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MONTHLY REPORT

HANFORD ATOMIC PRODUCTS OPERATION

FOR

APRIL 1953

HANFORD
50418

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By Authority of FRD-Co-4
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Compiled By
DEPARTMENT MANAGERS

May 20, 1953

Received by OSTI
APR 27 1992

RICHLAND, WASHINGTON

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

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MASTER

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MONTHLY REPORT
HANFORD ATOMIC PRODUCTS OPERATION

APRIL 1953

GENERAL SUMMARY

Production Operations

In the Metal Preparation Section net production for the month exceeded forecast. Canning of P-10 enriched slugs continued during the month, and at month's end the second commitment for pile loading of the slugs for the P-10 program was accomplished.

A major increase in maximum operating level of the C reactor was established. One uranium jacket failure occurred during the month; this was at C reactor. Both reactor input production and reactor output production exceeded forecast. The addition of sodium dichromate to the B, D and F reactor process water was resumed on April 10; the dichromate treatment of process water is now in effect for all reactors. The Ball 3X outage was started at H reactor on April 5.

Separations plants exceeded forecasts by the following amounts: Redox - 105%; TBP - 108%; UO_3 - 119%; T Canyon Building - 108%. Production at the TBP plant, although a record high, was hampered intermittently by low inventory of feed material, even though the third tank farm was added on March 15. Ten cars of powder were shipped offsite from the UO_3 plant. The Separations Section assumed responsibility for the complete reactivation of the P-10 facility at 108-B.

Engineering and Technology

The Hot Semiworks demonstrated a streamlined "head-end" $KMnO_4$ treatment which gave 100 fold decontamination of ruthenium. Experimental cans and caps with interlocking devices were received from ALCOA. The purpose of the interlock is to aid in aligning the slugs in the process tubes during the charging operations. One hundred and fifty slugs were canned using these components.

Design progress on 100-K Reactor Facilities advanced to 80.4% completion, while design work on the UO_3 Plant Expansion reached 72% completion. Detail design work on the 300 Area Expansion Program was 20% complete at month end.

Personnel and Services

Electrical distribution for Richland was transferred from the Plant Auxiliary Operations Department to the Community Operations and Real Estate Department.

Preparation of the budget for the Fiscal Year 1955 and revision of the budget for the Fiscal Year 1954 was completed in April, the final budget letter being transmitted to the Atomic Energy Commission on April 24.

Agreement in principle was reached on a new GE-HAMTC contract, and a final draft was submitted to the HAMTC on April 17 for review and comments.

The total number of housing applications pending is 699.

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STAFF

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

HANFORD ATOMIC PRODUCTS OPERATION
NUMBER OF EMPLOYEES
APRIL 30, 1953

	EXEMPT		OTHERS		TOTAL	
	4-30-53	3-31-53	4-30-53	3-31-53	4-30-53	3-31-53
Engineering Department						
General	15	14	83	83	98	97
Design	162	161	38	40	200	201
Project	215	212	296	296	511	508
Technical Section						
General	5	10	3	2	8	14
Applied Research	124	125	58	60	182	185
Separations Technology	111	108	24	23	135	131
Laboratory Engineering	48	48	59	60	107	108
Pile Technology	105)		65)		170)	
Fuel Technology	54)	161	46)	117	100)	276
Advance Technology	7)		1)		8)	
Manufacturing Department						
General	16	16	7	7	23	23
Reactor	239	239	1 007	1 008	1 246	1 247
Separations	323	328	1 199	1 203	1 522	1 531
Metal Preparation	87	84	427	425	514	509
Plant Auxiliary Operations Department						
General	1	1	-	-	1	1
Elec. Distribution & Telephone	32	35	142	154	174	189
Transportation	46	45	478	478	524	523
Purchasing & Stores	53	53	246	251	299	304
Plant Protection						
Patrol & Security	62	62	483	491	545	553
Safety & Fire	43	43	108	110	151	153
Office Services	23	30	300	308	323	338
Administration Main. Service	11	11	56	56	67	67
Statistical & Computing	39	34	55	54	94	88
Community Operations & R. E. Dept.	104	101	335	318	439	419
Financial Department						
General	4	4	5	6	9	10
Accounting	44	43	200	202	244	245
Payroll & Auditing	26	26	63	63	89	89
Employee & Public Relations Dept.	51	52	160	168	211	220
Radiological Sciences Department						
General	4	4	3	3	7	7
Records & Standards	25	25	145	146	170	171
Biophysics	61	59	56	57	117	116
Biology	42	42	36	37	78	79
Medical Department	41	43	211	214	252	257
Law	3	3	2	2	5	5
General	15	14	30	30	45	44
TOTAL	2 241	2 236	6 427	6 472	8 668	8 708

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PERSONNEL DISTRIBUTION - APRIL, 1953

	100-B Area	100-D Area	100-F Area	100-H Area	101 Area	100-K Area	200-E Area	200-W Area	300 Area	700-1100-3000 Area and Plant General	Total
Engineering Department											
Exempt	40	63	1	23	22	21	28	69	255	324	846
Other	18	34	4	56	18	14	12	24	223	270	673
Total	58	97	5	79	40	35	40	93	478	594	1 519
Manufacturing Department											
Exempt	65	58	41	69	-	4	8	307	86	27	665
Other	234	275	359	167	-	-	119	1 076	397	13	2 640
Total	299	333	400	236	-	4	127	1 383	483	40	3 305
Plant Auxiliary Operations Department											
Exempt	20	10	6	8	9	5	23	17	16	196	310
Other	89	66	112	56	19	-	99	211	118	1 098	1 868
Total	109	76	118	64	28	5	122	228	134	1 294	2 178
Community Operations & Real Estate Department											
Exempt	-	-	-	-	-	-	-	-	-	104	104
Other	-	-	-	-	-	-	-	-	-	335	335
Total	-	-	-	-	-	-	-	-	-	439	439
Financial Department											
Exempt	-	-	-	1	-	-	-	1	1	71	74
Other	-	-	2	1	-	-	2	1	-	262	268
Total	-	-	2	2	-	-	2	2	1	333	342
Employee & Public Relations Department											
Exempt	-	-	-	-	-	-	-	-	-	51	51
Other	11	5	3	4	3	-	5	2	33	94	160
Total	11	5	3	4	3	-	5	2	33	145	211
Radiological Sciences Department											
Exempt	1	-	44	-	-	-	2	14	59	12	132
Other	5	-	43	-	-	-	6	11	156	19	240
Total	6	-	87	-	-	-	8	25	215	31	372

	100-B Area	100-D Area	100-F Area	100-H Area	101 Area	100-K Area	200-E Area	200-W Area	300 Area	700-1100-3000 Area and Plant General	Total
Medical Department											
Exempt	-	-	-	-	-	-	-	-	-	41	41
Other	1	4	4	1	-	-	1	6	2	192	211
Total	1	4	4	1	-	-	1	6	2	233	252
General											
Exempt	-	-	-	-	-	-	-	-	2	16	18
Other	-	-	-	-	-	-	-	-	14	18*	32*
Total	-	-	-	-	-	-	-	-	16	34	50
Total Exempt	126	131	92	101	31	30	61	408	419	842	2 241
Total Other	358	384	527	285	40	14	244	1 331	943	2 301	6 427
GRAND TOTAL	484	515	619	386	71	44	305	1 739	1 362	3 143	8 668

* Includes 6 employees in Schenectady office.

MANUFACTURING DEPARTMENT

APRIL, 1953

May 12, 1953

METAL PREPARATION SECTION

The net production for the month was 159 tons (102% of forecast) which included 146 tons of 8-inch material and 13 tons of 4-inch material. The machining yield for the 8-inch material was 82.7% and for the 4-inch 77.6%.

The canning yield was 60.5% for 4-inch and 73.6% for 8-inch. The overall canning yield improved by 7% over the past month and is attributed to a significant reduction in the number of non-seat rejects for both the four and eight-inch slugs.

The melt plant produced 31 tons of billets with a yield of 86.2% and a solid yield of 96%.

There were no canned slug failures at autoclave testing during the month.

The canning of P-10 enriched slugs continued during the month with an overall canning yield of 85%. This represents a decrease in yield compared with the past month, and was the result of more stringent inspection procedures and the addition of a 100 percent radiograph test.

The overall yield for the P-10 target slug program was 78%. This was a marked improvement over last month's canning operation. Poor weld closures are still the primary cause of rejection although some improvement was shown in the welding operation.

At month's end the second commitment for pile loading of the slugs for the P-10 program was accomplished. Current reject material of the P-10 alloy from the present canning operation and a quantity of salvaged P-10-A material used previously has been returned to Savannah River for recasting and extrusion.

REACTOR SECTION

The total reactor input production was 105.9% of forecast, and the reactor output production was 100.1% of forecast resulting from the discharge of a new record quantity of metal.

Increases in established maximum operating levels during the month were 100 MW at C reactor and 5 MW at DR reactor. The maximum levels include 9 MW of "C" metal burnout at C pile and 52 MW of "J" burnout at DR pile.

The single uranium jacket failure which occurred at C reactor during this period, was the lowest number since March 1951. The total outage time for the slug removal was 26.6 hours. In addition, three "C" metal slugs were found to have ruptured. Two of these were at H reactor and one at C reactor. The high Beckman readings were confirmed when the slugs were removed during normal charge-discharge operations.

REACTOR SECTION (Continued)

There were no process tube failures during this period.

Numerous failures of solenoid coils, which are installed to operate the Ball 3X hopper doors at B, D, DR, F and H reactors, caused two outages when balls were dropped into one channel at each of the B and F reactors.

After startup of the B reactor on April 25, it was discovered that VSR No. 35 had broken, and the lower part had remained in the pile. Two days were required for removal, and replacement of the rod, and startup of the pile. Failure occurred at one of the joints. The design of the joint is now being reviewed by all interested organizations.

The addition of sodium dichromate to the B, D and F reactor process water was resumed on April 10, following a review of corrosion experience and pertinent literature. The dichromate treatment of process water is now in effect for all reactors.

A gradual increase of radioactivity in the effluent water from all reactors was experienced early in the month due to increasing turbidity caused by the spring run-off of the river. The main contributor is the short half-life Mn^{56} (2.59 hours) originating in the raw water.

The Ball 3X outage was started at H reactor on April 5, and is continuing on schedule at month end. Other associated work is essentially complete.

SEPARATIONS SECTION

A total of 13 runs was started in the T Canyon Building and the production was 108% of forecast.

The Redox plant produced 105% of forecast. An equivalent of four days were lost due to flushing columns and reworking batches of insufficiently decontaminated uranium.

The TBP plant production of uranium as UNH was 108% of forecast. Production although a record high, was hampered intermittently throughout the month by low inventory of feed material, notwithstanding the addition of the third tank farm on March 15. Decontamination was not as satisfactory this month as in March due to carry-through of Yttrium.

The UO_3 plant was plagued with severe caking in the calcination furnaces for a few days during the month; however, the month's production was 119% of forecast. Ten cars of powder were shipped offsite. Both of these items represent new record achievements.

Sluicing activities progressed with improved results in all tank farms during the month. It is indicated that the first cascades of tanks in U and C farms are nearing depletion of their contents.

SEPARATIONS SECTION (Continued)

No failure of Nagle pumps occurred during this period, however, some time was lost at 241-CR due to a sluice pump failure and at 241-BSR due to a sluice pump failure.

The month's commitment of the 234-5 operation was delivered. All processing was done on the RM line during the month.

The Separations Section assumed the responsibility for the complete reactivation of the P-10 facility at 108-B.

GENERAL

Effective April 1, 1953, P. E. Lowe was transferred to the Atomic Nuclear Propulsion Project at Evendale, Ohio.

T. W. Hauff visited the installations at Rocky Flats, K-25, Savannah River and Fernald from April 20 through April 30. This trip was made in connection with manufacturing process information.

Hot tar, which was employed on April 27 in making repairs to the pump pit in the slug recovery room in Building 313, ignited and caused damage estimated to be less than $5000.

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

Personnel

Total on Roll April 1, 1953	3310
Accessions	33*
Separations	35*
Total on Roll April 30, 1953	3308

*Does not include intra-department transfers.

C. N. Gross

C. N. GROSS, MANAGER

MANUFACTURING DEPARTMENT

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PATENT REPORT SUMMARY
FOR
MONTH OF APRIL, 1953

Richland, Washington
May 11, 1953

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

INVENTOR	TITLE
Truman H. Quinn, Reactor Section	Compound-Action Gain Control, dated March 11, 1953

C. N. GROSS, MANAGER

MANUFACTURING DEPARTMENT

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Richland, Washington
May 11, 1953

MANUFACTURING DEPARTMENT
METAL PREPARATION SECTION
APRIL, 1953

I. RESPONSIBILITY

Responsibilities of the Section remained unchanged.

II. ACHIEVEMENT

A. Operating Experience

1. Statistics

	April	March	Year to date
Bare Pieces Machined (4")(Tons)	1	28	49
Machining Yield (4")(%)	77.6	83.6	82.5
Bare Pieces Machined (8")(Tons)	91	86	418
Machining Yield (8")(%)	82.7	83.5	82.3
Total Pieces Machined (Tons)	92	114	467
Acceptable Pieces Canned (4")(Tons) Gross	14	23	97
Acceptable Pieces Canned (4")(Tons) Net	13	22	94
Canning Yield (4")(%)	60.5	63.1	66.5
Acceptable Pieces Canned (8")(Tons) Gross	147	160	550
Acceptable Pieces Canned (8")(Tons) Net	146	158	543
Canning Yield (8")(%)	73.6	65.2	69.5

1. Statistics (Continued)

	April	March	Year to date
Total Acceptable Pieces Canned (Tons) Gross	160	183	647
Total Acceptable Pieces Canned (Tons) Net	159	180	637
Acceptable Pieces Canned (4" and 8") (% of Forecast)	102	106	103
Autoclave Frequency (4")(No./M)	.00	.00	.02
Autoclave Frequency (8")(No./M)	.00	.02	.01
Briquettes Produced (Tons)	14	13	71
Chip Recovery Yield	84.5	84.2	85.4
Billets Produced (Tons)	31	35	224
Melt Plant Billet Yield (%)	86.2	87.5	85.5
Melt Plant Solid Yield (%)	96.0	96.0	95.7
Oxide Burned (Weight out Tons)	3	4	25
Poison Canned (Number Pieces)	0	0	4450
Chemical 68-56 Canned (Number Pieces)	0	0	0
Chemical 10-66 Canned (Number Pieces)	0	0	1449
"J" Slugs Canned (Number Pieces)	3091	2863	5954
"N" Slugs Canned (Number Pieces)	4336	1409	5745
Special Request (Man Hours)	1410	1001	5457
305 Routine Tests (Man Hours)	128	139	570
305 Special Tests (Man Hours)	1635	1063	3827
Average Steam Generated (M lbs/hr)	24.7	29.4	
Maximum Steam Generated (M lbs/hr)	41.0	41.0	
Total Steam Generated (M lbs.)	17,900	22,000	
Coal Consumed (Tons)	1158	1471	
Sanitary Water from 3000 Area (Million gals.)	40.2	41.4	
Total Water Average Rate (gpm)	930	927	
Chlorine Residual (ppm)	.39	.40	

2. Activities

The material machined consisted of 26% Hanford cast billets and the balance of virgin material. It is expected that all of the available rods on hand including 29 tons of rods for the exponential test will be machined during the month of May.

The net production of acceptable slugs was 159 tons of which 92% were 8-inch. An increase of about 7% in the combined canning yields is attributed to a significant reduction in the number of non-seat rejects for both four and eight-inch slugs.

The melt plant operated on a one-shift basis and the yields continued at a high level.

During the past month the Process Control Unit has been reinspecting production material to determine the accuracy of classification by

[redacted]

2. Activities (Continued)

operations personnel. Both good and reject material has been re-inspected to determine the correctness of classification. The results of this study indicate the inspection of process material is being done with little or no mis-classification of material. Reinspection will be continued in the future as a means of controlling quality.

Recent studies on canning bath composition have indicated that variations in performance may exist between AlSi from different vendors or between lots of AlSi from the same vendor. In correlating these differences with canning yields, some peculiar canning behavior has been noted. About 2400 pounds of AlSi with a record for low non-seating has been set aside as control material. This metal will be used for tests during periods of extended rates of high non-seating in order to evaluate the AlSi in use.

3. Special Operations

Receipts of insufficient quantities of lithium alloy target slugs to meet production requirements necessitated the salvaging and recanning of P-10 alloy manufactured at Hanford. Current reject material in addition to the salvaged P-10-A Hanford material is being shipped to the Savannah River plant for recasting and extrusion.

There were 4336 acceptable target slugs canned with canning yield, including recovered pieces, of 78%. Poor weld closures are still the primary cause of rejection although some improvement was shown in the welding operation. There were 3091 acceptable enriched slugs canned with an overall canning yield of 85%. The decreased yield for this material resulted from more stringent inspection procedures. The enriched slugs as well as the target slugs have been radiographed to insure good weld closure.

4. Schedule Variance

Canning production exceeded forecast by 2% as a result of improved eight-inch canning yields. Billet production exceeded the forecast by 3% and machining production exceeded forecast by 14%.

B. Equipment Experience

1. Operating Continuity

A minimum of production time was lost as a result of mechanical failures to canning equipment. Standardization of furnace types and associated equipment has reduced lost time for change-overs to a minimum.

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1. Operating Continuity (Continued)

Air switches for the canning jack were mounted in a central location to facilitate maintenance and prevent damage to the switches from metal spills. A third spare switch was mounted in the panel and connected so that it could be used to take over the operation of the jacks in a matter of minutes.

2. Inspections, Maintenance and Replacement

A new Ajax induction furnace was installed and several tests have been run as a canning furnace to check the temperature gradients and controls. Preliminary results indicate that this will be an improved canning furnace and will permit a very accurate temperature control of the bath.

C. Improvement Experience

1. Production Tests

PT-313-105-10M - "Fabrication and Irradiation of Triple Dip Slugs Canned in AlSi Bath with Impurity Levels Above Normal" (HW-26860). In this test the tin content of the canning bath was allowed to build up to 2% before bailing. Approximately 3900 slugs were canned with a yield of about 74%. Frost test rejects were the largest reject category. Approximately 3000 slugs are in storage awaiting shipment to the 100 Areas.

PT-313-105-15M - "Fabrication and Irradiation of 4-Inch Triple Dip Sleeveless Canned Slugs" (HW-26797). About 1900 slugs were produced on this test with a yield of 18%. This low yield was due primarily to a high percentage of non-seats which were out of specification 50 or 60 mils. Due to operational problems it was not possible to check for non-seats during the canning process. As a result no corrective measures were taken. It is believed this difficulty can be overcome in the future.

PT-313-105-17M - "Irradiation of 63S Aluminum Jacketed Slugs" (HW-27205). The triple dip fabrication of 63S jacketed slugs was completed during the month. Approximately 3200 slugs were canned with a yield of about 67%. The lead dip portion of the test has not been started. Additional difficulty was experienced in obtaining smooth welds on these slugs. This condition was alleviated to some extent by running the lathes faster to produce a smoother finish on the cap.

PT-313-105-18M - "Irradiation of Ultrasonic Tested Salt Bath Heat Treated Alpha Rolled Uranium Slugs" (HW-26759). This material is in storage ready for shipping to the 100 Areas.

PT-313-105-19M - "Irradiation of Triple Dip Canned Uranium Slugs from Rods Rolled at Fernald" (HW-26851). Canning on this test continued at about the same rate as last month's production.

C. Improvement Experience (Continued)

2. Process Tests and Revisions

It is estimated that the use of agitators on the AlSi dip furnaces will save $26,000 per year by reducing the amount of tin carryover to the canning pots.

Installation of the power house stack sluices for removing fly ash was completed. Initial tests have indicated an operating cost for this system of approximately $160 a year as compared with $2000 per year for the old method of trucking the ashes out. The cost of installing the equipment was $1436.

A program to equip all autoclaves with aluminum tube slug spacers which increases the capacity by 71% has been completed. The capital savings realized from the increased capacity is estimated to be $46,000.

3. Inventions and Discoveries

Personnel in the Metal Preparation Section engaged in work which could 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.

D. Events Influencing Costs

1. Labor Variance

Nothing significant.

2. Material Variance

The unit cost for process materials decreased slightly as a result of improvement in the combined canning yield in April. In addition, the cost of materials in March was abnormally high because of the direct purchase of metal stamps and containers in quantities which represented several months supply.

3. Other

Other costs increased slightly because of a 10.5% decrease in production.

E. Plant Development and Expansion

1. Project Status

Project CG-481 - "Equipment for 8-Inch Slug Manufacture". The unloading equipment installed in one metal shipping van was tested during the month. Minor modifications were necessary for acceptable operation. At month end equipment was being installed in the second van and will be completed in May.

E. Plant Development and Expansion

1. Project Status (Continued)

Project CA-514 - "Expansion of 300 Area Production Facilities". Through Work Authority CA-514 (3) dated March 31, 1953, and Project Authorization No. 372 dated April 14, 1953, the total funds authorized to the General Electric Company were increased from $200,000 to $600,000. This increase is being allowed for the procurement of engineered materials, critical equipment and preliminary construction on the expansion of the 313 Building. The A.E.C. has retained funds for detail design of 313 Building expansion and the construction of the new Operations Change House on which they carry management responsibility.

Work is being continued by the contractor on detailed design of the 313 Building expansion. The first phase which covered the foundation plans, building shell and utilities was completed and specifications issued.

The contract for construction of the new Operations Change House was awarded to L. A. Hopkins on April 6. The contractor started work on shop drawings April 20, and began moving materials on site for construction on April 27.

IR-135 - "Low Frequency Induction Furnace". The low frequency induction furnace was installed and subjected to preliminary tests. It appears that the furnace temperature will hold within the range of 1° C. during the actual canning. Completion notice will be issued as soon as operating tests can be completed.

2. Plant Engineering

Results of tests to date indicate no basic changes are required in the design of the new bronze agitator. Proper lubrication of the clutch and retracting assembly that is exposed to heat and fumes of the bath had not been thoroughly established. The replacement of the heavy duty air cylinders now being used should facilitate the vertical movement of the baskets.

Preliminary work on the design of a de-burring and stamping unit for canned slugs is in progress.

The fabrication of a prototype semi-automatic capping unit was completed except for the actuated air switch. It is anticipated that this unit will be ready for test early in May.

Fabrication has been started on the mechanized quenching unit. This unit has been designed to assure uniform quenching of canned slugs and to hold caps in intimate contact with slugs until bonding medium has frozen.

F. Significant Reports

1. Routine

HW-27601	Monthly Report, Process Sub-Section Metal Preparation Section, March, 1953	E. W. O'Rorke	4-2-53

[redacted]

F. Significant Reports (Continued)

2. Non-Routine

HW-27793	Suspected Discrepancy of SF Material in the Machining Inspection Balance Area.	F. E. Jochen	4-20-53
HW-27209	Report on Process Experience Gained by Operation of an Alpha Lead Dip Canning Process on a Production Test Basis	C. H. Pitt	2-24-53
HW-27650	Trip Report, March 23-29, 1953. Discussions of Uranium Slug Manufacturing Problems with National Lead Company of Ohio at FMPC, Fernald, Ohio.	S. M. Gill	4-7-53
HW-27655	Trip Report, March 2-6, 1953. Observation and Liaison Target Slug Fabrication at the Savannah River Plant, Augusta, Georgia.	H. G. Henry	4-1-53
HW-27691	Report of Trip to Seattle Welding Clinic	R. C. Aungst	4-10-53
HW-27709	Interim Report on P-10 Production, April 10, 1953.	H. G. Henry	4-10-53
HW-27730	Results of Sample Exchange Program	E. W. O'Rorke	4-15-53.
HW-27738	Results of Sample Exchange Program	E. W. O'Rorke	4-16-53
HW-27844	PT-MMP-313-2, Boss Depth as Index for Facing Operation	T. G. Lambert	4-27-53
HW-27479	Economic Study, Dry Canning of Process Material	R. D. Gilbert	3-23-53
HW-27542	Manufacturing Section, 300 Area Process Data, Project CA-514, 313 Building	A. D. Holben J. W. Nageley	3-30-53

III. PERSONNEL

A. Organization

No change.

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B. Force Summary

	Start of Month	End of Month	Net Change
Section General	4	4	0
Operations	213	213	- 1
Power and Maintenance	245	248	3
Process	25	29	4
Plant Engineering	19	19	0
Radiation Monitoring	3	3	0
Section Total	509	515	6

C. Safety Experience

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

The slug recovery operation was interrupted for 2 1/2 shifts by a fire which started while repairmen were pouring hot asphalt on a concrete floor in the acid and caustic pumping pit. No personnel were injured, however, damage to the equipment was estimated to be $4500. The details of the investigation are covered in Near-Serious Incident Report No. 53-10.

D. Radiation Experience

No exposures in excess of 300 mrep per week were reported during the month.

E. Personnel Activities

1. Visits and Visitors

S. M. Gill visited National Lead Company of Ohio at Fernald, Ohio to discuss uranium slug manufacturing problems.

W. W. Windsheimer attended a conference of the Society for the Advancement of Management in New York City, April 16-17, 1953.

Thomas C. Allen of National Lead Company of Ohio visited Hanford on April 8-9 to discuss chip recovery process and inspection equipment.

M. S. Bloomsburg, E. E. Hayes and J. E. Ross of E. I. duPont de Nemours & Co. were at Hanford April 19 through 23 discussing fuel and target slug fabrication problems.

E. C. Laing of duPont-Savannah River plant spent April 27 through May 1 in the 300 Area observing canning methods.

E. Personnel Activities (Continued)

2. Training

The series of training meetings was continued during April. S. M. Gill of the Process Sub-Section spoke on "Report Writing".

Information meetings for all employees were held during the month. A total of six meetings were held with average attendance of approximately 90 people per meeting. Favorable comments have been received concerning such meetings.

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Richland, Washington
May 11, 1953

MANUFACTURING DEPARTMENT
REACTOR SECTION
APRIL, 1953

I. RESPONSIBILITY

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

II. ACHIEVEMENT

A. Operating Experience

The total reactor input production during April was 105.9 percent of forecast and 5.2 percent lower than in March. This decrease resulted principally from the shorter month, a lower time operated efficiency, and diverting a portion of DR Reactor production to the P-10 program. Reactor output production was 100.1 percent of forecast. Increases in established maximum operating levels during April were 100 MW at C Reactor and 5 MW at DR Reactor. These maximum levels included 9 MW of "C" metal burnout at C Reactor and 52 MW of "J" slug burnout at DR Reactor.

The DR Reactor Ball 3X outage, begun on March 1, was concluded on April 7. On April 5, a similar outage was begun at H Reactor. At month end, installation of the Ball 3X facilities and other project work was progressing normally and operation was expected to be resumed about May 10.

There was one regular slug failure during April - (four-inch slug) and three "C" metal slug failures. Outage time charged to removal of the regular slug was 26.6 hours. The three "C" metal slugs were removed during scheduled outages and, therefore, were charged with no outage time. No process tubes failed during the month.

A. Operating Experience (Continued)

Upon the recommendation of the Engineering Department, the addition of sodium dichromate to process water was resumed as standard water treatment for all reactors pending the results of current slug and tube corrosion studies. (Sodium dichromate addition had been discontinued during the spring of 1952 based on previous studies.) Production tests placed in effect during November and December, 1952, had since authorized dichromate for C. D and DR Reactors so that, in effect, dichromate treatment begun during April, 1953, affected only B, F and H Reactors.

1. Statistics

	B	C	D	DR	F	H	Total or Average
Reactor Time Operated Efficiency (%)	78.8	88.2	92.7	77.2	91.1	15.5	73.9
Reactor Outage Time (Hrs.)							
Plutonium Production	138.3	68.7	49.0	163.9	60.6	608.3*	1088.8
Special Irradiation and Production Tests	14.0	16.2	3.5	-	3.5	-	37.2
Total	152.3	84.9	52.5	163.9	64.1	608.3*	1126.0
Reactor Unscheduled Outage Time (Hrs.)	114.6	28.7	1.4	0.6	38.3	0.3	183.9
Metal Discharged (Tons)	38.38	55.21	22.07	19.32	20.28	18.46	173.72
Water Quality (ppm Iron)							
Raw Water - Average	0.12	0.12	0.17	0.18	0.09	0.17	-
Raw Water - Maximum	0.20	0.19	0.25	0.31	0.15	0.33	-
Process Water - Average	0.016	0.006	0.005	0.006	0.007	0.019	-
Process Water - Maximum	0.023	0.018	0.012	0.012	0.014	0.023	-
Water Pumped (MM gals.)							
Bldg. 190 to Reactor	1379	2837	1828	1534	1612	392	9582
Bldg. 182 to 200 Areas	-		320		27	-	347
Bldg. 181	4875		4413		1912	544	11744
Steam Generated (MM lbs.)	133		210		123	30	496
Coal Consumed (Tons)	8467		13806		7711	2000	31984

*608.0 hours were for Ball 3X outage.

2. Activities

The DR Reactor resumed operation on April 7 concluding the outage, begun on March 1, for installation of the Ball 3X system. A summary of major work completed during this outage was given in this report for the month of March.

The scheduled outage of H Reactor for installation of the Ball 3X System was begun on April 5. At month end, the installation was approximately 75 percent complete. As at DR Reactor, minor construction forces performed this project work on a two-shift, six-day week basis since the

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2. Activities (Continued)

Building 107-H retention basin repair project (CG-506) determined the length of the outage. Other major reactor facility work being performed during this outage includes replacement of all rear face thermocouples and associated wiring (CG-482), repair and alteration of the near downcomer (CG-483), re-orificing of the reactor in connection with Process Test MR-105-12 (see Improvement Experience) and installation of a new thimble for "A" horizontal rod.

Preventive maintenance work performed in the H Water Plant during the above outage includes inspection, cleaning and minor repairs to water storage reservoirs, basins, tanks and associated equipment at Buildings 182-H and 183-H. Approximately 3500 cubic yards of silt was removed from the Building 182-H reservoir.

Non-routine project and maintenance work continued to be higher than normal during April. Overtime worked by Reactor Section personnel was slightly lower than during March. Minor construction forces performed work on the Ball 3X installations, the Building 107-DR and H retention basins, and the DR and H Reactor downcomers, while Reactor Section forces performed the remaining Ball 3X outage work outlined above.

The irradiation of P-10 material at DR Reactor was started during the month with a total of 249 tubes being charged with "J-2" slugs (enriched uranium-aluminum alloy) and "N" slugs (P-10 target slugs) during the Ball 3X outage. Current plans are to irradiate 1076 tubes of this material in four approximately equal groups. An estimated 8.5 percent of the DR Reactor power level was devoted to this program.

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

	Tubes Charged	Tubes Discharged	Casks Shipped
Chemical 10-66	3	0	0
Chemical 72-60	0	0	0
Production Tests	16	25	8
Total	19	25	8

B. Equipment Experience

During April, 15 reactor scrams occurred, attributable as follows: Nine to panellit gauge trips, two to failure of Ball 3X hopper door solenoids, three to failure of instrument power supply and one to plugging of process tube cone screens. Total ensuing outage time was 94.8 hours.

Failure of the solenoid coils on the Ball 3X hopper door electrical circuits became severe during the month and required 129.7 hours outage time for cor-

[redacted]

B. Equipment Experience (Continued)

rective action. Two of the numerous failures caused balls to drop into single VSR channels - 1 at F and 1 at B. As a temporary measure to correct this difficulty, resistors were installed in the solenoid circuits at B, D and F Reactors to reduce the nominal coil voltage from 125 to 85 volts. A similar modification will be made at DR Reactor during the next outage. Means of permanently correcting this difficulty are being studied.

Approximately 17 hours after a startup of B Reactor, investigation of excessive gas loss led to the discovery that VSR No. 35 had parted, apparently during the startup, with the lower 28 feet remaining in the reactor. An outage of 58.2 hours was required to remove and replace the broken rod. The radioactivity of the rod decayed rapidly in the 42 hours following shutdown so that working conditions during removal were not unusually severe from the radiation standpoint.

An inspection was made of various steel tanks and pipes in the 100-H Water Plant to determine corrosion damage. Since painted surfaces are withstanding corrosion appreciably better than unpainted surfaces, it appears that consideration should be given more general use of paint for corrosion protection in the interest of reducing screen plugging difficulties.

C. Improvement Experience

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

PT-105-313-12M (Exposure and Behavior of Unbonded C Slugs)
One tube of "C" metal, discharged from C Reactor at 15 percent concentration for inspection, was found to contain a ruptured piece. Effluent water samples had previously given minor indications of this failure.

PT-105-513-E (100 Areas Process Water Quality Evaluation Tests)
Water treatment in conformance with this test continued throughout April. Several cases occurred in which process tube film growth was checked by increasing alum or silica feed rates. A similar degree of film control with ferric sulphate was not obtainable.

PT-105-529-A (Ink Facility)
Use of this facility at DR Reactor for 72 hours following a startup prevented an outage for discharging temporary poison.

PT-105-531-A (Enrichment of H Pile)
Two ruptured "C" metal slugs were discharged from tube 0565-H during the month. The total number of tubes charged with "C" metal remains at 48.

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C. Improvement Experience (Continued)

PT-105-533-A (Local Controlled Increase in C Pile Tube Powers)
Following several flattening adjustments and increasing the bumper zone to 180 tubes, maximum tube powers have reached the desired level of 16-2/3 percent above the normal tube limit. The established maximum level of C Reactor was increased 100 MW during the month and is attributable to the above.

PT-105-534-A (D Pile Operation with Maximum Panellit Monitor Protection)
No reactor panellit scrams occurred in connection with this test during April. A similar test, sponsored by the Reactor Section under Process Test MR-105-12, will be started at H Reactor following the Ball 3X outage during which necessary orifice and panellit changes will have been made.

PT-MR-105-8 (Discharge of Ruptured Slugs Within Allowable Scram Recovery Time)
Demonstration of equipment for this test continued during the month. Plans are being made for actual reactor test of the method at F Reactor.

A new Reactor Section manual, "Process Standards - Reactor Cooling Water", HW-27155, was approved and issued during the month. Two Reactor Operating Standards were issued; one specifies new delta T limits for C Reactor while purging during operation, the other permits addition of helium to C and DR Reactor atmospheres.

A method of replacing plugged orifice screens during available scram recovery time was successfully used at D Reactor. The method involves use of an auxiliary water supply for the tube while the pigtail is removed.

There were no reports of inventions or discoveries filed by Reactor Section personnel during the month. The following invention, was inadvertently omitted from the March issue of this report.

Inventor	Invention
T. H. Quinn	Compound-Action Gain Control. (This is a special circuit arrangement for use in direct coupled amplifiers.)

D. Events Influencing Costs

Coal costs are expected to be approximately $25,000 lower for April primarily due to warmer weather.

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D. Events Influencing Costs (Continued)

An increase of 35 percent in water treatment chemical costs is expected to result from charges for sodium dichromate addition.

Auxiliary nozzle valves were installed on the remaining Building 190-F process water pump turbines during April. This completes this program designed to permit more efficient operation of these turbines in the five applicable Water Plants and now allows full realization of the $78,000 estimated total annual savings.

