaneous Equipment	2,415.24		
Automotive Equipment	251.53	30,407.02*	
Stores Material Transfers		954.97	
Off Project			
Machine Toole & Equipment	845.11		
Automotive Equipment	43,011.53		
Material and Supplies	69,463.35		

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PURCHASING AND STORES SECTION
STORES UNIT

STATISTICS (Continued)

Miscellaneous Equipment	118,580.78		
Office Furniture & Equipment	1,014.53	232,915.30	264,277.29
Balance of Account 10.10 as of 12-31-51			$4,640,133.43

*Includes $28,473.55 disbursed to Construction and C.P.F.F. Sub-contractors

Total Receipts to Date		$42,626,601.61
Total Disbursements to Date		37,986,468.18

Scrap and Salvage Disbursed		
Scrap Sales Completed	7	
Scrap Sales in Process	none	
Scrap Sales Pending - Not Approved	none	
Scrap Sales Approved	none	
Shipments per A.E.C. Authority	1	
Scrap Values (SAL)		$ 40.00
Scrap Sale Revenue thru Month of November		92,770.82
Scrap Sale Revenue for Month of December		22,596.79
Scrap Sale Revenue to Date, 1951		115,367.61
Scrap Sold Back to Project		117.15
Store Orders Processed	8	
AEC SS Sales Completed	7	
AEC SS Sales Completed to Date	20	
AEC SS Sales in Process	2	
AEC SS Sales Revenue thru month of November		$ 69,323.72
AEC SS Sales Revenue for Month of December		39,394.44
AEC SS Sales Revenue to Date, 1951		108,718.16
Item Statistics		
Receiving Reports (HW 1.54A) Processed	1,721	
Store Orders Processed	342	
Shipping Orders Processed	74	
Purchase Requisitions Screened	533	
Status of Excess Listing as of 12-31-51		
Book Value of Formal Excess Lists Sent to Commission in December		$ 209,766.18
Book Value of 10.10 Account Not Listed to Commission		1,014,682.68
Book Value of 10.10 Account Material and/or Equipment on Field Lists Circulated for Plant Screening		450,208.82
Book Value of Material and Equipment on Formal Excess Lists Waiting Commission Instructions on Disposition		3,175,241.93
Number of Formal Excess Lists Sent to Commission in December	15	
Total Number of Formal Excess Lists Sent to AEC (Beginning Date of Current Series 4-11-51	158	
Total Number of Open Lists Waiting AEC Disposition	135	
Total Number of Open Lists More than 90 Days Old Waiting AEC Disposition	32	

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PURCHASING AND STORES SECTION
STORES UNIT

STATISTICS (Continued)

Value of Materials Held at Request of Commission	$ 18,179.64
Value of Materials Held at Request of Operating Dept.	31,789.47
Value of Materials Held at Request of Engineering Dept.	none

WAREHOUSING, RECEIVING, DISBURSING & SHIPPING

Construction Held, Surplus, Salvage Materials	
Construction Materials	
Store Orders Filled	3,430
Items Filled for Shipping	132
Items Excessed	951
Surplus, and Salvage Materials	
Store Orders Filled	499
Excess Items Received	2,096
Items Filled for Shipping	574
Excess Items Re-checked	3,037
Items Transferred to Salvage Sales	317
Receiving and Shipping	
Receiving	
Receiving Reports Issued	4,707
Shipments Received	5,360
Operations Shipping	
Orders Completed (RM-RC)	169
Weight	201,601#
Excess Shipping	
Orders Completed	130
Weight	6,275,323#
Truckloads of Material Shipped	51
Carloads of Material Shipped	34
Items Shipped	817
Operations Materials	
Store Orders Registered	22,571
Items Received (Receiving Reports)	3,415
Items Received (Material Transfers)	5,200
Off-Shift Disbursements	19

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PURCHASING & STORES SECTION
TRAFFIC UNIT
December 1951

GENERAL

Amendment No. 20 by the Interstate Commerce Commission to Service Order No. 865, pertaining to demurrage charges on freight cars, will reduce such charges at Hanford Works particularly on outbound shipments.

Effective December 7, 1951, the practice of having parcel post shipments insured for a nominal sum of $.10 in order to trace and prove delivery was discontinued. This will eliminate confusion among vendors and simplifies instructions on the Purchase Order.

Through negotiations with motor freight carriers serving this area, U. S. Government Quotation No. 44-N was issued, which established reduced rates on freight, all kinds, from Portland, Oregon, and Vancouver, Washington. The reduced rates will reflect savings of from 21¢ to 72¢ per cwt. on shipments of 5,000 lbs. or over.

Negotiations with Union Pacific Railroad, regarding rates for shipments of boilers from Richland to Las Vegas, Nevada, resulted in a savings of $472 per car for the two cars shipped.

As a result of rate reductions obtained from the carriers there was a total savings in freight charges for the month of December amounting to $11,810.36. This makes a total savings from September 1, 1946, to date of $1,672,882.37.

PERSONNEL

As of 11-30-51			As of 12-31-51			Net Change		
Ex.	Non-Ex.	Total	Ex.	Non-Ex.	Total	Ex.	Non-Ex.	Total
2	8	10	2	9	11	0	+1	+1

SAFETY AND SECURITY

Safety and Security Meetings Scheduled	1
Meetings Held	1
Minor Injuries	0

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PURCHASING & STORES SECTION
TRAFFIC UNIT
December 1951

STATISTICS

Savings Report

1. Rate reductions obtained from the Carriers:

Commodity	Origin	Savings for December	Savings 9-1-46 thru Nov.,1951	Total Savings 9-1-46 to date
Lime	Evans, Wash.	$ 24.00		
"B" Blocks	Bremerton, Wash.	6,712.37		
Phosphoric Acid	South Gate, Calif.	960.99		
Caustic Soda	Tacoma, Wash.	1,324.96		
Soda Ash	Trona, Calif.	202.00		
Castings, Rough	Los Angeles, Calif.	2,054.00		
Railway Express	Various	526.07		
Hydrocarbon Gas	Various	5.97		
		$11,810.36	$1,661,072.01	$1,672,882.37
2. Freight Bill Audit		761.64	76,384.36	77,146.00
3. Loss & Damage & Overcharge Claims		281.75	108,859.64	109,141.39
4. Ticket Refund Claims		941.59	20,819.30	21,760.89
5. Household Goods Claims		235.43	15,857.38	16,092.81
		$14,030.77	$1,882,992.69	$1,897,023.46

Work Volume Report

Reservations Made	Rail	120
	Air	57
	Hotel	109
Expense Accounts Checked		180
Household Goods & Automobiles	Movements Arranged Inbound	4
	Movements Arranged Outbound	1
	Insurance Riders Issued	3
	Requests for Claim Billing	2
	Claims Collected - Number	5
	Claims Collected - Amount	$235.43
Ticket Refund Claims	Filed	34
	Collected - Number	31
	Collected - Amount	$941.59
Freight Claims	Filed	12
	Collected - Number	9
	Collected - Amount	$281.75
	Over & Shorts Processed	7
	Damage Reports Processed	12

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STATISTICS (CONT.)

Work Volume Report

Freight Bill Audit Savings		$761.64
Freight Shipments Traced		82
Quotations	Freight Rates	205
	Routes	217
Bills Approved	Air Express	33
	Boat	1
	Carloading	143
	Express	137
	Rail	1,076
	Truck	247
Return Orders Processed		38
Carload Shipments	Inbound - GE -AEC	1,154
	All Others	214
	Outbound - GE -AEC	22
	All Others	7

Report of Carloads Received

	C.&.T.P.&P.	N.P.	U.P.	TOTAL
General Electric Company				
Aluminum Ingot			1	1
Aluminum Sulphate		1	1	2
Aluminum Tubing		1		1
Asphalt	1			1
Blowers			1	1
Castings, Iron		3	1	4
Caustic Soda	9	8	3	20
Chemicals	3			3
Chlorine, Liquid	1	1	1	3
Coal	163	25	826	1,014
Cranes		2	1	3
Fans, Exhaust		1		1
Ferric Sulphate			1	1
Fittings, Pipe	1		2	3
Fittings, Plumbers		1		1
Furniture, Office			1	1
Hydrofluoric Acid			1	1
Lead Pigs			1	1
Lime	1			1
Machinery & Parts	1	6	3	10
Nitric Acid		10	9	19
Paper, Building		1		1
Phosphoric Acid		1	1	2
Pipe	14	1	11	26

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STATISTICS (CONT.)

Report of Carloads Received

	CMSTPP	N.P.	U.P.	TOTAL
General Electric Company (Cont.)				
Porcelain Grinding Balls	1			1
Pump Units & Parts	1		2	3
Salvage Material			1	1
Soda Ash	1	2	1	4
Solvent		1		1
Steel Scrap	1			1
Steel Structural	4			4
Sulphuric Acid	1			1
Tables	1			1
Tanks		1	1	2
Valve Parts	1			1
Vents	1			1
Express Cars	4			4
Mdse. Cars	3	1		4
TOTAL	213	57	870	1,150
A.E.C.				
Cabinets, Steel		1		1
Lumber		1		1
Paper, Roofing		1		1
Plywood		1		1
TOTAL		4		4
Atkinson & Jones Construction Co.				
Asphalt	2			2
Cement	17	37	10	64
Grating	1			1
Lumber	1			1
Pipe			3	3
Sand			1	1
Siding		1		1
Steel Bars	3			3
Steel Joists	2	1		3
Steel Plates			1	1
Steel Sheets	1			1
Tractor Parts		1	1	2
Welding Rods	2			2
TOTAL	29	39	16	84
Bonneville Power Administration				
Generator Parts	3			3
Switchboards, Electric	1			1
Transformer Oil	1			1
TOTAL	5			5

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STATISTICS (CONT.)

Report of Carloads Received

		CNSTR.P	N.P.	U.P.	TOTAL
Fred J. Early Company					
Scraper				1	1
	TOTAL			1	1
Electric Smith Inc.					
Pipe			1		1
	TOTAL		1		1
R. C. Larson & Co.					
Tanks			1		1
	TOTAL		1		1
Pittsburgh Des Moines Steel Co.					
Steel Plates				1	1
	TOTAL			1	1
Richland Fuel Co.					
Coal			17	18	35
	TOTAL		17	18	35
Sound Const. & Engr. Co.					
Laboratory Equipment				2	2
Siding		1	1		2
	TOTAL	1	1	2	4
Standard Oil Company					
Fuel Oil			1		1
	TOTAL		1		1
U. S. Army					
Autos, Freight		13	20	16	49
Guns & Equipment			1		1
Ordnance Stores			2		2
Platforms, Wooden			1		1
Trailers			6		6
Vehicles			2	2	4
Wire			9		9
Mdse. Cars			2		2
	TOTAL	13	43	18	74
West Coast Htg. & Plbg. Co.					
Pipe				4	4
Pipe, Sewer			1		1
	TOTAL		1	4	5
Woodward Bros.					
Fixtures, Light		1			1
	TOTAL	1			1

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STATISTICS (CONT.)

Report of Carloads Received

	CHSTPKP	H.P.	U.P.	TOTAL
York Corp. Tanks			1/	1/
TOTAL				
TOTAL - SUBCONTRACTORS	49	104	61	214
TOTAL - ENTIRE PROJECT	262	175	931	1,368

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TRANSPORTATION SECTION
MONTHLY REPORT
DECEMBER 1951

GENERAL

Transportation Section personnel forces were increased from 519 to 524 employees during the month by 15 new hires, 5 transfers in, 11 transfers out, 3 terminations and 1 deactivation - personal illness.

RAILROAD ACTIVITIES

Commercial cars handled during December decreased 7.8% over November. Receipts of coal and construction materials continued near the general high level which has been prevalent since August.

Process movements during December were slightly above normal; however, they decreased 12.6% over November.

Initial classified service was rendered to the 202-S Building on December 14.

There was a substantial increase in switching service for the North Richland area as two new tracks were activated for the U.S. Army. Heavy carload receipts required the services of one locomotive and a special train crew for three days.

Ballast service was furnished on the 105-C lead for the Atkinson and Jones Company on December 4.

Cars handled during December including process movements totaled 3,129 compared to 3,470 in November; 3,651 in October; 2,800 in September; 2,321 in August; 1,275 in July; 2,226 in June; 2,443 in May; 2,078 in April; 1,984 in March; 1,793 in February and 2,625 in January.

The following recapitulation indicates the number of commercial cars handled:

Carload Movements -	Loads In	Empties In	Loads Out	Empties Out
General Electric Company	1150	25	23	1128
Atkinson & Jones Co.	89	-	-	87
Browne-Morris Co.	2	-	-	2
Bryan W. Burtch Co.	2	-	-	2
Fred J. Early Co.	1	-	-	1
Electric Smith Co.	1	-	-	1
A. W. Graham Co.	1	-	-	1
Peter Kiewit Co.	1	-	-	1
R. C. Larsen Co.	1	-	-	1
Pittsburgh-Des Moines Steel Co.	1	-	-	1
Richland Fuel Co.	35	-	-	33
Selden, Inc.	1	-	-	1
Sound Construction Co.	0	-	-	1
Standard Oil Co.	1	-	-	1
West Coast Heating & Plumbing Co.	5	-	-	4
Woodward Bros. Co.	1	-	-	0
U.S. Army	75	6	6	76
	1367	31	34	1340

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Transportation Section

Completed annual inspection on depressed transformer flat car 10-B-3635.

An acceptance meeting for the Riverland Elevated Water Tank was held on December 18 by rerresentatives of the Subcontractor, General Electric Company and the Atomic Energy Commission. The tank was accepted with one exception, correction to be made early in January by the Electrical Contractor.

Railroad track maintenance and rehabilitation work continued on a routine basis except for ice and snow removal which required 848 man-hours. Lining, surfacing and dressing of track required 2,745 man-hours. Relay of rail and ties required 540 man-hours. Handling of track materials required 1,102 man-hours. Cutting and burning of weeds required 1,346 man-hours.

AUTOMOTIVE ACTIVITIES

The Plant Bus System transported 1.5% fewer passengers in December than in November. The following tabulation indicates the December passenger volume by shifts and the total revenue received:

No. 1 outbound and No. 3 inbound	30,995
No. 2 outbound and No. 1 inbound	63,018
No. 3 outbound and No. 2 inbound	60,606
Total	154,619
Revenue	$ 7,730.95

The following is a comparative breakdown of average daily bus trips to the Plant Areas:

Passenger buses - 100-B	11
Passenger buses - 100-D	11
Passenger buses - 100-F	11
Passenger buses - 100-H	8
Passenger buses - Hanford	4
Passenger buses - 200-West	31
Passenger buses - 200-East	9
Passenger buses - 300 Area	7
Passenger buses - Riverland	2
Passenger buses - Pistol Range	1
Passenger buses - White Bluffs	4
Passenger buses - North Richland	3
700-300 Area Shuttle Service	21
Inter-Area Passenger Service	3
Inter-Area Express Service	1
Inter-Area Mail Service	1

Effective December 5, around-the-clock, seven days a week, shuttle service was established for personnel assigned to the 242-B Building in 200-East Area; and on December 31 for personnel assigned to the 241-UR Building in 200-West Area.

Transportation Section

The Richland Local Bus System continued to show a seasonal increase by transporting 19.5% more passengers in December than in November. School bus service was discontinued from December 24 through December 31 because of the Christmas Holiday Vacation. Volume of service rendered is indicated in the following statistics:

Total passengers including transfers	42,781
Total bus trips	3,618
Total bus miles	19,899
Total revenue	$ 3,440.70

Off-Plant automobile trips (Company business and/or official visitors) totaled 161.

The following tabulation indicates the volume of Drivers Test Service rendered including the new permits issued in compliance with AEC Bulletin GM-181 and H.W. Instructions Letter No. 15.

Applicants:	Male	104	Number rejected	0
	Female	8	Number tests given	112
Permits Issued:	Limited to driving with glasses			26
	Urlimited			86
Permits Reissued:	Routine	28		
	New AEC	400		
	New AEC to date	4700		

The following tabulation indicates the volume of fuel distribution by Equipment Maintenance personnel:

	Gasoline	Diesel Fuel	50 Cetane	Kerosene	White Gas
Stock at start of month	43,624	18,391	16,117	2,433	270
Received during month	115,110	20,300	32,067	6,010	103
Total	158,734	38,691	48,184	8,443	373
Disbursed during month	129,292	22,904	30,034	6,435	121
Stock at end of month	29,442	15,787	18,150	2,008	252

The following tabulation indicates the volume of inspection and maintenance service rendered to Harford Works automotive and heavy equipment by Equipment Maintenance personnel: 40 motor overhauls; 106 Class A Inspections and Repairs; 1,256 Class B Inspections and Lubrications; 2,594 other routine maintenance repairs and service calls; 671 tire repairs: and 586 wash jobs.

Transportation Section

The following tabulation indicates the Plantwide usage of automotive equipment:

Code	Type	No. of Units	Total Mileage
1A	Sedans	320	460,112
1B	Buses	157	202,965
1C	Pickup Trucks	453	221,618
1D	Panel,Carryall,Sta.Wagon	125	115,850
1E	Armored Cars	12	717
1G	Jeeps	2	705
68 Series	Trucks	282	68,240
		1,351	1,070,217

Appropriation and Budget Requests were approved during the month for one White truck; one gasoline powered fork lift truck; five White buses; two 5,000 gallon tank semi-trailers; and nine replacement sedans.

LABOR ACTIVITIES

The following tabulation indicates in gallons the volume of road asphalt material handled by Transportation Services personnel:

	MC 1	MC 3	MC 4	MC 5
Stock at start of month	0	1,924	0	2,803
Received during month	0	9,400	0	0
Dispersed during month	0	0	0	0
Stock at end of month	0	11,324	0	2,803

Maintenance of primary roads required 591 man-hours; secondary roads 224 man-hours; patrol roads and trails 8 man-hours; sand and snow removal 535 man-hours.

Handling of miscellaneous materials for the Stores Unit at White Bluffs required 2,292 man-hours.

Handling of materials for the Stores Unit in the 700-1100 Areas required 2,060 man-hours.

Handling of Area deliveries required 1,470 man-hours; Stores deliveries 220 man-hours and office furniture 1,069 man-hours.

Handling of 5 carloads of equipment, 12 carloads of material, 23 truckloads of equipment and 107 truckloads of material required 2,151 man-hours.

