#1 - H. A. Winne
#2 - Zay Jeffries, Pittsfield
#3 - C. G. Suits, Schenectady
#4 - G. R. Prout
#5 - J. R. Rue
#6 - C. N. Gross
#7 - A. B. Greninger
#8 - F. R. Creedon
#9 - Hanford Operations Office
Attention: F. C. Schlemmer, Manager
#10 - Hanford Operations Office
Attention: F. C. Schlemmer, Manager
#11 - Hanford Operations Office
Attention: F. C. Schlemmer, Manager
#12 - Hanford Operations Office
Attention: F. C. Schlemmer, Manager
#13 - Hanford Operations Office
Attention: F. C. Schlemmer, Manager
#14 - 700 File
#15 - 700 File
#16 - 700 File

January 26, 1949

HANFORD WORKS

MONTHLY REPORT

DECEMBER - 1948

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This Document Consists of

291 Pages. N[redacted]

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GENERAL SUMMARY

DECEMBER 1948

A total of 103 tons of metal was discharged from the three piles which ran at an average operation efficiency of 87.8 percent. The nominal power level of 275 MW was maintained throughout the month. At month end the three piles were operating with the following concentration of CO_2 in the helium atmosphere: B—10%, D—40%, F—25%.

A total of 66 tubes of alpha-rolled, lead-dipped (not triple-dipped) material was discharged with difficulty at 225 MW/ton. It was decided to push the remaining 62 tons of this material at concentrations no higher than 230 MW/ton.

The appearance of alpha-rolled, triple-dipped slugs after an average exposure of 210 MD/ton was very good and encourages the belief that this material can be carried satisfactorily to an exposure of 400 MD/ton.

The 300 Area canned a total of 141 tons of acceptable slugs at a yield of 87.1%. The Melt Plant produced 36 tons of billets.

A total of 65 batches was processed through the isolation phase of the Separations Operations. The over-all waste losses throughout the Separations activities averaged 2.6 percent for the month.

There was no change in the operation of the sand filter and indicated efficiencies continued to be greater than 99.5 percent. It was fairly well established during the month that a major portion of the stack gas contamination which takes place after the sand filters is a function of the dissolving operation. Active study is continuing on this problem.

Extraction waste losses on material from B Pile (due probably to the long standby conditions) continued to run considerably higher than on material from the other piles, and it was necessary to rework practically all B Pile material through the extraction step. This situation is being followed closely.

The nine tube mock-up in the 305-A Building in the 300 Area was completed, thus permitting the Technical Division to proceed with their carbon block expansion and contraction, deflection, and other physical tests.

Better than average progress is being made by the Morrison-Knudsen Company, contractor on the railroad rehabilitation program. Already increased speeds have improved the railroad operation and lower maintenance costs is being realized It is noteworthy that the improvement came at a time when railroad traffic was reaching a peak condition. There was a 10% increase in traffic in December over that of November with a total of 5,225 cars handled.

An all-time electrical load was established on December 27 with a peak of 68,200 KW.

The quality of purified gas-baked coke (GBF graphite) has been showing erratic variations. Occasional bars are abnormally low in quality. The condition is now considered serious at present but at month-end the reason for this erratic behavior was still unexpla[illegible]

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Tests on a vertical rod guide for use with the 3-inch rods of the DR and H Piles showed leakage of an intolerable amount of fast neutrons. Possible corrective measures are being investigated.

Various ways in which the B Pile, in the future, might be shut down in a voluntary transition to operation of the DR Pile are being studied.

Tests on a sample of cadmium spline indicate that when twenty of these splines are available as emergency controls for one pile, the operating level as limited by control considerations can be raised to 400 MW.

Installation of tritium extraction facilities (Project P-10) proceeded reasonably satisfactorily.

During the month close attention was devoted to a search for suspected product hold-up points in the Separations Plants process equipment in an effort to improve running material balances. Tank and centrifuge sprays, tank calibrations, and flushing procedures were examined and revised in several places, resulting in improved product balances. A study of the alpha-emitting components in the metal waste solution was instituted in a search for possible higher isotopes in aged metal. Production tests reduced the time cycles for Isolation peroxide addition, digestion, and precipitate settling.

The 234-5 Project attained ca. 40% completion in construction during the month. The checking of prints and acceptance tests continued with particular attention also devoted to the inspection of hoods received and equipment installed therein. The General Engineering & Consulting Laboratory design of the remotely operated line attained 40-45% completion. Modification of a Bldg. 231 hood to house the "Pilot Line" and receipt of equipment for this unit were nearly complete at month-end. The Los Alamos training of General Electric technical operating personnel was also placed in motion.

The Redox development program encountered difficulty in Semi-Works operations with the appearance of poor phase disengagement in column studies. In the Scale-Up Unit, this was found to be caused by the accumulation of solvent oxidation products, and when these were removed by sodium carbonate washing of recycled solvent, the operation returned to normal. Similar troubles in the Demonstration Unit have been traced to the presence of some unknown component of metal feed solution prepared by the dissolving uncanned uranium slugs; the identification and removal of this component is still under investigation.

Redox process laboratory research was continued in both basic process studies and process improvement. Ruthenium volatization by ozonization continued to appear promising as a method of increasing decontamination, as did zirconium adsorption by glass wool. Process studies were carried out for the use of ozone as a cross-over oxidant, measurement of heats of extraction, causes of emulsion formation, chromium behavior in Redox, and effects of aqueous phase dispersion on Column IA decontamination. Preliminary studies of methods of coupling Redox to the $BiPO_4$ process were also initiated in the laboratory.

Production rolling of uranium rods for Hanford was conducted at Lockport, N.Y., under technical supervision by the 300 Area Plant Assistance Group. Arrangements were completed with the A.E.C., whereby personnel of their New York offfice will relieve Hanford of this supervisory responsibility, effective with the February rollings.

The four inch slug which ruptured in the 100-B Pile in late November was identified as rolled uranium which had been triple-dip canned in September. The welded cap end of the jacket had been separated completely from this slug when it was located after discharge. Separation apparently had resulted from the pressure of corrosion products seen on the exposed end of the slug. Surface distortion of the can and cap prevented effective preliminary examination, but more may be learned when the parts can be studied closely.

Canning trials were continued with rolled metal slugs machined to a smaller diameter and a greater length than standard to compensate for the dimensional change which this metal undergoes in the triple-dip process. It was verified that both canning yield and slug quality (particularly can wall penetration) are improved by this change in machining specifications. Consideration is being given to adopting the smaller diameter slugs as standard.

Metal and casting processes in use at Argonne National Laboratory for the production of lithium-aluminum alloy were studied and design work was started on similar facilities which are to be installed at Hanford for the preparation of this alloy (P-10 Project).

Survey findings in the Health Instrument Operationsl Division indicated increased frequency of contamination of personnel and work areas. In the Control and Development Division, analytical results on samples of water, air and vegetation were comparable to previous findings. A resample in the urine analyses for plutonium showed a positive result of 0.65 d/m though this may be due to a low spike yield. The maximum uranium content found in the urine of the 300 Area workers was 316 /ug/liter.

In Biological Monitoring, some relatively active rabbit thyroids were noted as well as highly active Russian thistle. Programs of the various Biology Division groups gained some in their scope of planned activity as requested by the Medicine and Biology Division, Atomic Energy Commission, despite acutely inadequate laboratory facilities.

During the month a slight but noticeable trend from the sellers market, which has been prevalent for so long, was noted.

Considerable difficulty was experienced in maintaining an adequate supply of fuel oil for heating village homes. This was due primarily to two reasons: 1) Fuel oil is a mandatory item and therefore must be procured by the Commission. Their contract specifies deliveries in tank trucks. It is necessary for these trucks to come over the Snoqualmie Pass. Since the Pass was closed several times during the month, deliveries were delayed. 2) Our storage tanks hold only 40,000 gallons and it was recommended that in order to provide a reasonably safe working stock that this capacity be at least doubled.

Excess materials valued at $115,321.99 were disposed of during the month. Of this amount materials valued at $83,587.94 were shipped off the Project in Government shipping orders. The remaining $31,734.05 in materials were used on the project.

There was one major injury during the month making a total of 17 for the year with a frequency rate of 0.99.

The Fire Protection Division returned to a five-day week on December 6, 1948.

Laundry volume in both the 200 West and 700 Area was down appreciably this month.

Preliminary assignment of numbers for the new dial system has started.

All divisions are now participating in the 9-Point Job Improvement Program and during December two divisional groups completed their series of conferences. Two sets of questions and answers were distributed to all supervisors during December.

Open requisitions for additional personnel decreased from 456 at the beginning of the month to 388 at the end of December. Total plant roll increased during December by 37 employees.

There were 1,846 contacts made by Employee Service Counselors during December. Two employees retired and one employee death occurred during December. Thirteen suggestion awards, totaling $115, were granted during December. During the month several G.E. films were procurred from the Portland office for use by three groups in Richland, as well as the Kiwanis Club in Kennewick. Continued publicity was prepared, explaining the causes of the power shortage and requesting the residents of Richland to conserve power. Publicity was prepared relative to several community recreation parks on school grounds in Richland.

Studies have continued for the purpose of assembling data relative to the composition of the bargaining unit for use in the forthcoming formal hearing to be conducted by the National Labor Relations Board. A representative was sent to Oak Ridge for the purpose of gaining information on labor relations and wage rate policies at that location. During December several meetings were held with the various divisions for the purpose of clarifying the wage rate policies. An official A.E C. reimbursement order covering the reclassification of non-exempt employees on July 19 was received during the month.

On December 7, 1948, the first election of the Richland Community Council was held. Four Councilmen-at-large were elected and one Councilman from each of five districts.

During the month automatic semaphore lights were installed and placed in operation on the by-pass highway at Van Giesen, Stevens and George Washington Way.

The Transportation Division found it necessary to resort to dynamiting ice in the vicinity of the Yakima Bridge in an attempt to protect the bridges from the ice pressure.

Design work has been completed and a project proposal prepared for two hundred, one bedroom apartments. Also, the design and project proposal is in the preliminary stages for the three hundred, two bedroom apartments.

A savings of approximately $68,000 will be realized resulting from reduction of the carpenter forces.

Two hundred sixteen ranch type houses, consisting of two-hundred nine, three bedroom and seven, four bedroom houses, were accepted from construction during the month.

A preliminary report consisting of a summary of basic shelter rents has been submitted by Messrs. Barrett and Wheeler. The final reports on their appraisal are expected during January, 1949.

The new gymnasium at the Columbia High School was dedicated December 1, 1948, by project and school officials, together with the High School student body.

On December 17, 1948, all keys for the Spaulding Grade School were turned over to the Community Activities Division, indicating the completion of all interior work by the contractor.

Work is progressing on the construction of chapels by South Side United Protestant Church, at Goethals and Gillespie; and by the Richland Baptist Church at George Washington Way and Wordrop.

Fire loss during the month amounted to $900 project loss and $522 personal loss in Richland; $575.28 project loss and $924.50 personal loss in North Richland. Twenty-three and nineteen alarms were answered in Richland and North Richland, respectively.

Additions, alterations and improvements have been effected in the following existing facilities: Construction of a three-chair barber shop in the Desert Inn; remodeling of the Pennywise Drug Store; addition to existing building housing the Richland Supply Company.

Richland Electric and Furniture, Inc., completed their new building and opened for business.

Cahoon Motors Company started construction on a new building to house a Studebaker sales and service agency.

Messrs. Joseph and Cannon have completed the installation of Bendix washing machines in the Richland dormitories.

Store locations were granted for the following facilities: A Men's Wear Store awarded to Messrs. Dawson and Richards; a Milk Depot location awarded to Mr. O. M. Wilmot; Fountain Lunch location awarded to Mr. H. A. Sewell; and a Sporting Goods Store location awarded to Mr. Frank Berry.

Invitations to bid were mailed on the following prospective facilities to be established in Richland: Skating Rink; Dry Cleaning Plant; and Theater.

There was no evidence of injury to any employee during the month due to radiation.

Employee physical examinations decreased by 10% to 4,500, while first aid treatments also dropped by 10% to 17,000.

Total absenteeism was 2.63%, while that due to sickness only increased from 1.41% to 1.73%, due to the usual winter increase of respiratory infections.

Seventeen major and sixty-four sub-major injuries were treated. There were ten less majors, but twelve more sub-majors. Of these, one major and six sub-major injuries were sustained by G. E. employees.

The health topic of the month covered heating of the home from the health standpoint.

One wing of the North Richland Hospital was opened for bed patients on December 13, due to extreme crowding at Kadlec.

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The average daily hospital census was 101, a 5% increase over November. A portion of this load was carried at North Richland during the latter part of the month.

Clinic visits were 5,798, a decrease of 8%, but were 73% higher than the December 1947 figures.

Dental clinic visits decreased to 3,143, a 13% drop since one week was lost by several dentists who were taking the State Dental Board examinations.

Public Health nurse home visits were up 100%. There was a sharp increase in communicable disease, especially chickenpox.

Budget estimates together with narrative explanations of the budgets for the General Divisions were completed early in the month.

Financial Statements and Operating Reports for November were issued on December 27 and December 22, respectively.

During the month studies were continued with regard to the method of liquidating various accounts and the assessment of charges to other divisions. Several changes in methods of determining amounts to be assessed were made as a result of these studies.

The first bonds purchased at Schenectady for Hanford Works employees representing payroll deductions made in October were delivered to employees on December 10. Custody Receipts for bonds purchased in October under the G. E. Employees Savings and Stock Bonus Plan were delivered to employees on December 17.

As a result of the recanvass of all employees in connection with participation in the Group Life Insurance Plan, the over-all percentage of participation increased from 72 to 75.6.

Due to increased efforts to reduce the amount of expenditures not billed to A.E.C., the amount unbilled as of December 31 was $1,786,589 less than that of November 30. Expenditures not yet reimbursed were also reduced by $4,278,149.

Following is a comparison of unreimbursed charges as of November, 1948 and December, 1948:

	November 30, 1948	December 31, 1948
Billed on Public Vouchers	$ 3 307 437	$ 1 937 078
Submitted on Pre-Billing Audit Vouchers	6 099 435	4 978 234
Unbilled	9 179 103	7 392 514
Total	$18 585 975	$14 307 826

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STAFF

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

FORCE REPORT
DECEMBER 1948

	Non-Exempt		Exempt		Total	
	11-30-48	12-31-48	11-30-48	12-31-48	11-30-48	12-31-48
GENERAL	14	14	11	9	25	23
LAW DIVISION	4	3	4	4	8	7
DESIGN & CONST. DIVISIONS						
ADMINISTRATIVE	28	29	6	6	34	35
CONSTRUCTION	265	250	190	189	455	439
CONST. ACCOUNTING	67	70	7	7	74	77
DESIGN	141	141	110	109	251	250
PROCUREMENT	32	30	54	55	86	85
NO. RICHLAND REALTY	272	274	23	24	295	298
MANUFACTURING DIVISIONS						
GENERAL	2	2	6	7	8	9
PROJECT ENGINEERING	71	72	51	53	122	125
MANUFACTURING ACCT.	38	36	5	7	43	43
OPERATIONS DIVISIONS						
"P" DIVISION	311	313	61	61	372	374
"S" DIVISION	245	251	60	60	305	311
POWER	346	366	81	81	427	447
MECHANICAL DIVISIONS						
MAINTENANCE	525	521	72	73	597	594
ELECTRICAL	235	236	46	47	281	283
INSTRUMENT	168	171	44	45	212	216
TRANSPORTATION	686	687	67	68	753	755
TECHNICAL DIVISIONS						
TECHNICAL GENERAL	2	2	4	5	6	7
PILE TECHNOLOGY	12	12	52	50	64	62
SEPARATIONS TECHNOLOGY	83	86	86	86	169	172
METALLURGY & CONTROL	402	412	112	112	514	524
MEDICAL DIVISION	428	427	97	95	525	522
H.I. DIVISION	222	221	91	94	313	315
ACCOUNTING DIVISION	164	160	23	22	187	182
EMPLOYEE & COMM. REL. DIV.	70	69	23	23	93	92
SERVICE DIVISIONS						
PLANT SECURITY & SERVICE	1061	1073	126	126	1187	1199
PURCHASING & STORES	164	169	25	25	189	194
COMMUNITY DIVISIONS	826	815	160	163	986	978
GRAND TOTAL	6,884	6,912	1,697	1,706	8,581	8,618

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PERSONNEL DISTRIBUTION - DECEMBER 1948

	100-B Area	100-D Area	100-F Area	200-E Area	200-W Area	300 Area	Plant General	3000 Area	700-1100 Area	Total
GENERAL										
Clerical	-	-	-	-	-	-	-	-	9	9
Total	-	-	-	-	-	-	-	-	14	14
	-	-	-	-	-	-	-	-	23	23
LAW DIVISION										
Clerical	-	-	-	-	-	-	-	-	4	4
Total	-	-	-	-	-	-	-	-	3	3
	-	-	-	-	-	-	-	-	7	7
DESIGN & CONSTRUCTION DIVISIONS										
ADMINISTRATIVE										
Supervisors	-	-	-	-	-	-	-	-	6	6
Engineers	-	-	-	-	-	-	-	-	1	1
Clerical	-	-	-	-	-	-	-	-	23	23
Others	-	-	-	-	-	-	-	-	5	5
Total	-	-	-	-	-	-	-	-	35	35
CONSTRUCTION										
Supervisors	-	-	-	-	-	-	15	31	-	46
Engineers	-	13	-	9	-	1	14	30	17	84
Clerical	-	17	-	-	-	-	16	100	9	142
Others	-	41	-	2	-	-	96	8	20	167
Total	-	71	-	11	-	1	141	169	46	439
CONSTRUCTION ACCOUNTING										
Supervisors	-	-	-	-	-	-	-	7	-	7
Clerical	-	-	-	-	-	-	-	70	-	70
Total	-	-	-	-	-	-	-	77	-	77

	100-B Area	100-D Area	100-F Area	200-E Area	200-W Area	300 Area	Plant General	3000 Area	700-1100 Area	Total
DESIGN & CONSTRUCTION DIVISIONS										
DESIGN										
Supervisors	-	-	-	-	-	-	-	-	13	13
Engineers	-	-	-	-	-	-	-	-	110	110
Clerical	-	-	-	-	-	-	-	-	70	70
Others	-	-	-	-	-	-	-	-	57	57
Total	-	-	-	-	-	-	-	-	250	250
PROCUREMENT										
Supervisors	-	-	-	-	-	-	2	-	12	14
Clerical	-	-	-	-	-	-	-	-	29	29
Others	-	-	-	-	-	-	11	-	31	42
Total	-	-	-	-	-	-	13	-	72	85
NORTH RICHLAND REALTY										
Supervisors	-	-	-	-	-	-	-	25	-	25
Engineers	-	-	-	-	-	-	-	4	-	4
Clerical	-	-	-	-	-	-	-	32	-	32
Others	-	-	-	-	-	-	-	237	-	237
Total	-	-	-	-	-	-	-	298	-	298
MANUFACTURING DIVISIONS										
GENERAL										
Supervisors	-	-	-	-	-	-	-	-	7	7
Clerical	-	-	-	-	-	-	-	-	2	2
Total	-	-	-	-	-	-	-	-	9	9

	100-B Area	100-D Area	100-F Area	200-E Area	200-W Area	300 Area	Plant General	3000 Area	700-1100 Area	Total
MANUFACTURING DIVISIONS										
PROJECT ENGINEERING										
Supervisors	-	-	-	-	1	-	-	-	13	14
Engineers	-	-	-	-	3	1	-	-	36	40
Drafting Personnel	-	-	2	-	5	3	-	-	27	37
Clerical	-	-	1	-	-	-	-	-	16	17
Others	-	-	1	-	2	-	-	-	14	17
Total	-	-	4	-	11	4	-	-	106	125
MANUFACTURING ACCOUNTING										
Supervisors	-	-	-	-	-	-	-	-	7	7
Clerical	-	-	-	-	-	-	-	-	36	36
Total	-	-	-	-	-	-	-	-	43	43
OPERATIONS DIVISIONS										
"P" DIVISION										
Supervisors	9	14	19	-	-	14	-	-	5	61
Operators	39	62	43	-	-	155	-	-	-	299
Clerical	2	2	2	-	-	5	-	-	3	14
Total	50	78	64	-	-	174	-	-	8	374
"S" DIVISION										
Supervisors	-	-	-	22	30	-	-	-	7	59
Operators	-	-	-	105	131	-	-	-	3	239
Clerical	-	-	-	4	7	-	-	-	2	13
Total	-	-	-	131	168	-	-	-	12	311

	100-B Area	100-D Area	100-F Area	200-E Area	200-W Area	300 Area	Plant General	3000 Area	700-1100 Area	Total
OPERATIONS DIVISIONS										
POWER										
Supervisors	18	18	17	6	7	1	2	-	-	69
Engineers	1	5	1	-	-	-	5	-	-	12
Operators	90	84	83	24	28	11	-	-	-	320
Clerical	1	1	2	-	1	-	3	-	-	8
Others	8	8	7	4	6	5	-	-	-	38
Total	118	116	110	34	42	17	10	-	-	447
MECHANICAL DIVISIONS										
MAINTENANCE										
Supervisors	2	8	7	5	16	8	17	-	2	65
Engineers	1	-	1	1	1	1	6	-	5	16
Mechanics	30	30	57	39	96	54	124	-	-	430
Clerical	1	1	2	1	2	1	4	-	1	13
Others	2	1	8	4	15	11	29	-	-	70
Total	36	40	75	50	130	75	180	-	8	594
ELECTRICAL										
Supervisors	2	3	3	2	4	2	2	-	23	41
Electricians	14	12	12	11	13	12	-	-	96	170
Clerical	1	-	1	1	1	1	2	-	4	11
Others	2	2	4	2	3	4	1	-	43	61
Total	19	17	20	16	21	19	5	-	166	283
INSTRUMENT										
Supervisors	3	4	2	2	4	6	-	-	5	26
Engineers	3	-	-	-	1	7	-	-	8	19
Mechanics	7	5	10	6	13	37	-	-	10	88
Clerical	1	1	1	1	1	4	-	-	5	14
Others	11	11	6	9	8	18	-	-	6	69
Total	25	21	19	18	27	72	-	-	34	216

	100-B Area	100-D Area	100-F Area	200-E Area	200-W Area	300 Area	Plant General	3000 Area	700-1100 Area	Total
TECHNICAL DIVISIONS										
METALLURGY & CONTROL										
Supervisors	-	6	-	7	10	32	-	-	4	59
Chemists-Engineers-Metallurgists-Technologists & Technical Grads.	1	7	3	8	20	94	-	-	1	134
Laboratory Assistants	9	14	25	41	58	103	-	-	-	250
Clerical	-	-	-	1	2	38	-	-	36	77
Others	-	-	-	-	-	4	-	-	-	4
Total	10	27	28	57	90	271	-	-	41	524
MEDICAL DIVISION										
Physicians	-	-	-	-	-	-	7	11	21	39
Dentists	-	-	-	-	-	-	-	2	10	12
Technicians	1	-	-	1	-	-	-	10	25	37
Clerical	1	1	-	2	1	-	-	32	92	129
Others	7	10	1	3	3	2	19	38	222	305
Total	9	11	1	6	4	2	26	93	370	522
[redacted] I. DIVISION										
Supervisors	1	1	3	4	8	17	-	-	5	39
Engineers	4	5	8	13	18	7	-	-	1	56
Clerical	-	-	1	-	1	3	-	-	5	10
Others	11	15	17	34	59	56	6	-	12	210
Total	16	21	29	51	86	83	6	-	23	315
ACCOUNTING DIVISION										
Supervisors	-	-	-	-	-	-	-	-	21	21
Clerical	-	-	-	-	-	-	-	-	161	161
Total	-	-	-	-	-	-	-	-	182	182

39 employees notified

DECLASSIFIED

	100-B Area	100-D Area	100-F Area	200-E Area	200-W Area	300 Area	Plant General	3000 Area	700-1100 Area	Total
EMPLOYEE & COMM. RELATIONS DIV.										
Supervisors	-	-	-	-	-	-	-	-	19	19
Employee Rel. Counselors	-	-	-	-	-	-	-	-	4	4
Clerical	-	-	-	-	-	-	-	-	61	61
Others	-	-	-	-	-	-	-	-	8	8
Total	-	-	-	-	-	-	-	-	92	92
PLANT SECURITY & SERVICE										
Supervisors	15	13	6	9	15	13	24	-	33	128
Off. Mach. Operators & Repairmen	-	-	-	-	-	-	-	-	59	59
Inspectors	3	4	4	4	2	2	5	-	1	25
Patrolmen	39	132	88	72	128	77	28	-	42	606
Firemen	65	-	8	-	14	14	-	-	22	123
Laundry Operators	-	-	-	-	8	-	-	-	2	10
Clerical	-	-	-	-	-	-	19	-	36	55
Others	6	7	6	10	44	16	3	-	101	193
Total	128	156	112	95	211	122	79	-	296	1199
PURCHASING & STORES										
Supervisors	-	-	-	-	-	-	-	-	25	25
Clerical	-	1	-	1	-	-	-	-	167	169
Total	-	1	-	1	-	-	-	-	192	194
COMMUNITY DIVISIONS										
Supervisors	-	-	-	-	-	-	-	-	163	163
Others	-	-	-	-	-	-	-	-	815	815
Total	-	-	-	-	-	-	-	-	978	978
GRAND TOTAL	492	640	530	579	896	1025	487	637	3332	8618

	100-B Area	100-D Area	100-F Area	200-E Area	200-W Area	300 Area	Plant General	3000 Area	700-1100 Area	Total
MECHANICAL DIVISIONS										
TRANSPORTATION										
Supervisors	7	2	2	4	4	2	12	-	35	68
Drivers (Based on areas served)	28	27	35	34	40	11	8	-	75	258
Mechanics	12	3	1	4	2	-	-	-	77	99
Trainmen	7	4	4	4	4	3	5	-	4	35
Laborers	9	15	11	32	8	7	-	-	37	119
Clerical	-	-	-	1	-	1	-	-	27	29
Others	10	9	12	16	23	6	2	-	69	147
Total	73	60	65	95	81	30	27	-	324	755
TECHNICAL DIVISIONS										
TECHNICAL GENERAL										
Supervisors	-	-	-	-	-	-	-	-	5	5
Clerical	-	-	-	-	-	-	-	-	2	2
Total	-	-	-	-	-	-	-	-	7	7
PILE TECHNOLOGY										
Supervisors	-	1	-	-	-	5	-	-	2	8
Chemists-Engineers-Physicists	7	6	2	-	-	27	-	-	1	43
Laboratory Assistants	1	2	1	-	-	3	-	-	-	7
Clerical	-	-	-	-	-	3	-	-	1	4
Total	8	9	3	-	-	38	-	-	4	62
SEPARATIONS TECHNOLOGY										
Supervisors	-	-	-	1	4	13	-	-	1	19
Chemists-Engineers & Tech. Grads.	-	12	-	13	18	53	-	-	1	97
Laboratory Assistants	-	-	-	-	-	7	-	-	-	7
Clerical	-	-	-	-	2	8	-	-	2	12
Others	-	-	-	-	1	36	-	-	-	37
Total	-	12	-	14	25	117	-	-	4	172

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DECLASSIFIED
WITH DELETIONS

1211277

[redacted]

MANUFACTURING DIVISIONS

DECEMBER 1948

SUMMARY

Operational

A total of 103 tons of metal was discharged from the three piles which ran at an average operation efficiency of 87.8 percent. The nominal power level of 275 M.W. was maintained throughout the month. At month end the three piles were operating with the following concentration of CO_2 in the helium atmosphere: B - 10%, D - 40%, F - 25%.

A total of 66 tubes of alpha-rolled lead-dipped material was discharged with difficulty at 225 MW/ton. It was decided to push the remaining 62 tons of this material at concentrations no higher than 230 MW/ton.

The 300 Area canned a total of 141 tons of acceptable slugs at a yield of 87.1 percent. The Melt Plant produced 36 tons of billets.

A total of 65 batches was processed through the isolation phase of the Separations Operations. The over-all waste losses throughout the Separations activities averaged 2.6 percent for the month.

There was no change in the operation of the sand filter and indicated efficiencies continued to be greater than 99.5 percent. It was fairly well established during the month that a major portion of the stack gas contamination which takes place after the sand filters is a function of the dissolving operation. Active study is continuing on this problem.

Extraction waste losses on material from B pile (due probably to the long standby conditions) continued to run considerably higher than on material from the other piles, and it was necessary to rework practically all B pile material through the extraction step. This situation is being followed closely.

MECHANICAL

The nine tube mock-up in the 305-A Building in the 300 Area was completed, thus permitting the Technical Division to proceed with their carbon block expansion and contraction, deflection, and other physical tests.

Better than average progress is being made by the Morrison-Knutson Company, contractor on the railroad rehabilitation program. Already increased speeds have improved the railroad operation and lower maintenance cost is being realized. It is noteworthy that the improvement came at a time when railroad traffic was reaching a peak condition. There was a 10 percent increase in traffic in December over that of November with a total of 5,225 cars handled.

An all time electrical load was established on December 27 with a peak of 68,200 KW.

C. N. Gross

C. N. GROSS, MANAGER
MANUFACTURING DIVISIONS

MANUFACTURING DIVISIONS

PATENT REPORT SUMMARY
FOR
MONTH OF DECEMBER, 1948

Richland, Washington
January 14, 1949

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
A. W. Hildebrandt (Instrument Division)	Ring Balance Recorder Indicator Scale
D. W. Morris (Instrument Division)	Automatic Adjustment for Sample Slide Ways (Simpson Proportional)
M. T. Slind (Instrument Division)	"Coulometer" - For Integrating the Current Flow Through an Electrolytic Cell
R. G. Hoff (Instrument Division)	An Improved Alpha Radiation Survey Meter
R. E. Connally (Instrument Division)	A Device to Detect Grain Orientation in Graphite Blocks
H. J. Bellarts (Project Engineering Division)	Flexible, Non-Callapsible, Rod Joint This rod joint does not transmit torque but is intended to permit rapid travel into a curved hole. Flexibility can be provided to any degree by the amount of joint movement and the number of joints employed.

C. N. GROSS

MANAGER, MANUFACTURING DIVISIONS

1211279

P DIVISION

DECEMBER, 1948

I. GENERAL

All piles operated at 275 M. W. throughout the month except for the outages listed under Area Activities in this report.

An unscheduled power outage occurred in the 300 Area on December 2. The outage was a result of overloaded transmission lines and lasted from 4:45 p.m. until 8:45 p.m. No difficulties were encountered except for the lost operating time.

A total of 103 tons of metal was discharged from the piles during the month.

Operating schedules in the 300 Area were reduced from a six-day week to a five-day week on December 20 because of the favorable status of the inventory of canned slugs. All processes are now working one shift a day except Canning and Machining which work two shifts a day.

II. ORGANIZATION AND PERSONNEL

Number of Employees on Payroll - December

Beginning of Month:	372
End of Month:	374
Net Increase:	2

Seven operators were hired and one terminated voluntarily. Twenty-four operators were transferred to the 100 Areas for training in anticipation of the startup of H pile. Three operators were transferred to the S Division, and one was removed from the payroll due to illness. Seven operators from the 100 Area group were assigned to the construction liaison group to assist in following construction checking at the 100-DR pile, effective December 20.

The following changes in monthly personnel took place during the month:

R. W. Hooper was promoted to Shift Supervisor effective December 1 and assigned to 100-F Area.

G. Bunker, Shift Supervisor in 300 Area, was transferred to 100-F Area on December 8.

R. G. Swift, Shift Supervisor in the 300 Area, was transferred to 100-F Area on December 13.

III. AREA ACTIVITIES

PILE SUMMARY	PILE B	PILE D	PILE F
Time Operated (%)	92.3	86.5	89.8
Operating Efficiency (%)	91.8	84.3	87.4
*Power Level (M.W.)	275	275	275
*Inlet Water Temperature (°C)	4.3	4.8	4.8
*Outlet Water Temperature (Maximum °C, 10 tubes, 0.240" zone)	47.4	47.5	49.6
Number of Scrams	0	1	1
Number of Purges	2	1	2
Helium Consumption (cu. ft.)	56,675	67,704	75,666
Metal Discharged (tons)	36.12	26.35	40.55
**Inhours Gained (this month)	4	(-)2	(-)7
*Inhours Poisoned	280	443	402
*Inhours in Rods	62	60	38

* Month end figures.
** Does not include increased reactivity due to CO_2 in gas system.

PILE BUILDING

Outage Breakdown

Date of Outage	Scheduled Metal Discharged	Scheduled Maintenance	Unscheduled	Length of Outage (Hours)
12/4	D			21.8
12/6	F			23.2
12/7	B			19.4
*12/11			D	0.5
12/13	F			27.0
12/14 & 15	D	D		51.0
**12/16	D			4.1
12/17	B			18.6
12/22	F			25.0
12/28	D			23.2
12/29	B			19.0
***12/31			F	0.3

* Scram caused by faulty electrical connection in #1 Beckman.
** Shut down to discharge temporary poison.
*** Scram caused by momentary surge of #1 Beckman.

Operating Experience

Production tests having operational significance are reported below:

105-114-P (Van Stone Flange Corrosion Tests)
Magnesium alloy slugs were positioned at the front Van Stone flange in six tubes in the F pile in order to evaluate their effect on Van Stone flange corrosion. All six Van Stone flanges were in good condition.

105-168-P (Replacement of Pile Helium Atmosphere with CO_2)
All three piles are now operating with CO_2 in the helium atmosphere. Changes which were made during the month and month end conditions are listed below:

100-B: Additions of CO_2 were begun December 20 and increased in increments of 3% at 24-hour intervals. Checks of operating data and unit motion indicators revealed no abnormal conditions. The concentration of CO_2 at month end was 10%. This concentration will be increased during January, 1949, when additional unit motion indicators have been installed.

100-D: The concentration of CO_2 was held at 40% during the entire month. No changes in operating conditions were noted.

100-F: Additions of CO_2 were begun on December 3 and the concentrations were increased in 3% increments at 24-hour intervals during equilibrium conditions until December 18 when 25% concentration was reached. This concentration will be held for complete evaluation of the results of this change. No unexpected operating conditions were observed during this change.

105-194-P (Unannealed Alpha Rolled Slugs)
Eight tubes, each containing sixty-four four-inch unannealed alpha rolled pieces, were discharged without incident on December 22.

Examination of the 4-inch metal pieces discharged from Tube No. 0569-B, which contained a ruptured piece (see P Division Monthly Report for November), revealed a piece with the cap displaced. A protrusion was noted on the exposed end of the metal slug. The force exerted on the cap by the metal apparently caused a rupture of the can wall at the interface between the metal and the cap. The cap weld was found to be intact. Details of this examination will be covered in a special report. A borescopic examination of this tube revealed no damage and it was reloaded with regular metal.

All three piles experienced unusual pressure drop acceleration during the month. These increases are considered abnormal for this season of the year and investigations of this problem are under way.

Considerable difficulty was experienced with the discharging of alpha-rolled, lead-dipped metal during the month at the D and F piles. A total of 66 tubes containing this type of metal required extensive oiling before they could be discharged, and four of the tubes at F Area required one hour's saturation with oil before they could be discharged. The metal in these tubes had an average concentration of 225 M.W./ton; in view of these difficulties a decision has been made to abandon any efforts to increase, beyond this point, the concentration of the remaining 62.5 tons of alpha-rolled, lead-dipped metal now in the piles.

A stuck slug was encountered at D Area on December 4 in Tube No. 1788-D, which contained alpha-rolled, lead-dipped metal. The slug was successfully discharged using the usual stuck slug procedures and the hydraulic equipment. The tube was replaced and recharged on the same day.

Mechanical Experience

All horizontal and vertical safety rods were in satisfactory operating condition at month end with the exception of three vertical safety rods, No. 23 at B Area and Nos. 27 and 36 at D Area. Vertical Safety Rod No. 23 at B Area was sticking at month end and will be corrected during the first outage in January.

No. 27 Vertical Rod at D Area was dismantled during the December 15 outage and a new 2¼" (DR) type stainless steel rod and guide were installed. The rod failed to go in when tested and an attempt to install an eccentric rod guide was abandoned when it was found that the interior of the guide was rough. The old rod and guide were replaced on December 28 but remained inoperable at month end. No. 36 vertical rod at D Area became tangled during the startup of December 28 and was secured in the out position until the first outage in January.

Other work, of an unusual nature, on safety rods during the month included:

1) During routine maintenance work on Rod No. 37 at B Area, the section next to the tip was found to be split and was replaced. Work was continued during the month on the realignment of No. 4 horizontal rod at B Area and at month end the galling condition noted in last month's report had been corrected.

2) The installation of the new 2¼" (DR) type stainless steel rods and guides in No. 15 position at D Area and in No. 11 position at F Area was made. These installations were made to evaluate the performance of this type rod.

3) No. 6 Horizontal Rod at F Area stuck during pre-startup tests on December 6. Realignment of the outer rod guides and removal of rough spots on the side of the rod resulted in satisfactory operation. Examination of No. 7 Horizontal Rod at F Area revealed several gouged spots on top of the rod. The rough spots were removed but the rod still tends to bind at the extreme "in" position.

4) A vertical alignment of all rod guides at D Area was completed during the month.

Two process tubes were replaced during the month as follows:

Tube No. 1467-D was replaced on December 14 after having been discharged with difficulty on November 16.

Tube No. 1788-D was replaced on December 4 after difficulty had been experienced in discharging it.

During the course of the yearly Van Stone flange inspections at D Area, a split front flange was found on Tube No. 4561-D. Since there was insufficient gunbarrel clearance available to allow turning a new Van Stone flange, it was necessary to discharge the partially exposed metal and make preparations to install a new tube. The new tube will be installed during the first outage in January.

Additional unit motion indicating equipment was installed during December at D and F Areas in order to evaluate more accurately the effects of CO_2 addition to the pile atmosphere.

A part of the concrete wall which separates the 107-D and 107-DR flumes at the 1904-D Building was removed during the December 14 shutdown in order that the water from the 107-DR Building could be diverted to the river via the 1904-D river effluent lines.

During the annual overhaul and inspection of the 100-D Area 30-ton Whiting crane, the drum was reground and new cables were installed. In accordance with Engineering Recommendation No. 100, a new stainless steel alloy brake shaft was installed; similar installations will be made at the other 100 Areas in the future.

Calcium hypochlorite was added to the water heel in the south side of the 107-D basin in a continuation of the algae control program. Results appear to be satisfactory.

Pile Development

An articulated perforated aluminum dummy train used for seating the charge in tubes containing no front dummies has been developed and tested satisfactorily. Linking these dummies together in this manner provides a time-saving method of withdrawing the dummies from a tube without the use of a long retrieving rod.

As the result of a study of power level cutbacks resulting from high exit water temperatures following start-up, the standard rod withdrawal order at 100-B Pile was revised, interchanging No. 8 and No. 5 rods. The revised withdrawal order permitted normal start-ups without cutback on the outages of December 7 and 29. The revised order has now been established as standard at 100-B.

A concrete pad used during construction of the DR Pile has been modified and fenced in for use as a cask storage and handling area.

In an effort to decrease the time required for charge-discharge operation and in order to more easily remove pieces which are difficult to discharge, the following steps were taken during the month:

1) The air system pressure was increased from 80 p.s.i. to 100 p.s.i. to enable the regular charging machine to move the "reluctant" pieces. It is estimated that this change reduced the time required for discharging a tube by twenty-five percent.

2) The fabrication of expanding rubber plugs, which may be inserted inside the end of a tube thereby shutting off the water supply and allowing the tube to be filled quickly with the oil solution and left until later for discharge, has reduced the time consumed in discharging "reluctant" tubes.

3) The fabrication of a fourteen-foot seating pole to seat charges after the front dummy charge has been removed has allowed these front dummies to be retrieved during a normally idle time for the front face crews; it is estimated that approximately one hour of elevator time is saved during a thirteen ton discharge as a result of using this piece of equipment.

GAS PROCESSING BUILDING

The dismantling and transfer to Construction of equipment in No. 2 purification room and No. 2 purge blower room at B Area was completed during the month.

SPECIAL HAZARDS

During the month, the 107-B pump room and the 105-B apparatus room danger zones were reduced in size as a part of a program aimed at reducing costs by eliminating unnecessary S. W. P. handling.

The contaminated car which was received in November containing a return shipment of "B" casks (see November report) was rehabilitated by replacing the floor boards and side walls to a height of three feet. The car has been released for service.

Readings on the top far neoprene seal at F Area increased during the month to 1350 mr/hr average as compared to 480 mr/hr reported during November. This reading included a reading of 54 mrem/hr of fast neutrons.

After the installation of the shorter rod guide in No. 27 thimble at F Area, readings of 173 mrem/hr of fast neutrons were experienced at the bumper plate. This condition resulted in a fast neutron reading of 13.5 mrem/hr at the vertical safety rod rail. The reading at the rail is approximately ten times greater than normal. Plans are now being developed to install additional shielding above the bumper plate.

300 AREA - METAL FABRICATION

Production Statistics

Production for the month of December was as follows:

Billets Produced	36 Tons
Rods Machined	190 Tons
Acceptable Pieces Canned	141 Tons

Melt Plant

The casting yields were as follows:

	November	December	To Date 1948
Billet	66.7	61.3	67.5
Solid Material	84.3	80.2	85.5

Considerable difficulty was experienced during the month with rough surfaces on billets, thus causing a reduction in the yield. It appears the rough surface condition results from the uneven application of the Zirconite mold wash on the inner surface of the mold, accompanied by insufficient drying before use. The use of the Zirconite wash will be continued on a controlled basis for another month, however, in an effort to realize the improved mold usage reported by other sites to result from the use of a mold wash; in this connection, the temperature of the mold preheat oven will be increased to the maximum possible in order to minimize the effects of inadequate drying.

One hundred crucibles fabricated from CS-312 graphite have been received. Twenty-five crucibles of each of the following four types were included in this order: Standard dimensions, standard dimensions with tapered inner sidewall, standard dimensions except for thick wall, and thick-wall with tapered inner sidewall. The evaluation of these crucibles was started on December 22.

Several billets were processed during the month with flat and chamfered ends instead of the conventional egg end. The rods rolled from these billets will be checked to determine if the quality of rod ends is improved.

Authorization to reduce the sampling of casting heats from 100% to 10% of all heats was received on December 23. This change is outlined in the revised "Operating Process for Uranium Remelting and Casting", Document No. HW-11745.

Machining

Machining yields were as follows:

% Yield (4" A's)		
November	December	To Date 1948
69.1	67.6	68.5

Chip Recovery

The Chip Recovery yield was as follows:

% Yield		
November	December	To Date 1948
92.0	92.3	91.3

The entire Chip Recovery Process was operated 14 eight-hour shifts, with the press being operated an additional 19 eight-hour shifts. A total of 66,394 pounds of TXB was produced.

The Chip Recovery operation was shut down on November 24 because of excessive vibration in the centrifuge. Repairs were completed and operation resumed on December 2. On December 15 it was necessary to shut down again when the shaft assembly was broken loose from the housing of the centrifuge at the weld. After repairing the weld and realigning the shaft and basket assembly, operation was resumed on December 22.

The material burned in the oxide burner was as follows:

Weight Out - Lbs.		
November	December	To Date 1948
20,309	14,458	129,981

Canning Operation

The canning yield was as follows:

% Yield (4" A's)		
November	December	To Date 1948
88.6	87.1	88.5

Canning rejects, by cause, were:

	% Total Canned (4" A's)		
	November	December	To Date 1948
Non-Seating	2.8	3.5	4.1
Marred Surface	2.7	3.0	1.8
AlSi on Outside of Can	0.5	0.7	0.9
Frost Test	1.9	2.4	1.4
Bad Welds	0.9	0.9	1.5
Miscellaneous	2.6	2.4	1.8
	11.4	12.9	11.5

The canning yield was 1.5% less than that for November. The increase in non-seats, marred surface, and frost test rejects was the major cause for the lower trend in yield. The quality control program started last month to reduce non-seating and bad weld rejects was extended to cover marred surface and frost test rejects on December 15. Some reduction in marred surface rejects was realized during the later part of the month.

Frost test rejects were reduced appreciably after December 21 when the use of standard 4" caps was resumed. A large percentage of the frost test rejects prior to that date was caused by the increased torque applied to the alternate thick cap during facing, which broke the bond between the can and the slug at the base of the cap.

Work was continued on Production Test No. 313-107-M, (Supplement A), ("Effect of Canning Conditions on Slug Yield and Quality"). The canning of 5842 slugs, machined to a diameter of 1.352" $\pm^{.002}_{.001}$" and length of 4.040" ● .010", was completed on December 1. In addition two other lots of 100 slugs each, machined to a diameter of 1.350" $\pm^{.001}_{.002}$" and a length of 4.045" ± .010", were canned with an equal number of control slugs having standard "A" dimensions. Non-seating rejects were significantly lower for the smaller diameter slugs and no AlSi penetration of the can wall to within less than .010" of the surface was found. Control pieces showed as high as 8.3% penetration to within less than .010" of the can surface.

Twenty-four slugs were dipped in the bronze and tin baths and quick quenched in water. Later they were reheated in the tin bath and canned. This was a part of the preliminary work on Production Test No. 313-108-M, ("Effect of Quick Quenching from the Beta Phase on the Behavior of Uranium Slugs"). The purpose of this test is to prepare canned slugs for pile testing that are free or almost free of columnar grains, and with a grain size that is 5 to 10 times smaller than that of standard triple-dipped slugs.

The following special canning was done during the month:

Request No.	Contents	Number of Pieces
S. R. 80	Mercuric Oxide	1
S. R. 80-1	Mercuric Oxide	3
S. R. 85	Selenium	1
S. R. 86	Thallium Nitrate	1

In addition, 30 receptacle slugs, 51 papoose slugs, and 6330 poison slugs were canned.

Recovery Operation

	% Recovered		Average Wt.- Lbs.	
	December	To Date 1948	December	To Date 1948
Z Slugs	78.1	71.5	3.905	3.905
X Slugs	16.9	21.7	3.800	3.849
Rejects	5.0	6.8	—	—
	100.0	100.0		

Inspection and Testing

Autoclave rejects were as follows:

November	December	To Date 1948
0.32/M	0.27/M	0.26/M

A total of twenty-one autoclave failures occurred in December. A large percentage of the failures were in the upper one-third of the pieces and resulted from pinholes in the can wall and around the weld bead.

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

	% Usable - (4")		
	November	December	To Date 1948
Aluminum Cans	93.6	95.2	92.5
Aluminum Caps	96.5	96.8	96.6
Steel Sleeves	51.5	98.4	86.0

A supply of standard 4" aluminum caps was received and the use of alternate thick caps ($\frac{1}{2}$") was discontinued on December 21. The standard caps were fabricated from $1\frac{1}{2}$" bar stock. They are of good quality and show no evidence of the folds or crack in their peripheries which caused previous difficulty in welding.

The inspection of 4950 aluminum cans received from the Aluminum Company of America, which were impact extruded from blanks cut from sheet aluminum instead of being cut from bar stock, was completed on December 2. A total of 4401 or 88.9% of these cans was usable. The breakdown of rejects was as follows:

Marred Surface	362
Small Inside Diameter	26
Dents	138
Thick Bottoms	9
Thin Bottoms	14

The acceptable cans were later used in canning with satisfactory results.

Material Handling

Seventy-eight tons of rods were received from Vulcan Crucible Steel Company and 156 tons from Simonds Saw and Steel Company. Eighty-nine tons of billets were shipped to Vulcan Crucible Steel Company and 15 tons of oxide were shipped to Vitro Manufacturing Company.

305 Area Test Pile

A total of 138 tests was run on canned slugs, 57 on billet eggs, 589 on graphite bars, and the following on special work requests.

Request No.		No. of Tests
44	To determine absorption cross-section of three samples of aluminum alloyed with magnesium.	10
45	To determine absorption cross-section of AlSi alloyed with magnesium.	10
46	To determine absorption cross-section of Aqua-Dag.	5
47	To obtain ratio between neutron flux on the outside of a bare slug and flux on inside, for use in theoretical calculations.	3
48	To obtain relative absorptions of a regular poison slug and new type cadmium plated spline for use in 105 piles.	7

In addition to the above, 16 tests were run in conformance with Production Test No. 313-107-M, Supplement A, ("Effect of Canning Conditions on Slug Yield and Quality").

Special Hazards

No unusual conditions developed during the month.

Development

A test was made to determine if a viscosimeter could be used to indicate changes in the viscosity of the AlSi canning baths which might contribute to non-seating rejects. The viscosimeter did not have sufficient sensitivity and indicated little or no change in viscosity over a range of 20°C in bath temperature. Additional testing is planned if the instrument can be made more sensitive.

Preliminary checks were made on several gamma extruded slugs to check the theory that it might be possible to obtain a grain structure similar to alpha rolled slugs after beta transformation. Four recovered gamma extruded slugs were processed through the bronze and tin at normal temperatures and on regular cycle, followed by a quick quench in water. The grain structure as observed in the regular cracking test appeared to be the same as for alpha rolled slugs; however, laboratory reports indicated the grains were somewhat coarser.

Preliminary design work has been started on facilities for pickling rods and turnings, dissolving oxides, and the associated recovery equipment.

S DIVISION

DECEMBER, 1948

OPERATING SECTION

I. GENERAL

Sixty-six batches were started in the Canyon Buildings and sixty-five were processed through the Concentration Buildings and the Isolation Building. The average purity for the completed batches was 98.9 percent.

The over-all material balance for the T and B Plants (including the Isolation Plant) averaged 97.0 and 99.1 percent, respectively, for a combined average of 98.1 percent. Waste losses for the two plants averaged 2.6 percent.

Canyon and Concentration Building Production Performance Data - (12-1-48 - 12-31-48, inclusive)

	B Plant	T Plant	Combined
Number of charges started	34	32	66
Number of charges completed	34	31	65
For completed charges:			
Percentage of starting product in waste:			
This month	2.4(a)	2.8(a)	2.6
Last month	2.7(b)	2.6(b)	2.6
Cumulative to date	4.8(c)	4.6(c)	4.7
Percentage of starting product recovered:			
This month	96.6	93.2	94.9
Last month	100.0	95.0	97.0
Cumulative to date	97.2	95.5	96.4
Percentage of starting product accounted for:			
This month	99.0	96.0	97.5
Last month	102.7	97.6	99.6
Cumulative to date	102.0	100.1	101.1
Gamma decontamination factor (Log.)			
This month	7.67	7.74	7.71
Last month	7.70	7.90	7.82
Cumulative to date	7.34	7.31	7.33

(a), (b), (c): Include waste from processing recycle. The recycle wastes are estimated as: (a) 0.020%-T Plant; 0.013%-B Plant. (b) 0.019%-T Plant; 0.013%-B Plant. (c) 0.128%-T Plant; 0.008%-B Plant.

Isolation Building Performance Data (12-1-48 - 12-31-48, inclusive)

	% of Incoming Product			
	Prepared for Shipment	Recycle	Losses	Material Balance
Average for this month	94.6	5.92	0.04	100.6
Average for last month	94.9	6.70	-0.03	101.6
Average to date	96.0	4.54	0.09	100.6

II. ORGANIZATION AND PERSONNEL

Number of employees on payroll:

Beginning of month	306
End of month	311
Net increase	5

Remarks: The changes which occurred in the S Division are listed below:

4 transfers from other divisions (all Weekly Roll)
2 terminations (1 Monthly Roll, 1 Weekly Roll)
3 new hires (1 Monthly Roll, 2 Weekly Roll)

Changes in supervisory organization:

T. J. de Vries, a new hire, joined the organization during the month as a Supervisor-in-Training.

L. N. Rynd, formerly Senior Supervisor, 200-W Area, resigned on December 31, 1948.

III. AREA ACTIVITIES

PRODUCTION PERFORMANCE

T and B Plants

Volume Reduction - Production Test 221-T-13

Evaluation of Production Test 221-T-13, involving the reduction of process volume at the end of the extraction step, was continued at both plants with all runs being processed at 30 percent volume reduction. Waste losses and decontamination factors were satisfactory.

Extraction Waste Losses

All runs were processed through the extraction step at both plants in accordance with standard procedures. Extraction waste loss experience for the month is tabulated below:

	T Plant (27 runs only)	B Plant (34 runs)
Average original waste analysis	0.87%	0.67%
Number of runs reworked	20	14
Average throw away loss	0.60%	0.53%
Number runs 100-B material	14	15
Average original waste analysis (November)	0.74%	0.52%
Average original waste analysis (October)	0.54%	0.44%

Essentially all material processed from the 100-B reactor since its reactivation has been reworked in the extraction step because extraction waste losses have been higher than normal. The possibility of the existence of an alpha emitter other than normal plutonium which was formed during the extended shutdown of the 100-B reactor is being investigated. Higher than normal waste losses have also been experienced on several runs of material which did not originate in the 100-B reactor. It is felt that these losses were caused by the mixing of normal material with 100-B reactor material in the dissolver and metal storage heels. The possibility that this effect may be partially due to the slightly higher enrichment of the metal now being received is recognized. The average MWD/T level of the material processed in the extraction step during the month was 206.8.

Acid Washes

An acid wash was made of the process equipment in both T and B Plants. No abnormal hold-up of product was indicated at either plant with the exception of the extraction (8-2) centrifuge at B Plant. The 10.55 percent hold-up at this point has been attributed to the frequent reworking of extraction wastes which involve a complete reverse strike giving a product cake which is difficult to remove from the centrifuge. The cake removal procedure has been modified to prevent a recurrence of this hold-up.

Reduction in Product Content of Isolation Building Recycle

Due to difficulty involving the removal of the lanthanum fluoride product cake from the B-2 centrifuge at B Plant, the centrifuge bowl sprays were inspected on December 7, 1948 and found to be turned 90° down stream from the proper position which directs the spray against the direction of bowl rotation. Following the correction of this condition, an immediate reduction in the product content of recycle material returned from the Isolation Building was noticed. The product content of the recycle material of the ten B Cell runs preceding the change was 5.5 percent as compared to 2.8 percent for the eight runs processed

following the change.

The average product content of the material recycled from T Plant during the month was 8.1 percent as compared to 3.6 percent for B Plant. The condition of the bowl sprays in both T Plant centrifuges (B and E Sections) is being investigated.

Reduction of Metathesis Time Cycle - T Plant

Three minor changes in the metathesis process procedure which reduce the metathesis time cycle from approximately 17 1/2 hours to approximately 14 1/2 hours were being tested during the month. These are:

1. The rework centrifugation rate has been increased from 12#/min. to 20#/min. for twenty-five runs with no significant effect on the waste loss.

2. Two 500# flushes of the F-1 precipitator tank at the end of the metathesis wash centrifugation have been substituted for three 400# flushes for three runs with successful results.

3. The metathesis centrifugation rate has been increased from 12#/min. to 15#/min. for one run with no adverse effect on the waste loss.

Change (1) above has been adopted as standard. Evaluation of changes (2) and (3) will be continued.

3

Isolation Building

Reduction of Process Time Cycles - Production Test 231-8

Evaluation of the first three phases of the Production Test 231-8, involving a reduction in the purification time cycles, was completed during the month. All tests have been run on B Plant runs in Cell 3. Completion of the first three phases which involve (1) a reduction in the peroxide addition rate, (2) a reduction in the plutonium peroxide precipitate settling time, (3) a reduction in the digestion time, have effected a reduction in the first purification cycle time of from twelve to ten hours. A fourth phase of the test involving a reduction in agitation time following the pre-reduction step (ammonium sulfite addition) will be completed next month.

Following the completion of the fourth phase, phases 1, 2 and 3 of the test will be extended to the 10 1/2 hour second purification cycle.

WASTE DISPOSAL

241-TX Tank Farm - Project C-163

Erection of the permanent fence which completes the sub-contractor's

4

phase of the work is in progress.

In the General Electric phase of the work, the connection of the T Plant to the 241-U and 241-TX tank farms is complete except for minor details. Work to tie the U Plant into the new system and to tie the new system into the 241-T tank farm is progressing. During the month the General Electric forces poured approximately 500 feet of encasement in the vicinity of the U Plant, installed drain lines at 154-UX diversion box, did miscellaneous backfilling work and started excavation at the 151-T and 152-T diversion boxes.

Cribbing of Second Cycle Waste - B Plant

The disposal of second cycle waste supernate from the X-105-B tank was completed on December 8, 1948. A total of 522,800 gallons was jetted to the crib system from this tank. The cribbing of the X-106-B tank was started on December 14, 1948. To date 235,100 gallons have been cribbed.

Isolation Building Sump Tank Installation - Project C-305

The installation of an additional sump tank in the Isolation Building sump pit to permit the segregation of process wastes from laboratory wastes for control purposes was made during the month. The new tank which is five feet in diameter by seven feet high, was removed from the 9-4 position in the 221-U Building where it is not essential to the operation of the building. The tie-in-of the cell 4, 5 and 6 waste line to the new tank, which will be made during January, will complete the project.

Waste Status

The status of the Waste Storage Areas as of December 31, 1948, is shown in the following table:

B Plant

Bldg. 241 Tanks	Waste	Percentage Full			Reserve Capacity In Batches to Process			
		B	C	BX	B	C	BX	Total
x101,2;3	Metal	100	100	97.9	0	0	6	6
x104,5,6	Metal	-	100	0	-	0	269	269
x201,2,3,4	Metal	0	100	-	-	0	-	-
x107,8,9	Metal	-	-	-	-	-	-	-
x107,8,9	1st Cycle	100	100	21.2	0	0	348	348
x110,11,12	1st Cycle	-	100	-	-	0	-	-
x104,5,6	1st Cycle	-	-	-	-	-	-	-
x104,5,6	2nd Cycle	35.7	-	-	408	-	-	408
x110,11,12	2nd Cycle	100	-	0	0	-	636	636

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T Plant

Bldg. 241 Tanks	Waste	Percentage Full			Reserve Capacity In Batches to Process			
		T	U	TX	T	U	TX	Total
x101,2,3	Metal	100	100	-	0	0	-	-
x104,5,6	Metal	-	100	-	-	0	-	-
x201,2,3,4	Metal	0	0	-	-	37	-	37
x107,8,9	Metal	-	33.0	-	-	179	-	179
x107,8,9	1st Cycle	100	-	-	0	-	-	0
x110,11,12	1st Cycle	-	100	-	-	0	-	0
x104,5,6	1st Cycle	94.0	-	-	28	-	-	28
x104,5,6	2nd Cycle	-	-	-	-	-	-	-
x110,11,12	2nd Cycle	77.3	-	-	133	-	-	133
x101,2,3,4	Metal	-	-	0	-	-	514	514
x105,6,7,8	Metal	-	-	0	-	-	514	514
x109,10,11,12	1st Cycle	-	-	0	-	-	819	819
x115	1st Cycle	-	-	0	-	-	205	205
x118	1st Cycle	-	-	0	-	-	205	205
x113,114	2nd Cycle	-	-	0	-	-	561	561
x116,117	2nd Cycle	-	-	0	-	-	561	561

MECHANICAL PERFORMANCE

Agitator Failure - T Plant

The agitator on the 6-1 metal reduction tank failed and was replaced with a repaired agitator which had previously been used in the 14-1 tank (1st cycle product precipitator). Excessive radiation levels prevented an inspection of the failed agitator which had been in service since start-up.