The "Statement of Manufacturing Costs" for the Reactor Section and Reactor Sub-Sections was revised during the month to present this information in a more usable form. The budgeted and the previous month's costs were added for ready reference.

The Reactor Section irradiation unit cost for April is expected to be approximately five percent higher than in March.

E. Plant Development and Expansion

1. Project Status

The most significant Reactor Section project activity is reported below. Further details concerning projects may be found in the report, "Status of Reactor Section Projects, Informal Requests and Budget Items", dated April 21, 1953, F. A. R. Stainken to E. P. Lee.

CA-431 (100-C Plant)
No construction work was performed on this project during April.

CG-438 (Ball 3X Facilities for B, D, DR, F and H Piles)
This installation was completed at DR Reactor during the month and at month end was nearing completion at H Reactor. Further details are contained above under "Operating Experience".

CA-512 (100-K Facilities)
Reactor design is approximately 80 percent complete. Water Plant design is 62 percent complete, a reduction from the previous month's report caused by addition of several items to the project scope. Overall project construction is approximately 10 percent complete. A strike, called by office workers on April 15 stopped the work of all Kaiser construction forces until April 20.

2. Plant Engineering

A number of engineering and development studies were active in the Reactor Section during April. The studies are, in general, aimedat decreased costs

2. Plant Engineering (Continued)

and/or increased production. Details are given in documents HW-27925 and HW-27942. Several items of interest are reported below.

Work on the evaluation of boiler performance in the 100 Areas consisted of follow-up checks of meter calibration and collecting data on coal consumption. Standards for coal utilization are under preparation.

In anticipation of higher power levels under PT-105-534-A, an investigation is being made of the expected reactivity transients, minimum recovery times, and overall effects of helium.

Feasibility studies for increasing the capacity of the Building 190 electric driven pumps were in progress during the month. Several pump trip-out tests were made in studying pressure decay characteristics following electric pump failure. These studies were aimed at more economical operation of these pumps through transferring some of the normal pumping load from the steam-driven to the electric-driven pumps.

F. Significant Reports

1. Routine

April monthly reports of Reactor Section Sub-Sections will be found in the following documents: Operations - HW-27952, Process - HW-27942, Plant Engineering - HW-27925, Radiation Monitoring (Technical Report) - HW-27962. The monthly reports of the Power and Maintenance Sub-Sections are Restricted documents.

Other major routine reports were:

"Slug Jacket Failures During April", HW-27857.
"Production Summary - April", HW-27911.
"Reactor Process Committee Meeting, April 29, 1953", HW-27905.
"Reactor Section, Process and Cost Improvement Report, January to March, 1953", E. P. Lee to C. N. Gross, April 8, 1953.
"Status Report of Projects CA-431 and CA-512", HW-27888.

2. Non-Routine

"Reactor Section Process Standards - Reactor Cooling Water", HW-27155.
"Recommendations on Ball 3X Solenoid Failures", W. J. Ferguson to E. J. O'Black, April 14, 1953.
"R-10 Program Cost Accounting", G. T. VanDeCarr, J. H. Warren, F. A. R. Stainken to File, April 10, 1953.
"Process Test MR-105-11, Allowable Working Pressure Panellit Pressure Gauges", HW-27653.

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2. Non-Routine (Continued)

"Process Test MR-105-12, Operation of H Reactor with Maximum Protection from Panellit System", HW-27816.
"Unit Motion Report Biological Shield Displacement", HW-27458.
"Process Water Chlorine Addition - Alum Areas", HW-27745.
"Cleaning of Unirradiated Regular Metal", HW-27783.
"Application of Crash Discharge Following a Grand Coulee Disaster", F. A. R. Stainken to H. A. Carlberg, April 17, 1953.

III. PERSONNEL

A. Organization

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

Twenty-one Radiation Monitoring Sub-Section employees worked a six-day week schedule for three weeks during the month in connection with the Ball 3X outages.

B. Force Summary

	Beginning of Month	End of Month	Net Change
Section General	3	3	0
Operations	267	266	- 1
Maintenance	444	444	0
Plant Engineering	25	26	1
Power	413	411	- 2
Process	38	38	0
Radiation Monitoring	60	61	1
Section Total	1250	1249	- 1

Changes during April consisted of 5 terminations, 3 new hires, 2 de-activations, 5 transfers out and 8 transfers into the Section.

C. Safety Experience

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

The Reactor Section Supervisor Safety Training Program was continued; three meetings were attended by a total of 45 exempt employees.

An industrial movie entitled, "How to Avoid Muscle Strains", was shown to three groups of Maintenance Sub-Section employees.

D. Radiation Experience

There were no Class II Radiation Incidents during April. Three Class I Radiation Incidents occurred. Number 60 involved uncontrolled radiation exposure to two Operations employees while handling contaminated equipment at H Reactor. Number 61, B Reactor, and 63, D Reactor, involved personnel inside the discharge area while material was being discharged. Investigations of these incidents may be found in documents HW-27750, HW-27861 and HW-27858, respectively.

The 24 hour dose limit of 360 mrep for reactor effluent water discharged to the Columbia River was exceeded at C and DR Reactors during the month. The maximum 24 hour dose was 516 mrep. Since this high activity was found to be due to short half-life Mn ^{56} which does not increase biological hazard, the condition has been tolerated with the concurrence of the Radiological Sciences Department.

E. Personnel Activities

At month end, 22 employees are receiving on-the-job training for engineering or supervisory assignments in the Section; 16 of these are on assignment under the Rotational Training Program.

Employee communication continued to receive major emphasis during April. E. P. Lee conducted four general information meetings for Reactor Section exempt employees in which salary plans, union relations, General Electric organizational aims and Reactor Sub-Section functions were the major topics.

H. A. Kramer attended the Western Snow Conference at Boise, Idaho, April 20-22, where he presented a paper on "Snow Forecasting for Industrial Application".

W. R. Conley, H. G. Harder and C. E. Harkins, attended the 26th Annual Conference of the American Water Works Association at Portland, April 16-18.

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Richland, Washington
May 12, 1953

MANUFACTURING DEPARTMENT
SEPARATIONS SECTION
APRIL, 1953

I. RESPONSIBILITY

In connection with the P-10 program, the Separations Section assumed the responsibility for the rehabilitation and reactivation of the Extraction facilities located in the 108-B Building.

II. ACHIEVEMENT

A. Operating Experience

1. Statistics

a. Bismuth Phosphate and Isolation Operations

	April		March	
	Normal	Acid Wash	Normal	Acid Wash
Charges started in Canyon Bldgs.	13	-	42	1
Charges completed in Conc. Bldgs.	15	-	47	1
Special charges - Conc. Bldgs.	38		25	
Charges completed - Isolation Bldg.	195	0	223	-
Average Waste Losses, %	1.7		2.1	
Special charges - Isolation Bldg.	66		43	
Material balance, %	107.8		99.7	
Yield through Process, %	106.1		97.6	
Average cooling time (days)	56		84	
Minimum cooling time (days)	46		64	

[redacted]

b. Redox Operations

	April	March
Equivalent charges started	189.8 Record	176.9
Charges completed	185.7 Record	177.3
Tons Uranium delivered to storage	132.1 Record	126.9
Average Production Rate per operating day, Tons	5.0	4.81
Average Daily Operating Rate for the month, Tons	4.4	4.10
Average yield, %		
Uranium	98.1	99.2
Plutonium	97.8	97.2
Total Waste Loss, %		
Uranium	.78	1.21
Plutonium	1.62	2.05
Average cooling time, days	83	91
Minimum cooling time, days	75	83
Percent down time	12	15

c. 234-5 Operations

	April	March
Batches completed through Task II	421	424
Runs completed through Task III	185	200
Reduction yield, RM	96.6	95.9
Waste Disposal, units	2.89	2.09

d. UO_3 Operations

	April	March	To Date
Uranium drumed, Tons	332 Record	281	1992
Uranium shipped, tons	318	287	1958
Average cooling time, days (Redox)	94	103	
Minimum cooling time, days (Redox)	87	94	
Waste loss, %	1.07	.87	

e. TBP Operations

	April	March	To Date
Tons received from Metal Removal	218	182	959
Tons shipped to UO_3 Plant	195 Record	165	897
Average Production Rate per operating day, Tons	7.10	6.78	
Average Daily Operating Rate for the month, Tons	6.49	5.33	

[redacted]

e. TBP Operations (Continued)

	April	March
Average Yield, %	94.43	91.95
Total Waste Loss, %	2.94	3.39
Ratio Waste Volume returned to Volume removed	1.0	1.29
Percent Down Time	8.6	21.4

f. Power

	200 East	200 West
Raw water pumped, gpm	1 148	6 392
Filtered water pumped, gpm	349	933
Steam generated, lbs/hr	38 118	178 033
Maximum steam generated, lbs/hr	52 000	238 000
Total steam generated, M lbs.	27 445	128 184
Coal consumed, tons (est.)	1 646	9 430

g. Waste Storage

	Equivalent Tons U
Metal Waste reserve storage capacity - T Plant	43
1st Cycle reserve storage capacity - T Plant	356
Metal Waste reserve storage capacity - B Plant	339
1st Cycle reserve storage capacity - B Plant	0*
Redox Waste reserve storage capacity	915

*Reassigned

2. Activities

a. Redox Processing

The Redox Plant operated at an average rate slightly in excess of 5 tons per day losing an equivalent of four days to flushing columns and reworking some batches of insufficiently decontaminated uranium. Eight product batches were routed through the T Concentration building for additional decontamination.

b. TBP Processing

"A" line (30% by Volume TBP Extractant) operated at rates varying from 3 to 5 tons per day, depending upon availability of feed. Decontamination was not as satisfactory as in March due to carry-through of Yttrium^{90}. Down time on "A" line was equivalent to 3 days.

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b. TBP Processing (Continued)

"B" line (12.5% by Volume TBP Extractant) operated at rates varying from 3 to 5.5 tons per day during the period. "B" line performance was better than "A" line but also had trouble with Yttrium. Down time for the "B" line was equivalent to 2 days.

c. UO_3 Processing

Severe caking was encountered in the calcination furnaces for a few days during the month. This difficulty was eliminated by removing the uranium which caused the trouble to the X-2 tank, processing only fresh material for a few days, and finally blending small quantities of the uranium stored in the X-2 tank into current production. The exact cause of the difficulty is not known; however, samples indicated a higher than normal iron content, 1000 ppm, in the feed tank, X-19.

The iron could have been introduced into the process stream while the 60% UNH concentrators were shut down for a brief period about the middle of the month or when the 100% UNH concentrator was cleaned with steam about the same time.

About 6,000 gallons of 60% UNH containing 14.40 tons of uranium which was collected in the X-2 tank early in February was discharged into the 111-BY underground storage tank in the 200-East area, to be stored for future recovery. Severe foaming made it impossible to process this uranium through the calcination furnaces.

d. Waste Metal Removal

Sluicing activities progressed with good results in all tank farms during the month. Production activities were changed from 104-U to 101-U on 4-11-53 for final cleanout of the first cascade in U farm. Results were very good until the latter part of the month when the tank was essentially empty. All sluicing in the 101-U tank was done using water as a sluicing medium. The supernate temporarily being stored in 115-TX was returned to 241-U without incident.

Sluicing was interrupted at 241-CR on 4-17-53 when failure of the sluice pump (Johnston) occurred due to shaft bearing failure. Production from this area was supplemented by blending supernate from 106-C until the sluice pump was replaced on 4-27-53. Water sluicing continues to give good results in 101-C; however, calculation predicts this tank to be essentially empty at this time. Sluicing continues at 101-B at a good rate. Supernate is being used as a sluice medium at this location. Failure of a sluice pump (Johnston) and continued switch gear trouble have contributed to lost production time at the 241-BXR installation.

e. 234-5 Processing

The April commitment of final shapes was produced and delivered to the AEC. No processing was done on the RG line during the month, and all equipment, with the exception of the coating units, was in standby condition.

3. Special Operation

a. Waste Evaporation

Operating data for the 242-B and 242-T waste evaporators since the start of first cycle waste re-evaporation is as follows:

Evaporator	Gallons Feed	Gallons Sludge	Gallons Condensate	Space Made* Available
242-T	1,225,825	921,950	412,280	24.8%
242-B	660,688	481,938	258,774	27.1%

*By measurement in waste tanks

A decision reached with Radiological Sciences during the month will allow the cribbing of first cycle supernate from the Bismuth Phosphate wastes. Therefore, when the job of re-evaporation of the supernate existing with the waste initially evaporated is completed, the 242-B and 242-T Waste Evaporator will be available for further evaporation of TBP wastes if such proves to be feasible.

b. B Plant Stand-by

All process equipment in B Canyon Building was wetted with water flushes each week.

Peroxide-caustic and weak nitric overflow flushes were processed through the Concentration Building and accomplished a combined product pick-up of 40.08% of a standard run. These solutions were added to the T process as recycle material.

The canyon deck and walls of sections 15 through 20 have been cleaned thoroughly and the sections 18, 19 and 20 cells and pipe trench opened, flushed, and steam cleaned. This method of cleaning the cells was adequate for removing the accumulation of rust and dirt, but radiation levels up to 330 mrep/hr at the open cells are still encountered.

c. Use of Water for Sludge Removal

Operations in 241-UR and 241-CR by use of water as a sluice medium has proven to be a very effective method of removing the hard uranyl carbonate compounds from the waste tanks. Operation at UR and CR

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c. Use of Water for Sludge Removal (Continued)

were conducted exclusively by this method during April and removal rates were good. It is anticipated that water sluicing at 101-B will be instigated when removal rates with supernate indicate a slow down.

d. Manganese Impurity in 234-5 Product

Material with a high level of manganese entered the 234-5 Building product stream and was detected through the routine analysis of MC casting samples. The suspected source of manganese is thought to be the PR cans used to transport the product solution from Redox. The cans are used for handling recycle and it is suspected that solids were left in the cans. Machining recycle from this material at month end is being carefully blended back into the Task III reduction operation and although still greater than normal in some instances, the manganese content of the final product has dropped to a tolerable level.

e. Recycle Handling in Concentration Building

The spare B-6 tank in the lanthanum fluoride product section of the 224-T Concentration Building was put into active service as an auxiliary recycle storage tank this month. In conjunction with the original E-4 recycle tank the additional storage space has provided greater flexibility and more even work load distribution in the handling of recycle material.

f. Low MWD Slugs

Processing of a substantial amount of low concentration material from C Pile (approximately 300 MWD/Ton) was started in T Plant during the month.

g. Skull Recovery - 234-5

The equivalent of 27 bottles of product from skulls and 11.5 bottles from returned laboratory metal samples was recovered during April. 37.8 bottles of material were transferred to the Concentration and Isolation Buildings for reprocessing.

h. Laboratory Equipment Development and Improvement

The installation of the equipment required for the determination of the reactivity of UO_3 powder was completed and tested.

4. Schedule Variance

The Redox record plutonium production was 105% of the amount forecasted in the April Annual Forecast. T Plant produced 108% of the forecast. The combined production was 105% of the April Annual Forecast.

4. Schedule Variance (Continued)

The TBP record production for April was 108% of the forecast. In addition, fourteen tons produced were returned to metal waste storage for future recovery due to high impurities which seriously affected the operation of the UO_3 Plant.

The UO_3 record production was 119% of the forecast.

The 234-5 operation produced its commitment for assemblies.

B. Equipment Experience

1. Operating Continuity

The failure of the condenser vent blower at the TBP Plant caused a loss of a day's operating time.

A total of 36 hours lost time was logged at 241-UR during the month. The major contributing causes of this lost time was the switching of operations from 104-U to 101-U. 252 hours were lost at 241-CR due to failure of the Johnston sluice pump. A total of 110 hours was lost at 241-BXR during the month due to electrical difficulties experienced with the 101-B Nagle pump, failure of the Johnston sluice pump, and malfunctioning of electrical switchgear.

2. Inspection, Maintenance and Replacements

a. Nagle Pumps

There were no Nagle pump failures during April. One electrical outage occurred due to water getting into the electrical connector in the pump pit. Four new Nagle pumps are on hand with two more in Spokane awaiting motors. Three pumps were repaired in the B Canyon repair shops during the month.

b. 291-T Fan Motor

It was necessary to replace the bearings of the #2 fan in 291-T when they became worn and excessively noisy. During the approximately 24 hours that the #2 fan was inoperative, the ventilation of the T Plant process areas was maintained at about one half of the normal pressure differential with the #1 fan and the steam engine. The change and subsequent run-in were accomplished without incident.

c. 224-T Elevator

The 224-T elevator was inoperative for six days in order to replace the cables which had become worn beyond the safe limit.

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d. Johnston Deep Well Pumps

Four 600 gpm low head deep well pumps were received and two were installed during the month. These pumps will be used in supernate service to replace Nagles. The two units installed, 109-U and 102-B, are operating satisfactorily.

e. Condenser Vent Blower - TBP

Shorting out of one phase of the condenser vent blower motor resulted in approximately 24 hours lost time on each line while the unit was being replaced. Simple motor replacement was impossible as the motor and blower share a common shaft. The entire unit was replaced with the operating spare. Repair of the failed unit is scheduled shortly.

f. Fume Vent Header Improvement - UO_3

The program for improving the performance of the fume vent header is essentially complete at month end. All furnaces have been equipped with an internal baffle, an external baffle chamber and a removable scoop in the fume line except one which remains to be outfitted. Marked improvement has been noted and it is expected that this equipment will be highly successful.

g. Silver Reactors- Redox Dissolver Off-gas

Both the A-3 and B-3 Silver Reactors were regenerated successfully. Each had failed after approximately four months of service. The effectiveness of B-3 decreased gradually over a two week period, discharging from one to seven curies I^{131} per day to the atmosphere. Decline of A-3 was more acute.

h. Vertical Pumps - TBP Canyon

In the TBP Canyon building six Johnston type vertical pumps failed during the month. Failures, in the main, were bearings and seals, which in some instances resulted in shaft damage.

A summary of the canyon pump failures is as follows:

1) The graphitar bearings and seals of pump 7-2 failed and the shaft was sprung.

2) The bearings of pump 8-2 failed.

3) The graphitar bearings and seals of pumps 8-6 and 8-7 failed. The 8-7 pump had combination of graphitar and boron carbide bearings, the latter of which were replaced with graphitar. Boron carbide bearings seem to chip and crack due to foreign materials entering the bearings.

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h. Vertical Pumps - TBP Canyon (Continued)

4) In pumps 9-6 and 10-6, bearings and seals failed. These pumps also have both graphitar and boron carbide bearings and seals. Due to unavailability of boron carbide, these pumps were also repaired with graphitar throughout. A study of the bearing problem is underway at the present time.

i. Optical System - Redox Crane

The left-hand optical system on the Redox canyon crane gave considerable trouble due to what was thought to be improper focusing. After a number of attempts to readjust the focus, it was found that the lenses on the Medium and High Power were darkened from radiation. The 300 area shop is now preparing a new head and will replace the present head as soon as possible.

j. Coating Units - 234-5

All production coating units have been converted to the Nitrogen Purge operation, and are operating satisfactorily.

C. Improvement Experience

1. Process Tests and Revisions

The Redox 2B column is now operating on a 1B column extraction section flowsheet. Use of a salted, reducing solution (ANN, ferrous sulfamate, HNO_3) instead of water, is intended to increase Pu cycle decontamination factor, reduce cost (approx. $100.00 per day in reduced 2BP ANN butt), and reduce PR HNO_3 concentration for improved Isolation Building operation.

Evaporation of TBP wastes to a specific gravity of 1.35 instead of 1.33 was adopted during the month for additional savings in waste storage space.

The complete time cycle through Task II in the 234-5 Building was maintained at seven hours forty minutes per charge. Three normal batches were hydrofluorinated at 500°C and then rehydrofluorinated at the normal 600°C cycle. After completion of each hydrofluorination, a 50 gram sample was submitted to the Development Laboratory of the Technical Section for testing. In all cases, the material hydrofluorinated at 500°C gave the same result through reduction as that hydrofluorinated at 600°C. More work will be done during the coming period on reducing the hydrofluorination temperature to reduce corrosion effects associated with a high temperature and to reduce the operating time cycle.

2. Inventions or Discoveries

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

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D. Events Influencing Costs

1. Labor Variance

Total force of the Separations Section dropped by seven, due mainly to a reduction of five in the Process Sub-Section and three in the Operations Sub-Section.

2. Material Variance

The use of 68% (instead of 65%) Aluminum Nitrate in the Redox 3DS and E-1-A streams has resulted in the saving of ANN, caustic and waste storage space amounting to $33 per ton of uranium processed.

Approximately 20% less chemicals per ton were used in the TBP operation as compared to March. This was due mainly to the processing of more sludge instead of supernate.

3. Other

In the 222-S Building Laboratory, a survey of analytical requirements for the various processes, and subsequent agreement by operating personnel to curtailment has resulted in estimated annual savings of approximately $2400.

A number of changes were completed in Redox Aqueous Make-up tank usage to effect more efficient arrangement and simplify scheduling of "cold" feeds. A total savings of $280.00 per month at present rates is possible in the light of fewer batch makeups to reduce the number of chemical assays. Piping revisions were made at a cost of $500.00.

E. Plant Development and Expansion

1. Project Status

The Project Proposal, including the expansion of Task II and replacement of Task III, has been revised to include final inspection facilities. The title of these combined projects is now "Expansion of Building 234-5 Facilities". The Project Proposal was approved by the A & B Committee on April 29, 1953. Funds for this project have been made available by the restoration of a portion of the 234-5 Building Expansion Fund.

CG-521, Redox Expansion, Phase I - The 1S Column (1A spare) is now being flushed and the raschig rings are being cleaned. Jumpers for this column are completed. The 1B column and jumpers are ready for installation in May.

CA-535, Redox Capacity Increase, Phase II - All column designs are complete. AEC approval for construction has not been received.

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1. Project Status (Continued)

CG-538, Redox Waste Diversion - A Work Authority has been issued on Revision I of this project authorizing funds of $510,000. All work will be done by Minor Construction forces.

During the month Project Proposal CG-550, Reactivation of P-10 Facilities, was submitted to the A & B Committee and transmitted to the AEC. Directive HW-303, dated April 17, 1953, authorizing funds for the project was received. Work Release, No. A-746, was issued by the 200 Areas Project Engineering Unit and work performance by Reactor Section, Maintenance Sub-Section was begun on April 28, 1953.

2. Plant Engineering

Correlation of all standards for the Separations Section is continuing. Operating labor and materials, Process Analytical labor and materials, and power labor and material standards are being engineered for each facility.

Correlation of data for establishing powerhouse steam standards is complete. Approval by the Power Unit is pending.

Standard analytical requirements were developed for the Metal Recovery Unit and a report is in preparation.

A study is being made to determine the practicability of self-concentrating the wastes in the first tanks of two cascades in the S Farm, by disposing of the vapor condensate instead of refluxing to the tanks. It was determined that by providing for self-concentration by July 1, 1953, 550,000 gallons of additional storage space may be gained. Approval of the Radiological Sciences Department to crib the condensate has been granted. Methods of performing the work to provide for condensate cribbing are being investigated.

F. Significant Reports

1. Routine

Number	Title	Author
HW-27943	Separations Section - Operations Monthly Report	V. R. Chapman
HW-27944	Separations Section - 234-5 Operations Monthly Report	V. R. Chapman
HW-27928	Separations Section - Process Monthly Report	W. N. Mobley
HW-27938	Separations Section - Radiation Monitoring Monthly Report	A. R. Keene

1. Routine (Continued)

Number	Title	Author
Unclassified	Separations Section - Power and Maintenance Monthly Report	R. T. Jessen
HW-27677	Separations Process Committee Minutes	O. F. Beaulieu
HW-27985	Separations Section - Plant Engineering Monthly Report	C. P. Cabell
HW-27975	Essential Materials - Operations Sub-Section Separations Section	J. P. McBride

2. Non-Routine

P.E. Report #61	Location of New Task III Equipment, Building 234-5	S. G. Smolen
HW-26818	Basic Information for Steam Standards, 202-S Building, P.E. Report #46	R. C. Burke
HW-27643	Minutes of Meeting to Discuss PR Can Radiation Levels and Corrective Action	O. F. Beaulieu
HW-27401	Quantitative Recovery of Plutonium from Analytical Residues	W. S. Ferguson
HW-27708	Radiation Incident Investigation, Class II, #16	A. R. Keene
HW-27776	Radiation Incident Investigation, Class I, #59	D. R. Koberg
HW-27818	Radiation Incident Investigation, Class I, #62	R. N. Donelson
HW-27914	Radiation Incident Investigation, Class I, #64	D. R. Koberg

III. PERSONNEL

A. Organization

Initial steps were taken to staff the P-10 Extraction facility. Supervisory and operating personnel will essentially all be provided by the Separations Section.

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B. Force Summary

	Start of Month	End of Month	Net Change
Section General	4	4	0
Operations Sub-Section	642	639	- 3
Power and Maintenance Sub-Section	571	571	0
Process	210	205	- 5
Radiation Monitoring	71	72	1
Plant Engineering	30	30	0
Section Total	1528	1521	- 7

C. Safety Experience

There were no major or sub-major injuries in the Separations Section during April. The 200 West Area has operated for 4,100,000 exposure hours without incurring a lost time injury. 200-W Operations has gone since start-up without a lost time injury which is truly a remarkable achievement, particularly in view of the nature of the work being conducted.

During the month of April, tests were conducted to attempt to determine the possibility of CWS filters catching on fire in the ventilation facilities of the various buildings utilizing the CWS filters. Although it was difficult to set them on fire, in the test duct work, once the fire had started it was extremely difficult to extinguish.

D. Radiation Experience

The frequency of radiation incidents remained undesirably high. There was one Class II incident involving exposure above the permissible limit to an electrician who was relamping the Redox canyon while a block was off D cell. The maximum exposure received was 465 mr although an exposure rate of around 20 to 30 r/hr must have been unknowingly encountered to account for the dose received in the short exposure time.

Three Class I radiation incidents resulted in high level ground and equipment contamination at the 102-B heel pit, uncontrolled personnel exposure to 15 to 20 r/hr during decanting of the aqueous layer from the O-1 tank at 276-S and unusually high exposure of two employees to airborne mixed fission products at the 104-U periscope location. In the latter incident, a small hole in the periscope base permitted air contaminated up to ca. 10^{-2} uc/liter to emerge from the tank where sluicing operations were in progress. Preliminary bio-assay studies indicate that internal deposition approaching the permissible may have occurred. Bio-assay studies of the exposed individuals are continuing.

Failure of the A-3 and B-3 silver reactors occurred at the Redox Plant. The maximum I^{131} emission rate was 19 curies before regeneration with silver nitrate could be effected. The average emission rate throughout the month was 3.4 curies/day.

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E. Personnel Activities

1. General

A committee, consisting of first line supervisors, was established to determine appropriate subjects for the first informational meeting of Separations non-exempt personnel which is scheduled for the near future.

2. Training of duPont Personnel

One Mechanical Engineer completed two weeks training in the Power and Maintenance Sub-Section on April 17. Three Radiation Engineers reported for 6 weeks training in the Radiation Monitoring Sub-Section on April 13.

3. G. E. Supervisory Selection Program

Evaluation was completed on ten Operations Sub-Section candidates during the month. Evaluation of candidates from Power and Maintenance Sub-Section is in progress.

4. Laboratory Technical Personnel

A Laboratory Instruction Program for all technical personnel of the Analytical Unit, Process Sub-Section was started on April 24. The training program is scheduled to continue through November 1.

5. Visitations

W. N. Mobley spent April 20 and 21 with representatives of Dow Chemical Co. at Rocky Flats, Colorado discussing metal fabrication process and specifications, April 23,24 and 25 with representatives of Carbide and Carbon Chemicals Corp. at Oak Ridge, Tennessee discussing UO_3 process and specifications, and April 27 and 28 with representatives of E. I. duPont Co. at Aiken, South Carolina discussing process technology and plutonium recovery problems.

During the week ending April 19, J. M. Blackburn and T. Prudich visited the Dow Chemical Rocky Flats plant for the purpose of studying equipment and methods developed by that installation which may aid in reducing costs and improving overall efficiency in the RMA operation in 234-5 Building.

On April 27, R. A. Kennedy went to Portland, Oregon, to meet with design engineers of the Bingham Pump Company to review preliminary design of the new type metal waste sludge pump which that Company is to design and build for the TBP Plant.

R. S. Bell attended the annual manufacturing conference of the American Management Association during the week of April 6th.

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ENGINEERING DEPARTMENT

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TECHNICAL SECTION

Reverse flushing of the plutonium cycle columns in Redox indicated solids to be restricting the capacity and contributing to erratic decontamination behavior.

Metal recovery production was improved through attainment of higher removal rates from the tank farms (60 tons of U/week). Solvent extraction was unchanged during the month. The calcination operation improved significantly to produce a new maximum of 334 tons of uranium as UO_3; this improvement is attributed to improved stripping of (TBP) feed solutions.

The Hot Semiworks demonstrated a streamlined "head-end" $KMnO_4$ treatment which gave 100-fold decontamination of ruthenium.

C Pile power level was increased about 12 percent this month as part of the program to permit verification of metal quality at higher tube powers. The local controlled hot spot continued to operate in the range 10 to 17 percent above the limit set for the rest of the central zone.

Difficulties have been encountered with ruptures of unbonded uranium-aluminum alloy slugs used in the fringe enrichment experiment at H Pile and for reactivity enhancement at C Pile.

Dichromate was returned to the process water in B, D, and F Piles because of evidence of future corrosion difficulties.

A P-10 Process Studies group was activated during the month in order to train Manufacturing personnel for the forthcoming production effort and to render process assistance during the start-up period.

The dimensional changes which occur in uranium slugs on irradiation have been correlated with the preferred crystallographic orientation existing before irradiation. Length and diameter measurements on 24 slugs before and after irradiation showed that samples with the b-axis oriented in the rod direction increased in length and decreased in diameter while samples with the b axis normal to the slug axis decreased in length and increased in diameter. Samples with both textures remained essentially unchanged in length.

The electrical resistivity, the temperature coefficient of electrical resistivity, and the X-ray diffraction pattern of an irradiated slug have been measured in this laboratory for the first time.

A long-standing disagreement between experimental values of the graphite diffusion length, L, obtained in the standard sigma pile and in Hanford

production piles has been resolved. It has been shown that the effect of streaming throughthe many holes piercing a production pile had not been properly taken into account in deducing L values of ca. 60 cm from the measured flux distributions. When this effect is taken into account, values of 54-55 cm for L are found. These are then in good agreement with the standard sigma pile result of 54.4 cm.

The adequacy of the present Metal Recovery Process flowsheet for decontamination of nine-month old feed in two cycles was demonstrated in laboratory mixer-settler equipment.

A number of proposed improvements in the Redox, Purex and Metal Recovery Processes have given successful laboratory results. The presence of phosphate during slug dissolution markedly increased the rate of slug dissolution and appears applicable to the Purex Process. Head-end permanganate treatment followed by a hydrogen peroxide kill improved ruthenium decontamination over one solvent extraction cycle by a factor of 10. Copper sulfide, silica gel and certain mercaptans, which have previously been shown to scavenge fission products efficiently, have now been shown to cause negligible plutonium loss when applied to Redox plutonium streams.

Approximately 40,000 slugs produced at the Feed Materials Production Center (Fernald) have been canned. These are part of a test lot of 200,000 of the FMPC slugs. Some of these have been charged to the piles.

Approximately 3,000 experimental Tru-Line cans and caps with interlocking dimple and protrusion on the can bottom and cap end, respectively, were received from ALCOA. One hundred and fifty slugs were canned using such components and appear satisfactory. The interlock will aid in aligning the slugs in the process tubes during the charging operations thereby providing assurance against misalignment of slugs and possible consequent intensification of certain forms of corrosion.

Following preliminary work at Ames Laboratories, uranium was cast directly into one-inch diameter zirconium cans producing a strong bond between the uranium and zirconium. Rolling of one of these canned slugs to a total reduction of 90 percent in the cross-sectional area, produced no evidence of zirconium jacket separation from the uranium core.

The electrical resistivity of the unirradiated compound layer in a Hanford slug was measured to obtain some data for evaluation of a theory concerned with energy conversion proposed by Dr. K. H. Kingdon that may also explain some in-pile corrosion phenomena. The results indicated a specific resistivity of 2000×10^{-6} ohm-cm. This value may be compared with that for aluminum, 3×10^{-6} ohm-cm; for uranium, 60×10^{-6} ohm-cm; and for a typical semi-conductor, germanium, one ohm-cm.

A total of 183 slugs were fabricated in a three-week period by hot press canning of AlSi coated uranium slugs to prepare a quantity of slugs for testing and to evaluate the feasibility of the method. By various changes in procedure, canning yields were increased from ten percent to 82 percent as

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measured by frost test acceptance.

Seventeen mechanically-bonded, four-inch uranium slugs have been successfully fabricated and are awaiting testing. By anodizing the slugs, a matte surface is obtained which can be mechanically keyed to the annealed aluminum jacket by the sizing operation. The soft aluminum is forced into the myriad crevices and pits of the prepared surface of the uranium, resulting in a degree of bonding.

The quarterly inventory of Special Materials within the Technical Section was completed and considerable quantities of unrecorded platinum and gold were located. Changes have been instituted in the requisition procedures in order to insure more positive control of all Special Materials.

DESIGN SECTION

Direct engineering effort of the Section for April was distributed approximately 67% to the Expansion Program, 19% to other design projects and 14% to research and development studies.

Design progress on Project CA-512-R, 100-K Reactor Facilities, was advanced 5.6% during April to 80.4% complete. These completion percentages are based on a total of 1,850 drawings, an increase of 50 above the previous estimate of 1,800, due to additional test facility drawings required. During the month, 159 drawings were approved, bringing the total approved to 1,391 drawings. An analysis of the downcomer hydraulics was completed with results showing that the proposed orificing will destroy the excess head of the design flow. The design of the process water supply piping in the 105 Building pipe rooms was modified to provide permanent 24-inch flushing lines and inspection manholes. A study is being made to evaluate the economic justification for the installation of charge-discharge equipment for poison loading. The Design Committee approved a scope revision increasing by approximately 50% the number of cooling tubes in the sides and nearly 100% in the top biological shields of the "K" Reactors to prevent biological shield temperatures from limiting the production that can be obtained from the reactors.

Three recommendations for scope changes in the 100-K Water Plant design were approved by the Design Committee as follows: (1) Construction of lime addition facilities should be stopped and facilities employing caustic soda for pH adjustment be designed which would result in a capital savings of $400,000; (2) sodium dichromate should be added to the process water as a corrosion inhibitor; (3) a sanitary water system independent of the process water system and originating at one of the head houses be provided for the 100-K Area. A meeting of a representative of S. T. Powell (Consulting Engineer) with personnel from the Technical Section and Design Section resulted in the agreement that the flow laboratory would be a pilot plant rather than a model.

Design work on CA-513-B, UO_3 Plant Expansion, was advanced 12% during the

month to 72% completion. The order for gas-fired calcination furnaces was placed with the Selas Corporation of America with delivery of the furnaces and controls scheduled for July 15 and October 13, 1953, respectively.