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ELECTRICAL DISTRIBUTION AND TELEPHONE SECTION

DECEMBER 1951

January 7, 1952

GENERAL

The section total scheduled work backlog was 5207 man days at the end of December, a 2.9 per cent increase from the previous month. The backlog is distributed as follows:

	Days Per Craftsman	Total Man Days	Net Change Man Days
Line Maintenance	59.5	1,963	141 Increase
Substation Maintenance	43.7	786	44 Decrease
Telephone Unit	61.4	2,458	41 Increase

Electric power peak demands for December were:

	Date	December KW Demand	Comparative November Demand
Process load	12-26-51 (5:30-6:00 p.m.)	75,400	73,350
Village Load	12-26-51 (4:30-5:00 p.m.)	32,130	26,900

Process demand is an all time peak and exceeds that of December 1950 by 14.4 per cent.

The Village demand exceeds that of December 1950 by 9 per cent, with an increase of 6 per cent in energy consumption. These figures are not significant for a single month but appear to reflect a gradual trend.

Civil defense activities included the following:

a) An Appropriation Request for $29,880 was prepared covering proposed purchase and installation of emergency radio equipment.

b) Agreement was reached with school authorities on locations for proposed radio equipment and associated emergency generators at six schools designated as District Aid Centers.

c) A detailed summary of emergency generators required for emergency communications, including a generator for the Control Center, was forwarded to the Transportation Section for procurement.

Codes and procedures have been established for development of basic system maps for the telephone and electrical distribution systems. Preparation of maps, and

[redacted]

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Electrical Distribution and Telephone Section

maintenance in "as built" condition, will be accomplished within the Section.

A formal report was prepared of telephone and electric power requirements for Program "X", followed by extensive discussion with the Engineering Unit.

ELECTRICAL DISTRIBUTION UNIT

Maintenance and Operation

A pole fire developed in a 230 KV tangent structure near the 100-F Area, December 1, 1951. Structure hardware had not yet been bonded. Replacement of the entire structure involved a complete power outage of two minutes duration for the 200 Areas. Production was curtailed under the Critical "Y" Power Condition established for twelve hours.

System Expansion and Planning

Project C-431 (100-C Area). A study was completed of construction requirements for placing the additional transformer and substation equipment in service at Substation 151-B. A series of required power outages were scheduled and a division of work components prepared for review by the Work Review Committee.

Project C-295 (Expansion of Substation 251). A preliminary inspection was completed and the project was tentatively accepted from subcontractors pending the correction of minor details. Final connections and adjustments are scheduled for January 1952.

Project C-380-R (Electric Metering of Richland). Thirty-two of a total of seventy-seven meter installations have been completed on Richland commercial facilities. Meter reading routes and record cards have been established.

The new power bank in the vicinity of Building 222-U was accepted and placed in service December 16, 1951.

Modifications were completed on the Richland North Commercial Area substations which increased their capacity to provide for building expansion.

TELEPHONE UNIT

Maintenance and Operation

A priority procedure has been established for official telephone service. Present exchange facilities are inadequate and will be expanded by installation of four-party service equipment scheduled for completion in April 1952.

A summary of telephone subscriber service is as follows:

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Electrical Distribution and Telephone Section

	Subscriber Stations In Service	Exchange Lines Available for Service	Exchange Line Sides Available for Service	Ex-Lines In Service
Richland	6,308	49	310	3,869
North Richland	517	151	19	449
Process Areas	1,301	535	0	1,215
Total	8,126	735	329	5,533

System Expansion and Planning

A new twenty-six (26) pair cable and three terminals were placed in service in Richland North Commercial Area to provide for expanding activities.

Preliminary engineering was completed for the proposed 100-B, 200 line exchange. Pending final approval of Project Proposal C-473, purchase requisitions were issued for critical items which are also useful elsewhere in the plant system.

Installation of equipment was started for providing private line service between the offices of the Manufacturing Department Manager and Manufacturing Section Managers.

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POWER STATISTICS
ELECTRICAL DISTRIBUTION AND TELEPHONE SECTION
FOR MONTH ENDING DECEMBER 31, 1951

ITEM	ENERGY - MW HRS. Nov.	Dec.	MAX. DEMAND - KW Nov.	Dec.	LOAD FACTOR - % Nov	Dec.
230 KV SYSTEM						
A-2 Out (100-B)	7,570	7,970	12,100	12,800	86.9	83.7
A-4 Out (100-D)	13,130	15,130	22,200	22,600	82.1	90.0
A-5 Out (100-H)	9,820	9,216	15,150	15,000	90.0	82.6
A-6 Out (100-F)	8,040	5,960	11,600	11,500	96.3	69.7
A-8 Out (200 Area)	5,220	5,796	9,720	9,720	74.6	80.1
TOTAL OUT	43,780	44,072	70,770**	71,620**	85.9	82.7
MIDWAY IN	44,491	44,757	67,600*	69,200*	91.4	86.9
Transm Loss	711	685				
Percent Loss	1.6	1.5				
115 KV SYSTEM						
B1-S4 Out (N. Rich.)	2,366	2,861	4,378	4,723	75.1	81.4
Richland	13,412	15,992	26,880*	31,680*	69.3	67.8
BB1-S3 Out(300 Area)	800	952	1,920	2,000	57.9	64.0
TOTAL OUT	16,578	19,805	33,178**	38,403**	69.4	69.3
Benton In	1,560	4,080	62,400*	57,600*	34.7	95.2
So. Richland In	15,280	15,000	31,200*	36,000*	68.0	59.0
TOTAL IN	16,840	19,880	93,600**	93,600**	25.0	28.5
Transm Loss	262	75				
Percent Loss	1.6	.4				
66 KV SYSTEM						
B9-S11 Out(100-C)	280	431	600	750	64.8	77.2
B7-S10 Out(W. Bluffs)	510	612	1,463	1,440	48.4	57.1
Hanford Out	369	435	600**	600**	85.4	97.4
TOTAL OUT	1,159	1,478	2,663**	2,790**	60.4	71.2
HANFORD IN	1,089	1,361	2,300*	2,600*	65.7	70.3
Transm. Loss	/ 70	/ 117				
Percent Loss	/ 6.4	/ 8.6				
PROJECT TOTAL						
230 KV Out	43,780	44,072	70,770**	71,620**	85.9	82.7
115 KV Out	16,578	19,805	33,178**	38,403**	69.4	69.3
66 KV Out	1,159	1,478	2,663**	2,790**	60.4	71.2
TOTAL OUT	61,517	65,355	106,611**	112,813**	80.1	77.9
230 KV In	44,491	44,757	67,600*	69,200*	91 4	86.9
115 KV In	16,840	19,880	93,600**	93,600**	25 0	28.5
66 KV IN	1,089	1,361	2,300**	2,600**	65.7	70.3
TOTAL IN	62,420	65,998				
Transm. Loss	903	643				
Percent Loss	1.4	1.0				

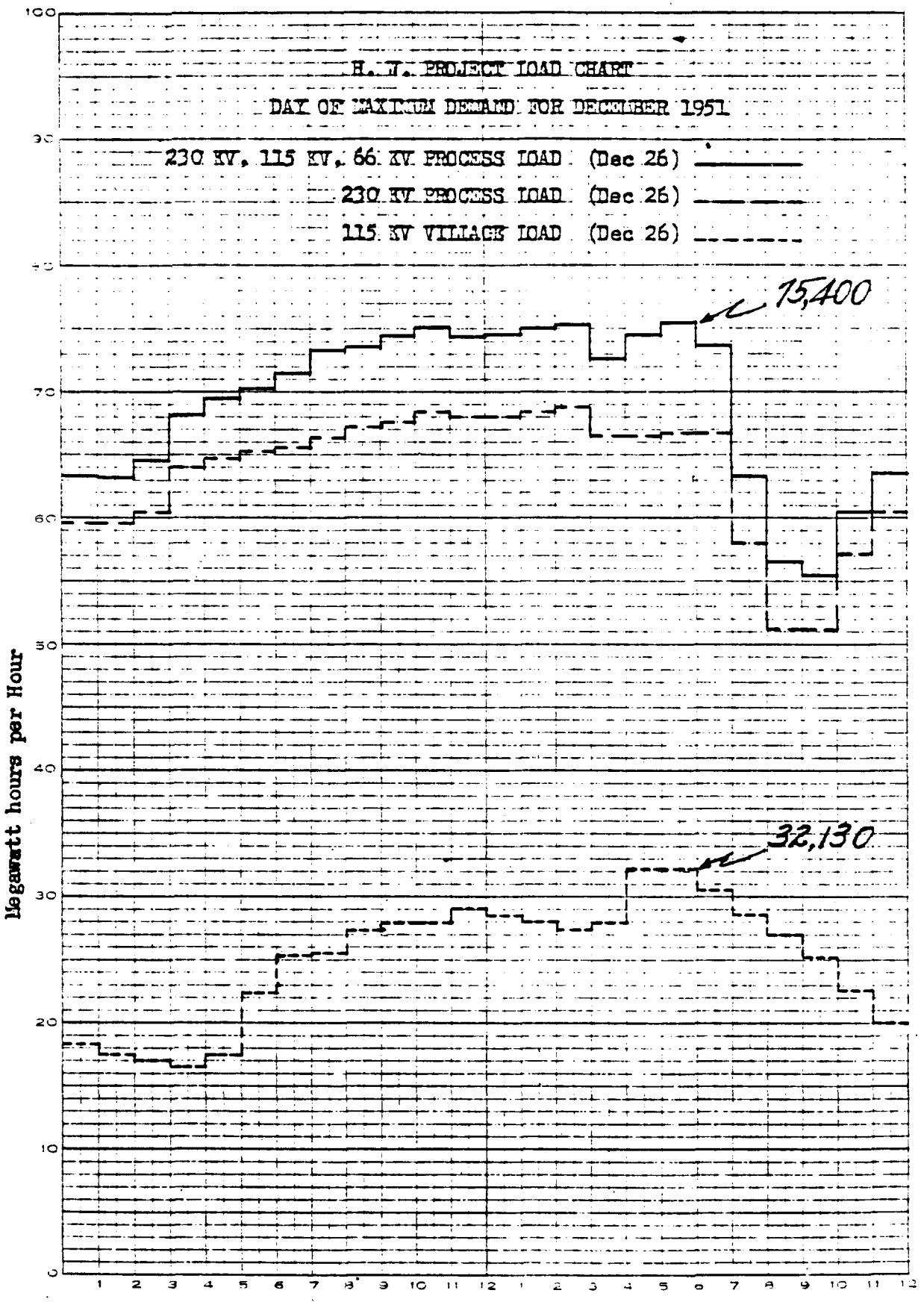
*Coincidental Demand
**Non-Coincidental Demand

Average Power Factor - 230 KV System--93.3
Average Power Factor - 115 KV System--95.3
Average Power Factor - 66 KV System-- 89.4

282

[redacted]

1225098


H. J. PROJECT LOAD CHART
DAY OF MAXIMUM DEMAND FOR DECEMBER 1951
230 KV, 115 KV, 66 KV PROCESS LOAD (Dec 26)
230 KV PROCESS LOAD (Dec 26)
115 KV VILLAGE LOAD (Dec 26)
75,400
32,130
Megawatt hours per Hour
100
90
80
70
60
50
40
30
20
10
0
1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12

1225099

EMPLOYEE AND PUBLIC RELATIONS DEPARTMENT

SUMMARY -- DECEMBER, 1951

The number of applicants interviewed in December was 1,110 as compared to 1,655 interviewed in November. Of these applicants, 331 were individuals who applied for employment with General Electric for the first time. In addition, 113 new applications were submitted through the mail. Open, nonexempt, nontechnical requisitions decreased from 267 at the beginning of the month to 178 at month end. Total plant roll increased from 9,070 to 9,104. Turnover rate increased from 1.17% in November to 1.41% in December. During December, 45 new requests for transfer to other type of work were received in the Employment Office, and 15 transfers were effected. Attendance recognition award pins and wallet cards were distributed and presented to 107 employees who qualified for one-year awards during November. As the result of the Atomic Energy Commission assuming responsibility for the work handled by the Contract Services Unit, it was necessary to terminate 14 employees on a lack of work basis. An aptitude testing procedure has been set up and is being administered for all new clerical personnel, both male and female. To date 23 of the temporary clerks presently in our force have been placed, and it now appears that Payroll will be able to absorb the balance, thereby eliminating a reduction of force.

Three employees, one of whom was retired, died during the month, and one employee retired. One hundred ninety visits were made to employees confined at Kadlec Hospital and 60 checks were delivered to employees confined either at home or at the hospital. At month end, participation in the Pension Plan was 94.4%, in the Insurance Plan, 98.2%, and in the Employee Savings and Stock Bonus Plan 42.7%. On December 4, a luncheon was held for all Hanford Works pensioners, which 60 were able to attend, and which initiated the program for an annual get-together for our retired employees. To date 181 employees have retired from Hanford Works. As of the end of December, there were 1,042 employees registered under Selective Service, and 758 military reservists on the rolls. Since August 1, 1950, 172 employees have terminated to enter military service, of which 15 have returned, leaving 157 still in military leave status.

Employee and Public Relations
Summary

A total of 49 news releases were distributed during the month. Of these, 39 were sent to the "local list". Three stories have been completed for annual progress editions of various newspapers.

A statement of General Electric Company's policy regarding the release of information concerning serious accidents that occur behind the perimeter barricade was prepared and given to the local newspapers.

The feature article on the inspection of incoming materials at Hanford Works, which was sent to Western Industry Magazine last month, appeared as the lead article in the December issue of that magazine.

The HOBSO Action Committee of Richland was assisted in its efforts to present HOBSO on the community level. At the Committee's request, a letter was written for mailing to all officers of Richland and North Richland P.T.A. groups inviting them to see a special presentation of the HOBSO Appreciation Session.

Five papers were submitted for clearance during the month, and six different speeches were delivered by members of Hanford Works.

Civil Defense movies were shown to approximately 115 G-E employees and members of community clubs and organizations.

A letter to civil defense district wardens was written. It served to introduce the new Chief Warden, furnish up-to-date information about the Hanford Civil Defense Organization, and mention that future plans and activities are being developed for the Warden Service.

A total of 5661 prints of photos were produced during the month. Of the total prints produced, 4304 were for employee identification and area admittance badges. Arrangements were made to photograph each member of management and speakers of the General Electric Company at Hanford Works, to be used in connection with news releases, magazines articles, and other public relations activities.

Paper conservation promotion activities included completion of a pamphlet entitled "On Guard" which explained ways to conserve paper. In addition, three "Imagine America Without Paper" Works News messages were published.

Four women's pages were prepared and published in the Works News during the month.

The Red Cross Blood Program was featured twice in the Works News during the month giving individual recognition to an employee for his outstanding efforts in recruiting blood donors.

Employee and Public Relations
Summary

Two letters to supervisors were written and distributed, and distribution of a third was handled. Subjects were: "Change in Holiday Pay Policy for Exempt Employees" and "Change in Vacation Plans."

Booklet information racks for an employee information service were completed. Arrangements were made with the Public Relations Services Division in Schenectady to receive G-E pamphlets and booklets for insertion in the racks on a no-charge basis.

The Special Programs supervisor was appointed Secretary of the Safety Program Committee of the Nucleonics Safety Council. He also represents the Employee and Public Relations Department on the Committee.

During the week of December 10-14, a total of 30 supervisors were enrolled by the major departments and participated in the Supervisors' 40-Hour Training Program.

On December 4, 11 and 18, sixty-five employees of the Design and Construction Services Unit participated in the 8-Hour Nonexempt Training Program.

During December, 80 supervisors attend and completed PMS conferences through No. 13, while an additional 80 supervisors completed PMS conferences through Meeting No. 5.

The program, "Accountability of Source and Fissionable Materials", was presented to a group of supervisors at the request of the Chemical Development Unit.

A talk, "Personality Development", was presented to 25 employees of the Commercial Facilities and Public Health Groups.

HOBSO institutes were held twice during the month to train instructors of State Jaycees in the appreciation version of HOBSO.

A total of 134 people attended orientation during December.

Supervisors' Handbooks returned by terminating employees were reissued, and revised Section 3 of the Handbook was addressed and distributed to approximately 1,500 Handbook holders.

Copies of "You and General Electric at Hanford Works" were distributed to the 2,200 employees who came on roll from March to November, during which time this employees' handbook was being revised.

Employee and Public Relations
Summary

A copy of the 1952 Objectives for Training and Program Development Section was sent to all members of senior management in the Nucleonics Division at Hanford Works.

The new in-service training program was inaugurated within the Training Section to broaden the knowledge and viewpoint of all Training Section personnel.

The NLRB advised that two petitions for representation had been submitted to them by the HAMTC. These involved Engineering and Construction Department Janitors and Dispatchers - Wire Chiefs, respectively. Meetings have been held between the Company, the Unions, and the FMCS relative to the Union Security issue at Hanford Works.

CISC recommends 62½ cents per day increase in isolation pay and a rate of $2.52 per hour for Sheet Metal Workers. AJ, GE and the Commission are protesting this recommendation. AJ insists on certification elections prior to agreement to a Union Shop provision in the Master Agreement. Carpenters demanding nine cents per hour increase above the maximum allowable under WSB regulations. Already agreed to in Spokane and Tri-City Areas. Schmidt of Davis Panel to be in Richland January 19, 1952, to attempt arbitration of Machinist dispute.

EMPLOYEE AND PUBLIC RELATIONS DEPARTMENT

DECEMBER, 1951

ORGANIZATION AND PERSONNEL

Employment and Employee Services

Effective December 18, 1951, a General Clerk "C" assigned to Sign Up terminated voluntarily to leave this vicinity.

Effective December 26, 1951, a Messenger assigned to Investigations and Personnel Files terminated voluntarily to remain at home.

Public Relations

Effective December 14, 1951, one Reproduction and Photographic D, assigned to Public Relations, terminated to accept other employment.

Effective December 19, 1951, one General Clerk D was added to this Section.

Training and Program Development

Effective December 1, 1951, a Training Staff Assistant was transferred to the Design and Construction Management Section of the Engineering Department.

Union Relations

No organizational changes during December.

Number of Employees on Roll	December
Beginning of Month	111
End of Month	109
Net Decrease	2

1225104

Employee and Public Relations

ACTIVITIES

Employment and Employee Services

Employment

	November, 1951	December, 1951
Applicants interviewed	1,655	1,110

331 of the above applicants interviewed during December were individuals who applied for employment with the Company for the first time. In addition, 113 new applications were received through the mail.

Open Requisitions	November, 1951	December, 1951
Exempt	2	1
Nonexempt	267	178

Of the 267 open, nonexempt, nontechnical requisitions at the beginning of the month, 170 were covered by interim commitments. Of the 178 open, nonexempt, nontechnical requisitions at month end, 95 were covered by interim commitments. During December, 98 new requisitions were received requesting the employment of 130 nonexempt, nontechnical employees.