Dissolver Failures - B Plant

The pot coils in the 4-5L dissolver developed a leak during the month necessitating the replacement of the dissolver. The replacement was accomplished by exchanging the dissolver with the spare dissolver from Section 3-L, using standard remote control methods. The faulty dissolver will be further tested before removing it to the heavy equipment burial ground. The exchange was effected without incident and with no delay in production.

16-1 Tank Precipitator Distributor Failure - B Plant

Erratic operation of the 16-1 second cycle by-product precipitator resulting in higher than normal waste losses led to the inspection of the precipitator spray distributor. The dip tube was found to have broken loose from the tank connector block at the spray slots.

The replacement was effected by normal crane remote control methods. The old dip tube was removed from the tank by use of the crane pipe grabber.

Alterations to 75 Ton Crane Periscope Assemblies - Project C-171

Installation of improved vision and quick change magnification opticals has been completed on all 75 ton Whiting Cranes with the exception of the right hand periscope on the 221-B Canyon Crane. This work is nearing completion at month end.

Removal of 10 Ton Crane, 221-U Canyon

Removal of the 10 ton bridge crane from the 221-U Canyon Building was started on December 20, 1948 by Atkinson-Jones personnel and is proceeding rapidly. This crane, which is not essential to the operation of the building, will be used in the construction of the Redox Test Plant.

Isolation Building

AT Adjustment Tank Replacements

The AT adjustment tanks in Cells 3 and 4 developed pin-hole leaks during the month and were replaced. The Cell 4 tank was a part of the original installation. This is the second replacement for the Cell 3 tank. The material used in the fabrication of the new tanks was increased from 1/8" to 3/16" 25-12 SCb stainless steel.

SPECIAL HAZARDS

Stack Gas Contamination

Operation of the sand filters at T and B Plants continued satisfactorily with no decrease in efficiency or through-put. Serious recontamination of the stack gas after filtration continues to be a problem, however. Although previous data based upon samples taken from the off-gas line indicated that the recontamination was not coming from the dissolvers, more recent data based upon samples taken from the fifty foot level at the stack with the dissolver vent jets shut off, indicate rather conclusively that the recontamination does come from the dissolver off-gas. It is not known at this time how much of the activity may be due to I^{131} or whether or not it is due in part to particulate matter. Particle collection data obtained from the environs appear to be somewhat conflicting. Particle collection on the mat type collectors shows very little improvement in the deposition rate, whereas a very decided improvement in the incidence of particles is indicated by the Motoair type air sampler.

DESIGN AND CONSTRUCTION CONSULTANT'S SECTION

Redox Development

The Engineering flow sheets for the Test Plant were received from the

Architect-Engineer during the past month and have been checked and returned with appropriate comments. The staking out of railroads and construction fences in the Test Plant Area is proceeding and core drillings for foundation information have been made. Disassembly of the 10 ton crane in Building 221-U has been started. This unit will be re-erected in the 201-R, Test Plant Building for construction purposes.

As a result of a meeting between the Design, Technical, Metallurgical, Procurement and Manufacturing Groups of General Electric, a decision has been made to accept type ASTM 347 stainless steel for Redox waste storage tank liners. Mill analyses and test coupons from each heat of stainless steel used for this purpose will be required. Corrosion tests are being set up to determine the effect of machine welding type 347 stainless steel plate with type 308 wire since it appears that this combination will give the most satisfactory results in the automatic welding of the tank liner seams. If the test results are not satisfactory from a corrosion standpoint, it will be necessary to employ hand welding using 347 rods for the tank liner seams.

Based on the results obtained to date from the operation of the sand filters in the 200 Areas, the Manufacturing Division has requested that a similar filter be installed for the Redox Test Plant. It was further requested that the ventilation stack be constructed with a stainless steel liner as an aid in the control of exhaust ventilation air contamination.

A recently completed study of the column hydraulics for the Redox Test Plant installations has shown that the gravity feed-gravity cascade system cannot be installed as originally planned without deepening the process cells. The cell depth at present is based on the process cell design visualized for mixer-settlers with the addition of three foot diameter column pits. It is claimed that any change in the floor level of the cells will seriously interfere with construction schedules. There are several alternatives to deepening the cells. These involve the projection of the upper portions of the column into the canyon area above the cell blocks, a pressurized column installation below the cell blocks which will substitute pump generated pressure for the liquid head necessary to force the aqueous column effluent to the level of the cell receiver tank inlets, or an in-line pump or sump pump installation at the aqueous effluent level which will force the liquid to the top of the cell tanks. A number of variations of these general principles have been studied and it is expected that the problem will be discussed at a meeting between General Electric and Architect-Engineer representatives in the near future.

BY Tank Farm

The detailed design work of the BY Tank Farm balance-off lines from

the 252-B diversion box is essentially complete. Work is now in progress on the routings of two inlet lines which will connect this diversion box with other boxes in the waste system. The original air condenser design has been checked for changes or improvements which should be made and the requisition for eight condensers will be issued shortly.

At month end the bottoms of all twelve tanks have been poured, the waterproof membrane and grouting applied and the bottom steel plates installed. Installation of the supports for the piping is in progress.

POWER DIVISION
DECEMBER 1948

GENERAL

The program on replacing all rejected steam line poles was completed during the month in all Power Division areas.

PERSONNEL AND ORGANIZATION

Number of employees on payroll	December
Beginning of month	428
End of month	448
Net Increase	20

The net increase, as indicated, was the result of the hiring of twelve operators and coal handlers, one steno-typist, the transfer to Power Division of eight operators, and the transfer out of the Power Division of one operator.

On December 27, the shift foremen formerly supervising operations of the river pump house, reservoir pump house and filtration plant in the 100 Areas was eliminated with the exception of the day shift on a 40-hour basis. Supervision of these buildings is now the direct responsibility of the shift senior supervisor and the power house shift supervisor. This combining of supervisory duties made it possible to release nine foremen who are at present being given extensive training for 100 H Area.

100 AREAS

An internal inspection of the east process water storage tank in the F Area on December 6, and of the south process water storage tank in the B Area on December 17 indicated a degree of corrosion and tuberculation similar to that reported in November.

On December 14, the north 30-inch water supply line to the filter plant in D Area was taken out of service to replace the 20,000 gpm orifice with the proper size to accomodate increased flow.

On December 12 both coal crushers at the D Area power house failed due to foreign objects coming through with coal from cars. The drive shafts were bent and chains broken. Repairs have been completed and coal vendor will be warned to use more care in preparing shipments to prevent recurrences.

Power Division

Both 30-inch process water lines between the filter plant and deaerator building in the D Area were out of service on December 14 to permit removal of two limitorque valves from the demineralizing plant.

On December 7, the No. 1 re-use pump, motor and switch gear were removed from the process pump room in the B Area and were installed in D Area, same building.

200 AREAS

A new 10-inch raw water connection was completed in the East Area on December 2 to serve a central concrete batch plant located between the East and West Areas.

Due to excessive maintenance on the West Area reservoir level 12-inch control cone valve, a 6-inch by-pass was installed on December 23. This by-pass will be used under normal operating conditions.

On December 27, the East power house main ash disposal line was removed from service for renewing three sections of Ashcolite pipe which was cracked due to freezing. Failure was caused by plugged drain not allowing line to drain.

The newly constructed 10-inch steam line to the 234-5 Area in the West Area was put into service December 31.

300 AREA

On December 2, a complete power failure was in effect from 4:50 p. m. to 9:00 p. m. It was necessary to operate the emergency generator during outage. Steam and water services were maintained.

Two new 6-inch service water lines from the North Richland supply were cut into service December 7. The entire area is now being supplied from this source. All area deep wells were removed from service on the same date.

WHITE BLUFFS

Ice in storage at the end of the year was 2,035,000 pounds.

Work is progressing on a new water supply line from the F Area export water line as a supplementary supply for the White Bluffs Area.

POWER DIVISION STATISTICS

From December 1, 1948

Through December 31, 1948

			AREAS		
			100-B	100-D	100-F
RIVER PUMP HOUSE (Building 181)					
River stage	Feet above sea level	(max)	385.8	378.5	365.0
		(min)	385.4	378.0	364.6
		(avg)	385.6	378.1	364.7
River temperature	avg. °F.		41.3	42.8	43.3
Water pumped to Reservoir	gpm avg. rate		38,200	38,661	36,862
Water pumped to Refg. Condensers	gpm avg. rate			0	0
RESERVOIR (Building 182)					
Water pumped to Filter plant	gpm avg. rate		33,172	32,880	32,776
Water pumped to Condenser System	gpm avg. rate		3,436	3,730	3,614
Water pumped to Export System	gpm avg. rate		1,592	2,051	472
	gpm normal rate		4,115	4,115	4,115
Chlorine added at #1 inlet	pounds		1,980	8,930	0
FILTER PLANT (Building 183)					
Filtered water to Power House	gpm avg. rate		318	315	292
Filtered water to Process	gpm avg. rate		31,001	27,684	30,370
Filtered water to Fire & Sanitary	gpm avg. rate		99	161	129
Chlorine used in Water Treatment	pounds		8,639	3,870	11,500
	ppm avg.		.84	.94	.94
Lime used in Water Treatment	pounds		12,942	10,200	10,000
	ppm avg.		1.0	.8	.8
Coagulant used in Water Treatment	pounds		111,926	115,280	130,075
	ppm avg.		9.0	9.4	10.7
Raw Water pH	pH avg.		8.6	8.0	8.3
Finished Water pH	pH avg.		7.54	7.40	7.40
Alkalinity, M. O. - Raw	ppm avg.		61	60	58
Finished	ppm avg.		60	54	52
Residual Chlorine - Settled	ppm avg.		.25	.26	.20
Finished	ppm avg.		.10	.13	.15
Iron - Raw	ppm avg.		.05	.07	.06
North Clearwell	ppm avg.		.017	.02	.02
South Clearwell	ppm avg.		.016	.02	.02
Hardness - Finished	ppm avg.		75	72	64
Turbidity - Raw	ppm avg.		3.5	4.0	3.0
Filtered	ppm avg.		0	0	0
REFRIGERATION (Building 189)					
Refrigeration produced	Tons per day			-	-
Temperature, Process Water In	avg. °F.			-	-
Temperature, Process Water Out	avg. °F.			-	-

Power Division

From December 1, 1948

Through December 31, 1948

POWER HOUSE (Building 184)

Steam generated - Total	M pounds	112392	113490	109346
Average rate	lbs./hr.	151064	152540	146970
225 psi Steam to plant (est.)	M pounds	97729	58695	95459
15 psi Steam to plant (est.)	M pounds	1176	1176	765
Coal consumed	Tons	8388	9095	8040
Coal in storage (est.)	Tons	37836	45603	44337

DEAERATOR PLANT (Building 185)

Water flow	gpm avg. rate	30751	27434	30120
Chemicals consumed:				
Dichromate	pounds	22756	23300	22000
Sodium Silicate	pounds	122015	212775	205140
Chemical Analysis:				
pH	pH avg.	7.62	7.65	7.63
Dichromate	ppm avg.	1.9	2.0	2.0
Silica	ppm avg.	2.5	5.5	5.4
Dissolved Iron	ppm avg.	.015	.02	.02
Free Chlorine	ppm avg.	.11	.15	.10

PROCESS PUMP ROOM (Building 190)

Total water pumped	gpm avg. rate	30576	27259	29945
	gpm normal rate	31440	30970	31420
Water temperature	avg. °F.	43.9	44.6	44.6

VALVE PIT (Building 105)

Chemicals consumed:						
Solids		pounds		2800	2000	3350
Chemical analayis:						
A, B, C, & D Headers						
	Standard limits					
pH	7.5-7.8	pH	(max)	7.66	7.70	7.65
			(min)	7.55	7.60	7.60
			(avg)	7.61	7.66	7.65
SiO_2		ppm	(max)	3.5	6.0	6.0
			(min)	2.0	5.0	5.0
			(avg)	2.5	5.5	5.4
$Na_2Cr_2O_7$	1.8-2.2	ppm	(max)	2.0	2.1	2.0
			(min)	1.8	1.9	1.8
			(avg)	1.9	2.0	2.0
Iron		ppm	(max)	.02	.03	.03
			(min)	.01	.01	.01
			(avg)	.014	.02	.02
Chlorides		ppm avg.		1.4	1.2	1.3

Power Division

From December 1, 1948

Through December 31, 1948

		200 AREAS	
		200-E	200-W
RESERVOIR (Building 282)			
Raw Water Pumped	gpm avg.rate	2037	2077
FILTER PLANT (Building 283)			
Filtered Water Pumped	gpm avg. rate	339	372
Chlorine Consumed	lb.	171	166
Alum Consumed	lb.	1100	1700
Chlorine Residual - Sanitary Water	ppm	.60	.66
POWER HOUSE (BUILDING 284)			
Steam Generated - Total	M lb.	29324	44502
Steam Generated - Ave. Rate	lb./hr.	39414	59814
Coal Consumed (Est.)	tons	2322.3	3178.7
Coal in Storage (Est.)	tons	14917.1	13085

		300 AREA
POWER HOUSE (Building 384)		
Steam Generated - Total	M lb.	19284
Steam Generated - Avg. rate	lb./hr.	25918
Coal Consumed - Total (Est.)	Tons	1590.6
Coal in Storage (Est.)	Tons	1625
SANITARY AND FIRE SYSTEM (300)		
Well Water Pumped - Total	gal.	29,078,950
Well Water Per Day	gal/day	905,772
Well Water	gpm avg. rate	629
Chlorine Residual	ppm	.36

INSTRUMENT DIVISION

MONTHLY REPORT

DECEMBER, 1948

GENERAL

The work load for the Division continues to increase, particularly that of the 300 Area shops. New employees have not been arriving as rapidly as desired and training of men for new plant operation has been delayed.

Project preparation has been requested for 7000 sq. ft. of space needed for maintenance and development facilities in the 300 Area.

Organization and Personnel

Number of employees on payroll:

	December
Beginning of Month	212
End of Month	216
Net Increase	4

Reason: 3 new hires; 2 transfers into Division; 1 transfer out.

100 AREAS (Reference Report HW-12060)

During the current month all operations personnel assigned to 105-DR acceptance testing were taken off the 48 hour work week. The acceptance testing of 105-DR instrumentation is approximately 40% complete.

Remaining orifice plate installed, in the 183-D 36" north raw water supply line, by construction. Changes increasing range of recorder from 25,000 to 30,000 GPM are also complete.

All controls and instrumentation to the 183-D filter plant addition and the 190-D Process Water Supply System were completed.

The addition of CO_2 to the pile atmosphere in 100-B and 100-F has been started.

Instrument work on No. 1 panel, P-10 project, is approximately 95% complete. All of the air monitoring equipment is now available.

The installation of electromagnetic strain gauges were completed at 100-B. Lack of rear elevator time has hindered installation of other unit motion gauges. Completed installations of tie strap micrometer brackets on front far side of 100-F pile. Remaining installations necessary to complete proposed pile motion instrumentation is as follows:

1. Pneumatic bowing indicator.
2. Tight wire bowing indicator.
3. Repair and calibrate Brown transmitter.

100 AREAS (Cont.)

A temperature regulated steam valve was installed on special equipment in the flow lab for the Technical Division at 100-D.

The quadrant monitor galvonometer failed during the December 21st shutdown. Investigation revealed a breakdown in resistance between the high voltage and No. 4494 chamber was disconnected and system returned to service satisfactorily, using the three remaining units.

The 100-D unit was shut down at 7:20 and 7:38 A.M. on December 11, 1948 due to faulty cable connectors. A new type connector is advocated.

On December 31, 1948, at 12:34 A.M. the 100-F unit was "scrammed" when No. 1 Beckman annunciator tab dropped. Investigation failed to reveal the cause. Resetting No. 1 and 2 RXG was unusually difficult. No. 1 unit was put on "by pass" and has operated four days without incident.

During the severe cold weather prevailing the latter part of the month, the instruments in the inner and outer instrument rooms at 100-B and F were subjected to temperatures below safe tolerance. The possibility of this condition was brought to the attention of the "P" Division. To date the following troubles have been experienced:

a. Solution frozen in Orsat analyzers.
b. Condensate frozen inside air lines.
c. Ink frozen in L&N recorders.
d. Liquid frozen in flow monometer.
e. Possibility of damage to standard cells.

200 AREAS (Reference Report HW-12062)

The addition of another sump tank at 231-W necessitated revision of existing liquid level recorder. The Ring Balance liquid level recorder now in use will be replaced by a double ring instrument removed from Section G, Building 222-U. The instrument is ready for installation upon completion of the sump installation.

Temporary thermocouples were installed on the recycle jets for tanks 8-1, 13-1, 14-1, 16-1 and 17-1, Building 221-T to measure the effectiveness of the jets. Incorporation, in jets now being designed, of a temperature indicator is being considered.

New orifice section of 1.6 CFM capacity were designed, fabricated and installed with inclined draft gauge indicators for measuring the flow to the sample filters which monitor the inlet to the sand filter.

The conductivity meters installed in sewer outlets have been successful in indicating process leaks. To determine the location of the leak, conductivity cells are being designed to go in individual cell drains. An experimental cell has been installed in 221-B.

Individual Sola regulating transformers are being installed on line operated health instrument equipment whenever possible, to correct low and fluctuating

200 AREA (Cont.)

line voltages.

A cathode follower circuit for checking poppy probe characteristics with an oscilloscope has been built and shows promise as a service instrument by eliminating varying characteristics of the poppy amplifier. It will be put in use at 231-W.

A device for keeping constant pressure on the ways of the sample pedestal slide, this minimizing air leaks was installed on the alpha Simpson proportional counter in 222-B for testing.

Preliminary service work on the air conditioning controls for 231-W is about 75% complete. All controls in 224-T have been serviced. The Buffalo systems in 222-B, 222-T and 222-U have been completed. Controls for 271-T and 221-T are approximately 60% complete. Control repairs in 200 East are in progress. The Carrier units in 221-B have been completed and work is in progress in 224-B.

Three thermocouple stations were fabricated for Project C-163.

An expanded indicator scale for Ring Balance liquid level recorders was fabricated and installed on one instrument. This gives added accuracy by eliminating parallax and by making the smallest division 1% instead of 2%. It eliminates erroneous readings due to eccentric charts.

300 AREA (Reference Report HW-12063)

As arranged with the "P" Division, instrument maintenance coverage on Saturday will be discontinued as of January 1, 1949.

C-141 - Addition to 3717 Instrument Shop

Color painting of the machines in the shop was completed during the month. This improved the lighting but additional light is needed. Project Engineering are investigating possible alteration to obtain desired improvement.

C-171 - Alterations to Crane Periscopes

The right periscope on the 200 East Area crane was converted to the new optical system. Parts for the left periscope are installed but not adjusted.

C-219 - Additional Health Instruments

This project is approximately 60% complete. CP units purchased from Technical Associates have been received and three of these were turned over to the Health Instrument Divisions for calibration and inspection.

300 AREA (Cont)

The Juno units received from the vendor have been altered by adding potentiometers for individual range adjustment. All units have been delivered to the Health Instrument Divisions with four to be accepted.

One Neutron Survey meter has been completed. It has been accepted by the Health Instrument Divisions and will be used as a prototype. Five additional units are nearing completion. The four remaining meters are scheduled for assembly to start January 1, 1949.

Operating tests are being conducted on probe type CP meters. Construction will be continued as soon as future plans are established.

A sample of the modified bent pencil probe is being field tested by the Health Instrument Survey Group. The 2" x 9" poppy probes are being assembled.

Tests are being continued by the Health Instrument Divisions to establish the proper type sampling unit for Air Sampler Units.

C-290 - Fabrication of Neutron Spectrometer

Materials are being ordered and shop work is scheduled to start January 1, 1949.

Maintenance Section

Relocation of the x-ray photometer in the 3706 Building was necessary to eliminate severe corrosion.

A plug-in circuit tester for CP and Juno instruments has been constructed and is in use. Batteries and important circuits can be checked by a series of switches working in conjunction with a common meter. The use of this tester indicates a considerable saving in time which may be derived on instrument repair.

Development Section

Graphite Grain Detector - This instrument was developed to aid in the inspection of machined graphite blocks. Grain direction is determined by a comparison of the resistivity taken along the grain versus across the grain.

Coulomb Meter - A meter is being developed to give a direct reading of the amount of current passing through an electrolytic cell without weighing the electrodes.

Alpha Survey Meter - An alpha survey meter weighing six and three quarter pounds has been developed jointly by the Development and Maintenance Sections. This meter may replace the present Victoreen alpha meter.

300 AREA (Cont.)

Development Section

Development work in progress includes:

1. Power level indicators for the 100 Areas.
2. Cover motion indicator for the 100 Areas.
3. Canning and Dipping viscometer study.
4. Methane proportional counters for beta work.
5. Special oscillators for the Technical Division.
6. Neutron counter studies.
7. Performance test of IDL - 162 scaler.

Design Section

1. The design of a dual printing register to record total pulses received from each of a pair of plug-in scalers.
2. A special head for adapting a borescope to an instrument used in detecting changes in width of graphite blocks within a pile.
3. An off-on switch for the electrode alignment light used in an enclosed source holder.

700 AREA (Reference Report HW-12064)

One ration box, for measuring small differences in resistance between similar standard resistors, and twenty-one total immersion mercury-in-glass thermometer with a combined range of -40°C to 500°C, were received from the National Bureau of Standards.

Tube Shop

Production Report

18 Mica Window Tubes
43 Thin Wall Glass Tubes
16 P.C. tubes
2 M.B. tubes

Tests on three thin wall glass low voltage tubes submitted by Radiation Counter Laboratories showed them to vary about 10% lower in voltage at their maximum counting rate as compared to Hanford Works thin wall glass tubes. With increasing voltage the counting rate drops to 60% of its initial value at a point about 75 volts above threshold. These tubes are available for tests under field conditions.

Comparisons of Miller Cold Catholde ion gauge tubes against hot cathode ion gauge tubes are as follows:

1. Indicated pressure (Miller gage) varies with interchanging of magnets.
2. Indicated pressure (Miller gage) varies with interchanging of amplifiers.

700 AREA (Cont.)

3. At pressures less than 10^{-5} mm Hg the Miller gage indicates greater pressures than the VG-1-A operated GE ion gage.
4. At pressures greater than 10^{-4} mm Hg the Miller gage indicates less than the VG-1-A operated GE ion gage.

These gages are being checked prior to installation in 234-5 Area.

DESIGN AND CONSTRUCTION (Reference Report HW-12061)

At the request of the Redox Design Section, an Instrument Division representative was moved to Building 761 to provide close contact and liason on instrument problems. This does not involve any change in the existing organization.

Studies on proposed instrumentation for a new pile are proceeding with particular attention devoted to rod position indication, detecting leaks, exit tube temperatures and ionization chambers.

At 100-DR the following design changes were necessary to clear obstructions and provide greater ease for servicing equipment.

1. Modify Beckman mounting panel at zero level, far side, 56 foot level, near side, to provide easier access to connectors.

2. Relocate "C" elevator ionization chambers and Beckman amplifier in accordance with "P" Division requests.

3. Eliminate three micrometer brackets for motion indication due to interference with duct work. Relocated Wye level station to clear obstructions.

4. Changed scales on all monitor indicators so cold readings will be somewhere near midscale.

The 105-DR Pressure Monitor is complete with the exception of connections at nozzles on unit face. This is held up due to leak tests. All gauges have been tested and the obviously defective ones returned to the vendor for repairs.

All work in the water area has been completed, equipment tested and placed in service with the exception of the over-pressure regulators on the 190 Building tubines.

The acceptance testing of 100-DR instrument equipment is approximately 80% complete.

The Beta monitor equipment design submitted by the Health Instrument Divisions was issued as a preliminary to get work started prior to issuance of formal drawings.

Instrument Division

DESIGN AND CONSTRUCTION (Cont.)

The design work for 100-H is complete with the exception of minor changes to improve design. A great deal of instrument equipment to be installed in this area has been received. As much as possible is being done on assembly of instrument panels at the White Bluffs Warehouse.

Installation of instrument equipment in the ventilation and gas section has begun.

The ventilator control system equipment order for 234-5 Building was placed with Johnson Service Co. Panels for Hoods 5, 6, 7, and 8 were taken to the 234-5 Building.

Additional instrument flow sheets were submitted by Kellex for the Test Plant. These were reviewed with representatives of Kellex and the GE Redox Process Group.

Several experimental instrument installations are under way in Building 231.

MAINTENANCE DIVISION
DECEMBER, 1948

GENERAL

A minor construction mechanic working in 100-F Area sustained a major injury on December 20, 1948, when a ladle of molten Tegul errupted in his face causing burns to his face and eyes. The employee returned to his normal duties on December 27, 1948.

A sub-major injury occurred on December 6, 1948, when a maintenance mechanic in the 200-East Area received a fracture of the ankle when a roll of roofing paper struck his ankle while riding in the bed of a truck.

The renovation of the administration buildings in the 100-D - 200-East and 200-West Areas have been started.

The construction of the 9 tube mock up in building 305-A was completed during the month.

Installation of a 12" water line in the 200-East Area for the A & J concrete mix plant was started and completed during the month.

At the request of H. I. Division a monitoring building was relocated from the 200-West Area to a designated site in the city of Kennewick.

ORGANIZATION AND PERSONNEL:

Employees on Roll	December
Beginning of Month	602
End of Month	595
Net Decrease	7

WORK ORDER SUMMARY:

Area	Backlog Mandays 12-1-48	Men on Roll	Backlog Days 12-1-48
100	3,374	130	26
200	4,301	144	30
300	2,523	66	38
M-C	18,911	156	121
Total	29,109	496	58

1211312

2 Maintenance Division

The total backlog decreased 1,589 mandays from the previous month, resulting in a reduction of crew days from 62 to 58.

100 AREAS:

In 105-B Building the 30 ton transfer crane brake shaft assembly was replaced with a high tensile steel assembly and the bearings on the low speed shaft were replaced with roller bearings per recommendation by the Project Engineering Division.

The second section from the bottom end of #37 vertical safety rod in the B pile was found to have a small split at the joint. This section was replaced with a new rod section.

It was necessary to replace a length of 10" C. I. pipe in the Fire and Sanitary water line on the north loop from 183-B Building.

The 30 ton transfer crane cable drum was regrooved in the 105-D Building. It was necessary to cut the grooves 5/32" deep into the drum in order to obtain a standard rib between the grooves. New stainless steel cables were installed. Also, the brake shaft assembly on the crane was replaced with a high tensile steel assembly per recommendation of the Project Engineering Division.

A new stainless steel vertical safety rod and a stainless steel chrome plated rod guide with cast iron bonnet were installed in #15 safety rod position in the D pile. In attempting to replace #27 vertical safety rod with a new stainless steel rod and a stainless steel chrome plated rod guide, it was found that the rod would not go into the unit. This was caused by the thimble being bowed and the tip of the rod striking the thimble 6 feet below the bottom end of the rod guide. The new rod was dismantled and a spare steel rod tip was inserted as a temporary measure in the rod guide to provide shielding. This safety rod is now out of service pending decision as to permanent repair.

Repairs were made on #1-A coal crusher, Building 184-D, after some steel bars that were mixed with the coal, fell into the rollers. The main drive shaft was bent on the sprocket end and was replaced with a new shaft. The shaft was bent in the #2 crusher roll; and, the bearing on the drive end was bent and broken. This crusher roll was replaced with a reconditioned roll.

#11 Vertical Safety rod in the F pile was replaced with a new stainless steel rod and a stainless steel chrome plated guide.

3

Maintenance Division

#7 horizontal safety rod in the F pile was inspected and deep cuts were detected 6 feet from the extreme tip end. The top of the tip was smoothed and polished but continues to bind at approximately 6 feet from the extreme "In" position.

The CO_2 rack, manifold and steam heater were relocated from the accumulator room in Building 105-F and installed in the southwest corner of 115-F Building.

Platforms for the unloading of full cylinders and storage of empty cylinders were built. Stalls were provided in the corridor of #1 purification room for the storage of 54 full cylinders.

200 AREAS:

Cell #7, 221-T was activated. This required new connector gaskets, lubrication of cell equipment, repairing and adjusting the hydraulic system and repairing gang valves.

A bad crack in the water jacket of agitator tank 17-1, 221-T Building was welded. This was apparently caused by fatigue in the metal.

New A T tanks of an improved and heavier design were installed in cells 3 and 4 of the Isolation Building.

The replacement of cell #2 water jet system in the Isolation Building with an air jet assembly was completed. The change was made in order to reduce the amount of water being run to the crib waste field.

A brake screw shaft of new design was installed on the 10 ton crane in 221-B Building in accordance with Project Engineering Division's recommendation.

During the month tile sewer lines in sections 14 and 16, "B" Canyon were replaced with 3½" O. D. stainless steel tubing. The old tile lines were cracked and leaking, causing considerable damage to concrete floors and presenting a safety hazard to personnel.

One 5 H. P. and one 15 H. P. gear reduction units were assembled in the 272 Shop Building and made ready for service for use as tank agitator drives in process area.

The replacement of steam line support poles in 200-East Area was completed. A total of 15 poles were replaced during the month of December.

4 Maintenance Division

300 AREA:

The chip recovery centrifuge was overhauled to eliminate excessive vibration. Fabrication of new type dies and ejection ram for the chip recovery press is in progress.

During a "P" Division shutdown, the Stokes vacuum pumps were repaired; leaking valves on the vacuum lines were refaced; and the Melt Plant furnaces rebricked.

The glass wool filters in one air wash unit in 313 Building have been replaced by distributors made in the shop of galvanized ¼" mesh hardware cloth. Similar filters have been operating successfully in the 3706 Building for approximately four years.

Four thousand wooden tote boxes used for 4" slugs were completed in our Carpenter Shop and put into use.

ELECTRICAL DIVISION

DECEMBER, 1948

GENERAL

Work Order Summary - Estimated Man Days:

Area	Work on Hand Nov. 30	Work Completed to Dec. 31	Work on Hand Dec. 31
100-B	624.7	319.3	740.7
100-D	410.0	292.5	383.3
100-F	471.0	271.0	480.0
200-E	349.4	253.7	396.0
200-W	427.2	256.9	426.0
300	198.0	201.5	218.2
Telephone	3183.0	805.0	2917.0
Minor Const.	222.8	191.0	258.0
Distribution	6957.0	1630.4	6620.0
Total	12843.1	4221.3	12439.2

The foregoing totals include routine work as well as construction and project work and regular work orders.

The attached load chart for the peak day of the month, December 27, shows a peak of 68.2 MW for the entire project with coincidental maximum demand of 29.2 MW for the 66 KV system. Both are new all time high figures. Thus, demand is probably slightly higher than seasonal because of unusually cold weather. Also, with completion of additional housing, this load is increasing. The growth of load on the 66 KV system creates greater urgency for completion of the new 115 KV Village substations.

Under Project C-177 (new 115 KV system), Subcontractor's portion of the north substation in Richland was accepted on December 3. Both 10,000 KVA transformers and all switchgear have been received and are in place. As of December 31, Electrical Division work was estimated at 55 percent complete. Completion of north section of transmission line by Subcontractor is planned for January 15, by which time substation work is expected to be complete enough to permit tying in some feeders and picking up load. The south substation in Richland has not as yet been turned over by Contractor but is essentially ready for electrical work; the two transformers (10,000 KVA each) have been shipped from the factory and are expected in Richland by early January. The 300 Area substation, concrete and steel work, has been accepted on preliminary basis. The general distribution scheme for 300 Area has been decided upon and drawings are now being prepared by the Project Engineering Division.

During the month, the Electrical Standards Committee reviewed previous decision to unground all 440 volt systems. After consultation with Schenectady, it is agreed that the standard will be to use a delta-Y, .5 KVA transformer in each 440 volt system for stability and for ground indication. Request has been made of the Appropriations and Budget Committee for allocation of funds to do this work on existing systems; the Design and Construction Divisions will so arrange 105 DR, 100 H, and all new 440 volt construction.

Electrical Division

Mr. H. Hughes, Project Engineering Division, Electrical Section, was elected Chairman of the Electrical Standards Committee for the first six months of 1949. It is agreed that the Electrical Division will continue to report this committee's activities.

A possible departmental educational and training program is being developed. A questionnaire, discussed with non-exempt personnel, showed the following results:

	No. Favorable	% Favorable
Willing to take part in program	126	89.3
Willing to pay fee and take course at Nucleonics School	108	73.2

In age and experience groups, equal interest was expressed for all groups. An Educational Program Committee, including three members of supervision and three non-exempt employees, has been established. In cooperation with the Nucleonics School (W-10), two classes in elementary electricity and one in telephone work will commence on January 17, sponsored by the division and using instructors from the Electrical Division. Assistance is also being given to an AIEE sponsored refresher course, intended as preparation for engineering license examination.

ORGANIZATION AND PERSONNEL

There were two terminations during the month (one Lineman and one Helper), and one Electrician B was transferred to the Design and Construction Divisions.

Two men of suitable experience were transferred in from the Power Division as Substation Operators. The following men were hired on temporary basis: two Electricians B, one Helper and one Utility Man. These men normally pertain to the Village but will be used to speed up our work on the telephone exchange. One Helper was transferred in from Patrol to work in the Distribution Section.

One Assignment Engineer, P. R. Baldinger, automatic telephone equipment specialist, was added to the payroll.

John F. Kane, Technical Graduate, 200 Areas, was sent to the 100 H Area on temporary basis for inspection and testing, and to represent the division's interests as electrical construction develops. G. L. Swezea, Technical Graduate, replaced Mr. Kane in the 200 Areas temporarily.

Dr. W. R. Varner, Assignment Engineer, has completed his work in the 200 Areas. He is now in the Distribution Section, concerned with load studies, ground checks, etc.

Because of diminishing construction work with which the Electrical Division was concerned in Richland, 700 and 1100 Areas, one Minor Construction crew was disbanded. Four men were sent to the 200 Areas where work is developing, and the balance to the 100 Areas to break in as replacements for Electricians in existing areas who will later be sent to man 100 H. The Foreman, R. L. Hibbard, was transferred to the 200 Areas to follow construction contact in the 200 Areas. There remains only one Minor Construction crew, used in 300 Area and in Richland as needed.

Electrical Division

Number of employees on payroll:	December Exempt	Non-Exempt
Beginning of month	46	235
End of month	47	238
Net increase	1	3

AREA ACTIVITIES

1. 100 Areas

A. General

A severe voltage dip occurred on December 19 at 8:12 p.m. due to trouble on the Coulee-Midway line. None of the equipment in the 100 Areas was affected.

B. 100-B Area

The "manual-automatic" selector switch on the 750 KW emergency generator in the 184 Power House Building failed due to a broken operating finger. Temporary repairs were made and a new switch has been ordered.

Project P-10, Conversion of Building 108, is electrically 30 percent complete.

105 Pile Building

Considerable trouble was encountered with the brake mechanism on the induction voltage regulator on the No. 4 amplidyne test rod drive. This device is now being redesigned by the Design and Construction Divisions as the present design is not acceptable for so important a function, and the redesign will be applied in 100 H Area.

The monitor panel in the valve pit was disconnected for removal.

Installation of conduit and wiring for "rear face" strain gauges is approximately 75 percent complete. Front face strain gauge installation is approximately 15 percent complete.

C. 100-D Area

Wiring to the exhaust fan in the 183 Head House Chlorinator Room was replaced. The old wire had failed due to water in the conduit.

105 Pile Building

Installation of the motion recorder equipment was completed.

Electric heaters were installed in the stack room to protect the instruments from freezing.

100 DR Area

The lights for the new flocculator beds at Building 183 were connected

for use.

The two 30 inch limitorque valves were disconnected in Building 186 for use in the 100 H Area.

Voice powered telephones in the 190 Building addition and the 105 DR valve pit were temporarily connected into the 190 intra-building phone circuit for construction acceptance tests.

The 190 Building annunciator wiring was rearranged to provide "drops" for the new construction installations.

"Tie-ins" were made to the relocated re-use water pumps in the north end of Building 190.

A bushing on the 2000 KVA transformer at Substation C4-S13 was damaged when it was moved by Construction forces from 186 to 190 Building. The bushing terminal was badly sprung and had to be straightened and a new gasket cut to stop the oil from leaking.

Installation was completed on the overhead control cables for instrumentation ties from 105 DR to 107 DR, 1904 D, 182 D, and 183 D.

The new bank, 440 volt, at 107 DR Building was energized.

D. 100-F Area

105 Pile Building

Temporary heat lamps were installed in the inner and outer instrument rooms to prevent freezing of instruments.

A clock was installed on "D" elevator.

A special spotlight was made up on a stand for use on top of the block. Similar lights will be made up for 100 D and 100 B.

Erratic operation of "D" elevator was finally traced to a sticking stop button and a corroded shunt wire on a relay contact. Corrections were made and no further trouble has developed.

2. 200 Areas

A. General

Line work is increasing rapidly in the 200 Areas with the development of the expansion program.

B. 200-E Area

On December 1, the No. 1 fan motor at the 291-B Building was reported to be inoperative. Investigation showed that the belts had loosened to such an extent that the fan would not handle the air flow. The Maintenance Division tightened the belts and the unit worked as usual.

On December 14, the "E" cell blower motor in the 224-B Process Building was removed from service. The shaft had frozen to the bearing. A heavy

squirrel cage fan is suspended on the motor shaft without any other bearing surface. This design is not good and will be studied. Another of the motors is becoming noisy and will have to be repaired in the near future.

On December 7, the rovatrol on F-2 centrifuge in the 224-B Process Building would not operate on slow speed. A broken connection was found in the speed change switch. Repairs were made and the equipment returned to service.

Thirty-four motors were repaired in the 200 East Area Electrical Shop during the month.

The 7.2 KV line was cleared for construction crews stringing new 13.8 KV lines to the 200 West Area.

C. 200-W Area

The taps on "Y" and "R" transformers in the C8-S1 substation were changed from position No. 3 to position No. 4 on December 21. This change was necessary due to the low voltage condition which existed throughout the area.

It was necessary to replace the grids on the 75 ton crane in the 221-T Canyon Building on December 9. These grids are burned out by the standard practice of braking the crane in first speed. The idea of increasing the current carrying capacity by adding additional resistors is being developed.

The 15 h.p. No. 6-1 agitator in the 221-T Canyon Building was replaced with a spare unit on December 15. The motor indicated a short circuit. However, it must cool off before further checks can be made.

The right hand impact wrench on the 75 ton crane in the 221-T Canyon Building developed a ground which caused a fuse to blow on December 22. Both the right and the left hand wrenches were replaced on December 23. The left hand wrench developed a considerable noise in the socket.

Considerable trouble was experienced with the tunnel door to the 221-T Canyon Building on December 27. The overload protection device operated several times. The trouble was caused by the effects of the extreme cold weather on the oil in the gearhead and the faulty operation of the brake.

The additional and new cubicles being installed in the 283 Pump House Building were connected to the original bus on December 10.

Eight poles were framed and set in the new 13.8 KV lines from the 251 Building to the 200 W Area.

3. 300 Area

Electrical power to the entire 300 Area was interrupted at 4:45 p.m. on December 2, due to trouble on the 66 KV system. Service was restored at 8:55 p.m. Several false fire alarms occurred during this period, which originated in the 3706 Building (Laboratory) and the 3717 Building (Instrument Shop), due to loss of air pressure on the dry sprinkler system.

The Tocco Junior "frost test" machine in the 313 Building developed trouble early on the 4-12 shift on December 31. A 2.4 MFD capacitor was found to be open circuited. This was replaced in time to avoid any loss of production.

A connection was made on December 31 to the experimental slug induction heating equipment which is being used by the Technical Division. This equipment, located in the 314 Building, has operated satisfactorily but will need refinements.

A number of exceptions were listed on the electrical work in 3703 Building when it was occupied by operating personnel, and it was found that fuses blow on several of the wiring circuits. These were pointed out directly to the Contractor and the General Electric Construction Division. The items covered at that time have since been corrected.

Project C-237 - 305A Building (Nine Tube Test), is 98 percent complete, awaiting delivery of outside lighting equipment.

4. Distribution and Transmission

Following last month's report, all hardware and dead-end assemblies on 22 three pole dead-end structures in the 230 KV loop were bonded. This work was done during three Critical "W" arrangements on December 13, 17 and 20, and will continue into January.

The series street lighting and road circuits in Richland were placed on a photo-electric cell during the month and time clocks were moved. This was done in conjunction with the power conservation program.

During an outage in the 300 Area on Sunday, December 12, to provide for the stringing of the 115 KV line over the existing 66 KV system, all line hardware, connectors, etc. were tightened on the 66 KV system between Hanford and the 3000 Area. This included replacing all hot line connectors with two Kearneys so as to give adequate carrying capacity at point of connection. Also, the primary on three poles was lowered to clear for new 115 KV line entering station.

Both area and Village line crews are extremely busy and will remain so for at least six months due to many details of the construction program, and tie-in of construction and new facilities. All of this must be done, partly at the expense of normal maintenance. The details of work done are too numerous to cite here. A great deal of line and substation crew activity is associated with electrical construction of new 115 KV substations, as well as re-routing of feeders to the new stations.

Because of division of men to substation construction, Osmose treatment and pole replacement programs were held up during the month.

The following radio equipment was serviced during the month: -

Two way movile units serviced	95
Two way mobile units overhauled	41
Stationary units serviced	6
Stationary units overhauled	7
Two way mobile units installed	6
Two way mobile units removed	3

6

Power Supply Interruptions

Date	Area	Circuit Affected	Duration	Remarks
		230 KV		
Dec. 2	200-E	Northwest fence light circuit	2 hrs. 50 min.	Bad fuse holder
Dec. 19	100-B	Substation C2-S60, 6.9 KV line	4 hrs. 2 min.	Pole broke, one phase down
		66 KV		
Dec. 1	Col. Camp	REA line	4 hrs. 25 min.	Trouble at Benton City
Dec. 2	300	B-94, B-41 & B-43 relayed	3 hrs. 54 min.	Wire down
Dec. 2	3000	Pasco-Hanford 66 KV line	3 hrs. 54 min.	Wire down
Dec. 2	B1-S1	Pasco-Hanford 66 KV	57 min.	Trouble at Pasco
Dec. 2	B1-S1	Pasco-Hanford 66 KV	17 min.	Trouble at Pasco
Dec. 2	B1-S2	Pasco-Hanford 66 KV	1 hr. 40 min.	Sectionalizing due to overload
Dec. 2	B1-S3	D1-L13	2 hrs. 17 min.	Sectionalizing due to overload
Dec. 2	B1-S3	D1-L11	2 hrs. 19 min.	Sectionalizing due to overload
Dec. 2	B1-S3	D1-L10	2 hrs. 38 min.	Sectionalizing due to overload
Dec. 17	Richland	B1-S2 to B1-S1 and B1-S3	1 hr. 48 min	Lead burned off to current transformer
Dec. 22	Col. Camp	REA line	2 hrs. 35 min.	REA trouble
Dec. 22	Col. Camp	Power transformer out	11 hrs. 40 min.	Transformer trouble

The troubles at Columbia Camp were mainly due to single phasing of REA lines accompanied by transformer burn out. The series of troubles on 66 KV system on December 2 were due to conductor burn-off, and excessive overload upon restoration of power mainly due to excess heating requirements after outage.

5. Telephone Section

A location for a fire proof exchange building has been approved for the 300 Area. Owing to the increasing fire hazards in the 3706 Building (Laboratory),

where the telephone exchange is now located, the construction of the new exchange building is being advanced, with construction scheduled to begin the week of January 3, 1949.

Equipment for the 200 E-W exchange is all scheduled for shipment in January, 1949. About 30 percent of this equipment is on hand. The building is under construction.

Construction of the alternate trunk route from the Richland exchange to the 200 E-W exchange has been progressing satisfactorily. Messenger wire has been completed to Point "H". Thirty-one poles are still to be set on the spur which will run from this line to the 200 E-W exchange. The cable has been installed for a distance of 140 poles past the 300 Area. An additional crew is to begin spinning cable on January 5, and a third crew is scheduled for shortly after that time. Cable splicing has been delayed due to lack of splicers but will start in early January.

Under Project C-138, Richland Exchange Conversion to Dial Operation, installation of the equipment is approximately 25 percent complete. A full carload of equipment is due to arrive on the Project January 5, 1949. Six men have been supplied by the Electrical Division to assist the North Electric Company on this installation.

The increase of telephone cable facilities in the original Village cable plant, under Project C-144, is approximately 30 percent complete.

Under Project C-265, Construction of a 27 Quad Trunk Cable to Kennewick, the underground portion of this cable is installed and about 3000 feet of the aerial cable are installed. Footings for the river crossing towers have been completed but no work has been done on the towers.

Dials have been installed, and the dial action timed on all telephones on hand. It was found that the timing needed to be corrected on most dials. An instrument was built for this purpose and the installation of dial telephones will now proceed at a much greater rate.

A formal inspection was made of the installations of underground telephone cable on Williams Boulevard and George Washington Way from manhole No. 12 to manhole No. 22. This work was satisfactory except for some manholes, and Project Engineering has agreed to raise the level of the top of the manholes accordingly.

The Project Engineering Division is revising the underground cable layout from the Richland exchange to the end of Leo Blvd. so that this system can provide for service to the proposed multiple housing units to be located near the J. L. Hudson Company material yard.

The number of lines and sides vacant on the Richland telephone switchboard as of midnight, December 30, is as follows:

Class	Lines Vacant	Sides Vacant
1500	6	23
Residential numbers	9	223
Office numbers	25	12

8

The following telephones were moved during the month:

Area	Installed	Removed
All work areas (active)	63	47
Richland	302	218
North Richland	69	39
White Bluffs, Hanford and 100 H	30	17
Total	464	321

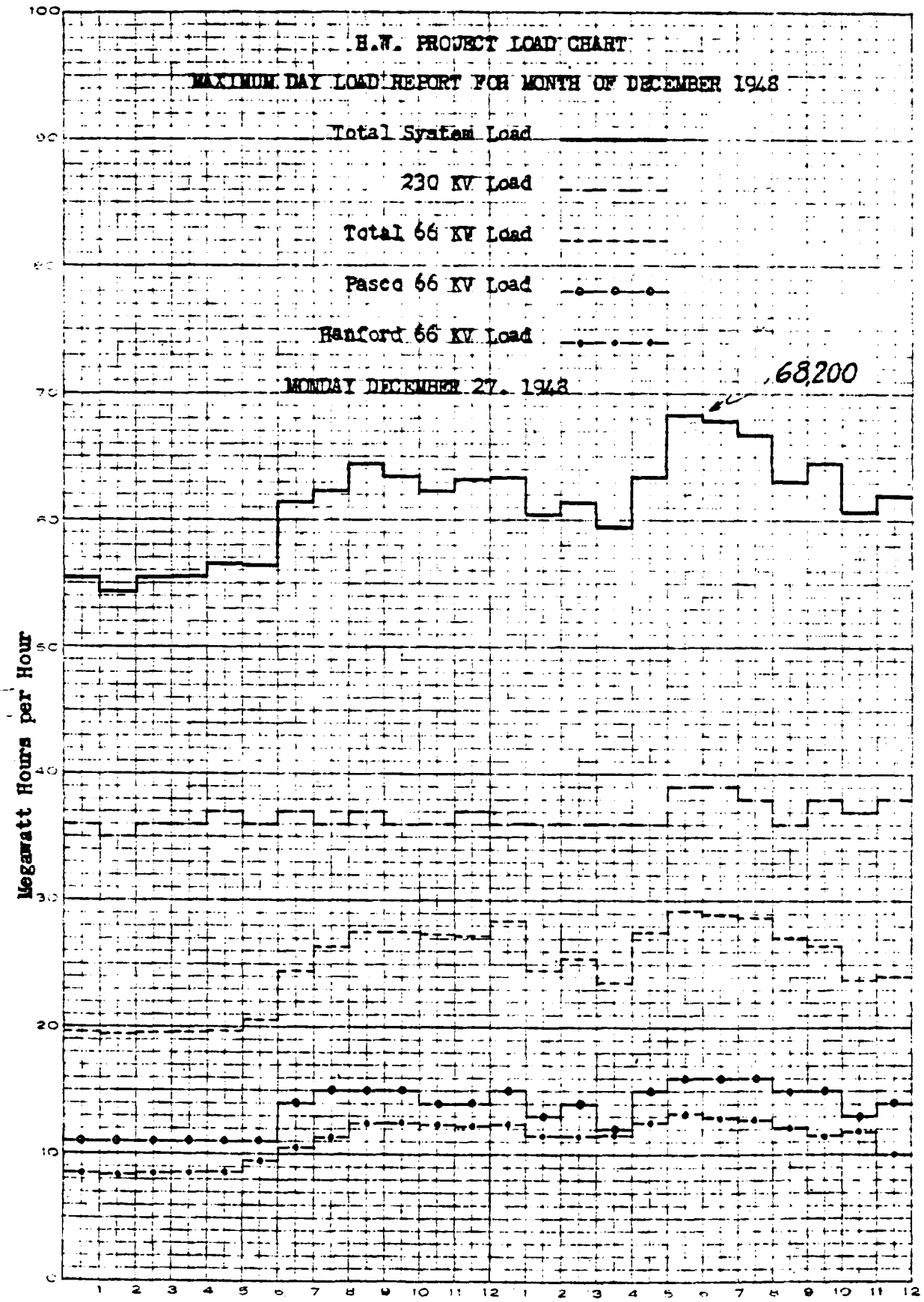
10 121 325

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

ITEM	ENERGY - MW HRS. Nov.	ENERGY - MW HRS. Dec.	MAX DEMAND - KW. Nov.	MAX DEMAND - KW. Dec.	LOAD FACTOR - % Nov.	LOAD FACTOR - % Dec.
230 KV SYSTEM						
A-2 Out (100-B)	7,120	7,260	11,700	11,200	84.5	87.1
A-4 Out (100-D)	7,420	7,740	12,300	13,000	83.8	80.0
A-6 Out (100-F)	6,680	7,170	11,200	11,300	82.8	85.3
A-8 Out (200 Areas)	2,420	2,860	4,300	4,600	78.2	83.6
TOTAL OUT	23,640	25,030	39,500**	40,100**	-	-
MI MIDWAY IN	23,981	25,475	37,600*	38,800*	88.6	88.2
Transm. Loss	341	445				
Per Cent Loss	1.4	1.7				
66 KV SYSTEM						
B1-S1 Out (Richland)	6,214	6,900	11,900	12,800	72.5	72.5
B1-S3 Out "	2,598	2,589	6,600	6,900	54.7	50.4
B1-S2 Out "	514	1,728	2,225	3,988	32.1	58.2
B3-S4 Out (300 Area)	230	231	504	468	63.4	55.2
B3-S5 Out "	624	600	1,240	1,280	69.9	63.0
B1-S4 Out (North R.)	2,635	2,980	4,550	5,011	80.4	79.9
B7-S10 Out (W. Bluffs)	411	474	1,125	1,147	50.7	55.5
B9-S11 Out (100 H)	264	322	840	880	43.6	49.2
Hanford Out	309	333	500	500	85.8	89.5
TOTAL OUT	13,799	16,157	29,484**	32,974**	-	65.7
Hanford In	7,058	7,666	16,400*	22,800*	59.8	45.2
Pasco In	6,648	8,713	15,600*	18,800*	59.2	62.3
TOTAL IN	13,706	16,379	32,000**	41,600**	59.5	52.9
Transm. Loss	93 +	222				
Per Cent Loss	.7 +	1.4				
PROJECT TOTAL						
230 KV (Item 5)	23,640	25,030	39,500**	40,100**	-	-
66 KV (Item 15)	13,799	16,157	29,484**	32,974**	59.8	65.7
TOTAL OUT	37,439	41,187	68,984**	73,168**	-	75.7
230 KV (Item 6)	23,981	25,475	37,600*	38,800*	88.6	88.2
66 KV (Item 18)	13,706	16,379	32,000**	41,600**	59.5	52.9
TOTAL IN	37,687	41,854	62,100*	68,200*	82.8	82.5
Transm. Loss	248	667				
Per Cent Loss	.7	1.6				

* Coincidental Demand
** Non-Coincidental Demand

Average Power Factor - 230 KV System---98.3
Average Power Factor - 66 KV System---96.3



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TRANSPORTATION DIVISION

MONTHLY REPORT

December 1948

GENERAL

Absenteeism in the Transportation Division for the month of December was 2.48% which is an increase of .43% over November.

ORGANIZATION AND PERSONNEL

Force of the Transportation Division for December was as follows:

Number of employees on payroll		
First of month		753
End of month		755
Net increase		2
New hires	7	
Return to work	1	
Total	8	
Terminations	3	
Transfers to other Divisions	2	
Removal from payroll	1	
Total	6	
Net increase	2	

Total force of Morrison-Knudsen, Track Maintenance Subcontractor, as of December 31 was 200 which is a decrease of 45 over November.

OPERATIONAL ACTIVITIES

1. Railroad Operations

Railroad operations continued in a routine manner with train movements being effected as scheduled. Process schedules were somewhat above normal and required the services of three train crews on a part time basis. Commercial tonnage increased substantially and was exceedingly heavy near the end of the month. There were 5,225 cars handled compared with 4,640 in November and 4,478 in October.

Non-routine work consisted of: work train service for the movement of concrete aggregate from White Bluffs to the 241-BY Area in 200-East and the 234-5 Area in 200-West; work train service continued on a six day week basis for the bank widening project between May Junction and North Richland; work train service was initiated December 15 for the movement and spreading of ballast at the new track site between 200-East and 200-West from White Bluffs; work train service was provided for distributing and unloading railroad ties as required; and a conductor-Pilot was provided for the Burro-Crane assigned to relaying rail between Riverland and 100-B and between Riverland and Susie.

2. Railroad Repairs

Alco locomotives 39-3731 and 39-3732, received recently, were inspected, serviced, and released for operation December 3 and December 10 respectively.

Completed major repairs on flat cars 10-A-3626 and 10-A-3611.

Major overhaul of Baldwin locomotive 39-3721 was started December 21.

Maintenance Division completed partition between Riverland Roundhouse Parts Room and Office; completed the installation of a gravity feed line from high water tank to boiler room for use in case of an electrical failure.

3. Railroad Track Maintenance

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

a. General

Cleaned snow and gravel from switches and flangeways throughout the Plant railroad system.

b. 100-B Area

Spread three cars of ballast, raised and dressed 350 feet of track, replaced 120 cross ties and one set of switch ties, unloaded one car of tie plates and distributed 250 ties for future replacements, and moved 400 unserviceable ties to the disposal ground.

c. 100-F Area

Installed gauge rods on 183 Track and removed temporary crossing on Coal Track.

d. 200-East Area

Cut and replaced track on coal spur for water line excavation and replaced 24 rails on coal track.

e. 200-West Area

Repaired 234-5 Switch, replaced 241-TX Turnout, and opened 221-U Building Track for pipe line excavation on Project C-163.

f. 300 Area

Raised, lined, and dressed 850 feet of track and dressed 600 additional feet.

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

Project C-214 (Rehabilitation of Plant Railroads) Surfaced, lined and dressed two miles of "A" track; relaid two miles of "B" track; salvaged 3.6 miles used rail and stored at Edna; replaced 14,160 cross ties and installed 28,220 tie plates; loaded from Construction stocks at Edna 50,091 lineal feet of 90# rail and 8,695 cross ties; received eight cars of 90# rail borrowed from Construction and distributed for relay; unloaded 34 cars of cross ties and two cars of tie plates; picked up and stacked 15,000 used ties which had previously been replaced; requisitioned 139 pairs of compromise joints to protect rail ends on new relaid rail; and distributed 13,280 cubic yards of bank widening materials.

AUTOMOTIVE OPERATIONS AND REPAIRS

1. Automotive Operations

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

b. The volume of Area bus service is indicated by the monthly total passenger count of 132,806 and the volume of Village Local bus service is indicated by the monthly total passenger count of 77,399. This compares with the December 1947 passenger count of 110,246 for Area service and 70,544 for Village Local service.

c. The extent of automotive equipment usage is indicated by the monthly total mileage of 1,278,857. This compares with the December 1947 total mileage of 1,064,776.

d. Off-the-Plant special automobile trips (Company business and official visitors) totaled 231.

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

2. Automotive Repairs

The Repairs Section received 212,218 gallons of gasoline, 57,587 gallons of Diesel fuel and 9,860 gallons of kerosene during the month for Project use.

Four electric starter units were installed on Caterpillar tractors during the month. Additional installations will be made as starter units are received until all Caterpillar equipment is equipped with electric starters.

Extensive major repairs are being made to the rock crusher which has been in operation for the past three years.

Twenty-four new Dodge power wagons, eight new Chevrolet panels, and fourteen new Ford pickups were serviced and released for assignment.

LABOR SECTION ACTIVITIES

1. Roads and Streets

Expended 1,088 man-hours in crushing and stockpiling 130 cubic yards of 3/4 minus and preparing 2,400 tons of pre-mix material.

Expended 1,087 man-hours in maintaining Village streets, used 100 tons of pre-mix material and 500 cubic yards of sand.

2. Areas

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

a. General

Project C-279 (Improvements to Area Administrations Buildings 1704 B-D-F and 2704 E-W) Expended 146 man-hours in hauling and unloading material and cleanup of construction areas at the 1704 Buildings.

b. 100-B Area

Project C-294 (Mock Up Facilities for Special Metallurgical Studies) Expended 68 man-hours in excavations, 88 man-hours in backfilling and sand cushioning, 45 man-hours in floor slab placement, 159 man-hours in concrete saddle removals, and 200 man-hours in general labor and cleanup for the 111-B Building.

Suspense Code 10240 (Alterations to 108 Building) Expended 32 man-hours in installing an exhaust system, 97 man-hours in backfilling, 71 man-hours in placing crib slabs, 111 man-hours in hauling material, and 316 man-hours in general labor and cleanup for the 108 Building.

c. 100-D Area

Project C-238 (Effluent Sewer Line 105-F to 107-F) Backfilled 1,350 cubic yards of earth and placed 4½ cubic yards of concrete. Expended 128 man-hours in setting a gate, hauling and stripping forms for the West Gate Box.

d. 100-F Area

Project C-238 (Effluent Sewer Line 105-F to 107-F) Expended 68 man-hours in excavations and placing 12 cubic yards of concrete

in sewer encasements at the 105 Building. Expended 78 man-hours in setting steps, steel supports, and general cleanup for the 105 valve pit. Expended 170 man-hours in constructing 107 effluent line fence and 72 man-hours in cleanup of the Minor Construction pipe yard.