Detailed design of the Purex Waste Facility was advanced approximately 12.5% during the month to 21.5% completion.

Over-all detail design of the Purex Outside Facilities is 65% complete.

Detail design work on the 300 Area Expansion Program, Project CA-514, was advanced during the month to 20% complete. This work does not include the 313 Building structure and services, which are being designed by an architect-engineer. Special emphasis was placed on the new process sewer which will be under the 313 Building addition. Drafting was started on items of process equipment and materials handling systems, and preparation of process equipment specifications was started. The design criteria for detailed design of the 300 Area Administration Building by an architect-engineer was completed.

A development order for a Metal Recovery slurry pump, for testing as a replacement for the Nagle pumps, was placed with the Bingham Pump Company with assured delivery by July 1, 1953.

Design of the prototype fuel element canning machine for the Metal Preparation process was advanced 4% to approximately 97% complete. The canning machine drawings were reviewed with engineers from the Cleveland Equipment Works, Lamp Division, and the Hanford design was considered satisfactory with only minor comments on detailed parts. Assembly of the machine at Bremerton was held up due to material shortage and pending settlement of a strike at Western Gear. A test program for the canning machine prototype was agreed upon with the Technical Section and installation of the prototype will be in the 314 Building.

A project proposal for the expansion of the 234-5 Building was prepared. The proposal includes plans for revision of Task II, Task III and the addition of vault space for the Final Inspection facility at an estimated cost of $800,000.

Detail design of the Recuplex Installation, CG-496, is approximately 78% complete, an advance of 6% during the month. Two process changes were made in the Solvent Extraction Hood. One was the elimination of the spare column and the other was the elimination of the ion exchange system and the modification of the extraction battery to handle the uranium build-up in the supernates of Task I. These changes have delayed the design completion date to August 15, 1953.

PROJECT SECTION

At the end of the month, construction completion status of major projects was as follows: CA-431-A, 100-C Waterworks, 99.8%; CA-431-B, 100-C Reactor,

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99.8%; CG-438, Ball Third Safety System, overall, 95%, 105-F, 105-B, 105-D and 105-DR completed; 105-H 90% complete. CG-483, Downcomer Repairs, overall, 99%, 105-F, 105-B, 105-D, and 105-DR completed; 105-H, essentially complete. CA-506, Repairs to 100 Areas Retention Basins, overall, 91%, 107-F, 107-B, 107-D, and 107-DR completed; 107-H, 83% complete. CA-512, 100-K Area Facilities, - Water Plants, KW, 13.3%, KE, 7.6%, - Reactor Buildings, 105-KW, 5.8%; 105-KE, 3.2%; CA-513, Part "C," Purex Prototype, 89%.

A laboratory has been selected to conduct corrosion testing on stainless steel, and samples are now being tested. Arrangements are being made by Blaw-Knox for off-site warehousing of materials to be furnished to fabricators of equipment for Purex Facility.

Two work stoppages during the month delayed the construction program, particularly in 100-K Area, the 2101 Building, and the 101 Shops at Hanford. The office workers (Kaiser Engineers) called a strike on April 15, 16 and 17, and picketed all the barricades. The strike was settled during the month by a general increase of $6.00 per week with $11.50 per week accruing to the employees in Group I (typists, messengers, etc.). The millwrights-machinists dispute caused a work stoppage on April 14 and 15 when 31 millwrights did not report to work in protest against assignment of work to machinists. On April 16, the millwrights accepted a decision that this particular work, drilling and tapping the step-plugs and hoppers for the Ball Third Safety System, should be done by machinists.

Progress on CA-406, Phase II, Mechanical Development Building, improved considerably during the month, chiefly due to the increased number of workmen. Construction was about 60% complete.

In 100-C Area the activity consisted of obtaining estimates of costs to complete the scope and punch list items. For CA-512, 100-K Area Facilities, progress consisted largely of placing concrete for slabs, supports, and walls in the water plant areas. In the 105-KW and 105-KE Buildings, work continued on placing of concrete and steel.

Construction progressed about 15% in the 2101 Building, 200-E Area. Particular attention is being given to graphite now being received because it is considerably harder than any previously machined at this site. Of the 17 carloads and 11 express shipments which have been received, 7 carloads have been stored at 2101, and the remainder at 101 Building. Accomplishment of tool design at the 101 Building was 98% complete. Work has continued on the design of erection and inspection tools, the rehabilitation of machine tools in 101 Building, and the storage of completed items in the 2101 Building.

ORGANIZATION & PERSONNEL

Total on Roll, April 1, 1953	1,520
Accessions	26
Separations	22
Total on Roll, April 30, 1953	1,524

R. J. Schiers
for A. B. GRENINGER, MANAGER
ENGINEERING DEPARTMENT

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ENGINEERING ADMINISTRATION SUB-SECTION

APRIL 1953

The volume of business transacted in Technical Information was about normal for the month. Book and periodical circulation in the Library for the month was the highest on record. This increased circulation was also reflected in the volume of inter-library loans. The volume of inter-area mail was 17% greater than any previous month, and the volume is sufficiently high now to warrant a complete review of this function as presently performed by Classified Files.

In conjunction with the establishment of the Schenectady office as an accountability-transfer station, with functional supervision from Richland, the Schenectady office Files Supervisor visited Hanford during the month and procedures for management of the files there were established.

A draft of a new AEC General Classification Guide was received at Hanford for comment. This guide was developed by the AEC Office of Classification working in conjunction with the Classification Committee of the Technical Information Panel. The scope of the guide includes all the classified activities of the Atomic Energy Commission. Personnel from Technical Information and Security held meetings in all areas to review the guide in detail, particularly as it relates to Hanford's operation. Comments are being accumulated for forwarding to the Atomic Energy Commission.

The Library and Document Control Committee, chairmanned by the Hanford representative, has been asked by the Technical Information Panel to set up two subcommittees. One is a subcommittee to examine the present rules for corporate entries being used by the Technical Information Service at Oak Ridge and to recommend amendments where they seem desirable. The other subcommittee is being set up to examine the possibilities of preparing a book catalog for use within the Commission. The present card catalog is growing very rapidly and is already beginning to present filing and storage problems. It appears desirable to attack this problem well in advance by examining the possibilities of setting up a book catalog of the AEC technical report literature. The subcommittee will be charged with evaluating the advantages, if any, of a book catalog over the present card catalog, setting forth in detail how such a catalog could be prepared, estimating the costs involved and describing the mechanics of its continuation. Personnel from the Technical Information Unit at Hanford are being nominated to both subcommittees.

The Supervisor, Abstracting and Bibliography, attended the workshop on the production and use of technical reports held at the Catholic University of America, Washington, D. C., April 13-18, 1953. The workshop featured a two-way cause and effect relationship between the producer and consumer of reports. The unity of all segments of the report producing and using process was emphasized, showing the interaction and interdependence between the originators of reports, the special libraries and documentation centers, and the

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scientists as the ultimate consumers. The workshop afforded an opportunity for these major groups directly concerned with report production and use to bring to bear their combined knowledge and experience with a view to improvement of standards and practices.

During the month the following contract activities were handled:

1. Special Agreement No. G-19 between Battelle Memorial Institute and General Electric, covering development of melting and fabrication techniques for uranium alloys, was executed by G-E on March 17 and was forwarded to the AEC for approval March 19. As of April 30, 1953, Commission approval has not been forthcoming but is expected early in May.

2. Preliminary negotiations with Industrial Models, Inc. of Arden, Delaware, covering the fabrication and delivery of six engineering models for the 100-K Areas on a fixed price basis indicate that the cost of the work with a fixed price contract will be 50 to 60% higher than with the originally proposed cost-type contract. A letter has been forwarded to the Commission requesting approval to proceed with further negotiations within the new maximum cost range on a fixed-price contract.

3. On April 10, the Commission returned Modifications Nos. 1 and 2 to Subcontract No. G-303 (Morrison-Knudsen Co., Inc.), covering the settlement of claims arising under Subcontract No. G-303 due to an accident which occurred in October 1950, to General Electric unapproved. The decision was made to close out and make final payment as quickly as possible, omitting Commission approval for those items which they refused to authorize. On April 28, 1953, Morrison-Knudsen acknowledged receipt of the check and returned all close-out papers properly executed.

4. Modification No. 2 to Special Agreement No. G-12 and Modification No. 4 to Special Agreement No. G-5 (both between G-E and National Carbon Company, covering the production of purified graphite), have been executed by G-E and the Supplier and were approved by the Commission.

5. Consultant Agreement No. 106 between G-E and Dr. Edward James, covering radiological services, has been executed and approved by the Commission effective May 1, 1953.

6. Consultant Agreement No. 107 between G-E and Dr. Sidney Marks, covering consulting services in the field of pathology, has been executed and was approved by the AEC effective May 1, 1953.

7. Special Agreement No. G-24 between G-E and the State College of Washington, providing for the acquisition of pigs for use in radiological research, has been executed by the College and was sent to the AEC for approval on April 24.

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8. Modification No. 2 to Consultant Agreement No. 109 between G-E and George W. Watt was approved by the AEC on April 10.

9. Consultant Agreement No. 111 between G-E and Bailey Meter Co. was executed by the consultant on April 2, following the prior approval of the AEC.

10. A proposed contract was negotiated between G-E and the Frank Mayer Engineering Co. of Los Angeles for the furnishing of drafting assistance. The contract was executed by Frank Mayer Engineering Co. on April 27 and is being processed for approval by General Electric.

11. Special Agreement No. G-25 between G-E and the Consolidated Mining & Smelting Co. of Canada Ltd., licensing G-E to construct a molten tin filter under a patent held by Consolidated Mining, was approved by the AEC on April 9.

12. Modification No. 2 to Consultant Agreement No. 112 between G-E and Dr. P. E. Church, providing for extension of the contract term, has been executed by the consultant and was sent to the AEC for approval April 6.

13. Modification No. 2 to Consultant Agreement No. 114 between G-E and Dr. M. E. Ensminger, providing for an extention of time of the agreement, was executed by the consultant on April 30.

14. Modification No. 2 to Subcontract No. G-395 between G-E and the University of Washington, providing an extension of time for the testing of heavy aggregate concrete, was approved by AEC on April 17.

15. Modification No. 1 to Consultant Agreement No. 101 between G-E and Robert J. Hansen, providing an extension of time for consulting services in the field of bomb blast resistant design, was approved by the AEC on April 30.

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HW-27932

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PILE TECHNOLOGY SUB-SECTION

MONTHLY REPORT

APRIL, 1953

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VISITORS AND BUSINESS TRIPS

E. C. Anderson, R. L. Shuch, M. P. Warren, F. N. Hayes, C. L. Cowan, Jr., F. B. Harrison, F. Rynes, and P. Powell visited here from Los Alamos Scientific Laboratory, Los Alamos, New Mexico, from February through May 1, 1953, to aid in the Nutrino Porgram.

C. A. Bruch visited here from Knolls Atomic Power Laboratory, Schenectady, New York, April 22 and 23, to discuss irradiation experiment work.

E. Fast visited here from Phillips Petroleum Company, Arco, Idaho, April 13 through 17, for consultations on reactor material analyses.

C. W. Johnstone visited here from Los Alamos Scientific Laboratory, Los Alamos, New Mexico, April 9 through May 1, to aid in Nutrino Program.

D. F. Klimas visited here March 18 through April 3, from General Engineering Laboratory, Schenectady, New York, for consultations regarding assembly of magnetic ball conveyor.

J. G. Winston and T. J. White visited here April 13 through May 1, from Los Alamos Scientific Laboratory, Los Alamos, New Mexico, to aid in the Nutrino Program.

L. P. Bupp visited Oregon State College, Corvallis, Oregon, April 2 and 3, to recruit technical personnel.

A. B. Carson visited Oak Ridge National Laboratory, Oak Ridge, Tennessee, April 15 through 17, for consultations on recycle specifications, and Savannah River Works, duPont Company, Aiken, South Carolina, April 20 and 21, for discussions on reactor design and technology.

P. M. Reinker and R. B. Richards visited Savannah River Works, duPont Company, Aiken, South Carolina, April 20 and 21, and Knolls Atomic Power Laboratory, Schenectady, New York, April 22 through 24, for discussions on reactor design and technology.

A. T. Whatley visited Argonne National Laboratory, Lemont, Illinois, April 13, to obtain information on cyclotron exposure experiments, and Knolls Atomic Power Laboratory, Schenectady, New York, April 16 and 17, for discussions on electron microscopy of graphite.

J. M. Lutton visited Columbia University, New York City, New York, April 16 and 17, to discuss internally heated mock-up.

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ORGANIZATION AND PERSONNEL

Personnel totals are as follow:

	March	April
Administrative	4	3
Pile Engineering	78	77
Pile Materials	70	68
P-10 Process Studies	0	6
Facilities Control	3	0
Special Irradiations	25	24
Total	180	178

General: One Chemical Engineer and one Secretary B transferred from Facilities Control, one Chemist and one Engineer Assistant transferred from Pile Materials Unit, and two Engineers transferred in from Fuel Technology Sub-Section to form the P-10 Process Studies Sub-Unit. One General Clerk B in Facilities Control terminated.

Administrative: One Staff Assistant and one Secretary B transferred to Technical-General.

Pile Engineering: One Mechanical Engineer transferred to Reactor Projects Sub-Section, one Stenographer went on a three month Leave of Absence, and one Technical Graduate was converted to Engineer Assistant.

Pile Materials: One Stenographer transferred in from Transportation, one Technical Graduate-Rotational was permanently assigned to the Unit, and one Technical Graduate was converted to Engineer Assistant.

Special Irradiations: One Chemist transferred to the Major Appliance Division, Erie, Pennsylvania, and one Engineer transferred in from Power and Maintenance Unit.

PROCESS CONTROL AND ANALYSIS

Ruptured Slugs

Only one regular metal slug rupture occurred during April. This was a Group 8 cleavage failure in the central zone at C Pile. Two of the unbonded 4-1/8 per cent uranium-aluminum alloy slugs used in the large scale fringe enrichment experiment at H Pile were found to be ruptured. There is evidence that the failure occurred some time ago. Slightly increased outlet water activity readings were first detected in February. The ruptured pieces were adjacent to one another, and both exhibited the same type of failure, a crack about one-inch long in the side of the can, with very slight slug swelling noted. Another enriched column suspected of containing a ruptured piece was also discharged at

the same time, but all pieces appeared to be in good condition. An enriched tube at C Pile suspected of containing a rupture was discharged later in the month at about half goal exposure. Discharge of a tube at this exposure for observation of unbonded slug canning effects had been previously scheduled. Slightly high outlet water activity for a week preceding shutdown led to the choice of this tube for discharge. Examination of the "C" material showed five pieces on which the can may have been penetrated, although none has yet been definitely identified as a rupture. These pieces showed heavy weld attack with a trough around the junction between cap and can. One piece showed a similar trough at the can end. Another piece was necked down along the side of the can as if there was a crack in the alloy underneath. All pieces discharged from this tube were heavily filmed, except at the ends.

With no Group 9 failures occurring this month, the performance of this material continues to show improvement over the Group 8 metal. The present Group 9 rupture rate is less than half that of the best Group 8.

Calculation of the C Pile rupture rate by the equivalent exposure method shows that the two slug ruptures to date correspond to a rate of 0.0018 ± 0.0009 ruptures per tube irradiated to 600 MWD/ton. This rate is comparable to recent slug performance at other piles.

Power Level Limits

With the exception of C Pile, the power levels of all operating piles were limited by vapor binding considerations during the month. C Pile power level limits were increased about 12 per cent as part of the program of step-wise increases in tube power to permit verification of slug performance at higher power levels. C Pile is not yet limited by any particular operating condition. As noted in the previous paragraph, the rupture rate calculated for C Pile is comparable to recent experience for piles at lower tube power levels which would indicate that there are no gross effects on slug behavior attributable to the higher power levels at C Pile.

Higher Tube Power Operation

The first column of uranium enriched to 1.75 per cent U^{235} for the study of higher specific power operation was discharged after a scheduled 24 days of operation. No unusual slug damage was found and in general the pieces were in unusually good condition, although mild peripheral etching was observed on some can ends adjacent to the bevel. On the basis of flux data which were not available until after the column had been charged, it appears that the power output was not as great as was desired, because of the proximity of control rods to the test columns. Higher powers and temperatures were obtained for short operating periods, but the rod configuration required could be held only at some sacrifice of pile power level. Data obtained after discharge of the single enriched piece reported last month indicated that the same conditions prevailed. The calculated power output has been revised on the basis of flux information from numbered solid aluminum dummies, down to 48.5 KW per foot of uranium which is equivalent to a tube output of 750 KW and a core temperature of 490 C.

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Three additional columns of slugs designed to investigate high can end temperatures have been charged in locations removed from the probable control rod positions. Provisions have been made for adjusting these charges upstream or downstream during shutdown to obtain the desired temperature conditions. Six other tubes have been charged and will operate at high core temperatures without going beyond the end cap limit.

The local controlled hot spot at C Pile continued to be used in the investigation of operation at higher local tube powers. Changes in the flattening loading made during the April shutdown improved the heat distribution so that 50 tubes are now operating from ten per cent and 17 per cent above the limit for the rest of the pile. Examination of the slugs and process tube from one hot spot location showed no unusual effects from the higher local power.

Operation with Maximum Panellit Pressure Monitor Protection

Operation with the reduced trip ranges continued to be satisfactory during April. Techniques were developed by the Reactor Section which lessened the down time required for gage range changes on tubes discharged during April. During the shutdown of April 23 and 24, a check of high and low trips after shutdown indicated three inoperative low trips and 14 inoperative high trips. A recheck prior to start-up indicated no inoperative low trips and five inoperative high trips. This represents no appreciable change from the previous month, but represents a considerable improvement over conditions a few months before the Ball 3X shutdown.

The present state of gage reliability is considered sufficient to justify relaxation of the excess header pressure requirement. The power level increases now possible with this requirement relaxed will be authorized for D Pile in the near future.

PILE PHYSICS

Pile Enrichment - H Pile - Production Test 105-531-A

Two effects noted during the current extended Ball 3X outage at H Pile are of particular concern to the enrichment experiment:

1. The first failures of "C" slugs, 4-1/8 per cent U^{235} aluminum alloy slugs canned by a die-drawing mechanical bonding technique, have been observed.

2. Significant deterioration of masonite in the pile shield has been observed for the first time.

Monitoring of rear dummies following a recent gradual increase in the No. 5 crossheader activity led to the discovery of two adjacent ruptured "C" pieces in the same column. The manner of their failure does not indicate a hazard to pile operation; of greater concern is "shadowing" of the detection of other

potential ruptures along the same crossheader and the possibility that an unexpectedly large number of ruptures might interfere with the DR P-10 production program in which the same canning process is utilized. The ruptured pieces have been shipped to 100-B for metallurgical studies.

Blackened chips of masonite recovered in vacuuming the bare VSR channels at H Pile can be traced to the ring and donut assembly surrounding the VSR rod guide and step plug. A further discussion of this observation is given later under "Shielding Studies".

Pile Enrichment - C Pile

A document outlining plans for the large scale enrichment of C Pile will be issued shortly. The operational aspects of conducting the program as discussed in a meeting of the appropriate technical representatives will be presented, as well as the results of the theoretical calculations pertaining to the required investment and expected gains. Further calculations indicate that nearly the same increase in additional plutonium production will result from somewhat less enriched material, than that necessary to extend the flattened zone to the enriched zone boundary. The rate of return of additional plutonium atoms formed per atom depleted in the enriched material may therefore be as large in the C Pile loading in the third lattice unit in from the reflector as the 2.5 to 1 calculated average rate in the existing H Pile loading which is in the fifth lattice unit ring.

Pile Enrichment - Production Test 105-502-A - Fringe Tube Enrichment

The final report of the reactivity and temperature data obtained from a single enriched column irradiated in tube 0674-H was completed for publication (HW-27698). This study served as the basis for planning the small enrichment of C Pile at start-up (9.2 kg) and as a pilot irradiation of unbonded U^{235} aluminum alloy slugs.

Production Test 105-529-A - In-Pile Test of the Ink Control Facility

Gas generation data obtained as a function of control solution concentration fits smoothly on a curve similar in form to that expected for "blackness" to neutrons. The measured rate increased from six cc/minute using pure water to a saturated value of 2360 cc/minute (0.62 gpm) in a solution containing approximately nine per cent $K_2B_4O_7 \cdot 5H_2O$ by weight. Of the order of one gallon per minute was predicted previously by extrapolating off-site data obtained in much lower fluxes.

Pile Control - Enriched Pile Calculations

The problem of safety control in the enriched pile has been reduced to setting up the flux equations for three, and in some cases four, pile regions in one dimension. The buckling of the enriched zone necessary to make the dry xenon-free pile critical when the third safety system is inserted is thereby determined. The results will indicate whether sufficient enrichment to cause significant production gains may be utilized in a safe manner in all of the piles.

SHIELDING STUDIES

Attenuation Studies

Preliminary data on the gamma radiation attenuation properties of magnetite limonite concrete have been obtained in the DR Test Wells. The longer relaxation length in this material is consistent with the fact that it has a lower density than either Brookhaven concrete or existing iron masonite shields.

Two recently designed and fabricated ion chambers employing magnesium interior surfaces to approximate on "air equivalent" cavity were utilized in the above measurements. Although in calibration tests these chambers failed to exhibit "air equivalence" and were somewhat sensitive to fast neutrons (up to five per cent of the total reading) the data obtained with these chambers agreed closely with other chamber and film data taken simultaneously.

Both bare and cadmium-covered foils were used as detectors in establishing the thermal flux distribution through the "E" Test Facility at F Pile. These measurements will allow the relating of shield flux measurements to reflector measurements and to some extent to fringe tube power generation rates. A thermal flux of 1.5×10^{13} neutrons per cm^2 per second was observed in this facility (which is downstream from the pile centerline) between two fringe tubes averaging approximately 175 kilowatts heat generation per column.

Radiation Damage Studies

A first order chemical kinetic equation to describe the breaking of hydrogen to hydrogen bonds has been employed to relate the masonite damage data, determined from a 400 day exposure in a temperature of 100 C, to the time of exposure. Tentative data at higher temperatures over a 13 day interval are then also employed to make a crude extrapolation indicating exponential rates of physical deterioration as a function of the shield temperature. Until additional data can be obtained and analyzed, the above extrapolations may be used as a rough indication of the manner in which masonite mechanical properties are affected by heating. Interpolation between the 100 C data and the small amount of 150 C data indicates the damage rate is nearly doubled with an increase of 10 C in shield temperatures.

The first group of conventional Brookhaven concrete samples prepared for thermal damage studies have completed curing and are undergoing heating at various temperatures. Moderate heating (100 C) accelerates the curing process causing the strength to increase, whereas under extreme heating this effect is overcome resulting in an immediate loss in strength.

Pile irradiation damage tests will be conducted on magnetite limonite samples in the H Pile Y Test Facility after the current Ball 3X installation outage.

Top Shield Masonite Damage

Blackened chips of masonite indicating exposure to temperatures considerably above 100 C have been recovered in vacuuming the bare VSR channels at H Pile. The shapes of the pieces and boroscope observations indicate that these chips came from the

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ring and donut assembly surrounding the step plug and rod guide. Investigation of the prints revealed that an inversion in the stepping arrangement midway through the shield would not allow a complete traverse of masonite samples to be obtained. Two step plugs have been retrieved in order to ascertain the maximum extent of the damage.

The manner of welding shown on the prints indicate the iron layers to be self-supporting in case the masonite deterioration should be widespread. The temperatures in the vicinity of the uncooled VSR channels would be expected to be much more severe, however, than over the top shield in general.

EXPERIMENTAL PHYSICS

Slug Rupture Detection

The mechanical turret, which permits a single gamma ray spectrometer slug rupture detector to scan cyclically the effluent water from approximately 12 crossheaders, performed satisfactorily in a uranyl nitrate injection experiment at H Pile during the month. A decrease of about ten per cent in the sensitivity of the system utilizing the rotating turret as compared with an ideal single crossheader system is the only adverse effect observed in this method of adapting the powerful tool of gamma ray spectroscopy to full pile effluent monitoring in a practical way. This slightly reduced sensitivity is not of significance since this system yields a basic sensitivity which is an order of magnitude greater than existing or alternate systems. The system operated continuously during the month without incident.

Continued advances are being made in simplifying the electronic circuitry associated with the spectrometer system in an effort so simplify maintenance and reduce the cost of an installation. A simplified dual counting-rate-meter circuit is being fabricated, the number of variable spectrometer controls are being reduced, and techniques for calibrating the two-channel spectrometer are being developed.

A number of calculations and experiments were performed to determine the feasibility of isolating the process channel containing a rupture prior to pile shutdown. The techniques reviewed were those based upon detecting the increase in delayed neutron or fission product gamma radiation at the rear nozzle. It was conclusively demonstrated that no simple method would identify the rupture tube in the presence of the high, diffuse radiation field existing at the rear face during pile operation. The more elaborate method involving collimating systems or energy discrimination will not receive high development priority until a more definite need for this degree of detection flexibility is established.

Neutron Distribution in Hanford Pile Lattice Cell

The data previously obtained which describe the distribution of fission and plutonium producing reactions in a Hanford slug are being extended to include measurements of the distribution of thermal neutrons through the lattice cell, e.g. through the process tube assembly and the associated graphite moderator.

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The initial determination in this series of lattice measurements was made in the Test Pile during the month utilizing aluminum-U^{235} alloy as the thermal neutron detector with the intensities of the induced fission product indications determined with a scintillating crystal gamma spectrometer. Only preliminary data analysis has been completed at the end of the month.

Pile Instrumentation

A measurement of the residual pile power resulting from neutron induced fission was made after an extended outage to ascertain the relative neutron to gamma intensities in which a detector monitoring pile start-up must function. In general, the residual gamma backgroud in several orders of magnitude above the neutron background and masks rising periods from low levels unless appropriate precautions are taken. A residual pile power of about one watt resulting from neutron induces fission was observed 60 hours after pile shutdown.

A pile period indicating device recently reported in the literature has been investigated as possessing possible applications at Hanford. This device is quite straight-forward - utilizing a signal obtainable from the existing Beckman amplifiers, a modified resistance bridge circuit and a high speed modified recorder. An operational model is being fabricated for performance test at one of the piles.

Measurement of Fast Flux in Hanford Pile

A positive program has been initiated to determine the distribution of fast neutrons at locations of interest in the Hanford piles. This work is utilizing various fast neutron reactions possessing energy thresholds in the one to eight Mev range. The use of threshold detectors in this application is not new, much of the shielding data having been obtained by similar techniques, and is not particularly quantitative since very few of the cross sections are accurately known as a function of energy. However, this method is being utilized in the absence of any other applicable techniques to provide as much of this important information as possible.

Test Pile Instrumentation

The boron tri-fluoride filled gas control rod has been modified and recalibrated; the recalibration showed the pressure-control characteristics to be quite reproducible. This system will be installed in the Test Pile for performance testing next month. The primary objective of this work is to provide a continuously variable "fine" control for the Test Pile for purposes of increasing precision. A system such as this is also potentially attractive for use in the Lattice Testing Reactor.

Automatic Tube Outlet Water Temperature Recording Facilities

The routine schedule of traverses obtained by the DR Pile IBM automatic tube outlet water temperature recording facilities has been suspended. Temperature distribution data of specific interest can be obtained by special request or from a bi-weekly schedule of traverses maintained by Reactor Section.

The improved Flexowriter automatic tube outlet water temperature recording facilities, which are serving as prototype equipment for subsequent Reactor Section installations, have been installed at B Pile and are operating successfully. A program has been established to train Operations personnel to obtain and interpret data from this installation and to train Instrument personnel in servicing this equipment.

Assistance, as requested, was given Instrument Design in modifying the specifications for the C Pile Flexowriter Recorder, which is still not on site, and to Reactor Section personnel in the preparation of the Project authorizing additional recording facilities. An extensive report has been prepared which discusses the technical features of the Flexowriter installation.

Test Pile - Routine Tests

Regular slug testing proceded routinely during the month. Eleven lots of Mallinckrodt billet eggs yielded TDS values ranging from 14 to 16. Two lots of Fernald billet eggs yielded TDS of 13 and 14. One Hanford billet egg lot yielded a TDS of 14.

Spot checks on the reactivity of "J" slugs to be utilized in the DR-10 loading were made to the extent of one slug per heat and continued to indicate high uniformity in this material. Thirteen lots of lithium-aluminum alloy P-10 material were sampled and tested according to the established procedure with 11 being accepted.

The over-all quality of TS-GBF graphite continues to be high in Test Pile reactivity measurements. With few exceptions the average quality has yielded dih (purity) ranging from +1.00 to 1.10. Recent express bar tests have shown indications, however, that bars being purified in mid-furnace locations are of a sub-standard purity with dih values ranging from +.78 to +.84. This recent experience is being investigated with National Carbon.

Test Pile - Special Tests

Two series of specially purified orange oxide samples prepared by the Harshaw Chemical Company and contaminated with known quantities of boron have been tested as part of a program to establish the feasibility of pile reactivity methods in supporting process control and improvement efforts in uranium fabricating plants. The data are being analyzed to ascertain the basic sensitivity of the Hanford Test Pile in this regard and will be extrapolated to the case of small enriched pile tests such as in a "water boiler". Preliminary calculations show the Test Pile to be a least ten fold more sensitive than the neutron "howitser" transmission technique now in use.

A series of calculations are under way to establish the radiation levels existing in Test Pile metal as a function of power level, exposure, and decay time. This work will be used as a basis for establishing the maximum permissible power level for Test Pile operation.

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Lattice Test Reactor

A co-operative effort with the Applied Research Sub-Section has been initiated to provide Hanford with an enriched reactor capable of yielding more detailed lattice constants at a rate substantially in excess of that possible with an exponential pile program. Future objectives of increased plutonium production rates and reduced unit product costs in both existing and future piles require that engineering and metallurgical efforts to effect improved fuel and lattice designs be supported in detail by physics measurements of the lattice neutron economy.

A project proposal has been prepared to provide reactor scoping and building design funds. Preparatory work leading to the preparation of a second proposal for building construction and reactor monies is in progress.

HEAT TRANSFER

Tube Flow Studies

The study of the possibility of the entrance of air into a process tube has been continued with attention being given to the probable effects of such air on flow behavior. It appears that the study is essentially complete; as anticipated, this consideration should not adversely affect plans to raise power levels based on reliance upon process tube instrumentation.

Tests were conducted to determine the response time of Panellit gages which are mounted on the pile under Production Test 105-538-A, "Test on Panellit Response Time", K. G. Toyoda, HW-27693, April 10, 1953. Valved pigtails and special timing equipment were installed on two tubes at the D Pile and the tests were run during the April 24 shutdown. It was found that the response time of the Panellit gage system as mounted on the pile is essentially the same as that of gages tested in the laboratory.

Thirty Meletron pressure switches were bench tested in the laboratory to determine the effect of pressure cycling on gage stability and to study all other factors which might influence the use of these gages on a pile. It was verified that the gages are relatively rugged and reliable and that their response time is much faster than that of Panellit gages. On the negative side, it was also confirmed that the electrical switch portion of the gage cannot be reset within about six or seven psi of the trip point. Additional tests indicated that the operation of Panellit and Meletron gages is relatively unaffected when both are operated from the same pressure line. In accordance with Production Test 105-540-A, "Testing of Meletron Pressure Switches for Tube Instrumentation", HW-27789, W. D. Gilbert, March 20, 1953, these 30 gages will be installed on the N Pile to obtain actual operating data. Installation will be made during the Ball 3X shutdown, if possible. The Meletrons will be connected into the Panellit pressure lines. During the initial portion of the test the Meletron will not be connected into the pile safety circuit; however, after a suitable testing period, they will be tied in as part of the No. 1 Safety Circuit.

Maximum protection is provided by the Panellit system when the Panellit gages are set to trip the safety circuit before boiling can begin in a tube. The flow reduction necessary to cause boiling will depend in part upon the relation between the tube outlet temperature and the saturation temperature of the water in the outlet crossheader for given Panellit trip settings. Thus, for given trip settings, the tube temperature rise must be limited. A document explaining the basis on which these limits are established is being prepared.

The water flow rate at the D Pile is less than was expected following the recent installation of larger orifices. A study was made of this problem and the results are reported in "D Pile Water Flow", K. G. Toyoda, HW-27791, March 21, 1953. On the basis of a tube by tube accounting of the flow, it appears that the pile flow should be greater than recorded. It is believed that the discrepancy is largely due to either (a) a faulty pile water flow measurement, (b) partial plugging of the cone screens or (c) an excessive amount of film in the tubes. Further study will be made.

Calculations were made and tests were conducted to determine the required central zone orifice size to provide a 275 psig Panellit pressure at the H Pile. This orifice size was found to be 0.315 inch for normal pump discharge pressures. Appropriate orifice sizes were also determined for the other zones of the pile. The purpose in installing larger orifices in the pile was to obtain a larger water flow; the latter was limited, however, by the restriction that the maximum average Panellit pressure could not be above 275 psig. The pile flow associated with this new orifice pattern will be something less than 50,000 gpm.

Work is being done in the flow laboratory to determine the flow through process tubes for various orifice sizes, pressures, tube loadings, etc. Results of this work will be reported separately.

A Venturi and a Mercoid differential pressure control were installed on tube 3377 during the C Pile shutdown early in April. The purpose of the installation was to provide an additional method of monitoring water flow in the tube since the latter contained enriched uranium slugs being irradiated in accordance with Production Test 105-532-A. No operating difficulties of any kind were encountered.

Plans are being continued for the on-pile installation of 35 Mercoids and Venturis. This will probably be done at the H Pile. The Venturis and pigtail assemblies are being fabricated at the F Area Maintenance Shop and delivery of Mercoids is expected about May 15.

A lead disc was recently discovered lodged against the cone screen in tube 3875-C. This disc was obtained and tests were conducted in the flow laboratory to determine the effect on tube flow rates which could result from the presence of such a disc at the screen. It was found that the tube flow rate could be decreased effectively to zero if the disc lodged against the screen in the worst, but never-the-less possible, position. Calculations were then made to determine the slug temperatures which would result following a total loss of

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flow from a 600 KW tube when the Panellit system is on an instantaneous-scram basis. It was concluded that the aluminum jackets of several slugs would almost surely be melted and that the jacketless slugs would be exposed to high temperature steam. An investigation is being made, largely by other personnel, to determine the source of these discs and to make sure that they are eliminated.

A pile power level limit might conceivably be reached due to a lack of sufficient water flow, following an electrical outage, to prevent the formation of steam in the outlet fittings. At the present time, a limit of a 90 C outlet temperature has been recommended. A new study is being made to show that equilibrium outlet temperatures at least as high as 95 C are permissible. If time permits, the investigation will be continued to study the effect of steam formation in the outlet fittings and to determine practical means to modify the fittings so that outlet temperatures as high as 120 or 130 C may be permitted.

Fuel Element Studies

A formal report is being prepared to present detailed data obtained from the thermocouple slug which was recently discharged.