	November, 1951	December, 1951
Employees added to the rolls	183	162
Employees removed from the rolls	106	128
NET GAIN OR LOSS	+ 77	+ 34

Of the 128 employees removed from the rolls, 14 were removed due to lack of work, and all were outside the bargaining unit.

Turnover:	November, 1951		December, 1951	
	Male	Female	Male	Female
Including employees who were laid off for lack of work	.89%	2.22%	.69%	3.36%
Excluding employees who were laid off for lack of work	.87	2.22	.80	2.95

Over-all Turnover:	November, 1951	December, 1951
Including employees who were laid off for lack of work	1.17%	1.41%
Excluding employees who were laid	1.16	1.25

1225105

Employee and Public Relations

During December, 27 employees terminated voluntarily to accept other employment, 16 terminated to leave this vicinity and 5 terminated to enter business for self.

Transfer Data

Accumulative total of requests for transfer received since 1-1-51	652
No. of requests for transfer received during December	45
No. interviewed in December, including promotional transfers	70
Trans. effected in December, including promotional transfers	15
Trans. effected since 1-1-51, including promotional transfers	437
Trans. effected in Dec. for employees given lay off notices	13
Trans. effected since 1-1-51 for employees given lay off notices	35
No. of stenos. transferred out of steno. pool in December	2
Transfer requests active at month end	141

During December, 13 people whose continuity of service was broken while in an inactive status were so informed by letter.

As a result of the Atomic Energy Commission assuming the responsibility of the work previously handled by the Contract Services Unit of the Design and Construction Section, 7 male and 7 female employees were laid off due to lack of work.

One-year emblems and wallet cards in recognition of perfect attendance were presented to 107 employees in December, who qualified during November.

During the month it was determined by the Manufacturing Department that they now have sufficient instrument trainees. In fact, commitments made will give them an excess of 10. The schools were notified to temporarily discontinue referrals. The Reactor Section has advised that out of the 12 instrument trainees received on the fifteen-month rate, or graduates from the trade schools in the East, 5 appear to be above average, 6 should develop into average employees, and there is some doubt as to whether 1 will adapt to our particular type work.

In addition to regular correspondence, the Auto Typist handled 16 letters for Employee Services, 142 letters for Medical Department and 71 letters for Technical Personnel, during the past month.

An aptitude testing procedure has been set up and is being administered for all new clerical personnel, male and female, including checkers.

Shirley Kreimeier, Assistant Employment Supervisor, addressed the Commercial Club of Columbia High School on Monday, December 3, outlining some of the qualities of a good stenographer. The talk was concluded with a brief description of what G.E. looks for in a stenographer as far as ability, and what we can offer to the qualified girls after graduation. Tentative arrangements were made for the Employment Supervisor, P.A. Bundy, to talk to this group at a later date.

Employee and Public Relations

Of the temporary clerks which are or will be in excess, 13 were placed during December, making a total of 23 being placed. At the present time, depending upon work load, it appears that Payroll will be able to absorb the balance, thereby eliminating any lay offs.

Employment Statistics

Number of employees on rolls	11-30-51	12-31-51
Exempt - Male	1,935	1,947
Female	56	56
	1,991	2,003
Nonexempt - Male	5,138	5,180
Female	1,885	1,865
	7,023	7,045
Community Firemen	56	56
TOTAL	9,070	9,104

ADDITIONS TO THE ROLLS

	Community Firemen	Exempt	Nonexempt	Total
New Hires	0	4	133	137
Re-engaged	0	0	0	0
Reactivations	0	0	24	24
Transfers (from other plants)	0	1	0	1
Actual additions	0	5	157[b]	162
Payroll exchanges	0	30[a]	0[b]	30
GROSS ADDITIONS	0	35	157	192

TERMINATIONS FROM THE ROLLS

Actual Terminations	0	22	69	91
Removals from the rolls (deactivations)	0	0	36	36
Payroll exchanges	0	0[c]	30[d]	30
Transfers (to other plants)	0	1	0	1
GROSS TERMINATIONS	0	23	135	158

GENERAL

	11-1951	12-1951
Applicants interviewed	1,655	1,110
Photographs taken	326	255
Fingerprint impressions (taken in duplicate)	371	273

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1225107

Employee and Public Relations

ABSENTEEISM STATISTICS F
(Weekly Salary Roll)

	11-1951	12-1951
Male	2.15%	2.15%
Female	4.13	4.36
Total Plant Average	2.57	2.64

PERSONNEL SECURITY QUESTIONNAIRES PROCESSED

General Electric cases	167	140
Facility cases	46	57
TOTAL	213	197

INVESTIGATION STATISTICS

Cases received during the month	303	261
Cases closed	312	347
Cases found satisfactory for employment	249	284
Cases found unsatisfactory for employment	15	11
Cases closed before investigations completed	56	0
Special investigations conducted	79	13

PERFECT ATTENDANCE RECOGNITION AWARDS

Total one-year awards to date	1,884
One-year awards made during December for those qualifying in November	107

a Transferred from Weekly Payroll
b Transferred from Monthly Payroll
c Transferred to Weekly Payroll
d Transferred to Monthly Payroll
f Statistics furnished by Weekly Payroll

Employee Services

The following visits were made with employees during the month by a representative of Employee Services:

Employees visited at Kadlec Hospital	190
Salary checks delivered to employees at Kadlec Hospital	54
Salary checks delivered to employees at home	6

As of the end of December, participation in Company Benefit Plans was as follows:

Pension Plan	94.4%
Life and Health Insurance Plan	98.2
Employee Savings and Stock Bonus Plan	42.7

PRIVACY ACT MATERIAL REMOVED

Employee and Public Relations

Two active employees and one retired employee died during December, namely:

[redacted], W-5745-XM, Manufacturing Department;
W-6995-MP, Manufacturing Department; and
retired employee.*

(*Although [redacted] died during November, notification was not received here until in December.)

Twenty-one letters were written to deceased employees' families during the month, concerning payment of monies due them from the Company, as well as answering other pertinent questions for them.

Since September 1, 1946, 72 life insurance claims have been paid totaling $ 391,500.00.

One employee retired during the month, namely:

John O. Marshall, W-3259-SJ, Utilities and General Services Dept.

On December 4, a luncheon was held for all Hanford Works pensioners, which initiated the program for an annual get-together for our retired employees. Of the 86 pensioners residing nearby, 60 were able to attend. The principal speaker for the occasion was the Hanford Works General Manager, G.R. Prout.

To date 181 employees have retired at Hanford Works. During the past month all of these employees were contacted either in person or by mail in line with our practice of making annual contacts with pensioners.

In connection with the Pre-Retirement Program recently initiated here at Hanford Works, 15 contacts were made during December.

Military Reserve and Selective Service

The statistics with respect to employees registered under Selective Service are as follows:

Employees registered	1,042
Employees registered who are veterans	509
Employees registered who are nonveterans	533
Employees subject to the draft	367
Deferments requested to date (including renewal requests)	409
Deferments granted	246
Deferments denied and appealed at state levels	20
Deferments denied and appealed at national levels	5
Deferments denied by local board and not appealed	1
Deferments denied by state board and not appealed	1
Deferments denied at national level (by Gen. Hershey's office)	1
Deferments requested, employees later reclassified	41
Deferments requested, later withdrawn	18
Deferments pending	76

PRIVACY ACT MATERIAL REMOVED

1225109

Employee and Public Relations

Statistics with respect to employees who are members of the military reserve are as follows:

Number of reservists on the rolls	758
Number who returned to active duty to date	89
Number who returned to active duty in December	0
Deferments requested to date	103
Deferments granted	96
Deferments pending	0
Deferments denied	4
Deferment requests withdrawn	3

Military terminations since 8-1-1950 are as follows:

Reservists recalled	89
Selective Service	81
Female employees enlisted	2
TOTAL	172

Employees returned from military service:

Reservists	14
Selective Service	1
TOTAL	15

Number of employees still in military leave status 157

PUBLIC RELATIONS

PUBLIC INFORMATION

A total of 49 news releases were distributed during the month. Of these, 39 were sent to the "local list" and two were sent to the "daily list". Eight were answers to requests from various newspapers.

A statement on General Electric Company's policy regarding the release of information concerning serious accidents that occur behind the perimeter barricade was prepared and printed on the front page of the Works News. Copies of this policy statement were given to the Columbia Basin News and Tri-City Herald.

A letter outlining arrangements that have been made to provide material for news stories about accidents, serious injuries, fires, and disasters was sent to all department managers as well as persons involved in the procedures that were set-up. Apparently, the arrangements made are satisfactory. The News Bureau has been receiving prompt reports of injuries and accidents from the emergency office or safety personnel, and the resulting stories have satisfied the local press. Eight stories of this type were distributed during the month.

Fourteen recreation stories were written for the "local list".

Three stories have been completed for annual progress editions of various newspapers. A story about business development in Richland was sent to the Spokesman Review, and to the Daily Journal of Commerce in Seattle. A story about construction development of Richland churches was sent to the Walla Walla Union Bulletin. Considerable work was done on several other feature-type stories being prepared for various annual editions. They will be published late in January.

A news release was sent to the daily list explaining the payment by checks of approximately $128,000 to certain present and past employees of the General Electric Company. Later, in answer to a request from the Tri-City Herald, an explanation was released concerning the paragraphs printed on the back of each check issued.

A story was released to the daily list announcing that effective January 1, 1952, General Electric employees at Hanford Works are eligible to receive three weeks vacation with pay after fifteen years continuous service.

The completion of current Kadlec Hospital construction program activities was announced. The news story was developed and approved during the month.

A group of photographs taken by the Photo House were sent to the person in the Schenectady News Bureau who is responsible for submitting material to college press. These were sent at the request of the News Bureau in the East and may be used in a mailing of suggested frontis pieces for college engineering magazines.

Information and photographs concerning the North Richland trailer camp were sent to a student of Washington State College at his request.

Paul Deutschman, former Denver Post Newspaperman, who is presently teaching and doing post-graduate work at the University of Oregon, spent three days in Richland gathering additional information for his master's thesis which is on the subject of conventional government for Richland. Interviews were arranged with Mr. Huck and Mr. Prout.

Vance Orchard, Walla Walla Union-Bulletin roving reporter, visited the News Bureau twice during the month to obtain feature stories.

A feature story on a boat used by Radiological Sciences to collect river botton samples was written and sent to Pacific Motor Boat Magazine. Photographs to illustrate the story were included.

The feature article on the inspection of incoming materials at Hanford Works, which was sent to Western Industry Magazine last month, appeared as the lead article in the December issue of that magazine. The News Bureau has requested 100 reprints of the article for distribution by Purchasing to its vendor inspectors and vendors. Purchasing has already requested that another article be done on their inspection procedures, to be sent to the same magazine.

The HOBSO Action Committee of Richland was assisted in its efforts to present HOBSO on the community level. At the Committee's request, a letter was written for mailing to all officers of Richland and North Richland P.T.A. groups inviting them to see a special presentation of the HOBSO Appreciation Session. Also, proposed opening and closing remarks for the meeting were furnished to the Committee Chairman at his request.

Luncheon meetings with community leaders were planned for January 24 (businessmen) and January 31 (ministers and educators). A program consisting of speakers and a question-and-answer period was outlined.

Community information in the Works NEWS included a story on the school board, employees presently serving on it, and information on how interested employees or others may file for the office of school board members.

Five Papers were submitted for clearance during the month.

At the request of the "Technical Association of the Pulp and Paper Industry", (TAPPI) a speaker was selected to address the Pacific Section meeting in Olympia, Washington, January 5, 1952, on the subject, "Radioisotope Tracers in Industry." Dr. John H. Rediske, an addition to the Speaker's Bureau and member of the Biology Section, was selected to address this group. Appropriate publicity was prepared and all transportation arrangements made for Mr. Rediske.

"Our Relations at Hanford Works" was the subject of a visualizer presentation made by the Department Manager to the Richland Rotary Club.

Dr. L. K. Bustad, of Radiological Sciences, presented a talk on "Toxicology of Radioiodine in Suffolk Sheep" to members of the Stockmen's Course at Washington State College.

W. E. Johnson spoke before the Pasco Chamber of Commerce. The subject of his speech was "Thumnail Sketch of the Atomic Energy Industry".

3-3-3-3-3-3

Purdue University students at Lafayette, Indiana, listened to an address on "Nuclear Engineering at Hanford Works," given by F. A. R. Stainken, a G. E. representative from Hanford Works.

D. E. Warner, of the Radiological Sciences Department, presented "Toxicology of Radioiodine in Suffolk Sheep" to the local F. F. A. Chapter.

At the request of the G. E. Apparatus Office in Tacoma, "Design Problems in Nuclear Engineering", was the subject of a presentation made by Reed Overson, Hanford Works engineer, to the Tacoma Sub-Section of the American Institute of Electrical Engineers. Overson substituted for Pat Cabell, author, who was unable to make this engagement. A news release based on this speech was sent to the daily list.

Civil Defense bulletin no. 6 was distributed to Richland and North Richland residents.

A biological warfare radio script was rewritten to include all information essential to survival under such an attack. The script will be reviewed by civil defense officials for technical accuracy, before it is released for public broadcast.

A civil defense poster for placement in Richland and North Richland buildings inspected for CD consideration was placed in production.

CD news stories and pictures released to local newspapers concerned the following: distribution of CD bulletin no. 6; letter sent to district wardens; printed material about civil defense available at the Richland CD Control Center.

Talks about Civil Defense were given by local officials before approximately 75 G-E employees.

CD movies were shown to approximately 115 G-E employees and members of community clubs and organizations.

A letter to civil defense district wardens was written. It served to introduce the new Chief Warden, furnish up-to-date information about the Hanford Civil defense organization, and mention that future plans and activities are being developed for the Warden Service.

Maps of Richland and North Richland showing District, Zones, and Blocks and the numbers of each were corrected and are being produced for distribution to each prospective warden in Civil Defense. As each Warden is contacted he will be given one of these up-to-date maps.

Letters to each former District Warden were prepared for Assistant Deputy Director's signature. These letters advised the District Wardens of the change in assignments to the plant departments, requested their reaffirmation of their former positions, and asked for their assistance.

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more

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4-4-4-4-4-4

Personal contact with former District Wardens has begun following letters and subsequent publicity.

Each district warden on contact is being given an up-to-date residence address of each former Zone Warden in his district. These lists were prepared by checking housing records.

Organization charts are being prepared for each District. From these will be prepared a large poster size chart showing a typical District, and will be used in subsequent warden meetings and training programs.

District No. 6 (North Richland) has been reorganized to resemble as closely as possible the district organizations in Richland.

Control center operation procedure for the Warden Service was prepared and forwarded to Assistant Deputy Director.

Those members of the North Richland Civil Defense organization whose responsibilities have been removed as a result of reassignments were notified by letter.

Advertisement for a Public Health Caseworker in the January issue of "Social Caseworker" magazine was handled. In addition, follow-up activities necessary to effect payment for advertisements placed prior to December included writing for additional tearsheets, and developing appropriate vouchers.

PHOTOGRAPHIC SERVICES

A total of 5,661 prints of photos were produced during the month. Of the total prints produced, 4304 were for employee identification and area admittance badges.

Arrangements were made to photograph each member of management and speakers of General Electric Company at Hanford Works, to be used for news releases, magazine articles, and other public relations activities. It was concluded by the Photo House Supervisor that portraits could be made cheaper on contract with a local portrait photographer. He will expose the negative, retouch it, and make one print. The negative and print will become the property of General Electric Company, Hanford Works, Photo House, for printing and reprinting.

Motion picture film classified as Secret was carried to Seattle and processed and returned by a member of the Photo House. A regular procedure has been established for the transporting and processing of classified motion picture films by the Photo House.

See statistical report of Photo House activities attached.

PROGRAM DEVELOPMENT

Extensive services, including lapel identification cards, organ music, public address system and other hospitality functions were furnished to Employee Services for the dinner they sponsored for retired G-E employees at Hanford Works. Reprints of the program for the get-together were ordered. These will be distributed by Employee Services to those retired employees who could not attend the dinner.

-5-5-5-5-5-5-5-

Paper conservation activities included completion of a pamphlet entitled "On Guard" which explained ways to conserve paper. In addition, three "Imagine America Without Paper" Works NEWS messages were published. Posters of these Works NEWS messages were posted in key locations throughout the plant.

A "live" broadcast was made by a local radio station of an interview conducted during the dinner for retired G-E employees at Hanford Works between four of the guests and two Employee and Public Relations Department supervisors.

As a community service, a thirty-minute radio program of choir music was tape-recorded for broadcast during the holiday season by local radio stations. Spot announcements were written, tape-recorded and broadcast to help publicize a benefit dance at Camp Hanford for Korean War Orphans.

The General Manager's address on "Hanford Works...and the Atomic Energy Program" given before the Chamber of Commerce at Sunnyside, Washington, was tape-recorded and edited for radio broadcast by Sunnyside and local stations.

Three twelve-minute devotional programs were produced and tape recorded for radio broadcast as a special service to one of the local church groups.

The General Manager was featured on a tape recorded radio program in which he related "The Thompson Story", and included his New Year's message. It was broadcast to all employees and Tri-City neighbors by local radio stations.

"Here's to Your Health!", a sound-slide film written and produced by Public Relations was completed and presented to the Director of the Medical Department and his staff. The Medical Director later used the film as his presentation before the Supervisor's 40-hour training program.

Three films from the Seattle G-E film Distribution Center were booked for presentation during the month.

EMPLOYEE INFORMATION

Four women's pages were prepared and published in the Works NEWS during the month. The pages featured holiday foods for Christmas giving, house cleaning suggestions for the holidays, suggestions for safest Christmas toys, prevention of holiday accidents around the house, a feature on table ware chosen for "Good Design" by the Museum of Modern Art, and suggestions for buying linens during January White sales.

A full-page layout was done on the Richland Symphony Orchestra, and a half-page each on the Pensioner's Dinner and the Richland firemen's toy repair project.

The Red Cross Blood program was featured twice during the month giving individual recognition to an employee for his outstanding efforts in recruiting blood donors, and recognition again to all that volunteered their blood during the drawing. This was accomplished by publishing all donors names. In addition an editorial cartoon was published to help promote the idea of giving blood.

Safety shoes were publicized in a feature story with a picture to draw employees attention to the new shoe bus that is visiting each area. The schedule under which it will operate also was run.

The attainment of the Nucleonics Safety Council Award was included prior to press time making the announcement that the award had been won. A full promotion program in conjunction with Safety and Fire Protection is being planned in which the progress of securing prizes, what they are, and plans for their distribution all will be covered. One progress story has already been published.

Season's greetings for the Christmas and New Year's issues was a subject requiring special efforts by the staff. Pictures in the Christmas theme were published as were appropriate editorials for each issue. A New Year's message was written up for the signature of both the A.E. C. Hanford Operations Manager and the Company Vice President for all employees.