Project C-269 (Radio Botany Laboratory* Expended 80 man-hours in excavations for floor drains and sewer, 70 man-hours in backfilling and fine grading floor slabs, 100 man-hours in placing concrete floor slab, and 16 man-hours in cleanup for the 1705 Building.

e. 200-East Area

Suspense Code 10225 (Stack Gas Decontamination Facilities) Expended 636 man-hours in hauling lumber from 291-B to the 200-West temporary lumber yard.

Project C-133 (Special Test Wells) Wells 34-88.5 and 62.5-90 were completed at depths 688 and 253 feet respectively. Footage on all wells drilled to date totals 16,155.

Excavated 4,000 cubic yards of earth, backfilled 1,050 cubic yards placed 12 cubic yards of concrete, and expended 100 man-hours in placing pipe for the 10" water line to the batch plant between 200-East and 200-West Areas.

f. 200-West Area

Suspense Code 10225 (Stack Gas Decontamination Facilities) Expended 154 man-hours in hand excavations, backfilling and grading, placing 8 cubic yards of concrete, building fence, and general cleanup for the 291-T Building.

Project C-163 (Additional Process Waste Storage) Excavated 650 cubic yards of earth, backfilled 8,725 cubic yards, and placed 153 cubic yards of concrete for encasements. Expended 600 man-hours in excavating, backfilling, grading, and tamping for the diversion boxes and catch tanks. Expended 423 man-hours on barricades, 227 man-hours in constructing temporary roads, 220 man-hours on temporary steam line, 180 man-hours in erecting temporary hutments, 395 man-hours in handling encasement lids and materials, and 213 man-hours in removing and cleaning forms.

Project C-273 (Water Supply and Plumbing for Meteorological Station) Expended 70 man-hours in hand excavating for water line and tile field, 157 man-hours in placing gravel bed in tile field, and 92 man-hours in placing 10 cubic yards of concrete at the Meteorological Tower.

Work Order F-10156 (Redox Test Holes) Test holes 3, 4, and 10 were started and completed during the month with completed depths of 50, 50, and 30 feet respectively.

Work Order D-28493 (Redox Test Holes) Test holes 241-T-1, 2, 3, 4 241-TX-1, 2, 3, and 4 were started and completed during the month at a combined depth of 199 feet.

g. 300 Area

Project C-177 (115 KV Power Line to Richland Plus Substation Facilities) Expended 333 man-hours in excavating, placing 18 cubic yards of concrete and moving equipment to deliver and unload transformer for the 115 KV Line. Expended 128 man-hours in moving material and general cleanup of the Minor Construction Yard.

EQUIPMENT CONTROL SECTION ACTIVITIES

One hundred and fourteen units of automotive equipment were excessed during the month making a total of 203 excessed to date.

The General Purpose Vehicle Study-Survey of HC 1-A Sedans is progressing. Compiling and assimilating of factual information obtained from field survey is presently under way.

TRAFFIC SECTION ACTIVITIES

In line with our October request, the North Coast lines have approved a rate of 50 cents per cwt. minimum 20,000 lbs. from Portland to Hanford on Alcohols other than Alcoholic Liquors. This rate became effective December 18 and will provide savings of 13 cents per cwt. or approximately $26 per car.

The Transcontinental rail lines approved extension of expiration date of rate on Office Records, Hanford Washington, to Wilmington, Delaware, to December 31, 1949, Supplement 91, TCFB Tariff 2-P.

Effective January 1, 1949, Washington truck lines have approved a rate of 32 cents per cwt. subject to increase supplement, on Machine Finished Castings, 50,000 lbs. minimum, from Seattle, Tacoma and Vancouver to Hanford and Pasco. This will provide savings of 34 cents per cwt. or approximately $170 per shipment.

The Willamette Tariff Bureau approved a 35 cent rate on Caustic Soda and other Chemicals in tank trucks from Portland to Hanford effective December 23, 1948. This is a reduction of two cents per cwt. under rate of November 14, 1948, and will provide a further saving of approximately $6 per shipment.

Effective December 9, 1948, our charges to Household Goods motor carriers for labor and carpentry services supplied them were increased as follows:

On employee moves at Company's expense - Labor $2.25 per hour
Carpentry $3.00 per hour

On employee moves at employee's expense*- Labor $2.80 per hour
Carpentry $3.50 per hour

*Includes actual cost plus overhead

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As a result of our proposal, the Freight Forwarders approved the reduction of Richland and North Richland rates in Section 3, Freight Forwarders' Tariff No. 10-A, to the same basis as Hanford rates, to become effective January 17, 1949. This will represent a savings of from six to nine cents per cwt.

As a result of rate reductions secured from the carriers, there was a total savings in freight charges for the month of December amounting to $57,133.83.

PROJECT ENGINEERING DIVISION

MONTHLY REPORT

December 1948

PRESENT STATUS OF WORK

Projects and Suspense Codes Authorized and Under Construction

100 AREAS

Project Number		% Phys. Complete	Date Auth.	Est. Cost
C-172	Dismantling of Equipment in Demineralization and Deaerating Plants	15	8-19-47	$484,000
C-184	Experimental Animal Farm - Part I (Part II Awaiting Auth. for Additional $507,000)	0	10-27-47	286,000
C-222	Dismantling Unoperated Equipment in 105 Valve Pits	18	2-10-48	4,000
C-238	Effluent Sewer Line 105-F to 107-F	94	3-26-48	207,000
C-269	Temporary Radio Botany Lab. 100-F Area	45	7-28-48	10,100
C-290	Fabricate & Install Spectrometer	0	9-29-48	9,000
C-294	Mock-Up Facilities for Metallurgical Studies	30	10-22-48	47,700
C-306	Revised Pile Shielding - Front Face Shield Nozzle Caps	0	11-30-48	88,000
SC 10239	Segmental Discharge Devices (Preliminary Program)	50	9-1-48	65,000
SC 10240	Special Technical Laboratory (P-10)	67	9-22-48	228,000
TOTAL Estimated Cost 100 Area Projects				$1,430,800

1.

Project Engineering Division

PRESENT STATUS OF WORK

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

200 AREAS

Project Number		% Phys. Complete	Date Auth.	Est. Cost
C-133	Special Test Wells 200-E and W (Additional wells authorized to the extent of available funds)	85	1-30-47	$180,600
C-163	Additional Waste Storage & Tie Lines 200-W (G.E. Portion Only - Subcontract not Included)	75	7-25-47	600,000
C-171	Alterations to Six Periscope Assemblies	100	8-6-47	7,200
C-262	Bismuth Subnitrate Preparation Fac.	100	7-13-48	23,000
C-273	Water Supply & Plumbing - Bldg. 622-A	30	8-4-48	13,500
SC 10225	Stack Filtration Facilities (Project C-313 Awaiting Authorization)	91	11-28-47	864,000
C-298	Decontamination Stations for Small Equipment - 221 T-B	0	11-15-48	33,000
C-305	Separation & Control of 231 Process Wastes	100	12-15-48	6,200
TOTAL Estimated Cost 200 Area Projects				$1,727,500

300 AREA

C-189	Building 3745-A X-Ray Facility Part II (Field Release Issued 12-8-48)	91	8-20-47	$ 33,000

Project Engineering Division

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

300 AREA

Project Number		% Phys. Complete	Date Auth.	Est. Cost
C-219	Construction of Additional H. I. Instruments	62	1-27-48	$97,200
C-220	Optical Instrument Bldg. and Elect. Shop 3708 - 300 Area	82	1-30-48	82,000
C-227	Conversion of Offices to Labs. Bldg. 3706 & Construction of 3707-C Change House	73	3-15-48	429,000
C-237	Nine Tube Mock-Up Bldg. & Equipment	100	4-12-48	106,000
C-287	Experimental Metallurgy Lab. Bldg. 3730	0	12-2-48	140,000
SC 10241	Increased Ventilation 313 & 314 Bldgs.	0	9-24-48	200,000
SC 10242	Process Sewer Effluent Pond - 300 Area (Project C-317 Awaiting Authorization)	95	10-13-48	62,000
TOTAL Estimated Cost 300 Area Projects				$1,149,200

GENERAL PLANT AREAS

C-138	Richland Telephone Exchange Bldg. 702	55	5-12-47	$470,500
C-144	Additional Telephone Cables - Richland	25	5-12-47	45,000
C-177	115 KV Power Transmission Line (Part III Auth. for Additional $197,000)	60	8-14-47	1,167,000
C-195	Radio Communications for Railroad & Electrical Division (Part II Auth. for Addit. $11,000)	85	10-15-47	34,000

Project Engineering Division

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

GENERAL PLANT AREAS

Project Number		% Phys. Complete	Date Auth.	Est. Cost
C-196	Electrical Distribution Headquarters Bldg. & Conversion of 2713-E to Garage	1	10-10-47	$ 162,400
C-214	Rehabilitation of Plant Railroad	66	2-18-48	3,214,000
C-265	Additional Telephone Cable - Richland to Kennewick	45	7-29-48	30,000
C-276	Overall Plant Telephone Project	44	10-6-48	1,232,000
C-279	Improvements to Area Administration Bldgs.	15	8-20-48	98,200
C-291	Security Fences - All Areas	0	10-18-48	246,800
TOTAL Estimated Cost Plant General				$6,699,900
GRAND TOTAL Est. Cost Authorized Work - All Areas				$11,007,400

Projects Being Routed for Authorization

E. R. No.	Project No.		
941	(C-184)	Experimental Animal Farm Part II	$ 507,000
A-502	(C-284)	Transportation Consolidation (Pending)	1,947,000
A-507	(C-308)	Workshop Addition to Bldg. 303-C for 300 Area Plant Assistance Group	50,000
A-511		Osmose Treatment of Plant Elect. Poles and Replacements where Necessary	154,000
2377	(C-313)	Stack Gas Decontamination	864,000
A-3065	(C-317)	New Retention Basin for 300 Area Process Wastes	62,000
TOTAL Estimated Cost of Projects Awaiting Authorization			$3,584,000

4.

Project Engineering Division - AREA REPORTS

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

100 AREAS

E. R. No.		% Engineering Complete
A-1004	Downcomer Design 105-F	20
A-1034	Alterations to Bldgs. 186 and 185	38
A-1044	Outlet Charging Device (through proposed Model III)	37
A-1051	Remove Equip. in Valve Pits - Bldgs. 105-B & F	78
A-1054	Design Roller Flanging Device for Van Stone Joints	100
A-1055	Design and Estimate a Radiation Shield for Top Far Side of 105-D & F	100
A-1057	Prepare Project for Earth Crib 100-B & F	95
A-1059	Prepare Project for Steel Sewer Line at 100-B Area	25
A-1060	Increased Shielding of Front Nozzle Caps	87
A-1062	Prepare Project for Mark II and Mark III Machines for Segmented Discharge	80
A-1063	Special Metal Splines	50
A-1064	Equipment Designs for Oxygen in Pile Atmosphere	10
A-1065	Equipment Designs for Large Scale CO_2 Evaporator	40
A-1066	Mock-Up Facilities for Metallurgical Studies	87
A-1067	Special Technical Laboratory (P-10)	78
A-1068	Design Special VSR-27	90

Project Engineering Division - AREA REPORTS

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

E. R. No.		% Engineering Complete
A-1069	Prepare Project for Dismantling and Crating of York Refrigeration Units - 151, 181, & 189-D & F Bldgs.	5
A-1070	Prepare Project for Changes to Unit Motion Instruments	32
A-1071	Prepare Project "B" Hole Type Sample Loading Facilities	5
A-1072	Design Cask Storage Pad - 100-F Area	0
A-1073	Design Top Far Side Joint Mock-Up	100
A-1074	Design Moisture Extraction System for Gas System - 105 Bldg.	0
A-1075	Recommend Adequate Warehousing for 100 Areas	0
	200 AREAS	
2277	Revise Cell Piping per Marked Prints	100
2279	Prepare Project for Regasketing Facilities - 221-T & B	85
2285	"B" Jet Assembly	75
2287	Study Rail Alignment of 200-N Cranes	75
2288	Special Test Wells - 200-E & W 70 Wells Complete	89
2309	Water Supply & Plumbing - 622 Bldg.	100
2326	Mark Grade on Steam Line Supports - 200-W (W.O. cancelled by Maintenance Division)	95
2327	Study Possibility & Redesigning Connector Head to Simplify Gasket Changing	90
2353	Crane Alignment & Rail Elevation - 221-T	80

Project Engineering Division-AREA REPORTS

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

E. R. No.		% Engineering Complete
2355	TX Waste Storage (Field Engr. for Proj. C-163)	75
2376	Cathodic Protection to Underground Waste Lines (Survey Work and As-Built Drawings)	95
2381	Design Acid Supply Tanks & Piping for 222-B	80
2385	Steel Stock Handling Equipment 272-E & W	90
2393	Steam Jet with Remotely Removable Features	0
2401	Maintenance Hoist for Cranes 212 N-P-R	10
2403	Revision of 222 T & B Control Labs	25
2417	Location Determination for Zone Signs & Directional Markers over BX Lines	100
2421	Procure & Install Lab. Equip. in 271 T-U-B Control Labs	15
2437	Prepare Project for the Study of Process Waste Separation 200-B-T-U - Cancelled	3
2438	Design and Estimate Improved Well Sampling Device	75
2442	Recommend Remedies for Tank Agitator Bearing Failures to Philadelphia Gear Works (Report in Preparation)	90
2443	Design Piping for Parallel Operation of Cells in 221-T & B	90
2444	Design Method of Storing 42 Instead of 30 Buckets per Row in 212-N-P-R	100
2449	Locate Shallow Wells in Waste Disposal Tile Fields	100

7.

Project Engineering Division - AREA REPORTS

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

E. R. No.		% Engineering Complete
2450	Design Disposal Sumps for 224-B Waste	25
2451	Check Crane Wheel Alignment - Bldg. 221-B	0
2452	Prepare Map of 200-E Area for H. I. Division	100
2453	Locate Water Supply Line for Batch Plant	100
2454	Select Oil Filter for Compressed Air Line - 221-T & B	90
2455	Prepare Map of Outside Steam Lines with Trap, Support Locations and Numbers	100
2456	Prepare New Map ofUnderground Water & Sewer Lines - 200-E & W	0
2457	Revise Piping Drawings for Cell #2 Bldg. 231	10
2458	Prepare Drawings for Conductivity Meter in Section 6 R, Building 221-B	5
2459	Design Facilities for Diluting Caustic Solution 221 Areas	15

300 AREA

A-3058	Design Air Conditioning System - Bldg. 321	0
A-3059	Evaluate Construction of "P" Div. Change House in the 303 Area	75
A-3060	Temporary Metal Melting & Fabrication Bldg.	68
A-3061	Increased Ventilation - 313 and 314 Bldgs.	23
A-3062	Installation of Rolling Mill in Bldg. 314	5

Project Engineering Division - AREA REPORTS

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

E. R. No.		% Engineering Complete
A-3063	Evaluate CO_2 System for Rooms 4A and 6 - Bldg. 3706	77
A-3064	Study Backfiring of Stokes Pumps	(Cancelled)
A-3065	Process Sewer Effluent Pond	100
A-3066	Revise Maps - 300 Area Water & Sewer Systems	0
A-3067	Billet Lifting Tongs	0
A-3068	Automatic CO_2 Fire Extinguishers - Bldg. 3706	0
A-3069	Solvents Storage - 3706 Bldg.	0
A-3070	Study 3706 Ventilation Requirements to Provide 40% Humidity	10
A-3071	Design C.W.S. Filters and Hoods for Room 55, Bldg. 3706, Exhaust System	0
A-3073	Design Glass Shop Gas System	5
A-3074	Estimate Cost of Converting Rm 50, Bldg. 3706 to Lab.	100
A-3075	Design for Nine Tube Mock-Up for 105-B-D-F Design	5
A-3076	Design Facilities for Chip and Bar Pickling and Metal Fines and Oxide Recovery	5
A-3077	Design Installation for Three Automatic Screw Machines 313 Bldg.	3

GENERAL PLANT AREAS

828	Bldg. 702 - Automatic Dial Exchange	97
872-R	Improvement to Area Administration Bldgs.	90
941	Designs for Experimental Animal Farm - Project C-184	95

Project Engineering Division - AREA REPORTS

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

E. R. No.		% Engineering Complete
E-962	Designs for 115 KV Power Line Through Richland	80
973	Designs & Engr. for Elec. Dist. Hdqts. Bldg. near 251 Substation & Conversion of Bldg. 2713-E to Garage. Project C-196	80
990-R	Fencing All Areas	75
E-401	Telephone Cable Layout - Bldg. 720	20
E-409	Telephone Cable Layout for Bldgs. 703, 705, 760 & 770	0
A-420	Engineering Work for Rehabilitation of Plant Railroad. Project C-214	90
E-452	Prepare Project for Expansion of Main Plant Telephone System (Design Work Only)	85
A-453	Roof Replacement - North Reservoir - Richland - Design Only	100
E-463	Electrical Drawings for Charging Device	45
E-464	Metering of Power - All Process Areas	70
E-492	Preparation of Project Additional Telephone Cable - Richland to Kennewick Design Work Only.	95
A-496	Design Work for Temporary Biological Laboratory Facilities - 100-F Area (Project C-296)	95
A-498-R	Prepare Project for Addition to Fire Station - 200-W Area	(Cancelled)
E-499	Lighting Study - Rooms 2240-1-2-3, 703 Bldg.	30
A-502	Prepare Project for Transportation Consolidation	6
E-505	Electrical Standards	15

10.

Project Engineering Division - AREA REPORTS

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

E. R. No.		% Engineering Complete
A-507	Project for Workshop Addition to 313 Building	30
A-509	Drafting for 300 Area Planning Committee	50
A-510	Badge House Addition - 300 Area	30
E-511	Prepare Project for Butt Treatment of Power Line Poles	95
A-513	Study of Air Conditioning First Aid Bldgs. - 300 and 100-B & F Areas	80
E-514	Prepare Project for Improvement to Area Fence Lighting	0
A-518	Partitioning of Manufacturing Division Offices - 703 Bldg.	60
A-519	Centerline Area Roads	20
A-520	Layout Pole Location for New 13.8 KV Line 200-W Area	100
A-521	Layout Parcel of Land in Kennewick for H. I. Monitor Station	100
A-522	Drafting for Training Charts	100
A-523	Drafting for 300 Area Technical Div.	10
A-525	Survey of Locke Island	90

ENGINEERING STUDIES GROUP REPORT

Studies Completed This Month

E. R. No.		Date Completed
4343	Forced Draft Fan and Turbine J.I.	12-20
4351	Asbestos Shakes vs. Painted Siding	12-27

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Project Engineering Division - AREA REPORTS

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

Studies Added This Month

E. R. No.		Date
4355	Inspestion and Care of Septic Tanks J.I.	12-6
4356	Project Engineering Division Procedure	11-24

Active Studies

E. R. No.		% Engineering Complete
A-489-S	Midway-Priest Rapids Road	98
4318	Packing & Gasket Standards	60
4326	Use of Inhibited Turbine Oil	85
4327	Maintenance of Pitched Roofs	40
4336	Review Oil Coding System	5
4342	Analysis of Heavy Duty Lacquers	90
4344	Operating Standards for Hydrocrane	98
4346	Welding Line Analysis	50
4347	Improved Frost Test Line	50
4348	Soft Water System - Kadlec Hospital	75
4349	Pistol Range Sanitary System	99
4352	Lubrication Survey - 105-DR	20
4353	Telephone Cost Study	90
4354	Bronze Furnace Heating	10
4355	Septic Tank J.I.	10
4356	Project Engineering Division Procedure	10

BACKLOG SUMMARY

	Work on Hand 11-30 Estimated Man Days	Work on Hand 12-31 Estimated Man Days
Studies	156	216
Project & Design	8,111	8,450
TOTAL	8,267	8,666

December 1948

SUMMARY

Pile Technology Division

The quality of purified gas-baked coke (GBF graphite) has been showing erratic variations. Occasional bars are abnormally low in quality. The condition is not considered serious at present but at month-end the reason for this erratic behavior was still unexplained.

The appearance of alpha-rolled, triple-dipped slugs after an average exposure of 210 MD/ton was very good and encourages the belief that this material can be carried satisfactorily to an exposure of 400 MD/ton.

Tests on a vertical rod guide for use with the 3-inch rods of the DR and H Piles showed leakage of an intolerable amount of fast neutrons. Possible corrective measures are being investigated.

Addition of carbon dioxide to the atmosphere of the B and F Piles was started during the month. At month end, the nominal carbon dioxide concentration in the B, D, and F Piles was 10, 40, and 25%, respectively.

The mock-up of a 9-tube section of a pile has been completed in Bldg. 305-A.

Various ways in which the D Pile, in the future, might be shut down in a voluntary transition to operation of the DR Pile are being studied.

Tests on a sample of cadmium spline indicate that when twenty of these splines are available as emergency controls for one pile, the operating level as limited by control considerations can be raised to 400 MW.

Installation of tritium extraction facilities (Project P-10) proceeded reasonably satisfactorily.

Separations Technology Division

During the month, close attention was devoted to a search for suspected product hold-up points in the Separations Plants process equipment, in an effort to improve running material balances. Tank and centrifuge sprays, tank calibrations, and flushing procedures were examined and revised in several places, resulting in improved product balances. A study of the alpha-emitting components in the metal waste solution was instituted in a search for possible higher isotopes in aged metal. Production tests reduced the time cycles for Isolation peroxide addition, digestion, and precipitate settling.

Plant sand filter evaluations continued at both T and B Plants, with activity removal efficiencies continuing to range from 99.4% to 99.99% at total air flows of ca. 25,000 CFM and without any increases in pressure drops. Preliminary studies indicate that the dissolver operation may be primarily responsible for the apparent recontamination of the sand filter air discharge. Pilot plant filtering studies with fiberglass have indicated activity removal efficiencies comparable to the sand filters, with only a fraction of the pressure drop of the latter.

Separations Technology Division (continued)

The 234-5 Project attained ca. 40% completion in construction during the month. The checking of prints and acceptance tests continued, with particular attention also devoted to the inspection of hoods received and equipment installed therein. The General Engineering & Consulting Laboratory design of the remotely operated line attained 40-45% completion. Modification of a Bldg. 231 hood to house the "Pilot Line" and receipt of equipment for this unit were nearly complete at month-end. The Los Alamos training of General Electric technical operating personnel was also placed in motion.

The Redox development program encountered difficulty in Semi-Works operations with the appearance of poor phase disengagement in column studies. In the Scale-Up Unit, this was found to be caused by the accumulation of solvent oxidation products, and when these were removed by sodium carbonate washing of recycled solvent, the operation returned to normal. Similar troubles in the Demonstration Unit have been traced to the presence of some unknown component of metal feed solution prepared by dissolving uncanned uranium slugs; the identification and removal of this component is still under investigation.

Redox process laboratory research was continued in both basic process studies and process improvement. Ruthenium volatization by ozonization continued to appear promising as a method of increasing decontamination, as did zirconium adsorption by glass wool. Process studies were carried out for the use of ozone as a cross-over oxidant, measurement of heats of extraction, causes of emulsion formation, chromium behavior in Redox, and effects of aqueous phase dispersion on Column IA decontamination. Preliminary studies of methods of coupling Redox to the $BiPO_4$ process were also initiated in the laboratory.

Metallurgy and Control Division

Production rolling of uranium rods for Hanford was conducted at Lockport, N. Y., under technical supervision by the 300 Area Plant Assistance Group. Arrangements were completed with the A.E.C., whereby personnel of their New York office will relieve Hanford of this supervisory responsibility, effective with the February rollings.

The four-inch slug which ruptured in the 100-B Pile in late November was identified as rolled uranium which had been triple-dip canned in September. The welded cap end of the jacket has been separated completely from this slug when it was located after discharge. Separation apparently had resulted from the pressure of corrosion products seen on the exposed end of the slug. Surface distortion of the can and cap prevented effective preliminary examination, but more may be learned when the parts can be studied closely.

Canning trials were continued with rolled metal slugs machined to a smaller diameter and a greater length than standard to compensate for the dimensional change which this metal undergoes in the triple-dip process. It was verified that both canning yield and slug quality (particularly can wall penetration) are improved

Metallurgy and Control Division (continued)

Metal and casting processes in use at Argonne National Laboratory for the production of lithium-aluminum alloy were studied, and design work was started on similar facilities which are to be installed at Hanford for the preparation of this alloy (P-10 Project).

A. B. Greninger

PILE TECHNOLOGY DIVISION January 10, 1949

DECEMBER 1948

VISITORS AND BUSINESS TRIPS

J. C. Maguire, Argonne National Laboratory, Chicago, Illinois, was here for consultation on the P-10 Project from December 13 through 17, 1948.

R. C. Gerber, Jr., General Electric Company, Schenectady, N. Y., visited J. M. West to discuss shielding problems. He was here December 14 through 21, 1948.

Business trips of Pile Technology personnel during December were as follows:

D. H. Curtiss attended the Radiation Damage Symposium at Fairchild Engine & Airplane Corporation, NEPA, Oak Ridge, Tennessee. He was there December 6-8, 1948.

W. K Alexander attended a symposium at Argonne National Laboratory on design and fabrication of slugs for new types of plutonium producing piles. He was there December 16 - 17, 1948.

ORGANIZATION AND PERSONNEL

	November	December
Pile Physics Section	38	37
Pile Engineering Section	21	22
Administration	5	5
	64	64

During the month of December one physicist terminated; one chemical engineer transferred into the division; one Steno-Typist B transferred to Metallurgy and Control Division, and one Steno-Typist A transferred into the Pile Technology Division.

PILE PHYSICS

Graphite Development

The purity of GBF material was found to be erratic. Thirteen per cent of the bars tested have had dih values below 0.80. (Values for dih of better than 0.90 are considered normal for purified graphite.) In general, bars from one end of the furnaces are lower in quality than the others but many of the poor bars have come randomly from other parts of the furnaces. Electrical resistance measurements indicate that wide temperature variations exist in a purification furnace. Bar

to bar variations indicate temperature differences of the order of 300°C. In all cases, the center of the bar appears to have been 50 to 150°C. hotter than the ends. There is, however, no correlation between the resistance measurements and the bar purity. At the end of the month the cause of the erratic purity had not yet been determined.

The presence of both europium and samarium in unpurified graphite has been definite established by measurements of the induced radioactivity in samples. Europium has also been found in a spectroscopic analysis of ash from oxidized samples. The sensitivity of the spectroscopic tests was not sufficient to allow the detection of samarium. The presence of neodymium now appears to be definitely excluded. The amounts of the rare earth elements have not been determined accurately. Calibration against known samples are now in progress. The concentrations are expected to be in the range 0.2 to 1.0 ppm.

Graphite Monitoring - Radiation Effects

Further measurements by the National Bureau of Standards have shown that the total stored energy in graphite, as determined by combustion, is continuing to increase. A sample exposed in a capsule for 1381 MD/CT had a stored energy of 526 cal/gram. If the linear relationship holds for higher exposures the graphite next to the process tubes in the central zone of D Pile could have a stored energy as high as 850-900 cal/gram.

A comprehensive X-ray study of the effect of thermal annealing up to 1000°C. on the c-axis spacing of graphite exposed in test holes has shown that for each exposure the recovery in c-axis spacing is linear with annealing temperature, and that the annealing temperature for complete recovery increases linearily with exposure. Samples with exposures greater than 1000 MD/CT do not recover completely upon annealing at 1000°C.

The c-axis spacing of irradiated lampblack graphite, as measured from X-ray spectrum showed four separate points of maximum intensity, while the spectrum of all other graphites studied has exhibited a broadening of a single maximum. After an exposure of 600 MD/CT values for c-axis spacing of 6.71, 6.91, 6.99 and 7.12 Å were detected in lampblack graphite. This unique behavior is being studied further.

The variation of effective neutron flux along a test hole was determined by measuring the changes in electrical resistance of a string of forty one-inch samples for an exposure of 17 MD/CT. A periodic variation with a distance between maxima equal to the lattice spacing was observed. The maximum variation in resistance change was 10 per cent, which is in good agreement with calculations of the periodic variation of fast neutron flux. The effect of poison columns and empty tubes near the test hole is being investigated.

Shielding

The design of vertical rod guide proposed for the DR and H Piles was tested for shielding effectiveness. It was found to be satisfactory for gamma rays and slow neutrons but to allow the leakage of intolerable amounts of fast neutrons. These guides are to be modified experimentally by placing moderating material, probably polythene, in two of the spiral grooves which were present to allow entrance of the third safety solution. Design Division will determine whether the two unfilled grooves are adequate for quick admission of the solution, after which tests will be conducted on the shielding effectiveness of the modified guide.

Segmented Discharge Physics

Refined calculations have been made of the increased metal exposure resulting from segmented discharge, when the product concentration is limited by the amount of Pu^{240} which can be tolerated. These calculations include such effects as burn out of Pu^{239}, and decrease in U^{235} concentration. The gain is found to be 11%, only slightly less than the 12% gain computed earlier by a first approximation. The use of segmented discharge will decrease somewhat the reactivity of the piles as compared with conditions when conventional discharge is used. For example, a loss of 20 inhours would result from use of segmented discharge at the 400 MD/ton level. Comparison with other uses of excess reactivity reveals that the use of segmented discharge to effect an 11% increase in product concentration is one of the most profitable ways in which reactivity can be used in the present piles.

Planning for D Pile Shutdown

Specific steps toward the abandonment of the D Pile for start-up of the DR Pile are being considered. The planning has been based on the abandonment of the 800 outer tubes as the metal reaches reasonable exposures. The remaining 1200 central tubes could be operated at about 100 MW with no poison columns. The first conclusion from the study is that a number of tubes on the fringes of the pile should be abandoned as soon as they come up for discharge if final abandonment is expected within the next three years. This study is continuing.

General Miscellany

Test Pile results indicate that magnesium has a neutron absorption cross section only one-half as large as that of aluminum. This is not in agreement with reports of previous measurements of the magnesium cross section at other sites. However, consistent results have been obtained with commercially pure magnesium and various aluminum-magnesium alloys. These results mean that any aluminum-magnesium alloy would be satisfactory, from a reactivity standpoint, for use in process tubes, thimbles, etc., in both new and old piles.

Test Pile results on a cadmium spline sample indicate that these splines, when fully inserted beneath the metal slugs in a process tube will absorb an average of ten inhours each. When at least twenty splines per pile are available, it will be possible to raise to 400 MW the power level limit arising from control considerations.

Coefficient tests performed at the D and B Piles indicate no significant variation away from expected trends.

Reactivity changes produced in all three operating piles by the addition of carbon dioxide to the pile atmosphere have been mutually consistent and directly explainable in terms of the increase in the operating temperature of the graphite. A reactivity gain of one inhour results from each per cent increase in carbon dioxide concentration. This is a very significant benefit obtained as a by-product of the use of carbon dioxide.

Reactivity

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

	B Pile	D Pile	F Pile
In rods	62 ih	60 ih	38 ih
In xenon	527	491	501
In over-all coefficient	-115	-150	-160
Total cold, clean reactivity	754	844	763

The B Pile gained 4 inhours during the month, while the D Pile lost 2 and the F Pile 7 inhours.

Status of Special Irradiations

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

Req. No. & Source	Material	Quantity	Exposure	Charged	Tube & Pile	Discharged	Shipped	P.T.	ih absorbed
12-B(UCRL)	Pu^{239}	1 slug	1 yr.	5/25/48	1769D			200	5**
		**Tube 1769D also contains 1 pc. SR-64, 4 pcs. SR-63, UCRL-100-105, 1 pc. SR ANL-111, and 2 cobalt slugs.							
13-5(ORNL)	Be_3N_2	53 slugs	6 mo.	5/12/48	2374F	10/20/48			
		53 slugs	6 "	5/12/48	1569F	10/20/48			
*		38 slugs	6 "	6/6/48	3169D	12/3/48			
		39 slugs	6 "	8/4/48	1569D				17
		53 slugs	6 "	8/13/48	1579D				17
		36 slugs	6 "	8/4/48	1474F	10/20/48			
		36 slugs	6 "	8/4/48	3274F	10/20/48			
15(ANL)	LiF	There has been no change in the SR-15 program since October 31.							
28-5(ORNL)	Iron Enriched	1 casing	Indef.	4/4/48	BTHD	1/49-T		87C	0

Req. No. & Source	Material	Quantity	Exposure	Charged	Tube & Pile	Discharged	Shipped	P.T.	th absorbed
*28-7-12(ORNL)	Iron	6 casings	2 mo.	1 casing 12/22/48	BTHF			87D	0
*29-5-10(ORNL)	P_2O_5	6 casings	60 days	10/22/48	DTHF	(2 casings (11/24/48	(2 casings (11/26/48	96B	0
*47(ANL)	BeO	4 slugs	1-15 da.	12/21/47	3169D	1/6/48	1/14/48	127	
			1-30 da.	Has not been received					
			1-90 da.	12/23/47	2666F	4/4/48	4/14/48		
			1-180 da.	12/22/48	3476F				0
48(ANL)	BeO	4 slugs	1-15 da.	12/21/47	3169D	1/6/48	1/14/48	128	
			1-30 da.	To be recanned at ANL					
			1-90 da.	12/23/47	2666F	4/4/48	4/14/48		
			1-180 da.	8/4/48	3876F				0
*49(ANL)	Graphite-U Oxide	4 slugs	1-15 da.	12/21/47	3169D	1/6/48	2/11/48	129	
			1-30 da.	11/5/48	3166B	12/7/48			
			1-90 da.	12/23/47	2666F	4/4/48	5/3/48		
			1-180 da.	Sample not received					
52(ORNL)	Al-U^{235} Alloy	123 slugs	160 da.	7/27/48	100F			208	0
		95 slugs	100 da.	7/30/48	100D	11/16/48			
59(ORNL)	Antimony	1 casing		1/27/48	BTHF			139	0
~~60~~(ORNL) 3	KCl	7 casings	1-2 wks.	2/16/48	BTHD	3/9/48	4/14/48	140	
			1-1 mo.	2/16/48	BTHD	4/4/48	4/14/48		
			1-3 mo.	3/2/48	BTHD	6/29/48	8/2/48		
			1-6 mo.	2/16/48	BTHD	8/26/48	9/23/48		
			1-10 mo.	2/16/48	BTHD	1/4/49-T			0
			2-1 yr.	2/16/48	BTHD				0
61(ORNL)	Co_3O_4	1 casing		1/27/48	BTHF			141	0
*62(ORNL)	Al-U^{235} Stainless, Be, U, Al	3 slugs	1 mo.	11/5/48	3166B (pc.U-1)	12/7/48			
			5 mo.	4/25/48	2382F (pc.Al-U2)	12/6/48			
			5 mo.	11/5/48	3276B (pc.U-2)				5
*63(ORNL)	Al-U^{235} Alloy	21 slugs	7-3 mo.	4/11/48	1671D	7/15/48	9/3/48	146	
			7-6 mo.	(6)4/25/48	2382F	12/6/48			
			7-12 mo.	(4)5/25/48	1769D				
				(1)11/5/48	1882B				5
64(ORNL)	Cu-Au Alloy	1 slug	300 da.	5/25/48	1769D				

5

1211354

Req. No. & Source	Material	Quantity	Exposure	Charged	Tube & Pile	Discharged	Shipped	P.T.	ih absorbed
*65(ANL)	Li-Al Alloy	15	2 mo.	10/27/48	3066D	12/22/48	1/5/49-T	143A	
		19	3 mo.	10/27/48	2066D				20
		30	3 mo.	11/19/48	3169B				26
		30	3 mo.	11/19/48	1569B				26
		38	3 mo.	11/23/48	1474D				33
		30	3 mo.	11/23/48	2666D				30
		31	3 mo.	12/6/48	2374F				29
		24	3 mo.	12/6/48	1569F				25
		24	3 mo.	12/6/48	1579F				25
		24	3 mo.	12/6/48	3169F				25
		24	3 mo.	12/6/48	3179F				25
		29	3 mo.	12/3/48	2682D				28
		34	3 mo.	12/3/48	3179D				30
		33	3 mo.	12/3/48	3274D				30
		9	3 mo.	1/5/49-T	1474F				
		9	3 mo.	1/5/49-T	2666F				
		9	3 mo.	1/5/49-T	3274F				
		15	3 mo.	1/5/49-T	2682F				
		42	3 mo.	1/7/49-T	2082D				
		42	3 mo.	1/7/49-T	2374D				
79(KAPL)	U^{235}	Experiment is on a continuous basis			0865F 1481F			180	10
80(ORNL)	HgO	4 slugs	6 mo.					163	
81(ORNL)	Zn	3 casings	1 yr.	4/25/48	DTHF			164	0
82(ORNL)	Ni	1 casing	1 yr.	4/25/48	DTHF			165	0
		1 casing	1 yr.	5/12/48	DTHF				0
*83(ORNL)	TiO_2	1 casing	6 mo.	4/25/48	DTHF	12/6/48	12/15/48	166	
84(ORNL)	$AgNO_3$	1 casing	1 yr.	4/25/48	DTHF			167	0
85(ORNL)	Se	1 slug	1 yr.					181	
86(ORNL)	$Tl(NO_3)_3$	1 slug	1 yr.					181	
*87(ORNL)	WO_3	1 casing	6 mo.	4/25/48	DTHF	12/6/48	12/15/48	181	
88(ORNL)	Sn	1 casing	1 yr.	4/25/48	DTHF			181	0
*89(ORNL)	Cd	1 casing	6 mo.	4/25/48	DTHF	12/6/48	12/15/48	181	
ANL-100	Be	5 casings	6-12 mo.	3/24/48	BTHF	3 pcs. 9/13/48	3 pcs. 9/15/48	176	
ANL-101	U^{238}	1 recept.	4-6 mo.	11/12/48	2074B			177	0
ANL-107	Bi	1 recept.	6 mo.	8/4/48	2173F			211	0

Req. No. & Source	Material	Quantity	Exposure	Charged	Tube & Pile	Discharged	Shipped	P.T.	ih absorbed
ANL-108	ThO_2	1 recept.	6 mo.	11/5/48	3271B			218	0
ANL-109	Pa_2O_5	1 recept.	3 mo.	11/5/48	3378B			218	
ANL-110	PuO_2	1 slug	6 mo.	8/4/48	2974F			210	5
ANL-111	PuO_2	1 slug	1 yr.	5/25/48	1769D			200	
ANL-113	$RaBr_2$	6 slugs	3 mo.					230	
*ANL-114	ThO_2	7 slugs	1 mo.(1 pc)	11/5/48	3166B	12/7/48		215	
			2 mo.(1 pc)	11/5/48	3181B				5
			3 mo.(3 pc)	11/5/48	3378B				
			6 mo.						
			1 yr.(1 pc)	11/5/48	1882B				
ANL-115	Mo	4 slugs	6 mo.(2 pc)	11/5/48	3276B			215	5
			1 yr.(2 pc)	11/5/48	1882B				
ANL-116	Diamond, Be, C	1 casing	3 mo.	10/22/48	DTHF			211	0
*ANL-119	Stainless Steel	2 recept.	6 mo.	12/22/48				227	0
*ANL-120	Stainless Steel	1 recept.	6 mo.	12/22/48				227	0
*ANL-121	Nickel	1 recept.	6 mo.	12/22/48				227	0
*ANL-122	Nickel	2 recept.	6 mo.	12/22/48				227	0
UCRL-100	Pu	1 slug	1½-5 yr.	5/25/48	1769D			200	
UCRL-101	Pu	1 slug	1½-5 yr.	5/25/48	1769D			200	
UCRL-102	Pu	1 slug	1½-5 yr.	5/25/48	1769D			200	
UCRL-103	Am	1 slug	2 yrs.	5/25/48	1769D			200	
UCRL-104	Pu	1 slug	1-3 yr.	5/25/48	1769D			200	
UCRL-105	Am	1 slug	2 yrs.	5/25/48	1769D			200	
UCRL-106	Tissue Ash	72 casings	2-3 wks.	(12 casings received)				189	
*UCRL-107	Osmium	1 slug	1 mo.	12/22/48	3066D			229	5
*UCRL-108	Tantalum	1 slug	1 mo.	12/22/48	3066D			229	
*UCRL-109	Phosphorus	1 slug	1 mo.	12/22/48	3066D			229	
*UCRL-110	Selenium	1 slug	1 mo.	12/22/48	3066D			229	
*UCRL-111	Palladium	1 slug	1 mo.	12/22/48	3066D			229	
*UCRL-112	Rhenium	1 slug	1 mo.	12/22/48	3066D			229	
*UCRL-113	Iridium	1 slug	1 mo.	12/22/48	3066D			229	
*UCRL-114	Tungsten	1 slug	1 mo.	12/22/48	3066D			229	
UCRL-115	Am. Oxide	1 slug	2 yr.					229	
ORNL-100	$CaCO_3$	8 casings	18 mo.	9/3/48	DTHF			182	0
ORNL-102	Zr	1 slug	6 mo.	8/4/48	3876F			204	
*ORNL-103	Be	30 slugs	3 mo-1 yr.	10/22/48	(1980F	12/13/48		217	
					(2385F				1
					(3473F				1
*ORNL-104	Metal	8 slugs	3-6 mo(4)	11/5/48	3378B			223	0
			(4)	12/22/48	3385F				0
ORNL-105	NaCl	3 casings	6 mo-1 yr	10/22/48	DTHF			219	

Req. No. & Source	Material	Quantity	Exposure	Charged	Tube & Pile	Discharged	Shipped	P.T.	ih absorbed
ORNL-106	Th	1000 slugs	125 days					228	
		40 slugs	125 days	11/14/48	3179B				31
		40 slugs	125 days	11/14/48	2374B				31
		40 slugs	125 days	11/12/48	1579B				31
*ORNL-107	Cobanic Alloy & Cobalt	3 slugs	1 mo.	12/6/48	2382F	1/5/49-T		229	5
ORNL-108	Cu_3Au Alloy	2 slugs	1 mo.	12/13/48	1980F			232	5
ORNL-110	Iron (Enriched)	6 slugs	3-6 mo.					232	

The following requests have been approved but the samples have not been received:

ANL-105, ANL-112, ANL-117, ORNL-101, ORNL-109, ORNL-111, UCRL-116.

PILE ENGINEERING

Corrosion and Blistering of Slugs

The appearance of eight tubes of alpha-rolled, triple-dipped slugs after an exposure of 210 MD/ton confirmed previous conclusions that this material is relatively resistant to both blistering and dimensional changes.

Examination of the entire discharge of alpha-rolled, lead-dipped material containing slugs from the two tubes which were discharged with difficulty at the D Pile (reported last month) failed to reveal any stuck slugs or slugs with serious deformities. One moderately blistered piece was encountered, but it is believe that this was gamma-extruded, lead-dipped material which lost its identity on re-canning.

Duplexed, triple-dipped slugs from one tube after an average exposure of 120 MD/ton showed slight blistering despite this low exposure. Such relatively poor blistering resistance is comparable to the behavior expected of gamma-extruded, triple-dipped material.

No surface distortion and no diameter change were observed in slugs of enriched uranium-aluminum alloy (Special Request No. 52) exposed for 109 days in the central flattened zone of the D Pile. Five tubes of this material are being retained in the pile for a longer exposure.

Corrosion of Van Stone Flanges

Van Stone flange assemblies were tested in water and various aqueous solutions for 16 months contact under stagnant conditions in an effort to find a fluid which would prevent corrosion in a non-operating pile maintained under stand-by conditions. The assembly in contact with water showed appreciable corrosion and pitting. The assembly in contact with 0.05% sodium dichromate solution showed severe pitting. No evidence of corrosion was found on assemblies in contact with solutions of 0.5% sodium dichromate, 5.0% sodium dichromate, or 0.5% sodium chromate or with a mixture of "soluble oil" and water in equal proportions.

Corrosion of Process Tubes

Tests of aluminum process tubing and steel specimens were conducted in carbon dioxide solution in order to evaluate the possible corrosion rate in a pile which might develop a tube leak during operation with a CO_2 atmosphere. A negligible rat of corrosion was observed at room temperature under conditions of no irradiation; tests at a higher temperature are in progress.

Assistance to New Construction

Type GHF graphite was approved for use in the H Pile as filler blocks in tube rows, starting with layer #31. It is estimated that the total of all types of purified graphite will comprise 63% of the H Pile, as compared to approximately 26% in the DR Pile.

Hydraulic oils of "Ucon," Silicone, and petroleum-base types were exposed to gamma irradiation in order to evaluate possible performance in the tool-dolly at the DR Pile. No serious changes were detected in any of the oils after an exposure equivalent to at least 60 years on the rear face of an operating pile. Some degradation (lowering of flash point) and polymerization (increase in viscosity) occurred in all the oils.

The mock-up of a 9-tube section of a pile has been completed in Bldg. 305-A. This equipment will be used first for development of the H Pile design, and later for studies of the effects of graphite expansion on the B, D, and F Pile structures.

Film tests of the shielding properties of an 8-inch, end-cap supported, aluminum slug showed that a maximum beam of 40 mr/hour is obtained from a dry tube in the area around the bolt head of the end cap. This result indicates that satisfactory shielding will be obtained by use of an aluminum slug attached to the end cap of an aluminum inlet nozzle.

Analyses of samples from ten coated tubes for the H Pile control rods showed an average of 53 mg. boron per square centimeter of area. These tubes were flame-sprayed with a powder mixture of boron oxide and aluminum.

Estimates of graphite temperature based on the premise that no heat crosses the gas-filled gaps indicate that the hottest graphite in the H Pile at start-up will be 19.3°C. above the coldest graphite of a process tube block, as compared to a comparable calculated figure of 7.6°C. for the old piles. Graphite expansion and subsequent reduction in thermal resistance of the gaps will decrease the relative differences in temperature rise, so that graphite temperatures at H are expected to approach those of the old piles after a few years of operation.

Graphite Expansion

Magnetic strain gage installations to monitor the strain produced in the biological shields by graphite expansion have been completed at the B and D Piles.

The carbon dioxide in the D Pile atmosphere was maintained at 40% during the month. On the basis of the greatly reduced rate of expansion experienced at the D Pile, carbon dioxide was added to the F Pile atmosphere to a 25% concentration, and at the B Pile to a 10% concentration. The concentration will be increased at B Pile to 25% as soon as instrumentation is complete. Definite conclusions concerning the effect of CO_2 on the rate of expansion still cannot be reached since the reduced rate observed at the D Pile may have been caused by "saturation" due to exposure rather than by the presence of the CO_2.

Studies of induction and gas heating for annealing of graphite in the piles were continued. Measurements were made of the electrical breakdown voltage of air, CO_2, and helium under irradiation for use in design of a suitable induction coil. The radiation had no effect on air or CO_2 atmospheres at 130 KC or 60 cycles, or on the helium at 130 KC. However, the breakdown of helium at 60 cycles under irradiation occurred at about half the voltage, as compared to the breakdown with no irradiation.

P-10 Project

At the end of the month design of facilities for the extraction of tritium was complete except for tritium storage facilities and construction was approximately 80% complete. The first of four extraction lines was completed except for the installation of the high vacuum lines, the component parts of which have been constructed. It is expected that tritium production from the backlog of irradiated lithium fluoride slugs will be underway before the end of January.

A total of four hundred lithium aluminum alloy slugs has been charged and thirty discharged. Extraction by ANL of twelve slugs irradiated gave very satisfactory results. The yield was and the tritium purity was per cent. Sufficient alloy slugs are now available to absorb all excess pile reactivity and it is expected that it will be possible very soon to maintain about 600-650 slugs in the piles.

ANL is continuing to work on the production of alloy slugs with low hydrogen content the development of a satisfactory furnace liner in which to melt the alloy during extraction, and the determination of the optimum heating cycle during extraction to obtain the optimum yield and purity. Because of the favorable outlook for the alloy process the Metallurgical Section is studying the possibility of producing slugs at Hanford.

INVENTIONS

All Pile Technology Division 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 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	Item
P. F. Gast	Use of boron bearing gunbarrels to improve shielding of end faces of a pile.
P. F. Gast	Use of reduced lattice spacing to improve conversion ratio when high purity graphite is available.

Signed W. K. Woods
W. K. Woods
Acting Division Head

WKW:sr 12 1359

SEPARATIONS TECHNOLOGY DIVISION

DECEMBER, 1948

VISITORS & BUSINESS TRIPS

N. B. Garden, Radiation Laboratory, University of California, visited this site on December 1 and 2 for consultations with the Research Section on laboratory hood and dry box design.

A. A. Christopher, J. N. Hall, L. G. Gitzendanner, and D. H. Marquis, General Engineering and Consulting Laboratory, Schenectady, visited the Process Section December 6 through 18 for consultations on the 234-5 program.

J. G. Attanas and W. L. Lyon visited the Los Alamos Scientific Laboratory, Los Alamos, New Mexico during December 8 through 17, and T. Prudich during December 8 through 10 for additional training in DP-West operations.

F. W. Albaugh, W. H. Reas, and M. K. Harmon visited the Radiation Laboratory, University of California, on December 13 to inspect and discuss laboratory dry box facilities and techniques.

C. F. Callis, K. M. Harmon, and O. F. Hill visited the Argonne National Laboratory on December 13 and 14 to attend a symposium on the chemistry of ruthenium.

E. T. Merrill visited the Argonne National Laboratory on December 15 and the Oak Ridge National Laboratory on December 16 and 17 for consultations on Redox process studies.

ORGANIZATION AND PERSONNEL

Personnel totals in the Separations Technology Division may be summarized as follows:

	November	December
Administration	1	2
Process Section	24	24
Development Section	94	91
Research Section	25	26
Tech. Grads. in Training	27	28
	171	171

New hires were as follows: One Chemical Engineer was added to the Development Section and two Technical Graduates were added to the training pool.

One Secretary B was transferred from the Maintenance Division to the Administration Section, one Operator D was transferred to the Development Section from the Maintenance Division, and one Steno-Typist B was transferred to the Research Section from the Commercial Facilities Division.

Two Chemical Engineers were transferred; one from the Development Section to the Pile Technology Division, and one from the Process Section to the Instrument Division. One Operator D was transferred from the Development Section to the Purchase & Stores Division.

Two Chemical Engineers and one Technical Graduate terminated. At month-end there was one non-exempt employee on the rolls awaiting security clearance.

200 AREAS PLANT ASSISTANCE

Canyon Buildings

Investigation of erratic second cycle by-product losses of both B and T Plants revealed that the Precipitator Tank spray was not operating properly at B Plant. The spray was inspected, found defective, and replaced following Run B-8-12-F-6. The second cycle by-product losses at T Plant were significantly lowered during a test period when the use of the cake solution acid as a Precipitator Tank flush was eliminated. The loss level is being investigated further.

Review of ionization chamber (Beckman) readings during the transfer of the first cycle by-product precipitate from the centrifuges indicated that the bowls were essentially clean after three of the routine six acid flushes. Starting with Runs B-8-12-F-6 and T-8-12-B-4 this transfer was accomplished routinely with four acid flushes. Additional flushes are made as necessary. The time cycle has been reduced by approximately forty-five minutes.

Investigation of erratic high first cycle by-product losses of T Plant indicated that there is some accumulation of precipitate in the 13-1 Precipitator Tank similar to that observed previously at B Plant.

Considerable difficulty was experienced at B Plant with product assays and batch size manipulations in Section 7 (used in parallel operation with Section 8 for product extraction). The 7-1 MR analysis for Run B-8-12-D-13 was nearly three times that allowable. One third of the run was centrifuged and the precipitate was dissolved for analysis. The assay of this product solution indicated that the batch in the F-1 Tank had been of normal size. The combined product solution and waste assays were normal. The reason for the high initial assay was not determined.

Recalibrations of the first cycle Product Solution Tank at T Plant led to the adoption of a new calibration approximately 2% higher than that in use since plant start-up. This change will not affect overall plant material balances.

Due to an indicated water leak into the 4-5L dissolver at B Plant, this dissolver was replaced with the equipment in Cell 3-L.

Concentration Buildings

A loose flange bolt, jammed between the Centrifuge E-2 bowl and a dip tube at B Plant, prevented complete transfer of the lanthanum fluoride product precipitate of Run B-8-11-D-14 from this machine to the Metathesis Tank. The transfer was completed and the recovered product was processed through metathesis and recycled to the recycle storage tank after the centrifuge was repaired. Approximately 33.5% of a normal run was recovered.

The sprays of the Centrifuge B-2 at B Plant were found to be incorrectly located upon investigation of difficulties in transferring the lanthanum fluoride product precipitate from the Centrifuge to the Metathesis Tank. The spray was repositioned following Run B-8-11-F-23. Subsequent transfers have been satisfactory.

Isolation Building

Increased rate of peroxide addition for the first cycle precipitation, reduction of the minimum settling time from two hours to one hour, and reduction of the precipitation digestion period to thirty minutes from the previous standard of one hour have been tested under Production Test 231-8. No adverse effects or product peroxide solubility have been observed. These tests are continuing.

REDOX DEVELOPMENT

Demonstration Unit Studies

During the month, many of the 2 and 3-inch IA Column studies were characterized by the presence of an abnormal "fish-egg"-type of emulsion above the interface. Associated phenomena also resulting were a marked reduction in flooding capacity and, therefore, throughput range-ability. Laboratory studies revealed that the "disengagement time" for the IAFS-IAX (pretreated hexone) phases following a standardized mixing procedure was of the order of 35-40 seconds, whereas IAFS synthesized from chemically pure uranium salts resulted in a "disengagement time" of the order of 10-15 seconds (considered normal) when contacted with the same IAX. The IAFS for the abnormal column runs was prepared from uncanned uranium slugs. The H.E.T.S. studies in the 3-inch IA Column, which were initiated to study the efficiency of 1/4 x 1/4-inch Raschig rings and methods of IAF-IAS mixing at volume velocities corresponding to 1/25 plant scale (0.06 short tons U/day) and below, were interrupted in order to define further the emulsification behavior by means of pertinent column studies.

The pertinent data for the 3-inch IA studies are tabulated below.

SIMPLE-COLUMN STUDIES: THREE-INCH IA COLUMN

Packing = 1/4 x 1/4-inch Raschig rings.
Process Conditions = IAX prepared from pretreated hexone. No $Na_2Cr_2O_7$ in IAFS
Extraction Length = 12.3 Ft.

Run No.	Purpose	Volume Velocity Gal./(Hr.)(Sq.Ft.)	Approx. Fraction of Nominal Plant Capacity(2)	Uranium H.E.T.S., Ft. (Extract. Sect.)	Interface Appearance
31	H.E.T.S.	177	0.04	1.4	2 Ft. Emulsion
32	H.E.T.S.	89	0.02	3.7	1 In. Emulsion
33	Flooding	420	0.09	—	Excessive Emulsion
33	H.E.T.S.	175	0.04	1.3	4 Ft. Emulsion
34(1)	Flooding	550	0.13	—	1.0 In. Emulsion
34(1)	H.E.T.S.	180	0.04	1.3	1/4 In. Emulsion

(1) IAFS prepared from UO_3 for Run No. 34 and from uncanned slugs for remaining studies.

(2) Nominal 1.5 short tons U per day.

Studies 31 and 32 were made for purposes of comparison with previously reported IA compound-column studies 28 and 30. The above H.E.T.S. values are slightly lower than those produced when IAF and IAS are introduced separately (studies 28 and 30) and would, therefore, indicate that steps be taken to improve the mixing action of the present 4-inch tee and 0.24-inch i.d. single-point IAF entry. However, until the effect of the emulsion-forming contaminant is more clearly defined, the above H.E.T.S. values should be considered preliminary. It is evident from observations of column performance that the quantity of "fish-egg" emulsion above the interface increases with total throughput. The flooding capacity of 420 gal./(hr.)(sq.ft.) determined during the first portion of Run 33 is in contrast to previous values of about 600 gal./(hr.)(sq.ft.) produced under comparable conditions. The IAFS feed (Run 34) prepared from UO_3 gave laboratory "disengagement times" of 15-20 seconds with IAX and a flooding capacity, as expected, slightly below normal. It is probable that a certain amount of contamination from the previous study still prevailed in the system. The above studies appear to be further evidence that the emulsion-forming contaminant is associated with the uncanned slugs. Inspection of the dissolver following the above studies revealed an excessive accumulation of tenacious black sludge which has probably been built up over the past year. This material is being analyzed and its effect on a synthesized IA feed after prolonged refluxing is being determined. An aqueous sample removed from the "fish-egg" emulsion during one run indicated a Si content about 1000 times greater than is normally found in a IAFS feed prepared from uncanned uranium slugs.

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Separations Technology Division

During the month, an attempt was made to determine the limiting capacity of the 2-inch IA Column under spray conditions (2"-37-U). Two Elgin-type IAX distributors, one containing 73 holes (each 0.046 in. i.d.) and the other 19 holes (each 0.104 in. i.d.), produced emulsion upon initial start up. This formation rendered the column inoperable at volume velocities above approximately 450 gal./(hr.)(sq.ft.). The IAFS feed for this study was derived from uncanned slugs and produced a "disengagement time" upon contact with IAX of about 40 seconds (normal = 10-15 seconds.)

Revised and additional analytical data for the 2-inch Column IB series reported previously are essentially complete. The preliminary data for uranium transfer are listed below.

IB FLOW SHEET STUDIES: TWO-INCH DEMONSTRATION COLUMN

Packing = 1/4 x 1/4-inch Raschig Rings

Packed Length = 11.6 Ft. Below Feed (Scrub), 7.3 Ft. Above Feed (Extraction)

Solvent = Pretreated Hexone

Run No.	Total Volume Velocity Gal./(hr.)(sq.ft.) Above Feed	Below Feed	Approx. Fraction of Nominal Plant Capacity	IBP U Losses g.UNH/l.	% U in IAF	Uranium H.E.T.S.,Ft. (Below Feed)
1	362	138	0.038	0.0090	36×10^{-5}	3.2
2	352	129	0.037	0.0022	8.8×10^{-5}	2.8
3	194	69	0.021	0.0120	48×10^{-5}	3.6
4	531	195	0.056	0.0021	8×10^{-5}	3.3
5	940(1)	324	0.099	—	—	—
6	779	307	0.082	0.00017	0.68×10^{-5}	2.5
7	858	314	0.090	0.000245	0.98×10^{-5}	2.4
7	900(1)	327	0.095	—	—	—
7	1159(2)	422	0.122	0.000380	1.5×10^{-5}	2.3
ANL Flow Sheet Limits			—	0.000600	2.5×10^{-5}	—

(1) Represents point where local flooding above feed point became perceptible.