Work is continuing to develop thermocouple slugs which will (a) permit measurement of surface, end cap and/or axial temperatures, and (b) resist failure while located in the pile. One prototype, having thermocouples at both the axis and surface of the uranium, has been made and is being tested. It represents an improvement over previous types in that the holes in the slug are filled with aluminum solder; thus, a water leak in the fittings would be much less likely to cause slug failure. In addition, weld joints rather than screw joints were utilized to prevent water leaks. A second prototype is being prepared in which the thermocouple is mounted in a groove on the surface of the jacket by a sizing method. The investigation is being continued and valuable assistance is being received from the Present and New Canning Sub-Units.

The equipment to permit measurement of the temperature drop across jacket-uranium bonds was modified and tests were run to evaluate the changes. It appears that the equipment is suitable for use at heat fluxes equivalent to about 25 KW/ft in a slug. Various types of specimens are being prepared by the Fuels Technology Sub-Section; tests of these specimens will be run following their arrival.

Thermal cycling of slugs has been delayed while a report to present all existing data is prepared. In addition, it has proven very difficult to obtain appropriate canning rejects for use on planned tests. However, progress has been made in another direction. In the past, axial temperatures have been limited to about 350 C with a 75 C surface temperature. This has been due to limitations in the generating equipment. An investigation is in progress to determine whether or not this electrical generation limitation can be removed; preliminary results are very encouraging. It appears that axial temperatures of at least 500 C may be reached.

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As tube power levels are increased, knowledge of axial temperatures will become more and more important. Therefore, a document reporting axial temperatures based on (a) probable operating conditions, and (b) the best data obtained from in-pile slug temperature measurements is being prepared for issuance.

One means to circumvent a slug axial temperature limitation is to remove the uranium from the axis of the slug. This would result in a lower maximum uranium temperature for a given power. A document is being prepared which will present the pertinent data and conclusions.

An investigation is being made to determine the increase in tube flow in the old piles which would result from practical decreases in slug diameter.

The study of the economic aspects of the use of thicker end caps has been postponed pending results of end cap boiling on the Eisenhower slugs in the C Pile.

A formal report to present the results of heat transfer tests on anodized layers is being prepared.

Moderator and Shield Studies

Analysis of the preliminary results from Production Test 105-514-A, Supplement A, "Channel Thermocouple Stringer Installation at DR Pile", was made. It appears that the temperature at the tube channel centerline is about 40 C higher than that at a normal lattice unit edge. It was, therefore, recommended to Reactor Process that, until better results are obtained, the pile be operated such that the chromel-alumel couples in the tube channels be restricted to 450 C or less.

Further study of the effect of pile exposure on thermocouple insulation has been made. It was found that 100 per cent of the glass braid insulation of the type used in this test will breakdown within three days after insertion in the center of the pile. However, asbestos insulation tends to stand-up for a longer, but as yet unknown, period of time.

A study was made to help in determining the best location of the couples in the replacable thermocouple stringers at the K Pile.

A request for the addition of tube block thermocouples to the K Pile was made to and approved by the Project Committee. Three sets, each composed of three couples, were recommended. The couples will be very valuable in the analysis of the effect of irradiation on the K Pile graphite.

The Technical Specifications on purging during operation were revised to conform to present tube loadings and Panellit trip settings at the piles. This work may permit a small increase in operating efficiency.

The test to determine the resistance to heat flow between a thermal shield block and a cooling tube was reactivated during the month. This work is being done at the request of the Process Engineering Unit. Preliminary data were obtained but have not been analyzed as yet. A suggestion was also made that consideration

be given to the use of zinc instead of lead to conduct the heat from the shield to the cooling tubes in future piles. A preliminary investigation indicated that appreciable savings in construction costs might result from use of zinc; no disadvantages were apparent.

MECHANICAL DEVELOPMENT

Charging and Discharging Studies

All information gathered to date in the course of the charging and discharging studies is being evaluated to determine the possible gains which could be realized by the use of the equipment which has been tested. There have been substantial changes in operating levels and conditions since the start of the continuous charging program which make many of the original assumptions no longer valid. It should be possible, at this time, to determine if continuous charging development should be terminated because it is not economically feasible, or continued on a larger scale.

The first of the Tru-line cans have been received from ALCOA and are being prepared for charging tests at 108-D.

Horizontal Rod Studies

The full-scale horizontal rod mock-up in the 189-D Laboratory is being modified for testing the new type rod designed for the B, D, F, DR, and H Piles. The drive equipment has been relocated, the new barricade wall shielding plug has been placed, and the biological shield step plug and guide rollers are nearing completion.

The dies for manufacturing the pressed powder horizontal rod coatings have been designed and fabrication is ready to start.

The experimental washer seal on No. 5 rod at C Pile was removed to determine the cause of the leak which had persisted since it was installed. It was found that it had been improperly installed, which no doubt accounted for the leak. There were no indications of deterioration of the rubber rings.

Vertical Rod and 3X Studies

The experimental electromatic ball conveyor is undergoing test in the 189-D Laboratory. It was put in operation the first of the month and its operation was demonstrated to all interested parties. In addition to the demonstration runs, tests have been completed to determine the effects of foreign material on ball pumping rates. It was found that graphite chips and dust have no deleterious effects; in fact, a small amount of graphite powder seems to be beneficial. The addition of small amounts of welding slag or fine gravel very seriously hampered operation and 1-1/2 pints of such material stopped the ball flow altogether. It was found that reduction of the current on the last several coils helped prevent blocking of the tube.

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The vertical entrance test section is being replaced by the short straight section in preparation for the remaining test which include heated ball tests, wet ball test, flow versus power and frequency, and endurance runs.

Supplemental Control

The "Ink" system has been in operation since DR Pile start-up after the Ball 3X outage. The system was modified considerably at that time and has operated very satisfactorily since. The Ink tube was actually used to supplement the horizontal rods during a critical reactivity period on April 12. A five per cent solution was used which provided enough additional control to prevent shutting down to reload poison columns. A series of tests was subsequently run to determine gas generation rates as a function of solution concentration. It was found that with a maximum concentration of .0115 g B/cc of solution, which is approximately ten per cent, the gas formation rate was five cu ft/hr at 570 MW. It was also noted that gas formation is proportional to neutron absorption and not to solution concentration. The gas composition remained practically constant throughout the test. The main constituents are hydrogen and oxygen in a volume ratio of about two to one. The original gas flow rotameter has been replaced by a gas meter which is much more accurate.

A second series of tests will be run shortly to determine accurately the control effectiveness of the Ink tube. When these are completed, the system will be put into full time use to gain operating experience.

Universal Slug Numbering

A study has been completed to determine the feasibility of applying individual numbers to slugs during canning and then recording these numbers as they are charged so the exact pile position can be determined when the slugs are picked up after discharge. As the result of this study, it is being recommended that commercial numbering machines be employed at 300 Area to apply an individual number to each slug. The slug charges would then be photographed just before charging to record the charging sequence.

Tube Channel Counterboring Equipment

A machine has been built and tested which will counterbore graphite tube channels up to .10 inch on the diameter. The machine can be controlled remotely such that any desired overboring pattern can be obtained from one pass of the cutting head.

SPECIAL IRRADIATIONS

Procedures for decontaminating the ANL 140 high pressure, high temperature loop have commenced. The loop is currently being operated with high hydrogen concentration in the recirculating coolant water. Two additional operations using high oxygen and hydrogen concentrations respectively will be required to determine if this process is effective.

Removal of the B Test Hole Facility at d Pile containing a broken sample of highly radioactive cesium carbonate was accomplished using remote handling techniques. This removal was also used as a study for the future removal of ANL 140.

Fission gases released from a small sample of U^{235} (KAPL-108) continue to build up at an approximately linear rate. Two creep studies (KAPL-105; WAPD-111) are undergoing testing preliminary to charging. The gamma irradiation facility for the GEL-100 program in the F Pile Basin has been completed. It will accommodate 98 samples.

Fabrication of the extensive removal equipment for the boron-carbide control rod and shield can exposure in C Pile has been finished. Samples pertaining to in-pile resistivity studies of alloys (WAPD-112) were discharged from B Pile. This MIR has now been completed. Progress in the reduction of the background level has been made by personnel of Project Nutrino from Los Alamos.

Progress on all remaining experimental work and in-pile exposures is likewise continuing as planned.

GRAPHITE STUDIES

Pile Monitoring

Since the removal of the aluminum thimbles for the installation of the Ball Third Safety System at B, D, and F Piles, damage to the vertical graphite blocks forming VSR channels has been observed by Operations.

At F Pile, one vertical block observed had shifted and partially blocked the channel. Broken pieces of graphite, presumably from the vertical blocks, have been found at the bottom of several VSR channels at both B and F Piles.

These observations indicate that the vertical graphite liner blocks have fractured as a result of the upward and outward distortion of the graphite stack. The movement of the fragments of the vertical blocks into the channel would potentially eliminate the use of a safety rod until the obstructions had been removed. In addition, a large number of balls would be lodged behind the vertical blocks and the removal of these balls would be difficult if the Ball 3X was tripped while the vertical blocks were displaced into the channel.

A program to inspect the conditions of the VSR channels at B, D, and F to determine the extent and seriousness of fractured and displaced vertical graphite blocks has been initiated.

Graphite - Carbon Dioxide System - Reaction Rates

A second continuous run in the reaction rate determination of the system carbon dioxide and graphite at 1000 C has been made. This run was a repetition of a previously reported determination. The results of both runs are in excellent agreement. Both runs show a rapid initial rise in reaction rate to a value of

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0.10 gm/gm sample per day at two per cent oxidation. At this point the reaction rate remains constant until about seven per cent of the sample has been oxidized. At the present time, it is felt that these data may be qualitatively explained by the change in surface area with oxidation and work is progressing in an attempt to correlate surface area with the reaction rates.

Materials Testing Reactor Correlations

The first quantitative indication has been obtained that an irradiation at the Materials Testing Reactor at Arco can be correlated with damage incurred in the Hanford piles. It has been found that if one plots values of C_o, the crystallite parameter, against physical expansion, the points obtained from Hanford and Arco irradiations fall on the same curve. These results hold for values of C_o as high as 7.57 Å and a corresponding physical expansion of 1.35 per cent. This is a strong indication that despite the higher flux and different distribution of flux at Arco, the same physical process is occurring as at Hanford. Thus, it would appear that the correlation between Arco and Hanford which is being attempted at present is possible.

Stored Energy Gradients

The first experimental information has been obtained as to the stored energy gradients present in tube blocks. Cores removed from approximately 15 feet from the Van Stone Flange from 2167 F, 2766 H, and 3574 D have been sectioned and the total stored energy determined in each of the two sections. Tube 2167 F has a history of normal metal loading and may be considered typical of many such tubes. The results obtained indicate that at the tube bore, a value of stored energy of about 450 calories per gram exists. This appears to decrease in an exponential fashion so that at the filler block edge of the tube block the value has decreased to some 250 calories per gram.

Tube 3574 D has 136 MD exposure and has run hot from 1946 to the time of sampling in 1951. The value of stored energy again decreases by about half from the bore to the filler edge of the tube block. However, the initial value at the edge of the tube block is only 200 calories per gram. This result indicates the difficulty of annealing by simply running a tube hot. Interpretation of the results from H await further data.

These and similar results will allow a much firmer re-evaluation of the condition of the piles with respect to stored energy.

WATER PLANT DEVELOPMENT

Flow Laboratory Studies

The five in-pile water quality tests at 105-D Flow Laboratory operated satisfactorily. These tests are evaluating the use of lime-free water with a floating pH, and water at pH 7.7 adjusted by caustic addition. All the experimental tubes exhibited rapid film formation rates and required frequent purging.

This effect is attributed to high iron pick-up in the new pipeline from 183-D to the Flow Laboratory. Inspection of the front tube sections after one month's operation showed them to be clean and free from pitting attack.

A series of tests is being initiated to determine effects of chloride concentration in raw water on aluminum corrosion rates. A mock-up "C" tube was started up at 50 gpm and 95 C to investigate water quality effects at high flow rates.

A model of the new "K" type downcomer has been installed in the 105-D valve pit and is being tested for the Process Engineering Sub-Section. The primary objective of the test is to evaluate the performance of the downcomer at flows higher than anticipated in the original design. Corrosion testing of the "C" horizontal rod mock-up continued.

Technical considerations of the K Flow Laboratory progressed with the assistance of a consultant in the field. Scoping drawings and design criteria are now scheduled for completion in July.

Water Quality Evaluation Studies

Production test operation of the areas using the alum-activated silica treatment continued. Higher effluent activities occurred in the alum areas; the increases in all cases were due to manganese. This phenomenon occurred at 100-F during a corresponding period in 1952. Investigations are under way to determine the cause of the increased manganese activity and possible methods of reducing it. Reduction of chloride limits to 1.0 ppm at the alum areas has resulted in undetectable amounts of chlorine in the clearwell, which is contrary to process specifications. Also, addition of less chlorine than that amount needed to maintain a detectable clearwell concentration is apparently no more effective than addition of no chlorine. For these reasons a production test is being prepared to determine the desirability of returning to the normally specified chloride limits of 2.0 ppm. Sodium dichromate addition to the process water was begun at B, F, and H. Specifications were prepared for dichromate addition at all areas to replace the present production tests at C, D, and DR.

A total of 144 front tube examinations was made this month, including tubes at B, C, F, and H. Evidence of continuing corrosion in the absence of dichromate was obtained.

A preliminary investigation was made of the problems that would be encountered with the use of raw river water for pile cooling. It appears that the considerable cost savings which would be realized by elimination of the treatment plants warrant further experimental investigation of the problem.

Recirculation Studies

The in-pile recirculation test facility operated satisfactorily during the month. A new experimental recirculating run was begun in the 105-F Flow Laboratory using water with a total impurity concentration of 25 ppm, obtained by mixing steam condensate with filtered water. An apparatus is being fabricated to recirculate deionized water plus specific additives in order that corrosion

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effects of individual ions can be isolated and studied. Preliminary investigations were made to determine the apparatus needed for the testing of recirculating water at temperatures up to 450 F.

Maximum Flow Tests

The 181, 182, and 183-F Pumping Stations were tested for maximum capacity during the month. A similar test was conducted at 183-D. The maximum capacity studies are now nearly completed for all areas. The information thus obtained is being compiled for use in planning water plant expansions needed to furnish increased process water flows at future higher power levels.

PILE COOLANT STUDIES

Slug Corrosion

Completed mock-up tests in which slugs were exposed to turbid water have further confirmed the hypothesis that F Pile pitting was an erosion-corrosion phenomenon. At 0.1 to ten ppm diatomaceous earth, 23 gpm, and 95 C for 20 days, severe slug and tube pitting similar to that observed at F Pile occurred at flow irregularities. Identical tests with two ppm dichromate in the water resulted in negligible attack.

A document, HW-27834, is being published to describe the effect of mercury contamination on aluminum corrosion. It is concluded that mercury was not the cause of F Pile pitting.

Another document, HW-27803, justifying increased outlet water temperatures has been completed. A Production Test, PT-105-519-E, designed to substantiate higher outlet temperatures, will allow a permissible 6.4 per cent production gain, when approved.

Completed impingement tests, up to 25 days duration, have shown the value of dichromate (as low as 0.5 ppm) in reducing the pitting of aluminum by high velocity water.

As a result of the data reported above and an evaluation of dichromate as an inhibitor, HW-27158, sodium dichromate is now being added to the cooling water at all the piles.

Tube Corrosion

Inspection of the front tube corrosion mock-up after 100 days operation showed that corrosion product barnacles are beginning to grow in 0.1 and 0.2 ppm dichromate water. The tube at 0.5 ppm is still clean. The four tubes at F Pile that were cleaned with chromic acid under Production Test 105-516-E now show a regrowth of barnacles after three months' exposure in dichromate-free alum water. The similarly cleaned tubes at D Pile (two ppm dichromate water) are still clean.

Tubes were removed from short tube mock-ups at B, C, D, F, and H Areas after 30 days' exposure. Barnacles were observed in tubes from dichromate free Areas (B, F, and H) but not in tubes from areas using dichromate (C and D).

Calibration of the Probolog, a tube testing device, showed that it is capable of detecting pits in process tubing as small as ten mils in diameter by ten mils deep.

Inspection of five process tubes from 105-DR and half of the two 105-C tubes was completed this month. Three of the five DR tubes showed slug junction pitting. One upstream section showed pits well into the 2S aluminum as well as severe 72S cladding removal. Five tubes each were removed from 105-B and 105-H to be examined for 72S removal and slug junction pitting.

A report of all tube examination work carried out before March 1, 1953, is being circulated for approval. A report of four completely examined 105-C tubes is being prepared. The portions of 2574-C (high flux tube) that have been examined showed no unusual conditions existing in the tube.

P-10 PROCESS STUDIES

Effective April 20, 1953, the P-10 Process Studies Sub-Unit was established for the purpose of assisting the Manufacturing Department in the recently authorized tritium program. To date, six individuals are assigned to the Sub-Unit. It is expected that maximum size of the Sub-Unit will be about 12, 11 exempt and one non-exempt.

P-10 Process Studies will include the following general functions: a) the preparation and presentation of a training program for the benefit of the Manufacturing Department organization which is responsible for extraction activities; b) extraction plant design and construction liaison; c) extraction operations material procurement liaison; d) shift process assistance and problem solution after hot extraction plant start-up.

In addition to early activity on the above broad functions, during April, 1953, members of the Sub-Unit have consulted with other Hanford organizations regarding: a) the manufacture of lithium-aluminum slugs from Savannah produced alloy and the reclamation and re-canning of Hanford produced alloy; b) pile exposure data required from the DR-10 irradiations; c) analytical activity expected to result from the current tritium program; d) tritium purity specifications.

INVENTIONS

All persons engaged in work that might reasonably be expected to result in inventions or discoveries advise that, to the best of their knowledge and belief, no inventions or discoveries were made in the course of their work

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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
D. B. Lovett	X-Ray Fluoroscopy

Signed: R. B. Richards
R. B. Richards
Manager, Pile Technology

RBR:mvt

May 7, 1953

SEPARATIONS TECHNOLOGY SUB-SECTION

MONTHLY REPORT
APRIL, 1953

VISITORS AND TRIPS

W. Henson visited here from Norton Company, Worchester, Massachusetts, April 15, for consultations on ceramic ware.

E. M. Shanks visited here from Oak Ridge National Laboratory, Oak Ridge, Tennessee, April 14 through 19, to obtain information on design of thorex, pilot plant, uranium dissolution, metal recovery in purex, Hot Semiworks, pulse column, interface controls and pulse generators.

G. W. Watt visited here from University of Texas, Austin, Texas, April 6 through 10, for technical consultations.

V. R. Cooper and R. E. Smith visited Dow Chemical Company, Rocky Flats Plant, Denver, Colorado, April 20 through 21, to discuss product shipment, process and equipment technology; Oak Ridge National Laboratory, Oak Ridge, Tennessee, April 23 through 24, to discuss product specifications interrelationship of Hanford and K-25 processing; and Savannah River Project, Augusta, Georgia, April 24 through 27, to discuss plutonium processing and recovery from by-product wastes.

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Separations Technology Sub-Section

N. G. Wittenbrock visited Stearns - Rodgers Manufacturing Company, Denver, Colorado, April 6 through 7, for consultations with Vendors on pulse generators.

ORGANIZATION AND PERSONNEL

Personnel totals are as follow:

	March	April
Administrative	3	2
Chemical Development	78	86
Plant Processes	55	53
Total	136	141

Administrative: One Technical Assistant transferred to Management General.

Development: One Chemist was hired, two Chemical Engineers were hired, one Laboratory Assistant "B" was transferred in from Applied Research, one Technical Graduate - Rotational transferred in from Radiological Sciences - Environment Hazards, one Technical Graduate - Rotational transferred in from Radiological Sciences - Bio-Physics, one Technical Graduate - Rotational transferred in from Radiological Sciences - Rad. Rec. and Stds., one Technical Graduate - Rotational transferred to Manufacturing-Reactor-Plant Engineering Services, one Technical Graduate - Rotational transferred to Project-Reactor Project.

Process: One stenographer was hired.

PUREX DEVELOPMENT

Purex Plant Design Liaison

The first group of Purex design drawings, which included a portion of the piping and equipment layouts, and equipment drawings, was received from the Vitro Corporation for General Electric approval. These drawings were commented on by Design, Manufacturing, Project, and Technical personnel and the comments were forwarded by the Purex Project Unit to Vitro.

The following information was transmitted to the Purex Project Unit during the month:

1. A revision of HW #2 Purex Flowsheet rotameter ranges was issued. The new ranges cover a production spread from 1.8 to 18 tons/day of uranium.

2. Specifications for a concentrated plutonium product stream filter were issued.

Separations Technology Sub-Section

Chemical Engineering Development

Solvent Extraction Studies - Sixty-eight Purex solvent extraction pulse column studies were carried out with "cold" uranium in the 321 Building pilot plant. These included sixty-two HC, IC, and IO Column H.T.U. and flooding determinations in a 3 inch diameter glass column, two IB Extraction Column flooding determinations in a 4 inch diameter glass column, and four HC Column H.T.U. studies in an 8 inch diameter stainless steel column. The approximate conditions of Purex Chemical Flowsheet HW #2 were employed. Shell Deodorized Spray Base was used as the diluent. The highlights of the new findings are as follows:

1. 3 inch diameter HC Column performance with fluorothene perforated plates spaced 4 inches apart approximately equalled that obtained with 1 inch fluorothene Raschig rings, with respect to both capacity and H.T.U. values. Four fluorothene plate designs tested gave H.T.U. values of 0.9 to 1.0 foot (about 0.1 per cent U loss from a 9 foot plate section) at volume velocities ranging from 200 to 800 gal./(hr.)(sq.ft.), sum of flows (4 to 16 tons U/day in a 34 inch diameter column). On the basis of differences in flooding characteristics and frequency requirements for good performance with the several fluorothene plate designs tested, plates with 3/16 inch holes and 23 per cent free area appeared most attractive. With these, a flooding capacity of approximately 1400 gal./(hr.)(sq.ft.), sum of flows, was obtained.

2. Under IC Column conditions the flooding capacity of the 4 inch spaced fluorothene plates with 3/16 inch holes and 23 per cent free area was approximately 20 per cent lower than under HC Column conditions. The IC H.T.U.'s were slightly (0 to 30 per cent) higher than the HC values.

3. The use of aqueous phase wetted (bare stainless steel), rather than organic wetted (polythene covered) spacers with the fluorothene plates resulted in unimpaired 3 inch HC Column performance.

4. There was little or no (0 to 30 per cent) increase in HC Column H.T.U. values with 4 inch spaced fluorothene plates with 3/16 inch holes, 23 per cent free area, on going from a 3 inch to an 8 inch column diameter.

5. In a 3 inch diameter glass IO Column, a flooding capacity of approximately 1000 gal./(hr.)(sq.ft.), sum of flows (corresponding to 19 tons U/day in a 34 inch diameter Purex Plant column) was obtained employing 4 inch spaced fluorothene plates with 3/16 inch holes and 23 per cent free area.

6. As a result of the favorable capacity and extraction performance of the above fluorothene plates, pulse column specifications for the Purex Plant HC, IC, 2E, IO, and 20 Columns (all 34 inch diameter) are being firmed up employing 1/8 inch thick fluorothene plates spaced 4 inches apart and perforated with 3/16 inch holes (23 per cent free area). These all-plastic plates will replace the dual faced plates which had been tentatively specified previously.

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Separations Technology Sub-Section

Mechanical Development

Pump Development

P-1 Pump - A submerged regenerative turbine pump, with a 2 foot drive shaft has operated for 2240 hours pumping water at a rate of 2.25 gal./min. against an 8 foot discharge head. The shaft of this pump is guided by one Crown No. 2 borosilicate glass bearing lubricated with the pumped solution. Only insignificant wear, 0.5 mil combined bearing and journal wear, were found when the pump was inspected after 1500 hours of operation.

Instrumentation - A Fielden capacitance-type liquid-level indicator is being evaluated for use as a column interface indicator. Based on the results of preliminary tests, the Fielden instrument appears to be satisfactory for the measurement of liquid level.

Materials Testing

Teflon Welding - A study to define the conditions for welding teflon rod into large diameter "O" rings, for use as gaskets in the Purex Plant, has been initiated.

Plastic Raschig Rings - A test has been initiated to determine the extent of cold flow of plastic Raschig rings under pulse column conditions.

Corrosion Studies - Several processing steps in which sulfur bearing compounds are present are being investigated for use as head-end or tail-end decontamination steps in separations processes. Since high corrosion rates have been observed on austenitic stainless steels in sulfide solutions, a corrosion test program has been started to determine the suitability of austenitic stainless steels as a construction material for these head-end processes. Specimens of 304 L, 347, 309 SCb, and Carpenter 20 stainless steels are being tested, by the Applied Research Sub-Section, in solutions of the following compositions:

Solution	UNH	HNO_3	Other Constituents	Temperature, °C.
A	2.0 M	0.1 M	0.01 M $Cu(NO_3)_2$, H_2S saturated	20 to 25
B	2.0 M	0.1 M	0.05 M 2, 3, dimercapto propanol-1	50
C	2.0 M	0.1 M	0.05 M Beta-mercapto propionic acid	50
D	2.0 M	0.1 M	0.05 M Beta-mercapto propionic acid 0.1 M Urea	50

When exposed to solution A at 25 C, 304 L stainless steel showed severe local attack and pitting and corrosion rates of 0.0009 and 0.0095 inch per month penetration. The coupons were tested in solutions into which H_2S was bubbled for two hours; one coupon was left in the solution for 16 hours and the other coupon for 64 hours before weighing. Specimens of Types 347, 309 SCb, and Carpenter 20, which were removed for weighing immediately after two hours of continuous H_2S bubbling, showed no signs of attack and suffered no weight

loss. Tests to date with solutions B and C at 50 C and solution D at 25 C indicate that the four types of stainless steel are not seriously attacked under these conditions.

REDOX DEVELOPMENT

Process Studies

Redox Head-End Economics - An economic study was made to determine the savings in chemical and waste storage costs which might be made if the new streamlined head-end treatment (i.e., feed solution made 0.075 M in $KMnO_4$ and later dissolved with the stoichiometric (plus 5 per cent) amount of $Cr(NO_3)_3$) were to provide enough additional decontamination to permit elimination of the Redox third uranium and plutonium cycles. Increased chemical and waste storage costs for the head-end treatment are approximately $400 per ton of U processed. Calculated savings in chemical and waste storage costs as a result of eliminating the two third cycles are $350/ton of uranium (for the third plutonium cycle) and $700/ton of uranium (for the third uranium cycle). Thus calculated annual costs for 2400 tons processed are as follows:

Process Step	$/Ton	$/2400 Tons
Streamlined Head-End (Cost)	$ 400	$ 960,000
Third Pu Cycle (Saved)	350	-840,000
Third U Cycle (Saved)	700	-1,680,000
Potential Annual Savings*	=	$1,560,000

* Based on full Phase II rates, provided both the third cycles can be eliminated. Approximately the same savings would result if employment of the streamlined head-end procedure permits back-cycling of both the 3DW and the 2DW waste streams.

Plutonium Continuous Concentration Equipment - Document HW-27996, "Operational Characteristics of the Purex and Redox Phase II Plutonium Continuous Concentrator Package", was issued. This document examines the plutonium continuous concentration equipment designed for the Purex Plant to determine whether it is adequate for use in the Redox Plant at Phase II processing rates. It is concluded that the excess nitric acid expected to be present in the Redox 3PB may be reduced to the allowable HNO_3/Pu ratio of no greater than 0.1 gram mole of HNO_3 per gram of Pu without exceeding the concentration and deentrainment capacities of the equipment if the product concentration is increased to the range of 85 to 100 g. Pu/l.

Materials Testing

Protective Coatings - Specimens coated with Amercoat 1574 and with Phenoline 300 have been immersed in hexone for 89 days. The Phenoline 300 has been unaffected and the Amercoat 1574 has shown no effect other than turning yellow after 8 days of immersion.

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Separations Technology Sub-Section

URANIUM RECOVERY DEVELOPMENT

Process Studies

Studies are continuing as a part of the long range planning for the Uranium Recovery Operation to determine the process and equipment modifications which are required to process the changing TBP Plant feeds at accelerated rates to permit completion of the recovery operation by December 31, 1954.

It appears promising that the goal could be achieved by revising the existing equipment to provide additional decontamination and processing capacity. Several schemes are being evaluated for which investment costs are estimated to be approximately $300,000.

For any of the methods being considered it appears that the waste storage situation will be critical. Although it appears that the volume of waste produced may be stored in the tankage available, the excess storage capacity at times is so small that tank farm flexibility may be seriously affected. Since cribbing of a portion of the waste would considerably "free up" the tank farms, a proposal for cribbing is being investigated.

Process Chemistry

A series of rate tests has been initiated for the laboratory reduction and hydrofluorination of UO_3. Incomplete results indicate that the presence of water vapor during the reduction step may accelerate the rate of reduction of UO_3 to UO_2 without the actual formation of the UO_3 hydrate.

UO_4 Precipitation: Decontamination from Fission Products

The decontamination of RCU from fission products was determined by precipitating UO_4 from an RCU prepared in the laboratory from a synthetic 1 year old RAF under TBP-HW No. 4 Flowsheet conditions. The data indicate that adequate decontamination is obtained to meet product specifications for both beta and gamma emitters.

Mechanical Development

Base Metal-Ion Contamination in 60 per cent UNH - Base metal-ion contamination experienced in concentrating RCU to 60 per cent UNH is being investigated in a single tube long tube evaporator in the 321 Building "Cold" semiworks. When this single tube evaporator was fed at a rate equivalent to 4 tons U/day in the U.R. Plant uranium product concentrator, EB-1, the iron contamination was approximately the same as found in plant 60 per cent UNH (450 to 820 parts Fe per million parts U). A two step concentration to 60 per cent UNH, first 6 to 40 per cent and second 40 to 60 per cent, resulted in a reduction of the total iron contamination to 100 parts Fe per million parts U.

Separations Technology Sub-Section

Continuous Calcination

The pilot plant fluidized bed continuous calciner has been completed sufficiently to allow initial cold operation and is approximately 95 per cent complete for elevated temperature test operation.

The turbine type dust separator (2170 rev./min., 10 inch rotor, 14 inch body) was tested with magnesium oxide dust. Dust removal efficiencies of over 99 per cent were obtained at air rates of 15, 35, and 55 cu.ft./min. The median particle size of the feed was 18 microns (measured by sedimentation), and that of the dust passed was approximately 1.3 microns (measured by cascade impactor).

MISCELLANEOUS SEPARATIONS PROCESS DEVELOPMENT

321 BUILDING OPERATION

Construction of the Purex Prototype Facility is approximately 83 per cent complete. Architectural and structural work is 90 per cent complete with only non-critical items (handrails, black top, etc.) remaining. With the exception of the column and concentrator connections, process piping is complete. The HA and HC Columns, concentrator, HA pulse generator, agitators, and pumps are installed. The 2A Column and HC pulse generator are completed, but not installed. Beneficial occupancy of the prototype facility should occur on June 15 with all equipment on hand and installed except the demineralizer and tank temperature control.

HOT SEMIWORKS

Two full Hanford radioactivity level runs (HR-6 and 7) were completed during the month and a third one (HR-8) is in progress.

The first half of run HR-6 was off standard in that the uranium dissolution was terminated after fifteen hours of boiling with considerable acid remaining. Starting with the second cut of HR-6, no air was sparged through the dissolver solution during the uranium dissolution. On all previous cuts, air was introduced via the sparger (no other air supply exists) to supply oxygen in an attempt to minimize acid consumption. In this cut, however, this air supply was cut off to evaluate any possible effect of the air sparge on decontamination. The ICU's and IBP's from the two cuts were combined and the second cycles run from common feed stocks. Tentative conclusions from this run are as follows:

1. The decontamination obtained in the first cycle when processing feed stock from the off standard dissolution was approximately the same as that obtained in HR-5 (see table of decontamination data, below). No adverse effect can be ascribed to the off standard dissolution.

2. The second cut, made without air sparge, gave better decontamination than any previous Hot Semiworks run, improvement being noted in both ruthenium and zirconium-niobium decontamination. It is now thought that HR-6B is

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representative of Hot Semiworks "standard operation", and that the second cycle performance is near "standard". Future dissolvings in the Hot Semiworks will be made without air sparge.

Runs HR-7 (completed) and HR-8 (in progress) were designed to explore the feasibility of volatilizing ruthenium from dissolver solution with permanganate.

The first run in this series (HR-7), made according to the procedure outlined in last month's report, resulted in complete destruction of the initial 0.072 M permanganate addition in less than 1 hour at 55 C. At this point a second (and equal) charge of $KMnO_4$ was added and the run was continued. The second charge was 87 per cent destroyed after 1 hour at 75 C and 1 hour at 95 C. The Ru decontamination factor over the head-end step was in the approximate range of 5 to 20, a more nearly exact value being obscured by sampling and analytical difficulties. Since it has been shown that the effect of radiation (during digestion) does not account for the observed reduction of $KMnO_4$, it must be assumed that the mechanism of reduction is based on the initial reduction of $KMnO_4$ by an agent such as peroxide (formed by radiation) which gives a catalytic form of a manganese oxide, which in turn causes the destruction of the initial charge of $KMnO_4$. To test this, two identical Moxie runs were made, in the Process Chemistry laboratory, one spiked with Fe^{+++}, the other not spiked. No difference was noted, and for this reason, the plans for such a test in the Hot Semiworks were dropped. The next Hot Semiworks run (HR-8) was piloted in the Moxie on the basis of a "sacrificial" charge of $KMnO_4$ of 0.02 M, heated to 95 C for one hour, followed by an additional 0.052 M, the solution then being heated to 55 C for 1 hour, 75 C for 1 hour, and 95 C for 1 hour. When this was done in the Hot Semiworks the initial charge was reduced completely, but the second charge was less than 10 per cent reduced. The data are incomplete at present, but a Ru D.F. of approximately 100 was obtained across the feed preparation step.

The decontamination performance obtained to date in the Hot Semiworks is summarized below:

Hot Semiworks Redox Performance

Stream	Gamma dF (Log Values) HR-5	HR-6A	HR-6B	HR-7	Redox Plant (For Comparison)
ICU	2.85	2.80	3.2	3.6	3.7
2EU	5.1	5.2		5.9	5.6
IBP	3.1	3.5	3.9	3.9	3.9
2BP	5.2	5.5		6.0	5.6

Conversion to Purex

The initial scoping and preparation of the project proposal for the conversion of the Hot Semiworks to a Purex process was started during the month. Early estimates indicate that the project will cost on the order of $670,000. Construction is scheduled (tentatively) to be started in October and completed in February.

Separations Technology Sub-Section

REDOX PLANT ASSISTANCE

Plant Performance

The Redox Plant operated at a 87.8 per cent time efficiency (IAF Basis) and averaged 5.0 tons of uranium per operating day during the month. With operation at an instantaneous rate of approximately 5.5 tons U per day, improvement in plutonium decontamination was achieved by a comprehensive flush of the Plutonium Cycle columns and product tanks; a considerable (approximately one half per cent) reduction in plutonium losses was achieved by minor flowsheet changes. The following is an overall summary of plant production performance for the month of April:

	Approximate
Tons Uranium Shipped	132.1
Plutonium Processed (Batch Equivalents)	185.7
Per Cent Uranium to Waste	0.77
Per Cent Plutonium to Waste	1.61

Operating Performance

A complete shutdown of the Redox Plant was effected on March 25 because of the loss of approximately 600 units of plutonium from the 2A Column via the aqueous waste stream. This loss resulted from operation of the column for an extended period under apparent flooding conditions; although several hypotheses have been advanced, the exact cause of a flood has not definitely been established.