Suggestion System promotion was included in two different issues. A pictorial feature on the largest award ever to be made at Hanford Works was the subject in one week's issue, and a regular award feature with pictures and story was the other.

A booklet on "65 Ideas for Christmas Lighting" was offered...and 20 were mailed out at the request of readers. One hundred twenty free patterns were mailed out to readers.

The Works NEWS carried a story on the Hanford Works Attendance Award Plan. The story announced that 134 more employees have received one-year pins. It also pointed out that Utilities & General Services Department has the highest percentage of participation in this plan.

The Union Relations news column answering a recent radio attack on the Company by a CIO organizer was written and published in the December 7 Works NEWS issue.

Two letters to supervisors were written and distributed, and distribution of a third was handled. Subjects were change in holiday pay policy for exempt employees; change in vacation plan allowing three weeks' vacation with pay for employees, under the original contract, who performed work which has since been reclassified as construction, rather than maintenance and repair.

Letters clarifying correct usage of the standard G-E signature and monogram were sent to Procedures Analysis and to the Manufacturing Department's illustrator. Correct use of the monogram and signature on local books and on a report cover was arranged.

Industrial Medical pamphlet "Step to Better Health," which urges women employees to take a more thorough physical examination, was completed.

Montly health bulletin "Your Aching Back" was developed; it will be distributed in the first week of January.

January safety topic of the month "Bright and Early" was developed and printed at the request of Safety.

Three thousand reprints of the recruitment pamphlet "Atomic Test" were obtained at the request of the Technical Personnel Office.

Purchase requisitions covering two grievance booklets-one for supervisors and one for all employees-were issued. Writing and obtaining approval of these booklets, and developing comprehensive dummies, was completed during December.

Request from the Michigan Historical Society for a large quantity of reprints of the booklet "General Electric Company's Records Management Program at Hanford Works" was answered with the suggestion that reprints could be obtained easily by the Society through some local photo-offset print shop, and that permission to reprint was granted.

Booklet information racks for the new employee information service were completed. In addition, arrangements were made with Schenectady to receive G-E pamphlets and booklets for insertion in the racks on a no-charge basis. Arrival of booklets is expected early in January.

Hanford Works Posting Service activities included the installation of: four Sheldon-Claire employee relations posters, four G-E Photo News Service posters, three posters on cold prevention, and a paper conservation poster. Six additional partial sets of Sheldon-Claire posters were received and the frames installed. Six additional G-E Photo News Service frames also were received.

The following items were developed and placed in production: revised Hanford Works News letter for community leaders; a poster covering the recent $1500 suggestion award; and reprint of the booklet "Records Management Program at Hanford Works."

Special Programs supervisor was appointed secretary of the Safety Program Committee of the Nucleonics Safety Council, in addition to representing the Employee and Public Relations Department on the Committee.

Five editorial cartoons were produced for the Hanford Works NEWS. In addition the commercial artist's work during the month included design, illustration, and layout work for bulletins, posters and booklets created by Public Relations.

News Bureau Space Report--See last page of report.

Hanford Works Photo House
Month of December

	2 x 2	2 x 4	5 x 7	8 x 10	Negatives	35 MM color	3½ x 4	11 x 14	Transportation	Processed	4 x 5
COMMUNITY REAL ESTATE & SERVICES											
Parks & Recreation			23								
Police			88		40						
EMPLOYEE AND PUBLIC RELATIONS											
Employment					232						
News Bureau			71	40	53						
Special Programs			69	5	39			1			
Radio & Special Events				37	8						
Works News			136	7	90						
ENGINEERING											
Design & Construction			51		3						
Pile Technology			6	8	6		3				
Technical			24	3							
Rotational Training									20		15
MEDICAL											
MANUFACTURING											
Plant Engineers				48	21		loan 32			5rls.	
Reactor Section						300 ft.					
UTILITIES AND GENERAL SERVICES											
Purchasing & Stores				12	12						
Security	4304	619		6	148						
Fire & Safety			2	64							
Transportation				3	1						
MISCELLANEOUS											
Civil Defense			4		2						
AEC Safety				18							
AEC Security				12							
TOTAL	4304	619	474	263	655	300ft.	3	1	20		15

Total prints- 5,661
Total Negatives 655 Assignments 103

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NEWSPAPER SPACE REPORT
November, 1951
As Compiled from the Nucleonics Division News Bureau clipping files

SUBJECT	NEWSPAPER	COL. IN.	PHOTOS
Plant General	Columbia Basin News	4½	1
	Yakima Herald	11	
	Spokane Chronicle	8	3
	Walla Walla Union Bulletin	4	
	Portland Daily J. of Commerce	2	
	Seattle Times	2	
	Oregon Journal	3½	
	Seattle Post Intelligencer	3	
Commercial Facilities	Tri-City Herald	10	
	Spokesman Review	6½	
	Walla Walla Bulletin	4½	
	Seattle Daily J. of Commerce	20	
	Columbia Basin News	43/4	
	Portland Daily J. of Commerce	8½	
	Spokane Chronicle	1½	
Recreation	Columbia Basin News	8½	9
	Tri-City Herald	11½	4
	Walla Walla Union Bulletin	3½	
	Spokane Chronicle	5½	
Safety (Bus-Army Accident)	Seattle Post Intelligencer	2	
	Olympian, Daily	2	
	Port Angeles News	2	
	Seattle Times	4	
	Yakima Herald	1½	
	Spokane Chronicle	2	
Organization Changes	Walla Walla Bulletin	2	
	Tri-City Herald	2	
Plant Hiring (9000th employee)	Washington State Evergreen	4½	
	Oregonian	1½	
	Spokane Chronicle	4	1
	Hanford Works News	7	1
	Columbia Basin News		1
	Walla Walla Bulletin	5½	1
	Tri-City Herald	7	
	Spokesman Review	5	
	Portland Journal of Commerce	1	
Speakers	Seattle Daily J. of Commerce	2	
	Tri-City Herald	4½	
	Seattle Times	4	
	Idaho Falls Post Register	4	
	Spokesman Review	3	
	Walla Walla Union Bulletin	3½	
	Bremerton Sun	3	
	Baker Democrate Herald	2½	
	Olympian	3½	
	East Oregonian	4½	
	Oregon Journal	3	

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SUBJECT	NEWSPAPER	COL. IN.	PHOTOS
Personnel General	Hanford Works News	1	
	Tri-City Herald	2½	
	Walla Walla Bulletin	2½	
	Spokane Chronicle	2	
Community General	Spokane Chronicle	40½	
	Columbia Basin News	12	
	Hanford Works News	3½	
	Walla Walla Union Bulletin	6	
	Prosser Record Bulletin	5	
	Tri-City Herald	4	
	Spokesman Review	2	
Plant Construction	Seattle Daily J. of Commerce	7	
	Walla Walla Union Bulletin	6	
	Yakima Herald	4½	
	Columbia Basin News	5½	
	Portland Daily J. of Commerce	10½	
	Spokesman Review	2	
	Oregon Journal	1	
	Tri-City Herald	5	
	Spokane Chronicle	3	
Community Construction	Portland Daily J. of commerce	29	
	Tri-City Herald	7	
	Seattle Daily J. of Commerce	24½	
	Yakima Herald	1	
	Columbia Basin News	9½	
Civil Defense	Tri-City Herald	42½	3
	Hanford Works News		1
	Columbia Basin News	6	3
	Spokane Chronicle	14	2
	Yakima Herald	3½	
	TOTAL	451 col. in.	30

Employee and Public Relations

TRAINING AND PROGRAM DEVELOPMENT

During the week of December 10 to 14, a total of 30 supervisors were enrolled by the major departments and participated in the Supervisors' 40-Hour Training Program. Again on Friday of that week, luncheon was provided for the participating members and five members of senior-management as guests. Although this was the last presentation of the Supervisors' 40-Hour Training Program as it has been known for the past three years, a revised new Supervisors' 40-Hour Training Program will be presented throughout 1952.

On December 4, 11, and 18, the 8-Hour Non-Exempt Training Program was presented at the request of the Design and Construction Services Unit. A total of 65 employees participated in this information program.

During the month of December, PMS Groups 17, 18, 19, and 20 completed the conferences through No. 13. Groups 21, 22, 23, and 24 completed PMS conferences through Meeting No. 5. No meetings were conducted during Christmas or New Year's week due to no PMS conferences being held during a week in which a holiday occurs.

A special meeting was presented at the request of the Chemical Development Unit in the 300 Area, on "Accountability of Source and Fissionable Materials" on December 6. A total of seven new supervisors of the hot semi-works of the Chemical Development Unit were in attendance.

Recently a member of the Training Section developed a talk "Personality Development" and presented it before a group in Richland. This talk was so well accepted that a request was received for presentation to 25 employees of the commercial facilities and public health groups. This presentation was made on December 18 and was well accepted.

At the request of the Public Relations Section, a special HOBSO institute was conducted on December 8 and 9, and again on December 17 and 18, to train personnel in the State Jaycees to present the appreciation version of HOBSO in their local communities. A total of 11 persons participated in these HOBSO institutes and qualified for presenting HOBSO.

1225121

Employee and Public Relations

TRAINING AND PROGRAM DEVELOPMENT

Orientation of new employees was held every working day throughout the month. A total of 134 persons attended, including 131 new employees, one transfer, and two re-activated. Of the total number, 97.1% elected to participate in our Group Insurance Plan.

During the month, 14 Supervisor's Handbooks were revised and re-issued. No net change has been made in the total number of Handbooks issued. In December the revised Section 3 of the Handbook was received from the printer. These were addressed and distributed to all existing Handbook holders.

Copies of "You and General Electric at Hanford Works" were distributed to the 2200 employees who came on roll from March to November, during which time this employees' handbook was being revised. During this period, new employees at orientation were told that they would receive a copy of the revised handbook when they were available.

On December 20, a group of management interested in civilian defense activities at Hanford Works attended a preview of a new McGraw-Hill film "Disaster Control." This film was borrowed directly from McGraw-Hill in New York arranged by T. S. Lisberger of our New York office.

On December 28 a copy of the 1952 Objectives for Training and Program Development Section was sent to all members of senior-management in the Nucleonics Division at Hanford Works. Incidentally, several telephone calls have since been received from recipients stating that the program as outlined for 1952 is quite desirable and well presented. Several section managers have called and at their request we are furnishing them with information regarding programs that their personnel have attended in the past, with the thought in mind that even existing supervisors may be given an opportunity to attend some of the training programs that they did not attend when originally presented. A new phase of operation of training that will be practiced, starting in 1952, is to make programs available for new exempt personnel immediately upon promotion. This includes, for example, a "Management Orientation" program which will be presented the first Monday of each month throughout 1952.

Employee and Public Relations

TRAINING AND PROGRAM DEVELOPMENT

One copy of the book "Men and Volts" was sold during December; 50 copies of the GE-HAMTC Agreement were made available to Labor Relations Section, and several copies of miscellaneous plan booklets were made available to supervisors upon request.

Beginning with the last staff meeting of December held by Training and Program Development Section, a new in-service training program was inaugurated. This will include a discussion of many items of concern with the executive in scoping over-all industrial organization production, finance, sales, technical and personnel fields. The subject of absences and their effect on business, as well as the basic philosophy of General Electric absence policy was discussed. It is the intention of this in-service training activity to broaden the knowledge and viewpoint of all Training Section personnel. This will assist all members of Training Section in conducting future management development programs.

1225123

MONTHLY REPORT

UNION RELATIONS
December, 1951

Organization and Personnel:

There were no changes in the organization of this section during the month of December:

Number of employees on payroll	December
Beginning of Month	27
End of Month	27
Net Change	0

Summary:

The NLRB advised that two petitions for representation had been submitted to them by the HAMTC. These involved Engineering and Construction Department Janitors and Dispatchers - Wire Chiefs, respectively. Meetings have been held between the Company, the Unions, and the FMCS relative to the Union Security issue at Hanford Works.

CISC recommends 62½ cent per day increase in isolation pay and a rate of $2.52 per hour for Sheet Metal Workers. AJ, GE and the Commission are protesting this recommendation. AJ insists on certification elections prior to agreement to a Union Shop provision in the Master Agreement. Carpenters demanding nine cent per hour increase above the maximum allowable under WSB regulations. Already agreed to in Spokane and Tri-City areas. Schmidt of Davis Panel to be in Richland January 19, 1952, to attempt arbitration of Machinist dispute.

PRIVACY ACT MATERIAL REMOVED

Employee and Public Relations

Union Relations

UNION RELATIONS - OPERATIONS PERSONNEL

During November, the Company received notice from the National Labor Relations Board that Janitors in the Engineering and Construction Department had petitioned for representation by the Hanford Atomic Metal Trades Council. In December, the NLRB sent an examiner to this plant for the purpose of verifying signatures on the petition, and he determined that an insufficient number of signatures had been submitted. The case is awaiting further action by the HAMTC, who indicated that additional signers were available and their signatures would be submitted to the NLRB.

A petition for representation has also been received from the NLRB in behalf of Dispatchers and Wire Chiefs who likewise wish to be represented by the HAMTC.

The Company's vacation plan was modified to the extent of providing for three (3) weeks vacation after fifteen (15) years of service, instead of after twenty (20) years of service. The Unions concurred in this revision on December 28, 1951.

On December 4, the Company began negotiations with the Unions on the Union Security issue. After two days of discussions, no agreement was reached, and the HAMTC appealed to the Federal Mediation and Conciliation Service for their assistance in this matter. Mr. Albin Peterson of FMCS met with the Company and the Unions on December 13, 1951, but no settlement was reached and future discussions were postponed until after January 1, 1952.

The Company and the Unions were signatory to an agreement by which an extended holiday was provided, incidental to Christmas and New Years. In spite of this agreement, innumerable questions and Step I grievances resulted, which may prevent the execution of similar agreements in the future.

The NLRB dispatched an examiner to this plant for the purpose of checking an unfair labor practice charge brought against the Company by the CIO in the case of who was discharged on October 30, 1951. The examiner suggested informally that the Company should consider placing this employee back on the rolls. No formal report of the examiner's investigation has been received from the NLRB.

Grievance Statistics:

Twenty-eight grievances were received during the month, bringing the total received this year to 216.

PRIVACY ACT MATERIAL REMOVED

Employee and Public Relations

Grievances were sent in this month from the following departments:

Utilities and General Services Department	
Plant Security and Services Section	5
Transportation Section	4
Community Real Estate and Services Department	
Community Services Section	1
Manufacturing Department	
Metal Preparation Section	5
Reactor Section	9
Separations Section	4
Total	28

Employee grievance reports were received regarding the following subjects:

Jurisdiction	16
Health-Safety-Sanitation	1
Hours of Work	4
Vacations	2
Seniority	2
Wage Rates	1
Miscellaneous	2
Total	28

The status of grievances received in 1951 as compared to those received during the same period in 1950 is as follows:

	1951	1950
Received in December	28	8
Received through December	216	204
Settled Satisfactorily, Step I, thru Dec. 31	105	129
Pending at Step I thru December 31	6	—
Settled Step II thru December 31	37	49
Pending at Step II thru December 31	74*	22
At arbitration	4**	4

*Including nine grievances received in 1950.
**Including one grievance received in 1950.

Five per cent of the total grievances received this year have been submitted by employees outside the bargaining unit.

One meeting was held during the month, with the Hanford Guards Union, for the purpose of processing grievances at the Step II level.

Employee and Public Relations

CONSTRUCTION LIAISON

A letter received from the Wage Stabilization Board on December 27 transmitted copies of the Construction Industry Stabilization Commission's recommendation for an increase of 62½ cents per day in isolation pay and a rate of $2.52 per hour (4½ cents over permissible limits) for Sheet Metal Workers. The Board invited comments on these recommendations. By letter to the Commission we submitted our comments protesting the granting of any increase in isolation pay, or to the Sheet Metal Workers above the rate prevailing in the local area which at this time is $2.47½, the maximum allowable under WSB regulations. Atkinson-Jones has also prepared a letter to the WSB protesting the increase to Sheet Metal Workers and the excessive amount of isolation pay recommended by the CISC.

During a meeting on December 12, AJ informed the Unions that they will insist that certification elections be held prior to any agreement on a Union Shop provision in the Master Agreement. This is contrary to a previous opinion expressed by AJ's San Francisco office.

The WSB has rejected AJ's application for approval of the recently negotiated wage increases for Technical Engineers. Their ruling treats the $5 wage adjustment granted this Union in 1950 as a general increase instead of a merit increase as it was considered by AJ in computing the amount available under General Wage Regulations. It is anticipated that AJ will file a formal request to the Board for a reversal of their ruling on this matter.

Demands presented by the Carpenters' Union at negotiations on December 4, included a nine cent per hour across-the-board increase effective January 1, 1952. This increase is entirely beyond the 10 per cent allowable under CISC regulations. The Spokane AGC and Tri-City Contractors' Association had previously joined the Union in a request for approval of this nine cent increase. Unofficial information indicates that the CISC has recommended WSB approval of the nine cents per hour. The action of the CISC in granting in- in excess of existing regulations will seriously affect Project negotiations and create a chaotic condition unless a revised policy is initiated which will allow for cost-of-living increases in the construction industry.

No Machinists' negotiations were held during December. We were informed that Godfrey Schmidt of the Davis Panel will be in Richland on January 19, to attempt to arbitrate the differences between the parties. AJ has been informed that the petition of the NLRB for enforcement of its order in the Hewes case will be heard by the U. S. Court of Appeals for the ninth circuit "sometime in '52."

On December 19 the Ironworkers served notice of a desire to open their Schedule "A" for wage negotiations. There is approximately 3 cents per hour available on the Project under the 10 per cent formula. It is expected that the Union will press for a cost-of-living increase in addition to this 3 cents per hour. Negotiations with the Operating Engineers Union were held in

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Employee and Public Relations

Spokane and Portland during December. The Union's attempt to obtain increases in excess of the five cents per hour negotiated last year to become effective January 1, 1952 was rejected by both Chapters. AJ has requested AEC approval of a 5 cent increase for the Project effective January 1, 1952.

Requests for Reimbursement Authorization handled during the month:

1. No. 105 Plug Welders - Wage Rate
2. Operating Engineers - Wage Rate
3. Secretary to the General Manager - Classification and Rate
4. Carpenters - Mealtime Status
5. Blacksmiths - Wage Rates

Reimbursement Authorizations received during the month:

1. Plasterers - Wage Rate
2. Plumber - Welding Inspector - Classification and Rate
3. Office Workers - Wage Rates

Work Stoppages:

A work stoppage of 8/10 hour duration occurred in the White Bluffs Machine Shop on December 21 as a result of objections lodged by the shop steward. A Foreman was temporarily using tools to assist a Journeyman in performing a certain task, which was not in violation of their agreement.