(2) Five-hour H.E.T.S. study conducted during local flooding in section above feed. Flood did not propagate to section below feed.

While complete flooding above the feed has yet to be attained, it is clearly evident that maximum column rangeability can best be obtained by increasing top section diameter to 2.5 to 3 inches. Such a recommendation is to be made for Redox Test Plant design. The existance of a high efficiency plateau is clearly evident from the above data. Approximately 4.5 perfect stages are required for the attainment of flow sheet uranium losses in the IBP stream.

Heretofore, the majority of IC studies have been devoted to non-flow sheet uranium recovery. Two studies have recently been completed under exact ANL flow sheet conditions in the 4-inch IC Column packed with 1/2 x 1/2-inch Raschig rings. The pertinent data are listed below.

IC FLOW SHEET STUDIES: FOUR-INCH DEMONSTRATION COLUMN

Packing = 1/2 x 1/2-inch Raschig Rings

Packed Length = 9.4 Ft.

Run No.	Volume Velocity Gal./(Hr.)(Sq.Ft.)	Short Tons U / day	Approx. Fraction of Nominal Plant Capacity	ICW Losses % of Feed U	Uranium H.E.T.S.,Ft.
10-C	111	0.053	0.035	0.95	4.7
15-C	227	0.107	0.071	0.075	3.1

To achieve the ANL flow sheet uranium ICW loss of less than 0.01%, 4 to 5 perfect stages are required. It is intended to define the H.E.T.S.-capacity relationship at higher volume velocities. Further investigation may point to a reduction in Test Plant column diameter from 4 inches to 3 inches. An extension of IC equilibrium data to U and HNO_3 concentrations above and below the typical flow sheet values has revealed that at high U and HNO_3 concentrations in ICF, the uranium equilibrium curve is shifted so as to require more equivalent stages to achieve a given amount of extraction and the HNO_3 concentration goes through a maximum before diminishing to a very low value in the ICW. It appears that a "Transfer Unit" may be a more pertinent means of correlation than the presently employed "Stage" concept.

Scale-Up Studies

During the month, operation of the 5-inch column under IA conditions has been characterized by excessive "fish-egg" emulsion formation above the interface. IAFS-IAX "disengagement times" have been of the order of 35-40 seconds. This problem was believed to be unrelated to the previously described phenomenon in the Demonstration Unit in that it was probably associated with impurity (possibly hexone decomposition products) build-up through continuous re-use of the IAW, ICU, and ICW streams. The 5-inch IA H.E.T.S. studies conducted during this period of excessive emulsification are listed below. In all cases, the ICW stream was washed with 10% Na_2CO_3 prior to conversion to IAX.

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SCALE-UP UNIT STUDIES: FIVE-INCH IA COLUMN

Extraction Length = 19.6 Ft.

Packing = 1/2 x 1/2-inch Raschig Rings

Run No.	Volume Velocity Gal./(Hr.)(Sq.Ft.)	U Capacity, Short Tons Per Day	Uranium H.E.T.S., Ft. (Extract. Sect.)
9(1)	897	0.98	1.6
10	627	0.68	1.3
11	377	0.44	1.7

(1) Emulsion formation propagated down column, rendering the unit inoperable at this capacity.

The limiting capacity of 1/2 x 1/2-inch Raschig rings determined previously with normal IAFS feeds was of the order of 1725 gal./(hr.)(sq.ft.). Emulsion prevailed at lower volume velocities but did not render the unit inoperable. The H.E.T.S. values listed above should be considered preliminary since they might be affected by the emulsion-forming contaminant. Following the above runs, all IAW streams were re-worked to recover the uranium and then removed from the system. This procedure was carried out to eliminate the recycled impurities. Feeds prepared with fresh $Al(NO_3)_3$ and ICU after this clean-out procedure indicated satisfactory "disengagement times". With this improved feed, flooding and H.E.T.S. determinations were made with 1/4 x 1/4-inch Raschig rings in the 8-inch column. These data are tabulated below.

SCALE-UP UNIT STUDIES: EIGHT-INCH IA COLUMN (SIMPLE)

Extraction Length = 19.9 Ft.

Packing = 1/4 x 1/4-inch Raschig Rings

Run No.	Type of Run	Volume Velocity Gal./(Hr.)(Sq.Ft.)	U Capacity, Short Tons Per Day	Uranium H.E.T.S., Ft. (Extract. Sect.)
12	H.E.T.S.	509	1.5	7.9
12	Flooding	825	2.5	---

During the above study only slight emulsion formation was evident. The limiting capacity appears to be slightly higher than that obtained previously in the 3-inch column and about half the value for 1/2 x 1/2-inch Raschig rings. The high H.E.T.S. value may constitute support that as column diameter is increased, packing diameter must also be increased to maintain adequate phase redistribution. The complete H.E.T.S.-capacity relationship is presently being defined. This series will be followed by tests of an intermediate feed mixer employing 1/2 x 1/2-inch Raschig rings. Because of the necessity of IAW disposal several IA "service" runs were carried out in the 5 and 8-inch units.

The "flow sheet" IC studies in the 5-inch column reported previously have been extended. The pertinent data are tabulated below.

FLOW SHEET IC STUDIES: FIVE-INCH SCALE-UP COLUMN

Packing = 1/2 x 1/2-inch Raschig Rings

Packed Length = 19.6 Ft.

Run No.	Volume Velocity Gal./(Hr.)(Sq.Ft.)	Short Tons U/Day	ICW Losses, % of Feed U	Uranium H.E.T.S.,Ft.
42	670	0.54	0.027	5.8
43	950	0.77	0.0023	5.0
39	1226	1.0	0.019	5.0
40	1540	1.4	0.099	6.1

It is planned to extend such studies to the 8-inch column and thus provide a good definition of the H.E.T.S.-Diameter-Capacity relationship.

The 7-stage Service Extractor was employed for two IC studies. Waste losses for both runs were less than 0.1%. Emulsification took place in three stages during the first run but did not render the unit inoperable.

Previously reported temperature-rise data for IA and IC Column operation have been extended. In the 5-inch IA column, maximum shell temperature rises of 13, 8, and 8° F. were obtained during flow sheet IA studies at 0.98, 0.68, and 0.44 short tons of uranium production per day. For flow sheet IC studies in the same column, shell temperature changes of -9.8, -11.4, and -15° F. were noted at uranium capacities of 0.54, 0.70, and 1.0 short tons per day.

Equipment Modifications and Development

The Demonstration Unit 2 and 3-inch column automatic flow control system (Fischer Scientific rotary vane pump--Fischer & Porter recording-controlling rotameter--Hammel-Dahl valve) was placed in operation during the month. A detailed evaluation will be presented when more performance data are available. A Schutte and Koerting recording-controlling rotameter has been installed in the Scale-Up solvent feed line. A "precontactor" column for removing IAF "crud" by contact with equilibrated hexone is being installed to check its feasibility for the Test Plant and Production Plant metal solution clarification step. A 1.5-inch diameter column packed with 1/4 x 1/4-inch Raschig rings has been fabricated to obtain design data for the steam stripping of hexone from the IAW and ICU streams. A 16-inch diameter steam stripper is now being installed for similar use with the Scale-Up feed preparation equipment.

The 14-stage labyrinth-type horizontal extractor has been equipped with perforated vibrating plates. Operation with a 1-inch stroke, a frequency of 500-600 cycles/min., and a total throughput of 300-400 ml./min., produces IA uranium stage efficiencies in the range of 60-70%. Further study of operating variables to

increase these efficiencies is now under way. The 21-stage, 1/100th-scale S.O.D. box unit has been redesigned to give positive interface control and vibrating-plate agitation. Studies are contemplated in the near future.

The G.E. Turbine Pump No. 2 is currently being tested in a submerged position with IAX. A Roth stainless steel turbine pump has recently been obtained for testing in Redox process solutions. The permanent-magnet rotor on the Kellex magnetically driven turbine pump disintegrated during testing at 3100 rev./min. Flaws in the casting were apparently responsible for the failure.

Flame-sprayed polyethylene, the most promising protective coating available to date, may be easily decontaminated from Co, Ru, Zr, Cb, Pu, and U by two short water washes and a 20% HNO_3 wash.

Process Laboratory

Efforts during the month have been devoted to defining further the anomalous emulsification behavior encountered in the Demonstration and Scale-Up Units. Standardized IAFS-IAX phase disengagement tests have been devised and an exhaustive search is being made for surface-active agents entering the system via the uranium metal, HNO_3, $Al(NO_3)_3$, or distilled water. Agitator lubricants and greases have also been tested.

All evidence obtained on Demonstration Unit feeds derived from uncanned slugs points to the contaminant being associated with the metal itself or a residual precipitate recently found in the dissolver.

To define further the Scale-Up problem, the cycle of feed re-use involving hexone removal, HNO_3 neutralization with aluminum screen, and concentration is being tested on a laboratory scale, and the phase disengagement times will be noted as the cycle is repeated on the same material. The resulting information should be useful in predicting the number of times Scale-Up feed may be recycled before encountering emulsion problems.

REDOX RESEARCH

Decontamination from Ruthenium by Distillation of RuO_4

Continued studies of the volatilization of RuO_4 from simulated dissolver metal solution have shown that the rate of removal of tracer ruthenium by ozone is markedly lowered by decreasing the temperature from 75° C. to room temperature.

It has further been found that clean stainless steel adsorbs activity from an ozone stream carrying tracer RuO_4. Present results indicate that this tendency to adsorb activity decreases with successive distillations of RuO_4 over the same metal coupon, and it appears that a saturation activity level may eventually be reached. It has been found possible to remove 96-99% of the adsorbed activity by soaking in 1 M H_5IO_6 solution. A similar treatment with permanganate solution appeared of little value for decontamination studies.

Glass Wool Scavenging

Investigation of the effects of glass surface pretreatment on the adsorption by Pyrex glass wool of zirconium and columbium from Hanford process solution is in progress. Pretreatments with neutral, acidic, basic, and organic reagents have been tried, the greatest adsorption being observed on water-washed glass wool. The 4-5-L plant dissolver solution was used at pH=1 (as received). Experiments conducted three to eleven days after dissolving indicated a decrease in the amount of activity adsorbed with aging.

Use of Ozone as Crossover Oxidant

1. Plutonium Behavior. It has been demonstrated that plutonium is completely oxidized to the (VI) state by ozonizing synthetic IBP solution for six hours at room temperature with 0.01 M $AgNO_3$ present. Complete oxidation to Pu(VI) without catalyst may also be practicable, as 96% oxidation was obtained in six hours under these conditions. The starting solutions were of flow sheet composition, including ca. 0.4 g Pu(III)/l.

The use of ozone as a crossover oxidant is, prima facie, subject to question on the grounds of lack of holding oxidant action in Column IIA. Preliminary results indicate no difficulty should be encountered in this respect. After ozonizing to 100% Pu(VI) and sparging out residual ozone, no reduction of (VI) was observed on standing for one week in the absence of hexone and no reduction was observed for several days when the solution was hexone saturated. Of greater significance was an experiment in which ozonized IBP, sparged free of ozone, was contacted with four successive equal-volume portions of plutonium-free but otherwise pre-equilibrated hexone. Only 0.04% of the original plutonium was left in the aqueous phase and on the fourth contact E_a^n had not fallen below 2.0. The total period of contact was four hours, including a total of one hour of vigorous stirring.

2. Effect on Column IIA Decontamination. In a single experiment, excellent cerium decontamination was obtained using ozone. A solution 1.3 M in ANN, 0.5 M in HNO_3, and containing 10^7 dis./min./ml. of Ce* (carrier-free) after ozonization for one hour at 75° was contacted with an equal volume of hexone. An E_a^n value of 0.0002 was obtained. The same starting solution oxidized with 0.02 M $Na_2Cr_2O_7$ at room temperature gave an E_a^n value of 0.87. Addition of 0.001 M $Na_2CR_2O_7$ to the ozonized solution increased E_a^n from 0.0002 to 0.18.

Zirconium Species in Nitrate System

The first nitrate complex constant for zirconium in mixed perchloric-nitric acid solutions has been measured by means of distribution measurements between a benzene-TTA solution and the aqueous acid solution. The first complex constant for the reaction

$$Zr^{+4} + NO_3^- = ZrNO_3^{+3}$$

is estimated to be about 0.25.

Separations Technology Division

Physical Properties of Redox Systems

1. Heat of Extraction. Column IA extraction section runs and Column IC runs were carried out in a vacuum-jacketed column, 2 inches I.D. x 5 feet packed length (Raschig rings), employing flows and concentrations specified in the ANL flow sheet of June 1, 1948. Temperature profile observations showed that in IA runs the maximum temperature rise was 6° C. above the inlet temperature. In IC runs the minimum temperature was 17° C. below the feed temperature. These data are to be used in the study of the mechanism of heat transfer in a two-phase system as well as for design engineering purposes.

2. Specific Gravity. Small corrections have been made on two of the density equations reported in the past:

Over-all Hexone Phase Equation. (H_2O sat.), 25°C:

$$d\ 25/4 = 0.7992 + 0.3500\ M_{UO_2(NO_3)_2} + 0.0439\ M_{HNO_3}$$

Over-all Aqueous Phase Equation. (Hexone sat.), 25°C:

$$d\ 25/4 = 0.9958 + 0.3164\ M_{UO_2(NO_3)_2} + 0.0298\ M_{HNO_3} + 0.1600\ M_{Al(NO_3)_3} + 0.1976\ M_{Na_2Cr_2O_7}$$

3. Hexone Solubility. A general equation has been derived for the solubility of hexone in aqueous Redox solutions. The equation is:

$$S = S_o + f_1(t)\ M_{ANN}\ \ f_2(t)\ M_{UNH} + f_3(t)\ M_{HNO_3}$$

where S = solubility of hexone in wt. %.

Constants have been determined for this equation which fit all of the available experimental data over the range 0-2.0 M $Al(NO_3)_3$, 0-2.0 M $UO_2(NO_3)_2$ and 0-1.0 M HNO_3, within the limits of error of the experimental measurements. It should be noted, however, that although accurate three-component data are available for comparison, no really accurate data are available for four and five component systems.

4. Emulsion Formation. A IAFS solution containing 1.717 M $Al(NO_3)_3$, 0.22 M HNO_3 and 0.40 M UNH was found by the Chemical Development Section to give an emulsion when contacted in Column IA with a flow ratio of 1.67 aqueous to 1.0 hexone. After measuring the disengaging times of batch equilibrations under different conditions, it was concluded that satisfactory operation would result if IAFS were diluted with one-half its volume of aqueous 0.25 M HNO_3 solution and the flow ratio changed to 1 aqueous to 1 hexone. The alterations proved satisfactory in the Semi-Works.

Chromium (VI) Behavior

1. Effect on Distribution of UNH. Studies of the distribution between hexone and water of Cr(VI) and U(VI) from various solutions have given further support to the theory that the distribution of UNH is not affected by the presence of 0.05 M $Na_2Cr_2O_7$. Also, optical densities in solutions containing both UO_2^{++} and $Cr_2O_7^{=}$ have been additive, suggesting the absence of complexing action.

2. Extraction of Chromium (VI) into Hexone. The distribution between hexone and water of Cr(VI) from CrO_3 solution as a function of concentration has been studied. From known equilibrium constants, the distribution of the species H_2CrO_4 has been calculated. From this and the pH of a solution, it is possible to estimate the Cr(VI) concentration in the hexone phase.

Pulse Column

Thirty-one additional pulse column runs have been made in studying factors affecting H.E.T.S. for HNO_3 transfer in $Al(NO_3)_3$-HNO_3-H_2O-hexone systems. The following summary is supported by the data.

1. At a hexone flow rate of 650 gal./hr/sq.ft. and an aqueous flow rate of 350 gal/hr/sq.ft., it was possible to obtain stage heights of 0.23 feet.

2. At low flow rates (total flow below 1000 gal/hr/sq.ft.), a plate spacing of 1 inch gives much lower HE.T.S. than 2-inch spacing. At high rates (1760 gal/hr/sq.ft), the 2-inch spacing is equally effective.

3. Sixty 0.039-inch holes per plate seem just as effective as 120 such holes; 0.060-inch holes are less effective.

4. From 10 to 20 percent of the pulse energy escapes through the aqueous exit stream. This loss is least at high flows.

Influence of Aqueous Phase Dispersion on Column IA Decontamination

Additional measurements of Cs* distribution ratios have been made on the premise that distribution of cesium activity into hexone is a measure of aqueous phase dispersion in that phase. Contacting of various IAFS and IAS solutions with pretreated hexone indicates the distribution ratio, E_a^h, for radio-Cs to be greatly increased by the presence of UNH, slightly reduced by substitution of 8 M NH_4NO_3 for 1.3 M ANN as salting agent, and independent of HNO_3 concentration in the IA Column range. If the approximately 100-fold increase in E_a^h observed on adding UNH to 0.5-1.0 M is actually representative of aqueous phase dispersion, the dispersion must be very fine indeed, since E_a^h was not affected by centrifugation at 1250 g for 15 minutes. If chemical dissolution of the alkali metal ion in the hexone phase is responsible, a cesium uranyl salt of an organic acid seems to play no part, as the addition of acetic acid does not influence the distribution ratio.

The distribution ratios for Cs in the feed plate and three succeeding scrub stages of a IA Column were found to be surprisingly high (about 0.025) but since this value was maintained in each stage no effect on Redox decontamination is to be expected.

Separations Technology Division

Redox-Phosphate Coupling

It has been proposed that plutonium (III) be separated from uranium (VI) in the aqueous effluent from a column operated under reducing conditions and at low acidity. It has also been proposed that this effluent be oxidized with $KMnO_4$ to give plutonium (VI), which is carried by a circulating hexone stream to a smaller volume of aqueous solution containing Fe(II), where quantitative removal occurs owing to reduction of plutonium to the (III) state.

Fragmentary experimental data indicate that complete oxidation can be obtained with 10^{-2} to 10^{-3} M $H_2Cr_2O_7$ in solutions 0.75 to 1.0 M in $Al(NO_3)_3$ and 0.03 to 0.10 M in HNO_3. Extraction of H_2CrO_4 into hexone is negligible at these low acidities. Use of Fe(II) in the aqueous strip solution, which could result later in inhibition of $BiPO_4$ carrying, may not be necessary. A distribution ratio of 0.0015 (hexone/aqueous) was obtained on stripping with 0.77 M HNO_3 to 0.85 M $(NH_4)_2SO_4$ solution.

STACK GAS DISPOSAL

Plant sand filter evaluation was continued at both plants except during the latter part of the month, when some frozen lines at T Plant precluded monitoring operations by the "S" Division. At B Plant, the filtration efficiency, based on instrument monitoring, varied from 99.77% to 99.99% during the month. The pressure drop across the thirty-six inches of sand was about 7.3 inches of water at approximately 26,000 CFM air flow. Gross recontamination of the filter effluent, as determined by the activity collected from the fifty foot sampler, ranged up to 200 fold. In order to determine the source of this recontamination two runs were made in which all dissolvers were shut down and the vent jets burned off. Low recontamination factors of 4 to 20 indicated dissolver operation to be responsible for the bulk of the previously noted recontamination. Two runs made while the dissolver vent jets were operated with air instead of steam also resulted in high recontamination factors. This indicated that the higher activity was not due to small particles passing through the sand filter and becoming collectable when they mixed with steam. A final check, sparging "cold" steam into the ventilation air at the base of the stack, is planned.

The T Plant sand filter efficiency, based on instrument beta monitoring, ranged from 99.4% to 99.9% during the period observed. The pressure drop through the twenty-four inches of sand was about 4.2 inches of water at approximately 25,000 CFM air flow. Recontamination of the filter effluent ranged to twenty fold, consistent with the previous observation that recontamination is less at T Plant than that observed at B Plant. Suspicion that the sampler at the top of the stack (the "snifter") had a leak at T Plant was confirmed by telescopic observation whereby it was determined that the Saran tubing was disengaged. Operation of this position was transferred to the line previously intended for flushing the stack with water.

Transverse monitoring of the plant sand filters indicated an increase in the activity levels of the sand layers. At T Plant, an appreciable activity level was found at the top of the bed. Efficiencies, however, have not fallen.

Additional sample filters were analyzed for I^{131}. Sand filter efficiencies, for removal of I^{131} from direct off-gas, of approximately 97% and 92% at B and T Plants, respectively, were indicated on certain runs.

Pilot plant sand filter work was resumed with the completion of a new upstream sampling line at B Plant. Confirmation test runs with thirty-six inches of 20-40 mesh Hanford sand were made and an evaluation of No. 55 fiberglass (0.00055" diameter) as a filter medium for particle removal was started. Tests with the fiberglass packed to a density of six pounds per cubic foot resulted in efficiencies ranging from 99.9% to 99.5% at air velocities of approximately 2 to 5 feet per minute, respectively, through a one-foot filter bed. Pressure drops were in the range of 0.13 to 0.7 inches of water, respectively. A twenty-four inch bed resulted in efficiencies in excess of 99.99% at air velocities of 1.8, 5.2, and 10 feet per minute, respectively, and in excess of 99.9% at an air velocity of 15.3 feet per minute. The pressure drop varied approximately proportionally from 0.3 to 2.1 inches of water in this range of air velocities. A thirty-six inch bed depth gave efficiencies in excess of 99.8% and 99.95% and pressure drops of 0.4 and 1.2 inches of water at air velocities of 1.8 and 5.0 feet per minute, respectively.

234-5 PROJECT

Operations Group

The training program for 234-5 Building operating personnel was started December 6, 1948, with two men at Los Alamos participating in purification operations. This program will continue through January and February.

Three Acceptance Testing and Inspection Procedures were issued during the month, covering waste piping, process equipment, and the general building. Arrangements were made for the Electrical and Power Divisions to issue Procedures covering their equipment. In order to save time, acceptance testing of the waste lines was correlated with the construction hydrostatic testing program; a considerable portion of this phase of the program was completed during the month.

Print checking, particularly of building design, continued throughout the month. Changes considered essential were brought to the attention of the Design Division and those considered desirable were tabulated in preparation for presentation to the Project Engineering and Maintenance Divisions for action after construction is complete.

During the month, six hoods for the rubber glove line were received from vendors. Installation of process equipment in these and other hoods in the 272-Z shop was checked by members of the group. Six hoods were completed by the shop, inspected by Technical, Design, and Construction, and formally accepted by Technical for installation in the 234-5 Building. These hoods were temporarily stored in 224-U.

Schenectady Liaison

As of the end of December the design work by the General Engineering and Consulting Laboratory for the remotely operated production line was 40 to 45% complete. Layout drawings of hoods and equipment for most of the design tasks

were approved by the Technical group in November and December after a series of week-long meetings with Schenectady people at Hanford. Revisions to cover the exceptions to the approvals were being received and studied at month-end.

Two general requests have been made of G.E. & C.L. as conditions under which task approvals were granted. Extensive mock-up of hoods to determine visibility and accessibility of equipment, with an opportunity presented for examination by Hanford personnel, is desired. Also, detailed study and presentation to Hanford of the "plastic bag and sleeve" maintenance and servicing technique for typical operations is planned.

Development Group

Modification of the hood in Room 38 of 231 Building to house the "Pilot Line" and receipt of equipment for this unit were almost complete at month-end. It is planned to apply surface coatings to the stainless steel before operations begin in order to test the usefulness of these materials.

Specifications have been given to the Essential Materials Group for all unclassified process materials to be used in the 234-5 Building. A six-months supply of these items has been ordered.

A study of decontamination of stainless steel as a function of type, history, and finish was made. Details of the experiments, which showed objectively an increase in ease of decontamination with fineness of finish, have been reported.

One man visited DP-West for a study of purification operations concurrently with the visit of Operations personnel for the same purpose.

INVENTION AND DISCOVERY STATEMENT

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 of Invention or Discovery
K. M. Harmon	The use of periodic acid for the removal of ruthenium activity from stainless steel surfaces.

Signed: R. H. Beaton
R. H. Beaton
Title: Head, Separations Technology Division

Date: January 6, 1949

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METALLURGY & CONTROL DIVISION

DECEMBER 1948

VISITORS & BUSINESS TRIPS

Prof. H. H. Willard of the University of Michigan was here December 2-3 in consultation with the Analytical Section on methods development problems.

Business trips of personnel in this Division during December were as follows:

J. W. Hall and L. F. Kendall spent December 13 at the Radiation Laboratory, University of California, investigating the use of gloved boxes for containing radioactive materials during analytical laboratory operations. C. H. Ice spent December 13-14 at the Radiation Laboratory for the same purpose.

M. Lewis attended the Second Ruthenium Conference at Argonne National Laboratory on December 13-14.

E. A. Smith spent December 13-18 at Argonne National Laboratory discussing the fabrication of Li-Al alloy slugs in connection with the P-10 Project, and attending a symposium on nuclear reactors.

R. Teats, W. T. Kattner and R. M. Padden followed the rolling of uranium rods for Hanford at Lockport, N. Y., December 1-7, December 1-7 and December 1-4, respectively.

ORGANIZATION & PERSONNEL

Personnel totals in the several subdivisions are summarized below:

	November 30	December 31
300 Area Plant Assistance Group	12	12
Metallurgy Laboratory Section	18	18
Analytical Section	421	428
Statistics Group	9	9
Information Group	51	54
Administrative	3	3
Totals	514	524

One exempt chemist and two weekly-roll chemists (one Technical Graduate and one Technologist) were employed by the Analytical Section. This section also employed eight laboratory assistants and transferred in two laboratory assistants from other divisions. Two non-exempt personnel were transferred by this section to the Information Group. The latter employed two non-exempt Files personnel. The Statistics Group employed one Engineer (Assignment) and had one go on leave of absence. There were a total of five terminations, all by non-exempt personnel; none was due to lack of housing.

At month-end, this division had nine non-exempt personnel on the rolls awaiting security clearance for classified work. Five of these were laboratory assistants in the Analytical Section, and the other four were Files personnel.

300 AREA PLANT ASSISTANCE

Uranium Melting and Casting

An investigation to determine the source of silicon impurity in billets cast from remelted uranium scrap has been started in the melt plant. The present silicon content of the billets (100 to 150 ppm) is still sufficiently low so that it probably will not cause any difficulty in rod or slug fabrication, but it is appreciably higher than the average of about 50 ppm formerly obtained.

P.T. 314-59-M has been issued as Document HW-11767 to study the effect of furnace pressure on the casting yield and quality of uranium billets.

Uranium Rolling

Rolling of uranium billets started at Lockport, N. Y., in late November was completed on December 7.

Six uranium rods that were finish-rolled especially hot at Vulcan in November, for use in canning trials to determine whether rolling temperature affects slug dimensional instability during canning, were found to be coarse grained. The finishing temperature of this material was estimated to be above 1200°F. This is the first time that coarse-grained rods have been produced by hand-round rolling.

Slug yield data on the 52 Type B uranium rods produced by forging and finish-rolling at Aliquippa, Pa., in October indicate that this method of fabrication shows promise of reducing the solid rod scrap in machining about 5%.

Slug Canning

In additional canning trials, rolled uranium slugs machined smaller than "A" diameter (1.359") continued to show a diameter expansion of about 0.007" with an attendant shrinkage in length of about 0.040". A slug diameter of about 1.350" now appears to yield an "A" dimension after canning, with much improved canning yield and slug quality. None of the 183 smaller diameter slugs canned according to the standard process that have been checked to date has had a can wall thickness less than 0.010", whereas 8.4% of the 83 regular FA slugs canned at the same time were found to have can wall thicknesses less than this desired minimum.

Test Pile results show these smaller diameter slugs to have less reactivity than FA slugs (about 20 inhours per 105 pile), even though the weight of the uranium is not changed. This is due to the ratio of aluminum plus aluminum-silicon to uranium being increased by diametral expansion. However, the reactivity of the specially dimensioned slugs is comparable to that of former gamma extruded slugs.

Canning trials with the coarse-grained alpha rolled uranium produced by Vulcan showed that this material did not exhibit the dimensional changes characteristic of normal alpha-rolled uranium. However, fracture tests indicated that grain refinement had occurred during bronze bath heating into the low beta phase so that the canned slugs were fine-grained. Triple-dip canning also effected grain refinement of the coarse-grained uranium rolled at Baltimore last April.

Examination of the 4" canned slug that failed in the 100-B pile late in November showed it to be rolled uranium which had been triple-dip canned in September and that it had passed the autoclave test. The welded-cap end of the jacket had been separated completely from the slug when it was found after discharge. A raised area which existed on the exposed end of the slug appeared to be caused by corrosion products rather than a metal "blister." No defects were observed in the can wall of the slug; distortion of the can at the top during discharge prevented evaluation of the can-slug bead. Also, surface mars on the weld bead so obscured the bead that if flaws existed, they could not be detected. Both parts of this slug were turned over to the Metallurgy Laboratory for further study.

A report for P.T. 314-57-M, High Nickel Impurity Billets, was issued as Document HW-11634 (dated 12-27-48). This report showed that nickel contamination in uranium, in amounts up to 200 ppm, had a negligible effect on rod and slug fabrication.

Design work was started on the melting and casting facilities which will be required at Hanford for the production of lithium-aluminum alloy (P-10 project).

METALLURGY LABORATORY

Uranium Alloys

Uranium alloy rods containing a nominal 0.01 and 1.0 atomic percent of magnesium and 1.0 atomic percent of calcium were received from Battelle. These rods, as well as all other uranium alloy rods received to date, have been examined in the following conditions: alpha annealed, beta (1 and 15 minutes) quenched, beta air cooled, and gamma quenched. Alloys not previously reported, which have been found to inhibit grain growth, are: gamma quenched 1.0 and 2.5 atomic percent boron and 0.01 atomic percent lead; beta quenched 2.5 atomic percent boron, 0.01 atomic percent lead, and 1.0 atomic percent molybdenum; and beta air cooled 1.0 and 0.1 atomic percent chromium and 1.0 atomic percent molybdenum. Different structures were found in the 1.0 atomic percent molybdenum and the 1.0 and 0.1 atomic percent platinum, but these structures are not yet fully defined.

Three of six one-half inch chill cast uranium rods made at Battelle were examined and found to have a grain size and shape similar to uranium rods air cooled from the beta phase.

Project C-287 for the construction of an experimental metal fabrication building (3730) was approved, and a list of the major items of equipment required for the building was supplied the Project Engineering Division for procurement.

X-Ray Crystallography

Calculations of the theoretical intensity ratio I/I_o were completed. These calculations included corrections for structure, multiplicity, polarization, and temperature, and check fairly well with the results of Jacob and Warren.

Longitudinal and transverse sections were removed from three alpha rolled slugs and were examined for consistency of orientation. Although the results did show strong reflections from the (110) plane in the transverse sections, the longitudinal sections showed varying intensities from several important planes. Additional sections have been removed from rods produced by a different fabricator, and these will be examined in the alpha, beta, and gamma heat-treated conditions.

An order was placed for the purchase of the General Electric XRD-3D diffraction unit.

Studies of Irradiated Materials

The cap from the ruptured slug removed from tube 0569 of the B pile in late November was examined preliminarily. Both slug and cap are being held at the B pile building until suitable arrangements can be made for decontamination and close examination.

A vertical safety rod guide and tip removed from the F pile on December 13 were obtained and removed to the 100-B burial ground for future metallurgical study.

Revisions to Building 111-B are continuing at a satisfactory rate (under Project C-294). General operational procedures for this building have been agreed upon, services arranged, and tools have been procured. The Rotobin is now in the shop for construction; the Cut-off Box, Dutch-Oven, Rockwell Table and Waste Disposal Cask have been designed and are now in drafting.

Dilatometry

Dilatometric tests were performed upon the nominal 1.0 atomic percent uranium alloys of iron, titanium, silicon, and copper, and upon the 1.0 and 0.01 atomic percent of manganese. Except for three samples, all the runs were made on the as received or as rolled specimens. All specimens, except titanium, showed about the same alpha coefficients of expansion (or contraction) after heating into the beta phase, thus indicating a general stabilizing effect by this treatment and, furthermore, the lack of any effect of the alloying elements in these small quantities upon the coefficients. It was observed that the transformation temperature was raised slightly with the addition of titanium and lowered by the addition of all the other elements, with manganese lowering the transformation temperature the greatest degree. Undercooling of the transformation temperature occurred with all alloying elements, the greatest occurring with iron to the extent of 66° C with a cooling rate of 2.85° C/minute.

Upsetting of Uranium

Five samples of alpha rolled uranium were upset to different degrees, alpha annealed, and examined by dilatometric, x-ray diffraction, and metallographic methods. Dilatometric results show a coefficient of expansion greater than the coefficient of supposedly random material, and thus it appears that a new type of preferred orientation may exist; this conclusion is supported by metallographic examination. X-ray diffraction results indicate a destruction of the rolled orientation and an approach to a random orientation.

Redox Corrosion Testing

No excessive corrosion has been observed in any samples of stainless steel (T-309 SCb, T-347, T-316 ELC, and T-318) after the first 90-day test period under dynamic conditions in 1A and 1B environments. Stressed welded samples of these steels are currently on their first 90-day test period, and alternate immersion tests are presently on their 30-day exposure period. Stainless steels T-304 and T-347 are on a first 90-day test and SAE-1020 steel is on a 30-day exposure to 1AW solution at elevated temperature and with partial immersion.

Miscellaneous

Tensile and punch tests on aluminum, aluminum-silicon composite sheets stripped from canned slugs indicate that approximately twice the maximum slug elongation noted to date (or 0.7 inches in 4-inch slug) can be tolerated before there is danger of can failure, provided the aluminum is at least 0.020" thick and there is no unbonded area larger than 0.2" in diameter.

The samples of irradiated aluminum tubing and SR-15 slug cans received from the Pile Technology Division in conjunction with the leak which developed in the F pile some time ago were mounted, polished, and etched. Examination of the two sections taken from the inner and outer cans showed nothing unusual in the microstructure. The section taken from the aluminum tube adjacent to the break showed grain boundaries adjacent to the break and for a considerable distance along the inside edge of the tube. As far as could be determined, this structure was not a constituent; rather, it looked more like a type of intergranular corrosion. To check this structure, a section of aluminum was melted with a welding torch, then mounted and prepared for microscopic examination. This section exhibited a definite Chinese script type of structure in the grain boundaries, quite unlike that seen in the irradiated tube sample.

Metallographic examinations and corrosion tests are currently being made on welded Type 347 stainless steel pipe sections removed from the Building 234-5 construction by the Design and Construction Divisions. These welds reportedly showed highly magnetic properties.

ANALYTICAL LABORATORIES

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
Routine Control - 200	2613	4288	2895	4597
Routine Control - 300	1380	6209	1173	5049
Water Control - 100, 700	12934	24737	13512	25562
Redox Control	2479	8020	2469	8124
Process Reagents	1030	2009	1260	2394
Essential Materials	129	678	133	658
Special Samples	3402	6043	3125	6895
Stack Gas Filters	180	502	4532	7800
Totals	24147	52486	29099	61097

200 Area Process Control

On December 1, the first session of the 200 Area Control Laboratory Training School was held. The purpose of this educational program is to give all laboratory personnel a greater appreciation of the various phases of their jobs and associated subjects.

To determine the source of fission product activity in the 200 Area process stack gases, various analyses are being made on a series of filter samples submitted by the Separations Technology Division. These analyses include quantitative determinations of iodine, zirconium, strontium, ruthenium, cerium, iridium, cesium, and rare earths (praseodymium, lanthanum and neodymium).

During the month, an oxidation study of the canyon starting solution (8-1-MR) was initiated. Ten 8-1-MR samples were oxidized and then assayed using the standard lanthanum fluoride precipitation method (CA-2a). Results indicated the presence of other alpha emitters which were heretofore counted as plutonium. Checks on the uranium waste solutions have verified these data. It is planned to continue the study as the enrichment level rises in an attempt to correlate the results with increased losses expected in the uranium wastes.

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

Laboratory	Ave. Geometry (%)	No. Tests
B Plant (222-B)	50.56	110
T Plant (222-T)	50.46	120
Isolation Bldg. (231)	50.53	61

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

Sample	Period Ending November 30		Period Ending December 31	
	Precision (±%)	Weeks Covered	Precision (±%)	Weeks Covered
8-1-MR	1.43	15	1.41	20
P-1	2.41	21	2.57	26
AT	1.99	21	2.03	26

The results of the synthetic 8-1-MR assays are tabulated below. The standard precipitation procedure (CA-2a) was used, and the percent recovery based on 2.077×10^6 c/m/ml.

Month	Laboratory	Ave. Results ($\times 10^6$)	No. Assays	% Recovery
November	222-B	2.064	16	99.4
	222-T	2.044	11	98.4
December	222-B	2.054	12	98.9
	222-T	2.037	11	98.1

The standard iron solution used in the Isolation Building Laboratory to check the chemical titration of plutonium was analyzed a total of 14 times during the month. There were 11, 2, and 1 results inside ± 1%, ± 2% and outside ± 2% of the assay value, respectively. The average precision for duplicate titrations was ± 2.26 as compared to ± 2.76 for November. Due to difficulties encountered in obtaining a true standard solution, only one such standard was analyzed in December:

Assay Value	Group Ave.	% Diff.	No. Determinations	Precision (±%)	
				Single	Duplicate
10.52	10.47	-0.5	14	3.19	2.26

300 Area and Essential Material Control

On December 27, the sampling frequency on melt plant heats was reduced from 100% sampling to only one sample from each ten heats. The analytical personnel gained by this reduction have been reassigned to the Chemical Research Service Group.

The control laboratories are now occupying approximately 50% of the new laboratories scheduled for completion on project C-227 (conversion of offices to laboratories, Building 3706). By accepting these laboratories, with minor exceptions, rooms equipped for radiochemical work have been released to the Chemical Research Section.

Spectrochemical analyses of graphite ash indicated the presence of more than 0.1 ppm of europium, but failed to detect either gadolinium or samarium. A modified technique which should definitely establish the presence or

On December 30, a second sump tank, with a capacity of 700 gallons, was completed and put into operation at the Isolation Building (231). All waste water from the operating cells now goes to this new sump, while that from the laboratory section continues into the original sump.

The two-month trial of rubber gloves initiated in the T Plant Laboratory on November 17 continued without incident. Results will be reported after its conclusion next month.

Analytical Research and Development

The Redox analytical research program has been reviewed in detail to assure that the present rate of progress is sufficiently rapid.

The X-ray photometer has been applied to the determination of UNH; standardizations for the analyses of IAU, IBU and ICF solutions have been made and a duplicate calibration of the control instrument has been started.

An amperometric determination of uranium in solutions containing less than 1 g/l UNH has been investigated. According to the procedure, ferrocyanide has been found to react completely with uranium and to provide a direct measure of the quantity present.

Three methods for the determination of high concentrations of aluminum in Redox solutions have been examined. One involves acidimetric titration and has shown a precision of 1.1% and a recovery of 99.5%. The second is an indirect method in which the decrease in oxine concentration in solutions, as a result of precipitation with aluminum, is determined by an amperometric technique. It has been found that an elevated temperature is necessary to obtain complete precipitation in a reasonable time. The third method, consisting of the conductometric titration of aluminum with oxine, has not yet yielded satisfactory results.

The determination of small quantities of plutonium in Redox solutions has been investigated using the lanthanum fluoride technique. Satisfactory results were obtained only with hexone-free solutions.

A procedure has been investigated for the determination of organic acids in hexone. This consists of vacuum distillation of the acids and titration of the distillate in an alcoholic medium with caustic. A pH meter is used to detect the separate end points in the neutralization of the nitric acid and the organic acid. Good recovery has been obtained from synthetic acetic acid solutions, but not from Redox solutions that contain smaller quantitites of organic acids.

Basic research has been completed on a procedure for the determination of sulfamic acid. According to this method, nitrogen is liberated in stoichiometric quantities upon treatment with nitrite, is freed from nitrogen oxides by treatment with bromine, and is measured gasometrically. The determination requires a 200 lambda sample and has an error of less than 2% for concentrations of 10 g/l. Iron and aluminum do not interfere.

A low-boiling fraction obtained from raw hexone has been examined with the infrared spectrophotometer and found to contain 95% 4-methyl 2-pentene.

As one phase of the research on pile graphite structure, a sample of anthracene was irradiated with neutrons in the pile; the infrared spectrum of this substance was not materially different from that of the non-irradiated compound. Radioactivation studies have shown that about 1 ppm samarium is present in pile graphite.

In the 234-5 program, satisfactory results have been obtained for the evaluation of aluminum in synthetic solutions. The method consists of extraction of plutonium cupferride into chloroform followed by spectrochemical evaluation. The method has been extended to determinations of beryllium and magnesium. A volumetric method for the determination of witch-hazel has been perfected and the training of control chemists in its use has been started.

STATISTICAL STUDIES

Slug Distortion

Statistical analysis of the slug canning rejects from Production Test 313-106-4 revealed no significant difference in rejects between completely transformed, partially transformed, and non-transformed slugs. There were, however, significant differences in the dimensions of the canned slugs. The diameter increased linearly with the degree of transformation, and the length decreased linearly.

Rod and Slug Yields

Non-orthogonal analyses of variance revealed no significant differences in uranium metal rod and slug yields attributable to casting plants or rolling mills, or to any particular combinations of these plants and mills.

Pile Technology Data

From data submitted by the Pile Physics Section concerning Special Request #15, the linear regression of yield on the average exposure was determined. The correlation was 0.4333, indicating that only about 20% of the variation in yield was explained by exposure. The Pile Physics Section is computing the expected proportionality factor between yield and exposure, which will enable tests to be made to determine if systematic as well as random deviations from the expected yield are present.

At the request of the Pile Engineering Section, calculations were made of the fractional exposure time necessary to maintain normal average plutonium concentration during the start-up of segmented discharge.

Chemical Research Data

The determination of families of equations relating hexone solubility with temperature for aqueous solutions containing varying amounts of nitric acid, UNH, and aluminum nitrate has been completed for the Chemical Research Section.

Analytical Data

From infrared spectrophotometer data submitted by the Analytical Section, a linear equation was fitted to the relationship between number of screw turns and the reciprocal of the frequency. Four additional calibration curves for the X-ray photometer were fitted by the least squares method for this Section.

LIBRARY AND FILES

Plant Library

Work on the acquisition, cataloging and circulation of books proceeded routinely. Reconversion of the Reading Room in the Main Library (300 Area) was completed, with additional furniture and book stacks installed, and the entire book and magazine collection reshelved.

Aided by the receipt of an unexpected number of pending Library of Congress card orders, the number of books cataloged more than doubled during the period. This did not include the detailed cataloging of a large backlog of photostated and reprinted periodical articles (covering material unavailable in the Library's files) which current procedure requires to be returned to the Library after use by the original requestor. Cataloging was also completed on a sizable shipment of classified books from the U. S. Office of Scientific Research and Development which were entered in the classified catalog and cross-referenced from the Main Library catalog. In addition, ninety-eight books were cataloged for the Kadlec Hospital Library.

Evening attendance at the W-10 Branch of the Library has climbed steadily since the schedule was started in September. During December this Branch was open eighteen evenings and served 201 plant personnel.

Library statistics were as follows:

	November	December
Number of books on order received	106	127
Number of books fully cataloged	106	275
Number of bound periodicals processed but not fully cataloged	16	42
Pamphlets added to pamphlet file	56	200
Miscellaneous material received, processed, and routed (Included maps, photostats, patents, etc.)	34	61
Books and periodicals circulated	1002	990
Reference services rendered	920	934

	Main Library	W-10 Branch	Total
Number of books	3619	1397	5016
Number of bound periodicals	2502	100	2602

Classified Files

Daily work on the receipt and issuance of documents proceeded routinely. A simplified Files procedure for the handling of Operations Project Proposals was developed, cleared through all interested personnel, and approved by the Project Engineering Division.

Following a meeting of representatives from AEC Security, Plant Security, Classified Files and AEC Mail and Records Section, a reciprocal procedure was established whereby AEC personnel withdrawing classified material from the Classified Files or Engineering File, or GE personnel drawing material from the AEC files, are to be cleared through all Files prior to termination. This procedure, formalized in a letter from the local AEC dated December 20, will supplement current termination requirements for all General Electric personnel.

The report index catalog was brought completely up to date for the first time.

Arrangements were made with the Health Instrument Divisions to monitor documents routed through the 300 Area; the first weekly check showed satisfactorily low contamination.

A survey was made of present plant mail distribution procedures, particularly as they relate to possible improvements in 300 Area mail service. A report with improvement recommendations was drafted. As an immediate aid to 300 Area service, arrangements were made with the Transportation Division to supply an additional daily delivery to Richland.

Work statistics for the Classified Files were as follows:

	November	December
Documents routed	10,042	10,225
Documents issued	5,452	5,247
Reference services rendered	5,570	5,375

Files Assistance Unit statistics, representing a notable increase over the previous month, were as follows:

	November	December
Ditto masters run	627	854
Mimeograph stencils run	248	626
Ditto master copies prepared	33,010	39,013
Mimeographed copies prepared	24,780	41,290

INVENTIONS

All Metallurgy and Control Division 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 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.

None.

Signed T. W. Hauff,
Division Head.

TWH:mcs

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MEDICAL DIVISION

ANNUAL HEALTH SUMMARY - 1948

At the close of 1948, there were 522 people on the Medical Division payroll, as compared to 429 at the end of 1947, an increase of 22%. There was an increase of approximately 85% in population cared for, accounting for the necessary increase in medical personnel. The population eligible for medical care at the present time is estimated as 39,000, divided as follows: 21,500 in Richland, 12,500 in North Richland, and 5,000 in surrounding trailer camps and communities

During 1948, Hanford Works has been operating on a budget and radical changes in accounting methods have been necessary in order to properly allocate all costs. Such methods have emphasized losses and indicated where there is a need for more drastic economy. Further improvement in our hospital accounting methods is in progress. While hospitals throughout the country operate at a loss, we shall try to operate Kadlec with the least possible net expense.

Industrial Medical Section

There has been no evidence of occupational disease or injury as a result of radiation. There was one death to a subcontractor employee due to carbon tetrachloride poisoning. There were 42 subcontractor employees who were followed medically because of complaints referable to exposure to carbon tetrachloride. Four cases were hospitalized but no serious complications resulted. The exposure was obtained on degreasing operations in the 100-DR construction area. The use of carbon tetrachloride for such operations was discontinued in favor of trichlorethylene, and much improved working conditions will obtain in the 100-H degreasing operations to be started soon.

Filters were installed at the base of the 200 area stacks, greatly lessening the speck problem. It is still the cause of great concern and it is hoped that a very active program of laboratory animal study will be executed under priority conditions at Rochester during 1949.

	1947	1948	% Increase
Physical Examinations (Pre-employment, Annual, Etc.)	36,101	68,211	89
Average per month		5,684	
Average per day (5 day week)		258	
First Aid (Dispensary) Treatments	73,187	213,379	192
Average treatments per month		17,782	
Average treatments per day (6 day week)		684	
Ratio $\frac{\text{occupational treatments}}{\text{non-occupational treatments}} = \frac{2}{1}$			
Major and sub-major injuries treated		925	
Average number major & sub-major injuries treated per month		77	

(The majority of these were incurred by subcontractor employees; 67 (7.2% of total) being by G. E. employees)

	1946	1947	1948
Total absenteeism, weekly employees, all causes	2.33%	1.74%	2.20%
Total absenteeism, weekly employees, sickness only	1.36%	1.19%	1.37%

1211309

MEDICAL DIVISION

ANNUAL SUMMARY

Public Health & Welfare Section

Home visits by nurses	11,135
(About half of these were for communicable diseases, and 30% for morbidity cases)	
Communicable diseases reported	2,276
(Mumps, measles and chickenpox were the outstanding infectious diseases)	
Sanitary inspections	1,409
(Food establishments, milk, water, sewage, schools-environment)	
Services handled by Social Service Counselors	417

As part of an effective combined community mosquito control program, 20,000 gallons of 5% D.D.T. larvicide and adulticide were sprayed over 30,000 acres by means of ground equipment and aircraft.

Kadlec Hospital & Richland Medical-Dental Clinic

	1947	1948	% Increase
Average daily hospital census	70	90	30
Outpatient Treatments (Medical)	50,889	91,863	80
Outpatient Treatments (Dental)	19,105	36,640	91
Total medical and dental outpatient treatments	69,994	128,503	84
Daily average outpatient treatments (6 day week)		412	
Major operations		401	57
Births		775	70
(There have been no maternal deaths with 2,365 deliveries to date at Kadlec Hospital. Birth rate is 30% higher than the national rate)			
Hospital death rate		0.86%	
(This compares with a rate of 4% in good general hospitals)			

Other vital statistics:

	Total (By occurrence)	By Residence Richland	Rate/ 1000	By Residence North Richland	Rate/ 1000	Estimated State Wash. Rate	Estimated National Rate
Births	771	542	31.1	100	20	23.7	24.1
Deaths	74	56	3.2	18	1.8	11.0	10.0
Infant Mortality	13	9	16.7	1	10	30.8	34.2
Maternal Mortality	0	0	0	0	0	0.7	1.1

2

ANNUAL SUMMARY

These data are comparable with figures of previous years, as indicated below:

	1946	1947	1948
Deaths per 1000 population	3.5	2.3	3.2
Infant mortality per 1000 births	31	15	16.7
Maternal mortality per 1000 births	0	0	0
Hospital death rate	.89%	.6%	.86%
Average age Richland			31
Average age United States			33

(Age figures were supplied by Community Housing Division)

Safety, Health Instrument, Industrial Medicine, Public Health, Clinic, Hospital Management, and employee cooperation have made it possible to make the following statements:

(1) The safety record is excellent.
(2) Total absenteeism weekly employees - 2.20%, and for sickness only - 1.37% compares favorably with any plant in the country.
(3) There is no evidence to date of occupational disease or injury as a result of radiation.
(4) Infant mortality is about one-half that of the state and national average.
(5) Maternal deaths are zero with 2,365 deliveries to date.
(6) Death rate continues to be approximately one-third that of the country as a whole. (With a comparable average age of population)

Plans for 1949

On April 1, 1949, all clinical physicians will go on a wage incentive program. Under this plan, the doctor receives a basic salary plus a percentage of all gross collections above the basic salary. This is considered an interval plan to encourage each doctor to build up his individual practice.

After the doctors have had the opportunity to build up individual practices, it is planned that they will be put on private practice. The proposed date for change to private practice is April 1, 1950, assuming no major changes in the operating program here.

With the change to private practice, we are extremely anxious to maintain the unified cooperative effort and good specialty coverage which obtains at present. Under such a program the General Electric Company would rent the medical-dental clinic offices individually or as a whole to the clinic group of doctors.

Our only financial interest in the clinic under such conditions would be to collect the rent for building and equipment. However, we shall be vitally interested in maintaining the present excellent standards of medical service.

Additions to Kadlec Hospital & Clinic

Plans and specifications are ready, so that contractor bids may be requested for additions to Kadlec Hospital and erection of a second story to the Medical-Dental Building.

MEDICAL DIVISION

ANNUAL SUMMARY

The hospital plans add 62 beds and 30 bassinets to the present structure bringing the total to 151 beds and 38 bassinets. With crowding, this capacity could be increased by about 25%. The expanded hospital is designed to care for a population of 25,000 nicely and 30,000 to 35,000 with crowding. Many internal changes to increase operating efficiency are added. Dr. Herman Smith, well-known hospital consultant, has worked with us officially as consultant in planning the hospital and clinic additions. Dr. Shields Warren and Mr. Souder have also given counsel and guidance.

Every effort is being made to operate as economically as possible. Comparative studies will be made of comparable hospitals in this area in an effort to make our charges and services comparable with those having the best practices along these lines. Our accounting practices are in process of improvement.

MEDICAL DIVISION

DECEMBER 1948

General

The Medical Division roll remained practically unchanged at 522.

There was no evidence of injury to any employee during the month due to radiation.

Dr. H. M. Rosendahl of K. A. P. L. Medical Division was a visitor.

Employee physical examinations decreased by 10% to 4,500, while first aid treatments also dropped by 10% to 17,000.

Total absenteeism was 2.63%, while that due to sickness only increased from 1.41% to 1.73%, due to the usual winter increase of respiratory infections.

Seventeen major and sixty-four sub-major injuries were treated. There were ten less majors but twelve more sub-majors. Of these, one major and six sub-major injuries were sustained by G. E. employees.

The health topic of the month covered heating of the home from the health standpoint.

One wing of the North Richland Hospital was opened for bed patients on December 13th, due to extreme crowding at Kadlec.

The average daily hospital census was 101, a 5% increase over November. A small portion of this load was carried at North Richland during the latter part of the month.

Clinic visits were 5,798, a decrease of 8%, but were 73% higher than the December, 1947 figures.

Dental clinic visits decreased to 3,143, a 13% drop since one week was lost by several dentists who were taking the State Dental Board examinations.

Public health nurse home visits were up 100%. There was a sharp increase in communicable disease, especially chickenpox.

Plans for bringing the mobile X-ray unit to Richland and North Richland from April 25th to May 15th, 1949 were completed.

A central Washington Red Cross Blood Center has been established with headquarters at Yakima. Blood collections will start in Richland on April 25th.

The net cost of operating the Medical Division for November was $151,695., a decrease of $9,500. over October. Net revenue was up by $3,000., while expenses were down by $6,600.

The net expense of hospital operations for November after assessments was $27,900., a decrease of $3,000. over October, while that of the clinic was $3,500., an increase of $2,500.

1211393

MEDICAL DIVISION

DECEMBER 1948

Plant Medical Section

Physical Examinations	Nov. 1948	Dec. 1948	Year to date
Pre-employment (G.E.)	263	186	4169
Annual	525	504	3611
Sub-contractors & food handlers	3055	2708	37902
Rechecks	524	437	6693
Interval Rechecks (area)	518	538	8136
Terminations & transfers (G.E.)	107	110	7414
Army & government	14	8	283
Total	5006	4491	68211

Laboratory Examinations
Clinical Laboratory

Government	58	35	862
Pre-employment, terminations, transfers.	11057	7230	171883
Annual	3354	3197	22631
Rechecks (Area)	2840	2891	42178
First Aid	72	51	1001
Plant Visitors	0	10	22
Clinic	3845	3276	35011
Hospital	3531	3632	37607
Public Health (Inc. food handlers)	640	663	8721
Total	25397	20985	319916

X-Ray

Government	1	8	85
Pre-employment, terminations, transfers.	1881	1180	29521
Annual	543	502	3704
First Aid	354	328	3658
Clinic	409	426	4184
Hospital	286	314	2884
Public Health (Inc. food handlers)	127	107	1964
Total	3601	2865	46000

Electrocardiographs

Industrial	219	227	1627
Clinic	28	17	170
Hospital	52	43	286
Total	299	287	2083

Allergy

Skin Tests	28	31	442

MEDICAL DIVISION

DECEMBER 1948

First Aid Treatments	Nov. 1948	Dec. 1948	Year to date
Occupational Treatments	2825	2274	33440
Occupational Retreatments	9777	8226	106294
Non-occupational (Welfare) Treatments	6600	6779	73645
Total	19202	17279	213379

Absenteeism Investigation Report			
Total No. calls requested	22	22	263
Total No. calls made	22	22	263
No. absent due to illness in family	0	0	1
No. not at home when call was made	1	1	5

General

Dr. H. M. Rosendahl of Knolls Laboratory, Medical Division, was a visitor to this plant during the month.

The new first aid station in 100-H began operation and relieved the load of the two temporary stations in that area. The mobile first aid unit has been moved from 100-H to the batch plant between the two 200 Areas, and was put in operation there. The 100-DR temporary station will be moved to the 200-W construction site.

The number of examinations during December decreased from 5006 in November to 4491. First aid treatments also decreased from 19,202 in November to 17,279.

Major injuries were as follows:	November	December
General Electric	3	1
Atkinson & Jones	18	16
Nettleton-Sound	3	0
Morrison-Knudsen	0	0
McNeil Construction	4	1
Total	28	18

Sub-major injuries were as follows:		
General Electric	1	6
Atkinson & Jones	46	55
Nettleton-Sound	2	0
Morrison-Knudsen	2	0
McNeil Construction	1	3
Total	52	64

No further or delayed effects have resulted from carbon tetrachloride exposure which occurred with the construction of the DR 105 building. A study is now being made of the plans and apparatus to be used for the 100-H degreasing operations. Final approval of these plans has not yet been made.

1211395

MEDICAL DIVISION

DECEMBER 1948

The recent press release that five scientists not at this location have developed cataracts as a result of fast neutron radiation has caused no known undue alarm among employees here. Questions however have been asked, and all physicians have been advised of the true facts in these cases so that inquiries can be intelligently answered.

One court hearing was attended during the month by two staff physicians. The case concerned the death of a General Electric carpenter from a probable coronary occlusion (heart disease) which had been alleged to be due to his work. Final decision in this case has not yet been given.

The health topic for the month of December was devoted to heating and humidity control in the home. Material on this subject was distributed throughout the plant. The health activities committee discussed various aspects of the industrial medical program and selected future health topic material.

Absenteeism for the month was as follows:

Total absenteeism weekly employees all causes	2.63%
Total absenteeism weekly employees sickness only	1.73%
Total number days lost by male employees due to sickness	1199
Total number days lost by female employees due to sickness	913
Total number days lost due to sickness	2112

Lowest absenteeism was in the Manufacturing Division with 1.76% and in the Community Division with 1.99%. Highest absenteeism was in the Accounting Division with 4.07% and in the Design & Construction Division with 3.11%.