Because of continued overflow difficulties in the 2A and 3A Columns, an extended plant shutdown was made on April 12. The 2A and 3A Columns and overflow lines were backflushed to remove solids. As a consequence of this flush, a considerable quantity of solids (containing adsorbed Zr-Nb activity) were permitted to enter the 3BP Receiver and Sampler tanks, and the shutdown period was extended until April 15 in order to rework the contaminated product solutions.

Production was reestablished on April 15 at approximately a 5.5 ton U/day rate and maintained essentially at this rate until the end of the report period, with the exception of short term, partial shutdowns for IA Column flushes on April 17 and 24.

Stack Activity

Activity released to the atmosphere through the ventilation stack has been erratic during the month due to failures of two Silver Reactors. Regeneration of the Silver Reactors brought the activity discharged under control.

Process Performance

The following table summarizes decontamination performance data by solvent extraction cycle. Because samples of individual column aqueous waste streams

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cannot be obtained regularly (due to gross contamination of samplers which occurred in February), overall waste losses only are given:

Period covering 4/17/53 to 4/24/53; nominal production rate of 5.5 tons U/day (IA Column at 3.75 tons U/day in parallel with IS Column at 1.75 tons U/day), processing 90-day "cooled" metal.

Cycle	Gamma Decontamination Factors (dF)		% to Waste	
	U	Pu	U	Pu
1st	3.5	3.9	---	---
2nd U	1.9	---	---	---
3rd U	0.8	---	---	---
2nd Pu	---	1.8	---	---
3rd Pu	---	0.8	---	---
	6.2	6.5	1.0	1.2

Feed Preparation

The procedure of dissolving 4.95 tons of uranium in two cuts has been continued and the dissolvers were charged during the month with 26 charges of uranium having an average pile exposure of 575 (527 to 614) MWD/T. The water rinse of the slugs following coating removal has been replaced with a 5 per cent HNO_3 rinse in order to test the possible effect of this change on IAF clarity and IA Column stability; a standard loss has not been adopted for the acid rinse, but the increase in loss is apparently on the order of 0.02 per cent of plutonium and uranium. The average age of 36 IAF batches prepared was 92 (80 to 116) days.

Uranium Extraction and Decontamination

In general, nominal conditions of the ORNL June, 1949 (acid-deficient) Flowsheet (Document HW-22834) were employed for the First Extraction Cycle and the Second Uranium Cycle. The 3D Column has continued to operate as a dual-scrub column with the 3DS introduced at the 3DF feed inlet tee and the 3DA introduced at the top of the column.

Plutonium Extraction and Decontamination

The flowsheet currently employed in the Plutonium Cycles is summarized below:

1. Solution Specifications

   2AF, 2AX, 3AF, 3AS, 3AX - same as HW #4 Flowsheet
   2AS - same as 3AS, and
   2BX and 3BX - 0.04 M HNO_3

   Nitric acid is again being used in the 2BX and 3BX streams because of evidence of entrainment of emulsion (relatively high in Pu content) into the

organic waste streams from the 2B and 3B Columns operating at current higher rates when water was used.

2. Flow Rates

The flow rates are adjusted to maintain an (aqueous/organic) flow ratio in the 2A and 3A Column extraction sections equal to 1.4 and in the 2B and 3B Columns equal or greater than 0.2.

Considerable difficulty has been experienced due to binding of the 2AP and 3AP overflow lines. Evidence points to the presence of accumulated solids in the overflow lines which apparently restrict the flow and which also have adsorbed significant quantities of Zr-Nb from past operation. As a result of contamination of product solutions with solids from the columns and from dirty PR Cans, filtration of Redox PR solutions in 231 Building has been performed on most batches since S-53-4-L-105. In order to prevent solids in Redox PR solutions, an effort is being expended to assure clean PR cans, and an adequate column flushing technique is being developed. Eight PR batches and three acid washes of the PR cage were shipped to 224-T Building (vice 231 Building) for further processing because of excessive activity.

Solvent Extraction: Waste Back Cycle - The comparison of single scrub vs. dual scrub IA Column type operation under conditions of 2DW and 3DW back-cycling as IAS has been extended by studies in a Mini (miniature mixer-settler) on a continuous basis. The results are in fairly good agreement with the earlier batch data and show that under dual scrub conditions in the IA Column, 3DW used as IAS gives approximately the same fission product decontamination as synthetic IAS. However, contrary to the earlier batch data, back cycling of 2DW to the IA Contactor resulted in a 2 to 5-fold loss in decontamination.

Back cycle of 3DW as 2DS in single scrub and dual scrub flowsheets was studied by counter current batch contacts consisting of three extraction stages and two scrub stages. The highest decontamination factors (nearly twice those attained under single scrub conditions) were achieved using 1.25 M ANN as 2DA (terminal scrub) and a 2DX:2DF:2DS:2DA volume ratio of 485:100:47.5:100.

Recycle of 231 Building Supernatants - Batch contacts were made in the laboratory to evaluate the effects of recycling both oxalate and peroxide supernatants from the 231 (Isolation) Building to the Redox process prior to LAF preparation. On the basis of these studies, recycling of these supernatants in the Redox Plant under controlled conditions is not expected to exhibit adverse solvent extraction behavior.

URANIUM RECOVERY PLANT ASSISTANCE

Tank Farms - Feed Preparation - Waste Disposal

During the month 690,000 gallons of alkaline stored waste containing 224.6 tons of uranium were removed from the "B", "C", and "U" tank farms. The

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effectiveness of water sluicing as an alternate method to supernate for mining "hard" uranium bearing sludges from the 75 foot diameter storage tanks has been further demonstrated in both East and West Areas with maximum rates of 6.1 and 6.6 T/D attained, respectively. The 101 U Tank has been essentially emptied with the removal of about 55 tons of uranium, using water as sluicing agent. No change in uranium removal rates was experienced in 101C when using a sluicing nozzle with an enlarged (1.75 inch) bore. The use of modified Johnston pumps for supernate transfer was initiated during the month. Maximum tank farm production rates of 60 tons uranium per week were sustained for two weeks from three tank farms and then at 40 tons uranium per week from two farms for an additional week. The overall tank farm on-stream efficiency was ca. 86 per cent. Down time was mainly due to electrical and pump failures. Continued efforts directed toward improvement of uranium removal rates and the planned utilization of supernate for blending with water sluiced material should result in even higher future tank farm production rates.

Some scaling difficulty was experienced during feed concentrator operation when using acidified feeds prepared from water sluiced slurries. It is probable the solubility of UO_2HPO_4 was exceeded at the concentration and temperature experienced during evaporation, since additional HNO_3 used before concentration eliminated this difficulty. Concentrated feeds were centrifuged for only approximately 50 per cent of the month.

The volume of waste returned to the tank farms was 1.16 times the volume of alkaline waste removed with a volume equivalent to 3530 gallons per ton of new uranium processed. No unusual difficulties were encountered but several evaporator tube cleanouts were again required to maintain good heat transfer values. Neutralization and concentration of wastes was carried out to give a final pH of 9 to 10 and density of 1.35 at 80 C.

Solvent Extraction Performance

The solvent extraction batteries processed 234 tons of uranium including 16 tons of rework with a waste loss of 2.7 per cent based on new feed. Essentially TBP HW No. 4 Flowsheet conditions were employed using 30 volume per cent TBP in hydrocarbon diluent as extractant (RAX) in "A" Line and 12.5 volume per cent TBP as "B" Line RAX. Summary data are:

Line	Range of Nominal Production Rates T/D	Tons U Processed		Average Rate T/D	Average Loss % Feed U(a)	On-Stream Efficiency Per Cent
		Virgin	Rework			
A	2.5 to 5	96	15	3.7	2.8	90
B	2.5 to 6	122	1	4.1	2.5	94

(a) Grab sample basis

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Separations Technology Sub-Section

Down time on A Line was experienced due to a short duration (50 hours) feed shortage during which modifications to increase the capacity of the RAW and RCU letdown valves were completed. Tests indicated the new capacities to be 35 and 40 gal./min., respectively, to give potential capacities of 9.3 and 7.8 T/D, respectively, under TBP HW No. 4 Flowsheet conditions. In addition, both A and B Lines were shut down for 24 hours due to condenser vent blower motor failure causing feed concentrator shutdown. A period of reduced operating rates (3 to 4.5 T/D) on A Line was caused by breakthrough of significant quantities of 65 hour Y^{90} during the processing of UR water-slurried feed.

General Performance

Average RA Column extraction waste losses were 2.6 and 2.2 per cent of new feed uranium for A and B Lines, respectively. Transient high losses (over five per cent) were experienced during periods of inadequate feed uranium concentration control. Interface jetting was successful in giving a two to four-fold reduction in RAW uranium losses in some cases. The effectiveness of interface jetting in waste loss reduction may be indicative of the removal of interface-favoring solids which were possibly introduced in larger than normal quantities during periods of uncentrifuged feed processing. No comparable improvement in dF was noted which could be attributed to interface jetting. RC Column losses were generally low with average values of 0.2 and 0.3 per cent of feed uranium in RCW for A and B Lines, respectively. Uranium was removed from RCW essentially quantitatively to the ROW in the RO Columns employing five weight per cent Na_2SO_4 as RO scrub. Gross beta, gamma, and plutonium log decontamination factors were 3.7, 4.3 and 1.3, respectively, for A Line and 3.9, 4.1 and 1.3 for B Line. Average product (RCU) fission product activity for A and B Lines was 65 and 45 per cent, respectively, of natural uranium beta with 65-hour yttrium-90 contributing 40 to 90 per cent of this value. Spectrochemical assays of random product (RCU) batches gave metallic impurity values at generally less than 140 parts per 10^6 parts U.

Solvent Treatment

Solvent treatment proceeded routinely with five weight per cent Na_2SO_4 washes in the RO Column and approximately twice-weekly batch washes with five weight per cent Na_2CO_3. It is planned to test the use of 2 to 2.5 weight per cent $Na_2C_2O_4$ as wash in the RO Column since laboratory data indicate that solvent quality should be satisfactory and semiworks "cold" run data indicate adequate RO Column capacity (up to 10 T/D).

Calcination

During the month, 334 tons of uranium as UO_3 were produced from 1245 calcinations. This total production was composed of a blend of 65 per cent TBP and 35 per cent Redox source uranium. Six carload UO_3 shipments were sent to the Harshaw Chemical Company because of continued high corrosion-product impurities. Four additional carloads contained metal impurities at a level

acceptable to K-25 (for testing purposes) as a result of the high Redox source uranium content of the product UO_3 and corrosion tests in progress. Product UO_3 beta, gamma, and plutonium specifications were not exceeded.

A test was initiated to permit further evaluation of the effectiveness of seven plates for tributyl phosphate stripping (vice the nine plates customarily employed), but the test was cancelled after 24 hours because of excessive foaming in the pots. A stripper-bottoms analysis indicated 90 p.p.m. of TBP, an increase of 80 p.p.m. over the average of analyses obtained during nine plate operation. However, since the L/V ratio was later found to be higher than normal (2.5 vs. 2.0), it is planned to again repeat the test under normal L/V ratios.

An inverted-type cyclone deentrainment chamber was designed for use with the nine plate stripper arrangement. Calculations show that the cyclone should operate with greater than 90 per cent efficiency and the pressure drop should be less than one inch of water.

A 60 per cent UNH evaporator tube submergence test was conducted over a five-day period. The test was designed to determine whether corrosion rates are a function of entrainment erosion or apparent liquid-metal contact area. Both E-B-1 and E-D-1 Concentrators were operated with the liquid level at weight factors of 30 to 60 (approximately 80 to 175 inches). Spectrochemical analyses of the concentrates (60 per cent UNH) indicated that operating liquid level has no significant effect on corrosion.

A test was performed to check Chemical Development data which indicated that the corrosion of Type 309 stainless steel is not excessive over the range from 6 to 40 per cent UNH. E-B-1 was operated at approximately 5 tons of uranium per day to yield 40 per cent UNH concentrate and, in order to maintain suitable feed for the 100 per cent UNH concentrator, E-D-1 was operated to yield 80 per cent UNH concentrate on the remainder of the TBP Plant production. Corrosion product pick-up in both concentrators was lower by a factor of two than that obtained for normal operation on a 60 per cent UNH concentrate.

The capacity of the 100 per cent UNH Concentrator, E-D-2, dropped sharply during the month; over-all heat transfer coefficients as low as 50 B.T.U./(hr.)(ft.^{2})(°F.) were obtained. The major cause of trouble was a faulty steam trap, although scaling of the tubes may have been a contributing factor since a tube boil-out and flush with water resulted in improved performance. At month's end, heat transfer coefficients have shown an increase to ca. 90 B.T.U./(hr.)(ft.^{2})(°F.)

The X-19 (100 per cent UNH) Pump graphitar bearings failed 3 times during the month. Glass-bearing pump installation was postponed, initially, because the last pump shaft was used to replace a badly scored shaft removed from the graphitar-bearing pump. Glass-bearing pump assembly was started upon the arrival of a new shaft, but the top glass bearing was cracked in the attempt. A replacement glass bearing will be ready for use about May 1.

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The pot room production rate ranged from a low of 1.2 tons of uranium as UO_3 produced per day to a new high of 17 tons of uranium as UO_3 with an average daily production for the month of 11.1 tons of uranium. Calcination pot charges averaged 537 pounds of uranium. The minimum charge processing rates were caused by a hard cake formation during the mastic stage. High agitator motor overloads during this stage tripped the agitator circuit breakers. Upon cooling, the charge formed a very hard cake, which could be removed only by chipping. The calcining time cycles ranged from 6.8 hours for non-caking feeds to 23 hours for the hard-cake material. Analyses showed iron as the only cation present in abnormally high concentration in the feed causing the hard-cake formation. This material was segregated and stored in RCU Storage Tank X-2 for blending with current feed.

The installation of UO_3 deentrainment chambers on the pot fume-vent lines is nearing completion. Only one chamber remains to be installed. A significant reduction in the frequency of vent-line plugging is already apparent.

Nitric acid recovery proceeded routinely. The amount of entrained uranium averaged 6.3 pounds per pot charge, representing a 0.4 pound per charge reduction from last month. This reduction is attributed to the increase in the number of installed UO_3 deentrainment chambers.

The dust loading in the air stream leaving the X-5 Cyclone was measured at 6.8 grains per cubic foot during the unloading of one pot. The mean particle size of this dust was ca. 2 microns. These instantaneous measurements indicate a cyclone efficiency of 98.5 per cent. A subsequent 24-hour normal production load-out test gave 30,303 pounds of UO_3 collected by the X-5 Cyclone and 2,158 pounds of UO_3 collected by the X-3 Bag Filter, thus indicating an over-all average cyclone efficiency of 93.4 per cent. A detailed report, X-5 CYCLONE OPERATING CHARACTERISTICS, has been prepared and will be issued.

The stored, high-butyl phosphate content 60 per cent UNH was removed from RCU Storage Tank X-2 and transferred to Underground Waste Storage Tank 111BY for later processing in the TBP Plant. The transfer was performed without incident.

Waste Evaporation - B and T Plant Operations

The waste evaporator at B Plant processed 364,529 gallons of feed (previous evaporator bottoms) into 279,867 gallons of concentrate and 120,582 gallons of condensate for a waste volume reduction of 30.1 per cent.

The waste evaporator at T Plant processed 535,562 gallons of feed (previous evaporator bottoms) into 420,112 gallons of concentrate and 179,939 gallons of condensate for a waste volume reduction of 30.0 per cent.

Separations Technology Sub-Section

Process Chemistry

Solvent Extraction - Effect of Additional Scrub Stages - The range of beta and gamma (arithmetic) D.F.'s measured across a single batch-contact scrub stage with simulated current metal waste was 4 to 8 and 2 to 5, respectively. A second scrub stage resulted in an additional beta and gamma D.F. of approximately 1.5. A third, a fourth, and a fifth scrub stage resulted in beta and gamma D.F.'s in the neighborhood of 1.2 per stage.

Effect of Acidity on D.F. - From a study of decontamination of simulated one year old waste as a function of stream composition the favorable effect of high HNO_3 appears to be most important at the feed plate.

Flowsheet Variations - By means of the Mini (miniature mixer settler), RA Column single scrub and dual scrub flowsheets were compared under varying conditions of scrub stream flows and compositions, with regard to the decontamination of the 5.5 year old waste currently being processed in the Uranium Recovery Plant. It appeared that with this older waste there is little or nothing to be gained from 1) dual scrub RA Column operation, and/or 2) increased acid concentration at (or immediately above) the feed point. It can also be seen that increased acidity at the top of the column increases the radio-yttrium concentration in the product stream when this 5.5 year old waste is processed.

Decontamination of BX and TX Tank Farm Supernatants - This work was extended to include supernatant from the Tank 101-TX. This waste, approximately the same age as the BX Farm material but of a different irradiation history, and resulting greater fission product content, will not be readily decontaminated to meet specifications under normal HW No. 4 Flowsheet conditions.

UO_3 Reactivity - Results of reactivity tests on plant UO_3 samples during the month are summarized below. The conversion ratios are based on the Mallinckrodt T-268 standard.

Carload	% UF_4	Conversion Ratio
053 to 060	88.9 to 93.9	0.96 to 0.99

Z AREA - ISOLATION, PURIFICATION AND FABRICATION PLANT ASSISTANCE

Isolation Building

Plutonium IV Oxalate Filter Boat Process

The 50 C oxalate strike temperature is now routine. Normal filtration times range from 50 to 90 minutes; occasionally two hour filter times are encountered. With the 35 C strike temperature, previously used, 6 to 14 hour filter times were common.

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Separations Technology Sub-Section

T-Plant High Recycle

The combination of flushing 224-T process tanks, a 12 to 14 per cent increase in peroxide addition and renewal of the 30 minute peroxide digestion has lowered the recycle from 15 to 95 per cent (ca. 75 runs) to 8 to 20 per cent (ca. 15 runs). One high recycle (90 per cent) supernatant was reduced to five per cent by complexing fluoride with aluminum nitrate.

Purification and Fabrication Building

Task II - Hydrofluorination

All Task II production passed through the RM Line equipment. The rehydrofluorination rate based on poor fluoride color was 22 per cent. The March rehydrofluorination rate was 31 per cent.

Silicone rubber "O" ring gaskets proved to be unsatisfactory for Task II furnace door seals. A knife-edge sealing against a teflon ring was tested using door E on furnace 4. Corrosion of the stainless steel knife-edge caused this sealing mechanism to fail. A Hastelloy knife-edge is being fabricated for further study.

Pressure surges in the Task II furnaces caused furnace doors and boats to be expelled on two occasions. A third known pressure surge jarred a furnace door loose. Special precautions being undertaken while studies are being made to determine the cause(s) of the incidents include: (1) Installation of latches to prevent furnace doors from being completely dislodged; (2) Checking of the heating elements of the HF lines to assure introduction of HF vapor (and not HF liquid) into the furnace; (3) Purging of HF cyclinders prior to putting them on the line to remove hydrogen, if present.

Task III - Reduction

All Task III production passed through RM Line equipment. Reduction yields averaged 95 per cent. Both the March and February reduction yields were 95 per cent. A total of four boil overs occurred during the report period. Boil overs have been duplicated previously in laboratory equipment by rapid evacuation during vacuum purging and it is interesting to note that the poor yields occurring with boil over is nicely correlated with the size orifice in the furnace, the larger orifices giving the lower yields.

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A report of invention titled "Refractory Composition for Reduction Casting Crucibles" was prepared.

Filter Boat Design

Design of the filter boat has been altered to correct deficiencies noted during mechanical testing of a lucite model. Completion of the design is dependent on completion of materials of construction testing.

234-5 DEVELOPMENT

Plutonium (IV) Oxalate Precipitation

A laboratory investigation of the plutonium valence adjustment step in Task I has shown that, at 50 C, the hydrogen peroxide must be added much more slowly to Redox PR solution at 60 g/l plutonium than is the current practice in the 231 Building with 10 g/l plutonium; otherwise, the hydrogen peroxide decomposition may be so vigorous as to cause the solution to overflow the precipitation vessel. The slow addition may be performed either immediately prior to, or simultaneously with, the addition of oxalic acid.

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Separations Technology Sub-Section

Plutonium Sulfate Precipitation in AT Solution

Laboratory studies have shown that the sulfate concentration in AT solution (at 350 to 450 g/l plutonium) must not exceed eight grams per liter if the precipitation of plutonium sulfate in sample cans is to be avoided.

Task II - Freonation

Further investigation of the use of Freon-12, as a fluorination agent in place of HF in Task II, has been abondoned for the following reasons:

a. Although non-corrosive at room temperature, Freon-12 has on occasion rapidly attacked inconel, Hastelloy C, and Haynes Alloy 25, at 450 C. At 550 C, freon-12 is highly corrosive to the above named alloys and to copper, nickel, molybdenum, and quartz.

b. In contact with platinum and plutonium oxide, thermal decomposition and polymerization of Freon-12 have been observed at temperatures as low as 450 C, producing materials which deposit upon the cooler surfaces of the off-gas lines. At temperatures as low as 650 C, the polymerization is extensive when the gas is in contact only with quartz and platinum or gold.

Task III - Reduction

No complete remedy for the slag to metal sticking problem was discoverd in a series of six plant scale reductions in which the use of sulfur was re-examined. It was concluded, however, that the task of separating and cleaning the button can be made somewhat easier by a combination of the following:

a. Use of a crucible having a reduced diameter at the bottom generally gives a better formed button and one with less surface area to be cleaned.

b. Addition of a small amount of iodine (>10 grams) along with sulfur may aid the rate of pickling in nitric acid.

Evaluation of Low Temperature Fluorides

Laboratory reduction (40 gram scale) of four samples of plant PuF_4 has shown no significant difference between powders prepared by hydrofluorination at 500 C and at 600 C. Bomb pressures of 180 to 190 pounds were produced in all cases.

Separations Technology Sub-Section

Single Column Operation of the Recuplex System

A short study demonstrating the mechanical feasibility of combining the extraction, scrubbing, and stripping operations of the Recuplex system into a single column was carried out in a pulsed mixer-settler extractor (HW-27739) of 1 inch i.d. and 29 inch overall length, using Flowsheet 9B with uranium as a stand-in for plutonium. No difficulty was encountered in removing an organic free aqueous product stream from the middle of the column. Equilibrium data for this system indicate that for a unit of this diameter an overall column length of about 40 inches would be needed to achieve flowsheet waste losses.

Initial Test of the Annular Pulsed Mixer-Settler Extractor

A compact solvent extractor, called the "annular pulsed mixer-settler column", has been tested on a cold Purex 1A simple extraction section system. This unit has an overall column length of 5 inches and an i.d. of 2 inches with an effective cartridge length of 3 inches. The one run made thus far gave an H.T.U. of 0.26 inch and an H.E.T.S. of 0.80 inch at a IAW concentration of 0.008 g UNH per liter (0.002 per cent loss). These results give an overall stage efficiency of a little over 75 per cent.

234-5 PROCESS RECOVERY

Hood 40 Operations

On April 7, 1953, Hood 40 (skull dissolver) operations were converted from a one run per day basis to a two run per day basis and operations have continued without incident with stored metal wastes now being recovered at a rate of 7.5 to 8 Kg. per month. Processing of stored metal laboratory sample remnants for both plutonium and amercium recovery was commenced during the month and at month's end approximately 2 Kg. of this material had been processed through Hood 40.

Recuplex

Directive No. HW-279, Modification No. 4, assigning management of Project CG-496, the Recuplex Installation, and Project CG-534, Removal of Recovery Equipment in the 234-5 Building, to the General Electric Company, was issued by the Atomic Energy Commission on April 7, 1953. The two projects were combined as one project. The Project Authorization for the combined projects was issued by the Appropriations and Budget Committee on April 9, 1953.

Discussions with personnel in Radiological Engineering, Radiological Sciences Department resulted in a plan to dispose of the solvent extraction waste stream by cribbing and the slag and crucible waste stream by a cascade system rather than storing the solutions in underground tanks. The relaxation of the cribbing limits has thus resulted in a savings of $100,000 in Recuplex construction costs and an annual waste storage savings of $40,000 to $60,000.

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Separations Technology Sub-Section

It has been determined that the periodic removal of accumulated uranium from the Task I supernatants can be accomplished by a modification of the Recuplex solvent extraction equipment to permit the operation of a uranium-plutonium partition flowsheet in the CA Column and thus eliminate the need for an ion exchange system. The reduction in the amount of installed equipment has resulted in a cost reduction of approximately $35,000.

INVENTIONS

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

INVENTOR	TITLE
Robert J. Anicetti	Refractory Composition For Reduction Casting Crucibles.

V. R. Cooper

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

May 13, 1953

VRC:bp

[redacted]

May 11, 1953

APPLIED RESEARCH SUB-SECTION

April, 1953

VISITORS AND BUSINESS TRIPS

[illegible] W. [illegible], University of Texas, Austin, spent April 6-10 at Hanford as a Con-[illegible] [illegible] research problems.

[illegible] M. Slansky, American Cyanamid Company, Arco, Idaho, spent April 6-8 discussing chemical separations and metallurgical examinations.

[illegible] H. [illegible], University of Washington, Seattle, spent April 15 discussing fluorine chemistry applications to separations processes.

R. [illegible] Kagel, General Electric Company, ANP Project, Lockland, Ohio, spent April [illegible] discussing automatic titrations and mass spectrometers.

Z. M. Krivobok, International Nickel Company, New York City, spent April 22 inspecting stainless steel failures and making recommendations for improvement.

[illegible] R. [illegible], Air Reduction Pacific Company, Seattle, spent April 23 delivering an Airomatic welding gun and giving instructions how to operate it.

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M. J. Sanderson and J. J. Cadwell spent April 13-15 at Brookhaven National Laboratory, Upton, Long Island, New York, attending a metallurgy information meeting; the afternoon of April 15 was spent at Sylvania Electric Products Company, New York City.

J. J. Cadwell spent April 16 at Knolls Atomic Power Laboratory, Schenectady, in consultation on metallurgical problems; April 17 at Northwestern University, Evanston, Illinois, and April 18 at the University of Wisconsin, Madison, recruiting technical personnel.

W. H. Swift spent April 27-29 in Toronto, Ontario, attending an AICHE Meeting. April 30 was spent at the North Carolina State College, Raleigh, discussing work on liquid-liquid extraction contactors.

G. J. Alkire spent April 27-28 at American Cyanamid Company, Arco, Idaho, discussing mass spectrometry.

J. E. Faulkner spent April 28-29 at Oak Ridge National Laboratory, Oak Ridge, Tennessee, discussing cross section measurements.

J. E. Faulkner and W. J. Ozeroff spent April 30 in Washington, D. C., attending an American Physical Society Meeting.

W. R. Smith spent April 30 in Spokane with the Kaiser Aluminum Company discussing procedures for setting up a welding laboratory.

ORGANIZATION AND PERSONNEL

Personnel totals as of April 30 were as follows:

	Exempt	Technical Graduates		Non-exempt	Total
		Permanent	Rotational		
Physics Unit	28	3	2	10	43
Metallurgy Unit	38	4	4	25	71
Chemistry Unit	52	-	3	14	69
Administration	2	-	-	1	3
Total	120	7	9	50	186

METALLURGY

Effects of Irradiation on Properties of Uranium

The dimensional changes which occur in uranium slugs as a result of irradiation have been correlated with the preferred crystallographic orientation which the fuel element exhibits due to the rolling procedure employed during its fabrication. Length and diameter measurements obtained before and after irradiation on twenty-four slugs of known crystallographic orientation and fabrication history show that the pile growth of uranium metal fuel elements is directly related to

the type of orientation exhibited by the fuel element prior to irradiation. Samples with the b - axis oriented in the rod direction were found to increase in length and decrease in diameter while samples with the b - axis oriented normal to the slug axis were found to decrease in length and increase in diameter. Samples with both textures predominating remained essentially unchanged in length. The growth coefficients during thermal cycling on samples from these same rods were all positive, thus indicating that the mechanism by which in-pile distortion occurs differs from the thermal cycling effect.

The electrical resistivity and the temperature coefficient of electrical resistivity has been measured on nonirradiated and irradiated specimens. An increase of approximately 3% in the resistivity of the irradiated specimen was noted when compared with measurements on a nonirradiated specimen.

The X-ray diffraction pattern of a sample from an irradiated slug has been obtained using the recently developed double crystal X-ray spectrometer. The wafer used during this test had received an exposure approximately one-fourth that of normal process material and shows no marked changes in crystallographic characteristics which could be observed by X-ray diffraction results. This observation, though preliminary in nature, is significant in that it suggests that a recovery of irradiation-induced damage occurred at the temperature at which this slug was exposed in the pile.

Preliminary results with an aluminum replication technique for obtaining electron micrographs have indicated the applicability of the method to the study of nonirradiated and irradiated uranium. No major difficulties were encountered during the replication of an irradiated specimen with the exception of securing a satisfactory bright field etch of the uranium. Since the preliminary work and associated results emphasize the need for some refinement in etching technique, this work is continuing in order to determine those conditions which influence the bright field etching of uranium.

Bonding Studies

Experimental work is being continued to determine the optimum conditions for anodically roughening uranium surfaces for mechanically bonding aluminum to uranium by cold pressing techniques. The variables currently being evaluated include: time in acid bath, temperature, current density, and bath composition.

Alloy Studies

A nominal 7 atomic percent zirconium-uranium alloy having severe segregation was remelted in an effort to obtain a homogeneous alloy. Chemical analyses made on samples from the top and bottom of the ingot indicated a homogeneous alloy was obtained. Microscopic examination of top and bottom portions of this ingot revealed a marked absence of the carbide inclusions normally found in production material. The average grain diameter of the as-cast material was approximately 0.05 mm indicating that the zirconium addition has a marked effect in refining the as-cast grain size.

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Applied Research Sub-Section

Replacement of Hydrofluoric Acid by Freon-12 in 234-5 Operations

Two additional bomb reductions of plutonium trifluoride using calcium as the reductant and a calcium and iodine booster (0.64 moles iodine per mole of plutonium) were carried out. The buttons were well formed and the metal yields were 94.5 and 96.7%.

During the conversion of plutonium (IV) oxalate to plutonium trifluoride with Freon-12, intermediate plutonium products are formed which contain substantial amounts of chloride. The chloride content of the plutonium product after a one hour freonation was 7.3 wt %. The chloride content after complete freonation is generally about 0.1 wt %.

The conversion of plutonium oxide to plutonium trifluoride by Freon-12 occurs rapidly if the oxide is prepared at about 300 C while oxides prepared above 700 C are essentially inert.

Freon-13, monochloro-trifluoromethane, has been found suitable for the preparation of cerium trifluoride from cerium dioxide. Since the fluorination reaction occurs more slowly than with Freon-12, it is necessary to carry out the freonation at about 700 to 750 C to obtain the product in a reasonable time. The freonation of plutonium dioxide or oxalate has not yet been attempted.

Replacement of Hydrofluoric Acid by Carbon Tetrachloride Vapor in 234-5 Operations

Bomb reduction of plutonium trichloride to plutonium metal by calcium and a calcium-iodine booster is being investigated on the twenty gram scale. Tentative results show that button yields of 97.7, 96.8, 89.3 and 89.0% are obtained when booster quantities are 0.6, 0.4, 0.3 and 0.2 moles of iodine per mole of plutonium, respectively.

Wet Plutonium Fluoride Studies

Eight grams of plutonium was precipitated as the ammonium plutonium (IV) fluoride double salt and then dried in a stream of Freon-12 at about 450 C. Some of the plutonium tetrafluoride was reduced to plutonium trifluoride by Freon-12 during the drying operation. The resulting product had a fluoride to plutonium mole ratio of 3.4. The dried plutonium fluoride was reduced to plutonium metal using bomb conditions generally employed for the plutonium tetrafluoride reduction. A well shaped plutonium button was obtained, however, the metal yield was only 53.5%.

About ten grams of ammonium plutonium fluoride was dried in a stream of Freon-12 at 300 C for one hour. The double salt decomposed to plutonium tetrafluoride and no conversion of the tetrafluoride to the trifluoride was observed. Reduction of this material to plutonium metal resulted in a yield of only 35.4%.

Plutonium Electrolytic Reduction Studies

The electrolytic reduction of plutonium halides to plutonium metal from molten salt baths is being investigated using cerium halides as plutonium "stand-ins". A run was carried out using 3.7 mole % cerous chloride dissolved in the eutectic

mixture of lithium chloride and potassium chloride. The temperature of the bath was 710 C which is about 75 C below the melting point of cerium metal. The cell was operated at 20 amps for 52 minutes and 26 amps for about 12 minutes. The cerium metal was recovered as a large dentritic mass which had some inclusions of the salt bath. The metal was highly reactive as it easily dissolved in water. The current efficiency of the cell was calculated to be roughly 75 to 90% of theoretical.

Preliminary investigations have been initiated to determine the feasibility of reducing plutonium compounds to the metal from fused organic baths such as ethyl pyridinium bromide. An electrolytic reduction of aluminum chloride, used as a plutonium "stand-in", dissolved in ethyl pyridinium bromide was carried out. The results of this electrolysis indicated that little or no aluminum was deposited on the cathode. This result was undoubtedly due to the presence of water in the cell during the electrolysis.

Autoradiography of Slag and Crucible Fragments

A calcium fluoride-calcium iodide slag from a 700g plutonium fluoride bomb reduction was examined by autoradiography techniques. The results of this examination show that plutonium metal or its compounds are dispersed throughout the slag as discrete particles and not by general dissolution. Examination of the excess calcium metal and plutonium droplets embedded in the slag indicates there may be some high temperature solubility of plutonium metal in calcium and of calcium metal in plutonium. An autoradiograph of three crucible fragments indicated little or no penetration of plutonium into the crucible but extensive penetration of the slag into the crucible.

Mechanical Properties of Plutonium

Tensile tests performed in the past indicate a need for more sensitive stress and strain measurements for the accurate determination of the Modulus of Elasticity and Yield Point. An extensiometer of small size has been fabricated and preliminary testing indicates a fair degree of sensitivity. A mercury manometer has been built and attached to the tensile machine. Thirty inches of mercury gives a total load on the ram of 500 pounds or a stress of 50,000 psi for a 0.10 by 0.10 inches tensile specimen.

Plutonium Metallurgy Facilities

Cold testing of the thermal analysis furnace is in progress. An alloy of 50 wt % tin in copper is being used for testing purposes. Inverse rate curves taken upon heating the copper-tin alloy indicate rapid furnace response as transformation points are very sharp and distinct.

The sealing of the metallographic hoods has been completed and the leak rates determined. Cold specimens will be prepared to test the workability and arrangement of the metallographic equipment prior to plutonium investigations.

Electrical connectors are being installed and sealed on the Tukon Hood. The vulcanizing of the neoprene rubber gaskets that seal the lucite panels to the

hoods has been completed. Upon completion of the electrical work, hood sealing and leak testing will be undertaken.