WAGE RATES

A Reimbursement request was submitted and tentative approval was given by the Atomic Energy Commission for secretarial classifications entitled Executive Secretary - Grade 20 and Executive Secretary - Grade 18.

A petition requesting approval of the above mentioned jobs was forwarded to the Federal Agencies Division of the Wage Stabilization Board. The request was made on the basis of inter-plant inequities. The petition basis was developed by a wage survey made among the larger industrial concerns in Pacific Coast cities. The study pointed up the fact our top management secretarial rates are not competitive.

Results of this management secretarial survey were distributed to approximately thirty concerns who participated in the study.

A request was submitted to Wage Stabilization Board for a ruling in connection with General Wage Regulation 5, Section 6, in which permission is being sought to reclassify specific jobs not covered by the regulation's phraseology of "new or changed jobs."

Distributed questionnaire in connection with a survey to optical companies seeking information relative to the rates of pay for specific work in the optical business.

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Employee and Public Relations

A reimbursement request in connection with the proposed 3.58 per cent productivity and cost-of-living adjustment was submitted to the Atomic Energy Commission.

A rate survey on Publicity Writers was continued but not completed at the months end.

A schedule of hiring rates for registered nurses, based on the length of time an applicant has worked in her profession or has been inactive in the nursing field, was developed and distributed to interested individuals.

With the issuance of checks in connection with the Debaset project, the major portion of the Wage Rates Unit's work for this program was completed during the month.

During December, 1951, 230 job reclassifications were studied and approved and 73 temporary reclassifications were checked and processed. Requisitions for 131 new hires were investigated concerning replacement, job grade and qualifications. One merit raise and 856 automatic increases were reviewed and processed. Inter-departmental transfers for 169 employees involved a check as to job grade, type of transfer, replacement and seniority. Reactivations for 23 people were checked, approved and processed.

SUGGESTIONS AND INSURANCE

Suggestion System:

	November, 1951	December, 1951	Total since 7-15-47
Suggestions Received	200	214	7918
Investigation Reports Completed	135	134	
Awards granted by Suggestion Committee	35	66	
Cash Awards	$ 815	$ 2,645	
Estimated Savings	$ 6,414.40	$ 40,643.90	

A $1500 award was made to an employee in the Reactor Section for his suggestion regarding a method of decontaminating material and equipment. Considerable savings in material was realized through adoption of this suggestion.

The second highest award was made to an employee of the Purchasing & Stores Section for his suggestion of consolidating carload shipments of coal onto one receiving report. This suggestion resulted in savings of material and labor.

Workmen's Compensation

Two cases under litigation were closed during the month.

Employee and Public Relations

Life Insurance:

Code information which is known only to Home Office Life Underwriters Association has been furnished 39 insurance companies and investigation agencies during the month of December, 1951. This is in accordance with an arrangement with the Underwriters whereby employees on this project might be insured on the same basis as those working elsewhere.

Insurance Statistics:

	November, 1951	December, 1951	Total Since Sept., 1946
Claims reported to the Department of Labor and Industries	121	85	5398
Claims reported to Travelers Insurance Co.	7	* 9	572

* Of the above claims reported during December to the Travelers Insurance Company, seven were property damage and two were both property damage and bodily injury.

COMMUNITY REAL ESTATE AND SERVICES
DEPARTMENT
SUMMARY - DECEMBER, 1951

ORGANIZATION AND PERSONNEL

Number of employees on roll:	Beg. of Month	End of Month
Administration	21	21
Community Services Section (Total - 218)		
Public Works	83	92
Recreation & Civic Affairs	38	10
Library	*	12
Police (Richland)	42	43
Fire (Richland)	50	50
Engineering	11	11
Community Real Estate Section (Total - 197)		
Housing and Maintenance	183	184
Commercial Property	13	13
700-1100-3000 Area Services Section (Total - 115)		
700-1100 Maintenance	58	61
Patrol (North Richland)	22	21
Fire (North Richland)	33	33
	554	551

There was a decrease of three employees in the Department during the month of December, 1951.

GENERAL

Total housing applications pending - 624.

The December fire loss, mainly due to a fire in the unfinished McVickers commercial building in the Uptown district and a residential fire at 1004 Wright brought the year's fire loss to an estimated $9,180.00.

The reorganization of the recreation and grounds maintenance function indicated in the last monthly report has been completely carried out. The Recreation and Civic Affairs Unit is now responsible for recreation, community activities coordination, and the management of the Community House; and the public grounds maintenance function has been consolidated within the Public Works Unit. The Library functions as a separate Unit.

HARoot/jak
1/10/52

1225131

Contract Number	Contractor	Title & Status	Project Number
G-334	Erwen Construction Company	Additions to Sewage Lift Station. Contractor awaiting arrival of electrical equipment which was ordered in February and has not as yet been received from the factory. Equipment is scheduled to arrive in Seattle on or about January 7. Awaiting AEC approval to extend time for contract completion to Feb. 15, 1952.	C-357
G-373	R. A. Neuman & Son	Interior Painting Prefabricated Houses. All necessary information has been submitted to the contract engineer of the Engineering Department for the preparation of a subcontract modification to adjust final quantities. The Release & Waiver of Lien, the Completion Certificate and the Final Estimate have been completed and have all necessary approvals. Final payment will be made immediately following the approval of the modification. This subcontract was not assigned to the Commission.	S-379
G-381	Associated Engineers Inc.	Shelterbelt Planting, Fire Protection Facilities Chief Joseph Jr. High School. Work completed October 19. Modification #3 adjusting final quantities approved. Contract closed December 6, 1951 and final payment made.	C-408 S-479 C-426
G-390	D & H Paving Company	1951 Street Improvements, Parking Lots at the Mart (south) and Campbells, Construction of Sidewalk to Jason Lee School, Extension of Parking Lot Dorm W-20. All work completed December 7. Contract to be modified adjusting final quantities, and will be closed out in January.	C-426 L-575 L-589
G-405	Weston Plumbing Company	Steam Pit Rearrangement at Dormitories. Modification #1 extending time approved December 12. Contract closed December 19, 1951, and final payment made.	S-321

Contract Number	Contractor	Title & Status	Project Number
G-410	Seattle Chain Link Fences	Fencing Riverside Park and Columbia Playfield, Fencing Around Sewage Lift Station. All work completed December 6. Contract to be closed early in January.	C-425 S-450 C-357

Payments to contractor's during the month totalled $103,433.85. Six contracts were active of which three physically completed their work during the month. Two of these were closed out and final payment made. Recommendations to award the contract for Site Grading, Irrigation, and Landscaping, Construction of Restroom, Water & Sewer Lines and Planting of Shelterbelts were submitted to the AEC December 4, 1951. (Projects C-408, C-425, L-262 and K-562) . All pertinent information for the painting of 331 houses is being assembled and will be submitted to the AEC the first week in January requesting that they call for bids to complete this work by contract.

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COMMUNITY SERVICES SECTION

SUMMARY

December, 1951

ORGANIZATION AND PERSONNEL:

	BEGINNING OF MONTH		END OF MONTH	
	Exempt	Non-Exempt	Exempt	Non-Exempt
ENGINEERING	7	4	7	4
FIRE	50	0	50	0
LIBRARY	4	6	4	8
POLICE	16	26	16	27
PUBLIC WORKS	15	68	17	75
RECREATION & CIVIC AFFAIRS*	9	19	5	5
	101	123	99	119

* The decrease in Recreation And Civic Affairs is due to transfers to the Richland Public Library and the Public Works Unit. A corresponding increase in these Units is indicated.

The expansion of parking facilities between W-20 and W-21 was completed during the month of December.

The reorganization of the recreation and grounds maintenance function which was indicated in the last monthly report has been carried out. The Recreation And Civic Affairs Unit is now responsible for recreation, community activities co-ordination, and the management of the Community House, and the public grounds maintenance function has been consolidated within the Public Works Unit.

The Engineering Unit is now established in the W-20 Building.

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COMMUNITY REAL ESTATE AND SERVICES DEPARTMENT
PUBLIC WORKS UNIT
DECEMBER 31, 1951

ORGANIZATION AND PERSONNEL

	Exempt	Non-Exempt
Employees - Beginning of Month	15	68
Transfers In	3	14
Transfers Out	1	8
New Employees	--	1
Terminations	--	--
Total - End of Month	17	75

SANITATION

Total weight of waste material collected during December was 1,182 tons. Collections normally scheduled for Monday and Tuesday of Christmas week (Tuesday being Christmas) were postponed to the day following Christmas, and collections due on Wednesday, Thursday, and Friday of this same week, were made one day late.

ROADS AND STREETS

Project C-426, "Street and Sidewalk Improvements, FY 1951", has been completed with exception of repair of disturbed lawns, which is scheduled for spring of 1952. Final inspection and acceptance of work performed by D & H Paving Company was made on 12-12-51.

Project L-589, "Increase of Turning Radii at Swift and Goethals, and Swift and Stevens", has been completed, and final inspection and acceptance was made on 12-7-51.

A project proposal for the improvement of Thayer Drive, from Swift to Van Giesen was approved by the A & B Committee on 12-18-51, and has been forwarded to AEC for their concurrence.

Sand spreaders were used quite frequently during the latter part of December, when unusual weather conditions caused much icing of streets. It was necessary to call sanding crews out on an overtime basis on eight occasions, in addition to the sanding done during regular hours.

ROADS AND STREETS (CONTINUED)

Snow was plowed to the edge of arterial streets and removed from public sidewalks on 12-27-51, following a six-inch snowfall on the preceding night.

Routine maintenance of streets, sidewalks, and street drainage system was continued as required.

GROUNDS MAINTENANCE

A total of 105 street trees were planted during December as part of Project S-405.

Replacement of 91 trees which had perished at the Duane Shelterbelt was completed during the month.

A total of 40 park benches were assembled, and 12 combination picnic tables and benches were constructed as part of Project C-425.

Burning or removal of weeds, and general clean-up of open areas within the city is now in progress.

Maintenance work performed at parks included tree pruning, filling and grading of low areas, and replacement of 12 dead trees.

DOMESTIC WATER

Normal operation and maintenance were continued, and average daily water consumption amounted to 4.91 million gallons. Production and consumption recordings for December were as follows:

Domestic Water

	Well Production Million Gallons	Avg. Daily Production	Total Consumption Million Gallons	Avg. Daily Consumption
Richland	89.2850	2.8802	76.4978	2.4677
North Richland	34.8420	1.1239	52.7284	1.7009
Columbia Field	28.1538	0.9082		
300 Area			23.0996	0.7451
Total	152.2808	4.9123	152.3258	4.9137

320

6

1225136

Public Works Unit

SEWERAGE SYSTEM

Flushing and cleaning of manholes and lines was continued, and this program is now approximately 75% complete.

Normal operation and maintenance of the treatment plants, lift station and collection system were continued, and average daily flow through the treatment plants was 2.98 million gallons. Flow records for the month are as follows:

Sewerage

	Total Sewage Flow Million Gallons	Average Daily Flow Million Gal. G.P.D.	Average Rate Flow Gals. per Min.
Plant No. 1	24.250	0.782	543
Plant No. 2	68.129	2.198	1,526
Total	92.379	2.980	2,069

IRRIGATION SYSTEM

Cleaning of silt and debris from gravity flow canals and burning of weeds along canal banks was continued and is progressing satisfactorily.

1225137

RECREATION AND CIVIC AFFAIRS UNIT
MONTHLY REPORT
December, 1951

ORGANIZATION AND PERSONNEL

	Exempt	Non-exempt
Beginning of month	13	25
New hires	0	0
Terminations	1	0
Transfers - IN	0	0
OUT	7	20
	5	5

SCHOOLS

The following is a tabulation of full-time paid School District #400 personnel as of December 31, 1951:

Administration	6
Principals & Supervisors	14
Clerical	23
Teachers	279
Health Audiometer	1
Cooks	44
Nursery School & Ext. Day Care	11
Bus Drivers	1
Maintenance	9
Operations	47
	435

CLUBS AND ORGANIZATIONS

As of December 31, 1951, the employees of the listed organizations, exclusive of those included in the Real Estate Commercial and Other Properties Unit report, include:

Youth Council - Chest	1
Boy Scouts	1
Camp Fire Girls	1
Hi-Spot Club	2
Girl Scouts	2
Justice of the Peace	1
Y.W.C.A.	2
Chamber of Commerce	1
	11

On Saturday, December 1, 1951, the Police Athletic League sponsored the annual "Policemans Ball" which was held in the girls gym at Columbia High School. The Recreation and Civic Affairs Unit made arrangements for the purchase by the Police Athletic League of four tanks of helium and oxygen to be used to inflate balloons to decorate the gym for the dance.

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Recreation and Civic Affairs Unit

Members of the Richland Light Opera Company made a tour of Richland on Sunday, December 23, singing Christmas Carols to shutins and patients at Kadlec Hospital. Arrangements for the use of a government vehicle to transport the group was made by the Recreation and Civic Affairs Unit.

On Christmas Eve a group of 40 boys and girls from Carmichael Junior High School under the direction of Mr. Ray King, sang Christmas carols throughout the business and residential districts of Richland. Arrangements were made by the Recreation and Civic Affairs Unit for the loan of necessary safety lights to be used on the two hay wagons used by the group. The Community House was made available to the group for the serving of refreshments and dancing after they concluded their tour of the town.

The following Richland organizations were authorized by the Recreation and Civic Affairs Unit to use metal folding chairs belonging to the Unit in accordance with the approved policies on the loan or rental of metal folding chairs:

Roving Bowmen	25 chairs
Seattle First National Bank	60 "
Safety Dept. (700 Area)	25 "
Uptown Merchants	50 "
Coordinate Club	50 "

The number and types of organizations presently served by the Recreation and Civic Affairs Unit include:

Business & Professional organizations	21
Churches & Church organizations	26
Civic organizations	17
Schools	13
Fraternal organizations	24
Political organizations	5
Recreation & Social Clubs - Alumni	3
Art, Music & Theatre	9
Bridge	3
Dance	4
Garden	2
Hobby	9
Social	19
Sports	18
Veteran & Military organizations	14
Welfare groups	7
Youth - Boy Scouts	20
Girl Scouts	49
Camp Fire Girls	36
Miscellaneous	10
	290

Recreation and Civic Affairs Unit

RECREATION

Two members of the Recreation and Civic Affairs Unit travelled to Ellensburg, December 6, for the officers meeting of the Washington State Recreation Society.

Basketball films as kickoff for the instructional and demonstrational basketball clinic to be held in all the elementary schools of the city were shown at the Uptown Theatre on December 8, at 10:00 AM.

The first in a series of instructional basketball clincis was held at the John Ball School on December 10, 14, and 17. On December 11, 12, and 13, the clinic was held at Marcus Whitman Grade School. The clinic was held at the Lewis and Clark Elementary School on December 18, 19, and 20. These clinics were under the direction of the Athletics and Playgrounds Supervisor.

The Youth Archery program at the Columbia High School girls gym held its last session on December 20. This activity assisted by the Roving Bowmen provided instructional and demonstrational aid free of charge to the boys and girls of Richland under 16 years of age. Awards certificates were given to those who had attended all six sessions.

Due to school activities which required use of the gym for assembly purposes and the holidays coming on, program nights cancellation of the adult activity classes were necessitated on December 17, 18, 24, 25, and 31.

Adequate publicity pertaining to the cessation of the adult program at Spalding was released to all the papers and oral notice was given sufficiently in advance to the participants by the Athletics and Playgrounds Supervisor.

Attendance figures for December, 1951, of participants in the Fall and Winter Adult and Family Group program sponsored by the Recreation and Civic Affairs Unit and held in the gym at Spalding Grade School are as follows:

	Children	Adults	Totals
General attendance	203	610	813
Special events			
Participants	726		726
Spectators			
Assisted activities			
Totals for month	929	610	1,569

Organized groups and classes conducted during December, 1951, by the Recreation and Civic Affairs Unit:

	Children	Adults	Totals
Basketball Instruction	225	12	237
Basketball Clinic			
John Ball	186		186
Marcus Whitman	181		181
Lewis & Clark	134		134
	726	12	738

Recreation and Civic Affairs Unit

COMMUNITY HOUSE

The new program for the second session of Fall and Winter of 1951 and 1952 has been completed. Few changes were made and only one new class, that of leadership, was added. It will be directed by Youth Council and Recreation and Civic Affairs personnel.

The Community House has hit its highest peak of attendance during the year 1951. The total attendance of all organized groups, major events, special activities, programs, contests and permanent groups was 10,311 people even with the three-day holiday period. The general attendance, including all people that entered the Community House was 11,222 people.

The storage cabinet in the Games Room has been partially renovated to create office space for personnel of the Recreation and Civic Affairs Unit. It is also an added asset in that it provides for a better control in the Games Room.

A Christmas Tree was donated by the Richland Junior Chamber of Commerce to the Community House. It was placed in the main hall of Community House and decorated by the Recreation and Civic Affairs Unit and the Rec-a-teers, the young adult group.

The new directors and the participants of the Hi-Spot Club did a very nice job of decorating the Social Hall for the Christmas festivities. A tree was placed in the east end of the room and trimmed with lights and decorations. The center section of the room was decorated with criss-crossed wires on which were hung tinsel, Christmas bells and Christmas lights.

Numerous groups used the Community House for their Christmas parties this season. The following groups held parties here:

Permanent Groups

1. Elementary Program - Tiny Tots
2. Square and Folk Dancing Group
3. Hi-Spot Club
4. Altrusa Club
5. Rec-a-teers
6. R. C. Servicemen's Center
7. Y.W.C.A.
8. Orthepedic Guild
9. V.F.W. Auxiliary
10. Richland Light Opera
11. Richland Light Opera Christmas Carolers

Non-Permanent Groups

1. School Boy Patrol
2. Jr. Chamber of Commerce - children
3. Richland High School Music Dept.
4. Projecteers
5. Homemakers Club
6. Carmichael Christmas Carolers practice.

Recreation and Civic Affairs Unit

Donation of peanuts, apples and candy was left by the Chief of Police of Richland for distribution to the elementary school children during their program that was scheduled to follow the School Boy Patrol Christmas Party.

The Richland Gardeniers presented the Community House with a Christmas floral display for the lobby. This was placed on the show case under the lobby clock.

The policies of the Community House are being revised along with the compilation of new policies to apply to the newly acquired kitchen and banquet room that should be in full swing within the next month or so. Dishes and silverware are being selected.

The various organizations that are using the Community House shall be approached concerning their helping to put on a function to acquire funds to buy new drapes for the Social Hall. The Director of the Hi-Spot group is all in favor of having his group help and others shall be contacted in January.