Village Medical Section

Clinic Visits	Nov. 1948	Dec. 1948	Year to date
Medical	2109	2008	18440
Pediatrics	922	776	9410
Surgical	888	718	9820
Gynecological	582	589	6439
Obstetrics (new)	90	96	1070
Obstetrics (recheck)	847	802	8386
Venereal Disease	390	375	7118
Ear, Nose & Throat	547	586	4592
Eye	282	176	3281
Visits handled by nurses(hypos, dressings).	1425	1223	14061
Night clinic visits	740	805	9246
Total	8822	8154	91863
Total clinic visits per day	339	314	295
Seen in Well-baby Clinic	281	244	2942
Home Visits			
Doctors	314	424	2940
Nurses	171	290	1971
Total	485	714	4911

MEDICAL DIVISION

DECEMBER 1948

Kadlec Hospital

Census	Nov. 1948	Dec. 1948	Year to date
Admissions	536	533	6054
Discharges:			
Surgical	146	122	1522
Medical	121	131	1266
Obstetric & gynecologic	107	116	1246
Eye, ear, nose & throat	49	58	698
Pediatrics:			
Children	27	47	519
Newborn	61	73	778
Total Discharges	511	547	6039
Patient Days	2881	3122	32891
Average Stay	5.3	5.8	5.4
Average daily census	96.0	100.7	89.8
Discharged against advice	2	7	41
One-day cases	90	87	998

Operations

Transfusions	72	53	527
Eye, Ear, Nose & Throat	41	39	382
Dental	1	1	15
Casts	21	24	242
Minors	70	65	745
Majors	78	53	631

Vital Statistics

Deaths	7	10	52
Deliveries	66	71	775
Stillborn	1	0	7

Physio-therapy Treatments

Clinic	80	150	1448
Hospital	53	97	825
Industrial:			
Plant	291	355	4280
Personal	52	60	608
Total	476	662	7161

Pharmacy

Number of prescriptions filled	3415	3944	37927

MEDICAL DIVISION

DECEMBER 1948

Patient Meals	Nov. 1948	Dec. 1948	Year to date
Regulars	3404	4222	42403
Lights	124	147	835
Softs	1429	1580	17936
Surgical Liquids	99	72	1068
Tonsils & Adenoids	105	118	1058
Specials	1536	1336	11242
Liquids	277	319	4201
Total	6974	7794	78746

Cafeteria Meals			
Breakfast	2	6	121
Noon	2691	2709	30711
Night	346	336	4199
Total	3039	3051	35031

Nursing Personnel		
First aid nurses	53	52
Clinic nurses	18	17
Public health nurses	13	13
Hospital general nurses	82	82
Aides and orderlies	56	57
Total	222	221

General

Clinic visits totalled 5,798, a decrease of 8% over the previous month, but 73% higher than a year ago.

One wing of North Richland Hospital was opened for bed patients on December 13th due to the extreme crowding at Kadlec Hospital.

Hospital patients admitted at both units totalled 533, which is approximately the same number as for the previous month. Admissions were 75% higher than December, 1947. The average daily census was up 5% to 101.

The net cost of hospital operations was approximately $22,000., a decrease of almost $3,000. over October. Salaries remained constant. Supplies and other expenses decreased about $4,000. Transferred charges from other divisions decreased about $1,000. Revenues decreased by about $3,000. The decrease in income is due to the reduction in laboratory and X-ray work done by the hospital for the Industrial Medical Section.

The net cost of clinical operations was $8,000., an increase of $4,000. over October. Salaries increased $7,000. No additional personnel was hired. The increase is due to the fact that a percentage of the salaries of the pediatricians, obstetricians and dentists was formerly charged to the Industrial Medical Section, and is now being charged to the clinic. Supplies and other expenses remained about the same. Transferred charges from other divisions increased about $2,000. Revenues increased $5,000.

General(Continued)

Total personnel on the active rolls decreased from 525 to 522. There were 12 unfilled requisitions in November. In December there were 19 unfilled requisitions. This made a net increase of 4 employees.

Public Health Section

Administration	Nov. 1948	Dec. 1948	Year to [illegible]
Newspaper Articles	35	25	240
Committee Meetings	3	4	41
Attendance	66	26	253
Staff Meetings	8	9	53
Lectures & Talks	0	0	38
Attendance	0	0	2191
Conferences	20	36	173
Attendance	70	70	471
Radio Broadcasts	0	0	3

Immunizations			
Cholera	0	0	3
Diphtheria	183	45	2681
Influenza	41	12	255
Rocky Mt. Spotted Fever	0	0	45
Schick Test	0	0	1
Smallpox	54	11	889
Tetanus	53	0	325
Typhoid	2	0	670
Whooping Cough	0	0	332
Total	333	68	5201

Social Service			
Cases carried over from previous month	61	77	
Cases admitted	28	18	378
Total	89	95	
Cases closed	12	13	296
Remaining case load	77	82	82

Sources of referrals:		
Public health	9	3
Doctors	7	5
Hospital	1	0
Interested Person	1	1
School	1	0
Personnel office	1	0
Personal application	2	1
Other agency	6	4
Housing	0	1
Newspaper publicity	0	2
Industrial relations	0	1
Total	28	18

Social Service (continued)

Admissions to service decreased 35% over the previous month, but were 20% higher than a year ago.

Sanitation	Nov. 1948	Dec. 1948	Year to date
Inspections made	381	340	3?5?
Bacteriological Laboratory			
Treated water samples	259	261	2893
Milk samples (Inc. cream & ice cream)	109	111	1634
Other bacteriological tests	328	257	4333
Total	696	629	8865
Communicable Diseases			
Chickenpox	42	113	257
German Measles	10	11	116
Gonorrhea	32	29	264
Impetigo	0	4	20
Influenza	0	0	74
Measles	0	3	755
Meningococcic Meningitis	0	0	2
Mumps	4	3	994
Pediculosis	0	0	8
Pinkeye	5	6	27
Poliomyelitis	0	0	1
Ringworm	8	2	18
Scabies	5	6	51
Scarlet Fever	7	9	34
Syphilis	38	28	370
Thrush	0	0	2
Tuberculosis	1	1	14
Vincent's Infection	3	0	16
Whooping Cough	1	0	49
Malaria	0	0	1
Typhoid	1	0	1
Food poisoning	0	0	7
Total	157	215	3081
Total number nursing field visits	781	1512	14662

12 **General**

During the month there was a sharp increase in communicable disease, especially in chickenpox. There was also one death with chickenpox as a contributing factor. The total number of home nursing calls increased 100%.

General (continued)

Plans for bringing the mobile x-ray unit to Richland from April 25 to May 15, 1949 were completed.

The Central Washington Red Cross Mobile Unit will be in Richland to collect blood for the blood center on February 8th.

As a result of recommendations from the School Health Council, a room in one of the school buildings has been decorated and appointed according to the principles of the Harmon Technique for school room lighting.

Several meetings have been held with representatives of the Adult Vocational Training Program of the State of Washington pertaining to the instigation of a culinary workers training program for Richland and North Richland.

Dental Section	Nov. 1948	Dec. 1948	Year to date
Patients treated.....	3600	3143	36640

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MEDICAL DIVISION PERSONNEL SUMMARY

Dec. 31, 1948

AREAS	Physicians	Dentists	Nurses	Aides & Orderlies	Technicians	Office Workers	Others
100-DR			4				
100-H			3			1	
234-5			3				
White Bluffs			2				
Pasco			0				
101			1				
3000	11	2	13	11	10	32	14
100-B							
100-D			5		2*	1	
100-F					2*		
200-E			3		2*	2	
200-W			3		2**		
300			2		2**	1	
Plant General	7		19				
700-1100	21	10	106	46	25	92	70
Total	39	12	164	57	37	129	84

Grand Total - 522.

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* One day per week.
** Two days per week.

No. of employees on payroll:

Beginning of month	525
End of month	522
Net decrease	3

HEALTH INSTRUMENT DIVISIONS

DECEMBER 1948

Summary

The force increased by four. Five Class I Special Hazards Incidents were investigated. None of these involved significant radiation exposure.

Survey findings in the Operational Division indicated increased frequency of contamination of personnel and work areas.

In the Control and Development Division, analytical results on samples of water, air, and vegetation, were comparable to previous findings. A re-sample in the urine analyses for plutonium showed a positive result of 0.65 d/m, though this may be due to a low spike yield. The maximum uranium content found in the urine of the 300 Area workers was 316 μg/liter.

In Biological Monitoring, some relatively active rabbit thyroids were noted as well as highly active Russian thistle. Programs of the various Biology Division groups gained some in their scope of planned activity as requested by the Medicine and Biology Division, Atomic Energy Commission, despite acutely inadequate laboratory facilities.

HEALTH INSTRUMENT DIVISIONS

DECEMBER 1948

Organization

The composition and distribution of the force as of 12/31/48 was as follows:

	100-B	100-D	100-F	200-W	200-E	300	700	P.G.	Total
Supervisors	1	1	3	8	4	17	5	0	39
Engineers	4	5	8	18	13	7	1	0	56
Clerical	0	0	1	1	0	3	5	0	10
Others	11	15	17	59	34	56	12	6	210
Total	16	21	29	86	51	83	23	6	315

This represents an increase of 80 people, or 34 percent during the year.

Number of Employees on Payroll	December
Beginning of Month	311
End of Month	315
Net increase	4

Additions to the roll were one technical graduate, two laboratory assistants, and four general clerks. Two general clerks terminated, and one was temporarily removed from the payroll.

General

The rate of active particle deposition on catching frames in the Plant areas was about the same as that prevailing in mid-year. The concentration of particles as measured by air filtration devices was lower than before. The reason for this apparent discrepancy has not been found.

Lively interest in the General Electric Company 9-Point Job Improvement Program contirued. Several representatives of other Divisions subjected themselves to a barrage of questions from the H. I. Divisions supervisors.

Health Instrument Divisions

H. M. Parker attended the Meeting of the Radiological Society of North America in San Francisco, with which was combined a restricted discussion on massive radiation exposures for the benefit of the Armed Forces program, and several meetings of sub-committees of the National Committee on Radiation Protection. The massive exposure discussions were characterized by widely divergent opinions from national experts. It was noticeable that those who had contact with the Atomic Energy Commission's program were decidedly more conservative than others, presumably as a result of animal experimentation which has shown damage at progressively lower levels through the history of the Project. Although the National Committee on Radiation Protection has made progress in its deliberations, it now seems that it will be three months before final reports can be issued. This handicaps the publication of any revised policy at Hanford; in the meantime, conservative approach indicates that Hanford should immediately accept those values which will almost certainly be reduced, while maintaining present standards in those cases where there may be an increase in permissible exposure.

Five Class I Special Hazards Incidents were investigated. Two involved contamination spread, two the improper attention to recommendations and instructions on Special Work Permits, and one failure to follow standard procedure. In none of these cases was there a significant radiation exposure.

During the period covered by this report, all persons in the Health Instrument Divisions 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
E. M. Parker	"Possible Improved Method for the Detection of Trace Amounts of Long-lived Alpha Emitting Substances, in the Presence of Radium and Thorium Decay Products in the Atmosphere".
R.J. Wyckoff and M.F. Scoggins	" Template "

Annual Summary

Thirty-nine Class I and two Class II Special Hazards Incidents were investigated during the year. One of the Class II incidents concerned an overexposure to the hand during sampling, and the other covered four overexposures in the Melt Plant. Sampling procedure was altered to prevent recurrence of the first incident, and the entire Melt Plant operation was critically studied to evaluate the radiation hazards, and to effect necessary improvements. Excretion of uranium in the urine of Melt Plant operators continues to be significantly higher than in all other cases, and further detailed study of this operation is clearly needed.

During the year, a record total of 1,692,224 pencil readings was made. Included were 38 significant readings between 100 and 280 mr. None was confirmed by the badge result. One hundred forty-two readings above 280 mr were reported, again with no confirmation by the badge result. Seventy-three readings were lost due to lost or damaged pencils. Some of these were coincidental with the lost badge reading, thus producing a gap in the exposure record of the individuals concerned. All such cases were carefully investigated and no evidence of significant exposure was obtained.

One hundred eighty-five thousand, one hundred fifty-nine badge results for Construction personnel and 267,412 for Operating personnel were registered. This was a 60% increase over the previous year, despite a change to a two-weekly schedule in April. This two-week schedule was forced by the rapid expansion of the plant, and was twice submitted to the Atomic Energy Commission for confirmation or denial, which has not been forthcoming. It appears to be an entirely satisfactory method of recording exposures where these have been shown by past experience to be normally low. Nevertheless, the new regulations of the National Committee on Radiation Protection, if published as now written, will specifically preclude this method of operation. How the Hanford system can be returned to a one-week schedule in the absence of budgeted funds for this purpose will be one of the problems for 1949. For Operations personnel there were 8,277 badge readings between 100 and 500 mrep, of which 2,618 occurred in the 300 Area. There were also fifty readings above 500 mrep, and these were confined to the 300 Area Metal Fabrication program. These clearly indicate the substandard protection offered in this area in comparison with standard Hanford practice. The readings of 111 badges were lost, with 35 of these attributable to processing faults. The processing loss was thus 0.008 percent, probably as close to perfection as can be expected.

For the Construction forces, there were 828 readings between 100 and 500 mrep, and 75 above 500 mrep. All these are based on the two-week period. This is a very high total of significant readings, and fully justifies the Health Instrument Divisions insistence that the Construction forces should be covered by a badge program. Many of these exposures arose from the use of X-radiation for radiography in the field.

Health Instrument Divisions

There were 429,163 alpha hand scores and 562,166 beta hand scores recorded. About 1 in 335 of the alpha, and about 1 in 430 of the beta, scores were high. Difficulty was experienced in reducing scores in the 300 Area and investigation disclosed the cause was uranium contamination on protective clothing. When this was corrected the "attempt failed" scores dropped again to zero. No attempt at reduction was recorded in about 24% of the high alpha scores and about 37% of the high beta scores; these again were largely uranium contamination in the 300 Area.

Thyroid checks for accumulation of I^{131} fell to 3637, all with no positive result. Analyses for radioactivity in the urine more than tripled to a total of 13,476. In these there was no confirmed positive result for plutonium in the urine* there was no significant elimination of fission products; transient elimination of pile activation products was noted following a known exposure; significant though presumably not dangerous amounts of uranium were frequently found in the urine of Metal Fabrication Plant employees.

Considerable time and effort was given by all the H.I.Divisions to attacks on the radioactive particle problem, arising from the widespread dissemination of active particles from the process stack. The number of particles emitted increased rapidly throughout the year until the sand filters were interposed in the gas stream. It was determined that the radiation hazard, if any, was confined to that of inhalation of the particles. At the close of the year, there was evidence supporting the conclusion that no employee could have been injured by inhalation of the particles, but such evidence was partially inconclusive, and in any case not capable of direct proof at this time.

In review, it appeared reasonably certain that another year had passed without significant general body exposure or local external exposure to any individual, and that no serious ingestion or percutaneous transmission of active material had occurred. There must be some reservation with respect to a similar statement for inhalation of active material.

Service work of the organization was maintained with only minor improvement in quality, but a quantity increase of 40 percent. This was done with an increase of only 6 percent personnel in the service functions. Failure to obtain laboratories for biological work and for general development programs again retarded the advancement of the Health Instruments art. Near the end of the year, funds totaling $2,000,000.00 had been allocated to construct and equip such laboratories. This compared with a requested allocation of $6,700,000.00. The Divisions are currently investigating the possibility of converting existing buildings into laboratories in which the planned program can be done at reduced cost.

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* At the year end, one sample still subject to doubt and to be further analyzed.

OPERATIONAL DIVISION

100 Areas

General Statistics

	November				December				1948
	B	D	F	Total	B	D	F	Total	Total
Special Work Permits	637	683	939	2259	563	667	762	1992	24,928
Routine & Spec. Surveys	431	386	531	1348	420	491	499	1410	13,246
107 Effluent Surveys	92	77	40	209	90	78	105	273	2,179
Air Monitoring Samples	189	41	129	359	164	43	100	307	*

* Included with Routine and Special Surveys until July, 1948.

Retention Basin Effluent

The activity of the water leaving the retention basin was as follows:

	100-B	100-D	100-F
Power Level	275	275	275
Average beta dosage rate (mrep/hr)	0.7	1.0	1.2
Average gamma dosage rate (mr/hr)	2.0	2.2	2.4
Average total dosage rate (mrep/hr)	2.7	3.2	3.6
Average integrated dose in 24 hours (mrep)	65	77	86
Maximum integrated dose in 24 hours (mrep)	72	98	103*
Maximum integrated dose in 24 hours - 1948 (mrep)	94	115	110

* The effluent water from the retention basin exceeded 4.1 mrep/hr for one day during the month, but dilution at the 1904 flume maintained the exposure rate below 4 mrep/hr at that point.

100-B Area

A ruptured uranium piece was removed from process tube #0569 and taken to the viewing pit for inspection. The end cap was found missing and was later located among the other pieces discharged from the tube. The cap was recovered and preserved for further study in a lucite and lead shield. All operations were carried out with no over-exposure to personnel. Water samples taken from the tube, header, and near the discharged piece were analyzed by the H. I. Methods Laboratory and gave concentrations as high as 786 d/m/liter for alpha and 2 x 10^2 µc/liter for beta.

A member of the Pile Technology Division contaminated a small area on the palm of his left hand during work at the "B" Experimental Hole. The

original hand check jammed the 5-fold counter, and after repeated washings with Lanokleen soap, the uncorrected surface dosage rate was 6 mrep/hr. Further washings with TiO_2 had little effect, but treatments with $KMnO_4$ and $NaHSO_3$ reduced the count below the 5-fold warning level.

A three inch section was cut from the tip of the #27 Vertical Safety Rod. After start-up, a fast neutron survey showed a flux of 650 $N/cm^2/sec.$ at the bumper plate and 400 $N/cm^2/sec.$ on the floor at the rail. Slow neutron fluxes were not appreciably increased.

Contamination was spread from the Experimental Level to the stairs and to the floor near the outside door of the building. Other contamination was spread to the truckbed and burial ground during transfer of equipment from the 100-F area.

High gas activity in the work area and corridor continued to be a problem. On several occasions the 5-fold counter in the work area corridor jammed due to this activity.

100-D Area

The contaminated boxcar (see last report) was thoroughly surveyed and all contaminated parts removed. Following repairs, the car was given an unconditional release.

High dosage rates were observed at the front and rear nozzles of tube #4561 while poison was being discharged after the extended shutdown. The activity continued during pile operation and was found to be caused by a perforated aluminum dummy which had inadvertently been charged into the tube sometime before.

A special sample of dirt from the concrete apron under the discharge elevator was submitted to the Methods Laboratory for analysis. Analyses showed 5000 d/m/gram of sample due to alpha from Polonium and 4.2 μc/gram of sample due to beta. The beta activity was due to the following components; 54% Fe, 15% Zn, 7% Zr, 12% Rare Earths, and 5% Cu. The source of the contamination could not be determined.

During the transfer of two Vertical Safety Rods and guides from the top of the pile to the burial ground, contamination was spread to the work area corridor.

100-F Area

A "P" Division operator became generally contaminated up to 500 c/m when he was splashed with water while attempting to correct a water leak at the end cap of tube #1559. His person was easily decontaminated but his clothing was removed for subsequent washing and survey.

Health Instrument Divisions

An experimental rod guide was installed in the "A" Experimental Hole in order to determine the shielding effectiveness of the guide. The fast neutron fluxes obtained with two different rods in the guide were 9600 $N/cm^2/sec.$ and 12,000 $N/cm^2/sec.$ respectively. Gas activity with the guide in place was as high as 2.2 rep/hr.

The gamma intensity of the beam at the top, far edge of the pile increased to greater than 1 roentgen/hr. at the neoprene seal. The dosage rate in the beam through the wall on the 50' level roof was 40 mr/hr.

On two separate shutdowns, shoe contamination was observed following work in the discharge area. All shoes were successfully decontaminated. One case of hand contamination was observed following work in the Discharge Elevator Machinery Room. The hands were easily decontaminated.

Health Instrument Divisions

200 Areas, T and B Plants

General Statistics

	November			December			1948
	T	B	Total	T	B	Total	Total
Special Work Permits	351	462	813	414	441	855	9280
Routine & Special Surveys	513	273	786	572	244	816	7762
Air Monitoring Samples	671	591	1262	625	508	1133	12042
Thyroid Checks	89	79	168	64	38	102	3637

Canyon Buildings

In the T Plant, the 18-2 and the 7-2 centrifuges were interchanged remotely; air samples taken during this period showed a maximum of 2 x 10^{-9} µg Pu/cc. Significant air contamination was detected at Section 13 during normal operation, with a maximum concentration of 1.5 x 10^{-5} µc f.p./liter, which appeared to be at this section of the canyon only as samples at Section 6 did not show comparable concentrations. Due to these uncertain air conditions, masks were required for all canyon entry. High radiation levels on 13-4 samples required monitoring by H. I. on eleven occasions. Dosage rates on trombones used were as high as 45 rep per hour surface including 4 roentgens per hour at 2", and the samples involved were disposed of in the laboratory with maximum exposure rates of 3 rep per hour. Locks in the jacket of the 17-1 tank were welded in place with a maximum exposure rate of 200 mrep/hr. Although gross product contamination was encountered, none was spread to personnel or the deck. Contaminated equipment was removed from the canyon to the burial ground in boxes on a flatcar. The work was done with a maximum exposure rate of 1.5 rep per hour, and the maximum dosage rate measured was 5 roentgens per hour at three feet from a box containing an 8-2 centrifuge. This box bumped the tunnel door upon removal and caused the spread of general low level contamination in the railroad cut, which was cleaned. The 7-4 port showed a dosage rate of 18 rep per hour including 500 mr/hr at 2", and the 7-1 port showed a dosage rate of 6 rep per hour including 140 mr/hr at 2". They were cleaned with a maximum exposure rate of 1.5 rep per hour.

In the B Plant, the 3-5L and 4-5L dissolver tanks were interchanged because of an apparent leak from condenser to tank in the 4-5L dissolver. Although cell 3L had not been used up to this time, connectors removed showed a maximum dosage rate of 2 rep per hour surface including 80 mr/hr at 2", and the 3-5L tank showed a dosage rate of 18 mr/hr at 2". The 6-1 sampler jet assembly was replaced under well controlled conditions. Dosage rates encountered included greater than 35 rep per hour over the open well, and 25 rep per hour surface including 500 mr/hr at 2" on the riser when removed. Gloves checked and changed routinely during the work showed surface dosage rates of 50 mrep/hr, maximum. An operator slipped and fell on the canyon deck,

bumping a bucket of contaminated acid, causing some acid to splash on his neck. After immediate washing, the neck showed 8000 c/m f.p. which was removed by a shower. Analysis of the acid showed 0.2 μc f.p./ml and 300 d/m alpha/ml. Maintenance work on a jet at Section 16 caused deck and protective paper contamination of up to 5 rep per hour surface, and an estimated 10 μg Pu. Boots worn showed up to 50,000 d/m. After removal of paper and hosing of the deck, three spots of about 10^6 d/m each were noted and yielded smears of up to 500,000 d/m. Further decontamination is in progress. On 12/29 a spot survey showed general product contamination on the deck at sections 16R and 17L with an estimated six μg Pu present. An attempt to unplug a 17-1 dip tube caused deck contamination of greater than 4,000,000 d/m. Considerable cleaning was done to reduce contamination in the canyon entrance stairwells. The R-9 stairwell was cleaned from a maximum reading of 80,000 c/m to 4000 c/m. A step-off mat with a dosage rate of 50 mrep/hr surface including 10 mr/hr at 2" was discarded and replaced. Stairwell contamination is attributed to laundry removal operations, and the need for improved handling methods is indicated. The 9-1 weight factor line in the Pipe Gallery was opened and showed a reading of 95,000 c/m. Connector #44 at Section 3 of the Pipe Gallery showed 4000 c/m gamma before opening, and 600 mrep/hr surface including 9 mr/hr at 2" when the line was opened. A total of 34 canyon air samples showed significant concentrations. A series of high level samples with a maximum concentration of 5.4×10^{-5} μc f.p./liter with no apparent cause over a period of about 36 hours led to the discovery that the drive belts of the #1 and #2 ventilating fans were slipping. The maximum product air concentration of 1.1×10^{-8} μg Pu/cc occurred when cell 17L was open.

Control Laboratories

In the T Plant, 217 items, not regulated with respect to handling, were found contaminated on surveys by Technical and Health Instrument Division personnel. In addition, 63 contaminated floor locations were reported. Four cases of fission product and eight cases of product hand contamination were reported and all were successfully cleaned. This significant decrease in the incidence of hand contamination is directly attributable to the wearing of surgical rubber gloves for all radiochemical operations during the entire month. The increase in number of not regulated items reported may be ascribed to increased surveys on the part of Health Instrument Division personnel.

In the B Plant, 285 items, not regulated with respect to handling, were found contaminated on surveys by Technical and Health Instrument Division personnel. In addition, 87 contaminated floor locations were reported. Twenty-four cases of fission product and twenty-six cases of product hand contamination were reported, and all were successfully cleaned. The increase in incidence of hand contamination may be partially attributable to the careless handling of laboratory gloves, as several pairs of both cotton and rubber gloves were found contaminated up to 50,000 d/m. The advisability

of discontinuing the policy of releasing acid bottles to the vendor for refill should be considered. Among the positive results obtained when these items were surveyed for release, were two bottle caps and a bottle showing a total of 57,000 d/m. This problem may be solved in the near future with the installation of an acid dispenser.

Concentration Buildings

In the T Plant, approximately 150 µg Pu was reported in E Cell with the maximum reading of 3,000,000 d/m on the top of the E-4 tank. A portion of this total was found on the cell floor where it was subject to tracking. Spread of product contamination through the pipe gallery, sample rooms, and stairways of the building was reported, apparently resulting from a spill during sampling in the B Sample Room. The contaminated locations were cleaned. Gross product contamination spread in the F-10 chained area, F-10 room, and the adjacent clothing change room was detected as a result of the discovery of personal shoe contamination and was cleaned. No specific cause of this incident was determined, but additional surveys showed contamination on the tops of PR and RC cans stored in F-10 as well as on the top of the Poppy instrument assigned to that location. Floor contamination was detected in the Locker Room, Wash Room, Hallway and Shower Room, with the maximum reading of 150,000 d/m occurring in the Shower Room. This apparently resulted from tracking by an operator's shower sandal which showed 500,000 d/m on a subsequent survey. It is postulated that the original cause could have been from drippage from an F-1-PS sample carrier when carried through the hallway. Decontamination of these areas is currently in progress.

In the B Plant, following maintenance work on the E-2 centrifuge, product contamination of about 3 µg was reported in the E Sample Room, and subsequently cleaned. After twenty-one items (principally sample risers and riser caps) were found contaminated in all five sample rooms, with readings from 1000 to greater than 40,000 d/m, it was deemed advisable for S Division personnel to self-monitor all sampling with an alpha detection instrument. Significant reduction in Sample Room contamination as found on H. I. surveys was noted since this policy was instituted.

Stack Areas

In the B Plant, slippage of the drive belts of the #1 and #2 fans was corrected with a maximum exposure rate of 640 mr/hr. No significant progress was made in the general decontamination of the fan area, as personnel were not available for this work. Several small test areas were decontaminated with various substances in an endeavor to determine the most efficient methods. Dosage rates up to 17 rep per hour surface, including 1.5 roentgens per hour were encountered, but the work was done with a maximum exposure rate of 300 mrep/hr. Ground contamination of 60 mrep/hr at 1" was noted at the location of the exhaust of the inlet air sampler steam jet, and this exhaust has been directed through a small sand filter. At an

H. I. check point on the inlet duct to the sand filter, the dosage rate has increased from 56 to 70 mr/hr at 2" between the 16th and the 29th of December.

Waste Disposal Areas

In the T Plant, as a check for possible ground contamination in preparation for the tie-in to the TX tank farm, test holes were dug in the vicinity of the 151-T and 152-T diversion boxes and no contamination found.

In the B Plant, a jumper installation in the 153-B diversion box diverted the flow of second cycle and stack drain waste from the 110-B series to the 104-B series. 104-B and 105-B are empty except for sludge, and 106-B is being currently emptied into the second cycle crib. A thistle plant in the B-3 Danger Zone showed a surface dosage rate of 425 mrep/hr including 25 mr/hr at 2", and clippings taken for analysis by the H. I. Radiobiology Division showed dosage rates of 125 mrep/hr surface including 4 mr/hr at 2".

General

All thyroid checks were below the warning level.

In the T Plant, radioautographs of 84 dustfoe filters showed 17 particles, with a maximum estimated individual activity of about 10 μμc. Radioautographs of air sample filters from the process buildings showed the following particle counts:

Building	Approx. Cubic Ft. of Air Sampled	Particles
221-T Galleries	42,000	6
224-T	33,000	1
222-T	35,000	88
221-T Canyon (Cells Closed)	40,000	528
221-T Canyon (Cells Open)	4,800	1075

The Isolation Building

General Statistics

	November	December	1948 Total
Special Work Permits	33	58	439
Routine and Special Surveys	302	230	3150
Air Monitoring Samples	230	811	4088

Air Monitoring

There were 735 spot air samples taken, of which 45 were above 10^{-11} μg Pu/cc. Twenty-three of these were in cell #4, most of them taken during normal operations. Assault masks were worn in the cell during portions of the

month when it was known that the air concentration exceeded tolerable limits. The maximum concentration was 4.9×10^{-9} µg Pu/cc and masks were worn. However two samples were obtained during periods when masks were not worn which exceeded 5×10^{-10} µg Pu/cc, and those concentrations were 1×10^{-9} and 4.2×10^{-9} µg Pu/cc. Spot samples are being run continuously in Cell #4 to detect off-standard conditions as soon as possible. The sealing of all floor drains in the cell was done but two significant samples were obtained with all drains sealed. Work is continuing in an effort to determine the cause of these more or less random high air samples. Four significant samples were obtained during slurping operations in Room 6-C and masks are now specified for this work. The maximum concentration at this location was 1.1×10^{-9} µg Pu/cc and assault masks were not worn at that time.

Three of the 61 continuous Little Sucker samples showed significant concentrations of 1.3, 1.4, and 8.7×10^{-10} µg Pu/cc and all occurred in Cell #4. Twelve samples of the 903 exhaust system air showed 6×10^{-12} µg Pu/cc as a maximum concentration.

Surface Contamination

A total of 335 items, not regulated with respect to handling, was found contaminated on surveys by Technical, Health Instrument, and S Division personnel. Seventeen items above 20,000 d/m were reported, and three of these were above 80,000 d/m. A total of 43 incidents of floor contamination were reported, 38 of which originated in the laboratories and 5 of which originated in the operating cells. The maximum amount involved in an incident was about 0.7 µg Pu in Room 35.

All thirteen cases of product skin contamination were successfully cleaned. The maximum individual amount involved was about 0.05 µg Pu.

The AT tank in Cell #4 was changed successfully on the second attempt. The first attempt failed due to improper tank top hole alignment. Slight wrist contamination was noted on an operator following this job which was easily cleaned, and several floor spots of about 5000 d/m were found and cleaned after the protective paper was removed. On the second attempt, no spread of contamination was detected.

Another tank was installed in the sump pit with no spread of contamination detected. This arrangement will allow separate handling of "S" and Technical Divisions waste solutions.

Gamma Radiation

P. R. Container	12 mr/hr (maximum)
Process Hood	4 mr/hr (maximum)
S. C.	5 mr/hr (maximum)

Laundry Monitoring

A total of 36 spot air samples and 42 continuous Big Sucker air samples was taken during Plant Laundry operations. The maximum concentration, calculated as uranium, was 1.2×10^{-4} µg U/cc at washer #2 during the washing of clothing from 300 Area operations.

The 300 Area

General Statistics

	November	December	1948 Total
Special Work Permits	146	244	3176
Routine & Special Surveys	210	127	1715
Air Monitoring Samples	391	187	1639

Metal Fabrication Plant

Twenty-eight of 44 air filter samples taken were above 5×10^{-5} µg U/cc as follows:

Location	No. Taken	No. Above 5×10^{-5} µg U/cc	Max. Conc. (µg U/cc)	Conditions
Melt Plant	15	13	1.8×10^{-3}	In furnace room-burnout exhaust not operating.
Other parts of 314	3	3	3.9×10^{-4}	By automatic-operator's position
Outside 314	6	4	1.3×10^{-4}	By exhaust of vacuum cleaner
Chip Recovery	14	3	1.1×10^{-4}	At press-during operation
R. R. Cars	6	5	2.9×10^{-3}	Near floor-during unloading

Technical Building

All air samples taken in rooms 4A, 8, 31, 33, 35, 36, and 38 were less than 5×10^{-5} µg U/cc. Two air samples taken in product work zones were above 2×10^{-11} µg Pu/cc, the maximum concentration being 5.8×10^{-11} µg Pu/cc in room #98.

High level radiation was encountered in room 98 while working with a zirconium sample. Surface dosage rates as high as 34 rep/hr were obtained on the sample and personnel were exposed for short periods to 1.25 rep per hour. A special cask containing a sample of titanium was opened in room 37. Personnel were exposed to a maximum of 300 mrep/hr.

A fire in room 8 activated the sprinkler system and caused water contaminated with uranium to flow into the hall and adjacent rooms. Samples of the water from the floor showed a maximum concentration of 1 mg U/liter. All water was flushed down the floor drains and a subsequent survey of all areas showed no contamination above 500 d/m.

Cold Semi-Works Building

Six of 70 air samples taken were above 5×10^{-5} µg U/cc, the maximum concentration being 1.5×10^{-4} while unloading the centrifuge in A-cell. About 283 lbs. of Uranium has been discharged to the 300 Area Pond and about 60 lbs. cribbed at the 300 North Area.

Calibrations Buildings

A Po-Be source and a Po-B source were canned in the 3745 Building. Some polonium contamination was spread to the trays used during this work, but there was no personnel contamination reported.

Plant General

A total of 88 frames exposed on the reservation and at Benton City and Pasco showed a deposition rate of 2.2×10^{10} particles per month. Frame studies completed in the 200 Areas during the month indicated deposition rates of 1×10^{8} particles per month in 200-W and 1.8×10^{8} particles per month in 200-E.

Eight particle traps exposed off-project during October and November showed the following results when studied.

Location	Psf/Mo	Location	Psf/Mo
The Dalles, Oregon	.85	LaCrosse, Wn.	.54
Arlington, Oregon	.57	Washtucna, Wn.	1.33
Moacham, Oregon	3.82	Pomeroy, Wn.	1.35
Stampede Pass, Wn.	.88	Lewiston, Idaho	2.64

Particle inhalation, estimated by the use of filters, showed the following results at certain key locations. (October and November results are included for comparison)

Health Instrument Divisions

Location	Inhalation rate particles per month* October	November	December
200 East Area Gatehouse (outside)	30	3	.3
200 East Area Gatehouse (inside)	6	1	.4
B Plant Excl. Gatehouse (outside)	45	10	1.0
200 West Area Gatehouse (inside)	35	1	1.0
200 West Area Gatehouse (outside)	50	2	1.0
T Plant Excl. Gatehouse (outside)	30	1	1
3 ft. Level Meteorology Tower	10	3	1
150 ft. Level " "	25	4	1
250 ft. Level " "	50	3	1
400 ft. Level " "	40	3	1
100-F Area	4	1	1
100-D Area	3	1	1
100-B Area	4	1	None
Benton City	5	1	1
Richland	5	1	None

Air samples taken inside various 200 Area buildings showed the following estimated particle inhalation rates:

Location	No. Samples	Particles Inhaled per Mo.* Nov.	Dec.
2707E-A Site Survey	5	2	1
East Area Maintenance Shop	5	6	1
West Area Maintenance Shop	5	2	1
222-T Hall	5	3	5
224-T Air Conditioning Room	5	1	1
622 Meteorology Building	5	2	1
2704-E Administration Bldg.	5	3	1
222-B Hall	5	4	5
B Plant Operating Gallery Sec.11	5	3	2
West Area Garage	5	2	1

* Rounded off to nearest whole number.

Air samples taken in off-area locations showed the following results:

Location	Particles inhaled per Month Dec.	Average	Months Sampled
Spokane, Wn.	0*	.8	4 *Machine not operating properly.
Walla Walla, Wn.	0	0	1½
Stampede Pass, Wn.	0	.1	3
Boise, Idaho	.2	.3	2
Meacham, Ore.	.2	.3	2
Klamath Falls, Ore.	.2	.7	2
Great Falls, Mont.	0	0	2
Bellingham, Wn.	.2	.1	2
Lewiston, Idaho	.2	.5	3
Mullen Pass, Idaho	3.0	1.6	4

12 | 4 | 8

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An air sampler, adapted from a car heater motor, was operated from Pasco to Sprague and back to Connell, Washington sampling about 1300 cu. ft. of air. No particles were found.

Hand Score Summary

There were 37,400 alpha and 45,144 beta hand scores recorded. About one in 345 alpha and one in 750 beta scores were high. No attempt at reduction was recorded in 6 high alpha and 18 high beta scores. The record shows decontamination failed for one high alpha score in the 300 Area.

Health Instrument Divisions

PERSONNEL METERS

	100-B	100-D	100-F	E&N 200	200-W	300	Total	1948 To Date
Poncils								
Total Poncils Read	12,788	12,887	14,646	32,002	47,395	42,179	161,897	1,692,224
No. of Single Readings (100 to 280 mr)	25	33	20	46	79	73	276	4,894
No. of Pairod Readings (100 to 280 mr)	0	0	0	0	1	2	3	38
No. of Single Readings (Over 280 mr)	20	28	34	55	98	105	340	9,761
No. of Pairod Readings (Over 280 mr)	0	0	0	0	2	4	6	142
Pairod Readings Lost	1	1	1	2	1	3	9	73

No significant poncil result was confirmed by the badge result. Investigation of lost readings where required showed no possibility of an overexposure.

Health Instrument Divisions

Badge Resume, Construction Areas

	105-DR	241-TX	115-KV 384	241-BY	Total	1948 To Date
Badges Processed	9,856	7,123	650	786	18,415	185,159
No. of readings (100 to 500 mrep)	13	5	0	0	18	828
No. of readings (Over 500 mrep)	0	0	0	0	0	75
Lost Readings	4	4	0	0	8	125

Lost readings were occasioned as follows:

Badge lost in area	3
Damaged packet	1
Exposed to heat	1
Light leak	1
Overdeveloped	2

Badges

	100-B	100-D	100-F	200-E	R.R.T. 200-N	200-W	300	Total	1948 To Date
Badges Processed	2,793	2,160	2,068	2,586	369	3,570	8,455	22,001	267,412
No. of readings (100 to 500 mrep)	1	8	8	9	1	9	215	251	3,277
No. of readings (Over 500 mrep)	0	1	0	0	1	3	0	5	50
Lost Readings	1	2	2	0	0	0	1	6	111

The results of over 500 mrep were due to contaminated badge (3), light leak (1), and stuck film (1). There were nine results in the 300 Area above 300 mrep per week with a maximum of 370 mrep recorded.

Lost readings were accounted for as follows:

Badge dropped in caustic	1
Badge lost in Area	4
O.W. exposed to X-ray	1

Badges processed, 1948	-	Operations	267,412
" " "		Construction	185,159
		Total	452,571

In addition, 2,698 items of non-routine nature were processed. The 1948 total of such items was 25,178.

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Health Instrument Divisions

CONTROL AND DEVELOPMENT DIVISION

Water Monitoring

Two hundred and fifty-one 500 ml. samples of drinking water were analyzed during the month. The maximum individual value of alpha activity was 742 dis/min/liter from the Benton City Chevron Station, but this value was not confirmed by any resample and was probably due to contamination in the laboratory. Other individual values of 200 dis/min/liter from Richland Well 13 and 579 dis/min/liter from the 300 Area sanitary water were not confirmed by resamples and may be due to the same cause since the average values from these sources were 9.3 and 33.5 dis/min/liter, respectively. Other water sources in Richland, Benton City, and White Bluffs continued giving results comparable to those expected from previous work. The 300 Area Wells are no longer used as a source of drinking water supply and are consequently sampled as test wells. Four beta results greater than 5×10^{-5} μc/liter were obtained this month. One from the Benton City Chevron Station was the same sample previously given as high in alpha activity. The other three were Pasco H and R, 1.3×10^{-4} μc/liter; Kennewick Standard Station, 6.6×10^{-5} μc/liter; and 100-H Sanitary Water, 7.0×10^{-5} μc/liter. It is noteworthy that all of these are obtained from the river which is now at a low stage.

Seventy-one test well samples were analyzed with maximum alpha results of 60 - 430 dis/min/liter from the 300 Area Wells, and 9 - 25 dis/min/liter from Spring #13, 300 North, and the White Bluffs Wells. No beta activity as high as 5×10^{-5} μc/liter was found.

Forty-eight routine samples of Columbia River water were taken with one sample from near the 300 Area giving an alpha value of 13 dis/min/liter. All locations averaged less than 6 dis/min/liter for the month. The maximum beta activity was 2.3×10^{-3} μc/liter from a Hanford sample.

Seventy mud samples from the Columbia River gave a maximum of 0.11 uc/kg of beta activity at 100-F Area and Pasco. A cross-section survey of the river between Richland and the 300 Area gave, in general, less than 6 dis/min/liter of alpha activity and about 4×10^{-4} μc/liter of beta activity. The maximum beta activity was 7×10^{-4} μc/liter. Eleven samples of Yakima River water were taken, and no result as high as 6 dis/min/liter of alpha activity or 5×10^{-5} μc/liter of beta activity was found.

Atmospheric Monitoring

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

Location	Integrons (mrep/24 hours) November	December	1948 Average	C Chambers (mrep/24 Hrs.) November	December	1948 Average
100-B Area	< 0.1	0.3	0.3	0.3	0.3	0.3
100-D Area	0.3	0.9	0.6	0.4	0.4	0.4
100-F Area	1.2	1.1	0.9	0.4	0.4	0.4
200-W Area	0.4	0.4	0.4	0.4	0.7	0.4
200-E Area	0.3	0.4	0.8	0.6	0.7	0.6
Riverland	0.5	0.6	1.6	--	--	--
Hanford	5.1	2.5	1.4	--	--	--
300 Area	0.6	0.9	0.9	0.5	0.6	0.4
700 Area	0.5	0.4	0.4	--	--	--
Kennewick	< 0.1	< 0.1	0.2	--	--	--
Pasco	< 0.1	0.3	0.2	--	--	--
Benton City	0.6	0.2	0.5	--	--	--

Film badge readings averaged less than 5 mrep per 24 hours at the 28 locations used. Detachable chamber readings at Hanford, 100 DR, and White Bluffs, averaged 0.72, 0.81, and 0.68 mrep per 24 hours, respectively. The maximum eight hour reading on a constant air monitor was 4×10^{-7} μc/liter at the 200 East Area. The maximum average air filter for the month was 1.3×10^{-9} μc/liter in the 200-East Area. The maximum rain sample was 0.014 μc/liter in the 200 West Area. The maximum off-area rain sample was 1.5×10^{-3} μc/liter at the Pasco H and R Depot.

Land Vegetation Contamination

The average vegetation contamination as analyzed for I^{131} and for non-volatile beta activities was:

Location	μc I^{131}/kg Maximum	Average	1948 Average	μc Other Activities/kg Maximum	Average
North of 200 Areas	0.032	0.005	0.04	0.049	0.011
Near the 200 Areas	1.4	0.072	0.13	0.379	0.045
South of 200 Areas	0.005	0.002	0.04	0.042	0.011
Richland	0.003	< 0.002	0.04	0.017	0.013
Pasco	0.002	< 0.002	0.04	0.019	0.009
Kennewick	0.002	< 0.002	0.04	0.027	0.010
Benton City	0.002	< 0.002	0.04	0.008	0.006
Richland "Y"	0.003	< 0.002	0.04	0.006	< 0.005
Hanford	0.012	0.002	0.04	0.021	0.012

The results for activities other than I^{131} will include K^{40}. The results obtained by the direct counting method on samples from off-area surveys are given below:

Location	Number Samples	µc per kg Maximum	µc per kg Average	Location of Maximum
Wahluke	1	--	<0.04	---
Plymouth-Finley	12	0.05	<0.04	Kennewick - Finley
Burbank - Dayton, Walla Walla	16	0.06	<0.04	Near Burbank
Ellensburg, Grand Coulee, Spokane	29	0.05	<0.04	Spokane
Toppenish - Wallula	14	<0.04	<0.04	---

Waste Monitoring

The 300 Area Pond gave an average of 2740 and 2130 dis/min/liter of alpha activity in the old and new ponds, respectively. The beta activities were 3.4×10^{-4} and 3.2×10^{-4} µc/liter. Mud samples from the old pond inlet gave values up to 680,000 dis/min/kg of alpha activity.

Four samples were analyzed from each of the 200 Area retention basins. The maximum beta activity was 2.9×10^{-4} µc/liter in the 200 West basin. The maximum alpha contamination in the water of the two 200 Area Swamps was 1100 dis/min/liter in the U Swamp. The maximum beta activity was 6.7×10^{-4} µc/liter in the T Swamp. The laundry lint gave a maximum alpha activity of 2.6×10^{6} dis/min/kg.

Fifty-one samples of the 100 Area effluent water were analyzed. The maximum activity was 0.50 µc/liter from 1904-D. All effluents averaged between 0.15 and 0.33 µc/liter. Seventeen samples from the 107 basins and 1904 buildings were analyzed for polonium with no result greater than 6 dis/min/liter. Three samples of condensate from the 100-B drier room gave values from 100 to 300 µc/liter of S^{35}. Two samples of water soluble oil from 100-B gave 5.6×10^{-3} and 8.3×10^{-2} µc/liter.

Geology

The only significant contamination detected in water samples from the eleven wells in the 361-B Area is shown in the following table:

Well No.	µc/liter (beta)	dis/min/liter (alpha)
361-B-1	1.0×10^{-3}	144 ± 20
361-B-3	7×10^{-5}	not significant
361-B-9	1.6×10^{-3}	450 ± 30

Tests on the alpha contamination indicate that it is primarily due to uranium and not plutonium. A sample of rust was separated from the water

of the above samples, and this was found to have 8.8 μc of f.p's. per kilogram, and 0.63 grams of U per kilogram.

The activity in samples taken from the lateral sampling hole, 10 feet beneath the second cycle crib in the 241-B Area, have dropped continuously from a high value of 13.3 μc/liter since the tile field was put in operation on November 11, 1948. Values for contamination are now on the order of 1 μc/liter for beta activity, and about 100 dis/min/liter for alpha activity.

In the 241-T Area, fission product activity was again found in a soil sample taken from a point 20 feet beneath the #3 (second cycle) crib. The liquid contamination in the other wells around this crib is about the same as previously reported.. No contamination was found by field checks made on samples taken from four shallow test wells drilled in the second cycle tile field.

Only one of the three wells drilled between the 300 Area retention ponds and the river had observable activity, and this one had alpha activity of about 100 dis/min/liter which was shown to be mostly due to uranium by use of the fluorophotometer. Plutonium has been observed in some samples with a maximum of 46 dis/min/liter, and an average value of about 10 dis/min/liter.

The final two of the additional 25 wells called for by Part II of Project 133 were completed during the month. The results of the studies on the bedrock formations are essentially as previously reported; the only significant change being the positive determination of the depth of the pre-Ringold channel in the basalt in the Cold Creek Valley area. This channel bottom is at a depth of slightly below sealevel west and south of the 200 West Area, and apparently gets deeper to the southeast of this point.

The remaining four water stage recorders were installed, making a total of fifteen installed and working. A study is being made to determine the best locations for recorders to be placed between the 200 Areas and the Columbia River. The data obtained so far shows several prominent ground water mounds beneath the 200 Area effluent discharge areas, the 200-N Area, and the laundry discharge area. It is expected that the gravel washing plant will create another ground water mound which will coalesce with the existing mounds to form a semicircular arc surrounding the 200 Areas.

Meteorology

Eight-hour Production Forecasts - ninety-three were made. The average accuracy was 78.9%. Twenty-four hour General Forecasts - sixty-two were made. The average accuracy was 77.6%. Special Forecasts - fifteen were made. All of these were correct 100%.

December, 1948, was both colder and wetter than normal. The mean temperature was 26.8, and this was 3.9 degrees below the normal. The highest temperature of the month, 52, occurred on the 1st. The lowest temperature, - 2, occurred on the 27th. This was the lowest temperature yet observed at 622 Building, but was far short of the record low of -27 established at Hanford in December of 1919. Minimum temperatures of 32 or below were recorded on every day except one during the past month, and the average minimum was 18.9. There were 13 days in which the maximum failed to get above 32, and on the 27th the maximum was only 19. The average maximum was 34.8.

Precipitation during the past month totaled 1.11 inches, and this was .33 of an inch above the normal. Total snowfall was 8.1, or 3.7 inches above the normal of 4.4.

A duststorm occurred on the 1st, and the maximum speed at the 400 ft. level in this storm was 64 mph.

Bioassay

Five hundred and seventy-seven samples were analyzed for plutonium. Seventy-four resamples were necessary this month; sixty because of low spike returns. Resamples are not being obtained rapidly enough to keep an accurate check on the exact status. Of all resamples run during the month, one was higher than 0.65 d/m. The average yield during the month was 78%, which is consistent with last month. A spike of about one-half the value of the routine spike was run for 31 samples. The results indicate no difference. The new T.T.A. supplied by Dow Chemical Company has been tested and found to perform as well as the material from Berkeley.

Two hundred and eighty-eight urine samples were analyzed by the fluorophotometer method. The average uranium content found in the urine of the 300 Area workers was:

	µg/liter	
	Maximum	Average
Melt plant	316	38
Material handling	58	14
Machining	31	7
Canning and dipping	21	3
Inspection	13	3
305 Building	18	5

Methods Development

The coincidence counter has been set-up for use in calibrating active sources that decay with a beta-gamma cascade. Tests of the circuit indicate 100% counting of coincidences using Eck-Krebs tubes with a resolving time of one micro-second. The instrument has been used to calibrate an I^{131} source for future studies of the chemistry of this material. Studies of the effect of sample size on beta counter geometries have continued with a value obtained for C^{14}. Attempts to reconcile the discrepancy between the Bureau of Standards beta source and the sources made here are continuing with studies of the effect of sample size and coincidence losses in the alpha counter used to calibrate the sources. The 1½" plate on the standard alpha counters was found to give 97.3% of the rate from a point source when no correction is made for the loss in the raised rim of the plate. Studies of the backscatter of particles from Fe^{59} and Ca^{45} from stainless steel and various precipitates are in progress but need checking.

An investigation of the T.T.A. process started with spiked water has not yet revealed any extremely critical step in the process that would explain some of the spotty and overall low values obtained in the bioassay group. Yields for most of the samples run in the study have been between 80% and 100%. The effect of the crud remaining from the urine is now being studied at a plutonium level used at Bioassay for control of the process. The attempt to purify lanthanum nitrate by ion column separation is continuing with apparent success in decreasing the activity, but more data on the buildup of activity in these samples is needed before any conclusions may be drawn. The procedure developed for analysis of urine samples for S^{35} has been checked with the cooperation of the Biology Division who supplied urine and feces samples from an animal that had been fed S^{35}.

Methods Control

Thirteen water samples from 100-B, two vegetation samples, two soil samples, one air filter, and one flake of unknown material, were analyzed for beta activity and fission product activity. In addition, three air filters, a sample of contaminated acid, a sample of oil, and a sample of liquid, were examined for total alpha and beta activity, and in some cases for plutonium and uranium specifically. Analyses for Po, U, Ra, and Pu, are now being made on a cask lid from the 100 Areas. A series of C^{14} analyses were made for the Technical Divisions on solutions used for the analysis of gases exposed in the pile. These results will be rechecked and reported next month.

A large percentage of the vegetation samples are now being analyzed specifically for radio-iodine and for non-volatile beta activities. The average yield of the I^{131} procedure is about 70%, and the average yield for the non-volatile beta activities is about 90%, based on a mixed f.p. spike prepared in the laboratory. Three thousand, six-hundred and eighty-one measurements were made for beta activity for a total of six thousand, eight hundred and seventy-six measurements. These figures include about 20% recounts for alpha

and about 10% for beta. In addition, seven absorption curves, one hundred and thirty decay points, thirteen hundred and forty-six control points, and three hundred and sixty-one calibration points were measured. Three hundred and forty-two fluorophotometer analyses were made.

The following summaries represent annual summations of routine work loads in the various groups:

Bioassay Group - 1948

Total urine analyses for plutonium	5,597
blank analyses	992
spike analyses	1,287
Total urine for fission product	5,268
blank analyses	937
spike analyses	1,004
Fluorophotometer analyses	2,611
Total number analyses	17,696

Counting Room - 222-U - 1948

Total alpha counts for samples	25,090
Total beta counts for samples	45,066
Total counts taken for control alpha sets	3,080
Total counts taken for control beta sets	4,082
Total number counts taken	77,318

Site Survey Group - 1948

Total Water Samples Taken		7,115
Drinking water	4,010	
Test Wells	208	
River water	1,035	
Waste water	1,020	
Rain Water	842	
Air filter samples	610	
Detachable chambers (paired readings)	11,574	
Handpump air samples	35	
Film packets	1,373	
Vegetation On-Area	4,468	
Vegetation Off-area	2,816	
Solids	511	
Mobile instrument surveys	95	
Portable instrument surveys	295	
Miscellaneous - Special surveys	1,572	
Total number Surveys and Samples		30,464

Physics

The Physics group collaborated with the Instrument Development group in decontaminating the polonium neutron sources and casing them in new aluminum capsules. When the sources were placed in their respective shield containers, no radiation approaching the eight-hour permissible limit was observed anywhere around the containers.

The two polonium sources were compared to the two standard radium-beryllium sources in the calibration pile in Building 3745 by means of indium foils. Taking the values of the radium-beryllium sources as,

68-B 6.54×10^6 neutrons per sec
69-B 6.72×10^6 neutrons per sec,

the total fluxes from the new polonium sources have been found to be,

Pb-106 (Po-Be) $2.08 \pm 0.14 \times 10^7$ n per sec on 12.16.48
Pb-107 (Po-B) $1.72 \pm 0.09 \times 10^7$ n per sec on 12.15.48.

At the request of the 100-F, H.I. Operations group, a number of fast neutron slides was exposed in an attempt to determine the increase in fast neutron flux on the top of the unit occasioned by the short rod guide for rod No.27. The highest value obtained at the rod enclosure railing was 70 $\pm$ 14 neutrons per sq. cm. per sec. This result is difficult to interpret since slides placed a few inches on either side gave values less than half of the value on the highest slide. A similar picture was given by slides placed around the periphery of the bumper plate, where a peak value of 5,000 $\pm$ 1,000 neutrons per sq. cm. per sec. was obtained, again bracketed by lower values.

It appears that there is a fault in the pile shield at this point which produces a region of relatively high neutron flux density. In the presence of this situation, it is difficult to determine what fraction of the increased neutron flux to attribute to the shortened rod guide.

A laboratory investigation was begun on a coincidence method of investigating the natural decay products on air filters. A Mica window beta counter in a vertical lead pig was set up and got into a fair state of control. Another Mica window tube was set up as an alpha counter. It is operated in the proportional region, feeding through a cathode follower and an amplifier with a gain of ten into a conventional scaler. At the chosen operating voltage it demonstrates an efficiency of about 17%, with a plutonium source in the plane of the window flange. It will count alpha particles of 3.5 Mev and greater from a source in this position, is relatively nonmicrophonic and demonstrates a background of a few tenths of a count per minute.

A few air samples have been collected, and counted individually, with these two counters. Circuit design and a critical evaluation of errors are under way.

Health Instrument Divisions

Instrument Development

The maintenance work on the field test models of the portable poppy has been taken over by the Instrument Division. The completion of the design of a pencil probe for use with portable poppy closes out the development work on this instrument.

The most successful operation of the soft beta counter was obtained with helium gas flowing through the counter, and with the use of a Neher-Pickering quench circuit. A 40-volt plateau was obtained with an operating voltage of 830 volts. Pulses were large enough to operate an Offner scaler without additional amplification.

The design of a special small connector series was completed, and it is hoped to have these made commercially.

The design of a beta sample changer for the Methods group was started, and is about one fourth completed.

The pulse analyzer project is now concerned with lowering the noise level in the preamplifier to allow more accurate determinations at low counting rates.

A special poppy probe measuring 8 inches by 18 inches has been built and wired, and work now in progress is to reduce electrical leakage in the unit.

Calibrations

The routine calibrations were:

RADIUM CALIBRATIONS	Number of Calibrations		
	November	December	1948 to Date
Fixed Instruments			
Gamma	572	573	6,764
Portable Instruments:			
Alpha	87	177	802
Beta	173	281	1,378
Gamma	668	807	5,702
X-ray	36	15	97
Neutron	4	6	183
Total	968	1,286	8,162
Personnel Meters			
Beta	962	987	12,411
Gamma	6642	6487	97,871
X-ray	5996	6900	75,561
Neutron	--	--	--
Total	13,600	14,374	185,843
GRAND TOTAL	15,140	16,233	200,769

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BIOLOGY DIVISION

Aquatic Biology

1. Effect of Pile Effluent Water on Aquatic Life

All chinook salmon eggs in the monitoring test have hatched during the past month. Mortalities experienced in variously exposed groups during the egg stage were from 7 - 14 per cent, the higher mortalities caused by increased handling to free the eggs from silt introduced in river water as a diluent.

Beta activities in fish held in undiluted pile effluent amounted to about 4 μc/kg, which is approximately 20 times that of the remaining yolk and 10 times that of the water.

Larvae of the caddis fly Hydropsyche cockerelli from eggs introduced into the salmon monitoring troughs via river water had 0.5 μc/kg activity when hatched from 5 per cent area effluent. An activity of 0.1 μc/kg was found in larvae hatched in river water itself.

2. Biological Chains

Due to cold water temperatures now prevailing, the metabolism of fish being fed active foods is very low, resulting in no significant increase in activity. A specimen of algae from the 107-F Basin used in feeding had 700 μc/kg moist weight. 109 tissues and 10 water samples, have been counted and 94 decay studies were in progress during the month.

3. Radiobiological Survey

Recent freezing temperatures have increased the difficulty of making bottom collections, although 250 samples were counted. In the vicinity of Hanford, bottom algae showed 1.5 μc/kg, and fish (sucker) about one-tenth that figure.

Zoology

1. Chronic Toxicology of I^{131} in Stock Animals

The sheep feeding of I^{131} has continued without change. Wool samples received from Washington State College for self-absorption studies showed, surprisingly, an activity of 0.1 to 0.2 μc/kg. At least one half-life expired from the time the wool was collected until it was counted.

Attempts to raise rabbits from I^{131} fed mothers failed due to the killing of the young by the mother as a result of unfavorable facilities for raising laboratory animals.

No eggs have been obtained from the two hens on I^{131} because of their exposure to unfavorable weather. Their feed now contains 2 µc/kg and their water 3 µc/l.

For the proposed animal farm drastic changes in plans are being suggested due to the limited funds available. They include utilizing two distant tract facilities and Locke Island as well as decreasing the size of exposure barns. The result will be decreased efficiency of operation and increased likelihood of invalid results.

2. Biological Monitoring

Three coyotes trapped on the project have been assayed for beta activity; the highest thyroid count represented about one-tenth of the recently recommended daily tolerance dose. Of nine rabbits caught in the 200 Areas, those from West had approximately the tolerable amount of I^{131} present in their thyroids. Rabbits from 200 East had deposited somewhat larger amounts, ranging from the new tolerance dose to about ten times that figure. The most active thyroid had 40 µc/kg, representing the largest amount found in two years. Biological monitoring of other areas has proceeded without incident.

3. Special Studies

The study on implantations of active particles in rabbits is nearing completion and a summary report is being prepared. Experimental facilities were such as to indicate expectations for vague and doubtful results. However, two subcutaneous specks were found quite active after one year of decay.