The vulcanizing of the neoprene rubber channels that seal the lucite panels to the hood has been completed. The hood has been moved to its operating position, and the installation of the glove ports, air lock, electrical connections and ventilation system are in progress.

The vacuum system modifications on the melting furnace have been completed, and the system is being leak checked. A 20 inch glove port has been installed so that replacement bell jars can be introduced into the hood by the plastic bag technique. The lucite panels have been installed on the hood, and the hood is ready for leak testing.

Irradiated Slug Examinations

A continuation of the examination of the split type rupture (#250) from C Pile has indicated that this failure was probably caused by irradiation induced stresses at the base of a rolling seam in the uranium. There appeared to be no defect in the aluminum jacket. An interim report is being prepared.

Twenty-six slugs were examined in the 111-B Building laboratory to ascertain the degree and types of rupture. Three did not appear to be ruptured. One of these three had been thermally cycled previously in hot circulating water without imparting any radioactivity to the water. It was also observed that sixteen of these slugs were ruptured in a different fashion than had previously been reported from underwater observation. This may be due, in part, to confusion in existing rupture identification systems or in handling. Any conclusions will have to await completion of the present examination program.

The metallographic examination of the bonded J-slug which resisted chemical dissolution at the American Cyanamid Company plant at Arco was completed. No reason for the difference in dissolution rate between unirradiated and irradiated J metal was obtained by this examination.

The metallographic examination of a section from a slug having an exposure of 130 MWD/T indicated that no microstructural changes were induced by the irradiation.

Examination of one of the "C" slugs which ruptured in tube 0565-H revealed that there was very little necking down of the aluminum can through the length of S shaped crack. Also, no crack in the U-Al alloy was observed.

The second distorted powder metallurgy slug from production test PT-105-313-4M was received. A replica of the first distorted slug has been obtained and the can wall removed by chemical stripping.

Radiometallurgy Facilities

Radiographic testing of the four multi-curie cells for the 327 Building has been completed. The cast iron sections of the cells were found to be free of

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voids greater than 6% by instrument surveys and limited film studies showed the cast iron to be quite homogeneous. The high level cell had a radiation leak along the joint of one of the doors and the side wall but it is believed that this may be corrected after installation in the 327 Building.

A mechanical stripper has been obtained from the Technical Services Unit and is being set-up for testing.

A design for making thermal expansion and creep measurements of metals during irradiation without external circuits has been completed.

Materials of Construction

Study of austenitic stainless steels as materials of construction of process vessels and associated lines for a proposed ruthenium decontamination treatment of first cycle uranium streams was continued. Corrosion was observed on test coupons of types 304L, 347, and 309SCb stainless steels which were exposed at room temperature to a simulated UNH process solution saturated with hydrogen sulfide. The attack appeared to be due to concentration cells resulting from the precipitation of copper sulfide.

In order to shed further light upon the high iron, chromium, and nickel content of UO_3 product, additional laboratory equipment was designed and built which allows closer control of the solution temperature and area of sample exposure in tests simulating the UNH evaporation step. Preliminary data employing this equipment indicate that galvanic coupling increases the corrosion rate of the 309SCb test coupon in 60% UNH solution by a factor of thirty over an uncoupled specimen.

A review of the corrosion requirements for the Recuplex facility was made. By examining the design prints and arbitrarily classifying the service requirements as "critical" or "non-critical" it was possible to waive a number of corrosion tests on the materials of construction.

A series of static immersion tests of SAE 1010 mild steel in simulated TBP waste solutions was started. These tests are for the purpose of determining whether or not the present underground storage tanks will resist corrosion by TBP wastes stored at a pH in the range of 7-9.

The recently developed oxalic acid etch test was employed to screen stainless steels for the construction of the substitute D-12 waste concentrator in the Redox plant. The material screened did not pass the oxalic acid etch test; however, it did pass the Huey test and consequently was acceptable from a corrosion standpoint.

The Metallurgy Unit participated in the decision as to the methods and procedures of joining tubes to tube sheets in heat exchange equipment for the Purex facility. The decision was that the tubes would be expanded by rolling to effect a mechanical joint and then welded by the inert gas shielded tungsten-arc process. To facilitate the welding, the tube ends will be recessed.

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Several boron carbide bearings from the waste cycle tank pumps at TBP were examined for corrosion. Metallographic examination showed no evidence of corrosion, but showed instead that the cracking of the bearings was probably the result of shaft misalignment.

CHEMISTRY

Process Studies

Laboratory tests demonstrated that two-cycle operation with the present Uranium Recovery Process flowsheet would adequately decontaminate feed solutions of age nine months. The tests were carried out with the "Mini" using counter-current flow with feed cooled five months.

In view of the enhanced decontamination obtained with the Purex high acid flowsheet, consideration was given to the capacity of the evaporators for recovery of an increased quantity of acid. It was concluded that the evaporators for H cycle waste were not of sufficient capacity but that those for the first cycle wastes were adequate, thus suggesting that research effort be directed towards application of the high acid flowsheet in the partition cycle.

An alternate process for recovery of uranium from UNH solutions is suggested by work showing that complete precipitation of UF_4 is obtained by reduction of uranium in the presence of HF; hydroxylamine, bisulfite, and hydroquinone were ineffective reducing agents, but ferrous sulfamate proved satisfactory.

Further studies were carried out in an effort to determine the effect of various additives on slug dissolution and on the subsequent extraction behavior of fission products. Employing high concentrations of acid during dissolving and the high acid Purex flowsheet, it was noted that the addition of phosphate increased the dissolution rate and improved beta and gamma decontamination in the extraction stage by factors of seven and four, respectively. The presence of zirconyl nitrate as a holdback carrier resulted in the formation of a precipitate which carried relatively little zirconium activity, thus suggesting incomplete exchange. The presence of ruthenium holdback carrier resulted in the formation of a precipitate and the development of a highly colored solution, again demonstrating the complex chemical behavior of that element.

A modified permanganate pre-treatment for conditioning ruthenium was evaluated with several process solutions. It involves oxidation with permanganate and subsequent reduction with hydrogen peroxide. Applied to a simulated Redox first cycle uranium product solution, the treatment was found to improve the second cycle ruthenium decontamination eleven-fold. When applied to a dissolver solution that was subsequently subjected to a first cycle Redox treatment, an eight-fold improvement in ruthenium decontamination was observed. The conditioning of ruthenium by this means showed no improvement for a first cycle Purex extraction, presumably because the higher acid content of the Purex flowsheet effects a more efficient separation of this activity.

Several promising scavenging agents were tested for their behavior in the treatment of plutonium-containing streams. A combination of copper sulfide and silica

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gel yielded an overall beta-gamma decontamination of 10. Treatment with BAL (British Anti Lewisite) followed by filtration through a silica bed yielded a ten-fold decontamination of ruthenium and an approximate 100-fold decontamination of zirconium-niobium. Scavenging with mercaptopropionic acid and silver ion, followed by filtration in a silica bed was ineffective for ruthenium but afforded a high removal of zirconium-niobium. The plutonium loss was nil in all cases.

A search for a method to reduce the activity of Uranium Recovery process wastes in order to allow cribbing of the solution resulted in the observation that ferri ferrocyanide is an excellent scavenging agent. Copper ferrocyanide is likewise effective in that it produces a gamma decontamination of RAW in excess of 100 and has the added advantage of resisting hydrolysis in slightly alkaline solutions.

Physical Chemistry

Studies with a two-inch pulse column led to a development of an equation relating the flooding rate, i.e., the organic and aqueous flow volumes at which flooding occurs, with the pulse parameters of frequency and amplitude. The equation shows an exponential relationship and for a given set of constants applies only with a fixed organic to aqueous flow ratio.

The previous report described in investigation of the interfacial tension of organic-aqueous systems containing uranium and TBP. These studies were made with systems that were at equilibrium. Further studies were conducted with similar systems that were not at equilibrium. The somewhat surprising observation was that values from the latter set of experiments were little different from those in the first set, indicating that an equilibrium condition at the interface is established almost immediately upon contact of the phases.

Analytical Separations

An interesting and informative correlation was established between atomic radius and the minimum pH at which an element is extracted by TTA. A plot of the data for the rare earth and Group III elements showed a continuous relationship that allows one to, and in one case was employed to predict the pH at which extraction occurs. Two specific analytical applications of TTA extraction are reported. The previously developed method for determining yttrium in Uranium Recovery product has been established in the Redox laboratory on a routine basis; the determination of neptunium by extraction with this reagent was improved through the use of cuprous chloride as a reducing agent to control the valence state of the neptunium.

The somewhat unique procedure for determining dibutylphosphate has been employed routinely in the Redox laboratory in support of development studies. The method involves use of zirconium-DBP complex as an emulsifying agent in a water-carbon tetrachloride system and measurement of the time required for disengagement of the emulsion.

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Radiochemical Instrumentation

In view of the proposed increase of Uranium Recovery process flow rates and of the higher beta and gamma activity of Uranium Recovery product when processing younger wastes, it becomes desirable to consider means for the blending of uranium nitrate solutions. Since the process is beta controlled, an instrument for continuous monitoring of beta activity would be of considerable value in providing immediate information. In developing such an instrument, it was found that a thin, anthracene, scintillation crystal with a plastic protective coating was effective for beta monitoring and was subject to a minimum of gamma interference. A probe of this type was tested in the process RCU cell adjacent to a full RCU receiver tank and was found to have a low gamma background.

It was previously reported that the low energy X-ray emission from plutonium offered prospects for a continuous plutonium monitor. Further work supports this observation, and a unit is under design for testing on the Recuplex waste line. The unit is patterned after the gamma counter currently employed on the Redox waste distillate line.

The previous report described the possibility of simplifying the X-ray absorption technique by employing americium as an external gamma source and using a scintillation counter as a measuring system. The potentialities of such a system were further verified by tests using a 50 uc americium source and using various thicknesses of lead as an absorbing medium. From the data obtained it is calculated that a 5 mc americium source would be adequate for monitoring plutonium in Recuplex main streams.

Spectrochemistry

A series of tests were initiated in an attempt to interpret the reactivity of UO_3. It was noted that the light scattering properties of UO_3 increase in a regular manner to a maximum when plotted against the dispersion time, i.e., the length of time during which the suspension is mixed in a Waring Blender. A series of oxides were then treated in this manner to produce optimum light scattering, and the resultant light scattering ability was plotted against the reactivity to yield a continuous S-shaped curve. UO_3 obtained by decomposition of uranium peroxide proved to be extremely finely divided to have exceptionally high reactivity. The data suggest that the size of the individual particles, as contrasted with the size of the agglomerates, is a more important function of reactivity than has been considered in the past.

Another series of studies is that of determining the infrared absorption pattern of a series of solid uranium compounds, including UO_3, UO_4, U_3O_8, UO_2, UF_4, UC_2, and UN_2.

The first three members of the above series showed a definite absorption corresponding to the U - O bond, thus indicating crystals which are not of an ionic nature. The latter four compounds showed no such absorption band, thus indicating the absence of covalent bonds and the existence of ionic crystals.

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Residues obtained by employment of several techniques for recovering inclusions in uranium metal exhibited no absorption bands, thus proving the absence of UO_3, UO_4, and U_3O_8. A further observation in the study of methods for identifying such inclusions is that the inclusions in unrolled uranium have a C/N ratio of one but after rolling the inclusions have a corresponding ratio of ten.

Infrared absorption studies were carried out in an attempt to identify the residue obtained from the digestion of hexone. The material obtained by digesting hexone with aluminum nitrate in the laboratory proved to be similar to that obtained in the Redox Process and was found to contain one acidic and one non-acidic component. The residue obtained by exposing hexone to alpha and gamma radiation was found to be entirely different in nature.

The X-ray head on the 300 Area X-ray photometer was replaced by a medical source head, and the instrument was restored to routine operation. The new unit is considerably cheaper, more readily available, and more easily repaired. Tests are continuing on the swing shift to determine if the higher X-ray energies obtained from the unit are of advantage for the determination of heavy metals.

Successful operation of a preliminary model uranium colorimeter for in-line application led to design and construction of a unit suitable for process application. The device is constructed of Teflon with the exception of two sealed-in, optical glass windows that serve as the cell. Overall precision of the method with RAF solutions is about ± 10%. This figure may be reduced to about ± 2% by applying corrections for variations in the phosphate, sulfate, and nitrate content of the solutions. The optical and instrumental components yield results that are precise to within ± 1/2%. Application of the technique is being considered in connection with continuous uranium monitoring in RAW solutions.

An attempt was made to improve the porous cup electrode technique for the spectrographic analysis of solutions by investigating modified electrodes. The graphite electrodes as received from the vendor proved to be most satisfactory. The various modifications tried include pre-ignition of the electrode and alternate methods for introducing the liquid sample.

The new grating for the "Jaco" spectrograph in the 300 Area control laboratory was installed without difficulty, and the instrument has been made available for routine analyses. Following installation, the operating conditions were modified to allow the recording of 63 different elements on one exposure, thus adding considerably to the speed and utility of the instrument. The new grating affords a five- to ten-fold increase in sensitivity of measurement. Spectrographic methods for the determination of 11 elements that have been added to aluminum cap and can specification analyses were developed and are being employed in that connection. A method was established at the request of the Radiological Sciences Department for determination of microgram quantities of beryllium in air monitoring samples; the porous cup electrode technique was employed, and 90% recovery of standards was observed.

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Applied Research Sub-Section

Instrumentation

The first tests for determination of TBP by means of dielectric constant measurement were quite successful, high sensitivity and instrument stability being obtained. TBP in the concentration range 20-40% in Shell spray base were determined with a relative precision of ± 0.5%. Since variations in water content constitute an interference, it is necessary to saturate the solution with water and filter through dry paper to remove droplets. Sulfate and carbonate do not interfere; nitric acid does interfere, but the effect is eliminated by pre-treatment of the sample with sodium carbonate.

In assistance to the Lockland plant, limited tests were made to evaluate coulometric procedures for the troublesome determination of uranium in stainless steel, as used for fuel elements. Very promising results were obtained by a procedure involving preliminary reduction with excess chromous ion and subsequent step-wise coulometric back-titration of the excess chromous ion and the uranium.

The application of derivative polarography, which involves direct measurement of the slope of polarograms rather than that of current, has been employed to good advantage in several laboratories in the country. In view of this success, equipment was assembled at Hanford for such measurements. The procedure offers the advantage of improved resolution and was shown to allow determinations of uranium with a reproducibility of 10% in the range 0.05 to 3 g/l, a range in which few satisfactory analytical procedures are applicable.

Mass Spectrometry

With the return of the P-10 Process on a continuing basis, a detailed outline of equipment for continuous mass spectrometric analyses has been issued, and the component parts to be purchased have been defined.

Analysis of C Pile atmosphere continues to show that the steady state concentration of carbon monoxide is about 2.6% at the 800 megawatt power level. This confirms previous observations from which it was calculated that one pound of graphite per day is oxidized and lost from the pile through gas leakage. As a result of the interest exhibited in this observation, a similar set of analyses was initiated on 100-D Pile atmosphere in order to establish the steady state carbon monoxide content before and after raising the power level from 600 MW to about 800 MW.

Investigation and various modifications of the research mass spectrometer have further improved the performance of that instrument. The reproducibility currently obtained in the analysis of natural uranium for U-235 is ± 0.00034 for a single determination. The instrument thus is in a position to yield extremely precise information on the burnout of uranium during pile exposure.

Arrangements were made through the Hanford Operations Office to assist Boeing Aircraft in identifying a lacrymator found in cabin pressurizing atmosphere of a newly developed jet plane. Two samples of the cabin atmosphere were delivered

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to Richland and were examined by infrared and mass spectrometric methods. One sample showed no contamination. The other showed an infrared absorption band corresponding to the C = O group and mass components corresponding to 43 and 60. Consideration of these observations suggested acetone, acetic acid or a derivative of either. Subsequent contact with Boeing personnel revealed the fact that one of the gas containers had probably been cleaned with acetone! As a result the positive tests are meaningless, and the only conclusion of concern is that in the samples as received at Hanford the lacrymator is present in limits below the detection limit of these highly sensitive measuring techniques.

PHYSICS

Lattice Physics

A proposal for simulating critical lattice experiments in an exponential pile has been largely worked out. The aim will be to test the interpretative procedures intended for use with a critical lattice experiment. This will involve flux traverses in an exponential pile with only one, or with only a few layers of reactive rods and the deduction, if possible, of bucklings to be compared with previous exponential pile results.

The feasibility of controlling the ratio of fast to slow neutron fluxes in the core of a lattice test reactor has been further examined with two-group theory. The general shape of the core flux distribution has been found for various values of the reflector thickness. Curves from which the general shape of the flux distribution curve can be deduced for various reactor conditions were found. A report covering this study is being issued.

In the program mentioned last month for the calculation of the distribution of neutrons in a lattice cell by means of transport theory, a first calculation has been completed. For an 8-3/8 inch dry lattice, it is found that the thermal flux on the center line of a slug is 9.8% less calculated on the basis of first order transport theory than on the basis of diffusion theory. Further work on wet lattices is proceeding.

The problem of neutron slowing down and diffusion is being formulated in terms of the methods used in the problem of random flights. An expression has been obtained for the average rate of collision of neutrons at a given point. Several difficult integrations are involved and considerably more work is required before usable approximations will be available. One result of this formulation, however, is that it shows that the usual Fermi theory not only assumes a constant fractional energy loss in each collision, but also that there is no correlation between the position and energy of the neutrons which are slowing down.

The buckling value in the dry 6-3/16 inch lattice with the 0.926 inch slug was found to be 115×10^{-6} cm^{-2} with a BF_3 counter. A value of 114×10^{-6} cm^{-2} for the buckling was obtained with a small fission chamber which served as a check on the BF_3 counter. Upon completion of the dry lattice measurements, water was added to the process tubes and the wet lattice measurements

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were taken. These have now been completed with the exception of the background determination. The buckling resulting from the BF_3 measurement is 98×10^{-6} cm^{-2} which may have an error of $\pm 2 \times 10^{-6}$ cm^{-2} on account of the uncertainty in the estimated background. It is of interest to note that this is the highest wet buckling obtained with any lattice spacing or slug size measured thus far. From the buckling versus lattice spacing curves, the largest wet buckling for the standard slug size would occur at a spacing of about 7-3/4 inches and would have a value of 85×10^{-6} cm^{-2}.

A document describing the problems and procedures related to increasing the flux in the exponential experiments by means of enrichment has been issued.

The streaming correction calculations for the graphite diffusion length measurements in 105-DR, H and C have been completed and the density and aluminum corrections recalculated. The results for the graphite diffusion length corrected to a density of 1.6 are as follows: 105-DR - 54 cm; 105-H - 55.5 cm; 105-C - 54.2 cm. The result obtained with the Hanford Standard Pile is 54.4 cm. In view of the size of the corrections involved, the remaining disagreement between these values is not unreasonable. Though some improvement might be made by a more meticulous evaluation of the streaming term, there seems to be little doubt that these calculations are essentially correct and explain the previously observed discrepancy between 105 piles and the Hanford Standard Pile diffusion length.

Nuclear Physics

Several runs were made with the enriched xenon generator slug and the xenon separation system. The efficiency of removal of xenon from the traps of the separation system and the generator slug was determined with the use of counters. The calculated yield of xenon-135 from the generator slug, after exposure to a measured flux at the slug surface of 1.7×10^8 neutrons/cm^2/second for four hours and subsequent 8-hour delay for the xenon activity to reach a peak, would produce an activity 3.14×10^7 disintegrations/second. The final sample activity, as determined by coincidence counting, had an activity of 9.5×10^6 disintegrations/second. Thus the final yield was 30% of the calculated total. An additional 40% remained in the traps. The yield from the slug is thus about 70% of the total. It is believed that the amount of xenon remaining in the traps may be reduced either by extended heating or by refilling them with a smaller amount of charcoal. In this way the separation efficiency can be increased.

Tests were run to determine the reproducibility of taking a definite aliquot of xenon from the total sample. Two counting volumes were placed at the end of the delivery line, aliquot bulb and tubing having a volume of about 1/150th of the main sample. The mercury level was placed just below the branch between the two volumes until equilibrium was believed to be established and then moved up until the gas was in counting position. Two fixed Geiger counters were used to determine relative counting rates. By lowering the mercury below the branching point and raising again to counting position, the constancy

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of the counting ratio was checked. The aliquot system appears to be reproducible to about 2%.

A fission chamber, designed to monitor the neutron beam at DR Pile, has been constructed and put into operation.

The first sample tube containing lithium and cobalt which was exposed with the carbon-12 sample at MTR was discharged in February, after receiving 2916 MWD exposure. A cobalt-aluminum wire was exposed in the same facility during the following fuel burnup cycle in order to obtain an integrated vertical flux traverse for this position. This has now been discharged and will be shipped to Hanford with the sample tube. Carbon samples, together with an associated cobalt monitor, will be irradiated until about October, 1953. The irradiated LiI sample, to be used in developing a tritium extraction technique for the MTR sample, will be discharged from a Hanford facility this month.

In connection with the design of a neutron beam catcher for DR Pile, several recipes of boric acid, water and paraffin are being prepared. These samples will be used with the neutron and gamma beam from the DR test hole to study the neutron and gamma attenuation characteristics of these mixtures. A mixture containing a sufficient amount of boron might be particularly effective in eliminating the gammas produced in the reaction: neutron + proton giving a deutron + a gamma ray. A reduction in the amount of gamma shielding normally used, which is heavy and costly, might then be realized.

The neutron beam collimator for the plutonium fission cross-section experiment has been installed in the new step plug and shielding assembly at 105-DR. Measurements of the neutron beam from this collimator indicate that the beam is inclined downward at an angle of $2 \pm 0.8 \times 10^{-4}$ radians. The neutron spectrometer has been aligned such that the center of the neutron beam passes over the spectrometer axis of rotation to ± 0.005 inches. A measurement of the effective zero angle of diffraction of the spectrometer was made by a determination of the transmission of a cadmium filter on each side of the central neutron beam. A determination of zero angle to ± 0.02° seems feasible by this method.

INVENTIONS

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

Inventor(s)	Title
G. B. Barton	Separation of Zirconium and Uranium Metals
G. A. Last	Mechanical Bonding of Aluminum to Uranium

[redacted]

HW-27932

Applied Research Sub-Section

G. B. Barton

E. E. Voiland

Handling of Irradiated Uranium in the Fluoride Volatility Process

Use of Phosphate to Suppress the Extraction of Zirconium and Niobium in a Modified Purex System

Signed: F. W. Albaugh
F. W. Albaugh, Manager
APPLIED RESEARCH SUB-SECTION

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LABORATORY ENGINEERING AND FACILITIES UNIT

APRIL 1953

VISITORS & BUSINESS TRIPS

One off-site trip was made by members of this Unit during the month.

T. R. Cartmell spent April 29 and 30 attending the Electronics Components Symposium for 1953 at Pasadena, California.

Two off-site visitors were sponsored by this Unit during the month.

Beal P. Moore, Chief Project Engineer, Greer Hydraulics Company, Brooklyn, New York, spent April 10 discussing remote hydraulic manipulators with Equipment Development personnel.

R. E. Kupel, General Electric Co., Lockland, Ohio, spent April 14-17 discussing mass spectrometer methods with Analytical Laboratories personnel.

ORGANIZATION & PERSONNEL

Personnel totals for Laboratory Engineering and Facilities Unit are summarized as follows:

	March	April
Laboratory Engineering	61	39
Analytical Laboratories	43	45
Equipment and Materials	--	11
Laboratory Facilities	--	9
Administration	3	3
Unit totals	107	107

Effective April 1, Material Control and Laboratory Facilities were separated to form independent sub-Units within the Unit. In addition, the Standards Laboratory personnel were transferred to the Analytical Laboratories Sub-Unit. One Staff Engineer was transferred to the Technical Administration Unit. Five exempt and eighteen non-exempt personnel were involved in these changes.

[redacted]

LABORATORY ENGINEERING SERVICES

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

Work volume statistics for the Mechanical Shops are as follows:

	Customer Unit or Program	March No. of Jobs	March Man-Hours	April No. of Jobs	April Man-Hours
Work Done on Jobs Completed	Applied Research	33	701	39	884
	Pile Technology	46	1077	78	1769
	Separations Technology	9	190	10	189
	Lab. Engineering & Fac.	8	197	22	452
	Others	25	274	37	286
	Sub-Totals	121	2439	186	3580
Work Done on Jobs Not Completed	Applied Research	6	224	9	587
	Pile Technology	18	367	15	209
	Separations Technology	2	209	0	0
	Lab. Engineering & Fac.	5	354	5	685
	Others	8	111	8	322
	Sub-Totals	39	1265	37	1803
Total Work Done			3704		5383
Work Backlog			Man-Hours To Comp.		Man-Hours To Comp.
Jobs Started	Applied Research	6	810	9	623
	Pile Technology	18	605	15	715
	Separations Technology	2	379	0	0
	Lab. Engineering & Fac.	5	491	5	157
	Others	8	385	8	246
	Sub-Totals	39	2670	37	1741
Jobs Not Started	Applied Research	12	366	4	96
	Pile Technology	23	855	8	291
	Separations Technology	0	0	1	341
	Lab. Engineering & Fac.	3	68	1	40
	Others	3	100	1	60
	Sub-Totals	41	1389	15	828
Total Backlog			4059		2569
These figures include:					
Cross-Orders		3	187	7	374
Outside Vendors		1	341	1	341
Total Net Backlog			3531		1854

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The increase from 3704 to 5383 total hours completed is a result of the periods covered by the tabulation. Mechanical Development Shop journals cover even two week periods. A six week period is covered in the tabulation for April as opposed to the four weeks normally reported.

The net backlog of 1854 man-hours will require approximately nine crew days to complete. The shop's backlog has been reduced to its lowest point since the establishment of the Mechanical Development Shops on July 1, 1951. This may be directly attributed to Technical Section Budget difficulties and the cross ordering of much work to other plant shops. Almost immediate service is available from the shop at the present time. This condition is ideal from the standpoint of the Technical Section.

The established journal closing periods made it impractical to separate Fuel Technology from Pile Technology work. The figures for the two Sub-Sections are therefore composited for this report but will be indicated separately in the future.

The following work was completed for the Technical Units:

Applied Research

A differential expansion thermometer was fabricated for use in studies of the effects of radiation on Invar. This device consisted of a 2S Aluminum capsule and cap. The inside of the cap was drilled and threaded to accommodate a bolt made of two semi-cylindrical pieces of 2S Aluminum and Invar and a phonograph needle was diametrically inserted through the outboard end of the Invar piece in such a manner that the sharp point rested against the flat surface of the 2S Aluminum piece. The expansion characteristics of Invar will be studied with the device. A second expansion bolt of Zirconium and 2S Aluminum was also fabricated.

Fabricating end caps and welding the ends closed on process and can tubes for the Exponential Pile program required 327 man-hours during the month. All available can and process tubes are now complete. Further work on this program is pending vendor delivery of additional tubes, which is currently scheduled for mid-June. Fourteen special boxes for moving the loaded 8 foot tubes were fabricated.

A Metron variable speed-O ring drive for stirrer shafts was installed on a previously fabricated 19 stage Miniature Mixer settler.

One internal mold and one external mold were fabricated to mold 90° corners in neoprene channel gaskets. Several Lucite windows were custom fitted with the gaskets.

Fabrication was completed on several items of miscellaneous equipment for start up of the Radiometallurgy Building.

Pile Technology

Fabrication of a special manipulator for the under-water handling of sections of irradiated process tubes was essentially completed. The slug breaker previously completed was returned to the shop for repair and adaptation to under-water operation. A new device to replace the band saw used to slit process tubes prior to

inspection and testing was fabricated. The device has been completely revised and adapted for under-water operation and can be used to cut off or slit process tubes longitudinally. The band saw blade has been replaced with two milling machine slitting saws which are remotely operated by means of bevel gears.

A modified washer seal cartridge and a rectangular rod seal were fabricated for design feasibility tests in connection with 100-C Area modifications.

Fuel Technology

The experimental welding of zirconium tubing sections to form a facsimile of the interior of process tubes was accomplished. This required the cutting, forming and rewelding of a short section of zirconium tubing in such a manner that when reassembled, an approximate 20 feet section of the land area of a process tube was duplicated.

An attempt to weld sheet zirconium and sheet nickel into replicas of aluminum cans was unsuccessful without fabricating suitable jogs and fixtures. The failure to accomplish the desired results can be attributed primarily to a lack of material uniformity, and to previous working of the material.

Two complete split-die assemplies, two sets of split-die pieces, and a series of press punches, cap punches, split-die punches and can expanders on work orders totaling approximately 400 man-hours were cross ordered to the 234-5 Building Tool and Die Shop. Due to the lack of grinding facilities, this work could not be done in the Mechanical Development Shops. Delays in completion are expected due to the present load in the 234-5 Shop.

A third device to be used in machining the ends of graphite thermal conductivity samples was completed. The customer reports that the devices have been highly successful and that additional Arco irradiation tests have been possible because of the rapidity with which samples may now be prepared. An Eddy Current Balancing Unit and Support Bracket for the non-destructive testing program were fabricated. The roll type conveyor was returned to the shop for modification and adaptation to under water operation.

Separations Technology

A plywood sample storage hood, a stainless steel weighing tank, a stainless steel hopper, and a serum bottle decapper were fabricated.

Laboratory Engineering and Facilities

Fabrication of various pieces of equipment for the Laboratory Equipment Development RDS required the expenditure of 254 man-hours of shop time on a routine work order. An additional 102 hours chargeable to the same RDS was completed through specific work orders for shop assistance.

Others

Fabrication of six Cold Spot Heaters and a variable stroke agitator for the Process Control laboratories of the 222-S Building were completed.

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GLASS SHOP

Work volume statistics for the Glass Shop are summarized as follows:

	March	April
New Jobs	103	97
Revisions	21	21
Repairs	11	9
Total	135	127

Of this total there were 21 jobs requiring quartz fabrication. The shop is currently operating with a backlog of approximately four crew-days.

The mass spectrometer installed in 108-B was revised to facilitate rapid repair in the event of breakdown and also to permit use of a reserve panel which was also fabricated. The panels hold most of the glassware and may be replaced by merely disconnecting at the ball and socket joints connecting the panel with the instrument.

Four constant temperature boilers were fabricated for Metallurgy. These boilers were built into 1000 ml flasks and have seven entry tubes each involving a different type of seal.

Equipment Development

Work volume statistics for Equipment Development, expressed as man-hours, may be summarized as follows:

[redacted]

	March			April		
	Eng.	Misc.	Drafting	Eng.	Misc.	Drafting
Applied Research						
Chemistry	238	130	209	210	172	401
Physics	-	-	1	11	-	10
Metallurgy	321	135	293	412	107	186
Pile Technology						
Pile Materials	-	-	80	9	6	36
Pile Engineering	22	22	213	32	26	26
Pile Services	-	-	-	-	5	32
Fuel Technology						
Pile Fuels	51	35	159	52	114	256
Pile Materials	-	-	-	23	6	-
Separations Technology						
Chemical Development	74	62	78	128	70	119
Manufacturing						
Process Assistance	112	159	22	81	158	10
Lab. Engineering & Facilities						
RDS	945	329	152	1042	262	507
Engineering	317	248	159	288	388	142
Tech. General	-	-	179	-	-	39
Totals	2080	1120	1545	2288	1392	1760

Principal development activities are indicated below:

Chemistry

Drawings and specifications were prepared for plastic cells for an X-ray spectrometer. A remote laboratory installation for experimental uranium burning was scoped. An RDS developed teflon screw-lift pump was installed as a feed pump between two miniature mixer-settlers. A "mini" drive and a pump were revised and test operated. A fluorescent lamp was revised and installed for viewing "mini" stage cells. A cask-hoist was revised in a hood and an air filter was replaced on a high-level plutonium gloved box in Building 3706.

Physics

A high speed tool for boring rubber stoppers was designed.

Metallurgy

Controls were designed for a furnace dilatometer. Assistance was given in setup and initial "hot" operation of the double crystal X-ray spectrometer; various tongs developed on RDS TC-1 were provided, and others were designed. A remote control panel for an in-cell electropolisher was developed in model form, test operated, and designed for shop construction. [redacted]

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Pile Materials

An underwater slug manipulator was scoped for use with an underwater periscope.

Pile Fuels

Equipment designed included a modified roll-type slug conveyor, and a mounting assembly for an induction type slug heater.

Chemical Development

The preparation of a Junior cave and "brickpile" installation for operation of a miniature mixer-settler and related apparatus was followed in various stages of design, fabrication and installation. A custom-built UO_3 hydrator was installed.

Analytical Control

Design, alteration or installation assistance was given on various equipment, including a laboratory cart tray attachment, a ball-mill enclosure, sample carriers, gloved boxes and a variable stroke agitator.

RDS TC-1

The program of development and testing of successive models of fifteen "hot" handling tools was carried on. New items which were scoped, designed or built during April include a miniature, air-operated hacksaw, a lift-pump employing a teflon screw impeller, a stopcock actuator, and a remotely manipulated mirror. The first model slave-type manipulator for use with "brickpiles" is being used for "hot" work at the Redox laboratory prior to completion of formal design drawings.

A downdraft "brickpile" setup was in trial operation in the Redox laboratory, as an example of possible Radiochemistry installations. The users of this "brickpile" report that it offers considerable flexibility both in operation and in access for alteration of equipment.

Controlled, air-filter tests were underway in two Redox laboratory hoods. A CWS filter is being compared with an inexpensive AA fiberglass filter (developed under this RDS) for air flow, life, condensate effects, and contamination passage. A saving of approximately $40 per filter will be realized in future installations if the fiberglass filter proves effective.

A "hot" laboratory setup was prepared for controlled comparison of sandblast decontamination with standard practice chemical decontamination of metalware.

Scoping of the portable airborne-contamination recorder continued by testing proposed amplifiers and components in the full-sized unit.

New Laboratory Planning

Mechanical Development Building - Project C-406

This building is approximately 65% complete as compared to a scheduled completion of 76%, hence, it is doubtful that the scheduled completion date of June 13 will be

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realized. All concrete floor slabs have been completed and partition work is proceeding within the office areas. Essentially all of the construction materials are on site.

Radiochemistry Building - Project C-381

This building is approximately 86% complete, but for the second consecutive month only 3% has been accomplished. Minor strikes, one involving Kaiser Engineers personnel and one in the sheet metal craft contributed to the slow progress. The locker rooms are essentially completed. The piping, electrical and ductwork is proceeding slowly.

Radiometallurgy Building - Project C-385

This building is approximately 97% complete and is in its final stage of completion. The 15 ton bridge crane was unacceptable after testing and several major deficiencies were noted. It will be necessary to return the main hoisting trolley to the factory for rework and adjustment, however, before it is dismantled all cells will be installed within the building. At month's end the high level cell and the first intermediate level cell had been successfully installed.

Outside Facilities and Utilities - Project C-394

This project is approximately 98.5% complete. The parking lot has been accepted and the sidewalks are being paved. The acceptance tests have started in the retention neutralization building but difficulty has been experienced in loading the waste trucks.