Attendance - Community House	Children	Adults	Total
General Attendance	7,241	3,981	11,222
Special Events - participants	99	70	169
spectators	452	361	813
Assisted Activities	43	870	913
Totals for the month	7,835	5,282	13,117
At end of previous month	29,458	24,057	53,515
Fiscal Year Totals to Date	37,293	29,339	66,632

Indoor attendance to date - 66,632
Outdoor attendance to date - 77,853

MAJOR EVENTS DURING DECEMBER, 1951

December 1	- Policemens Ball	Columbia High School
2	- Kiwanis & Y.W.C.A. Paper Drive	Richland
9	- Richland Symphony Concert	Carmichael Jr. Hi. Sch.
23	- Richland Light Opera Co. Christmas Carols	Richland
24	- Carmichael students Christmas Carols	Richland

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COMMUNITY SERVICES SECTION

RICHLAND PUBLIC LIBRARY
December, 1951

ORGANIZATION AND PERSONNEL:

	Exempt	Non-Exempt
Employees - Beginning of Month	4	7
Transfers In		1
Transfers Out		
New Employees		1
Terminations		1
Total - End of month	4	8

CIRCULATION

Books	10,975	(Adult - 6500; Juvenile - 4475)
Magazines	263	
Records	672	
Pamphlets	16	
Inter-library Loans	31	
TOTAL	11,957	

Books added during Month 577 (Adult)

Current Book Stock 17,822

REGISTRATION

Adult	276
Juvenile	63
Total	339

Total registered borrowers - 8,061

Children's Story Hour Attendance - 417 (Includes 2 combined Christmas parties and story hours - 135)

An interesting exhibit of local painting by the Allied Arts Group was in the North Hall during the first two weeks of December.

Mrs. O. H. Pilkey was appointed to fill the vacancy on the Library Board. She will serve for a five year term.

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The following persons have been appointed to serve on the Library's American Heritage Project Committee: Mrs. A. H. Bushey, Mrs. W. I. Patnode, Mrs. Howard Gorst, Mr. Gordon Collins, Mr. Jim LeClair, Rev. R. Uphoff, and Miss Doris Roberts.

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COMMUNITY SERVICES

RICHLAND POLICE DEPARTMENT

DECEMBER 1951

ORGANIZATION AND PERSONNEL

	Exempt	Non-exempt
Employees - Beginning of Month	16	26
Transfers In	0	0
Transfers Out	0	0
New Hires	0	1
Terminations	0	0
Total - End of Month	16	27

GENERAL

The Second Annual Policemen's Ball sponsored by the Police Athletic League was held on December 1. Proceeds from this ball will be used in the League's activities.

Courtesy warning parking tickets were issued in lieu of court citations during the week prior to Christmas. These tickets carried an appropriate holiday message and were printed in the traditional colors.

Four red Neo-Flasher lights were received during the month for use at accident scenes.

A number of forms have been revised during the month to provide for more efficiency of operation and to conserve paper.

During the month, a total of 88 letters were received, compared to 112 last month. These consisted of 80 inquiries on arrests and 8 requests for assistance.

During the month, 31 prisoners were processed through the Richland Jai. Eleven of these were from North Richland.

During the month, 16 gun registrations were recorded.

During the month, 98 bicycle registrations were recorded.

During the month, 201 traffic violation reports were received. These consisted mainly of speeding and illegal parking. A total of 86 other reports were received. These consisted mainly of larceny and public intoxication cases.

Fourteen safety films were available for the use of personnel groups, civic organizations and schools during the month. Approximately 1450 school children and adults viewed these safety films during the month.

1225145

TRAFFIC

There was a sharp increase in accidents this month with a total of 40 and a 43% increase over the preceeding month. The majority of these accidents were caused by weather conditions as reports indicate that icy roads contributed to 23 of the above accidents, 12 of which were rear end collisions. This brings the total accidents for the year to 266, an increase of 30.3% over 1950. There was one pedestrian accident this month which resulted in severe injury. This was the only major injury of the month and there was one other minor injury reported.

There has been a total of 54 persons injured in automobile accidents this year as compared to 30 for 1950, or an increase of 80%; however, there were only two persons injured this month as compared to six for the same month last year.

The total property damage this month was estimated at $7,293.84. This is an average of $182.34 per accident and an increase from last month's average of $162.98.

Twenty seven of the above accidents for this month were investigated by members of the Richland Police Department. Only 67.5% of the reportable accidents were reported to the Police Department and these investigations resulted in one driver being arrested at the scene and Criminal Complaints being signed against 15 other drivers. Since weather conditions were a main contributing factor to many of the accidents, no enforcement action was taken.

Driving violations which contributed to the 40 accidents this month were:

Failure to yield right-of-way	13	Drunken driving	1
Following too close	7	Reckless driving	1
Unsafe speed	13	Ran stop sign	1
Negligent driving	4	Ran traffic light	1
Failure to signal	2	Improper backing	1
Inattention to driving	1		

Meetings were conducted with each of the school boy patrol groups this month. Equipment was checked and some replacements made. All groups seem to be operating very efficiently and apparently most of the problems of previous years eliminated. Twelve new yellow rain coats and 96 caps were received during the month for distribution to the patrols.

The Police Athletic League sponsored a Christmas party for the school boy and girl patrol on December 21. It was held at the Community House and was attended by approximately 250 girls and boys. This party was given as a tribute to a job well done.

During the month of December there were 22 new traffic control signs installed in Richland and six signs re-set or renewed due to damage by traffic.

During the month of December the traffic group was requested to conduct three traffic safety meetings. These meetings were attended by approximately 70 people who were shown traffic films and given safety suggestions for winter driving.

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TRAINING

The subjects for classroom training for the month were accident investigation and public relations.

Training at the small arms range for the period in field instruction consisted of two hours pistol instruction.

Qualifications on the Army-L Course were as follows:

Score	No. Men	Per Cent
Expert	7	64%
Marksman	3	27%
Unqualified	1	9%

A total of 11 men reported for police training.

ACTIVITIES AND SERVICES

	October	November	December
Doors and windows found open in facilities	27	15	37
Children lost or found	42	18	18
Dogs, cats reported lost or found	60	38	45
Dog, cat, loose stock complaints	25	30	42
Persons injured by dogs	1	3	1
Bank escorts and details	0	0	0
Fires investigated	17	13	10
Miscellaneous escorts	7	15	8
Complaints investigated (no enforcement action)	63	40	74
Deaths reported	1	2	1
Property lost or found	22	37	17
Records inquiries	150	162	171
Law enforcement agencies assisted	16	5	19
Private individuals assisted	3	6	9
Plant departments assisted	64	69	149
Emergency messages delivered	31	35	47
Street lights out reported to Electrical		157	107
Totals	529	645	755

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MONTHLY REPORT
RICHLAND POLICE DEPARTMENT
DECEMBER, 1951

OFFENSES	KNOWN	UNFOUNDED	CLEARED ARREST	CLEARED OTHER*
PART I				
1. Murder	0	0	0	0
2. Rape	0	0	0	0
3. Robbery	0	0	0	0
4. Aggravated Assault	0	0	0	0
5. Burglary—Break. & Ent.	2	0	0	0
6. Larceny—Over $50.00	4	1	1	0
Larceny—Under $50.00	13	2	1	13*
Bike Theft	19	0	0	16
7. Auto Theft	1	0	0	1
TOTAL PART I CASES	39	3	2	30
PART II				
8. Other Assaults	0	0	0	0
9. Forgery	0	0	0	0
10. Embesslement & Fraud	0	0	0	0
11. Stolen Prop:Buy:Rec:Poss.	0	0	0	0
12. Weapons:Carry:Poss.	0	0	0	0
13. Prostitution	0	0	0	0
14. Sex Offense	0	0	0	0
15. Off.Ag.Fam.& Child.	0	0	0	0
16. Narcotics—Drug Laws	0	0	0	0
17. Liquor Laws	2	0	0	2
18. Drunkenness	14	0	14	0
19. Disorderly Conduct	0	0	0	0
20. Vagrancy	2	0	2	0
21. Gambling	0	0	0	0
22. Driving While Intox.	3	0	3	0
23. Violation Rd. & Dr. Laws:				
Speeding	32	0	32	0
Stop Sign	18	0	18	0
Reckless Driving	7	0	7	0
Right of way	6	0	6	0
Negligent Driving	23	0	23	0
Defective Equipment	6	0	6	0
24. Parking	66	0	66	0
25. All Other Traffic	14	0	14	0
26. All Other Offenses:				
Public Nuisance	2	0	2	0
Malicious Mischief	1	0	0	1
Vandalism	3	0	0	3
Dog Nuisance	2	0	0	2
Investigation	11	0	0	11
Improper Disposal of Garbage	1	0	1	0
Disturbance	3	0	0	3
27. Suspicion	2	0	0	2
TOTAL PART II CASES	218	0	194	24

*Nine cases of Larceny (Under $50.00) in "cleared other" column occurred during previous months.

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	OFFENSES	KNOWN	UNFOUNDED	CLEARED ARREST	CLEARED OTHER*
PART III					
28.	Missing Persons	7			7
	Lost Persons	12			12
	Lost Animals	11			3
	Lost Property	8			2
29.	Found Persons	0			0
	Found Animals	17			17
	Found Property	6			6
	TOTAL PART III CASES	61			47
PART IV					
30.	Fatal Motor Vehicle Traffic Accid.	0			
31.	Pers.Inj.Motor Veh. Traffic Accid.	2			
32.	Prop. Dam. Motor Vehicle Accid.	38			
33.	Other Traffic Accidents	0			
34.	Public Accidents	No accurate statistics kept			
35.	Home Accidents				
36.	Occupational Accidents				
37.	Firearms Accidents	0			
38.	Dog Bites	0			
39.	Suicides	0			
40.	Suicide Attempts	0			
41.	Sudden Death & Bodies Found	0			
42.	Sick Cared For	0			
43.	Mental Cases	0			
	TOTAL PART IV CASES	40			
	COMPOSITE TOTALS PARTS I, II, III, IV CASES	358	3	196	101

*Cases listed under "Cleared Other" are those cleared by various means other than arrest, such as: orders from prosecutor, juvenile probation officer or other situations in which a mutual agreement is obtained. They are definitely "cleared" cases and differ from the arrest column in that there were no arrests.

Property Reported Stolen During Month $1,137.95 (includes 19 bikes)
Property Recovered During Month 614.35 (includes 16 bikes)

SEE PAGE THREE FOR JUVENILES INVOLVED

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PAGE THREE RICHLAND POLICE DEPARTMENT MONTHLY REPORT DECEMBER 1951

OFFENSES	NO.	JUVENILES	SEX	JUVENILES INVOLVED 5	6	7	8	9	10	11	12	13	14	15	16	17	TOTAL
JUVENILES WITH LIQUOR	2	1	M											1			4
		3	F												1	2	
DELINQUENCY	1	1	M														1
			F						1								
VAGRANCY	1	2	M												1	1	2
TOTALS	4	7							1					1	2	3	7

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Number of offenses known to police per 25,000 inhabitants in cities of 25,000 persons:

Wash.Ore.& Calif. Six months (July-Dec.1950)	One month average	Richland July-Dec.1950	Richland November 1951	Richland December 1951
Murder	.76	.13	0	0	0
Robbery	19.8	3.3	0	0	0
Agg. Assault	14.9	2.4	0	0	0
Burglary	128.1	21.3	12	1	2
Larceny	392.	65.3	155	27	17
Auto theft	57.	9.5	12	2	1
Bike theft			134	19	19

Number of offenses known to police per 25.000 inhabitants regardless of whether offenses occurred in cities or rural districts:

State of Washington Six months (July-Dec.1950)	One month average	Richland July-Dec.1950	Richland November 1951	Richland December 1951
Murder	.74	.12	0	0	0
Robbery	16.7	2.8	0	0	0
Agg. Assault	5.0	.8	0	0	0
Burglary	120.4	20.0	12	1	2
Larceny	377.6	62.9	155	27	17
Auto theft	54.5	9.0	12	2	1
Bike theft			134	19	19

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

National Average Percentage of cases (July-Dec. 1950)	Wash. Ore. Cal. Actual cases (July-Dec.1950)	Richland July-Dec.1950	Richland November 1951	Richland December 1951
Robbery	54.1	.23	0	0	0
Burglary	61.6	6.0	1	0	0
Larceny	45.4	4.5	24	4	1
Auto theft	67.3	17.3	0	1	0

Note: Statistics of juvenile offenses throughout the United States were taken from the Uniform Crime Report published by the Federal Bureau of Investigation, which states: "It should be remembered that the number of arrests recorded is doubtless incomplete in the lower group because of the practice of some jurisdictions not to fingerprint youthful offenders."

RICHLAND POLICE DEPARTMENT
RICHLAND JUSTICE COURT CASES
DECEMBER 1951

VIOLATION	NO OF CASES	NO OF CONV.	NO OF FORF.	CASES CONT.	CASES DISM.	WARR. ISS.	SENT JAIL	SENT SUSP.	LIC. REV.	CASES ORIG. PREV. MON.	CASES INCL. OTHER VIOL.	BAIL FORF.	FINES	FINES SUSP.
Defective equipment	14	6	4	1	2	1				1	8	$ 22.00	$ 5.00	$
Drunken driving	3	3							3				209.00	
Drivers license	20	7	7	2	3	1				2	13	22.50	11.00	7.50
Failure to dim lights	1			1							1			
F.T.S. & I.	2	1		1							1		15.00	
F.T.Y.R.O.W.	10	4	5		1					2		62.50	47.50	15.00
Following too closely	1		1								1			
Illegal parking	83	30	40	11	2					12		133.00	110.00	89.00
Illegal passing	1	1								1			5.00	
Impr. license plates	2	1		1							1			
Negligent driving	30	13	9	3	4	1			2	7		247.50	[illegible].50	55.00
No registration	3	3								1	3			
Permitting a child to operate a motor vehicle w/out an operators permit.	1			1						1				
Reckless driving	6	2		2	2				2	2			75.00	
Speeding	42	15	20	2		5				11		232.00	155.00	25.00
Stop sign	11	2	8	1								40.00	12.50	
Petit larceny	2	2					1						[illegible].50	
Public intoxication	7	4	3				1					37.50	47.50	
TOTAL	239	94	97	[illegible]	14	8	2		7	40	28	$797.00	$[illegible]7.50	$191.50

One grand larceny case amended to petit larceny.
One drunken driving case amended to negligent driving.
Four reckless driving cases amended to negligent driving.

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POLICE DIVISION - TRAFFIC CONTROL STATISTICS
DECEMBER, 1951

MOTOR VEHICLE ACCIDENTS:

	Total Number		Fatalities		Major Injuries		Minor Injuries	
	Nov.	Dec.	Nov.	Dec.	Nov.	Dec.	Nov.	Dec.
Richland	28	40	0	0	0	1	0	1

ACCIDENT CAUSES:

	Negligent Driving		Failure to Yield Right of Way		Reckless & Drunken Driving		Other Cases	
	Nov.	Dec.	Nov.	Dec.	Nov.	Dec.	Nov.	Dec.
Richland	7	4	13	13	0	2	8	26

PLANT WARNING TRAFFIC TICKETS ISSUED:

Richland: NO WARNING TICKETS ISSUED FOR NOVEMBER AND DECEMBER, 1951.

TRAFFIC CHARGES AND COURT CITATION TRAFFIC TICKETS ISSUED:

	Speeding		Stop Sign		Drunken Dr.		Reckless Dr.		Right of Way V.		Neg. Dr.		Parking V.		Other V.		Totals	
	Nov.	Dec.	Nov.	Dec.	Nov.	Dec.	Nov.	Dec.	Nov.	Dec.	Nov.	Dec.	Nov.	Dec.	Nov.	Dec.	Nov.	Dec.
Richland	83	31	24	11	0	3	7	5	7	8	25	20	151	71	48	36	345	185

TRAFFIC VOLUME: No Traffic Volume Count taken for the month of December, 1951, due to weather conditions.

NOTE: Traffic Control Statistics show ORIGINAL CHARGES ONLY.

1225153

CONFIDENTIAL

RICHLAND FIRE DEPARTMENT

DECEMBER 1951

Organization and Personnel

	Exempt	Non-Exempt
Employees - Beginning of the Month	50	0
Transfers In	0	0
Transfers Out	0	0
New Hires	0	0
Terminations	0	0
Total - End of Month	50	0

Fire Protection

Fire Loss (Estimated):		
	Government	$1,709.00
	Personal	3,081.00
	Total	$4,790.00

Response to Fire Alarms	7
Investigation of Minor Fires and Incidents	14
Ambulance Responses	51
Inside Drills or Schools	16
Safety Meetings	8
Security Meetings	4
Fire Alarm Boxes Tested	196
Fire Hydrants Tested	57
Airport Standby	1

Dry fire hose was installed in two 700 Area hose boxes.

A remote control radio unit was installed in No. 2 Fire Station to provide direct radio contact with mobile units and inter-communication with other fire stations.

Members of the Fire Department devoted their spare time in December to the rehabilitation of several hundred used toys that were later distributed directly or through church and other organizations to needy families of the area.

December fire loss, mainly due to a fire in the unfinished McVickers commercial building in the Uptown district and a residential fire at 1004 Wright, totalled more than the other eleven months of 1951, bringing the year's loss to an estimated $9,180.00.

Fire Prevention

A total of 152 fire inspections in December resulted in back-charging 154 manhours to other units.

Assistant Fire Marshal continued with temporary assignment on Civil Defense shelter survey of Richland buildings. Completion is expected in January.

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RICHLAND FIRE DEPARTMENT December 1951

Assistant Fire Marshal attended a December 11th meeting of the Richland Traffic Committee.

Investigation was made of the origin of the December 23rd fire in the McVickers multiple-occupancy building under construction in the Uptown business district.

Following a Board of Investigation meeting on the December 27th residential fire at 1004 Wright, special publicity was released to local newspapers and Hanford Works News on the hazards of electrical heaters.

Investigated the December 12th fluorescent light fixture incident in the 760 Building. Transformer failure was found to be the cause. A report wassubmitted on the incident to Plant Safety.

A bulletin on Christmas Safety For Dormitory Residents was prepared and posted prior to the holidays in the lobby of each dormitory.

Recommendations submitted to prevent the leaking and freezing of fire department connections on the 703 Building sprinkler systems.

Recommended to Tenant Relations the removal of extra wiring with exposed ends in residence at 1317 Hains and repairs to shorted 220-volt wiring at 413 Snow.