4. Miscellaneous

A member of the biochemistry group has been temporarily assigned to Zoology for devising more satisfactory ashing procedures for tissues containing radioactive sodium and phosphorous.

A sub-group in histology has been formed for studying histopathology due to internally deposited fission products.

Botany

The first report of this group was to be submitted next month. However, note should be made at this time of one of their minor projects. The Russian thistle growing in the vicinity of the R-3 stair-well, 271-B Building, 200-E Area gave the following beta activity:

Bracts (Modified leaves)	5,000 µc/kg
Seeds	2,400 µc/kg
Stem tissue	650 µc/kg
Root tissue	500 µc/kg

3/

GENERAL ACCOUNTING DIVISION

DECEMBER 1948

GENERAL

Budget estimates together with narrative explanations of the budgets for the General Divisions were completed early in the month.

Financial Statements and Operating Reports for November were issued on December 27, and December 22 respectively.

During the month studies were continued with regard to the method of liquidating various accounts and the assessment of charges to other divisions. Several changes in methods of determining amounts to be assessed were made as a result of these studies.

The first bonds purchased at Schenectady for Hanford Works employees representing payroll deductions made in October were delivered to employees on December 10. Custody Receipts for bonds purchased in October under the G. E. Employees Savings and Stock Bonus Plan were delivered to employees on December 17.

As a result of the recanvass of all employees in connection with participation in the Group Life Insurance Plan, the over-all percentage of participation increased from 72 to 75.6.

Due to increased efforts to reduce the amount of expenditures not billed to AEC, the amount unbilled as of December 31 was $1 786 589 less than that of November 30. Expenditures not yet reimbursed were also reduced by $4 278 149.

Following is a comparison of unreimbursed charges as of November, 1948 and December, 1948:

	November 30, 1948	December 31, 1948
Billed on Public Vouchers	$ 3 307 437	$ 1 937 078
Submitted on Pre-Billing Audit Vouchers	6 099 435	4 978 234
Unbilled	9 179 103	7 392 514
Total	$18 585 975	$14 307 826

General Accounting Division

STATISTICS

Employees and Payroll	Total	Monthly Payroll	Weekly Payroll
Employees on Payroll at beginning of month	8 608	1 722	6 886
Additions and transfers in	162	11	151
Removals and transfers out	(143)	(18)	(125)
Transfers from Weekly to Monthly Payroll	--	17	(17)
Employees on payroll at end of month	8 627	1 732	6 895

Employees on Payroll at end of Month	November	December
Manufacturing	3 127	3 156
Design & Construction	1 209	1 199
Community	983	971
Other	3 289	3 301
Total	8 608	8 627

Overtime Payments - Weekly Paid Employees	November	December
Number	10 441	6 659
Amount	$178 086	$96 998
Overtime Payments - Monthly Paid Employees		
Amount	$ 60 706	$33 464
Number of changes in Salary Rates and Job Classifications	1 193	829
Gross Amount of Payroll		
Manufacturing	$1 344 267	$1 090 568
Design & Construction	493 137	428 532
Community	366 031	294 712
Other	1 165 644	983 190
Total	$3 369 079	$2 797 002*
Annual Going Rate of Payroll		
Manufacturing	$14 063 863	$13 917 427
Design & Construction	5 403 169	5 380 516
Community	3 862 359	3 691 445
Other	12 426 910	12 312 132
Total	$35 756 301	$35 301 520

Average Salary Rate Per Hour	November			December		
	Weekly	Monthly	Total	Weekly	Monthly	Total
Manufacturing	$1.933	$2.584	$2.031	$1.927	$2.607	$2 031
Design & Construction	1.469	2.623	1.828	1.470	2.591	1.810
Community	1.708	2.256	1.795	1.712	2.261	1.804
Other	1.550	2.498	1.735	1.547	2.489	1.730
Total	$1.706	$2.530	$1.863	$1.701	$2.526	$1.860

*Includes four weeks in case of weekly paid employees. November included five weeks.

General Accounting Division

Employee Plans

Pension Plan

	November	December
Number participating at beginning of month	5 697	5 886
New participants and transfers in	217	107
Removals and transfers out	(28)	(33)
Number participating at end of month	5 886	5 960
% of eligible employees participating	94.3%	94.8%

Employees Retired	December	Total to Date
Number	4	42
Aggregate Annual Pensions including Supplemental Payments	$917	$7 553
Amounts contributed by employees retired	$209	$2 484

Group Life Insurance

	November	December
Number participating at beginning of month	5 892	5 930
New participants and transfers in	99	399
Cancellations	(22)	(9)
Removals and transfers out	(39)	(49)
Number participating at end of month	5 930	6 271
% of eligible employees participating	72.0%	75.6%

Insurance Claims

	December	Total to Date
Number of deaths	1	17
Amount of insurance	$3 650	$90 473
Amount contributed by employees who died	$ 45	$ 823

Group Disability Insurance - Personal

	November	December
Number participating at beginning of month	7 199	7 255
New participants and transfers in	125	131
Cancellations	(9)	(12)
Removals and transfers out	(60)	(195)
Number participating at end of month	7 255	7 179
% of eligible employees participating	90.7%	89.1%

Group Disability Insurance - Dependent

Number participating at beginning of month	4 310	4 343
Additions and transfers in	62	73
Cancellations	(10)	(13)
Removals and transfers out	(19)	(84)
Number participating at end of month	4 343	4 319

General Accounting Division

Employee Plans (continued)

Group Disability Claims	November	December
Number of claims paid by insurance company:		
Employee Benefits		
Weekly Sickness and Accident	81	95
Daily Hospital Expense Benefits	84	84
Special Hospital Services	77	81
Surgical Operations Benefits	52	58
Dependent Benefits Paid		
Daily Hospital Expense Benefits	84	90
Special Hospital Services	83	81
Amount of claims paid by insurance company:		
Employee Benefits	$ 8 993	$ 8 634
Dependent Benefits	2 898	3 232
Total	$11 891	$11 866

Group Disability Insurance - Premiums	November	December
Personal - Employee Portion	$12 127	$12 054
- Company Portion	6 690	7 469
- Total	$18 817	$19 523
Dependent- Employee Portion	$ 3 850	$ 3 857
- Company Portion	299	426
- Total	$ 4 149	$ 4 283
Grand Total	$22 966	$23 806

Annuity Certificates (For du Pont Service)	December	Total to Date
Number Issued	0	55

U. S. Savings Bonds	Mfg.	D & C	Comm'y	Other	Total
Number participating at beginning of month	2 206	561	527	1 674	4 968
New authorizations	31	16	8	41	96
Voluntary cancellations	(114)	(29)	(32)	(52)	(227)
Removals and Transfers out	(5)	(4)	(9)	(2)	(20)
Transfers in	8	1	0	2	11
Number participating at end of month	2 126	545	494	1 663	4 828
% participating	67.4%	45.5%	50.9%	50.4%	56.0%
Bonds issued					
Maturity Value	$145 850	$38 275	$29 350	$103 825	$317 300
Number	2 970	775	640	2 196	6 581
Refunds issued	117	39	28	42	226
Revisions in authorizations	16	3	3	10	32
Annual going rate of deductions					
New Plan	$ 881 052	$198 713	$190 285	$656 357	$1 926 407
Old Plan	293 970	69 476	42 778	168 139	574 363
Total	$1 175 022	$268 189	$233 063	$824 496	$2 500 770

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General Accounting Division

Employee Plans (continued)

Suggestion Awards	December	Total to Date
Number of Awards	14	258
Total Amount of Awards	$115	$2 545
Security Slogan Awards		
Number of Awards	--	7
Total Amount of Awards	--	$175

Employees Sales Plan	December		
	Total	Major Appliances	Traffic Appliances
Certificates Issued	824	98	726
Certificates Voided	59	14	45

Salary Checks Deposited	November	December
Monthly	875	862
Weekly	1 043	1 007
Total	1 918	1 869
Special Absence Allowance Requests		
Number Submitted to Pension Board	10	3
Absenteeism (Weekly Paid Employees)		
January to December 19	1947	1948
	1.73%	2.19%

PERSONNEL AND ORGANIZATION

Number of Employees	November	December
On Payroll at beginning of month	187	185
Removals and transfers out	(12)	(10)
Additions and transfers in	10	5
Number at end of month	185	180
Net increase (or decrease) during month	(2)	(5)
% of terminations and transfers out	6.4%	5.4%
% of absenteeism	3.73%	3.01%

Changes by division in number of Accounting Division employees during December were as follows:

General: Decrease of one employee

One transfer to Special Assignments

Accounts Payable: Decrease of one employee

One transfer to General Accounts

Cost: No Change

General Accounting Division

PERSONNEL AND ORGANIZATION (continued)

General Accounts: Decrease of one employee

Two new hires
One transfer from Accounts Payable
One on Leave of Absence
One transfer to Construction
Two terminations

Property: Decrease of one employee

One on Leave of Absence

Weekly Payroll: Decrease of two employees

Three new hires
One transfer to Manufacturing
One on Leave of Absence
Three terminations

Monthly Payroll: No Change

Methods: Decrease of two employees

Two transferred to Special Assignments

Special Assignments: Increase of three employees

Two transfers from Methods
One transfer from General

Injuries	November	December
Major	0	0
Sub-major	0	0
Minor	1	1

Number of Accounting Division employees as of December 31, 1948 were as follows:

	Number of Employees		
	Non-Exempt	Exempt	Total
General	3	3	6
Accounts Payable	27	1	28
Cost	8	1	9
General Accounts	18	1	19
Property	19	3	22
Weekly Payroll	72	5	77
Monthly Payroll	13	1	14
Special Assignments	1	4	5
Total	161	19	180

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General Accounting Division

PERSONNEL AND ORGANIZATION (continued)

Open employment requests as of December 31, 1948, were as follows:

General Clerk B	2
Office Machine Operator B	1
Steno-Typist C	1
Steno-Typist D	2
Total	6

General Accounting Division

	November	December
Accounts Payable		
Number of Vouchers Entered	2 258 *	2 336 *
Amount of Vouchers Entered	$ 1 069 340 *	$ 882 068 *
Number of Checks Issued		
Community	242	235
Design and Construction	1 354	1 253
General	1 606	1 719
Manufacturing	705	610
Total	3 907	3 817
Amount of Checks Issued		
Community	$ 111 549	$ 214 558
Design and Construction	12 297 264	13 598 970
General	1 150 583	797 139
Manufacturing	892 150	948 267
Total	$ 14 451 546	$15 558 934
Public Vouchers (1034) Submitted to AEC		
Not Reimbursed at Beginning of Month	$ 6 520 785	$ 3 307 437
Submitted During the Month	16 635 849	17 694 243
Sub Total	$ 23 156 634	$21 001 680
Reimbursements During the Month	19 849 197	19 064 602
Not Reimbursed at End of Month	$ 3 307 437	$ 1 937 078
Public Vouchers (1034) Submitted to AEC		
Not Reimbursed at Beginning of Month	154	100
Submitted During the Month	452	480
Sub Total	606	580
Reimbursements During the Month	506	466
Not Reimbursed at End of Month	100	114

* General Divisions Only.

General Accounting Division

	November	December
Pre-Audit Vouchers (1035) Submitted to AEC Not Yet Approved		
Community	$ 64 807	$ 66 739
Design and Construction	3 505 842	2 724 338
General	2 447 263	2 161 560
Manufacturing	81 523	25 597
Sub Total	$ 6 099 435	$ 4 978 234
Not Submitted to AEC on Pre-Audit Vouchers		
Community	72 652 cr.	93 212
Design and Construction	3 802 820	4 673 155
General	5 048 484	2 332 049
Manufacturing	400 451	294 098
Sub Total	$ 9 179 103	$ 7 392 514
Total Unbilled Items	$ 15 278 538	$ 12 370 748
Cash Receipts		
Community	$ 169 537	$ 104 733
Design and Construction	277 927	35 698
General	20 070 739	19 145 326
Manufacturing	27 300	11 734
Total	$ 20 545 503	$ 19 297 491
Detail of Receipts *		
U. S. Government	$ 19 849 197	$ 19 064 602
Hospital	72 855	69 143
Miscellaneous Accounts Receivable	1 532	919
Employees Sales	1 480	1 364
Educational Program	487	63
Liquidation of Savings Bonds Account	121 050	-0-
Refunds from Vendors	8 841	2 696
Scrap Sales	2 618	585
All Other	12 679	5 954
	$ 20 070 739 *	$ 19 145 326 *
Cash Disbursements		
Accounts Payable	$ 14 451 546	$ 15 558 934
Payrolls (net)	2 095 316	2 408 648
U. S. Savings Bonds	243 758	214 098
Total	$ 16 790 620	$ 18 181 680

* General Divisions Only

General Accounting Division

	November	December
Travel Advances and Expense Accounts		
Cash advance balance at end of month	$ 9 582 *	$ 9 316 *
Cash advance balance Outstanding over one month	818 *	119 *
Traveling and Living Expenses:		
Paid Employees	13 262	18 243
Billed to Government	15 049	17 735
Balance in Variation Account at end of month	2 474 cr.	1 964 cr.
Hospital Accounting		
Accounts Receivable Balance at Beginning of Month	$ 66 557	$ 69 261
Total Invoiced During Month	106 645	107 029
Total	$ 173 202	$ 176 290
Less Cash Received and Payroll Deductions	103 941	98 806
Accounts Receivable Balance at end of Month	$ 69 261	$ 77 484
Property		
Number of Transfer Notices Received	585	538
Number of Items Affected	2 821	1 909
Number of Receiving Reports Classified	8 970	9 688
Number of Items Tagged at beginning of month	94 866	93 784
Number of Items Tagged this Month--Metal	1 141	1 091
Number of Tagged Items dropped from record	(2 223)	(4 233)
Total Tagged Items Recorded	93 784	90 642
Number of Items Recorded in quantity only at beginning of month	13 811	13 958
Items added to record during month	151	45
Dropped from record during month	(4)	(187)
Total Items Recorded in Quantity	13 958	13 816
Total Items on Record	107 742	104 458

* General Divisions Only

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General Accounting Divisions

ACCOUNTS PAYABLE DIVISION

Vouchers entered for payment in December numbered 2 336 and totaled $882 068. Number of checks written for General Divisions numbered 1 719 and totaled $797 139. Total checks for all divisions numbered 3 817 and total accounts payable disbursements for all divisions amounted to $15 558 934.

All invoices are continuing to be paid when due even though they cannot be submitted for reimbursement at that time. To date, there have been no lost discounts. Vouchers on hand requiring additional supporting data before submission to AEC for reimbursement can be made number 879 and total $291 279.

In December, 223 freight bills were paid totaling $11 307. The balance of the general ledger account Freight, representing paid freight bills not yet distributed to other ledger accounts, is $290.

Unbilled accounts payable vouchers and freight bills to date for the General Divisions amount to $1 330 442 and $61 662 respectively.

Personnel at the end of the month totaled 28, comprising 1 exempt supervisor, 7 non-exempt men, and 20 non-exempt women.

COST DIVISION

The November Operating Reports for the General Divisions were completed and issued on December 22. It is expected that subsequent months' reports will be issued earlier, as many problems which have delayed the issuance of these reports have been eliminated.

In December, cost distribution studies were continued and as a result revisions were made in cost distribution of Purchasing and Stores, Laundries at 200-W and 700 Areas, and Stationery.

The IME Variance, representing underliquidations for all General Divisions combined, was reduced from $114 206 in October to $76 016 in November. The variance to date as of November 30, 1948 for all General Divisions is $46 585. This reduction has been made possible through more accurate determination of estimated amounts to be liquidated based on past months' experience.

GENERAL ACCOUNTS DIVISION

An improvement in the condition of the work as regards unbilled items was made in December. General Divisions' unbilled disbursements were reduced from $5 048 484 in November to $2 332 049 in December. December billings

GENERAL ACCOUNTS DIVISION (Cont'd)

for all divisions totaled $17 694 243. At the end of the month vouchers from all divisions in the AEC Audit Branch for approval totaled $4 978 234. and unbilled items totaled $7 392 514 for all divisions.

Net cash disbursements for all divisions, represented by the issuance of 3 817 checks, were $18 181 680. Cash receipts for all divisions totaled $19 297 491, including $19 145 326 reimbursements from AEC. Ending balances in the two contract bank accounts were: Richland, $4 955 595; New York, $3 257 758.

Billings and transfers of items between divisions, all of which clear through this Division, totaled 358. Due to improved methods and personnel becoming more experienced, fewer correcting entries have been necessary and little trouble has been experienced in handling this work and balancing divisional current accounts.

Hanford Works and Nucleonics Department Financial Statements for the month of November were prepared and issued on December 27.

MEDICAL ACCOUNTING DIVISION

The accounts receivable balance of $77 484 is $8 223 greater than that of last month and has continued to increase for the past six months. Of this balance, $73 945 is on the Kadlec Hospital ledgers consisting of 2 149 accounts, $3 539 is on the North Richland Medical Center ledgers consisting of 251 accounts.

Invoices issued at both Richland and North Richland totaled $107 029. Credits to accounts receivable during the month totaled $99 205 and consisted of the following: cash receipts, $69 143; payroll deductions, $20 350; and billings to subcontracts, $9 712.

The review of office methods as regards the preparation of lists of names for forwarding to the Payroll Divisions to enable them to make payroll deductions was completed in December. Changes in procedure have been agreed upon and the necessary adjustments to make these changes effective are being made.

SPECIAL ASSIGNMENTS

Various forms which were reviewed, approved and indexed during the month numbered 10, bringing total forms indexed to date to 2 164.

Two suggestions were received from the Suggestions Committee secretary, were investigated, and replies were prepared.

General Accounting Divisions

SPECIAL ASSIGNMENTS (Cont'd)

Office procedures and methods in connection with the preparation of lists by the Medical Division for payroll deduction for accounts receivable, and the payroll deduction schedules for rents and telephones prepared by the Community Division were reviewed and suggestions were made.

Sample forms were prepared to be used in reporting operating costs by all divisions, samples of a personnel record form were prepared for the Technical Divisions, and ledger sheets were designed for use by the Surplus, Salvage, and Scrap Division.

One employee was on loan to the Design and Construction Divisions for the entire month of December.

PROPERTY

Further decentralization of Property Accounting Records was made during December in anticipation of proposed changes in over-all plant accounting procedures.

A decentralization of accountable records and location records between Community, Design and Construction, Manufacturing, and General Divisions was begun and personnel was assigned to handle all work pertaining to each respective division.

The practice of having field inventory crews traveling between areas to record property receipts and recheck inventories was discontinued. One man will be assigned to the 100 Areas, 200 Areas and the 300-700-1100-Pasco Areas on a permanent basis to handle the work. Working hours of these employees will be the same as other employees in the same area and the loss of travel time will be eliminated. Changes resulted in reducing the number of employees by 8 and also made it possible to return two sedans to the Transportation Division.

Offices of this Section were moved from the 703 Building in Richland to Building 31 in the 3000 Area on December 13, 1948.

Number of items on record at December 31, 1948 totaled 104 458. Personnel comprised 3 exempt and 18 non-exempt employees.

General Accounting Division

PAYROLLS

Audit by the A.E.C. Audit Section of weekly payrolls for November, 1948 and monthly payroll for September, 1948 revealed no errors.

The number of time cards received late in Payroll fluctuated during December. The greatest number of cards received late in any one week was 61 and the lowest was 26. This is considerably better than it has been in the past.

There was a total of 84 transfers and reclassifications received in Payroll at least two weeks after the effective date. Retroactive salary adjustments were necessary in many of these cases.

Bonds purchased under the G. E. Employees Savings Plan during the month of October were received from the Employees Savings Division in Schenectady on December 8 and were delivered to employees on December 10, 1948. Custody receipts for bonds purchased in October under the G. E. Employees Savings and Stock Bonus Plan were received from the Employees Savings Division on December 13 and were delivered to employees on December 17. All bonds purchased by payroll deductions are issued by the Employees Savings Division. Prior to October 1948, such bonds were issued at the Hanford Works. The change in procedure involved a considerable volume of detail work both locally and in Schenectady, resulting in a delay in delivery of October and November bonds. It is expected that bonds purchased in December will be delivered early in February.

During December all eligible non-participating employees were given an opportunity to enroll in the Group Life Insurance Plan. The re-canvass of these employees was carried out by the Personnel Division. This re-canvass resulted in an increase in the percentage of participation of eligible employees from 72.0% to 75.6%. Insurance certificates have been issued to the newly insured employees and deductions of Group Insurance premiums are being made from their salary checks.

In accordance with the provisions of the Pension Plan all eligible non-participating employees were recanvassed in December. There were 342 employees re-canvassed and only 274 employees returned an application card. Of these, 75 applied for participation in the Plan. Supervisors have been asked to contact employees who have not yet returned an application card.

For the convenience of employees, weekly salary checks were delivered on Thursday December 23, 1948 instead of Friday, the day before Christmas.

Weekly payrolls have been reimbursed by the Government through the week ended November 21, 1948, and monthly payrolls have been reimbursed through the month of September, 1948.

SERVICE DIVISIONS

SUMMARY - DECEMBER 1948

Purchasing and Stores Division

During the month a slight but noticeable trend from the sellers market, which has been prevalent for so long, was noted.

Considerable difficulty was experienced in maintaining an adequate supply of fuel oil for heating village homes. This was due primarily to two reasons. Fuel oil is a mandatory item and therefore must be procured by the Commission. Their contract specifies deliveries in tank trucks. It is necessary for these trucks to come over the Snoqualmie Pass. Since the Pass was closed several times during the month, deliveries were delayed. Our storage tanks hold only 40,000 gallons and it was recommended that in order to provide a reasonably safe working stock that this capacity be at least doubled.

Excess materials valued at $115,321.99 were disposed of during the month. Of this amount materials valued at $83,587.94 were shipped off the Project in Government shipping orders. The remaining $31,734.05 in materials were used on the project.

Plant Security and Services Division

There was one major injury during the month making a total of 17 for the year with a frequency rate of 0.99.

The Fire Protection Division returned to a five-day week on December 6, 1948.

Laundry volume in both the 200-West and 700 Area was down appreciably this month.

Preliminary assignment of numbers for the new dial system has started.

PURCHASING AND STORES DIVISION
DECEMBER 1948

GENERAL

Purchasing

There was little change in the work load during the month. 1,427 purchase orders were placed as compared to 1,434 placed in November. 2,135 purchase requisitions were received as compared to 2,461 received during November. Requisitions on hand at month end totaled 653 as compared with 711 at the end of the previous month.

In our November report it was mentioned that there were two remaining orders on which cancellation had been requested by the Project Engineering Division. On one claim requesting $18,769.98 minor irregularities were corrected and final settlement was made for $18,735.74. This figure brings the total cancellation charges paid to $25,583.05. On the remaining order a cancellation claim for $764.40 was received, but this also had to be returned for more information regarding the final inventory of work in progress.

A survey of our first quarter requirements of steel to be secured under the Voluntary Steel Allocation Plan showed our only need was for black and galvanized pipe. Requisitions for seven carloads were written and invitations for bid were mailed to prospective vendors.

Twenty-two additional orders were placed during the month for Project P-10. All outstanding orders for this Project are now 90 per cent complete.

During the month a slight but noticeable trend away from the sellers' market was apparent. This trend was not manifested in any single major transaction but rather in many small ways which if analyzed separately would not be too significant.

Pursuant to our previous reports of the critical situation with respect to Aluminum, the Atomic Energy Commission advised that it was not necessary to establish a Voluntary Allocation Plan. In lieu of a Plan, the Aluminum producers committed themselves to supply the full requirements of the A.E.C. Our responsibility in this program is to be sure that our purchases from Aluminum producers are properly identified. This will be accomplished by a certification on our purchase orders that the Aluminum and Aluminum products will be used only for the United States Atomic Energy Commission's program.

Additional samples of Aluminum Cans were received from Scovill Manufacturing Company and these proved satisfactory. Scovill is now preparing to fabricate the Cans on a regular production basis and will notify us at least two weeks in advance of their starting date. This is sufficient time to allow our inspectors to be on hand when they begin production.

Victor Industries has advised us that they will receive additional slugs the first part of January and will ship additional sample Cans on the eleventh of January.

Hooker Electrochemical Company was awarded the contract covering Caustic Soda requirements for 1949.

We continue to experience considerable difficulty in maintaining an adequate supply of fuel oil to meet the requirements for heating village homes. This is due to our receiving all shipments on A.E.C. orders in tank trucks and to inadequate storage facilities. The tank trucks are continually held up by slides, ice, and blizzards

GENERAL (Cont.)

Purchasing

on Snoqualmie Pass which delay deliveries to our storage tanks.

At the present time there are only two 20,000-gallon storage tanks in use. It is our understanding that two additional tanks were authorized on August 9, 1948. These tanks were to be installed by the Construction Division and were to be completed the week of December 20, 1948. To date the tanks are not in use.

The Housing Division was in daily contact with us in an effort to get additional oil as the trucks did not arrive as scheduled. If facilities were available for unloading railroad tank cars into the two tanks now in use, a great deal of the trouble and uncertainty would be eliminated.

It is our recommendation that steps be taken immediately to install tank car unloading facilities and rush all possible the completion of the two additional storage tanks.

Stores

Activity in the Receiving Section during the month of December reached a new high when 4,371 receiving reports were issued. This record was established in spite of most unpleasant working conditions. The cold weather was a severe handicap, and many times during this period the temperature in the Receiving Warehouse fluctuated from zero to 20 degrees above zero. The Receiving office, too, could not be heated satisfactorily due to low voltage and general inefficiency of the electric space heaters. Arrangements are now being made to supplement this type of heating in the office proper with the installation of an oil furnace and blower.

A great deal of time has been spent during the month of December in educational and training meetings relative to the application of the Nine Point Job Program. It is hoped and felt that compensating benefits will result from increased efficiency in supervisory standards.

A review of the general activities in Stores for the calendar year 1948 is very revealing. The total valuation of Stores inventories increased during that period approximately $500,000. An analysis of this figure indicates that during 1948 Stores was successful in excessing and obsoleting 2,344 items from stock. However, the benefit of this manouver was more than offset by adding to Stores inventories 6550 new items.

Surplus, Salvage and Scrap

Excess Lists No's. 41 through 45 were transmitted to the Atomic Energy Commission during the month. These lists were comprised of automotive equipment, machine tools and equipment and materials and supplies. Many items received during the month have been consolidated on Field Lists and are now being screened by various Divisions for possible use.

On December 13, 1948 we assumed the responsibility for the operation of the Scrap Yard at Leazer Spur. Fifteen prospective customers of Excess Materials and Scrap were escorted about the Project by our representatives. We anticipate several sizable shipping orders as a result of these visits, at completion of the

GENERAL (Cont.)

Surplus, Salvage and Scrap

circularizing period required by the Atomic Energy Commission. One sale of scrap lumber was completed involving 107 truck loads. This sale involved scrap lumber at Leazer Spur that had been there since Hanford days. Receipts of metal scrap at Leazer Spur have been averaging 60,000 to 80,000 pounds daily. Several large scrap sales on metals are now in process.

The Construction Division has declared as excess Warehouse No. 4 and its contents at the Pasco General Depot. Receiving reports are being processed on the items in Warehouse No. 4 and Field Lists will immediately be circulated to the entire Project.

Two typists have been recently transferred to the Receiving Section for the purpose of typing Receiving Reports. This should increase the number of Receiving Reports processed daily by at least 50 per cent and, consequently, make more time available for the checkers to actually check material.

To date 252 pieces of automotive equipment have been delivered to us. These items consist of busses, sedans, pick-up and flat bed trucks, tractors and panel trucks. Preventive maintenance will be performed on the above equipment as deemed necessary by Atomic Energy Commission representatives in compliance with a recent directive.

Several cost problems have been satisfactorily solved during the month. The Surplus Salvage and Scrap Division is now receiving credit for the handling and packing charges assessed against other Government agencies for the material shipped them. This credit will materially reduce the total debits shown as our operating cost and enable us to effectively study and determine the most economical method of operation. In order to establish a firm control on materials, inventories and costs, the responsibility of the Accounting Section has been divided and a Material Control Section created. This move will not increase personnel but will result in records and control that are complete and accurate.

The screening of purchase requisitions for the Project is being handled in a satisfactory manner. We have been able to delete items from requisitions and furnish those items from our stock. The number of items furnished by us will of course increase as our inventory increases. Effective January 8, 1949, we will have one employee working each Saturday to screen requisitions for Construction and the Subcontractors and, if necessary, delivery emergency items immediately.

Tentative plans have been formulated to assume the responsibility of the Pasco General Depot effective February 1, 1949. Warehouse No. 1 will be retained by the Construction Division and will be used for storage of items to be used at a later date. Two General Electric employees will be used by the Construction Division.

The plant wide program of removing usable materials from the vicinity of various burning pits on the Project is progressing satisfactorily. In the near future we will have under our jurisdiction all scrap or usable material of value so that proper disposition can be effected.

PERSONNEL

Administrative Supervision 1

PERSONNEL (Cont.)

Purchasing	
Employees Exempt	8
Employees Non-Exempt	27
Stores	
Employees Exempt	8
Employees Non-Exempt	109
Surplus, Salvage & Scrap	
Employees Exempt	8
Employees Non-Exempt	34
TOTAL	195

SAFETY AND SECURITY

Purchasing	
Safety and Security Meetings Scheduled	1
Number of Employees attending	25
Minor Injuries	1
Stores	
Safety and Security Meetings Scheduled	9
Number of Employees attending	104
Minor Injuries	2
Surplus, Salvage & Scrap	
Safety and Security Meetings Scheduled	6
Number of Employees attending	42

STATISTICS

Purchasing	
Requisitions on hand 12-1-48 (includes 61 assigned to Govt.)	711
Requisitions received during December	2,185
Requisitions placed during December	2,243
Requisitions on hand 12-31-48 (includes 90 assigned to Govt.)	653
HW Orders placed	1,427
TPS Orders placed	176
M.O.'s placed	0
O.R.'s placed	7
Alterations issued	161
Scrap Sales completed	1
Value of Scrap Sold	$35.00
Orders Expedited	220
Stores	
Number of items added to Stores stock	296
Number of items deleted from Stores stock	50
Items in Stores stock at month end	52,110
Receiving Reports issued	4,371
Store Orders filled	20,515
Emergency Store Orders filled	7

STATISTICS (Cont.)

Stores

Returnable Containers on hand at month end	6,199
Returnable Containers on hand over six months	1,191
Inventory valuation (903-all captions, 906 and 912) Stores at month end	$2,912,985.12
Inventory valuation Spare Parts at month end	1,521,110.42
Total value inventories at month end, including Spare Parts	4,434,095.54
Value of disbursements, not including cash sale items	282,978.99*
Value of transfers from Excess and Salvage to Stores	47,901.53
Value of material declared excess and removed from Stores stock	9,830.22

*Includes $26,319.30 disbursed to Construction and CPFF Subcontractors.

Surplus, Salvage & Scrap

Excess Account #10.10 Balance 11-25-48		$1,308,144.89
Receipts - 11-26-48 to 12-25-48		
Process Equipment	$ 80,316.60	
Automotive Equipment	125,268.69	
Machine Tools and Equipment	12,392.28	
Office Furniture, Machines, etc.	3,770.33	
Household Furniture, etc.	1,246.34	
Material and Supplies	59,231.46	
Miscellaneous Equipment	44,787.60	
	327,013.30	327,013.30
		$1,635,158.19
Disbursements - 11-26-48 to 12-25-48		
Project:		
Miscellaneous Equipment	$ 839.40	
Material and Supplies	5,096.71	
Office Furniture, Machines, etc.	122.54	
Automotive Equipment	25,670.40	
Household Furniture, etc.	5.00	
Off Project:		
Office Furniture, Machines, etc.	1,090.50	
Automotive Equipment	6,000.00	
Material and Supplies	76,497.44	
	115,321.99	115,321.99
Balance of Account #10.10 as of 12-25-48		$1,519,836.20
Value of Excess Lists to AEC - #41 thru #45		
Automotive Equipment	86,587.42	
Material and Supplies	277.92	
Machine Tools and Equipment	2,688.18	
	$89,553.52	
		$89,553.52
Receiving Reports (HW 1.54A) issued (1,347 items)	525	
Store Orders Processed	39	
Shipping Orders Processed	27	
Lists transmitted to AEC	5	
Purchase requisitions screened	2,384	
Scrap Sales Completed	1	

STATISTICS (Cont.)

Surplus, Salvage & Scrap		
Value of Scrap Sold	$550.00	
Scrap Sales pending - approved	1	
Scrap Sales pending - not approved	6	
Salvage Material Disbursed Prior to Excess Declaration		
Richland Salvage Yard		
Number of Store Orders	500	
Total Value	$6,679.84	
Leazer Spur Salvage Yard		
Number of Store Orders	2	
Total Value	$13.68	
Number of Store Stock transfers	1	
Total Value	$213.84	
Total of Salvage Material Disbursed		$7,457.36

PLANT SECURITY AND SERVICES DIVISION

MONTHLY REPORT - DECEMBER 1948

ORGANIZATION AND PERSONNEL

Number of employees on payroll:

	Beginning of Month	End of Month	Increase	Decrease
Staff	2	2		
Patrol and Security	693	700	7 (a)	
Safety & Fire Protection	183	186	3 (b)	
Office Services (General & Clerical)	308	312	4 (c)	
TOTAL	1186	1200	14	

NET INCREASE - 14

(a) - 16 New Hires - Patrolmen
1 Returned from Leave of Absence (Patrolman)
1 Transferred from Maintenance (Patrolman)
2 Transferred from Community (Patrolmen)
10 Terminations (9 Patrolmen - 1 Security)
1 Discharged (Patrolman)
1 Transferred to Electrical (Patrolman)
1 Transferred to Purchasing and Stores (Patrolman)

(b) - 5 New Hires (Firemen)
2 Terminations (Firemen)

(c) - 9 New Hires (7 Clerical 2 General)
1 Transferred from Community (General)
2 Returned from Leave of Absence (1 Clerical - 1 General)
4 Terminations (Clerical)
1 Removal due to Leave of Absence (Clerical)
3 Transferred to other Divisions (Clerical)

HW-12036-DEL

Service Divisions
Plant Security and Services

SAFETY AND FIRE PROTECTION

Safety

Plant Safety Record - 11 days

[redacted]

Major Injuries	1	1	17	0.99
Non-Tabulatable Major Injuries	0	0	0	-
Sub-Major Injuries	2	2	37	
Minor Injuries	445	458	5692	3.31

Major Injury No. 58

December 20, 1948, at approximately 1:30 p.m. [redacted], a mechanic of the 100-F Maintenance Minor Construction section, sustained burns on face and cornea of both eyes when Tegul being melted in a plumbers furnace exploded in his face. Injured and another employee were running a tile drain line. The Tegul used for caulking had become hardened in the plumbers furnace when the fire was extinguished during lunch period. Injured re-lit the furnace, and approximately five minutes later stooped to adjust the flame when a charge of Tegul blew out of the pot striking him on the face and causing the injury.

Sub-Major Injury No. 132

December 5, 1948, at approximately 3:40 p.m., [redacted], a carpenter of the

Service Divisions
Plant Security and Services

Safety Meetings

There were 627 Safety Meetings held during the period of December 1 through December 31, 1948, with a total attendance of 7,205.

Safety Spectacles

There were 56 pairs of prescription safety spectacles ordered during the period of December 1 through December 31, 1948; 61 pairs of prescription safety spectacles were checked, received, and fitted; and 195 adjustments and repairs were made to all types of safety spectacles.

Exposure Hours

There were 1,487,819 exposure hours from December 1, 1948 to and including December 31, 1948.

100 Areas Activities

One Major Injury was investigated in the Minor Construction Section of the Maintenance Division. A Near-Serious Investigation was held in the 100-D Area involving an employee of the Maintenance Division.

A bulletin was issued to all Divisions in the 100 Areas asking their cooperation in complying with eye protection regulations in the Maintenance Shops.

A new program to stimulate safety interest in the 100-D Area has been launched and the second phase is under way.

The 100-B Area Safety Slogan Contest has shown good results and the first month's winners have been chosen.

A letter relative to sub-standard stairways in the 190-D Building was sent to the Power Division for their action.

A request was made to the Technical group in charge of new operations in the 109-B Building to replace a ladder installation which was constructed of wood. A steel ladder is to be substituted.

A request submitted to the "P" Division to have stairways in the 105-DR Building changed to meet standards is being taken care of.

It has been noted that numerous Divisions have been lax about carrying glass containers of various size and shapes without proper carriers or protective covering. This has been brought to the attention of some of the Divisions to date.

Foot control switches, which apparently were missed at the time these recommendation were made--as the result of an accident several years previously, have been installed on a number of drill presses in the 100 Areas.

Quite a number of group safety orientations have been held in each of the three 100-Areas during the month of December with an attendance composed of new employees and those recently transferred to these Areas.

Services Divisions
Plant Security and Services

This office has requested all Divisions in the 100 Areas to submit a monthly exposure hours report so that we may maintain our records by the standard frequency method.

Supervision of several Divisions has shown a noticeable increased safety interest relative to minor injuries during the past month.

200 Areas Activities

One gas mask demonstration was given in the 200 East Area and two pair of gas mask clips were distributed in the 200 West Area.

Nine films were shown in the Areas.

The 200 East Area had their Safety Celebration for the completion of one year without a lost time injury.

Three near-serious accident investigations and one Sub-Major Injury investigation were held.

700-1100 Areas Activities

Promotion of injury free days has been attempted by attending and speaking at as many meetings as possible.

Recommendations were given to the Transportation Division for equipment of a welding room in 716 garage. Pipe and metal storage rocks were installed, hydraulic press was relocated, and an emergency exit was installed.

It has been recommended that revisions be made to the exhaust system in 716 and 1131 garage. A survey is being made to determine changes necessary.

A deep basin sink installation has been requested for 716 garage battery room to facilitate in cleaning and handling of batteries in a safe manner.

Approval was given for use of a new type elevator truck tail gate. Safety catch was revised for greater safety.

Circuit inspections are being made of outlying jobs handled by Transportation. Several well drilling sites have been visited for the purpose of checking procedures and practices.

General

The results of the four Injury Free Days during the month of December, which is one of the most hazardous months of the year, showed two outstanding beneficial results.

1. The number of minor injuries on these four days was reduced 21%.

2. The efforts put forth by a large majority of the employees throughout the plant in making Monday an Injury Free Day increased the safety mindedness to the extent that on the last Monday, six areas had no injuries and one area had only one injury.

Services Divisions
Plant Security and Services Division

FIRE PROTECTION

Fires	Number of Fires November	Number of Fires December	Estimated Damage November	Estimated Damage December
Plant Area	7	4	$10.00	$10.00
Miscellaneous	0	0	No Damage	No Damage
Construction Fires	5	8	No Damage	$60.00

No fires of any significance

Routine Duties

Fire Extinguishers

Inspected	3,071
Installed and Relocated	71
Refilled	115
Repaired	3
Winterized	3

Gas Masks

Inspected	86
Serviced	17

Fire Drills and Lectures

Outside	37
Inside	118
Auxiliary Brigade	102
Safety Meetings	38

All fire alarm boxes in the Industrial Areas were tested.

All fire hose houses, hydrants, and lines in Plant Areas were inspected and hydrants flushed.

SAFETY DIVISION - INJURY AND ACTIVITY STATISTICS

	300 Area	100-B Area	100-D Area	100-F Area	200-E Area	200-W Area	700-1100 Area	Misc. Area	3000 Area	Pasco Area	TOTAL
Minor Injuries	83	29	19	31	54	108	72	19*	42	1	458
Sub-Major Injuries	0	0	0	0	0	1	1	0	0	0	2
Major Injuries	0	0	0	1	0	0	0	0	0	0	1
Days since last Tabulatable Major Injury	97	219	701	11	414	147	215	43	109	519	
Days since last Sub-Major Injury	90	182	49	437	387	25	18	85	64	445	
Days without a Minor Injury	6	18	17	11	8	5	7	22	11	31	
Safety Meetings Conducted	99	60	66	85	54	71	144	15	17	16	627
Number in Attendance	1325	410	526	776	512	721	2178	184	497	76	7205
Safety Spectacles Delivered	12	7	9	13	5	7	8	0	0	0	61
Safety Spectacles Serviced	11	34	37	38	35	30	10	0	0	0	195

* 6 injuries added to correct for year.

MONTHLY INJURY ANALYSIS

Period - November 16 through December 15, 1948

Minor Injuries

	Burns	Abrasions	Contusions	Lacerations	Punctures	Splinters	Strains & Sprains	Foreign Body	Blisters	Unclassified	TOTAL DECEMBER	TOTAL LAST MONTH
GENERAL	0	0	0	0	0	0	0	0	0	0	0	0
MANUFACTURING	35	46	23	78	14	13	15	14	9	14	261	237
COMMUNITY	0	4	7	16	0	1	4	1	0	1	34	39
ACCOUNTING	0	1	0	0	0	0	0	0	0	0	1	0
LEGAL	0	0	0	0	0	0	0	0	0	0	0	0
TECHNICAL	12	8	6	13	2	2	2	0	0	2	47	38
MEDICAL	0	0	1	8	4	1	0	0	0	2	16	13
HEALTH INSTRUMENT	1	3	1	2	1	1	1	0	0	1	11	7
SERVICE	1	7	6	7	3	2	5	1	1	4	37	24
EMPLOYEE AND COMMUNITY RELATIONS	0	0	0	1	0	0	0	0	0	0	1	1
DESIGN & CONSTRUCTION	0	5	6	3	0	3	3	3	0	3	26	12
TOTAL	49	74	50	128	24	23	30	19	10	27	434	
LAST MONTH	54	50	49	100	25	18	20	26	14	15		371

OFFICE SERVICES DIVISION

General Services Division

Laundering volumes were as follows:

	November	December
Plant Laundry (Building 2723)		
Coveralls - Pieces	33,525	30,558
Towels - Pieces	7,546	7,288
Miscellaneous - Pieces	69,256	65,861
Total Pieces	110,327	103,707
Total Dry Weight - Lbs.	150,463	141,263
Richland Laundry (Building 723)		
Flatwork - Pieces	154,812	150,685
Rough Dry - Pieces	31,971	29,904
Finished - Pieces	5,690	5,495
Total Pieces	192,473	186,084
Total Dry Weight Lbs.	134,107	120,955
Monitoring Section (Building 2723-W)		
Poppy Check - Pieces	73,203	63,132
Sealer Check - Pieces	105,603	98,301
Total Pieces	178,806	161,433

Clerical Services Division

Telephone

Preliminary assignments of numbers for the new dial system has started to allow for issuance of a directory concurrently with the cutover to the dial system.

Peg counts during this month show our calls running 30,658 and 31,683.

Line capacity of the Telephone Exchange is as follows:

	November	December
Lines working as 1 - 0 Lines	623	630
2 - 0	62	59
0 - PBX	24	24
1 - N	24	24

Service Divisions
Plant Security and Services

	November		December	
2 - N	2		2	
2-O-R Combination	1		1	
Total Official Lines		736		740
Lines working as 1 - F Lines	91		92	
2 - F	17		16	
F-PBX	6		6	
1 - R	9		8	
2 - R	1266		1277	
2 - RF	21		19	
3 - RF	2		2	
Total Non-official Lines		1412		1420
Vacant Lines		52		40
Total lines in Multiple Bank		2200		2200

Mail Room and Stationery

A new postal scale along with the new postal charts have been installed covering the new postal regulations effective January 1, 1949.

	November	December
Pieces of First Class Mail received	33,888	36,653
Pieces of Parcel Post received	1,084	1,715
Pieces of Registered Mail	427	353
Pieces of Insured mail received	172	267
Pieces of Special Delivery mail received	326	328
TOTAL	35,897	39,316
Pieces of Mail sent out	38,448	18,159
Amount of money used in Postage Meter	1,673.94	1,022.12
Teletypes sent out	2,152	1,847
Teletypes received	2 255	1,633
Total teletypes handled	4,407	3,480

Office Equipment

There were 357 typewriters received from the Federal Bureau of Supply. The machines were older than our specifications and were in poor condition. Arrangements have been made to reject acceptance of these machines.

	November	December
Machines repaired in shop	226	270
Machines serviced in calls	240	276
Total machines repaired and serviced	466	546

Service Divisions
Plant Security and Services

Printing

Two new Multilith machines have been received and installed which, along with a complete rearrangement of our shop, will allow for better working conditions and efficiency.

	November	December
Multilith orders received	215	220
Multilith orders completed	202	242
Multilith orders on hand at month's end	53	31
Mimeograph orders received	2200	1929
Mimeograph orders completed	2200	1929
Mimeograph orders on hand at month's end	0	0
Ditto orders received	3121	3370
Ditto orders completed	3121	3370
Ditto orders on hand at month's end	0	0

Stenographic Services

Work progressed on a somewhat curtailed basis due to transfers, terminations, and reducing the pool personnel from the normal twelve girls to only six girls.

Records Service Center

An inventory has been taken of all records in the records hutment and is ready for submission to a records committee when formed to provide for setting up retention and disposal schedules.

	November	December
Cartons of material received for storage	164	90
Cartons of material processed	153	90
Material shipped	0	0

Summary of persons viewing records for the month of December, 1948:

General Electric	61	75
du Pont	56	17
Atomic Energy Commision	22	16
Total	139	108

Service Divisions
Plant Security and Services

PATROL AND SECURITY

General

An Operations Evacuation Plan - 200-West Area, Fifth Revision, was issued December 10, 1948.

Effective December 24th, a procedure was established for the Personnel Identification Spot Check of Construction Busses by patrol at the time of entering the Richland Barricade.

A procedure outlining the clearance requirements for the 234-5 Exclusion Area was issued under the date of December 24, 1948.

H.W Instructions Letter #107 entitled "Security Clearance Requirements for Project Work" was issued to all Operations personnel December 28, 1948.

A recommendation and Work Order were issued December 29, 1948, for the installation of fire proof windows and steel placed fire proof doors for the 700 Area Classified File Vault.

The special detail assigned to the 1100 Area warehouses as protection against possible arson attempts was continued during the month of December.

During the month of December, all Captains and Lieutenants assigned to the plant areas were reassigned to different areas. This reassignment was made to broaden the experience of the individual officers, and to strengthen certain critical areas. The Captain stationed at the 100-D Area will temporarily command both the 100-D and 100-B Areas until a new Area Commander is appointed.

Effective December 8th, the 700 Area Field Sergeants will make an inspection of the Pasco Patrol on all shifts unless circumstances prevent their absence from the 700 Area.

On December 21st, .30 caliber carbine rifles and ammunition were placed on sealed boxes and fastened to the wall.

For greater protect on to patrolmen manning the railroad crossings, scotchlite tape is being affixed to yellow raincoats for use on these posts.

PATROL

The 200 Areas handled 176 process escorts between the areas.

Requests handled totaled 499, mainly consisting of opening doors, gates and escorts for employees of other departments.

A total of 18 construction employees were escorted into areas for first aid treatment.

There were 134 unusual incident reports received, consisting mainly of contraband picked up at barricades, lost badges, pencils and traffic violations.

There were 19 classified escorts handled during the month.

Three employees were given emergency first aid treatment in the areas by patrol supervision during periods when medical personnel were absent from areas.

The outer area traffic car issued ten citation tickets, thirty verbal warnings during the month.

Practice evacuations were held as follows:

12/2/48	100-D Area	9:45 a.m.
12/3/48	100-F Area	10:05 a.m.
12/16/48	100-B Area	10:38 a.m.
12/22/48	100-H Area	7:56 p.m.

Practice blackouts were held as follows:

12/12/48	100-F Area	1:30 a.m.
12/31/48	100-D Area	5:30 p.m.

Training

Division Supervisors and Patrol Captains have completed their training on the Job Improvement Program. Lieutenants and Sergeants are continuing with this training.

A new program was started December 29, 1948, whereby all members of patrol supervision will receive the standard patrol training course prior to the regular sessions held with the patrolmen. This program was initiated primarily for the purpose of better acquainting patrol supervision with the activities of the Training School and to afford them an opportunity to comment on the training material.

Basic and advanced training at the patrol small arms range was continued and qualifications in Army "L" course firing were as follows:

	July		December	
	No.	Percent	No.	Percent
Unqualified	67	14%	52	10%
Marksman	138	29%	150	28%
Sharpshooter	110	23%	102	20%
Expert	158	34%	222	42%

The machine gun course was not fired this period.

Four hours each day were devoted to the Traffic Class consisting of instructions on making out the arrest ticket and all accompanying reports.

Twelve (12) new Garand M-1 Rifles were received during the period and all patrolmen will be trained in the handling and use of these weapons.

Safety meetings included a discussion on "The Employee's Responsibility for Safety".

Services Divisions
Plant Security & Services

Security meetings were conducted by Mr. Headley of the Security Office and covered the topic, "Vigilance Versus Security".

Health talks were covered by the topic for the month of November, "Services of Gadlec Hospital".

SECURITY

Operations Section

There were 410 Security Meetings held and attended by 6,625 General Electric employees.

Security Education talks were given by M J Headley, Security Education speaker at 26 Operations meetings - 937 employees attended

Two sets of "Burma Shave" type signs were posted within the plant area during this period with the following slogans:

"For the future good of all mankind,
Let's renew our pledge in forty-nine"

"He who thinks twice, before once speaking,
Will help win the peace that we are seeking"

The following G. E. Security Bulletins were issued during the month:

Bulletin No. 31 - "Self Defense", December 21, 1948
Belletin No. 32 - "Security Newsletter", December 30, 1948

Employee Clearances

Class "Q" clearance received on old employees this month	444
Class "Q" clearances received on old employees to date	4,354
Class "Q" clearances received on new employees this month	234
Class "Q" clearances received on new employees to date	5,480
Class "Q" clearances received on both old and new employees since February 17, 1947.	9,834
Formal "P" clearances awaiting change to "Q"	115
Authorization clearances issued this month to employees	113

Statistical Summary of Outstanding Area Badges (on next page)

Services Divisions
Plant Security and Services

November	A	B	C	Total
100-B	688	1367	688	2743
100-D	778	1431	662	2871
100-F	760	1397	660	2817
200-E	1118	1498	495	3111*
200-W	1338	1555	515	3408
200-N	47	837	166	1040
300	1505	1486	392	3383
100-DR	4908	466		5374
241-TX	1651	302		1953

* Includes 47 "A" badges at Riverland Yards

December	A	B	C	Total
100-B	707	1421	697	2825
100-D	807	1468	666	2941
100-F	750	1467	674	2891
200-E	1121	1534	505	3160*
200-W	1337	1604	513	3454
200-N	45	832	1663	2540
300	1499	1530	391	3420
100-DR	4917	482		5399
241-TX	1618	332		1950

*Includes 51 "A" badges at Riverland Yards

Visitors or Temporary Badges

Area	November	December
100-B	173	190
100-D	269	306
100-F	314	346
200-E	277	302
200-W	428	484
200-N	188	200
300	557	657
100-DR	410	443
241-TX	200	221
Total	2816	3149

Specail Clearances Section

Following is a statistical summary of emergency clearance status of vendor and consultant vendor companies:

Total companies forwerded to AEC this month: 10 Personnel: 38
Total companies forward to AEC to date: 179 1,931

Total companies cleared for restricted data this month: 18 Personnel: 68
Total companies cleared for restriced data last month: 20 Personnel: 70

No new companies were forwarded to the Atomic Energy Commission this month.