Pile Research and Development Building - Project C-414

This building is approximately 85% complete and is now scheduled by the commission to be complete on July 1, 1953 with air conditioning balancing to follow thereafter.

Laboratory Supply Building - Project C-458

The scoping of the renovation of the northeast wing of 3706 to accommodate this facility is continuing.

Solvent Storage Building - Project CA-441

The project proposal at month's end was in the accountant's hands for the cost review. This building is not a part of the Works Laboratory Area construction program.

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ANALYTICAL LABORATORIES

The Analytical Laboratory in support of Chemical Research and Chemical Development continued the analyses of "cold" Purex stream samples and the analyses of "active" Redox type samples. Fission product determinations to evaluate the effectiveness of various additives in dissolution has occupied much of the analytical time. The Gamma Ray Energy Spectrometer is being utilized effectively on an "off-shift" to assist in fission product determinations. RCU and RAF samples are being analyzed weekly for complete fission product evaluation. The plant is using waste as young as 2½ years. Niobium and zirconium are detectable in waste of that age; although, they represent only some 2% of the total gamma radiation. Several ruthenium determinations were made on dissolver solution type samples submitted by the Hot Semi-Works plant in connection with ruthenium decontamination studies. The water-cooled X-RD-2 Head in the G.E. X-ray photometer was replaced with a new air-cooled D-3 Head. This unit is equally efficient for the present operation and much cheaper than the original. It is anticipated that maintenance costs will be greatly reduced.

The Spectrochemical Laboratory completed a series of 90 Al-Si samples in connection with a production test where slugs were canned in an Al-Si bath containing 0.2 to 2.0% tin. Routine work continued to be normal for 300 Area Metal Preparation process samples.

The Special Analytical Laboratory continued to render analytical service to a wide variety of problems. Insulating materials, glass fiber and magnesia asbestos insulating cement to be used in piles, were analyzed for a number of impurities felt to be critical for materials used in this manner. Work continued on the analyses of "minute inclusions" separated from uranium slugs to assist the investigators in identifying these particles and their subsequent elimination. A series of irradiated Masonite samples were analyzed for carbon and hydrogen by combustion methods. Irradiated ethylene glycol was analyzed for formaldehyde. P-10 target material was checked for gas content. A series of Al-Si samples from a production test were analyzed wet chemically for those impurities which could not be determined quantitatively by spectrographic means. A member of this laboratory was loaned to the Process Unit for a two-week period to assist in setting up and training their personnel in the operation of a train for the determination of hydrogen gas in "cold" P-10 material.

The Water Quality Laboratory continued to support the programs of Water Plant Development and Pile Coolant Effects. Two new methods now being used in this laboratory are: (1) Total chromium in the presence of large amounts of aluminum and (2) Small amounts of aluminum in the presence of iron and copper.

The Mass Spectrometer Laboratory continued gas and isotopic analyses in support of the various Pile and Radiological Sciences programs. A more complete removal of carbon dioxide from pile gases, being studied for other constituents, is accomplished by introducing the gas to the spectrometer through an Ascarite cartridge rather than freezing it out with liquid nitrogen. Complete and constant removal of carbon dioxide gives a more accurate picture of the residual gases. The technique for running dissolved gas in P-13 water has been developed. The method consists of introducing the water into a evacuated trap, warming it to evolve the

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gas, freezing the water with a mixture of ethyl alcohol and liquid nitrogen(-117C), then introducing the gas into the spectrometer. Two samples of the atmosphere inside a B-50 Bomber were analyzed for Applied Research in an attempt to identify a lachrymator that is present in the air. A number of gases other than air were detected but no definite conclusions drawn. A new replaceable manifold was constructed and installed on the C-N spectrometer.

Work volume statistics for the Analytical Laboratories are as follows:

	March		April	
	No. of Samples	No. of Detns.	No. of Samples	No. of Detns.
Research and Development				
Applied Research Unit	1767	3093	1756	3575
Pile & Fuel Technology Unit	387	3542	451	5539
Sep. Technology Unit	608	1008	779	1441
Lab. Eng. & Fac. Unit	0	0	3	3
Process Control	781	4828	727	3287
Others	397	1814	171	1511
Total	3940	14285	3887	15356

Standards and Calibrations

	March	April
Number of standard solutions prepared	29	36
Stock solutions dispensed	71	95
Number of calibrations performed	51	36
Number of calibrated glassware dispensed	17	49
Number of checked glassware dispensed	37	180
Total	205	396

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EQUIPMENT AND MATERIALS

Material Control, Photographic Services and Miscellaneous Services activity is summarized as follows:

	March	April
Purchase Requisitions		
Total number processed	95	115
Number requiring emergency	0	0
Photographic Services		
Number of work requests	43	40
Number of negatives	201	140
Number of prints	930	998
Number of slides	67	16
Color Photos	7	6
Miscellaneous Services		
Stores Stock request	1	0
Office Furniture requests	6	15
Office Machines sent in for repair	10	11
Precious Metal transactions	13	16
Special Messenger trips	44	44

Approximately 150 new scientific catalogues and bulletins were received in Material Control during April.

The quarterly inventory of Special Materials within Technical was completed. Considerable quantities of unrecorded platinum and gold were located. During the last several years there has been no positive means of accounting for the purchase of Special Materials within Technical and consequently discrepancies have arisen. Recently all sub-sections within Technical were requested to process all requisitions for Special Materials through Equipment and Materials, Laboratory Engineering and Facilities Unit. This should result in a positive control of all Special Materials.

The photographic laboratory took the pictures and assisted in the lay-up for the "Classified Files Procedure Manual". Special pictures on the radiographic examination of the Hanford fuel element were completed.

LABORATORY FACILITIES

Laboratory Facility services are summarized as follows:

	March	April
Work Orders processed	67	62
Work Requests processed	-	34
Service Requests processed	-	47
Special Work Permits processed	-	41
Key Requests processed	-	25

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The last four items in the preceding table are reported for the first time as services from this new organization.

A revised Technical Section Survey of Space and Personnel Assignment was completed incorporating single line drawings of buildings for better identification of the space occupied. The issued report will furnish information for checking landlord rent charges and assisting management in making assignments when changes are necessary. The Sub-Sections have been requested to report all changes promptly to maintain the survey on as current a basis as practical.

The Works Laboratory Retention Waste system has been in operation since February for service to the Radiological Sciences Department's Bio-Physics Laboratory. During this period the volume of waste collected and processed has been averaging 30,000 gallons/day or 30% of the retention capacity. This experience is being reported for purpose of documentation in event the capacity of the system is exceeded after other Works Laboratory Area Buildings of the Technical Section are occupied. This condition is being brought to the attention of Radiological Science for possible remedial action. As new buildings are occupied the relative increase in volume will be noted.

INVENTIONS

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

Signed J. W. Underwood

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MONTHLY REPORT
DESIGN SECTION

VISITORS AND BUSINESS TRIPS

Guy H. Taylor and Homer S. Wong, representing Moffat, Nichol & Taylor Structural Engineers, Portland, Oregon, visited Richland April 1 to discuss the structural design of the "K" Reactors.

Albert F. Sperry, representing Panellit, Inc., Chicago, Illinois, visited Hanford April 6-11 for consultation on pressure monitor details for the "K" Reactors.

K. E. Atwood and A. J. Hornfeck, Bailey Meter Co., Cleveland, Ohio, visited Hanford April 8 for consultation on power calculator requirements for the "K" Reactors and to inspect equipment which failed to meet design requirements on the "C" Reactor.

E. L. Knoedler, representing Sheppard T. Powell, Baltimore, Maryland, visited Richland April 13-16 to discuss development of emergency underground water supplies.

J. O. Borst, Western Gear Co., Seattle, Washington, visited Richland April 17 to discuss canning machine gear box delivery.

R. W. Moulton, University of Washington, Seattle, Washington, visited Richland April 22 to discuss results of the graphite drying program.

E. B. LaVelle attended a meeting of the American Welding Society, Seattle, Washington, April 1.

E. L. Reed and E. Hollister visited Cleveland Equipment Works, Lamp Division, General Electric Company, Cleveland, Ohio, April 2-5 for consultation on fuel element canning mechanization.

J. W. Kolb visited General Electric Company, Schenectady, New York, Metal Washing Co., Elizabeth, New Jersey, Gilmer Belt Co., Philadelphia, Pennsylvania, and Scientific Electric Co., Garfield, New Jersey, April 4-11 for consultation on expansion and mechanization of the Metal Preparation process.

L. E. Kusler visited General Electric Co., Schenectady, New York, Udylite Corp., Detrex Corp., and Mechanical Handling Inc., Detroit, Michigan, and Ransburg, Inc., Indianapolis, Indiana, April 4-11 for consultation on expansion and mechanization of the Metal Preparation process.

C. W. Sege visited the University of Washington, Seattle, Washington, April 6 to discuss graphite drying tests.

E. Hollister visited Puget Sound Naval Shipyard, Bremerton, Washington, April 8-9 and April 16-17 for inspection of the canning machine.

H. J. Bellarts visited Bingham Pump Company, Portland, Oregon, April 14 for consultation regarding a revised metal recovery pump.

G. L. Locke visited Bingham Pump Co., Portland, Oregon, April 14 & 27 to discuss pump design.

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C. O. Clemetson visited (1) Chas. T. Main, Boston, Massachusetts, April 13-15 and April 21-22, (2) Builders Providence, Providence, Rhode Island, April 14, (3) Selas Corp. of America, Philadelphia, Pennsylvania, April 16-17 and (4) Vitro Corporation of America, New York City, April 20 to firm-up instrument design details; Brown Instrument Co., Philadelphia, Pennsylvania, April 18, to expedite instruments; Panascan, Inc., Chicago, Illinois, April 24 for inspection of temporary monitor components; and Claude S. Gordon Co., Chicago, Illinois, April 23 for inspection of resistance thermometer conductors.

R. H. Beaton attended General Engineering Laboratory conferences, Schenectady, New York, April 15-17 and a Nuclear Energy Committee Meeting, Ann Arbor, Michigan April 18.

J. C. Wood visited the Aluminum Company of America, LaFayette, Indiana, April 29-30 to inspect fabrication of an aluminum tube.

W. J. Dowis attended an American Power Conference, Chicago, Illinois, March 23-29 to attend a forum on industrial use of atomic energy; and visited General Electric Co., Schenectady, New York, April 22-26 to consult on Third Safety System coil design.

ORGANIZATION AND PERSONNEL

Personnel Statistics:

	March 31			April 30		
	Exempt	Non-Exempt	Total	Exempt	Non-Exempt	Total
Design Management	3	2	5	3	1	4
Process Engineering Sub-Section	59	14	73	59	13	72
Design Planning Unit	15	12	27	15	13	28
Design Engineering Sub-Section	84	12	96	85	11	96
Total Section Personnel	161	40	201	162	38	200
Technical Graduates (Rotational)	-	9	9	-	9	9
TOTAL	161	49	210	162	47	209
Personnel on loan to Design Section			3			3

Accessions = 1
Separations = 2

GENERAL

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

	Man Months Expended	% of Total
1952 Expansion Program	109.9*	66.8
Research and Development	23.6	14.3
Other Projects & Design Orders	31.1	18.9
	164.6*	100.0

*Equivalent man months expended reflects amount of overtime on Expansion Program.

Industrial Models, Inc., submitted a bid of about $70,000 for fabrication of five models of 100-K facilities and one of Building 202-A. Permission is being requested from the AEC to negotiate a contract for this work.

The drafting service contract, which is being negotiated by the Project Section at the Design Section's request, is expected to provide draftsmen at Richland by June 1, 1953.

DESIGN DEVELOPMENT

Statistics:

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

		Man Months Expended	% of Total
RDS-10	Reactor Design Development	2.1	8.9
RDS-11	Water Plant Design Development	3.1	13.1
RDS-12	Separations Design Development	1.1	4.7
RDS-13	Mechanical Design Development	11.7	49.6
RDS-14	Utilities & Services Design Development	2.5	10.6
RDS-15	Engineering Standards and Materials Development	3.1	13.1
		23.6	100.0

RDS-D-10 - Reactor Design Development

Preliminary planning was started on the development work associated with a new reactor design. A report outlining the objectives and preliminary schedules is being prepared.

RDS-D-11 - Water Plant Design Development

Study of protective coatings for steel retention basins and effluent lines was continued to April 10 at which time the 100-H Area was shut down. Coating samples which had been placed in the H Area effluent line on January 7, 1953, indicated that approximately 30% could effectively withstand further testing. Inspection of samples in the flow laboratory after 66 days immersion time showed that eight samples had failed and 12 other samples appeared as if they would eventually fail but were still protecting the metal.

RDS-D-12 - Separations Design Development

A study was made, at the request of the Manufacturing Department, of the technical and economic feasibility of heat recovery from the evaporation steps in the Purex process. The results indicated that sufficient quantities of heat could be recovered in large "heat pump" facilities to allow abandonment of the fifth boiler addition, but that the additional savings in steam consumption gave a marginal justification for the proposal involving a write-off period of about seven years. This period was considered too long when recognizing potential increases in electric power costs and decreases in steam costs in the future.

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The design of the Purex waste storage tanks was reconsidered in line with the new concepts of the Radiological Sciences Department relating to the minimization of the expected hazards resulting from moderate leakage from a tank. It was concluded that the tank design could be greatly simplified.

Consideration was given to facilities needed for TBP waste reduction by scavenging for removal of long-lived fission products. Further laboratory results are needed before preliminary design scoping on any such proposal can be made. Justification for this activity is great when the magnitude of reclaimed waste volume is realized. Ultimate achievement of waste reduction by removal of long-lived fission products may result in reclamation of a large fraction of all waste volume now holding $BiPO_4$ and TBP wastes.

Study was continued on the ultimate and potential cost reduction which may be realized by revisions in the Redox plant under Phase II conditions including ANN backcycling, adoption of the precycle flowsheet, cribbing of coating and final plutonium cycle wastes, and self concentration of column wastes. In addition to potential economies in manufacturing costs from these revisions, gains can be obtained in additional yields of uranium and plutonium. Preliminary cost figures indicate that ultimate manufacturing costs may be about one-half of those predicted on the basis of the existing flowsheet. It is concluded that ample justification exists for continued effort toward such improvement.

RDS-D-13 - Mechanical Design Development

Design of the prototype fuel element canning machine for the Metal Preparation process was advanced 4% to approximately 97% complete. The canning machine drawings were reviewed with engineers from the Cleveland Equipment Works, Lamp Division, and the Hanford design was considered satisfactory with only minor comments on detailed parts. Fabrication of the canning machine was completed at Bremerton, but delayed delivery of gear boxes and screw shafts due to a strike at the supplier's plant has held up assembly work. A test program for the canning machine prototype was agreed upon with the Technical Section and installation of the prototype will be in the 314 Building.

Meetings were held with members of the Technical Section and the Manufacturing Department to discuss the design of an in-line alpha counter for Redox and other facilities. The proposed equipment will take periodic samples from the process line, measure and record the activity of the sample and activate an alarm when-un safe limits of activity are reached.

Study of the design of solvent-extraction column interface indicator was continued. A sensing probe was designed and fabricated for installation on a column in the 321 Building. An indicating instrument also was fabricated as a prototype for test prior to production installation.

Testing continued on differential pressure transmitters for use as a process tube flow monitor. It appears feasible to design a flow meter which takes a differential pressure signal from an orifice or venturi and transmits an electric signal. No commercially available unit is known which fulfills the requirements of size, range, ruggedness, etc., but careful design and test should produce an acceptable instrument.

Industrial Models, Inc., submitted a bid of about $70,000 for fabrication of five models of 100-K facilities and one of Building 202-A. Permission is being requested from the AEC to negotiate a contract for this work.

The drafting service contract, which is being negotiated by the Project Section at the Design Section's request, is expected to provide draftsmen at Richland by June 1, 1953.

DESIGN DEVELOPMENT

Statistics:

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

		Man Months Expended	% of Total
RDS-10	Reactor Design Development	2.1	8.9
RDS-11	Water Plant Design Development	3.1	13.1
RDS-12	Separations Design Development	1.1	4.7
RDS-13	Mechanical Design Development	11.7	49.6
RDS-14	Utilities & Services Design Development	2.5	10.6
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A development order for a TBP slurry pump as a replacement for the Nagle pumps was placed with the Bingham Pump Company with assured delivery by July 1, 1953. The company will design the pump while the Design Section will provide design for the pump installation. Approximately three drawings will be required.

The electro-magnetic ball conveyor, which is being studied as a return mechanism for the Ball Third Safety System, has been assembled in 189-D Building. Extensive testing was conducted by the Technical Section during the month.

RDS-D-15 - Engineering Standards and Materials Development

Cost plus estimated commitments to date for development of engineering standards is $70,030.

The HW Standards Committee approved the following standards and revisions to standards during April:

HW-4926-S	Specifications for Welding Carbon Steels
HW-4680-S	Specification for Chain Link Security Fence, Revision 1
D-8-1a	Pole Mounted Fire Alarm Box, Revision 1
D-8-4	Fire Alarm Circuit 90° Turn on Pole, Revision 1
D-7-13	Street Lighting Transformer Structure, Type "K", Revision 1

The progress on standards and materials development work for April is as follows:

a. Work on four Standard Welding Specifications was advanced 5% during the month to 100% complete. However, three additional welding specifications were started.

b. A new Design Guide Book is being prepared for issue and is approximately 80% complete, an advance of 40% during the month.

c. As a part of this year's program, it was planned to rehabilitate and re-issue the existing Standard Books. The new books are in the process of being issued at this time.

DESIGN PROJECTS:

Statistics:

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

		Man Months Expended	% of Total
CA-512-R	100-K Reactor	74.2*	52.7
CA-512-W	100-K Water Plant	8.2	5.8
CA-513	Purex Separations Facility	17.5	12.3
CA-514	300 Area Expansion	10.0	7.1
Major Projects - Other than Expansion Program		18.3	13.0
Minor Projects and Design Orders		12.8	9.1
	TOTAL	141.0*	100.0

*Equivalent man months expended reflects amount of overtime.

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CA-512-R - 100-K Reactor Facilities

Design progress on Project CA-512-R, 100-K Reactor Facilities was advanced 5.6% during April to 80.4% completion. These completion percentages are based on a total of 1,850 drawings, an increase of 50 above the previous estimate of 1,800, due to additional test facility drawings required. During the month, 159 drawings were approved, bringing the total to 1,391 drawings which have been approved.

Expenditures to date for design scope and detail design are approximately $1,318,000 against an authorized amount of $2,781,500. At the present level of activity, expenditures are in the order of $106,000 per month.

Seven hundred and nine requisitions have been issued to date by the Design Section for procurement of engineered items for the 105-KW and 105-KE facilities. The total value of this equipment is approximately $14,130,000.

An evaluation and analysis of the downcomer hydraulics was completed. Calculations show that the proposed orificing will destroy the excess head of the design flow. It was concluded that there is no danger of cavitation, the by-pass lines are adequate for emergency operation, and the approach section strength is capable of handling any encountered pressure.

The design of the process water supply piping in the 105 Building pipe rooms was modified to provide permanent 24-inch flushing lines and inspection manholes. Completion of the piping rooms and the 105-KW - KE crosstie drawings was held up pending settlement of the above modification.

A study is being made to evaluate the economic justification for the installation of charge-discharge equipment for poison loading. The justification is based on improving the power distribution and the saving of downtime by being able to charge and discharge temporary poison columns during pile operation.

Testing of impingement effects due to present inlet nozzle design was recommended with the possibility of future modification of design.

The design of the die blocks at the exit ends of the process tubes was modified to a full bearing block with the graphite to facilitate the cooling of the block. The highest expected temperature, 700° F, will not effect the material of the block, even upon thermal cycling to this temperature.

Panellit, Incorporated requested a few weeks more time for design of a coordinate light system for the pressure monitoring system before submitting a firm quotation on this addition to the system. It is apparent that it will be very difficult to provide a coordinate light system which will retain the reliability of previous systems.

The Design Committee approved a scope revision increasing by approximately 50% the number of cooling tubes in the sides and nearly 100% in the top biological shields of the "K" Reactors to prevent biological shield temperatures from limiting the production that can be obtained from the reactors. It also approved the recommendation that the active length of four horizontal rods in each of the "K" Reactors be reduced to take advantage of the nuclear gains obtained from improved neutron flux distribution.

CA-512-W - 100-K Water Plant Facilities

Three recommendations for scope changes in the 100-K Water Plant design were approved by the Project and Design Committees as follows: (1) construction of lime addition facilities be suspended and facilities employing caustic soda for pH control be designed; (2) sodium dichromate should be added to the process water as a corrosion inhibitor at the rate of 2 ppm; (3) a sanitary water system independent of the process water system and originating at one of the head houses be provided for the 100-K Area. If caustic soda can be used instead of lime for pH adjustment, a reduction in capital cost of the "K" Reactors as high as $400,000 may be realized.

A meeting of a representative from S. T. Powell (Consulting Engineer) with personnel of the Technical Section and Design Section on flow laboratory scope design resulted in an agreement that the flow laboratory would be a pilot plant rather than a model and that much more flexibility should be provided than was originally included.

Review of drawings submitted by the architect-engineer to the Project Section continued through the month.

An interim report of the results of the a-c network analyzer board study was prepared. The study is a determination of the electrical system stability as well as a study of fault currents throughout the system.

CA-513 - Purex Facility

Design work on CA-513-B, UO_3 Plant Expansion, was advanced 12% during the month to 72% complete. The order for two gas-fired calcination furnaces was placed with the Selas Corporation of America with delivery of the furnaces and controls scheduled for July 15 and October 13, 1953, respectively. An instrument engineer visited the vendor to establish instrument requirements for the furnaces on the order.

Detailed design of the Purex Waste Facility was advanced approximately 12.5% during the month to 21.5% complete with 171 drawings required for construction, exclusive of standards or study drawings. Drawings of a diversion box, waste line encasement and process building were prepared and issued for comment. Preliminary design studies of the most feasible double wall tank design were made. However, work on the storage tanks was suspended the latter part of the month pending consideration of a scope change to a single wall tank.

Over-all detail design of the Purex Outside Facilities is 65% complete based on a total of 106 drawings required. The AEC approved seven drawings and one specification, and seven drawings were issued for comment. The study of four alternate methods of handling and storing coal was reviewed and recommended solution approved by the Project Section and the Manufacturing Department.

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

The Design Committee approved waste disposal criteria which established the separation of the disposal of steam condensate and cooling water, and incorporated changes brought about by the relaxed cribbing tolerances.

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CA-514 - 300 Area Expansion

Detail design work on the 300 Area Expansion Program was advanced during the month to 20% complete. This work does not include the 313 Building structure and services which are being designed by an architect-engineer. Particular emphasis was placed on design of the new process sewer which will be under the 313 Building addition and should be constructed before work begins on foundations. The Sewer drawing and specifications were approved and three equipment layout drawings were issued for comments. Drafting was started on items of process equipment and materials handling systems, and preparation of process equipment specifications was started. Discussions were held with the architect-engineer concerning the 313 Building addition and the preliminary and final drawings and specifications were reviewed and approved. The design criteria for detailed design of the 300 Area Administration Building by an architect-engineer was completed and transmitted to the Project Section.

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

An investigation was being made on the addition of a temperature controller and valve on the vacuum system to prevent overheating of the vacuum producer at no load. Revision of drawings to the as-built status continued during the month.

CG-496 - Recuplex Installation - 234-5 Building

Detail design of the Recuplex Installation is approximately 78% complete, an advance of 6% during the month. Two process changes were made in the Solvent Extraction Hood. One change involved elimination of the spare column, relocating the remaining three columns in a straight line and changing the spacing and holes in the column plates. The other change was the elimination of the ion exchange system and the modification of the extraction battery to handle uranium build-up in the supernates of Task I. This revision reduces the amount of mechanical design but increases the instrument design. These changes have delayed the design completion date to August 15, 1953.

CA-535 - Redox Capacity Increase, Phase II

Design drawings of ten out of approximately 30 jumpers were completed and approved. Twelve drawings for the nine columns also were approved. The instrument scope for design work to be accomplished by the Vitro Corporation on the product concentration building and the new and revised canyon equipment is being prepared.

CA-539 - Redox 241-SX Tank Farm

Over-all design of the Redox Tank Farm was advanced to 45% complete. Drafting has been started on 47 of a total of 69 drawings while the specifications are 70% complete. One specification and 27 drawings were approved during the month.

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

Review of the electrical, civil and structural drawings submitted by the architect-engineer was completed during the month.

D.O. 100362 - Underground Waste Line Between "S" Area and "U" Area - 200-W

Plans and specifications were advanced 20% during the month to 100% complete and are fully approved.

D.O. 100402 - Repair of 105-D Reactor Effluent Line

All design except electrical was completed and six of eight required drawings were approved.

D.O. 100422 - Improved Lighting 700 Area Buildings

Plans and specifications were completed and transmitted to the Plant Auxiliary Operations Department.

D.O. 100427 - Expansion of Building 234-5 Facilities

A project proposal for the expansion of the 234-5 Building was prepared. The proposal provides for revision of Task II, Task III and the addition of vault space for the Final Inspection facility at an estimated cost of $800,000.

D.O. 100438 - Personnel Meter Gate House Facility Improvement

Work on the final design of alterations to the personnel meter gate house was advanced approximately 20% during the month to essentially 100% complete.

D.O. 100476 - Positive Ion Accelerator Laboratory

Final design has been started on the positive ion accelerator laboratory and two architectural drawings were issued for comment. The work was advanced during the month to 65% complete.

D.O. 100483 - Two Phase Flow Equipment

Design calculations of the heating tube were completed and forwarded to the Technical Section. Three required drawings were issued for comment and additional fabrication drawings may be required at a later date.

D.O. 100500 - Combined Civil Defense and Plant Disaster Mobile Control Center

Design on the revision of two existing trucks for use as a mobile control center and service unit was advanced 20% during the month to 50% complete.

D.O. 100503 - Moisture Detection System for Location of Leaking Process Tubes

Work on the problem was limited by the Project Section to a proposal for the installation of a silica-gel system in all existing 100 Areas and this project proposal is being prepared.

D.O. 100513 - UNH Stripper

Mechanical design is 25% complete with four of eleven drawings checked and ready for approval. Plans, specifications and purchase requisitions are being prepared.

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D.O. 100525 - Reactivation of P-10 Facilities

Detail design was started on the reactivation of the P-10 facilities in the 108-B Building. Approximately 50 drawings will be required with completion scheduled for July 31, 1953.

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

An engineering study was started to determine methods required to correct deficiencies in the existing Ball Recovery System.

D.O. 100540 - Redox Cooling Water Disposal Basin

A sketch of a rock-filled crib was prepared for a project proposal.

DESIGN SECTION WORK IN THE CLOSING STAGES OR COMPLETED DURING APRIL

D.O. 100346 Auxiliary Civil Defense Control Center
*D.O. 100507 Effluent Water Junction Box Vent - 100-D
D.O. 100510 Redox Capacity Increase, Phase I
*D.O. 100511 Biophysics Laboratory
*D.O. 100502 Changes on Prints of Buildings 3745 and 3746

*Design Section Work Completed During April.

INVENTIONS

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

INVENTOR	SUBJECT
E.M. Johnston and W.R. Felts	Shaft Seal
B.J. Beaty and J.C. Estes	A Simplified Vertical Safety Rod (Air operated Model X-3)
J.C. Estes	Method of Combining Moderator and Absorbing Material in Reactor Control Rods.

R H Beaton
MANAGER, DESIGN

DESIGN SECTION WORK STATUS

PROCESS ENGINEERING UNIT
ENGINEERING MAN MONTHS *

Description	Backlog Start Of Month	Orders Received During Month	Time Spent During Month	% of Total Effort	Backlog End of Month	May	June	July	Aug.	Sep.	Oct.	Balance
CA-512-R	453.7		32.6	58.0	421.1	30	30	22	18	14	13	294.1
CA-512-W	39.1		3.3	5.9	35.8	2	2	1	1	1	1	27.8
CA-513	29.5		1.8	3.1	27.7	1	1	1	1	1	1	21.7
CA-514	33.2		2.2	3.9	31.0	2	2	1	1	1	1	23.0
RDS Program - FY 1953	87.5		15.5	27.6	72.0	20	23					29.0
RDS - Anticipated FY 1954								33	38	42	45	
Design Orders	13.6	1.0	0.9	1.5	13.7	2	2	2	2	2	1	2.7
TOTALS	656.6	1.0	56.3	100.0	601.3	57	60	60	61	61	62	398.3

DESIGN ENGINEERING UNIT
ENGINEERING MAN MONTHS *

CA-512-R	197.3		26.0	31.1	171.3	22	20	20	18	15	13	63.3
CA-512-W	46.8		4.3	5.1	42.5	4	3	3	2	2	2	26.5
CA-513	116.1		14.3	17.3	101.8	16	16	14	12	10	8	25.8
CA-514	58.8		6.9	8.2	51.9	6	5	4	4	3	2	27.9
RDS Program - FY 1953	43.9		4.7	5.6	39.2	9	13	14				3.2
RDS - Anticipated FY 1954									17	20	23	
Major Projects - Other	85.9	11.0	15.7	18.9	81.2	15	15	15	12	12	10	2.2
Minor Projects & Design Orders	66.9	8.0	11.5	13.8	63.4	10	10	10	10	10	12	1.4
Available for Anticipated Future Work									3	8	12	
TOTALS	615.7	19.0	83.4	100.0	551.3	82	82	80	80	80	82	150.3

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

	Authorized Projects	Anticipated Future Work	Total
Architectural & Civil	105.0	35.0	140.0
Mechanical	167.0	107.0	274.0
Electrical	132.0	65.0	197.0
Instrument	110.0	61.0	171.0
Standards	37.3	19.0	56.3
TOTALS	551.3	287.0	838.3

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

Design Section

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MONTHLY NARRATIVE REPORT - APRIL 1953

PROJECT SECTION

I. SUMMARY

A. ORGANIZATION AND PERSONNEL

The organizational changes made in Project Section on March 1 have given every indication of being effective as anticipated; and most of the personnel made available for other work were placed within the Section. Those not placed were made available for transfer to other Sections or Departments.

Shortage of drafting manpower in relation to the Expansion Program necessitated specific action on a drafting assistance contract. Representatives of the Project Section and Engineering-Contracts travelled to the Los Angeles area to interview draftsmen and designers. At two major sources about 50 applicants were interviewed. To meet the expected peak work load in September, 1953, it is now planned to contract immediately for the services of 15 drafting personnel in the ratio of 60% designers and 40% draftsmen. Preliminary arrangements have been made for work space and dormitory accommodations.

Following is a summary of personnel data for the Project Section covering April, 1953.

	April 1, 1953	April 30, 1953	Net Change
Employees on Payroll	513*	513	0
Technical Graduates-Rotational	7	7	0

The end-of-month status involved these changes:

	Project Section Personnel	Tech. Grad. - Rotational
Payroll Additions	4	
Payroll Removals	6	
Transfers into Section	5	1
Transfers from Section	3	
Transfers within Section	5	

* Increased by three over March total through transfers which were effective April 1, 1953.

B. SCOPE OF ACTIVITIES

At the end of the month, construction completion status of major projects was as follows: CA-431-A, 100-C Waterworks, 99.8%; CA-431-B, 100-C Reactor, 99.8%; CG-438, Ball Third Safety System, overall, 95%, 105-F, 105-B, 105-D and 105-DR completed; 105-H 90% complete. CG-483, Downcomer Repairs, overall, 99%, 105-F, 105-B, 105-D, and 105-DR completed; 105-H, essentially complete. CA-506, Repairs to 100 Areas Retention Basins, overall, 91%, 107-F, 107-B, 107-D, and 107-DR completed; 107-H, 83% complete. CA-512, 100-K Area Facilities, - Water Plants, KW, 13.3%, KE, 7.6%, - Reactor Buildings, 105-KW, 5.8%, 105-KE, 3.2%; CA-513, Part "C", Purex Prototype, 89%.

[redacted]

C. MATERIAL PROCUREMENT

The inspection and procurement program was expanded during the month by the addition of eight exempt personnel. Arrangements have been made to assign qualified technical graduates for a six-month period. The Unit work load increased substantially both in the Materials and Inspection Sub-Units. In order to honor the many requests, the Inspection Unit shifted personnel freely. A laboratory has been selected to conduct corrosion testing on stainless steel, and samples are now being tested. Arrangements are being made by Blaw-Knox for off-site warehousing of materials to be furnished to fabricators of equipment for Purex Facility.

D. CRAFT LABOR

Two work stoppages during the month delayed the construction program, particularly in 100-K Area, the 2101 Building, and the 101 Shops at Hanford. The office workers (Kaiser Engineers) called a strike on April 15, 16 and 17, and picketed all the barricades. The strike was settled during the month by a general increase of $6.00 per week with $11.50 per week accruing to the employees in Group I (typists, messengers, etc.). The millwrights-machinists dispute caused a work stoppage on April 14 and 15 when 31 millwrights did not report to work in protest against assignment of work to machinists. On April 16, the millwrights accepted a decision that this particular work, drilling and tapping the step-plugs and hoppers for the Ball Third Safety System, should be done by machinists.

Seven millwrights previously employed by Kaiser Engineers have filed an Unfair Labor Practice Charge with the National Labor Relations Board, alleging that by refusing to reinstate them the Kaiser Engineers organization has "interfered, restrained and coerced them". Negotiators between Kaiser Engineers and the Carpenters Union and Technical Engineers Union reached substantial agreements; however, wages and overtime rates have not been agreed upon. If present negotiations fail, both matters will be submitted to the new Labor-Management Relations Panel of the Federal Mediation and Conciliation Service.

E. SAFETY AND SECURITY

There were eight regular meetings for discussions of safety, security and health topics, and they were attended by about 410 personnel. The Section continued its "Tool-Box" meetings for contractor personnel, foremen's meetings, orientation for new employees, and special hazards meetings. The field supervisor groups continued publication of bulletins, directives, and promotional writing related to safety and security topics. An oiler assigned to Minor Construction work was crushed to death on April 27th.

F. HIGHLIGHTS OF UNIT ACTIVITIES

Inspection, Drafting and Estimating Sub-Section continued to provide necessary services to the Hanford Atomic Products Operation. Inspection and Materials Unit completed inspection on 21 orders, assigned 280 orders to inspectors, and transmitted 142 requisitions for the Expansion Program. Drafting production was 275 new drawings, 17 charts and graphs, and 133 revisions. The drafting room average was 7 man-days per drawing. The April out-put of the Reproduction group was 745,565 square feet, a figure very close to the March record and which was likewise accomplished with limited overtime (156 hours). The Estimating group completed 40 estimates, including 11 project proposal estimates. Field Surveys group continued its scheduled work of furnishing data on Hanford expansion projects to the Design Section and to off-site architect-engineers.

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F. HIGHLIGHTS OF UNIT ACTIVITIES - (Cont'd.)

Minor Projects Sub-Section worked on 70 project items and three informal requests, representing an estimated total of $24,746,800. Completed work consisted of two projects, one informal request, and three engineering requests. The Sub-Section accepted and began work on four engineering requests. Three project proposals were transmitted to sponsors. Two project proposals were approved by the A & B Committee. Seven authorizations were granted by the A.E.C. Important projects now in progress include the Ball 3X Program, Pile and Pile Water Plant Improvements, Downcomer Repairs, Recuplex Installation, Repairs to the 100 Areas Retention Basins, 300 Area Expansion Program, and Fuel Element Pilot Plant.