Inspected trash accumulations behind recessed drinking fountains in eight plant buildings. Recommended to Plant Safety that, where lack of space exists for cleaning, metal shields be installed around the top of fountains to prevent trash from falling behind them.

Discussed with School maintenance supervisor the chain and post barricades across the Columbia High School fire lane.

On the follow-up of emergency lighting inadequacies in local theatres, were advised by Real Estate that these systems would be brought up to Code requirements.

Found all fire extinguishers empty in the Boys' Gymnasium at Columbia High School. Urged School maintenance supervisor to have them promptly refilled.

Fire Marshal assisted on site selections for radio and emergency generators at six grade schools for Civil Defense purposes.

Reported to Real Estate hazards encountered in the common attic over Klopfenstien's and Shoe Salon.

Inspection committee composed of School maintenance supervisor, school custodians, Fire Marshal and Assistant Fire Marshal made thorough inspection of all school buildings except Chief Joseph and Jason Lee. All buildings were in excellent condition except for Columbia High School where vocational classes are being conducted in projection booth and attic storage room.

COMMUNITY REAL ESTATE AND SERVICES DEPARTMENT -

ENGINEERING UNIT

December 1951

Personnel

	Exempt	Non-Exempt	Total
Employees - Beginning of Month	7	4	11
Employees - End of Month	7	4	11

The Status of Active Projects is as follows:

K-562 - Automatic Irrigation Levee 2-C - Award of contract for construction in progress

L-262 - Water and Sewer - Assembly of God Church - Award of contract for construction in progress

L-575 - Parking Lots - Facilities - 100% complete

S-350 - Improved Lighting 705 Building - Work complete and accepted. Physical Completion Notice returned by the Secretary of A & B Committee for reasons for underrun. Request is in to Accounting to make thorough check for cost of lighting fixtures.

S-450 - Fencing Riverside Park - Work complete and accepted. Physical Completion Notice prepared and submitted.

S-405B - Street Tree Planting - Additional Erosion Control - Street tree planting progressed during the first half of December with 105 trees being planted on portions of 11 streets. Work temporarily stopped due to weather conditions.

S-479 - Fire Protection - Chief Joseph School - Work completed on October 17, 1951, and all exceptions completed and accepted by Using Department, Physical Completion Notice prepared and submitted.

S-552 - Additional Fire Protection - Desert Inn - Richland Theater - Design 100% complete. Preparing specifications which are 90% complete.

C-357 - Alterations to Sewage Lift Station - Subcontractor's work completed and accepted by formal acceptance with exception of two pieces of electrical equipment with delivery date scheduled for sometime shortly after the first of the year. Cyclone fence around Lift Station completed and accepted by formal acceptance on December 6, 1951.

C-408 - Additional Erosion Control - Award of contract for planting in progress.

C-425 - 1951 Park Development Program - Playground facilities being installed. Award of contract for balance of work in progress.

C-426 - Street Improvement Program 1951 - Subcontractor's work completed and accepted without any exceptions. Final quantities are being prepared.

Status of Active ESRs

235 -PW Town Planning Board Work - Def. for other work

369-CA Site Map CAP Field - Def. for other work

510-M Roads and Streets Drawings - 1950 Construction - Def. for other work

547-MD Fixed Irrigation System - Preliminary design in progress

552-MF Fire Protection - Desert Inn and Richland Theater - 100% complete. Now Project S-552 - Field Release No. 1 issued 12-21-51

561-SD Chief Joseph Grounds - Contract for construction awarded. Notice to Proceed issued December 28, 1951. Work to begin January 2, 1951 unless weather turns inclement.

565-RC Site South of Tract House 0-1224 - Def. for other work.

572-M First Baptist Church - Work progressing 40% complete

473-M Westside United Protestant Church - Final inspection to be made.

579-MS Goethals Drive to Williams - Study of intersection - Def. for other work

581-RC As Built Plans for LDS Church - Plans returned to building committee for correction

585-M Anderson Motors Addition - Construction work progressing - 90% complete.

586-M Standard Oil Station - Construction work progressing - 65% complete

590-PR Rehabilitation of Bomber Bowl Fence - Work abandoned.

591-M Preparation of Advice Pamphlet for contractors - Rough completed. Temporarily delayed for other work.

595-M Shell Oil Company - Work progressing - work 95 % complete

596-M Store Building No. 3 - C. D. Joseph - Work progressing - 90% complete.

597-RC Addition to Mart - Plans rejected for non-conformance with the U.B.C.

598-RC Legal Description of Church and Club Sites - 95% complete

603 - RC Legal Description - McVicker Building #3 - Waiting for ground assignment

605-PR Erosion Control - Project Proposal submitted for portion of work.

606-RC Legal Description - 69 Lee - 25% complete - waiting for ground assignment

607-M Maintenance - Roads and streets - 100% complete

608-MU Elimination of Odors Emanating from Sewage Lift Station - Study 99% complete. Preparing Cost Estimate

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609-M Plan Checking - Store Bldg. #4 - C. D. Joseph - 30% complete

610-RC Business Development - 95% complete

612-RC As Builts for Richland Thrifty Drug.- Temporarily delayed for other work

613-RC Building Alteration Permit #11 - Central United Protestant Church - Work Progressing.

614-M Building Code - Temporary Loan of Employees - Assignment completed

615-M Plan Checking -McVicker Building #4 - Work progressing - 50% complete

616-M Level Control Valve - Sewage Treatment Plant - Def. for other work

617-RC As Builts for Theater Building - Temporarily delayed for other work

618-RC Legal Description - Area between photographic studio and automatic laundry co., in North Commercial Area (Block #1) - 75% complete

REAL ESTATE SECTION

SUMMARY

DECEMBER

ORGANIZATION AND PERSONNEL:

	BEGINNING OF MONTH		END OF MONTH	
	Exempt	Non-Exempt	Exempt	Non-Exempt
Commercial Property Unit	7	6	7	6
Housing & Real Estate Maintenance Unit	22	161	22	162
	29	167	29	168

Net increase of employees for month of December 1

GENERAL

On December 27, 1951 a fire at 1004 Wright caused extensive damage to a two bedroom prefab. The apparent cause of the fire was drying clothes in front of two electric heaters in the bathroom.

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HOUSING AND REAL ESTATE MAINTENANCE UNIT

December, 1951

ORGANIZATION AND PERSONNEL		December
Number of employees on payroll:		
Beginning of month	22 Exempt Employees	
	161 Non-Exempt Employees	
	183	183
End of month	22 Exempt Employees	
	162 Non-Exempt Employees	
	184	184

Richland Housing

Housing Utilization as of Month Ending December 31, 1951

Houses occupied by Family Groups

	Conventional	Block	T	Precut	Ranch	Prefab	Apt	4th add	Tract	Total
G.E.Employees	2236	260	9	383	829	1165	56	272	39	5249
Commercial Facilities	85	11	1	33	74	62	8	8	5	287
Community Activities	9				7	4			1	21
Medical Facilities	4	15			1	1		3		24
Post Office	6				3	12		1	3	25
A.E.C. and other government	87	29		19	45	16	2	11	4	213
Schools	48	1		5	12	53	1	2		122
Vitro Corporation	6	3		4	9	3				25
Atkinson Jones	8	13		2	11	4	5	1		44
Newberry Neon	3	1		1			1	1		7
Vernita Orchards									4	4
Robert's Filter	1									1
V.S.Jenkins					1					1
Urban-Smythe-Warren					2			1		3
Charles T. Main				1	3	10				14
Total	2493	333	10	448	997	1330	73	300	56	6040
Houses assgn.Leases written	1			1	1	2				5
Houses assgn.Leases not written	3				1	5				9
Houses available for assgn.	3			1	1	5	1			11
Total	2500	333	10	450	1000	1342	74	300	56	6065

	Begin Month	Moved IN	Moved Out	Month End	Difference
Conventional Type	2487	42	35	2494	Plus 7
Block Type	332	2	2	332	
"T" Type	10	2	2	10	
Precut Type	450	7	7	450	
Ranch Type	994	22	20	996	Plus 2
Prefab Type	1321	57	49	1329	Plus 8
Apartments	71	13	10	74	Plus 3
4th Housing Addition	231	68		299	Plus 68
Tract	56	1	1	56	
Total	5952	214	126	6040	Plus 88

DORMITORY STATISTICS

Dormitories:

		Occupants	Vacancies	Total Beds
Men Occupied	15	616	---	616
Women Occupied	12	*481	---	481

Women's Dormitories Occupied by:

G.E. Office	2
Education	1
Apartments	1

*This includes space of 2 beds in W-9 used for supply rooms and dormitory offices.

There are 204 men waiting for rooms in Richland.
There are 7 women waiting for rooms in Richland.

GENERAL		ALLOCATION SECTION STATISTICS	
Houses Allocated to new tenants	120	Voluntary Terminations	21
Exchanged Houses	22	R.O.F.	1
Moves(Within the Village)	72	Discharge	-
Turnovers	6	Transfers	4
Total Leases Signed	214	Retirement-Divorce-Death-Misc.	3
Terminations	21	Houses Assigned "As Is"	77
Total Cancellations	126	Move Off Project	8
Applications Pending	624	Houses sent to Renovation	31

TENANT RELATIONS WORK ORDER AND PROGRESS REPORT — MONTH OF DECEMBER, 1951

Processing of Service Orders, Work Orders & Service Charges

	Orders Incomplete as of November 30	Orders Issued 11-30 to 12-31	Total Orders Incomplete as of December 31, 1951
Service Orders	196	2106	265
Work Orders	1500	322	1341
Service Charges	15	372	8

Principal Work Order Loads

	Incomplete as of November 30, 1951	Incomplete as of December 31, 1951
Laundry tub replacements	64	63
Bathroom Renovations (tub, lino., tile)	95	28
Tileboard Only (Bathroom)	1	7
Kitchen Cabinet Linoleum	9	30
Kitchen Floor Linoleum	7	12
Shower Stalls	42	41

Alteration Permits Issued During the Month of December totaled 55 compared to 97 issued in November.

Floor sanded	2	Install driveway	1
Install Auto. dishwasher	1	Install water softener	6
Install fence	1	Reverse range and refer.	1
Install Auto. washer	13	Install coal stoker	2
Install auto. dryer	19	Basement partition	3
Basement excavation	2	Shelter cover	1
Install oil burner	2	Thermostat in furnace	1
Install electrical wiring	2	Install double door	1
Install clothes poles	2	Shower stalls	1

1010 Inspections were made during the month of December compared to 1657 made during November.

Alteration permits	1	Shower Stalls	7
Bathtubs	27	Sidewalks	7
Cupboards	1	Sinks	11
Drainage	2	Tileboard	9
Sticking doors	5	Toilet seats	39
Floor boards	30	Top soil	1
Jack & Shim	9	Walls	7
Linoleum	71	Windows	2
Lot lines	9	Cancellations	101
Paint	23	Renovations	100
Porch & Steps	12	Shows (new tenants)	137
Screen doors	17	Miscellaneous	381
Leaking faucets	1		

Item of Interest: Freeze-ups started on December 21, 1951and through December 26, 1951, Total 22, with the following breakdown:

Precuts	17	A & J	1
Prefabs	3	T	1

1004 Wright 2 Br. Prefab, damaged by fire on December 27, 1951

DORMITORY REPORT FOR DECEMBER 1951.

241 MINOR REPAIRS TO FUSES, PLUMBING, ETC.

32 WORK ORDERS STEAM, GLASS, EQUIPMENT, ETC.

98 PIECES OF FURNITURE REPAIRED.

43 HOUSEKEEPING CONTACTS.

456 LIGHT GLOBES REPLACED.

50 ROOMS VACATED.

LINENS LAUNDERED

8,589 SHEETS

4,556 PILLOW CASES

234 BED SPREADS

42 BED PADS

187 SHOWER CURTAINS

6 PAIRS DRAPES

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MISCELLANEOUS STORES WAREHOUSE INVENTORY SUMMARY
MONTH ENDING Dec. - 31 - 1951

	EXPENDABLE ITEMS	FURNITURE (GEN. LEDGER)	FURNITURE (KARDEX CONT.)	PLANT ITEMS	TOTAL
BEGINNING BALANCE	$ 20,288.46	$10,966.06	$11,313.23	$43,203.70	$74,458.22
RECEIPTS:					
On Purchase Orders	694.00				
On Store Orders	118.33				
From Excess					
From Housing	446.09		822.67	3088.57	
From Dormitories	4.70		209.84		
From Other (Misc.)					
TOTAL RECEIPTS	$ 1,263.12		$ 1032.51	$ 3,088.57	$
TOTAL AVAILABLE DISBURSEMENTS:	$ 21,551.58	$10,966.06	$12,345.74	$46,292.27	$
Cash Sales (Backcharge)	63.91				
To Excess			141.44		
To Salvage					
To Housing	1647.99		1595.26	594.00	
To Dormitories	228.95		133.43		
To Dormitories-Linens	43.50				
Dorm-Shades & Reflectors	16.85				
To Warehouse Supplies	6.09				
To Other (Misc.)	51.83		.96	100.50	
TOTAL DISBURSEMENTS	$ 2059.12	$ 10,966.06	($ 1871.09)	$ 694.50	$
ENDING BALANCE (1) (2) (4)	19,492.46	10,966.06	($10,474.65)	$ 45,597.77	$76,056.29
NET CHANGE	$ 796.00		$ 338.58	$ 2394.07	$ 1,598.07

ENDING BALANCE GENERAL LEDGER (BALANCE-COL. 1 PLUS CO. 2) $30,458.52

COLUMN 3 FOR LOCATION CONTROL ONLY- COLUMN 4 MEMO ACCOUNT ONLY

EXCHANGED:	PIECES
Dorm. Furniture	52
Ranges	14
Refrigerators	3
Prefab Heaters	21
Sent to Maintenance	101
From Maintenance	189

REAL ESTATE ENGINEERING UNIT
DECEMBER 29, 1951

Following is the status of projects being handled by this unit:

S-379, Interior Painting - Prefabs

Project completed June 30, 1951. Final contract payment in process.

S-909, Exterior Cycle Painting - 329 Houses - Divisions II and III

Plans and specifications for this project completed and sent to the Contracts Unit December 28, 1951, for preparation to go out for bid.

K-918, Exterior Painting - Three Government-Owned Buildings

Field Release (1) issued December 12, 1951. Plans and specifications for this project completed and sent to the Contracts Unit December 28, 1951, for preparation to go out for bid.

HOUSING AND REAL ESTATE MAINTENANCE

December 1, 1951

I. ORGANIZATION AND PERSONNEL

	Exempt	Non-exempt	Total
A. Employees: as of December 1, 1951	13	122	135
B. Employees: as of January 1, 1952	13	124	137
C. Requisitions are in for:		2	139

II. REALTY MAINTENANCE BACK-LOG REPORT

TYPE OF WORK	OLDEST ISSUE DATE	BACK-LOG	RATE OF RE-LACEMENT
Bathtubs, including tile board (bath) floor lino (bath) painting (bath)	8-13-51	28	10 per week
Tile Board - A & J (other than tub installation)	9-28-51	7	4 per week
Tile Board - Conventional (other than tub installation)	None		
Painting (Misc.)	Orders ready 11-1-51	15	10 to 12 per week
Kitchen floor lino (Prefabs)	None		
Kitchen floor lino (Conv.)	11-20-51	12	2 per week
Bath floor lino (Prefabs)	None		
Bath floor lino (Conv.)	11-28-50	2	When notified
Kitchen sink lino (Prefabs)	9-12-51	9	None
Kitchen sink lino (Conv.)	11-15-51	21	None
Shower Stall installations	2-28-51, other types 12-7-50, D house 41 11-30-50, 1 BR		Emergencies only
Prefab cupboard doors	None		
Laundry trays	7-31-51	63	3-4 per week

351

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III. MAINTENANCE TRANSPORTATION FACILITIES

Heavy Maintenance

TRUCK TYPE	NUMBER IN POSSESSION	CRAFT
1½ ton Flatbed	8	Carpenters
1/2 ton Pickups	9	Carpenters
3½ ton Dump trucks	2	Labor
1/2 ton Pickup	1	Labor
3/4 ton Power Wagon	1	Labor
1/2 ton Pickups	2	Sheetmetal
Panels	2	Millwrights
3/4 ton Walkin	1	Millwrights
Panels	2	Painters
1½ ton Flatbed	2	Painters
1/2 ton Pickups	2	Painters
1/2 ton Pickups	2	Plumbers
3/4 ton Pickups	3	Plumbers
Subtotal:	39	
SERVICE ORDERS:		
3/4 ton Pickups	2	Plumbers
1/2 ton Pickups	2	Plumbers
1/2 ton Pickups	4	Electricians
1/2 ton Pickups	2	Carpenters
1/2 ton Pickup	1	Locksmith
1/2 ton Pickup	1	Glazier
Subtotal:	12	
RENOVATIONS:		
Chevrolet Carryall	1	Painters & Janitresses
1/2 ton Pickup	2	Carpenters
Subtotal:	3	
GENERAL:		
Sedans	2	Supervision
Subtotal:	2	
GRAND TOTAL:	58	

IV. PROGRESS REPORT

A. INTERIOR PAINT PROGRAM:

Carpentry repair work, prior to painting on interior, was completed in 110 units of housing. This work included repair and replacing cupboard doors, checking doors and windows for free operation, replacing sash balances, cabinet door catches, loose molding, etc. This work is done only in portion of house that is to be painted.

Interior painting was completed in 100 units of housing.

Dormitory interior painting was completed in M-6; consisting of 17 guest rooms, lobby, stair well and halls both first and second floors. Work is now in process in Dorm. M-5.

B. LINOLEUM AND TILE:

Floor lino installed:	75
Sink lino installed:	17
Tile in bathrooms:	62
Chempoint program:	258 units of housing.

Floor area of Ganzel's barber shop was recovered with plastic tile. Three-hundred sixty hours of labor were expended covering wall area in shower and wash rooms in Mens' Dorms.

C. FIELD CARPENTRY:

The following is the work completed by the Field Carpentry Function:

Level houses	17	Repair walls - Sheetrock	6
Caulk baseboard (R. houses)	3	Install cupboard doors	2
Apply roof coating	4	Replace street steps	35
Repair window screens	5	Repair stairs	4
Repair screen doors	2	Install house numbers	25% complete
Repair roofs	35		
Replace sash balances	6	Repair floors	6
Replace doors	8	Repair kitchen ceilings	4
Repair doors	6	Miscellaneous	32

Painting done by Misc. Paint function. (Field Carpentry, Gen.)

Paint touchups	47	Dorm rooms painted	10
Paint houses - cycle paint	1	Misc. paint jobs	20
Fire jobs painted	2		

D. CARPENTER SHOP:

Routine work such as filing of saws, sharpening of tools, repair of ladders, repair of office furniture, upholstering of furniture and shop painting continued throughout month.