Number and type of clearance granted by the AEC this month to vendors and consultants:

Formal "Q"	12
Formal "P"	56

Emergency clearances requested this month for General Electric employees: 2
Emergency clearances received this month for General Electric employees: 2
Emergency clearance requested this month for General Electric consultant: 1
Emergency clearances for GE employees requested to date: 159
Emergency clearances for GE employees received to date: 118
No "Q" clearance cards were issued to consultants this month

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HANFORD WORKS
General Electric Company
Richland, Washington

REPORT OF VISITORS FOR PERIOD ENDING DECEMBER 31, 1948

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Classified	Restricted Data Unclassified
MEDICAL DIVISION						
I. Visitors to this Works						
H. M. Rosendaal Knolls Atomic Power Laboratory Schenectady, New York	Discuss mutual health problems	W. D. Norwood	12-1-48	12-3-48	X	
CONSTRUCTION DIVISION						
I. Visitors to this Works						
J. E. Weaver Whiting Corporation Harvey, Illinois	Assist in supervision and installation of winches purchased from his Company	G. E. Hotaling	12-8-48	Indefinite		X
D. Williams Diebold Company Seattle, Washington	Install vault doors in 200 Areas	G. E. Hotaling	12-28-48	Still here		X
J. L. Lenton American Machine & Foundry Buffalo, New York	Renegotiate firm price bids on hoods fabricated by his firm	G. E. Hotaling	12-30-48	12-31-48	X	
E. W. Forth American Machine & Foundry Buffalo, New York	Renegotiate firm price bids on hoods fabricated by his firm	G. E. Hotaling	12-30-48	12-31-48	X	
J. T. Roos The Door Company Seattle, Washington	Assist in installation of equipment	G. E. Hotaling	11-23-48	12-30-48		X

[redacted]

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Classified	Restricted Data Unclassified
II. Visits to other Installations						
R. H. Burrell to: American Bridge Company Pittsburgh, Pennsylvania	Obtain towers for HW	A. Wagner	11-22-48	11-23-48		X
R. H. Burrell to: Carnegie Illinois Steel Co. Pittsburgh, Pennsylvania	Regarding steel procurement for towers	D. Jenkins	11-23-48	11-23-48		X
R. H. Burrell to: General Electric Company Pittsburgh, Pennsylvania	Obtain assistance in procuring steel	J. Baryn	11-23-48	11-23-48		X
R. H. Burrell to: North Electric Company Galion, Ohio	Discuss engineering details on telephone equipment	R. B. McBerty G. E. Davis	11-24-48	11-26-48		X
R. H. Burrell to: General Electric Company Schenectady, New York	Regarding procurement of electrical equipment	G. A. Boyle T. H. Garrahan	11-29-48	11-29-48		X
R. H. Burrell to: S. Blickman, Incorporated Weehawken, New Jersey	Discussion on hoods	B. Blickman N. Blickman	11-30-48	11-30-48		X
R. H. Burrell to: American Machine & Foundry Buffalo, New York	Discussion on hoods	J. L. Lenton E. W. Forth	12-1-48	12-1-48	X	
R. H. Burrell to: Buffalo Forge Company Buffalo, New York	Discuss procurement of fans	N. R. Johnson G. B. Kellogg	12-2-48	12-2-48		X
R. H. Burrell to: Pennsylvania Furnace & Iron Warren, Pennsylvania	Discussion on hoods	J. DoFrees R. L. Blodgett	12-3-48	12-3-48	X	

[redacted]

[redacted]

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Classified	Restricted Data Unclassified
R. H. Burrell to: Giffels & Vallot Detroit, Michigan	Discuss engineering problems	C. J. Steigleder R. J. Clare	12-5-48	12-5-48	X	
R. H. Burrell to: Kewaunee Manufacturing Co. Adrian, Michigan	Discuss procurement of laboratory equipment	C. A. Moudry	12-6-48	12-6-48		X
J. C. Hamilton to: Kellex Corporation New York, New York	Technical consultation	J. J. Cuniffe	12-2-48	12-4-48	X	
J. C. Hamilton to: Colonna Plant New York, New York	Discussion on hoods	A. Colonna	12-4-48	12-4-48		X
J. C. Hamilton to: American Machine & Foundry Buffalo, New York	Discussion on hoods	J. L. Lenton E. W. Forth	12-5-48	12-7-48	X	
J. C. Hamilton to: Pennsylvania Furnace & Iron Warren, Pennsylvania	Discussion on hoods	J. DeFrees	12-8-48	12-8-48	X	
H. A. Hauser to: Northwest Laboratories, Inc. Seattle, Washington	Regarding Bell Jar Assemblies	C. V. Smith	12-21-48	12-21-48	X	
G. E. Hotaling to: San Francisco, California	Attend AEC Munitions Board Meeting	-	12-13-48	12-13-48		X
G. E. Hotaling to: Jensen Machinery Company Oakland, California	Discuss hood schedule	A. V. Osborne	12-14-48	12-14-48		X
L. G. Jones to: Weber Showcase & Fixture Co. Los Angeles, California	Discuss hood deliveries	D. Morrison	12-9-48	12-15-48		X

[redacted]

[redacted]

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Classified	Restricted Data Unclassified
L. G. Jones to: Waldrip, Incorporated Los Angeles, California	Discuss inspection procedure on HWC orders	E. Wagener	12-9-48	12-15-48		X
L. G. Jones to: Jensen Machinery Company Oakland, California	Discuss hood schedule	A. V. Osborne	12-14-48	12-14-48		X
H. D. Tibbals to: Valley Iron Works Yakima, Washington	Discuss inspection of panels and thermocouple sleeves	Mr. Whittaker Mr. Price	12-15-48	12-15-48		X
DESIGN DIVISION						
I. Visitors to this Works						
C. W. LaPiere American Machine & Foundry Buffalo, New York	Conference	D. D. Streid	12-1-48	12-2-48		X
W. F. Dalezol Raytheon Manufacturing Company Seattle, Washington	Discuss application of Electro Static precipitation in separations plant	H. E. Hanthorn	12-2-48	12-3-48		X
R. Y. Atlee American District Telegraph Co. New York, New York	Discussion of Alarm System for particular area	J. A. Carlen	12-7-48	12-9-48	X	
K. E. Atwood Bailey Meter Company Seattle, Washington	Instrument discussion	E. Hilgeman	12-9-48	12-10-48	X	
H. W. King Worthington Pump Company Spokane, Washington	Discuss pump problems	C. F. Quackenbush W. C. Royce	12-14-48	12-14-48		X

[redacted]

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Classified	Restricted Data Unclassified
C. A. Raynor H. H. McVeigh Company Spokane, Washington	Discuss engineering details	I. M. A. Garcia	12-17-48	12-18-48		X
E. B. Layfield Ralph M. Parson Company Los Angeles, California	Contract discussion	W. E. Johnson W. H. Clymer	12-20-48	12-20-48	X	
E. W. Forth American Machine & Foundry Buffalo, New York	Discussion	D. D. Streid	12-30-48	12-30-48	X	
II. Visits to other Installations						
A. J. Karnie to: Willamette Iron & Steel Portland, Oregon	Discussion on design of equipment	D. J. Kooker	12-6-48	12-7-48	X	
J. M. Frame to: Argonne National Laboratory Chicago, Illinois	Technical consultation	S. Lawroski	12-14-48	-12-18-48	X	
J. M. Frame to: Oak Ridge National Laboratory Oak Ridge, Tennessee	Technical consultation	M. D. Peterson	12-14-48	12-18-48	X	
W. B. Webster to: Carbide & Carbon Chemical Corp. Oak Ridge, Tennessee	Technical consultation	R. B. Korsmeyer	12-14-48	12-21-48	X	
R. S. Perry to: Van Steel Metallurgical Corp. Chicago, Illinois	Check shop drawings	Mr. Ostrander	12-8-48	12-13-48		X
J. R. Wolcott to: Radiation Laboratory Berkeley, California	Technical consultation	R. Martinelli	12-12-48	12-15-48	X	

[redacted]

[redacted]

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Classified	Restricted Data Unclassified
J. M. Holeman to: Bausch & Limb Optical Co. Rochester, New York	Inspection of periscopes	M. H. Stevens	12-13-48	12-18-48		X
J. M. Holeman to: General Electric Company Schenectady, New York	Inspection of periscopes	G. R. Read	12-13-48	12-18-48	X	
J. B. Medlin to: Washington Iron Works Seattle, Washington	Consultation	O. C. Nugent	12-19-48	12-21-48	X	
L. H. Hildebrandt to: Washington Iron Works Seattle, Washington	Consultation	O. C. Nugent	12-19-48	12-21-48	X	
HEALTH INSTRUMENT DIVISION						
I. Visits to other Installations						
H. M. Parker to: Radiation Laboratory Berkeley, California	Health Instrument consultation	E. O. Lawrence	12-3-48	12-11-48	X	
P. L. Eisenacher to: IRE Conference New York, New York	Attend AIEE-IRE Conference	-	11-25-48	12-4-48		X
PROJECT ENGINEERING DIVISION						
I. Visitors to this Works						
L. Gitzendanner General Electric Company Schenectady, New York	313 Mechanization	C. A. Lyneis R. O. Mehann E. A. Smith	12-9-48	12-10-48	X	
II. Visits to other Installations						

[redacted]

[redacted]

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Classified	Restricted Data Unclassified
H. J. Bellarts to: Puget Sound Naval Shipyard Bremerton, Washington	With regard to P-10	K. H. Stevens E. L. Churchill C. A. Forsmark	12-9-48	12-10-48		X
TECHNICAL DIVISION						
I. Visitors to this Works						
N. B. Garden Radiation Laboratory Berkeley, California	Technical consultation on laboratory design	R. H. Beaton J. B. Work	12-1-48	12-2-48	X	
A. A. Christopher Gen. Engineering & Consulting Lab. Schenectady, New York	Technical consultation on 234-5 Program	R. H. Beaton J. B. Work	12-6-48	12-18-48	X	
J. N. Hall Gen. Engineering & Consulting Lab. Schenectady, New York	Technical consultation on 234-5 Program	R. H. Beaton J. B. Work	12-6-48	12-18-48	X	
L. G. Gitzendanner Gen. Engineering & Consulting Lab. Schenectady, New York	Technical consultation on 234-5 Program	R. H. Beaton J. B. Work	12-6-48	12-18-48	X	
D. H. Marquis Gen. Engineering & Consulting Lab. Schenectady, New York	Technical consultation on 234-5 Program	R. H. Beaton J. B. Work	12-6-48	12-18-48	X	
J. C. Maguire Argonne National Laboratory Chicago, Illinois	Consultation on P-10 Project	A. A. Johnson J. C. L. Chatton	12-13-48	12-17-48	X	
R. C. Gerber, Jr. General Electric Company Schenectady, New York	Discuss shielding problems	J. M. West	12-14-48	12-21-48	X	
II. Visits to other Installations						

[redacted]

12-11-48

[redacted]

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Classified	Restricted Data Unclassified
D. H. Curtiss to: Fairchild Engine & Airplane NEPA, Oak Ridge, Tennessee	Attend Radiation Damage Symposium	D. D. Cowen	12-6-48	12-8-48	X	
W. K. Alexander to: Argonne National Laboratory Chicago, Illinois	Attend symposium	W. P. Bigler	12-16-48	12-17-48	X	
J. W. Hall to: Radiation Laboratory Berkeley, California	Laboratory design inspection and consultation	N. B. Garden	12-13-48	12-15-48	X	
L. F. Kendall to: Radiation Laboratory Berkeley, California	Laboratory design inspection and consultation	N. B. Garden	12-13-48	12-15-48	X	
C. H. Ice to: Radiation Laboratory Berkeley, California	Laboratory design inspection and consultation	N. B. Garden	12-13-48	12-15-48	X	
M. Lewis to: Argonne National Laboratory Chicago, Illinois	Attend the second Ruthenium Conference	H. N. Hyman	12-13-48	12-14-48	X	
R. Teats to: Simonds Saw & Steel Co. Lockport, New York	Supervise production rolling of uranium	A. D. Potts	12-1-48	12-7-48	X	
W. T. Kattner to: Simonds Saw & Steel Co. Lockport, New York	Supervise production rolling of uranium	A. D. Potts	12-1-48	12-7-48	X	
R. M. Padden to: Simonds Saw & Steel Co. Lockport, New York	Supervise production rolling of uranium	A. D. Potts	12-1-48	12-4-48	X	

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Classified	Restricted Data Unclassified
E. A. Smith to: Argonne National Laboratory Chicago, Illinois	Attend symposium on nuclear reactors and discuss fabrication of P-10	W. P. Bigler F. Foote alloy	12-15-48	12-17-48	X	
T. Prudich to: Los Alamos Scientific Lab. Los Alamos, New Mexico	Training in DP West Operations including Bldg.5	E. R. Jette R. D. Baker I. B. Venable	12-8-48	12-10-48	X	
J. G. Attanas to: Los Alamos Scientific Lab. Los Alamos, New Mexico	Training in DP West Operations including Bldg.5	E. R. Jette R. D. Baker I. B. Venable	12-8-48	12-17-48	X	
W. L. Lyon to: Los Alamos Scientific Lab. Los Alamos, New Mexico	Training in DP West Operations including Bldg.5	E. R. Jette R. D. Baker I. B. Venable	12-8-48	12-17-48	X	
F. W. Albaugh to: Radiation Laboratory Berkeley, California	Inspection of laboratory facilities	G. T. Seaborg	12-13-48	12-15-48	X	
W. H. Reas to: Radiation Laboratory Berkeley, California	Inspection of laboratory facilities	G. T. Seaborg	12-13-48	12-15-48	X	
C. F. Callis to: Argonne National Laboratory Chicago, Illinois	Chemistry of Ruthenium Conference	H. H. Hyman	12-13-48	12-14-48	X	
K. M. Harmon to: Argonne National Laboratory Chicago, Illinois	Chemistry of Ruthenium Conference	H. H. Hyman	12-13-48	12-14-48	X	
O. F. Hill to: Argonne National Laboratory Chicago, Illinois	Chemistry of Ruthenium Conference	H. H. Hyman	12-13-48	12-15-48	X	

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Classified	Restricted Data Unclassified
M. K. Harmon to: Radiation Laboratory Berkeley, California	Technical discussion and inspection of shielding apparatus	N. B. Garden	12-13-48	12-15-48	X	
E. T. Merrill to: Argonne National Laboratory Chicago, Illinois	Redox technical consultation	S. Lawroski	12-15-48	12-17-48	X	
E. T. Merrill Oak Ridge National Laboratory Oak Ridge, Tennessee	Redox technical consultation	M. D. Peterson	12-16-48	12-17-48	X	
CONSULTANT TO THIS WORKS - TECHNICAL DIVISION						
H. H. Willard University of Michigan Ann Arbor, Michigan	Consultation on analytical chemistry	D. W. Pearce W. W. Marshall H. R. Schmidt	12-2-48	12-3-48	X	
TRANSPORTATION DIVISION						
R. T. Cooke to: Oak Ridge National Lab. Oak Ridge, Tennessee	Attend automotive conference	--	12-17-48	12-23-48	X	

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EMPLOYEE AND COMMUNITY RELATIONS DIVISION

SUMMARY - DECEMBER 1948

All divisions are now participating in the 9-Point Job Improvement Program and during December two divisional groups completed their series of conferences. Two sets of questions and answers were distributed to all supervisors during December.

Open requisitions for additional personnel decreased from 456 at the beginning of the month to 388 at the end of December. Total plant roll increased during December by 37 employees.

There were 1,846 contacts made by Employee Service Counselors during December. Two employees retired and one employee death occurred during December. Thirteen suggestion awards, totaling $115, were granted during December. During the month several G.E. films were procured from the Portland office for use by three groups in Richland, as well as the Kiwanis Club in Kennewick. Continued publicity was prepared, explaining the causes of the power shortage and requesting the residents of Richland to conserve power. Publicity was prepared relative to several community recreation parks on school grounds in Richland.

Studies have continued for the purpose of assembling data relative to the composition of the bargaining unit for use in the forthcoming formal hearing to be conducted by the National Labor Relations Board. A representative was sent to Oak Ridge for the purpose of gaining information on labor relations and wage rate policies at that location. During December several meetings were held with the various divisions for the purpose of clarifying the wage rate policies. An official A.E.C. reimbursement order covering the reclassification of non-exempt employees on July 19 was received during the month.

EMPLOYEE AND COMMUNITY RELATIONS DIVISION

DECEMBER, 1948

ORGANIZATION AND PERSONNEL

Employee Relations

Effective December 1, 1948, one Reproduction and Photographic Assistant "E" was added to the Employment Group to replace a similar employee transferred to the Construction Division the previous month.

Effective December 10, 1948, a General Clerk "D" terminated voluntarily.

Community Relations

Effective December 17, one Publicity Writer was added to replace a Publicity Writer who terminated voluntarily.

Labor Relations and Wage Rates

No organization changes were made in this Group during December.

Number of employees on payroll	December, 1948
Beginning of month	93
End of month	93

ACTIVITIES

Employee Relations

General

Representatives of the Comptroller's Office, Community Division and Medical Division visisted instructors' classes in the 9-Point Job Improvement Program during the month of December for the purpose of discussing the functions of their respective divisions as well as answering many questions relative to their work.

Two sets of questions and answers were distributed through the instructors to all supervisors during the past month.

Employment

	November, 1948	December, 1948
Applicants interviewed	1,554	1,126

Open Requisitions	November, 1948	December, 1948
Exempt	41	26
Non-exempt	415	362
Total	456	388

Of the open requisitions at the beginning of December, 236 were covered by interim commitments and 21 of the individuals in exempt requisitions had accepted offers, 10 had been made offers but had not accepted and the remainder were in the process of investigation. At the end of December, 177 non-exempt requisitions were covered by interim commitments and 15 of those individuals on exempt requisitions had accepted offers, 4 had been made offers but had not accepted and the remainder were in the process of investigation.

	November, 1948	December, 1948
Employees added to the rolls	235	162
Employees removed from the rolls	144	125
Net Gain	91	37

Early in the month of December, the Employment Group was informed of the necessary layoff of 10 exempt employees assigned to the Construction Division. Subsequently, an additional 5 exempt employees were added to this number. This layoff was necessary due to the fact that these exempt employees were engaged in inspection work concerning concrete building and streets and roads for which the work had been completed. At the end of the month, arrangements had been completed to transfer 3 of these employees to other divisions. 2 were re-assigned to other work by the Construction Division and retained. 10 of these

employees were laid off, 7 of them obtained positions with sub-contractors on the project; 1 left to enter business for himself and 2 were unable to locate employment on this project.

During the month of December, 34 new requests for inter-divisional transfers were received and reviewed by the Employment Office. 19 of the persons making such requests were personally interviewed and as a result, 10 transfers were effected.

Employee Services

During the month of December there were 1,846 contacts made by Employee Service Counselors. These contacts resulted in 2,100 inquiries, summarized as follows:

	Supervision	Weekly
Policy	110	189
Military Service	56	15
Group Life Insurance	222	159
Group Disability Insurance	105	127
Pension Plan	14	20
Suggestion System	7	8
Savings Plan	75	90
Social Security	19	28
Employee Sales Plan	93	235
Housing	4	43
Community	5	12
Personal	35	65
Income Tax	83	138
Miscellaneous	59	84
	887	1,213

Grand Total 2,100

Exit interviews were given to 117 terminating employees. 146 new employees were given orientation. Of this latter number, 77 elected to participate in the Group Life Insurance Plan and 73 elected to participate in the Group Disability Insurance Plan.

Employee Services Counselors attended two Area Council Meetings, with a total of 37 members in attendance. Twenty-one meetings were conducted by Counselors with a total of 364 employees in attendance. A majority of these meetings were held for the purpose of presenting to supervisors, the recanvassing program on group life insurance. The group life insurance recanvassing program was completed during December; however, returns from the various divisions are not available at this time.

Employee and Community Relations Division

The following employees retired during the month of December:

Beulah Taggart, Medical Division
Adelard F. DeMers, Community Power Division

Both of these employees were participating in the Pension Plan, and were interviewed prior to their retirement and fully informed as to the benefits they would receive under this plan.

One employee death occurred during December. This employee was , Construction Division. This employee's family was contacted by an Employee Services Counselor and all arrangements relative to insurance were made at that time.

Five contacts with employees absent because of illness were made by Employee Services Counselors during December.

During the month of December, two non-veteran, single employees of the Technical Division received 1-A classifications from their local draft boards. Deferments have been requested and granted on these employees.

Suggestion System

At the end of December, the volume of work in the Office of the Secretary of the Suggestion System was as follows:

	November	December	Total since 7-15-1947
Suggestions received and acknowledged	131	145	2,970
Investigation reports completed	142	86	2,637
Awards granted by Suggestion Committee	28	13	260
Cash awards	$ 330	$ 115	$ 2,550

To eliminate the constant problem of regular daily suggestion box mail pick-ups, arrangements have been made to seal the mailing compartments of these boxes. In the future, all suggestions will be submitted to the Secretary's Office through the regular plant mail. This action has been taken in order to minimize the possibilities of suggestions not being promptly received.

Insurance

1. Insurance Coverage - Public Liability

The recommendation has been made by the attorney for the Travelers Insurance Company in this case, to the effect that a compromise be considered, based on what the employee would have received if the claim had been determined to be a compensable injury under the Workmen's Compensation Law. At the same time, the Travelers Insurance Company has advised that they are not in favor of a compromise

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settlement at this time.

An answer has been prepared by the attorney for the Travelers Insurance Company defending this suit. This answer has been submitted to the J. A. Terteling and Sons for signature by officers of that Company.

2. Life Insurance

Code information used by insurance companies in issuing insurance to employees of this Works was furnished to 47 insurance companies and investigation agencies during December.

In connection with the resurvey of various jobs at this Works by Mr. R. C. Stratton, a representative of the Home Office Life Underwriters Association, information has been received from Mr. Stratton that he expects to conduct this survey during the early part of February.

3. Compensation

As a result of a study conducted by the Insurance Group, Company Counsel and the Atomic Energy Commission Insurance Group relative to the advisability of continuing the existing special agreement with the Washington State Department of Labor and Industries regarding compensation, it has been agreed that efforts should be made to obtain legislation during the next legislative session of the State of Washington to extend the present agreement. A meeting is planned for the early part of January to discuss this proposition. The need for the legislation at this time is considered essential inasmuch as the law provides that the present working agreement between the Department of Labor and Industries and this Works should have remained in effect only "during the emergency as proclaimed by the President of the United States and thereafter for such reasonable time as the Department of Labor and Industries deems necessary". The Department of Labor and Industries has indicated their feeling that such a reasonable period has now expired.

The State Department of Labor and Industries has been advised with reference to the claimants who were affected by carbon tetrachloride and who are receiving time loss payments, that laboratory tests revealed in every case there were no permanent damages due to the exposure to these fumes. In view of the results of these tests, the Department of Labor and Industries has been requested by letter to carefully review these cases prior to continuing payment of time loss.

STATISTICS

Employee Relations

Number of employees on rolls	11-30-48	12-31-48
Exempt	1,697	1,706
Non-exempt	6,884	6,912
Totals	8,581	8,618

Employee and Community Relations Division

ADDITIONS

	Exempt	Non-exempt	Total
New Hires	5	137	142
Reengaged	1	2	3
Reactivations	8	9	17
Net Additions	14	148	162
Payroll Exchanges	18*	2**	20
Gross Additions	32	150	182

* Transferred from Weekly Salary Roll
** Transferred from Monthly Salary Roll

TERMINATIONS

	Exempt	Non-exempt	Total
Actual Terminations	19	79	98
Removals from Roll	2	25	27
Payroll Exchanges	2***	18****	20
Gross Terminations	23	122	145

*** Transferred to the weekly salary roll.
**** Transferred to the monthly salary roll.

Approximately 86% of all actual terminations were on a voluntary basis, and most of these were for the following reasons: (a) Another job, (b) To remain or return home, (c) Personal Reasons.

GENERAL

	11-1948	12-1948
Applicants interviewed	1,554	1,126
Photographs processed	3,768	3,461
Fingerprint impressions taken (in duplicate)	407	313
Procurement letters written	1,199	989

Employee and Community Relations Division

ABSENTEEISM STATISTICS
(Weekly Salary Roll)***

	11-1948	12-1948
Male	1.80%	2.03%
Female	3.51%	3.45%
Total Plant Average	2.48%	2.41%

*** Statistics furnished by Weekly Payroll Division.

INVESTIGATIONS STATISTICS

	11-1948	12-1948
Cases pending at beginning of month	1,437	1,435
Cases received during the month	408	288
Cases closed	410	393
Cases pending at month end	1,435	1,330
Number found satisfactory for employment	364	232
Number found unsatisfactory for employment	16	11
Cases closed before investigation completed	24	12
Special investigations conducted	72	87

Compensation and Insurance

Claims	Reported in December, 1948	Reported in November, 1948	Total since Sept. 1, 1946
Workmen's Compensation	117	128	1,890 *
Liability	6	11	265

*This total includes Broken Glass Claims which beginning January, 1949, will be shown in all monthly reports.

Employee and Community Relations Division

Compensation Payments Approved (Department of Labor and Industries)

	November		October		Total since September 1, 1946
	No. of Claims	Amount	No. of Claims	Amount	Amount
Medical Aid	47	$1,508.13	28	$1,204.10	$ 15,734.15
Accident Fund	131	7,110,01 *	103	6,659.03**	105,942.92
Pension	28	1,280.32	29	1,364.49	37,518.55

* This amount includes $969.17 for Administrative Expenses
** This amount includes $1030.00 for Administrative Expenses

Liability Payment Approved (Travelers Insurance Company)

	November, 1948	Total amount paid out since Sept. 1, 1946
Bodily Injury - Excluding Auto	$ 0	
Bodily Injury - Auto	$ 0	$ 67,027.88
Property Damage - Excluding Auto	$181.60	
Property Damage - Auto	$105.41	

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Employee and Community Relations Division

Community Relations

The work of Community Relations continued to follow the basic pattern as outlined in the monthly report for November 1948. During December, work completed, in addition to general community relations matters, was handled under the two headings: "Public Information," and "Employee Information."

General Community Relations matters handled during the month of December included the meeting of community thought leaders which was held in the recreation hall small dining room on December 16. This meeting was attended by 41 people, including the school superintendent and 13 members of his staff, 17 ordained ministers representing churches in Richland and North Richland, representatives of the TRI-CITY HERALD, SPOKANE CHRONICLE, and the Richland VILLAGER, and 7 General Electric employees including the Nucleonics Department General Manager, the Employee Relations Division Head, the Community Relations Division Head and 2 members of his staff, and the superintendent of the Community Activities Division and 1 member of his staff.

The purpose of the meeting was to give thought leaders in Richland an opportunity to become acquainted with the new Nucleonics Department General Manager, and to provide him an opportunity to become acquainted with those invited to attend. A luncheon was provided all those who attended the meeting, the General Manager spoke for approximately 45 minutes, and personally met each individual present following his talk.

Work with the Richland merchants during the past month has included attendance at Chamber of Commerce meetings and contributing of several suggestions as to the manner in which problems they are facing might be solved. The possibility of conducting a shopping area survey was discussed, and matters concerning the formation of a Better Business Bureau have been discussed at the request of the merchants concerned.

A complete mailing list of Richland community thought leaders was completed during the month of December.

Public Information -- Community

Informative newspaper releases made during the month to the "Local List" of newspapers and radio stations served, which includes the VILLAGER, TRI-CITY HERALD, SPOKANE CHRONICLE, HANFORD WORKS NEWS, WALLA WALLA UNION BULLETIN, radio stations KPKW and KIT, including release dates, were as follows:

12-2 Announcement that General Manager R. C. Muir would be awarded the Certificate of Merit by President Truman for his contribution to the war effort. This news release was made simultaneously by the General Office News Bureau in Schenectady and by Robert W. Jackson's office in San Francisco.

12-9 Suggestions through which tenants can shorten the period of time that their electricity is off in case of another city-wide electrical failure were publicized.

12-9 Announcement that the in-patient section of the North Richland Medical Center would be placed in operation. Photographs showing typical in-patient facilities were sent to four selected newspapers with the story.

12-16 Announcement that long-term ground leases had been awarded for the building and operation of a grocery store, drug store, and service station as a nucleus of a neighborhood shopping center, to be located at the intersection of Swift and Wright.

12-20 R. C. Muir's departure for Schenectady was the occasion for a story that described his part in the establishment of the Nucleonics Department and his career with the Company. Thirteen photographs were sent to a selected group of newspapers with the news story.

12-20 A photograph showing the power conservation poster produced by this division and various members of the Community Divisions and the Richland Junior Chamber of Commerce was sent with a caption to 11 daily papers in the Northwest.

12-23 An adult recreation area to be built around Spalding Grade School was described in a story sent to our regular list of daily papers.

12-24 News story was released discussing the program to date on Richland's tree and grass planting program.

12-30 Announcement was made that Cahoon Motors had begun construction of the building that will house their Studebaker dealership. Four pictures of the building site were distributed.

12-30 Robert E. Anderson's appointment as supervisor in charge of the newly established Recreation Section of the Community Activities Division was announced. Twelve photographs of Anderson were distributed with captions.

12-30 Glossy prints of a diagram showing the types and locations of recreation equipment and athletic playing fields surrounding Spalding Grade School were sent to 12 daily papers.

Public Information -- General

Informative newspaper releases were sent to 41 of the leading daily newspapers in the Pacific Northwest during the month. The release date is given for each story, and they are as follows:

12-2 Three electrical interruptions scheduled to occur during the coming week were announced.

12-2 Announcement was made that G.E.'s "Instruments of Industry" show would appear in Richland.

12-3 An explanation of the failure of electricity that affected all of Richland on December 2 was released to local newspapers.

12-9 An article describing coming Christmas fire hazards and ways to avert them was distributed.

12-9 A follow-up story on the "Instruments of Industry" program giving dates and times of performances and complete details about the show was released.

12-9 Two electrical interruptions for the coming week were announced.

12-16 One electrical interruption for the coming week was announced.

12-17 A release prepared from the text of a speech given by George R. Prout before Richland's clergy and school teachers was prepared. The release was distributed to newspaper representatives who attended the luncheon at which Mr. Prout spoke.

12-23 Three electrical interruptions for the coming week were announced.

12-23 The establishment of a new bus route in Richland, and details concerning the new route were released.

12-27 Available details concerning an automobile accident that occurred within the operating areas and resulted in serious injuries to Robert Cline were released.

12-30 Two electrical interruptions for the coming week were publicized.

12-30 Glossy prints of a diagram showing the proposed Spalding Grade School recreation park were distributed to local papers with a localized caption.

12-30 A round-up of news concerning the progress of commercial development of Richland during 1948 was written up from a local point of view and distributed.

12-30 Beginning of the spring term of the G.E. Education Program on January 17 was announced. Available courses and their instructors were listed, as well as instructions for enrollment in the program.

12-30 A news release was prepared informing Richland residents that damage to Richland houses caused by improper protection against sub-freezing temperatures would be the financial responsibility of the tenant.

Coming of the "Instruments of Industry" program was publicized, a place for the demonstrations was found, as well as other equipment, men were provided via H.W. Work Order to load and unload the exhibits. Photographs of the exhibits were supplied to local newspapers as well as to the EVERGREEN of Washington State College, the next stop for the exhibits. Four shows were presented, one of which attracted the largest audience a single showing has had since the exhibit left the East early in 1948.

Francis Bello of FORTUNE Magazine spent several days in Richland in connection with a story that appeared in the January issue of FORTUNE. Arrangements were made for Mr. Bello to interview Mr. Prout, Mr. Muir, Mr. Baker and Mr Euck. Proofs of the article were sent to this office for checking before publication, accompanied by a note from the author stating that although very little of the material obtained while at Hanford could be accommodated in the article, it would perhaps be of use in the future.

An agreement was reached with Hanford Works Security and Patrol Division whereby details of accidents occurring inside the barricade will be given to this office for distribution to the press. Heretofore newspapers have gotten such stories directly from Patrol.

Arrangements were made for Helen Gleason of the SF KANE CHRONICLE to interview Mr. R. C. Muir shortly before his departure for Schenectady. The resulting story was returned to this office by Mrs. Gleason for checking prior to submitting it for publication.

G.E. films were secured from the Portland Office for use by three groups at Hanford Works and Kiwanis Club in Kennewick during the month.

Mr. Lufkin from the WALLA WALLA UNION BULLETIN received the assistance of this office in preparing a feature article on Whitman College graduates at Hanford Works for his paper. A member of the Division helped Mr. Lufkin interview and photograph Whitman graduates. The Employee and Community Relations Division photographer took pictures of two Whitman graduates after Mr. Lufkin's visit and photographs, as well as biographical information about the subjects were mailed to Mr. Lufkin. Arrangements were made for Lufkin to attend one of the "Instruments of Industry" shows here. He obtained photographs and material for a story.

Display racks for various General Electric publications were designed and ordered by the Division and placed during December in Buildings 720 and 761, and in the reception room of Kadlec Clinic. This makes a total of 6 display racks that have been erected in the 700 area.

Employee Information -- Special Programs

The Island Presentation of the 9-Point Job Program was given for 32 supervisors in Dormitory W-10 on December 1. Fifteen Employee and Community Relations employees were present to acquaint them with the program. Due to the great demand for Supervisor's Guides which are used with the 9-Point Job Program, 300 additional copies were printed. Distribution of these and other 9-Point Job material was arranged.

Following a prolonged power failure throughout Richland and North Richland, two news releases were prepared. One explained the causes of the power failure and emphasized that the power failure was prolonged by the heavy power consumption immediately after power was first restored. The second news release explained to residents what steps to take to assure as prompt restoration of service as possible, in the event of another general power failure.

Employee and Community Relations Division

A magazine article describing Richland and its commercial development was received from the AMERICAN CITY magazine for approval. Certain changes and additions were made and the article was returned to the magazine. The article was written by a free-lance writer who was given assistance in obtaining background material.

Publicity was given to the establishment of several Community Recreation Parks on school grounds in Richland. This involved an initial news release announcing that one such park at Spalding School would be completed early this coming summer, and that plans call for the establishment of five others on school grounds in Richland. An artist's sketch of the Spalding Recreation Park was also prepared and subsequently released generally with a caption which explained the establishment of the parks. The sketch showed the locations of the various recreation equipment and facilities for both adults and children. Liaison was maintained with the Community Activities Division for the preparation and approval of the material.

To help maintain public interest and cooperation in the present power conservation campaign, one hundred large posters were prepared which urge Richland and North Richland housewives to help reduce consumption of electric power during the peak load hours. These posters were placed prominently in commercial facilities in both Richland and North Richland. To assist in publicizing the power conservation campaign, a picture of Richland Chamber of Commerce and General Electric Company power conservation representatives looking at the poster was distributed locally with caption. For the Works NEWS, a picture of the poster and G.E. employees was prepared.

The display case in front of the Municipal Building was decorated with an appropriate "Season's Greetings" display prior to Christmas.

Employee Information - Works NEWS

Four issues of the Works NEWS were published during the month of December, "Candid Camera" was inserted in the December 31 issue and contained two pictures of Hanford Works; one was the Atomic Frontier Days queen and another was of Mr. Pineer's amphibious jeep crossing of the Columbia River.

In the December 3 issue an article was run with respect to the recanvassing program of employees on Group Life Insurance. In the Christmas issue of the Works NEWS on December 24, a message was carried to all employees from President Wilson. This was followed by a New Years message in the December 31 issue, signed by Vice President G. [illegible]. Prout and A.E.C. Manager F. C. Schlemmer. In this same issue a story was run in which the highlights of the year just passed and the new year ahead were discussed by Mr. Prout.

A complete spring catalogue of courses for non-academic graduate and under-graduate credit in the G.E. Education Program was also published in the December 31 issue.

A change in distribution from Friday of each week to Monday of each week was necessary to allow time for more complete news and picture coverage, to enable the printer additional time to produce a better appearing paper, and to ease the distribution problem caused by the frequent demand for increases in the number of copies by the various distribution points. Notice to all employees was made of this change in the December 24 issue and was supplemented by a Hanford Works office letter.

Employee Information -- Women's Activities

"Today's G.E. Woman" appeared in four issues of the Hanford Works NEWS during December. One week the page was devoted to publicity for the education program set up by the G.E. School of Nuclear Engineering. Syndicated material is being received which makes available free patterns and directions for knitted and crocheted articles. Also timely information is being received from the U.S.D.A. Extension Service.

A total of 46 women came to work for General Electric during the month of December and were present for the women's orientation conducted in the Women's Activities Office.

Fifty-one women were removed from the payroll during December. However, 29 exit interviews were conducted in this office. The former number represents a large number of women on leave of absence who will not return and their leaves have culminated. Also a number of women in the Construction Division who are given exit interviews elsewhere.

There were 8 requests for counsel and information during the month. The questions concerned the shorthand and educati n program, requests for job transfer, and recreation.

Our file of all Hanford Works women has been brought up to date. Each card has been checked for proper job title and placed in the job classification according to the new classification system.

There were 230 requests for rides or passengers to various points in the state and distant states. Destinations included Salt Lake, Denver, San Francisco, Los Angeles, Oakland, Roseburg, Oregon, North Dakota, Idaho, Dayton, Ohio, Sacramento, Texas, Bend, Oregon, Utah, Great Falls, Tulsa, Birmingham, Seattle, Portland, Spokane, Pendleton, Pullman, Wenatchee, Yakima, and Tollgate.

On December 5, the OREGON JOURNAL featured a story of "Women at Hanford" with five pictures. The material was prepared in this office.

Employee and Community Relations Division

Labor Relations and Wage Rates

Labor Relations

Special studies have been conducted for the purpose of assembling data relative to the composition of the bargaining unit for use in the forthcoming formal hearing to be conducted by the National Labor Relations Board. No official notification has been received as to the date on which such hearing shall take place.

Mr. J. N. Duguy, of this division, spent several days at the atomic energy plant located at Oak Ridge, Tennessee, for the purpose of gaining information to be used in comparing labor relations and wage rate policies between the Oak Ridge plant and Hanford Works.

Notification was received from the Instrument Craftsmen's Guild, Independent, which informed the company that the Guild had contacted the Regional Director, National Labor Relations Board, Seattle in regard to recognition as the bargaining agent for its members and thus be considered as possible intervener in the present union organizing activity.

Wage Rates

The completed data collected as a result of the recent community wage rate survey has been formalized and distributed to Division Managers.

Special wage rate studies have been conducted for the purposes of getting more specific data to be used in comparing rates of several classifications used here at the Hanford Works with those of the surrounding community. A special study was conducted at the Boeing Aircraft Company of Seattle, Washington, for the purpose of comparing comparable jobs in the blue printing and related work divisions. Such studies were instigated as a result of the feeling that our rates were not in line with those of the Boeing Aircraft Company for this type of work. Such was found not to be the case.

A telephone survey was conducted for the purpose of gaining information as to the pay rates, hours of work, holidays, vacations, pensions, and other benefits provided by a number of large cities in the states of Washington and Oregon to their people engaged in fire fighting and police work.

A number of sessions in the current 9-Point Program have been turned over to representatives of the Wage Rate Division. These sessions were devoted to a discussion of the history and other information relative to the current wage rate plan placed into effect on July 19 at this plant.

A review of the status of all personnel who are subject to merit increases has been conducted and all divisions notified of those employees who possibly should be considered at this time for a merit increase. This was done in the interest that no employee be overlooked as a result of misunderstanding of the new classification system.

Meetings were held with the manufacturing division in regard to clarifying the Wage Rate policies relative to upgrading personnel. It was agreed that the policy of transferring employees at their existing rate, excepting certain cases, would be observed and that merit increases would be given in $2.00 increments no less than three months after the last date of increase or the date of reclassification. A general review of the classifications in the "S" Division, Accounting Divisions, Community Divisions and H. I. Division is currently in progress.

Official copies of the A.E.C. reimbursement order covering the reclassification of all non-exempt employees on July 19th was received.

Statistical Summary of Labor Relations and Wage Rate Internal Contacts:

Number of contacts made relative to the following subjects:

Additions to Payroll	34
Requisitions	20
Classification Review	131
Additional Classifications	7
Labor Relations Policy	38
Wage Rate Policy	173

Statistics

Transfers from Weekly to Monthly Payroll	51
Transfers from Monthly to Weekly Payroll	3
Transfers approved	60
Job Reclassifications approved	260
Automatic Increases	548
Merit Increases	92

COMMUNITY DIVISIONS

SUMMARY-DECEMBER,1948

ORGANIZATION AND PERSONNEL

Number of employees on roll:	Beg.of Month	End of Month
Community Administration	6	8
Community Accounting	31	29
Community Public Works	586	563
Community Commercial Facilities	19	18
Community Housing	41	41
Community Fire	139	151
Community Patrol	150	149
Community Activities	12	12
	984	971

GENERAL

Appropriations were approved by the Appropriations and Budget Committee covering aerial survey of Richland Village.

Requests for type A work authorities were issued covering the following:
1 - Construction of street extension to run from the intersection of Jadwin Avenue and Goethals Drive to join Guthrie Avenue at Gilmore;
2 - Widening and extension of Jadwin Avenue.

On December 7, 1948, the first election of the Richland Community Council was held. Four Councilmen-at-large were elected and one Councilman from each of five districts.

COMMUNITY PATROL

During the month automatic semaphore lights were installed and placed in operation on the by-pass highway at Van Giesen, Stevens and George Washington Way.

The Transportation Division found it necessary to resort to dynamiting ice in the vicinity of the Yakima Bridge in an attempt to protect the bridges from the ice pressure.

One-hundred twenty prisoners were processed through the Richland jail during the month.

COMMUNITY PUBLIC WORKS

Design work has been completed and a project proposal prepared for two hundred, one bedroom apartments. Also, the design and project proposal is in the preliminary stages for the three hundred, two bedroom apartments.

A savings of approximately $68,000.00 will be realized resulting from-reduction of the carpenter forces.

Sixty house renovations were completed during the month.

COMMUNITY HOUSING

Two-hundred sixteen ranch type houses, consisting of two-hundred nine, three bedroom and seven, four bedroom houses, were accepted from construction during the month.

A preliminary report consisting of a summary of basic shelter rents has been submitted by Messrs. Barrett and Wheeler. The final reports on their appraisal is expected during January, 1949.

Freezing of water pipes were reported in one-hundred one houses. The majority of these freeze-ups occurred in occupied houses.

COMMUNITY ACCOUNTING

Rental revenue during December was as follows:

Equipment	$ 220.03
Houses	212,087.53
Dormitories	15,437.51
Facilities	49,692.99
	$277,438.06

Certain equipment located in the Carnation Milk Depot was sold to that facility for $1,731.90 on December 28, 1948.

COMMUNITY ACTIVITIES

The new gymnasium at the Columbia High School was dedicated December 1, 1948, by project and school officials, together with the High School student body.

On December 17, 1948, all keys for the Spaulding Grade School were turned over to the Division, indicating the completion of all interior work by the contractor.

Work is progressing on the construction of chapels by South Side United Protestant Church, Goethals and Gillespie; and by the Richland Babtist Church at George Washington Way and Wardrop.

COMMUNITY FIRE

Fire loss during the month amounted to $900.00 project loss and $522.00 personal loss in Richland; $575.28 project loss and $924.50 personal loss in North Richland. Twenty-three and nineteen alarms were answered in Richland and North Richland respectively.

COMMUNITY COMMERCIAL FACILITIES

Additions, alterations and improvements have been effected in the following existing facilities: Construction of a three-chair barber shop in the Desert Inn; remodeling of the Pennywise Drug Store; addition to existing building housing the Richland Supply Company.

Richland Electric and Furniture, Inc., completed their new building and opened for business.

Cahoon Motors Company started construction on a new building to house a Studebaker sales and service agency.

Messrs. Joseph and Cannon have completed the installation of Bendix washing machines in the Richland dormitories.

Store locations were granted for the following facilities: A Men's Wear Store awarded to Messrs. Dawson and Richards; A Milk Depot location awarded to Mr. O. M. Wilmot; A Fountain Lunch location awarded to Mr. H. A. Sewell; and a Sporting Goods Store location awarded to Mr. Frank Berry.

Invitations to bid were mailed on the following prospective facilities to be established in Richland: Skating Rink; Dry Cleaning Plant; and Theater.

COMMUNITY DIVISIONS

COMMUNITY ADMINISTRATION

DECEMBER, 1948

ORGANIZATION AND PERSONNEL

Number of employees on payroll	December
Beginning of month	6
End of month	8
Total increase*	2

* 1 employee transferred into Community Administration
1 employee returned from leave

GENERAL

A request for appropriation was approved by the Appropriations and Budget Committee covering aerial survey of Richland Village, and the project proposal was transmitted to the Atomic Energy Commission.

Requests for type A work authorities were issued covering the following:

a. Construction of street extension to run from the intersection of Jadwin Avenue and Goethals Drive to join Guthrie Avenue at Gilmore.

b. Widening and extension of Jadwin Avenue.

A meeting of the Disaster Control Committee was held to discuss emergency measures to be taken and assign responsibilities in the event of flood of the Yakima River due to present heavy snow conditions in the Yakima drainage basin and possible warmer temperatures accompanied by rainfall. The staff of the Community Divisions was alerted and responsibilities assigned.

Community Safety Committee

Work orders were issued to correct inadequate lighting at the crosswalk at the commercial bus depot.

Due to heavy and damaging truck traffic en route to North Richland, recommendations were approved by the committee to install signs reading "North Richland Truck Route" at both the Coordinate Club intersection and at the North Richland junction of the by-pass road to relieve this traffic from George Washington Way.

Publicity in local newspapers was given such matters as:

Flame proof Christmas trees.

Safety devices on rear doors of autos to prevent children falling from moving vehicles.

COMMUNITY CLERK'S OFFICE

On December 7, 1948, the first election of the Richland Community Council was held. Four Councilmen-at-large were elected and one Councilman from each of five districts.

COMMUNITY SAFETY DIVISION

A statistician has been added to the Community Safety Division Staff. Complete records will be set up regarding all accidents, fires, etc., occuring in the Village.

COMMUNITY DIVISIONS
PUBLIC WORKS DIVISION
DECEMBER 1948

ORGANIZATION & PERSONNEL

Number of employees on payroll:	Exempt	Non-exempt	Total
November 30, 1948	67	519	586
December 31, 1948	66	496	562

During the month of December, the following personnel changes were made:

New Employees		1
Terminations		8
Transfers:		
To Power Division		7
Security & Services Division		3
Maintenance Division	1	1
Electrical Division		5
Technical Division		1
Returned from sick leave		1

GENERAL

Courses for all supervision in the Public Works Division were started during the month, covering the 9-Point Program, and handled by V. J. Byron with assistance from D. B. Clay. It is anticipated that these sessions will last for approximately sixteen weeks and are being held once a week for each group.

Transfer of the road maintenance repairs and other personnel from the Transportation Division to work in the village has been held up until satisfactory supervision can be made available for this work. It is anticipated that this transfer can be completed not later than the end of February.

Design work has been completed and project proposal prepared for the 200 one bedroom apartments. The design work and project proposal are in preliminary stages for the 300 two bedroom apartments. Both jobs are being handled by J. Gordon Turnbull, Inc., Graham, Anderson, Probst & White, Inc. through the Design Division.

A report covering the study made by Greeley & Hansen, Engineers, on the garbage collection and disposal system in Richland has now been promised for January 15. It had originally been promised for December but was delayed due to the illness of the engineer who made the study.

A proposal has been made to form a coordinating committee for design and construction work in the Village in order that closer cooperation may be developed between the Atomic Energy Commission, the Design Division, and the Community Divisions.

Community Public Works Division

GENERAL (Continued)

A savings of approximately $68,000.00 will be realized as a result of a reduction of the number of carpenter mechanics in the Community Maintenance Section.

PROJECTS

C-134 - RICHLAND VILLAGE DUST CONTROL AND LANDSCAPING. All shipments of street trees, shrubs and evergreens for the year 1948 have been received. Rye seeding has been discontinued due to the severe cold weather, a total of 133 acres having been seeded. During the month 705 street trees were planted. This work has also been stopped for the present due to weather conditions.

C-146 - EXTENSION TO PRESENT IRRIGATION SYSTEM. Irrigation system south of Jefferson School is in place and complete with the exception of testing and backfill. Work was completed on December 31. The irrigation system for area bounded by Hetrick and Davison Avenues is complete, with the exception of installation of valve heads and risers. Approximately eight hours of backfill and site grading are needed to complete this job. Preliminary studies have been made on Marcus Whitman irrigation system and work is progressing on this plan.

C-254 - PAINTING EXTERIOR OF 514 PERMANENT HOUSES

Number of houses primed	290
" " " sprayed	230
" " " completed	234
" " " accepted	234

Work officially ceased December 22, 1948, and will be resumed on or about April 1, 1949, weather permitting.

ENGINEERING SECTION

Organization & Personnel

Number of employees on payroll:	Exempt	Non-exempt	Total
November 30, 1948	16	11	27
December 31, 1948	16	12	28
Transferred from Labor Section		1	

General

A total of 12 back charge estimates were prepared during the month.

This group was represented at the meeting of the Electrical Standards Committee. The National Electric Code was adopted for use in the Facility Sponsored Construction.

Community Public Works Division

ENGINEERING SECTION (Continued)

C. E. Lange and E. A. Monson attended a dinner conference of the Washington State Chapter, Pacific Coast Building Officials Conference, at Tacoma, Washington, on December 18, 1948. Inspection was also made of the Bellevue Square shopping center and the street lighting at Kirkland.

Material Control Section handled the following routine work:

Requisitions	72
Store Stock Requests	19
Store Stock Adjustments	5
Purchase orders expedited	14

A survey was begun on store stock items, stocked for use in Community Division which can be declared excess, due to their having been replaced with new types of material.

The following major alterations, authorized by Alteration permits, were reviewed and approved during the month for Commercial Facilities Division:

Pennywise Drug Store - Installation of refrigerator (walk-in type) and dishwasher. Installation of Slimline lighting fixtures throughout the store.

Proposals are now being considered requesting the assignment of ground space and preliminary approval for the following:

a. Church of Nazarene
b. All Saints Episcopal Church
c. Christian Science Church

Arrangements and layout of the following proposed facilities at neighborhood areas were reviewed:

a. Service Station - Swift-Wright Area
b. Food Store - "
c. Drug Store - "
d. Food-Drug Store - Geo. Wash. Way & McMurray Road

Building alterations were completed and inspected at the following facilities during the month.

a. Garmo's Food Store - Addition to Bakery

Technical information and instructions were furnished the following churches and clubs prior to preparation of detailed working drawings and specifications.

a. Proposed construction of Eagles' Club
b. " " " Latter Day Saints Reorganized
" " " Redeemer Lutheran Church

12CT1503

Public Works Division

ENGINEERING SECTION (Continued)

Facility Sponsored Construction approximates the following schedule:

Facility	Const. Started	Status % Comp.	Est. Date of Completion
Diamond Store	9-20-48	99	*
Pennywise Drug	10-21-48	99	*
Klopfenstein's	8-23-48	99	*
S.S. U.P. Church	11- 5-48	50	Feb. 1, 1949
Baptist Church	11-27-48	50	Feb. 1, 1949
Furniture Store	9-27-48	99	*
Cahoon Motors	11--29-48	35	Feb. 19, 1949
Richland Supply	12- 6-48	75	Jan. 15, 1949

*Final approval awaiting clearance of minor exceptions.

A total of 33 alteration permits were inspected during the month for the Housing Division.

The Marvair Unit at 635 Cedar has been installed and is now in operation. The representatives from the Marvair Company plan to return in January, at which time some changes may be made in the water control. Operating data will be furnished by the tenant on a weekly basis.

The inspection and acceptance of new houses is as follows:

Previously Accepted	360 - Y, Y-1, Z and Z-1 Ranch Type
Accepted During Dec.	216
Total Accepted	576

Project Proposals

Job No.	Description	% Complete	Completion Date or Remarks
17	Renovation - Tract House NN-1040	10	
18	Exterior Painting of Commercial Facilities	95	
51	Additions and alterations to Bldg. 1182	25	Scope of work revised 12-22-48
56	Municipal Bldg. Alterations to house Tenant Relations	75	
60	Asbestos Siding - 703 Building	10	

Studies & Specifications

18	Specifications, Painting Commercial Fac.	70	Rough Draft Comp.
22	Lutheran Church Roof Repair	80	
35	Roofing Specifications, Commercial Facilities	50	
37	Standards - Tenant Installation Linoleum and Wall tile board	50	Tile board specs comp. 12-27-48
65	Anticipated steam loads - 700 area boilers	100	12-21-48
66	Landlord obligations - Commercial Facilities	50	

4. 1211504

Community Public Works Division

ENGINEERING SECTION (Continued)

Cost Estimates and/or drawings.

Job No.	Description	% Complete	Completion Date of Remarks
20	Water & Sewer Mains, Richland and 700 Area	49	Sewer Main Drawing comp. 12-30-48
33	Toilet Installation, MS Warehouse	100	12-10-48
36	Repairs - MS Warehouse 100		12-20-48
40	Water Service - Tract House K-777	100	12-20-48
46	Renovation, Air Conditioning System 703 Building	100	Engineering Request #58
49	Toilet Installation - Hutment Labor Yard	100	12-30-48
52	Alterations, Women's rest room American Legion Hall.	100	12-2-48
53	Door closer installations, 23 Dorms.	100	12-5-48
55	Floor Plans & Elevations, 8 Tract Houses	100	12-10-48
58	Repair, re-conditioning & Enlargement air conditioning system, 703 Building.	10	Started this Mo.
61	Paint and re-roof Building 723	0	
62	Paint and re-roof 717	35	
63	Right of Ways, Streets, Richland Village	100	12-17-48
64	Lighting Study - Building 720	20	
66	Alarm System, Building 720	0	
73	Hot water, Jefferson School Cafeteria	50	

Project proposal for water service to 5 tract houses was approved by the A & B Committee, and AEC. The project has been assigned identification number 311.

A total of 1928 man hours was spent by the Transportation Division on street maintenance.

Eighty man hours were spent on sidewalk repair.

Road signs and striping required 36 man hours.

Street right of ways were established and shown on map H-11-775. Quantities were estimated for a proposed project covering irrigation, grass seeding, walks, and spot and cover areas in 700 area. Job approximately 60% complete.

MAINTENANCE SECTION

Organization & Personnel

Number of employees on payroll:	Exempt	Non-Exempt	Total
November 30, 1948	26	292	318
December 31, 1948	25	274	299

5. 1211505

Community Public Works Division

MAINTENANCE SECTION (Continued)

During the month the following personnel changes were made:

	Exempt	Non-exempt
New Employees		1
Terminations		4
Transfers:		
To: Power Division		7
Security & Services		3
Maintenance Divn.	1	1
Electrical Divn.		4
Utilities Section		1
Returned from sick leave		1

General

During the month of December 60 renovations were completed, of which 29 were permanent type houses, 29 prefabs and 2 apartments cleaned. Twenty of the permanent type house renovations were complete paint jobs, 2 were partially painted, and 7 were cleaned only. Of the prefab renovations 28 were complete paint jobs and one was partially painted. There were on hand at the end of the month 30 orders for renovations not completed

The interior painting of 96 conventional type units was completed. Bathrooms were repaired and painted in 25 units. The interior painting of the Columbia high school auditorium was completed.

Bath tub replacements were completed in 8 conventional houses, laundry tubs in 49, water heaters in 12, kitchen sinks in 21, sink faucets in 175,1 prefab shower stall and 7 repaired, wash basins in 2 and toilets in 5.

Frozen pipes in approximately 300 houses were thawed out. The reasons for these freeze-ups are:

a. Design in precut houses calling for water service pipes inside of an outer wall.
b. Tenants having temporarily left Richland on week end trips or vacations without having made arrangements for heating their houses.
c. Hose bibs on A&J type houses and on precuts that are exposed and without shut off valves.

Other freeze-ups were caused by:

a. Lack of foundation walls on 760 building left water and steam pipes completely open to the freezing weather.
b. Piping of fire sprinkler water over newly constructed vaults of 703 building were without protection from below freezing temperatures.
c. Unprotected water service line in attic of 717 building for the air conditioner froze and burst.
d. Pilot line at P.R.V. station froze at 705 building, causing steam failure over night and which caused freezing of the services into the building.

MAINTENANCE SECTION (Continued)

Our part of the work in connection with the contract of Richland Plumbing and Heating Co., for the installation of the irrigation system on Davison, is 95% complete. Tap-ins to the main line are completed for the Jefferson and Duane irrigation jobs. Installation on Duane is approximately 20% complete.

New septic tanks and drain fields were provided at Tract houses O-1224 and L-865.

The installation of condensate cooling wells and revision of condensate lines has been completed in Dorms M-6, 7, 8, and W-12. This will greatly reduce water hammer.

The installation of a hood and exhaust system for the dishwasher in the new section of the Jefferson School is now complete. This relieves the condition greatly of steam in the air of the kitchen.

The storm gutter and down spout for the observation porch at the Desert Inn is completed.

The ash ejector and receiver of the 784 Boiler House were dismantled and some revisions made. To date, it appears that an improvement has been made in the number of stop-ups.

During the month only 85 prefab heaters were cleaned and cords replaced due to the volume of other work and man power available.

In the month of December 274 hot water tanks were repaired and 113 refrigerators repaired or replaced.

The summary of work performed in the furniture and upholstery shop is as follows: 40 mattresses, 6 davenos, 13 rockers, 64 chairs repaired and refinished, 86 beds, 21 dressers, 16 tables, 19 desks, 137 bed rails, 69 bed ends and 658 dormitory drapes.

On December 9, one 45 ton (without oil) three phase 115 KV transformer was removed from a flat car and set in place at the new substation near 1131 area. The second transformer was placed in position on Dec. 29.

Alterations to the men's rest rooms in the 762 building were completed.

The Masonic Temple roof repairs still remain to be completed with the use of tar kettle when the weather permits.

All work is completed on the installation of truck scales for the Labor Section.

Additional partitions and doors were installed in the 703 building and 760 building for AEC, to facilitate office space.

Community Public Works Division

MAINTENANCE SECTION (Continued)

The carpentry work on exterior repairs to houses in Div. #4, prior to painting, was stopped for winter months due to bad weather. Approximately 85% complete.

Approximately 150 new fence posts were replaced in 1131 garage area fence.

Repairs were made to exterior portions of commercial facility and school buildings, preparing for paint jobs. Completed were Marcus Whitman, Sacajawea, Jefferson schools, Cafeteria, Village Theater, and Style Center.

Approximately 1-1/2 million board feet of lumber have been loaded for shipment off the project from the 3000 area lumber yard. There remains about 2-1/2 million board feet yet to be shipped.

LABOR SECTION

Number of Employees on payroll:	Exempt	Non-exempt	Total
November 30, 1948	13	150	163
December 31, 1948	13	145	158

During the month the following personnel changes were made:

New Employees	None
Terminations	3
Transfers:	
To Technical Division	1
Engineering Section	1

Garbage and trash pick-up continued on a five day basis with the exception of eating facilities requiring Saturday pick-up. All trash in the village is being picked up on Wednesday or each week, this being considered a permanent service.

Sawing and stockpiling of kindling for village consumption continued during December.

A total of 19 personal furniture moves were accomplished.

167 refrigerators and 167 electric ranges were installed in new homes.

The new mower shop is completed and mowing equipment for next season is being repaired.

The yard crew have completed numerous excavation jobs for the Utilities Section, requiring the use of power equipment.

Bad weather has slowed the burning operations for the canal crew.

LABOR SECTION (Continued)

As soon as the change house is completed the Labor Section will move to its new quarters on the south west side of the 700 area. Since the spring flood these groups have been housed in temporary quarters, which have been very unsatisfactory.

The oil crews are well ahead of consumption, this is due to the starting of two extra 800 gallon trucks and working several days on a 12-hour basis. On an eight hour basis there is now being delivered 10,000 gallons of oil per day to residences. When working 12 hours 15 to 16 M. gallons per day are delivered. Due to failure in completing the oil storage tanks, lack of storage space has placed the fuel supply in a precarious state. Bad weather and other difficulties make scheduling of supply tankers uncertain, and several times the storage tanks have been empty at night.

Coal deliveries to residences have been proceeding satisfactorily. The new equipment for handling the coal makes it possible to deliver as much as 300 tons per day to houses only with 26 men, where previously it required 32 men to deliver a maximum of 110 tons to residences. This has reduced the labor of coal delivery from 2¼ man hours per ton to 3/4 man hour. Steps are being taken to further reduce the cost of handling and to provide a better quality coal to the bin with less slack being taken to the power house.

Fuel Inventory

Coal:

On hand 12-1-48	3,968,400
Received during December	17,977,400
Consumed in Village	8,371,000
Delivered to other areas	10,731,800
On hand 12-31-48	2,843,000

Fuel Oil:

Gallons on hand 12-1-48	16,577
Gallons received during December	298,008
Consumed in Village	244,058
Gallons transferred to other areas	34,602
Gallons on hand 12-31-48	35,925

UTILITIES SECTION

Organization & Personnel

Number of employees on payroll:	Exempt	Non-exempt	Total
November 30, 1948	9	64	73
December 31, 1948	9	63	72
Terminations (Retirement)		1	
Transfers: To Electrical Divn.		1	
From Maint. Section		1	

Community Public Works Division

UTILITIES SECTION (Continued)

Steam Facilities:
On December 7, 1948 we started supplying heating steam to Robert Gray School. The ash ejector system at 784 building has been completely overhauled. Operation is much improved.

Maximum peak load for the month was 90,000
Maximum average load for the month was 51,500

Domestic Water:
Inspection of all 3000 area well pumps is being continued. Due to static water elevation dropping too low it was necessary to discontinue operating 3000 "D" well. On Dec. 8, 1948, the pump motor on 3000 "E" well burned out, motor failure being due to faulty motor protection relay. On Tuesday, Dec. 7, water supply to 300 area, through North Richland grid system, was commenced.

Average daily water use in Richland	2,850,000	gallons
" " " " " North Richland	1,600,000	"
" " " " " 300 Area	860,000	"

Sewage System:
Normal operations and routine maintenance. Average daily sewage load 3,420,000 gallons.

Pasco Warehouse Area:
Due to the extended cold spell considerably more heat has been furnished to warehouses. We have had some difficulty in keeping ice out of pumps at River Pump Houses.

General:

Although the amount of work necessary has increased considerably, due to addition of new housing, schools, etc., it has not been necessary to increase man power.

MONTHLY REPORT OF UTILITY OPERATIONS
700, 1100 AREAS & NORTH RICHLAND

Period from 12-1-48 to 12-31-48 Inc.

STEAM

784 BUILDING.

	Total M. Gal.	Total M. Lbs.	Rate	Unit
Water Softened	4847.8	40,431.	108.60	G.P.M.
Steam Auxiliaries		5,776.	7763.	Lbs/Hr
Boiler Feedwater		46,207.	62106	Lbs/Hr
Steam Generated		38,284.	51457.	Lbs/Hr.
Blowdown		7,923.	17.15	Percent
Steam Leaving Plant		32,508.	43694.	Lbs/Hr
Coal Consumed		5,735.	7708	Lbs/Hr
Coal Received		5,583.5		
Coal in Storage		8,958.7		
B.T.U./Lb Dry Coal		11,378.		
Evaporation/Lv. Coal		6.68		
Average CO_2 - %		7.5		
Salt Used, Lbs.		7,250		
Sulphuric Acid Used, Lbs.		10,479.		
Phosphate Used, Lbs.		436		
Sulphite Used, Lbs.		123		

WATER ANALYSIS - PPM

	RAW Avg.	SOFT Avg.	BOILER Maximum	BOILER Minimum
Phenolphthalein Alkalinity	0	--	146	30
Methyl Orange Alkalinity	214	21	210	31
Chlorides	27	22	260	65
Hardness	157	-	--	--
Phosphate			100	0
Sulphite			40	3

RICHLAND AND NORTH RICHLAND DOMESTIC WATER

	Richland	North Richland	Combined
Total Pumpage, Million Gals.	87.520	76.710	164.230
Avg. Daily Flor, Million G.P.D.	2.823	2.475	5.298
Rate of Flow, G.P?M.	1961	1718	3679
Chlorine Used, Lbs.	342		
Avg. Chlorine Residual, PPM	0.25		
Water to 300 Area	22.715 Million Gallons		

SEWAGE DISPOSAL PLANT

Sewage Flow: 106.000 Million Gals. Total. 3.419 Million G.P.D. Avg.
Sewage Flow: 2374 G.P.M. Average.
Chlorine Used 8475 Lbs. Lime Used 1550 Lbs.
Chlorine Residual, Average: 2.5 PPM.
Average B.O.D. 189 Raw Sewage: 62 Final Effluent.
Average Suspended Solids: 166 Raw Sewage 44 Final Effluent.

1211511

11.

/s/ Harold N. Petty

COMMUNITY COMMERCIAL FACILITIES DIVISION

December 1948

ORGANIZATION AND PERSONNEL — DECEMBER

Number of employees on Payroll:	
Beginning of month	19
End of month	18
Net decrease	1

COMMERCIAL FACILITIES

The following figures indicate trends in commercial activities as related to various basic items:

	NOVEMBER	DECEMBER
Cafeteria meal customers	91,866	83,676
Percent of room-day occupancy - Desert Inn	94%	85%
Gallons of ice cream sold	11,247	5,228
Carnation milk and cream deliveries	93,025	97,773
Darigold milk & cream deliveries (wholesale only)	7,735	8,454
Theater customer count	54,669	51,961
Gallons of gasoline sold	177,842	192,891

Total number of commercial facility operators' employees, full and part-time, as of December 31, 1948, is 1,149.

Construction of a three-chair barber shop in the Desert Inn has been completed, and is now open for business.

The Operator has completed remodeling the east and north side of Pennywise Drugstore building.

Richland Electric and Furniture, Inc., completed their new building and opened for business.

The Operator of Pennywise Drugstore was issued an alteration permit to install a walk-in refrigerator, dishwashing machine, "Slimline" lighting fixtures, and rearrange the kitchen and storeroom. The Project is supplying the dishwasher. All other work and materials are at the Operator's expense.