K. C. Chairs reupholstered:	3	12 hours used.
KIX Chairs Reupholstered:	12	18 hours used.
Cushions reupholstered:	80	120 hours used.

(Carpenter Shop, Cont'd.)

Tarpaulins made	4	8 hours used
Cleaned shop		2 hours used

160 hours used; covering a 20 day period.

BOQ Dorm. screens repaired:	36
Screen doors repaired in 1100 Area	12
New screen doors fabricated	30

E. GENERAL PLUMBING:

Installed 72 bath tubs.
Installed 17 water heaters.
Installed 11 laundry tubs.
Completed 4 bath faucet repairs.
Cleaned 18 sewer lines clogged with tree roots and other foreign matter.
Completed 49 plumbing work orders consisting of replacing broken water lines, sewers, broken plumbing fixtures, etc.
Completed 38 lino repair orders; such as removing and replacing kitchen faucets for lino men.
Completed 41 steam orders consisting of replacing rusted out pipe, repairing and replacing steam valves and traps, and checking Dorms, Commercial buildings, Geo. Wash. Way Apartments once a week for steam leaks.
Checked steam heated hot water tanks for temperature.
Started a copper sulphate program in town. This work consists of inserting two pounds of copper sulphate in each toilet bowl and flushing through sewer lines. The copper sulphate, in time, will kill the tree roots growing in sanitary sewer lines.
Thawed out frozen water lines and drain lines in houses.

F. MILLWRIGHTS: 3 men.

This group has been on furnace Service calls exclusively for past 30 days.

G. SHEETMETAL: 3 men.

The following is a summary of work done by Sheetmetal function:

Group worked on shower stall, gutter, smokepipe and duct work.
Shower stalls were installed in M-8, M-6, M-3 and M-5.
Twenty-five gutter orders have been completed.
Twelve smokepipes were replaced.

H. RENOVATION:

Thirty-four houses were processed in Renovation group during month. Of these 34 houses, five received complete paint jobs and thorough cleaning. Four houses were partially painted and received complete cleaning. The remaining 25 houses had complete cleaning only. We have ten (10) work orders for Renovation on hand at the present time.

I. SERVICE ORDER FUNCTION:

The following is a status report of Service Orders:

A.	On hand at the beginning of the month:	196
B.	Received during the month:	2106

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(Ser. Orders Cont'd.)

C. Completed during the month: 2174
D. On hand at the end of the month: 128

PLUMBING BACKLOG:

A. Seventy-six (76) incomplete Service Orders.

ELECTRICAL BACKLOG:

A. Eight (8) incomplete Service Orders as of Dec. 26, 1951.

LOCKSMITH BACKLOG:

A. Thirty-four S. O., but has increased amount of work from areas on Work Orders.

CARPENTRY AND GLAZING:

A. Up to date on backlog.

Total time applied to Work Orders other than the regular Service Order work:

A. 492.1 hours.

J. LABOR:

This group of six men has been on numerous assignments; such as, hauling ashes from 784 building, pumping out waste oil from service stations, removing insulation from under Dorms., sweeping snow from Dorm. walks, picking up trash from sixty renovated houses, delivering fuel and inspection of vacant houses for heat.

COMMERCIAL PROPERTY - REAL ESTATE SECTION

DECEMBER, 1951

PERSONNEL - COMMERCIAL PROPERTY:

	December
Beginning of month	13
End of month	13
Net difference	0

PERSONNEL - COMMERCIAL AND NONCOMMERCIAL FACILITIES:

	Commercial	Noncommercial	Total
November	1,295	115	1,410
December	1,327	118	1,445
Net difference	32	3	35

SUMMARY OF ROUTINE ITEMS PROCESSED:

Work Orders	60	25	85
Back Charges	2	2	4
Service Orders		1	1

CONTRACTS AND NEGOTIATIONS:

A. Commercial

1. Supplemental Agreements:

Parcell's Automotive Service - to provide for the construction of a building addition.

2. Assignment of Lease:

Johnson & Reutlinger, a partnership - to M. R. Petersen, for the continued operation of the Facility.

3. Leases:

(a) Chalmer D. Joseph Company - covering the construction, operation and maintenance of a commercial building, Block 6, Uptown Business District.

(b) Western Union Telegraph Company - covering the continued operation of a telegraph office in a Government-owned building, 94-X, located at 617 George Washington Way.

(c) Standard Oil Company of California - covering the construction, operation and maintenance of an automotive service station at the southeast intersection of Lee Boulevard and Gillespie Street.

4. Letters of Authorization:

(a) F. H. Moller - to permit Ellis L. Burgamy to sublet space in the Bus Depot for the continued operation of a restaurant.

(b) Richland Investment Company - to permit sublessee Wiley Dickson to sublet his space in the Richland Investment Company Building to LaGrant Barfuss for the continued operation of a shoe repair shop.

5. Conditional Sales Contract - covering the sale of Government-owned equipment to L. C. Foisy.

B. Noncommercial:

1. Assignments of Lease:

(a) Northwest United Protestant Church:

(1) From Northwest United Protestant Church to Washington Christian Missionary Society.

(2) From Washington Christian Missionary Society to the Board of Church Extension of Disciples of Christ.

SUMMARY OF OCCUPANCY AND EXPANSION STATUS:

A. Commercial:

	November	December
1. Number of Government-owned buildings	37	37
(a) Number of businesses operated by prime lessees	41	41
(b) Number of businesses operated by sublessees	16	16
(c) Total businesses operating in Government-owned buildings	57	57
2. Doctors and dentists in private practice, leasing space in Government-owned buildings	21	21

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COMMERCIAL PROPERTY - REAL ESTATE SECTION: December, 1951

	November	December
3. Number of privately-owned buildings		
(a) Number of businesses operated by prime lessees.	38	38
(b) Number of businesses operated by sub-lessees	33	32
(c) Total businesses operating in privately-owned buildings	71	70
4. Privately-owned buildings under construction	4	4
5. Total Number of businesses in operation	128	127
B. Noncommercial:		
1. Government-owned buildings		
(a) Churches	4	4
(b) Clubs and organizations	9	9
(c) Government agencies	3	3
Total	16	16
2. Privately-owned buildings		
(a) Completed and in use	6	6
(b) Under construction	6	6
3. Sites tentatively allocated or leases in process of negotiation (See GENERAL #3)*	6	2
Total	18	11
4. Pasture Land Permits	35	37

GENERAL:

A. Commercial:

1. Termination of sublease - between Wiley Dickson and Paul Eichorn, effective December 1, 1951, a sublessee of Richland Investment Company.

B. Noncommercial:

1. American Legion - installation of two propane gas heaters in the Legion Hall was completed with certain exceptions.

2. Church of Christ the King - the existing coal-fired furnace was converted to an oil-burning furnace.

*3. Four club site applications, previously included in this total, no longer active.

COMMERCIAL PROSPECTS:

Inquiries were received during the month concerning the establishment of the following types of commercial enterprises:

Automobile Agency
Service Station
Drive-In Theater

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700-1100-3000 AREA SERVICES SECTION
MONTHLY REPORT
DECEMBER 1951

700-1100 MAINTENANCE & STEAM UNIT:

General Maintenance

Crating, banding, shoring and preparation of materials for excessing involved approximately 512 manhours.

Hauserman partitions were relocated and short sections installed in 700 Area offices.

Numerous repair jobs were performed; furniture repair, caulking and weatherstripping doors, windows, step repair, etc.

Exterior door closers were winterized to prevent ice forming in the mechanism.

Linoleum was replaced with floor tile and rubber bases repaired in two rooms of the hospital.

Interior painting was stepped up at the hospital. Twenty rooms and several hallways were completed this month.

Street curbs in "No Parking" zones were repainted as weather permitted.

Miscellaneous repair jobs were touched up.

Sign painters spent two weeks in the 300 Area doing miscellaneous sign work for Area Maintenance.

Screen was cut for 100 Security signs, completion is pending arrival of new shipment of cardboard.

To reduce electrical panel heating at 713 Building all panels were tightened, circuits balanced, motors cleaned, and fixtures repaired. A complete preventive maintenance check was also made and the system was refused and relamped.

In the 703 Building all panels were tightened and 80 fifteen-amp fuses were installed.

Installation of outlets on drafting tables in 760 Building was completed.

Portable tools were inspected and repaired. Numerous buzzer systems were revised and installed for changing occupancy.

Installed auxiliary heating coil in south duct of old section of Telephone Building to provide balanced heating. Assembled metal shelving for new section. Performed numerous miscellaneous mechanical repairs.

The overhaul of No. 4 boiler at 784 Building was completed and relief valves were checked on all four boilers.

Acid lines and tank were repaired at water softener plant. The acid mix tank is being replaced.

Repaired radiator valves, traps and risers in 761 Building.

360

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4c

Installed three radiators in 703 Building.

Repaired leaks in several radiators resulting from erosion of steel nipples.

Steam Operation:

Three 784 Building boilers were in operation for the entire month. No. 4 boiler was removed from service and No. 1 placed on the line in its stead.

It was necessary to shut down the 784-A water softening plant on December 19 to repair leak in lead-lined acid-mixing tank and to repair Spence 6" water-pressure-reducing valve. Attempting to operate temporarily on untreated water resulted in "freezing" the boiler feed pumps from accumulation of scale, necessitating an emergency overhaul of No. 1 boiler feed pump on December 20. Temporary repairs were also made to lead-lined tank to enable it to be returned to service until a new tank can be built and installed.

Colder weather has caused freezing of coal in railroad cars intransit and necessitated stopping incoming rail shipments, the last car being unloaded December 26. Use from stockpile by means of bulldozer continued for the balance of the month.

Sub-contractor on the new wing of 703 Building began using steam on December 27.

The quantity of steam generated at 784 heating plant for the month of December was 20% more than for the same month last year.

With the present quality of coal being received, one boiler has been able to meet heating loads at the 1131 Bus Terminal.

Steam, Coal and Soft Water Statistics:

Steam Generated	33,949.8 M. Lbs.
Steam Leaving Plant	28,857.3 M. Lbs.
Steam Delivered	26,625.3 M. Lbs.
Coal Consumed	2,611.50 Net Tons
Total Water Softened	4,814,900 Gallons
Soft Water to Kadlec Hosp.	720,100 Gallons
Soft Water Used at 784 Plant	4,094,800 Gallons
Soft Water Service Time to Kadlec Hospital	411.8 Hours

NORTH RICHLAND FIRE UNIT:

Alarm No.	Response to Alarms	Cause for Alarms	How Received
150	Bks. 219-A, Rm. 21	Smoke Scare	Phone
151	5th St. & "M" Ave.	Accidental Alarm	Box
152	720 "I" Ave.	Faulty cord to electric heater	Box
153	808 "E" Ave.	Short in plug-in to trailer	Box
154	5th & "M" Ave.	Accidental Alarm	Box
155	1125 "L" Ave.	Improperly operated oil stove	Radio

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1225177

Alarm No.	Response to Alarms	Cause For Alarms	How Received
156	1st St. & Geo. Wash. Way	Accidental Alarm	Box
157	907 "E" Ave.	Short Circuit	Box
158	4th St. & "Q" Ave.	Unattended cooking of food	Phone
159	5th St. & "M" Ave.	Accidental Alarm	Box
160	314 "D" Ave.	Overheated oil stove	Phone
161	Bks. 224	Accidental Alarm	Box
162	Bks. 169	Accidental Alarm	Box
163	5th St. & "M" Ave.	Faulty connection in Protecto wire	Box
164	Bks. 196	False Alarm	Box
165	1125 "J" Ave.	Heater too close to material	Box
166	4th St. & Stevens	False Alarm	Box
167	Bks. 210	False Alarm	Box
168	Bks. 230 (3104)	False Alarm	Box
169	300 "G" Ave.	Faulty Oil Stove	Box
170	315 "H" Ave.	Improperly operated oil stove	Box
171	Bks. 200 between A & B wings	Broken Steam Pipe	Box
172	1120 "I" Ave.	Defective wiring	Box

Investigations:

12/14/51, trailer at 328 "G". Short in wiring.
12/21/51, trailer at 806 "G". Improperly operated oil stove.
12/29/51, trailer at 1209 "F". Short in wiring.

Personal Loss	H. W. Loss	Total Loss	Alarm No.
$ 225.00	$	$ 225.00	165
12.00		12.00	169
1,000.00	40.00	1,040.00	172
$1,237.00	$ 40.00	$1,277.00	

General:

There were 3 safety and security meetings; 14 inside drills and schools; and 2 outside drills.

Seventy-four fire alarm boxes were tested and 4 extinguishers charged.

All on-duty members of B Shift attended the movie on "The Common Cold".

Chief Olson attended court in Yakima on December 17, 18 and 19. Lt. Mitchell and Lt. Reynolds attended court on December 19 and 20.

Chief Olson and Fireman Van Loan inspected loose auxiliary box in Hospital.

Chief Olson visited Hospital Building to aid in testing Protecto wiring system.

List of 3000 Area buildings containing ammunition was submitted by Mr. Carcio, Army Inspector. Copies were made and posted on boards for information of Fire personnel.

Chief Olson attended a training meeting in Richland.

Fireman C. Van Loan attended a Civil Defense meeting in W-20.

Various inspection tours of 3000 Area were made by Fire personnel during the month.

Personnel of Fire Department sprayed water on frozen ground area to provide a skating rink for school children.

NORTH RICHLAND PATROL UNIT:

General:

One hundred twenty traffic warning tickets were issued. These tickets were issued principally for Illegal Parking.

Forty traffic citation tickets were issued during December; 4 for Running Stop Sign, 18 for Illegal Parking, 3 for No Operator's License, 9 for Speeding, 2 for Leaving Motor Vehicle Unattended with Motor Running, 1 for Failure to Flare Stalled Vehicle, 1 for Passing in No-Passing Zone, and 2 for Defective Equipment.

Eleven persons were incarcerated in the Richland jail during the month; 7 for Public Intoxication, 2 for Drunken Driving, 1 for Attempting to Remove Liquor From a Public Bar, and 1 for Third Degree Assault.

During December eight inquiries regarding formerly employed General Electric and Construction personnel were answered by this office. These inquiries came from the Civil Service Commission, the U. S. Navy and the U. S. Army.

All fire, safety and traffic hazards observed were reported to proper authorities.

All facilities, warehouses, buildings and John Ball School were checked on No. 1 and 3 shifts daily and on all shifts on Sundays and holidays.

A total of 38 Courtesy Cards were issued during the month. These cards were placed on automobiles that did not warrant receiving a warning or citation ticket. Cards request cooperation of drivers in helping North Richland Patrol to uphold traffic laws of the State of Washington.

Twenty-four weekly hours and 8 monthly hours were spent on bank escort service from Pasco.

Three firearms were registered with Arsenal Officer in Richland during the month. These belong to people living in Trailer Camp and Bremerton Houses in North Richland.

An Appearance Officer was assigned to Judge Earle W. Brown's court in Richland to appear against persons cited to court by North Richland Patrol.

There are 10 posts in the North Richland Area at the present time; 5 fixed posts and 5 re-posts.

North Richland population is as follows:

Bremerton Houses	675	Total Occupied Lots in Trailer Camp	1,444
Trailer Camp	4,083	Total Bremerton Houses Occupied	195
Men's Barracks	1,383		
Women's Barracks	83		
TOTAL POPULATION	6,224		

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Unusual Incident Reports:

Public Intoxication	7
Operating Motor Vehicle While Under Influence	2
Negligent Driving	3
Negligent Driving - Liquor Involved	2
Delinquent Child	1
Accident (1 Private Vehicle & 1 Barricade Cable)	1
Accident (1 Private & 1 Government Vehicle)	3
Accident (1 Private Vehicle)	1
Third Degree Assault	1
Recovery of Stolen Car	1
Attempt to Transport Liquor from Public Bar	1
Broken Sprinkler	1

Special Services Performed:

Emergency Messages Delivered	68
Emergency Long Distance Telephone Calls	133
Western Union Telegrams	3
Pacific Telegraph Telegrams	2
Fires (Sig. 12)	9
False Fire Alarms	11
Unusual Conditions Reported to Maintenance	16
Escorts to First Aid	2
Complaints on Dogs (Trailer Camp)	4
Dogs Impounded	1
Escort for Public Health Nurse	2
Billfolds Reported Lost or Stolen	3
Billfolds Turned in to Patrol	1
Billfolds Returned to Owners	1
Disturbances Investigated	7
Suspicious Persons Investigated	3
Personnel Locked out of Rooms	8
Bicycles Reported Lost or Stolen	2
Bicycles Found	5
Child Bitten by Dog	1
Escort for Wide and High Loads	2
Soldiers turned over to M.P. Detachment for Disposition	5
Calls to Assist Ambulance	5
Cars Impounded at North Richland Patrol Headquarters	3
Lost Children	4
Children Returned to Parents	4

Complaints:

Grand Larceny	4
Petit Larceny	4
Miscellaneous	1

NORTH RICHLAND COURT CASES
DECEMBER 1951

VIOLATION	NO. OF CASES	NO. OF CONV.	NO. OF FORF.	CASES DISM.	CASES CONT'D.	WARR. ISS.	SENT. SUSP.	LIC. RVKD.	TOTAL FINES	TOTAL SUSP.	TOTAL BAIL FORFEITED
Illegal Parking	15	6	8		1		6			$ 21.00	$ 41.00
Ran Stop Sign	4	2	2						$ 12.50		10.00
Speeding	9	2	5		2				42.50		60.00
Reckless Driving	3	2			1				48.00		
Negligent Driving	2	1				1			12.50		
Defective Equipment	3	2			1				8.50		
Illegal Passing	1		1								5.00
Failure to Have Flares By Stalled Truck	1				1						
Drunken Driving	5	3	1		1			3	206.50		102.50
Attempt to Remove Liquor from Public Bar	1	1							15.00		
Public Intoxication	9	3	4	1	1				37.50		65.00
Third Degree Assault	1		1								37.50
TOTAL	54	22	22	1	8	1	6	3	$ 383.00	$ 21.00	$321.00

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ORGANIZATION AND PERSONNEL:

No. of Employees on Roll:	Beginning of Month Exempt	Non-Exempt	Total	End of Month Exempt	Non-Exempt	Total
North Richland Patrol	5	17	22	5	16	21
North Richland Fire	33	—	33	33	—	33
Maintenance & Steam Operation	8	50	58	8	53	61
TOTAL	46	67	113	46	69	115

Personnel Changes During Month:

Maintenance & Steam Operation

Transfers from Public Works	1
Transfers from Utilities & General Services	1
Transfers from Legal	1

North Richland Patrol

Termination	1

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