Richland Supply started construction on an addition to the existing building. This work is being done at the expense of the Operator.

Cahoon Motors Company started construction on a new building, located at Stevens Drive and Lee Blvd., to house a Studebaker sales and service agency.

Messrs. Joseph and Cannon have completed the installation of Bendix washing machines in Richland dormitories.

CONTRACTS AND NEGOTIATIONS

An Operating Agreement dated October 25, 1948, was entered into by and between General Electric Company and John Lienhard, covering the establishment and operation of the Laundry and Dry Cleaning Pick-up Station in North Richland.

An Operating Agreement dated October 25, 1948, was entered into by and between General Electric Company and Earl Harris, covering establishment and operation of The Poudre Puff Beauty Salon in the multiple-business building in North Richland.

An Operating Agreement dated November 1, 1948, was entered into by and between General Electric Company and Wiley C. Dickson, covering establishment and operation of a Shoe Repair Shop in the multiple-business building in North Richland.

An Operating Agreement dated November 8, 1948, was entered into by and between General Electric Company and Dr. Byron Friedman, covering establishment and operation of an Optometrist's Office in the multiple-business building in North Richland.

An Operating Agreement dated October 18, 1948, was entered into by and between General Electric Company and Robert D. Hand, covering construction and operation of Hand's Buy-Rite Drugs, North Richland.

An Agreement dated November 22, 1948, was entered into by and between General Electric Company and Seattle-First National Bank, providing for a monthly compensation to General Electric for use of building and the furnishing of utilities and services by General Electric. This Agreement cancels and supersedes Agreement dated August 21, 1946.

A Commercial Facility Lease dated September 22, 1948, was entered into by and between General Electric Company and Richland Electric and Furniture, Inc., covering construction and operation of a furniture and electric appliance store in Richland.

An Assignment and Acceptance of Contract dated December 10, 1948, was entered into by and between General Electric Company and Max R. Walton and John R. Hills, covering operation of Columbia Service Company. Max R. Walton, an individual, is assigning his interest in the contract to the copartnership of Max R. Walton and John R. Hills.

A Contract of Sale dated November 25, 1948, was entered into by and between General Electric Company and Carnation Company, covering sale to the operator of Government-owned equipment, located in the Richland Milk Depot.

A Men's Wear Store location was awarded to Grover W. Dawson and J. H. Richards, Vancouver, Washington, who will construct their own building.

A Milk Depot location was awarded to O. M. Wilmot, Morning Sun Dairy, Moses Lake, Washington, who will construct his own building.

A Fountain Lunch location was awarded to H. A. Sowell, 721 South 38th Street, Tacoma, Washington, who will construct his own building.

A Sporting Goods Store location was awarded to Frank Berry, Yakima Tent and Awning Company, 207 West Yakima Avenue, Yakima, Washington, who will construct his own building.

Invitations to Bid were mailed on the following prospective facilities to be established in Richland:

Skating Rink
Dry Cleaning Plant
Theater

It is anticipated that invitations to bid for additional facilities to be established in the new commercial area will be sent out during January.

INVENTORY AND PROPERTY

The annual 1948 inventories of Government-owned equipment at the following locations were completed:

Richland Supply Company	Dog Pound
Co-Ordinate Club	Richland Rod and Gun Club
Food Store "A" - Garmo's	Civil Air Patrol
Veterans of Foreign Wars	Riverside Stables
Lutheran Redeemer Church	Richland Lutheran Church
Richland Masonic Temple Association	All Saints Episcopal Church

REQUESTS FOR ESTABLISHMENT OF BUSINESS IN VILLAGE

A number of individuals expressed a desire during the month to establish and operate businesses in Richland. The types of establishments desired are shown in the following list:

Architect	Luggage Store
Auto Accessories	Men's Store
Cabinet Shop	Music Store
Catering Service	Public Accountant
Drugstore	Radio Station
Florist Shop	Roller Skating Rink
Food Market	Service Station
Garage	Sporting Goods Store
General Merchandise	Upholstery Shop
Golf Driving Range	Variety Store
Laundry & Dry Cleaning	Women's Specialties Shop

Written permission was granted to eighteen (18) Village tenants to conduct the following part-time businesses in their homes:

Represent Northwestern Tailoring Company
Represent the Retail Credit Company
Do baby shoe bronzing in the home
Represent the Equitable Life Assurance Society
Sell the "Baby-Tenda"
Sell Needlecraft hobby products
Take orders for Kahn Made-to-Measure clothes
Conduct real estate transactions in his home
Take photographs in the homes of Village residents
Represent the Northwestern Mutual Life Insurance Company
Launder and stretch curtains (2)
Take care of children in Village homes (4)
Sell Christmas gift wrappings
Cover buttons and buckles and make buttonholes

Written permission was granted eleven (11) individuals living outside of Richland to contact Village tenants, on an appointment basis only, on the following business matters:

Represent Retail Credit Company (2)
Sell "Good Leader" Bibles (2)
Sell and service sewing machines (2)
Sell and service Hoover vacuum cleaners
Pick up laundry and dry cleaning for the Deluxe Cleaners
Represent the Spokane Venetian Blind Company
Represent Lildale Sewing Machine Center
Sell hand-tooled leather goods

COMMUNITY DIVISIONS

COMMUNITY HOUSING DIVISION

December, 1948

ORGANIZATION AND PERSONNEL

Number of employees on payroll:	December
Beginning of Month	41
End of Month	41
No Increase	0

RICHLAND HOUSING

Housing Utilization as of Month End

Houses Occupied by Family Groups	Conventional	Block	T	Pre-Cut	Ranch	Prefab	Apts.	Tract	Total
Operations	2200	263		370	473	1094	63	38	4282
Facilities	148	4		18	10	118	1	9	308
Government	100	29		15	12	39	4	8	207
Kellex Corporation		6		6		1	1		14
Morrison-Knudsen	4			1	1		1		7
Atkinson-Jones	25	23		25	11	20	2		106
J. Gordon Turnbull	1	2		3	5	15			26
Giffels & Vallet	3	1		1	7	12			24
J. A. Terteling & Sons			10	2		2			14
McNeil Construction Co.	2			2		4			8
Newberry Neon Electric	1	2		2		1			6
Urban, Smythe & Warren	2	2		1	1	2	1		9
Robert's Filter	1								1
Graysport Construction				1				8	9
Newport-Kern Kibbe								1	1
Vernita Orchards								5	5
C. C. Moore Co.		1							1
P. S. Lord Co.	1								1
TOTAL HOUSES OCCUPIED	2488	333	10	447	520	1308	73	*69	5029
Houses utilized for special purp.								1	1
Houses assigned (leases written)	3				4	4			11
Houses assigned - awaiting tenants	9			3	51	20	1		84
Government houses - unassigned								**36	36
TOTAL HOUSES	2500	333	10	450	575	1332	74	106	5161

* Occupancy figure includes 4 houses occupied by Bonnerville Power in Priest Rapids and White Bluffs.

** This includes 31 Tract Houses boarded up for salvage.

1. 1211516 DECLASSIFIED

COMMUNITY HOUSING DIVISION

Housing Turnover During Month	Begin Month	Moved In	Moved Out	Month End	Difference
Conventional Type	2479	43	34	2488	Plus 9
Block Type	332	4	3	333	Plus 1
T Type	10			10	None
Precut Type	444	15	12	447	Plus 3
Ranch Type	299	244	23	520	Plus 221
Prefab Type	1301	61	54	1308	Plus 7
Apartment Type	71	5	3	73	Plus 2
Tract	71		2	69	Minus 2
Total	5007	372	131	5248	Plus 241

Dormitory Statistics

Dormitories		Occupants	Vacancies	Total Beds
Men - Occupied	14	540	*16	556
Men - Unoccupied				
Women- Occupied	14	588	* 4	592

Women's Dormitories Occupied by:

G. E. Office	1
Education	1
Apartment	1
	31

* This includes 6 beds in W-9 and 10 beds in M-12 not in use. Space in W-9 is being used for Supply Rooms and Dormitory Offices. Space in M-12 is being used for F. B. I. Offices.

GENERAL

There were 216 Ranch type houses accepted during the month of December; 209 Y, three bedroom type, and 7 Z, four bedroom type. This makes a total of 575 Nettleton Sound houses accepted to date.

The final appraisal report of Messers. Barrett and Wheeler has not yet been received but their summary, giving the basic shelter rentals has been submitted and in turn forwarded to the A.E.C. The final report of Messers. Barrett and Wheeler is expected some time this month.

On December 31, 1948 a fire occured in an A house located at 510 Van Geisen. Damage was confined to the living room at an estimated cost of $800.00. It was necessary to provide temporary living quarters for the occupants at 1321 McPherson.

TENANT RELATIONS

The processing of Patrol Orders and Work Orders during the month is as follows:

	Incomplete 11-30-48	Issued Dur. December	Incomplete 12-31-48	Issued Prev. Month
Patrol Orders - Days	1258	3821	873	3444
Maintenance & Electrical				
Patrol (Off shift elect.)	0	664	0	537
Patrol (Off Shift Maint.)	36	604	55	447
Regular Work Orders	321	212	422	159
Backcharge Tenant Relations orders	8	59	15	46

7 Scrap Lumber Permits were issued during the month of December as compared to 21 during the previous month.

78 Conventional type dwellings were painted by Project forces as compared to 91 during the previous month (Interior).

353 Home Fire Inspections were reported and processed. 683 homes were visited. 386 Home Fire Inspections were made in November and 703 homes were visited.

Items of Interest:	Dec. 1948	Outstanding Dec. 1948	Outstanding Prev. Month	
1. Window Glass Replacement Requests (All Types)	88	88	47	(+41)
2. Sink Linoleum Replacement Requests	53	96	115	(-19)
3. Bathroom Painting Requests		70	57	(+ 13)
4. Kitchen and Bathroom Faucets	48	105	161	(+ 56)
5. Miscellaneous	366	584	935	(-351)

181 Freeze-ups with the following distribution:

Pre-cuts	118
Pre-fabs	45
Conventional	10
Ranch-type	5
Tract	3

Alternation Permits issued to tenants during the month of December, 1948 amounted to 52 as compared to 57 issued during the month of November. Permits were issued during December as follows:

Installation of automatic washers and dishwashers	19
Basement excavations	8
Sanding of Floors	7
Partitions in basements	3

Construction of tool boxes	3
Installation of air conditioners	2
Construction of driveways	2
Interchange of front and back door (Ranch type)	2
Construction of shelves in Prefabs	2
Installation of humidifier on furnace	2
Installation of clothes poles	1
Reverse position of range and refrigerator	1
Change position of range	1
Installation of thermostatic control on furnace	1

ALTERATIONS FOR MONTH OF DECEMBER, 1948 - TOTAL 54

Inspection Information:

672 inspections were made during the month. A break-down of the inspections shows the following distribution:

a. 122 Window Shade Inspections
b. 6 Lot Line Inspections
c. 15 Top Soil Inspections
d. 15 Bathtup caulking Inspections
e. 25 Floor Board Inspections
f. 13 Sidewalk Inspections
g. 22 Leaking Basement Inspections
h. 26 Linoleum Inspections
i. 41 Wall Inspections
*j. 387 Miscellaneous Inspections

* Under this heading one inspector spent most of his time on the interior house painting program.

M. S. WAREHOUSE MONTHLY REPORT FOR DECEMBER, 1948

Orders handled for month of December, 1948

Recall Orders	Items
107	628
Delivery Orders	
36	190
Range & Refrigerator Orders to Ranch Houses	
167	334
Total Orders	**Total Items**
310	1152

Items received from Maintenance	354
Items sent to Maintenance	386
Items exchanged in Dormitories	235

4. 1211519

TENANT RELATIONS

Three-burner ranges exchanged in Village	16
Refrigerators exchanged in Village	19

TRIPS TO PASCO - 24

TENANT RELATIONS' STORE:

Orders handled	490
Items disbursed	2223

	Paint Disbursed	Paint on Hand
Muratone & Kemtone	986 Qts.	6,780 Qts.
Enamel	401 "	542 "
Varnish	46 "	374 "

ORGANIZATION AND PERSONNEL:

J. J. Ervin transferred to Technical Division.

GENERAL CHANGES IN POLICY AND IMPROVEMENT IN OPERATIONS:

a. New kardex system is being set up to use Stores' method so that cost can be figured on all items.
b. New items now handled in Tenant Relations' Store:
    1. Kitchen reflector for one, two and three-bedroom prefab houses.
    2. Bathroom reflectors for all old Village type houses, including prefab houses.
    3. Porch reflectors for all Village type houses, excluding prefabs.
    4. Mailboxes.

    (the saving on above items is represented in the cost of installation by craftsmen.)
c. Establishment of a price on all items handled.

GENERAL

Dormitory Section Progress Report for month of December

GROUNDS

1. Dead and/or useless trees and stump hazards were removed from Women's Area and resulting holes filled in to prevent injury to anyone.
2. Trees in the Women's Area were trimmed to prevent injury from overhanging branches as well as beautify the surrounding area.
3. Roads are in process of repair with bumperlogging being installed to prevent damage to lawns from Car abuse as well as Truck traffic.
4. All safety hazard depressions are being filled in as soon as they occur in the area to prevent unnecessary bodily injury to people using grounds for travel.

5.

TENANT RELATIONS

5. Directional signs were installed to assist interested parties in locating Dormitory Offices as well as House Matrons.
6. Traffic control signs were installed throughout the Men's and Women's Area.
7. Parking lots were repaired as far as weather would permit for the present with the advent of warmer weather they will be put in first class condition.
8. Grounds are being cleared of all unnecessary rubbish of any nature as fast as refuse accumulates.

BUILDINGS

1. Air conditioning installations in the Men's Dormitories M-9 through M-14 inclusive were completed during the month.
2. Automatic washing machines were installed in all Dormitories during the period.
   (a.) New circuits were installed to accommodate this facility.
3. Fire walls are in process of completion with painting and identification only remaining in the following Dormitories namely; M-9 through M-14.
   Note: These walls were installed to eliminate a bad safety hazard as well as provide a fire stop in stair-wells of these buildings.
4. Exit and hallway lights were relocated to comply with standard safety practice now existing in this plant.
5. Operating quarters for Dormitory personnel were completed in Dormitory W-9.
6. Plumbing and steam fitting problems were worked in several dormitories. (Above normal operation requirements such as extreme cold and unusual loads.)

FURNITURE

1. A sizable amount of furniture was exchanged and/or repaired during the period.

COMMUNITY DIVISION REPORT

COMMUNITY FIRE DIVISION

December 1948

Organization and Personnel

	November
Number employees on payroll	
Beginning of the month	139
End of month	151
Terminations	0
New employees	12

	Richland	North Richland
Response to alarms	23	19
Fire loss (Estimated)		
Hanford Works	$900.00	$474.28
Personal	522.00	924.50
Investigation of minor fires and incidents	19	19
Safety Meetings	17	8
Outside Drills	9	11
Inside Drills	77	43
Fire alarm boxes tested	134	71

Richland Fire Prevention

Fire Inspections:	700 Area buildings	114
	1100 Area buildings	156
	Commercial Facilities	66
	Schools, clubs, churches	33
	Homes	353
		722

Fire Extinguishers:	Inspected	1107
	Installed	69
	Recharged	5
	Removed (Condemned)	57
	Winterized	50

Demonstrations and Drills:-

Fire extinguisher demonstrations given to 12 cooks at Jefferson School, to 50 students at Lewis and Clark School and to 6th grade at Marcus Whitman School. Evacuation drills held in 760 building and Columbia High School, both satisfactory.

Fire Prevention Talks:-

Talks given to 35 Village Engineering, 10 Salvage Yard and 18 Operations Accounting employees.

Instruction Course (Juvenile):-

Fire Department personnel conducted classes at Fire Station No. 1 for 193 boys and certificates awarded each as Junior Fire Marshal.

COMMUNITY DIVISIONS

COMMUNITY PATROL

DECEMBER 1948

ORGANIZATION AND PERSONNEL

Number of employees on payroll:	December
Beginning of month	150
End of month	149
Net Decrease for month	1

Reason: 1 V. T. Personal

GENERAL

There were no traffic fatalities in Richland during 1948. There was one fatality in North Richland and four within the barricaded area. Traffic statistics show that private car operation increased approximately 92% during 1948 compared to 1947.

On December 10, 1948, in order to effect a better coverage of Richland, the practice of assigning one man to a car went into effect on all shifts.

On December 14, 1948, arrangements were made with the Federal Bureau of Investigation to have them report to the Desk Sergeant their whereabouts. This is to be on a 24-hour basis so as to bring about our being able to contact the F. B. I. at any time of the day or night.

Mr. George P. Rhodes, F. B. I. agent in charge of the Butte Office, was assigned here from Tuesday, December 14 through Friday, December 17, 1948, for the purpose of making a survey of our Patrol records system. A record of his findings and recommendations along with a complete analysis will be forwarded to the Community Patrol Division from Washington, D. C.

On December 14, 1948, a meeting of the Yakima River Peace Officers Association was held in Richland. The valley officers met at 2:00 P. M. at North Richland Patrol Headquarters and were conducted on a tour of the Hanford Works Project. At 5:30 P. M. dinner was served at the Desert Inn after which several interesting and timely subjects were discussed. Capt. C. H. Overdahl and Capt. W. A. Ziegler were in charge of arrangements.

During the month automatic semaphore lights were installed and placed into operation at Stevens Drive and the By-Pass, Van Giesen and the By-Pass, and George Washington Way and the By-Pass.

Patrol was charged with the responsibility of making frequent checks of ice conditions on the Yakima River in the vicinity of the bridges. In the event that conditions warranted, the Transportation Department was to be notified, and they in turn would take the necessary measures. During the month it was necessary to dynamite ice in the vicinity of the bridges at which time Patrol assisted in the endeavor by the handling of traffic and the curious onlookers.

Three men were provided the local school district for basketball games on December 7, two men on December 27, and two men on December 30, 1948.

During December, 1948, 120 prisoners were processed through the Richland Jail.

During December, 1948, 39 gun registrations were taken by the Richland Patrol.

TRAINING

Lt. F. J. Schultz, Crime Prevention Section, was in charge of Community Patrol training from December 1 to December 24, 1948. He gave instruction on "Interrogation of Suspects" and "The Protection of the Scene of the Crime."

Effective December 21, 1948, each Community Patrol Shift Lieutenant was placed in charge of the training program for his particular shift. Classes for men assigned to North Richland were held at North Richland Patrol Headquarters, and classes for men assigned to Richland were held at Richland Patrol Headquarters.

Advance training for Community Patrol members at the Small Arms Range for the period November 19, 1948, to December 17, 1948, inclusive, was divided into Field Instruction as follows:

Pistol	1½ hr.
Riot Gun	1 hr.
Machine Gun	1 hr.

Progress of scores and qualifications on the Army-L Course:

	June		September		December	
Unqualified	4	5%	0	0%	7	7%
Marksman	20	25%	15	27%	28	26%
Sharpshooter	14	17%	10	18%	26	24%
Expert	43	53%	31	55%	46	43%

Progress of scores and qualifications on the Machine Gun Course:

	November		December	
Unqualified	1	1%	1	1%
Marksman	8	4%	3	3%
Sharpshooter	34	17%	7	7%
Expert	155	78%	96	89%

Note: During the winter months, the Army-L Course will take the place of the FBI Course.

RICHLAND AREA (VILLAGE)

	October	November	December
Check on absentees	3	3	5
* Persons assisted	237	261	296
Doors & windows found open in commercial facilities	8	15	31
Lost children found	10	9	13
Ambulance runs	22	37	32
Lost dogs reported	4	3	5
Dog & cat complaints	35	35	29
Persons injured by dogs	2	4	5
Bank escorts & details	41	42	52
Fires investigated	12	31	29
Miscellaneous escorts	40	36	36
Complaints investigated	118	96	77
Missing persons reported	3	0	4
Totals	535	572	614

* Includes: Persons admitted to residence; delivery of messages to residents who have no telephone; relay of messages; handling requests of out of town police; miscellaneous aids to private parties; and opening trailer parking lot for individuals.

RICHLAND AREA (NORTH)

	October	November	December
Check on absentees	9	7	15
* Persons assisted	465	470	526
Doors & windows found open in commercial facilities	48	61	55
Lost children found	5	5	4
Ambulance runs	15	12	19
Lost dogs reported	0	0	0
Persons injured by dogs	0	2	1
Dog & cat complaints	23	8	4
Bank escorts & details	48	68	50
Fires investigated	10	15	21
Miscellaneous escorts	89	61	31
Complaints investigated	130	121	148
Missing persons reported	10	0	1
Totals	852	830	875

* Includes: Admitting persons to their rooms; contacting parties on long distance calls; issuing rooms and bedding; locating persons wanted for various reasons; relaying messages; assisting outside police agencies; assisting other departments; aiding private persons, etc.

TRAFFIC SECTION

Traffic accidents in Richland during the month of December declined 24% compared to the November figure. Motor vehicle traffic over the main arterials of Richland declined approximately 9%.

Inclement weather conditions contributed to 23% of the accidents. The majority of all traffic accidents were caused through "Driver Failure" with right-of-way violations of the traffic laws as leading cause.

Approximately 40% of all accidents occurred during the three hour period from 4:00 P. M. to 7:00 P. M. The balance occurred during the remaining 21 hours. Possible reason for the high frequency during the three hour period can be attributed to the fact that practically every Richland and North Richland patrolman is assigned to directing traffic at intersections during a portion of the period leaving little or no control over traffic in other locations.

TRAFFIC AND OFFENSE STATISTICS

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

PATROL

A total of 179 Unusual Incident Reports was received, which consisted mainly of Accidents, Traffic Violations, and Intoxications. Regular Traffic Violation Reports, not accompanied by an Unusual Incident Report, are presented in separate tables in the Traffic Statistics attached to this report.

PATROL DIVISION REPORT

COMMUNITY

DECEMBER 1948

FORCE REPORT		Entire Patrol 11/30/48	Entire Patrol 12/31/48
Patrol			
Patrol Supervisor		1	1
Division Supervisor		1	1
Captains		5	5
Lieutenants		12	12
Sergeants		17	17
Patrolmen		109	109
	Total	145	145
Clerical			
Steno-Typists		5	4
	Total Clerical	5	4
	Grand Total	150	149

Terminations

1 Steno-Typist

TERMINATIONS CONSIST OF

1 V. T. Personal - By Mail

5 1211527

PATROL DIVISION - TRAFFIC CONTROL STATISTICS
December - 1948

MOTOR VEHICLE ACCIDENTS

	Total Number		Fatalities		Major Injuries		Minor Injuries	
	Nov.	Dec.	Nov.	Dec.	Nov.	Dec.	Nov.	Dec.
Plant	None Reported	9	0	0	0	2	0	3
Richland	33	25	0	0	0	0	5	3
North Richland	17	12	1	0	0	0	3	2
Totals	50	46	1	0	0	2	8	8

ACCIDENT CAUSES

	Negligent Driving		Failure to Yield Right of Way		Reckless & Drunken Driving		Other Causes	
	Nov.	Dec.	Nov.	Dec.	Nov.	Dec.	Nov.	Dec.
Plant	0	6	0	0	0	0	0	4
Richland	19	12	12	8	1	1	2	6
North Richland	11	6	4	4	2	0	1	3
Totals	30	24	16	12	3	1	3	13

PLANT WARNING TRAFFIC TICKETS ISSUED

	Speeding		"Stop" Sign		Parking		Imp. License		Def. Equip.		Other Violations		Totals	
	Nov.	Dec.	Nov.	Dec.	Nov.	Dec.	Nov.	Dec.	Nov.	Dec.	Nov.	Dec.	Nov.	Dec.
Plant	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Richland	2	2	0	1	118	91	1	1	18	10	3	1	142	106
N. Rich.	0	0	1	1	154	134	0	0	11	7	0	0	166	142
Totals	2	2	1	2	272	225	1	1	29	17	3	1	308	248

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.
Plant	25	10	4	0	1	2	0	1	0	0	3	5	0	0	5	1	38	19
Richland	44	16	12	7	3	2	3	0	5	5	19	13	24	25	16	4	126	72
N. Rich.	12	11	8	7	6	0	0	2	3	2	15	10	12	4	7	15	63	51
Totals	81	37	24	14	10	4	3	3	8	7	37	28	36	29	28	20	227	142

Traffic Volume: Count taken on December 1, 1948, on Duane Avenue just north of Thayer Drive, all traffic, 24 hour period, 944 Cars.

Count taken on December 1, 1948, on Williams Blvd., west of Geo. Wn. Way, all traffic, 24 hour period, 1,433 Cars.

6

COMMUNITY PATROL DIVISION
RICHLAND JUSTICE COURT CASES
DECEMBER 1948

Violation	No. of Cases	No. of Convictions	Total Fines	Total Susp.	Sentenced To Jail	Sentence Suspended	License Revoked	Average Fine Paid	Cases Dismissed	Warrants Issued
Drunken Driving	4	3 *	$272.50	--	1	0	3	$94.16	0	0
Reckless Driving	2	0 a	--	--	0	0	0	--	0	0
Negligent Driving	15	15	312.50	--	0	0	0	20.83	0	0
Speeding	53	51	640.50	--	0	0	0	12.55	2	5
Stop Signs	16	15	79.00	--	0	0	0	5.13	1	1
Failure to YROW	7	7	65.00	7.50	0	0	0	8.21	0	1
Improper Passing	7	7	48.00	12.50	0	0	0	5.07	0	1
Improper Parking	32	32	70.00	17.50	0	0	0	1.60	0	12
No Driver's License	19	19 b	54.75	5.50	0	0	0	2.59	0	4
Defective Equipment	4	4	7.25	4.00	0	0	0	.84	0	0
Following Too Closely	1	1	3.25	--	0	0	0	3.25	0	0
Failure to Obey Traffic Officer	1	1	7.50	--	0	0	0	7.50	0	0
Illegal Use of Spotlight	1	1	5.50	--	0	0	0	5.50	0	0
Permitting Unlicensed Driver To Drive	1	1	7.50	--	0	0	0	7.50	0	0
No Certificate of Registration	1	1	--	--	0	0	0	--	0	0
Public Intoxication	43	43	447.50	62.50	10	3	0	8.95	0	0
Public Nuisance	30	29	325.00	65.50	12	7	0	8.94	1	0
Disorderly Conduct	8	8	47.50	30.00	5	2	0	2.18	0	0
Vagrancy	28	28	--	--	28	24	0	--	0	0
3rd Degree Assault	4	3	--	--	3	3	0	--	1	0
Armed Robbery	1	Turned over to Superior Court								
Larceny by Check	1	0	--	--	0	0	0	--	1	0
Petit Larceny	2	2	---	--	2	2	0	--	0	0
Investigation of Grand Larceny	1	0	--	--	0	0	0	--	1	0
Failure to Stop & Identify	1	1	27.50	27.50	0	0	0	--	0	0
Gambling	3	3	52.50	--	0	0	0	17.50	0	0
Bootlegging	5	5	392.50	100.00	0	0	0	58.50	0	0
TOTAL	290	280	$2,865.75	332.50	61	41	3		7	24

Total Fines	$2,865.75
Less Fines Suspended	332.50
Total Received	$2,533.25

The above violations occurred on Hanford Works

* - One violation reduced to Neg. Driv.
a - Two violations reduced to Neg. Driv.
b - 5 cases included with other violations

DECLASSIFIED

1211529

PATROL DIVISION - NORTH RICHLAND OFFENSES - DECEMBER 1948

Classification	Offenses Reported to Patrol During December	Offenses Unfounded	Actual Offenses Nov.	Actual Offenses Dec.	Offenses Cleared By Arrest	Offenses Cleared By Other Action	Perpetrators Involved
Assault	8	0	2	8	4	2	6 a
Attempted Suicide	0	0	1	0	0	0	0
Burglary-breaking and/or entering	5	1	2	4	1 (1)	1	3 b
Larceny-Theft (except Auto & Bike)							
(a) $50.00 and over value	9 (1)	2 (1)	6	7	1	1 (1)	3 (1)
(b) Under $50.00 value	22 (1)	0	24	22	3	5 (1)	8 (1)
Automobile Theft	4	0	2	4	0	1	1
Bicycle and Motor Bike Theft	3	0	0	3	0	0	0 u
Carrying Concealed Weapon	0	0	5	0	0	0	0
Destruction of Government Property	1	0	2	1	0	1	1
Destruction of School Property	0	0	0	0	0	0	0
Destruction of Personal Property	2	0	1	2	0	0	0 u
Disorderly Conduct	7	0	3	7	7	0	7
Drunkenness	43	0	38	43	43	0	43
Embezzlement and Fraud	0	0	0	0	0	0	0
Forgery	0	0	0	0	0	0	0
Gambling	3	0	3	3	3	0	3
Missing Person	1	0	1	1	0	1	1
Narcotics	0	0	1	0	0	0	0
Offense Against Family & Children	0	0	0	0	0	0	0
Pickups for Outside Agencies	1	0	3	1	1	0	1
Prowlers	0	0	1	0	0	0	0
Public Nuisance	26	0	13	26	26	0	26
Rape	1	0	0	1	0	1	1
Robbery	2	0	1	2	0	1	1
Sex Offense	0	0	0	0	0	0	0
Vagrancy	26	0	14	26	26	0	26
Violation of State Game Laws	0	0	0	0	0	0	0
Violation of State Liquor Laws	5	0	1	5	5	0	5
Miscellaneous	0	0	1	0	0	0	0
Totals	169	3	125	166	120	14	136 c

a Two of the offenses were perpetrated by one juvenile, age 13.

b One of the offenses was perpetrated by two juveniles, ages 8 and 13.

c 70 of the perpetrators are colored.

u Represents - Unknown

Shown in parenthesis are old cases that have been cleared during December, 1948.

Value of property recovered during December, 1948 - $2286.83.

8

PATROL DIVISION - NORTH RICHLAND - COMPARISON

DECEMBER 1948

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

	Wash. Oregon, & Calif.		North Richland		
Classification	Six Months (Jan-June 1948)	One Month Average	Six Months (Jan-June 1948)	Nov. 1948	Dec. 1948
Murder	.181	.030	0	0	0
Robbery	3.47	.57	1.00	.66	1.33
Aggravated Assault	1.75	.29	5.16	1.33	5.33
Burglary	35.69	5.94	.08	1.33	2.66
Larceny	127.06	21.17	25.16	20.00	19.33
Auto Theft	15.56	2.59	1.66	1.33	2.66

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

	State of Washington		North Richland		
Classification	Six Months (Jan-June 1948)	One Month Average	Six Months (Jan-June 1948)	Nov. 1948	Dec. 1948
Murder	.140	.23	0	0	0
Robbery	4.90	.81	1.00	.66	1.33
Aggravated Assault	.78	.13	5.16	1.33	5.33
Burglary	36.91	6.15	.08	1.33	2.66
Larceny	92.22	15.37	25.16	20.00	19.33
Auto Theft	18.15	3.02	1.66	1.33	2.66

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

	National Average	North Richland		
Classification	Six Months (Jan-June 1948)	Six Months (Jan-June 1948)	Nov. 1948	Dec. 1948
Robbery	55.5	0	0	0
Burglary	59.9	0	0	25.55
Larceny	45.2	5.3	10.00	0
Auto Theft	71.6	0	0	0

Note: Statistics of juvenile offenses throughout the United States were taken from the Uniform Crime Report published by the Federal Bureau of Investigation which states: "It should be remembered that the number of arrest records is doubtless incomplete in the lower age groups because of the practice of some jurisdictions not to fingerprint youthful offenders."

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

PATROL DIVISION - RICHLAND OFFENSES
DECEMBER, 1948

Classification of Offenses	Offenses Known or Reported to Patrol	Offenses Unfounded	Actual Offenses Nov.	Actual Offenses Dec.	Offenses Cleared By Arrest	Offenses Cleared By Other Action	Perpetrators Involved
Arson	0	0	3	0	0	0	0
Assault	1	0	1	1	1	0	1
Attempted Suicide	0	0	0	0	0	0	0
Burglary-Breaking and/or Entering	0	0	5	0	0	0	0
Breaking and Entering	4	1	1	3(a)	0	2	2
Robbery	0	0	0	0	0	0	0
Larceny-Theft (Except Auto & Bike)							
(a) $50.00 and over value	3	0	3	3(b)	6	1	6
(b) Under $50.00 Value	10	0	20	10(c)	2	0	2
Auto Theft	0	0	0	0	1*	0	1
Attempted Auto Theft	0	0	0	0	0	0	0
Bicycle Theft	6	2	16	4(d)	5 (x)	0	1
Weapons:Carrying-Possessing-Using	0	0	0	0	0	0	0
Destruction of Government Prop.	1	0	4	1	0	0	(u)
Destruction of Personal Property	1	0	6	1(e)	0	0	(u)
Destruction of School Property	0	0	0	0	0	0	0
Disorderly Conduct	2	0	5	2	0	2	3
Drunkenness	1	0	18	1	1	0	1
Embezzlement & Fraud	0	0	0	0	0	1	1
Forgery	12	0	0	12	0	1	1
Gambling and or/Possession	0	0	0	0	0	0	0
Missing Persons	1	0	0	1(f)	1	0	1
Offense Against Family & Children	0	0	1	0	0	0	0
Pickup for Outside Agency	0	0	1	0	0	0	0
Prowlers	0	0	1	0	0	0	0
Public Nuisance	3	0	1	3	3	0	3
Rape	0	0	0	0	0	0	0
Sex Offense	2	1	1	1	1	0	1
Cohabitation	0	0	0	0	0	0	0
Vagrancy	0	0	1	0	0	0	0
Violation State Game Laws	0	0	0	0	0	0	0
Violation State Liquor Laws	0	0	0	0	0	0	0
Miscellaneous	1	0	2	1	0	1	1
Juveniles (Other than above)	0	0	0	0	0	0	0

(Continued on Page Two)

Continued from Page One—Patrol Division-Richland Offenses—December, 1948

Juveniles	Offenses Known	Unfounded	Actual Nov.	Actual Dec.	Cleared By Arrest	Cleared By Other Action	Perp. Involved
Disorderly Conduct.....	0	0	1	0	0	0	0
Total Offenses.....	48	4	91	44	21	8	25

(a) One Offense perpetrated by two Juveniles, Ages 16 & 12.
(b) One offense perpetrated by five juveniles, Ages 16 & 4 19Yrs of age.
(c) One offense perpetrated by one juvenile, Age 16.
(d) One offense perpetrated by one juvenile, Age 16.
(e) One offense perpetrated by one juvenile, Age 14.
(f) One offense perpetrated by one juvenile, Age 14.
(u) Represents Unknown.

(*) Reported stolen in September, 1948.
(x) Reported stolen in previous months.

Recovery for the month was $1,710.00 (8 bikes)

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

Classification	Wash., Oregon & Calif. Six months (Jan-June 1948)	Wash., Oregon & Calif. One Month Average	Richland Six Months (Jan-June 1948)	Richland Nov. 1948	Richland Dec. 1948
Murder	.181	.031	0	0	0
Robbery	3.47	.58	0	0	0
Aggravated Assault	1.75	.29	1.5	.66	.66
Burglary	35.69	5.95	4.55	3.33	0
Larceny	127.06	21.18	22.0	26.0	19.5
Auto Theft	15.56	2.59	1.44	0	0

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

Classification	State of Washington Six months (Jan-June 1948)	State of Washington One Month Average	Richland Six Months (Jan-June 1948)	Richland Nov. 1948	Richland Dec. 1948
Murder	.140	.023	0	0	0
Robbery	4.90	.82	0	0	0
Aggravated Assault	.78	.13	1.5	.66	.66
Burglary	36.91	6.15	4.55	3.33	0
Larceny	92.22	15.37	22.0	26.0	19.5
Auto Theft	18.15	3.03	1.44	0	0

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

Classification	National Average (Jan-June 1948)	Richland Six Months (Jan-June 1948)	Richland Nov. 1948	Richland Dec. 1948
Robbery	55.5	0	0	0
Burglary	59.9	8%	0	0
Larceny	45.2	8	8%	15%
Auto Theft	71.6	38	0	0

Note: Statistics of juvenile offenses throughout the United States were taken from the Uniform Crime Report published by the Federal Bureau of Investigation, which states: "It should be remembered that the number of arrest records is doubtless incomplete in the lower age groups because of the practice of some jurisdictions not to finger-print youthful offenders".

In Richland every delinquent juvenile is entered in the records.

COMMUNITY PATROL DIVISION
U. I. MONTHLY REPORT
DECEMBER 1948

TRAFFIC ACCIDENTS	32
3RD DEGREE ASSAULT	3
PUBLIC INTOXICATION	37
TRAFFIC VIOLATIONS	21
PICKUP FOR OUTSIDE AGENCY	3
DRUNK AND DISORDERLY CONDUCT	7
DISTURBANCE	3
DEATHS	3
VAGRANCY	25
PUBLIC NUISANCE	22
BOOTLEGGING	5
CARRYING CONCEALED WEAPONS	1
AUTO THEFT	3
LOST SHIELD	1
LOST SHIRT	1
ROBBERY	3
MENTAL CASE	1
BREAKING AND ENTERING	1
DESTRUCTION OF GOVERNMENT PROPERTY	1
MISSING PERSONS	3
BURGLARY	1
GAMBLING	2
TOTAL	179

COMMUNITY PATROL DIVISION
OPEN DOORS & WINDOWS
MONTHLY REPORT
DECEMBER 1948

LOCATION	OPEN DOORS	OPEN WINDOWS
SUB-CONTRACTORS (N. RICHLAND)	31	3
FACILITIES (N. RICHLAND)	12	5
SCHOOLS (N. RICHLAND)	4	0
FACILITIES (RICHLAND)	12	3
SCHOOLS (RICHLAND)	1	0
TOTALS	60	11

COMMUNITY DIVISIONS

COMMUNITY ACTIVITIES DIVISION

December, 1948

ORGANIZATION AND PERSONNEL

Number of Employees on roll

Beginning of Month		12
Additions	0	
Terminations	0	
End of Month		12

SCHOOLS

Richland high school students joined with plant and school officials on December 1 in dedicating the new high school gymnasium. The Deputy Manager of the Atomic Energy Commission addressed the capacity crowd and turned the new athletic plant over to the president of the school board who in turn presented the gymnasium to the superintendent of Richland schools.

It was announced on December 9 that machine shop, fly tying, slip cover making, and knitting classes had been added to the offerings in night school education [redacted]

The Columbia High School Band presented a concert in the school on December 10.

A survey of the Columbia High School Auditorium was made on December 13 and arrangements made to redecorate the interior during the Christmas vacations.

On December 15, the students of the upper class of Sacajawea presented an operatta in two acts titled "Red Candles."

On December 16, the Division delivered to the Columbia High School complete sets of master keys for the recently completed additions.

It was announced on December 16 that the construction program by which John Ball Grade School is being expanded will be completed within a month. The total cost is estimated at over $200,000.

Students of the Columbia High School presented a Christmas Choral Concert on December 17 in the auditorium of the high school.

On December 17 the McNeil Construction Company turned over to the Division the keys for the new Spalding Grade School.

Community-Activities Division

On December 21, representatives of the Division and Fire Protection officials inspected all schools for fire hazards, particularly in relation to special Christmas decorations.

On December 22, arrangements were made to winterize Sacajawea Grade School so that a stoker could be installed.

On December 23, representatives of the Activities Division and the Atomic Energy Commission inspected the Carmichael Junior High School.

On December 29, Division representatives accompanied maintenance men on tour of High School in relation to faulty door installations and arrangements were made to replace the defective equipment.

On December 30, the redecorating of the Columbia High Auditorium was completed and a new stoker was installed at Lewis and Clark Grade School. Due to labor difficulties, the installation of a stoker at Sacajawea was temporarily abandoned and the school de-winterized.

Representatives of the Division attended a conference between Dr. Sandin and the Community-Relations Division with regard to sponsoring student essay and poster-art contests on such subjects as the conservation of electricity. It was pointed out that it is a school administration policy not to award prizes for this type of activity.

CHURCHES

The following is a tabulation of full time paid personnel, as of December 31, 1948:

	Ministers	Staff	Total
Assembly of God	1	0	1
Catholic	2	2	4
Central United Protestant	2	1	3
Church of Christ	1	0	1
Church of God	1	0	1
Episcopal Church	1	0	1
Free Methodist	1	0	1
Mission Baptist	1	0	1
Mo. Synod Lutheran (Redeemer)	1	1	2
National Lutheran	1	2	3
Regular Baptist	1	0	1
United Protestant - North Richland	2	1	3
United Protestant - West Side	1	0	1
United Protestant - South Side	1	0	1
	17	7	24

On December 16, the new General Manager of General Electric's Nucleonics Department addressed a combined group of representatives of Richland's Churches and schools.

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Community-Activities Division

Sacajawea, Jefferson, and Marcus Whitman units of the United Protestant Church School joined in the production of an all-schools pageant December 22 at Columbia High School.

The South Side United Protestant Church has practically completed the first phase of its construction program. Finishing touches were put on the church basement preparatory to receiving the main sections of the converted army chapel.

The Richland Baptist Church moved three sections of the former Hanford Hospital to the site at George Washington Way and Wordrop Street and during the month of December assembled these sections and finished placing the initial siding on all outside walls.

The All-Saints Episcopal Church completed negotiations for the purchase of the Nettleton-Sound Company's Barracks Unit No. 6 which it will move to another site and convert into a church unit.

The Richland Church of the Nazarene purchased, through the War Assets Administration, a surplus army chapel and made application for a building site north of Marcus Whitman School in the new housing development area.

The Senior Choir of the Richland Lutheran Church presented its fifth annual Christmas Eve Concert at the church on Christmas Eve, December 24.

The Reorganized Church of the Latter Day Saints sponsored a series of illustrated travelogs in color on the Hawaiian Islands with the former pastor of the Kirtland Temple in Ohio appearing as the lecturer. These lectures were presented throughout Richland and North Richland over a two week period and were free to the public.

All Richland Churches presented special Christmas and New Years programs. The Community-Activities Division assisted in allocating space, procuring materials, and conducting periodic inspections regarding holiday decorations hazards.

COMMUNITY

The Richland Girl Scouts, working in conjunction with the Girl Scouts' national drive for 100,000 clothing kits for children in Europe, prepared 71 clothing kits.

The Richland Community Concert Association sponsored the appearance at Columbia High School auditorium on December 2 of Mia Slavenska and the "Slavenska Ballet Variante."

During the first week of December, the Jay-Cees installed over 200 Christmas trees on standards throughout the community business district, strung 14 cross-street streamers of electric lights, erected a 30 foot community tree in the square, and set up a Nativity scene, also in the square. Christmas carols, recored by the various community choirs, were played over a speaker system in the down town area and Santa Claus, complete with hugh sleigh, mounted on a jeep, made regular appearances.

The redecoration of the Veterans Administration Building was completed on December 2.

The first of a series of dances to be sponsored by the Richland Junior Chamber of Commerce was held December 3 at the Sacajawea gymnasium and featured the appearance of Jimmy Zito, his orchestra and entertainers.

On December 7, 1948, the School Board Election was held in conjunction with the Council election resulted in the appointment of two new members of the Board. The major details relating to the preparation for, conducting and tabulating of the election and its results were handled by the staff of the Community-Activities Division.

The Meistersingers, on December 17, completed the construction of a new set of portable risers to replace the improvised set formerly in use at the Columbia High School auditorium. The new set was constructed with volunteer labor and with the Meistersingers paying the cost of the materials amounting to $300. It was announced that these risers would be available to any approved community group.

The Richland Boys' Choir presented a pre-Christmas concert at Columbia Auditorium on December 18.

The Jay-Cee sponsored Hi-Spot Club for teenagers presented a musical review "Our Richland" at the Columbia High School auditorium on December 20 and 21. Proceeds were used to sponsor additional teenage activities.

It was announced on December 23 that blueprints had been approved and equipment ordered for the Spalding Community Recreation Park which will be a model for the five other proposed recreation parks.

Final plans for the completion of the Richland Community Swimming Pool were completed on December 23. A check for $13,000 was written as part payment of the new filtration plant which arrived in November. The merchants of Richland, through the Chamber of Commerce, pledged $15,000 and have turned in $9,000 of the amount to date.

The Richland Post Office installed new, automatic stamp vending machines to relieve congestion at stamp windows and to provide for the sale of stamps during hours when the windows are normally closed.

The Camp Fire Girls of Richland were granted permission to sell "Holly for the Holidays" in the down town area during the holiday season for the purpose of raising funds to sponsor additional character-building activities.

Approximately 2 tons of clothing were turned in for shipment to Tiel, Holland, the town 'adopted' by Richland in the spring of 1946. The Kiwanis Club of Richland has sponsored an annual drive for this purpose each year.

Community- Activities Division

Special Christmas and New Years parties and events were sponsored by all the Community Clubs and Organizations. The Community-Activities Division assisted in the allocation of space for these events, procurement of materials, clearances, and the necessary safety and fire inspections.

An Engineering Service Request for Recreational Facilities Equipment for schools and parks was submitted on December 16. This request involved $50,000 of the budget, under item # 7-F-2.

Representatives of the Recreation Section of the Community-Activities Division held three meetings with the Richland Independent Basketball League Board. The Division assisted in scheduling the first round of competitions and supplied mimeographed copies for the League's use. Arrangements were made to have the Division represented at all league play.

Representatives of the Community-Activities Division made detail studies of North Richland's Mess Hall #3 and Richland's Recreation Hall as locations for proposed youth centers.

Acting as liaison between the Columbia Sports Officials Association and the Church Basketball League, the Division arranged for the donation of Officials' services each Monday night for league play.

Division representatives began preliminary surveys of the High School Athletic Field for the purpose of planning additional recreational equipment and facilities for youth and adult groups.

Representatives of the Community-Activities Division, Fire, and Safety Divisions made regular monthly inspections of all club buildings and grounds.

The format of the Community-Activities Division's book, "Guide to Richland," scheduled for publication in January 1949, was submitted for approval. The book will contain general information about the various commercial, recreational, religious, and social activities available to community residents.

The number and types of organizations presently served by the Community - Activities Division include 14 business and professional clubs, 23 churches and church organizations, 5 civic organizations, 15 fraternal organizations, 8 music and art associations, 9 private instructors, 32 recreation and hobby groups, 7 schools and 7 parent teachers associations, 10 social clubs and organizations, 10 veteran and military organizations, 5 welfare organizations, 18 Boy Scout Troops, 13 Camp Fire Girls troops, 36 Girl Scout tropps, 3 other youth groups, and 14 miscellaneous organizations.

On December 3, final security clearance and approval by the Atomic Energy Commission was completed for the Richland Light Opera Company, Richland Golf Association, Richland Stamp Society, Inter-Mountain Alpine Club, "P" Division Recreation Association, and the Society for the Preservation and Encouragement of Barber Shop Quartet Singing in America, Inc.

Community-Activities Division

The Recreation Advisory Committee held its regular monthly meeting to consider applications for approval of community organizations and activities. There were no applications submitted or awaiting approval so the committee submitted a negative report to that effect.

As of December 31, 1948, organizational personnel included:

State Game Commission	1
Villagers, Inc.	8
American Legion	2
Co-ordinate Club	1
Youth Council	1
Boy Scouts	1
Camp Fire Girls	2
Hi-Spot Club	1
Jr. Chamber of Commerce	2
Red Cross	3
Castle Club	1
Post Office	78
Veterans Administration	2
Girl Scouts	2
	105

MAJOR ACTIVITIES

December 2	Slavenska Ballet Variante	Columbia High School
3	Jay-Cee Jimmy Zito Dance	Sacajawea Gymnasium
7	Gonzaga Glee Club	Columbia High School
18	Richland Boys Choir	Columbia High School
19	Richland Choral Society's Messiah	Columbia High School
20 - 21	Hi-Spot Teenage Review	Columbia High School

Community - Activities Division

RICHLAND PUBLIC SCHOOLS PERSONNEL AND ENROLLMENT REPORT

The following is a tabulation of full-time school district paid personnel, as of December 22, 1948:

Administration	3
Clerical	15
Principals and Supervisors	17
Teachers	225
Building Custodians	36
Cooks	21
Nursery School Ex. D. C.	17
Bus Drivers	2
	336

On December 22, 1948, there were 65 children enrolled in the Richland Nursery School with an average attendance of 45. There was a decrease in enrollment during the month of 5. On this day there were 15 children enrolled in the Extended Day Care program of the Nursery with an average attendance for the month of 12. There was a decrease in enrollment during the month of 1.

COLUMBIA HIGH SCHOOL

	Boys	Girls	Total
Freshmen (9th grade)	170	176	346
Sophmore (10th grade)	156	164	320
Junior (11th grade)	114	96	210
Senior (12th grade)	106	104	210
	546	540	1086

GRADE SCHOOLS

	Marcus	Sacajawea	Jefferson	Ball	Lewis	Spalding	TOTAL
Kindergarten	66 (2)*	71 (2)*	58 (4)*	97 (4)*	95 (4)*	82 (4)*	469
1st grade	109 (3)	127 (4)	108 (3)	152 (2)	154 (5)	82 (3)	732
2nd grade	186 (2)	110 (4)	89 (3)	118 (4)	122 (4)	77 (3)	602
3rd grade	80 (3)	108 (3)	77 (2)	115 (4)	117 (4)	72 (3)	569
4th grade	100 (3)	111 (4)	85 (3)	102 (3)	108 (3)	58 (2)	564
5th grade	75 (2)	104 (3)	65 (2)	88 (3)	98 (3)	86 (3)	516
6th grade	70 (2)	90 (3)	69 (2)	91 (3)	85 (3)	40 (2)	445
7th grade	103 (3)	86 (3)	68 (2)	86 (3)	94 (3)		437
8th grade	249 (8)			68 (2)	61 (2)		378
	938	807	619	917	934	497	4712

*Half days
() Number of classes

HW-12086

GENERAL ELECTRIC COMPANY
HANFORD WORKS
COMMUNITY ACCOUNTING DIVISION

MONTHLY REPORT FOR DECEMBER, 1948

ORGANIZATION

Employees - Beginning of the Month	31	Exempt	5	Male	10
Terminations or Transfers	2	Non-exempt	24	Female	19
Employees - End of Month	29	Total	29	Total	29

One employee terminated in order to spend more time with her family and one was transferred to the General Accounting Division. All groups are presently sufficiently staffed to take care of the work assigned. Absenteeism throughout the Division was unusually high due to illness, principally bad colds. Morale of employees seems particularly good.

ACCOUNTS RECEIVABLE

RENTS

The volume of work has increased during the month in comparison with previous months.

House Leases Processed:	Dec.	Nov.
New	351	219
Modifications	271	301
Cancellations	141	81

We are still collecting rent on a furnished basis from 27 conventional type houses, 44 prefabs and 3 efficiency apartments which are occupied by employees who are on the Project in a temporary or a special assigned capacity. The total number of houses leased as of December 31, 1948 was 5,250 and of this number 471 were of the new ranch type group.

There were 94 dormitory assignments and 98 removals.

Rental revenue was as follows:

Equipment	$ 220.03
Houses	212,087.53
Dormitories	15,437.51
Facilities	49,692.99
Total	$277,438.06

TELEPHONE

A redistribution of work in the telephone group proved of benefit with each employee maintaining a posting balancing control which was a part of the over-all control maintained by the Clerical Leader. This plan has neutralized the high and low points in the work loads. A new toll posting machine was installed in December which made a total of four toll posting machines and two billing machines available which is expected to meet the requirements for some time to come.

1211544

There are 2,450 working phones and there were 13,000 resident and facility toll calls during the month.

A procedure concerning supplemental phone listing charges was agreed upon to go into effect January 1, 1949.

MISCELLANEOUS RECEIVABLES

There were 118 miscellaneous receivable invoices issued during the month accounting for $3,273.73 in revenue. Six Building Permit Applications have been processed to date resulting in fees of $627.98. There was $696.92 in travel advance funds unaccounted for as of December 31, 1948. A total of 14 collection letters were written and resulted in the payment of $146.64 closing ten delinquent accounts.

Certain equipment located in the Carnation Milk Depot was sold to that facility for $1,731.90 on December 28, 1948, and represented the first of many such sales of Government equipment to the respective operating facilities. This will eliminate maintenance service to these facilities except for that of a structural nature.

ACCOUNTS PAYABLE

STATISTICS

	December	November
Accounts Payable Vouchers Processed	304	327
Freight Bills Processed	198	186
Purchase Orders Received	83	73
Amount of Purchase Orders	$ 62,215.92	$ 57,736.74
Receiving Reports Received	227	224
Total Net Amount Disbursed	$214,558.33	$111,549.71

GENERAL

The Accounts Payable balance as of 12-31-48 was $122.17 representing one open voucher in November and twelve December vouchers.

The Freight Account balance was again closed completely to zero.

There were four new subcontracts received during December making a total of eight subcontracts for which we are responsible.

HW-12084

SUBCONTRACTOR	SUBCONTRACT NUMBER		AMOUNT AWARDED	AMOUNT PAID	AMOUNT RETAINED
Vance Properties, Inc.	None applied		CPFF	$ 60,793.50	-0-
Graysport Constr. Co.	G-187		$ 20,500.00	18,450.00	$ 2,050.00
Touche, Niven, Bailey & Smart	G-213	*	14,022.04	14,022.04	-0-
Puyallup Gardens	G-216	*	87,933.67 est.	47,376.30	5,166.81
Touche, Niven, Bailey & Smart	G-218	*	18,691.01	18,691.01	-0-
West Coast Painters Co.	G-219		46,449.19	12,042.18	1,338.01
McAtee & Heathe	G-223	*	41,414.45 est.	40,323.33	4,480.37
Lone Pine Roofing & Paving Co.	G-227		7,500.00	6,000.00	-0-
Graysport Constr.Co.	G-231	*	43,270.00 est.	28,273.84	2,163.50
			$340,573.86	$245,972.20	$15,198.69

* Total amount of contract will be the total of the estimates as submitted. Contract is based on a unit price award.

The audit of Vance Properties payroll records with relation to maid service furnished the dormitories resulted in a net credit of $274.43 to the Project for discrepancies appearing in invoices rendered to us prior to November 1, 1948. All invoices after that date are being audited with the original records before payment is made. The November invoice received and paid in December was correct as received.

COST

The volume of work has increased in this Division during December, the cause of which is primarily due to the preparation of special reports and analysis regarding unusual trends in Cost. An additional employee may be requisitioned if the present volume continues.

WORK ORDERS

The list of those in the Community Divisions authorized to approve work orders has been received and is on file for reference purposes.

A code system for identifying foremen was placed into effect in December to assist in a more complete analysis of the summary sheets as to the foreman responsible for the work. This will assist both the cost group and the foremen when questions concerning charges arise.

Work Order Summaries beginning December 26, 1948 will show the overhead applied (I.M.E.) as well as the actual labor and actual material charged to each order.

Hanford 2086

REPORTS

The November Operating Report was distributed on December 31, 1948 which indicates some improvement in the issuing time but is still not satisfactory.

The budget was reviewed with relation to operating cost during the month. The costs are running over the budget figures in quite a few cases and emphasis will be given to bring the costs in line with the budget figures.

An audit of the active projects with relation to charges applied was carried out covering those projects for which responsibility was assigned to the Community. Several exceptions were noted where records did not substantiate charges.

Work was begun on recasting July and August cost figures to Divisions and Sections of the Community, so that the Section Reports will be uniform and complete.

The September and October Utility Report was completed and typed, and the November report is being computed.

GENERAL LEDGER

The trial balance for November and the reconciliations supporting the Accounts as well as the General Ledger Balance Sheet were prepared and sent to the General Division for consolidation on December 23, 1948.

All work pertaining to the General Ledger, Second Class Invoices and Government Billings has been consolidated and is being done by one employee where previously two were required.

Work is in good condition and all work is on a current basis.

RHH:jam
1-7-49

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Hw-12086

PROJECT AND RELATED PERSONNEL

	11-30-48		12-31-48	
GOVERNMENT EMPLOYEES				
Civilian Personnel - Atomic Energy Comm.	346		343	
Civilian Personnel - G. A. O.	4		4	
Total		350		347
RICHLAND VILLAGE PERSONNEL				
Commercial Facilities(Includes No. Rich.)	1670		1888	
Organizations, Clubs, Etc.,	105		105	
Schools	331		336	
Churches	24		24	
Total		2130		2353
MORRISON-KNUDSEN PERSONNEL(Columbia Camp)		245		200
CONSTRUCTION SUB-CONTRACTORS				
Atkinson-Jones	8953		8397	
Newport, Kern & Kibbe	17		14	
Newberry Neon	739		776	
Urban, Smyth, Warren Co.,	1645		1870	
J. B. Head Co.,	45		19	
Kellex Corp.,	552		585	
J. Gordon Turnbull	139		139	
Giffels & Vallet, Inc.,	162		187	
Morrison-Knudsen Co.,	184		173	
C. C. Moore	201		158	
V. S. Jenkins Insulating Co.,	45		40	
Curtis Sand & Gravel	31		12	
National Carbon/Carbide Co.,	290		320	
Trowbridge & Flynn Electric Co.,	13		8	
J. A. Terteling & Son	677		548	
Graysport Construction Co.,	275		28	
Nettleton-Sound	347		124	
Thorgaard Plumbing	17		17	
Chris-Berg Co.,	204		158	
Holert Electrical Co.,	33		28	
Kelly-Wells Co.,	2		-	
McNeill Construction Co.,	588		448	
Rust Engineering Co.,	9		17	
Arnold & Jeffers Co.,	35		28	
Pacific Roofing Co.,	31		-	
Central Service Co.,	16		11	
Charles Swanson & Lyle	139		102	
Builders Insulating Co.,	5		-	

(Continued on page #2)

CONSTRUCTION SUB-CONTRACTORS	11-30-48	12-31-48
Fox Metal Products	7	9
Pioneer Sand & Gravel	9	-
Scott-Buttner	39	19
Pittsburgh-Des Moines Steel	16	-
Martins Furniture	22	23
Parsons Tile	5	3
Williams Paint & Glass	-	5
Seldon's Inc.,	2	-
West Coast Painters	6	11
Holaday & Edworthy	3	3
Chicago Bridge	13	8
P. S. Lord	98	46
Haughton Elevator Co.,	7	9
E. J. Bartells Co.,	65	47
H. P. Fischer & Sons	4	6
Nelse-Mortenson	9	-
Howard P. Foley Co.,	37	41
E. F. Sherrill	3	2
E. F. Hauserman	1	1
Combustion Engine Company	1	1
Indust. Eng. & Contractors	9	17
Lone Pine Roofing	2	-
Hanley & Company	-	6
Johnson Service	-	2
X-Ray Products	-	5
Total	15,752	14,471
GENERAL ELECTRIC PERSONNEL	8,581	8,618
GRAND TOTAL	27,058	25,989