Reactor Projects Sub-Section: Progress on CA-406, Phase II, Mechanical Development Building, improved considerably during the month, chiefly due to the increased number of workmen. Construction was about 60% complete. In 100-C Area the activity consisted of obtaining estimates of costs to complete the scope and punch list items. For CA-512, 100-K Area Facilities, progress consisted largely of placing concrete for slabs, supports, and walls in the water plant areas. In the 105-KW and 105-KE Buildings, work continued on placing of concrete and steel. Construction progressed about 15% in the 2101 Building, 200-E Area. Particular attention is being given to graphite now being received because it is considerably harder than any previously machined at this site. Of the 17 carloads and 11 express shipments which have been received, 7 carloads have been stored at 2101, and the remainder at 101 Building. Accomplishment of tool design at the 101 Building was 98% complete. Work has continued on the design of erection and inspection tools, the rehabilitation of machine tools in 101 Building, and the storage of completed items in the 2101 Building.

Separations Projects Sub-Section continued work on the revised project proposal CA-187-D, Redox Production. The A.E.C. has issued two directives, one approving the scope changes already completed and continuing close-out on this part of the project, the second approving the proposed new work (sample gallery ventilation and aluminum nitrate back-cycle) and setting up a project CA-187-D-II to cover costs. Since the second directive reduced the authorization below the $42,000,000 previously authorized, no work has been done pending resolution of the problem. Personnel of this Sub-Section made journeys to New York, Denver, and other points to discuss design of equipment for the Purex Facility. There was also considerable work done on testing and developing the Fielden Capacitance probe, Moore Products pneumatic relay, and Wobble meter. Work on CA-513-B, Uranium Oxide Plant Expansion, consisted of preparation of the revised project proposal and various design work. The estimated cost of this project is now $325,000. For CA-513-C, Purex Prototype, all major equipment except the 2A column, has been delivered and installed in the 200 Area. The Technical Section will take advantage of a delay in construction to clean-up and test the installed equipment. Work authorization for the Redox Tank Farm, 241-SW, in the amount of $600,000 was received. Work began April 6th on clearing off the construction area for Radiological Sciences observation of contamination at the site. No further work was accomplished on CA-535, Redox Capacity Increase, Phase II.

Project Control Unit continued its routine function of preparing budgets, coding drawings and requisitions, unitization, and analysis of project costs. The History group issued four histories.

[redacted]

G. MONTHLY REPORT OF INVENTIONS AND DISCOVERIES

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

NONE

for / J. S. McMahon, Manager - Projects

April 30, 1953

II. STATISTICAL AND GENERAL

A. SIGNIFICANT ASSIGNMENTS

1. Initial Reporting

ER A-748 - Laboratory Supply Space, 3706 Building

Design was 5% complete. A project proposal is being prepared to do the necessary work to modify the northeast section of the building for use as a permanent central storage area for Caption 10 laboratory supplies and chemicals.

ER A-1196 - Pile Test Hole Mock-Up

Scoping was 50% complete. Preliminary sketches have been submitted for estimates. The preferred location for mock-up is in Building 189-D. Negotiations to secure the necessary space are in progress.

ER A-1205 - New Facility for Lattice Testing

Neither design or construction has begun. A work order for $5,000 has been received to prepare a project proposal for installation of a lattice test reactor, probably to be installed in an addition to the 326 Building. This reactor will be critical; however, calculations are being made to determine possible radiation hazards for personnel working in adjacent areas. Another possible location is in the P-11 exclusion area.

A project proposal requesting funds to complete final design to the building for housing the reactor is being prepared. This building is to be a sub-grade concrete structure approximately 70' x 100'. Funds may be made available from the budget item covering the Hanford Atomic Products Operation Laboratory projects.

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ER 2740 - Final Inspection Facilities, Building 234-5

Design was 1% complete. This request covers the preparation of a project proposal for constructing an addition to the 234-5 Building to house facilities for the final inspection of the finished product. The addition is estimated on a high-spot basis to cost between $80,000 and $90,000, with the work to be performed by Minor Construction forces.

There is a possibility that the work may be lumped into a 234-5 expansion project under Program "X", which would also include Task-II and Task-III line modifications.

2. Final Reporting

CA-500-Lubrication Pits, 1716-D and 1716-F Garages

Design had been completed previously; construction progressed 35% to completion. Final inspection and acceptance were held on April 23, 1953.

CG-534-(ER-2732), Removal of Recovery Equipment, Rooms 221, 222, & 223, Bldg. 234-5

Design progressed 5% to completion; no construction has been done. By Directive, the A.E.C. has combined this work with the Recuplex Project, CG-496. All future work will be reported under Project CG-496.

IR-128-Remote Supervisory Control 100 Area Water Plants

Completion status remained at design 15%, construction 0%. The project proposal was completed, but is not being submitted because this work has been deleted from the F.Y. 1954 budget. The informal request is being closed out, although the project could be reconsidered if the item is included in the F.Y. 1955 budget.

ER A-743-Installation of Coal Meters, 100-B,D,F, and H

Neither design or construction work has begun. On the basis of insufficient justification, the sponsor has requested that the work be cancelled.

ER A 1193-Slug Rupture Detection Instrumentation

Design progressed 5% to completion. A letter was written to the sponsor of the project as requested stating the "order of magnitude" estimate of equipment and installations cost for ruptured slug detection instrumentation. This report completed the work on the project.

ER - 2726-Adaption of 200-W Laundry Building to Branch File Use

Completion status remained at design 20%, construction 0%. Because of insufficient justification, the sponsor has requested that this work be cancelled.

3. Current Projects

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

Completion status remained at design 98%, construction 88% for total project. Construction on Parts III and IV only was 1% complete.

Material procurement for the ventilation work (G.E. phase of the project) in the existing building has continued. It is expected that this work, to be performed by Minor Construction, will begin in early July, 1953.

Construction on the train shed conversion was begun April 15, 1953. The schedule completion date for this lump sum contract phase is December 30, 1953.

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

Completion status remained at design 100%, construction 99.8%. An estimate of the cost of remaining work has been received. Except for minor jobs of an emergency nature no work was done during the month.

CA-413-B - New Reactor - 100-C Plant (Reactor)

Completion status remained at design 100%, construction 99.8%. The Estimating group has prepared an estimate of the cost of the work required to complete the scope and punch list items.

CA-413-C - Metal Examination Facility - 105-C

Design progressed 3% to a total of 14%; construction has not begun.

An additional authorization of $20,000 has been given General Engineering Laboratory to continue with design work, and $10,000 has been authorized for procurement of critical materials. On the basis of observation of the prototype slug dolly, representatives of Project and Technical Sections suggested several modifications. However, the operation of the dolly during testing was generally good.

Because of difficulties in obtaining design engineers before August, 1953, it is now planned to request additional engineering and design assistance from General Engineering Laboratory.

CG-438 - Ball Third Safety System

Design had been completed previously; construction progressed 12% to an overall total of 95%. Installation of the Ball 3X System in 105-H Reactor was 90% complete, and the scheduled completion date is May 9, 1953.

A revised project proposal is being prepared requesting funds for additional Ball Third Safety System equipment and to revise existing equipment where operating conditions have indicated its inadequacy, as was the case with the hopper gate solenoids which failed after about 60 days of operation. The hopper gate solenoids are being replaced on all hoppers in all areas. There have been no coil failures since the coil voltage was reduced from 115 volts to 88 volts. New solenoids are expected in early May 1953.

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CG-482 - Pile and Pile Water Plant Improvements

Design had been completed previously; construction progressed 90% to a total of 95%. Replacement of thermocouples and thermocouple lead wires at 105-H is scheduled for completion during the first week of May 1953. Activity levels on the rear face of the unit have ranged from 20 MR to 80 MR, permitting an average working time per man per day of one hour. Plant forces have benefited materially from the experience gained in previous areas and are performing this work well within their established schedule.

A revision of the project proposal is being prepared reducing the funds to approximately $460,000. It is possible that the funds previously expended may be reduced to $240,000, depending upon cancellation negotiations for 105-H nozzles and gun barrel flanges, and possible transfer of useful equipment to Purchasing & Stores Section and other projects.

CG-483 - Downcomer Repairs in 100-B, D, DR and H and Replacement in 100-F

Design had been completed previously; construction progressed 9% to a total of 99%. Downcomer repairs in 105-H were essentially completed during the month. The near side downcomer in this area was found to be in the poorest condition of any of the cascade type downcomers. Several holes had been worn in the downcomer walls, and 80% of the vent pipe had been broken loose. These items have now been satisfactorily repaired. S.W.P. conditions permitted approximately 45 minutes average man-day in the "H" area downcomers.

Under this project plant forces are installing an 8" sheet metal duct extending from the 105-F downcomer penthouse to the top of the unit exhaust. The purpose of this duct is to remove the vapors escaping from the downcomer which have been contaminating the 105-F control room and work area.

CG-506 - Repairs to the 107 B,D,F, and DR Retention Basins

Design had been completed previously; construction progressed 22% to a total of 91%. The west side of 107-H was completed except for final clean-up work. Grouting, was about 67% complete on the east side of 107-H. All replacement slabs have been replaced. Packing of the joints has progressed in the east side. During the pouring operation an operator was crushed to death on April 27, 1953 at 2:45 P.M.

On April 18, 1953 an inspection was made of the 107-B basin, and it was observed that the expansion joints had started to fail. The Thiokol base material which had been intruded into the joint during the repair program has been extruded from the joint beyond its elastic limit. This sealant was supposedly capable of a 300% deformation, but in practice has not returned to its original shape. A representative of the vendor of the sealant inspected the 107-B basin on April 23rd. Samples of the material have been sent to the 300 Area for analysis, and the manufacturer is reviewing test samples that they had collected during the compounding of the Thiokol. When inspection of other basins has been completed, and the test information compiled, a review meeting will be held to determine what corrective action, if any, should be taken.

CA-512 - 100-K Area Facilities

100KW and 100KE Water Plants

The over-all design of the water plants progressed 13% to a total of 73%. Construction progress was as follows: KW progressed 4.73% to a total of 13.3%; KW progressed 2.96% to a total of 7.6%. The total excavation in the KW water area was 832,593 yards, and in KW water area 370,423 yards. Total concrete placed in the KW water area was 31,634 yards, and in the KE water area 12,562 yards. Work during the month on various phases of water plants consisted of the following:

181-KW and KE - Forming and placing concrete in the walls and excavation of the forebays;

183-KW and KE Head House - Completion of rough excavation on both buildings;

183-KW Basins - Pouring walls, slabs, and dry wells, and completion of under slab drainage;

183-KE Basins - Pouring tunnel wall sections;

183-KW Filter Building - Pouring Wheeler bottom supports, pipe gallery walls, and structural concrete in general;

183-KE Filter Building - Pouring effluent flume slabs;

183-KW Clearwells - Pouring columns, rough beams, and wall section;

183-KE Clearwells - Completion of bottom slabs;

190-KW Building - Fine grading and forming for tunnel slabs, also issuance of excavation and foundation prints;

Outside Lines - Excavation for box sewer, raw water lines, and cross-tie tunnel.

105-KW and 105-KE Buildings

Over-all design progressed 5.5% to a total of 81%. Construction progress was as follows: KW progressed 2% to a total of 5.8%; KE progressed 1.6% to a total of 3.2%. The cumulative total concrete placed for 105-KW was 11,200 yards, for 105-KE, 5,540 yards. The corresponding totals of structural and miscellaneous steel placed in the buildings are: 105-KW, 715 tons; 105-KE,436 tons.

2101 Building, 200-E Area (A.E.C. administered)

Design was 95% complete; construction progressed 15.3% to a total of 65.3%. The structural details of the facility, frame and panels, are essentially complete. Work is progressing on installation of interior lighting and duct work. Construction progress was generally retarded by the strike of April 15-20, 1953. Design has completed a review on the drawings and specifications as prepared by the architect-engineers.

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CA-512 - 100-K Area Facilities - 2101 Building, 200-E Area (Cont'd.)

To date 17 carloads and 11 express shipments of graphite have been received, of which 7 carloads have been stored at 2101 Building, and the remainder at 101 Building. Tests have indicated that this graphite, while otherwise satisfactory, is considerably harder than any machined heretofore. The average is less than 200 pieces between changing cutters on the mills. Procurement has been initiated for a new grade of carbide inserts. If these do not materially increase the life between grinding cutters, the overall schedule will be delayed.

101 Building, Hanford

By the end of the month accomplishment of tool design was increased by 18% to a total of 98%. Design of erection and inspection tools progressed 15% to a total of 35%. The rehabilitation of machine tools in the 101 Building progressed 14% to a total of 64%, and a number of items have been moved to the 2101 Building for later installation.

CA-513-A - Purex Facility

Design of the Purex Facility progressed satisfactorily during the month. The architect-engineer delivered 162 drawings, 7 specifications, and 12 requisitions; these make totals of 450 drawings, 10 specifications, and 20 requisitions. Of these totals the following items have been approved: 355 drawings, 4 specifications, and 10 requisitions. Design of the waste disposal facility has progressed. During the month 10 drawings were issued for comment, and two of these drawings were approved.

Design work was completed on the 2901-A elevated storage tank, and the 2607-A sanitary sewer system. Design is progressing on the 284-E power house addition, 282-E reservoir and pump house, 2901 export water system, the outside electrical facilities, and the 2601-E roads.

Mechanical modification of the "2-phase" test centrifuge has now been completed and testing was scheduled for early May. Test and development work in the 300 Area was continued on the Fielden Capacitance probe, Moore Products pneumatic relay, and Wobble meter. Construction is progressing on the 2601-E railroads and 2901-E 12" sanitary water line.

CA-512-B - Uranium Oxide Conversion Facility

The revised project proposal has been prepared for submittal to the A & B Committee on May 11, 1953. The estimated cost of this project is now $325,000 instead of $960,000 as previously estimated. Minor Construction has scheduled the beginning of construction for May 11, 1953.

Of the 61 required drawings, 11 were approved during the month. Fifteen requisitions were issued during the month.

[redacted]

CA-513-C - Purex Prototype 321 Building

Design had been completed previously; construction progressed from 60% complete to "substantially complete". All major equipment except the 2A column has been delivered and installed in the 300 Area. All equipment and materials on site are scheduled to be installed by May 18. After this date Minor Construction will suspend work until the remaining material is delivered. During this interval the Technical Section has scheduled clean-up and testing of the installed equipment. It is now estimated that the Technical Section could begin operation of this unit on June 15, 1953.

CA-514 - 300 Area Expansion Program - Production Facilities

Over-all scoping progressed 5% to a total of 93%; detail design progressed 6% to a total of 13%; construction began and progressed to an over-all completion of .1%. The work authority authorizing $400,000 for procurement and preliminary construction was received on April 21, 1953. Progress on Project CA-514 was as follows, according to its various parts:

A. Process Facilities

Scoping 95%, detail design 16%, construction .1%. Work was done on a great many details related to bid assemblies, contracts, preliminary proposals from vendors. The architect-engineer is preparing a cost estimate for the first contract (313 Building and outside facilities), and obtaining information for the second phase. Minor Construction forces began erecting temporary construction fences, excavating for the process sewer, and preparing the area for a lump sum contract.

B. Acid and Caustic Facilities

Scoping 95%, detail design 10%. Information has been transmitted to the architect-engineer.

C. Methanol Still

Scoping 95%, detail design 10%. Information has been transmitted to the architect-engineer.

E. Decontamination Station

Scoping 80%. Design information is being assembled.

G. Railroad

Both scoping and detail design were completed. This item was included in the first bid assembly which was issued April 17, 1953.

H. Process Sewer

Scoping 100%, detail design 95%, construction 2%. Minor Construction forces began work April 27, 1953. A study is being made of the two alternatives: the first being to dig the pond deeper, and the second to let the water escape directly to the river. The Radiological Sciences group is assisting in the study of the second alternative.

J. Operations Change House

Completion status remained at scoping 100%, detail design 100%, construction 1%. The contractor began moving equipment in on April 27, 1953.

K. Administration Building, Gate House, and Parking Lot

Scoping 96%. The design criteria have been completed and are being routed for approval. At the request of the A.E.C., additional justification is being prepared. The A.E.C. has scheduled negotiations for an architect-engineer contract on May 4, 1953.

L. Change House Renovations 3707 A and B

Scoping 96%. The design criteria have been completed and are being routed for approval.

M. Oil and Paint Storage

Scoping 96%. It has been determined that the existing first-aid building, 3719, will be used for this storage. The design criteria have been completed and are being routed for approval.

N. Steam and Water Facilities

Scoping 94%. The design criteria for the new 12" water supply line from North Richland have been completed and are being routed for approval.

P. Hutment Removal and Expansion of the Coal Pile

With scoping at 75%, no further work has been done.

Q. Fire Alarm System

With scoping complete, detail design has been scheduled for July and August 1953.

R. Telephone and Security Alarm

With scoping complete, no further work has been accomplished.

B. OTHER ASSIGNMENTS

CG-187-D - Redox Production Plant
The project was re-opened by Revision #4, and the Atomic Energy Commission has issued two Directives. One approved the scope changes already completed and contract close-out on this part of the project; the second approved the proposed new work (sample gallery ventilation and aluminum nitrate back-cycle) and set up Project CA-187-D2 to cover costs. Since the second Directive reduces the authorization below the $42,000,000 previously authorized, no work has been done pending resolution of the problem.

CA-406 - Phase II, Mechanical Development Building
Design had been completed previously; construction progressed 25% to a total of 60%. Rate of progress has improved considerably during the past month, chiefly due to the increased number of workmen. It is now believed that the estimated completion date of July 18, 1953 can be met, unless labor delays are prolonged. The estimated ready-for-use date, allowing six weeks for moving and installation of shop machinery, is September 1, 1953.

CA-434 - New Bio-Assay Laboratory
Completion status remained at design 20%, construction 0%. A contract for architect-engineer services for Title I and Title II work on this new laboratory has been awarded. The present schedule, as established by the A.E.C., requires the detail design to be completed by May 20th, and that construction start before July 1, 1953. As a result of this "tight" schedule, a hasty study was made of the possibility of using Building 744; however, it has now been decided to proceed on the basis of the new building.

CA-441 - Solvent Building
Design completion status remained at 25%. The project proposal for an estimated cost of $59,000 is expected to be ready for submittal during May 1953.

CG-447 - Portable Meteorological Mast
Design progressed 1% to completion; construction progressed 2% to a total of 99%. Since testing of the various elements was essentially complete, the project is being closed out with exceptions, particularly vacuum pumps for the cascade impactor system and the component meter.

CA-455 - Replace Two Elevated Water Tanks in 200-E Area
Design progressed 5% to a total of 95%; construction has not begun. The contractor's drawings are being checked by the interested G.E. personnel.

CG-477 - Building 284-W - Fifth Boiler Addition
Design had been completed previously; construction progressed 10% to a total of 98%. Steaming tests have been successfully performed, and the contractor is now performing miscellaneous work on insulation and painting.

CA-489 - Neutron Monitoring Calibration Facilities
Design progressed 45% to a total of 65%; construction has not begun. The status of funds for this project has been qualified by the local A.E.C. office. Total complete design is progressing as scheduled. The purchase order for the 2 MEV accelerator has been passed and the vendor has been requested to supply some additional speciality items.

CG-495 - (ER E-483) Outlet Tube Temperature Monitoring Thermocouples
Design progressed 3% to completion; construction remained at 75% complete. Revision No. 2 of the project proposal to include the 100-DR reactor in the replacement program has been returned by A.E.C. for re-estimating; so no work was done during the month.

[redacted]

CG-496 - Recuplex Installation, 234-5 Building
Design progressed 7% to a total of 75%; construction has not begun. In response to the project proposal requesting $1,410,000 for CG-496 and $80,000 for CG-534, the A.E.C. issued a Directive authorizing $1,400,000. The scope of the two proposals is combined under CG-496. It is now planned to submit a revised project proposal to cover the combination and to present a revised estimate.

Procurement had been transferred from A.E.C. to G.E., with the former continuing negotiations on any orders already being processed by them.

During April a scope change was made in which the Ion Exchange system was deleted thereby allowing an estimated savings of $40,000. A field revision has been issued to Minor Construction forces for work on a hood removal and temporary construction facilities.

CA-497 - New Substation Fences and Grounding of Existing Fences
Design had been completed previously; construction progressed 23% to a total of 53%. The contractor is making satisfactory progress, having regained about half of the 12% schedule lag.

CA-511 - Completion of Minor Construction Fabricating Shops
Design progressed 5% to a total of 30%; construction progressed 3% to a total of 5%. Installation of asbestos shakes is progressing, and plans in sufficient detail to guide estimators and craftsmen are being prepared for issue in late May.

CA-516 - Gable-Butte Railroad
Completion status remained at design 50%, construction 0%. With the assistance of personnel loaned by the sponsor, a review is being made of the proposed new job scope and the establishment of firm justification. The present planning is based upon submittal of the project proposal during the current fisical year.

CA-517 - Fire Protection Buildings, 272 E and W
Completion status remained at design 30%, construction 0%. A new job scope is being prepared which excludes the work on 272-E Building, and a revised project proposal is being prepared.

CG-519 - Replacement of 100-D Reactor Effluent Line
Design progressed 2% to a total of 97%; construction remained at 22%. A control estimate based on final design is being prepared.

CG-520 - P-13 Pressure Assembly Removal
Design began and progressed to 5% complete. Arrangements are being made to expedite design and drafting work.

CA-525 - Permanent Auxiliary Combined Civil Defense and Plant Disaster Control Center
Design progressed 5% to completion; construction has not begun. Final design and specifications have been completed.

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CA-527 - (ER-2718), Fire Protection - 200 East and West Spare Parts Warehouse
Completion status remained at design 100%, construction 0%. The G.E. portion of the work, the fire alarm system, has been completed. The requested changes for the lump sum portion of the work were included in the bid assembly which is being prepared.

CA-529 - Personnel Meter Gatehouse Facility Improvements
Design progressed 5% to completion; construction has not begun. It is expected that construction may start in June, 1953.

CG-530 - (ERA-3096) - 314 Building Revision for Canning Development
Design had been completed previously; construction progressed 30% to a total of 90%. Since late delivery of electrical components has delayed completion beyond the scheduled date of May 1, 1953, a revised project proposal has been submitted requesting an extension of time to June 15, 1953.

CA-533 - (ER-479) - Hanford Works Official Telephone Exchange
Final design was 12% complete; construction has not begun. Design work has been delayed on the location and arrangement of an exchange building. The specifications for equipment have been completed and transmitted to the A.E.C. for lump sum bid purposes.

The A.E.C. has authorized $350,000 for procurement of telephone exchange equipment and for engineering, and has issued a Work Authorization to G.E. in the amount of $20,000 for scoping and preliminary design, preparation of specifications for the exchange equipment, acceptance test, and tie-ins.

CA-535 - Redox Capacity Increase, Phase II
No authorization for construction or procurement has been received.

CG-536 - (ER-A-686) - Painting High Tanks - 105-B and 105-F
Completion status remained at design 75%, construction 0%. Work has been scheduled to begin about May 15, 1953.

CG-538 - (ER-2734) - Install Underground Waste Line Between "S" Area and "U" Area 200-W
Design progressed 30% to a total of 80%; construction has not begun. The expenditure of $510,000 for design and construction was authorized April 15, 1953. Virtually all the design drawings have been approved and distributed to the field for construction, which is scheduled to begin about May 1, 1953. The work is to be done by Minor Construction forces, and they have been orientated on the contamination problem known to exist on the site.

All critical materials are on order, of which about 40% have been received.

CA-539 - Additional Waste Storage for Redox
Detail design progressed 22% to a total of 60%. A Work Authorization for $600,000 was received early in the month. Construction work began April 6th with blading off the construction area for Radiological Sciences to observe contamination at the site. A revision of the project proposal is being circulated for signatures.

[redacted]

CA-542 - (ER-A-733) - Asbestos Shakes - 100B, D, and F Buildings
Design completion status remained at 50%. The A.E.C. rejected this work because the cost of asbestos shakes as compared to the cost of painting exceeds the criteria. The project proposal is being returned.

CG-543 - (ER-2733) - Replace Sanitary Tile Field 200 West Administration Area
Completion status remained at design 35%, construction 0%. The project proposal is being revised to request funds for a single tile field. It is also planned to include in this project proposal a request for funds to complete a new tile field at the 200-U Area.

CG-545 (ERA-724) - Soil Science Laboratory Facilities
Completion status remained at design 22%, construction 0%. A Work Authority for $15,200 authorizing laboratory work only was received on April 10, 1953. The project proposal is being revised to include only the authorized work.

CA-546 - (ER-3099) - Fuel Element Pilot Plant
Scoping progressed 2% to a total of 92%; neither design or construction has begun. Comments on the design criteria for this new facility are being incorporated before final issuance.

CG-549 - (ER-2731) - Activate Task I, RMA Line - Building 234-5
Completion status remained at design 15%, construction 0%. The project proposal was approved by the A & B Committee and the A.E.C. during the month. A Directive authorizing $240,000 for design, procurement, and demolition work is expected in early May, 1953.

CG-550 - (ERA-746) - Reactivation of P-10 Facilities
Design began and progressed to 5% completion. Scoping and design phases are in progress. Approval was obtained on a project proposal in the amount of $150,000 for design, dismantling of equipment in the 108-B Building, and the procurement of materials and equipment necessary to the reactivitation of the P-10 facilities. Actual dismantling work in the 108-B Building was begun by plant forces on April 29, 1953.

IR-116 - (Job 015) - Combined Civil Defense and Plant Disaster Control Center
Design progressed 30% to a total of 50%; construction has not begun. Final design for converting the existing Hanford Works Safety Shoe Trailer to a Mobile Control Center is scheduled for completion about May 8, 1953. A project proposal for the remodeling of the unit and installation of necessary equipment is to be submitted about May 15, 1953.

IR-133 - Water Quality Laboratory, 108-B Building
Design completion status remained at 100%; construction completion status was revised downward to 95%. An extension of time on the physical completion date is being requested. The ventilation and electrical difficulties are being reconciled, and the work should be completed during May, 1953.

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The following studies and Engineering Requests, involving preparatory work and scoping of future projects, were active during the month:

ERA-661 - Central Distribution Headquarters
Design progressed 2% to a total of 27%. The project proposal is being prepared on the basis of using the existing 212-R Building. It now appears that this type of building is adequate for the customer's needs.

ERA-725 - Particle Problem Animal Exposure Equipment
Design completion status remained at 5%. No work was accomplished because of other higher priority work.

ERA-727 - 313 Building Roof Repair or Replacement
Design completion status remained at 50%. Further action on preparation of the project proposal was suspended until early 1954 so that the work may be coordinated with the new 313 Building addition.

ERA-730 - Solvent Storage Building Rescoping
Design completion status remained at 25%. Preparation of the project proposal is continuing as outlined under CA-441, Solvent Building.

ERA-735 - Graphite Hot Shop and Storage Building
Design progressed 2% to a total of 10%. Before formal submittal of the project proposal, further work is being done on justification and a review of alternate facilities.

ERA-736 - Transportation Garage and Facilities - 2713-E
Design progressed 5% to a total of 10%. Submittal of this project proposal is awaiting final disposition of the project proposal, Central Distribution Headquarters, ERA-661.

ERA-741 - Renovation of 3722-A, 3702, and 3703 Buildings
Design completion status remained at 50%. Since another proposal, CA-542 for application of asbestos shakes was rejected by the A.E.C., the submittal of this proposal is being delayed. Possibility of painting the exteriors of these three buildings is being discussed with the Manufacturing Department.

ERA-742 - Remodeling First Aid Buildings 100-B, D, and F
Design completion status remained at 1%. Further work was suspended because of higher priority work.

ERA-744 - Installation of Steam Meters, 100-B, D, F, and H
Design progressed 3% to a total of 5%. The rough draft of a project proposal for $48,000 has been prepared and is being reviewed.

ERA-747 - Hot Semiworks Conversion
Design was 5% complete. The project proposal is being prepared as a part of Project CA-513, 200 Area Facilities Expansion. The total estimated project cost for the Hot Semiworks Conversion Phase is $670,000. It is now planned for Technical Section to perform detailed design of the engineering items, and for Design Section to perform mechancial, electrical, architectural and instrumentation phases.

ERA-1188 - Xenon Generator
Design completion status remained at 10%. The Applied Research Sub-Section has assumed the responsibility for securing funds. Work is awaiting receipt of a work order from the Applied Research Sub-Section.

ERA-1192 - Vertical Rod Test Tower
Design completion status remained at 20%. The project proposal has been rejected by the A & B Committee for lack of justification.

ERA-1195 - Two Phase Flow Facilities
Design progressed 60% to a total of 65%. Preliminary prints for the 52S aluminum and the electrolytic cosine curve heating tube and the accompanying thermocouple probe have been forwarded to the sponsor for comments. These prints are to be used for information to possible fabricators before the project proposal is prepared.

ERA-1197 - X Level Cask Handling Facilities, 105-B, C, D, DR, F, and H
The work order has been received, but no work has been performed.

ERA-1198 - E Test Hole Facility, 105-B
The work order has been received, but no work has been performed.

ERA-1199 - Heat Transfer Process Tube Mock-Up
The work order has been received, but no work has been performed.

ERA-1200 - Heat Transfer Laboratory
The work order has been received, but no work has been performed.

ERA-1201 - X Level Controlling and Recording Equipment
Design began and progressed to 10% complete. Scoping before submittal of the project proposal is proceeding. Water is to be supplied to the 105-C test holes through a reducing station tied into the front face risers. Effluent from the 105-C test holes is to be taken from the inner rod room to the rear face near side riser. Two instantaneous type heat exchangers controlled with temperature control valves are to provide heated water to two of the test holes.

ERA-1203 - Manipulator for Cave in 108-B Building
Design was 1% complete. The scope of work has been determined, and a cost estimate and project proposal are being prepared. The problem of limiting the area of openings into the cave for purposes of contamination control appears to be solved. This is to be accomplished by a relatively simple alteration of the existing sliding door rails and attachment of the sliding doors to the manipulator crane.

ERA-1204 - Panellit Gauge Testing Facilities
Neither design or construction has begun. A project proposal is being prepared for the installation of a high pressure, constant pressure pump, and toggle valves in each gauge line of the pressure monitoring system in 105-B, D, F, DR, H and C Buildings. Rough draft copies have been distributed for comments. The snubbers have been eliminated from the project. The snubbing of the pressure lines will be made by a small needle valve attached to the toggle valve. These needle valves also serve as shut offs to the gauges to facilitate their removal.

ERA-3098 - Cobalt 60 Source for Radiation Studies
Design was 40% complete. The Technical Section is furnishing detailed sketches so that an estimate of cost may be made.

ER-2723 - Steel Handling System - 272W
Design completion status remained at 20%. A revised scope has been received from the Manufacturing Department, and work is to be started in May 1953.

ER-2727 - 235 Building Laboratory Revisions
Design completion status remained at 20%. The project proposal was not approved by the A & B Committee. Further work is suspended until the sponsor completes a review of justification.

ER-2736 - Replacement of Mixing Equipment Task III, RMA Line, 234-5 Building
Design completion status remained at 5%. The sponsor has requested further delay of work until a general Task III remodeling project is approved.

ER-2737 - Fiscal Year 1954 Water Tank Replacements
Design completion status remained at 15%. The rough draft of a project proposal was prepared to cover the cost of replacing the first four elevated wooden storage tanks on the Manufacturing Department's priority list. This project was estimated to cost $150,000 which is the limit of funds available for this work. The problem is being studied jointly with the local A.E.C. office to determine whether additional funds may be procured or the scope may be reduced to three tanks.

ER-2739 - Redox Cooling Water Disposal Basin
Design progressed 5% to a total of 10%. A revision is being written to Project CG-187-D, Redox Production Facilities, to include installation of the disposal basin for the Redox Plant. The total project cost is expected to be between $175,000 and $200,000.

ER-6020 - Future Records Storage Study
Design completion status remained at 50%. Higher priority work caused suspension of this study. It is now planned to schedule completion for June 15, 1953.

ERE-484 - Flexowriter Temperature Recorder, 105-D, DR, and F Areas
Design had been completed previously. The project proposal is being routed for signatures. The work is estimated at $43,000, and the Manufacturing Department is recommended to have project management.

CC-5285 - Mock-Up Cells, 300 Area
Two cells have been sand blasted and painted and are ready for delivery to the 300 Area. Work is continuing on the step-plugs.

CC-5423 - Exploration and Minor Repairs To Effluent Sewer Box, 105-B
Work was 20% complete and is awaiting further tests.

CC-5433 - Vent Line 105-D Effluent Sewer
Construction began April 7th and is estimated to be 85% complete.

CC-5461-5464 - Thermal Insulation At Building 2101-E, 200-E Area
Work has begun on one of these work orders; however, these jobs are being rescoped to cover additional insulation.

C. RELATED FUNCTIONS

The increasing load on inspection personnel was partly distributed by the addition of eight new people; however, there was considerable shifting of personnel in order to fulfill the many requests for inspection. Arrangements have been made to assign technical graduates for a six months period, the first to be assigned during May. A laboratory has been scheduled to conduct corrosion testing on stainless steel, and a quantity of stainless steel is being sampled by this laboratory. Arrangements are being made by Blaw-Knox for off-site warehousing of materials to be furnished to fabricators of equipment for Purex Facility. These materials include such items as: exchanger tubing, fittings weld rods, plates, sheets, bars, and vessel heads.

Through a misunderstanding, the sludge pump vendor (Byron-Jackson) shipped some pumps after they had been rejected by the inspector. The pumps are being tested on site according to an agreement between General Electric Company and the vendor.

The following is a resume of inspection activities during the month:

ITEM	NUMBER
Open requisitions requiring inspection	188
Orders assigned to inspectors	280
New orders received	51
Orders completed	21
Sub-vendor orders assigned to inspectors	18
Total requisitions for Program "X" transmitted	142
Total orders for Program "X" placed	97

At the end of April there had been a grand total of 1038 Program "X" requisitions transmitted.

Drafting production for the month was 275 new drawings, 17 charts and graphs, and 133 revisions. The drafting room average was 7 man-days per drawing. About 80% of the present drafting personnel worked three Saturdays of April. Preliminary arrangements were completed to obtain a drafting assistance contract. Representatives of the Project Section and Engineering-Contracts travelled to the Los Angeles area and interviewed about 50 applicants. The proposed contract is planned to obtain the services of 15 drafting personnel in the ratio of 60% designers and 40% draftsmen. Arrangements are being made for work space and dormitory accommodations.

The reproduction out-put for April was 745,565 square feet. This was close to the record of 811,753 square feet established in March, 1953. Limited overtime (156 hours) was worked to provide service on priority jobs. The largest orders processed during April were 13,383 prints for CA-512-R and 7,772 prints for CA-512-W. The Audit Inventory crew completed inventory of the 300 and 3000 Area records and are now working in the 700 Area.

The Estimating group completed 40 estimates during the month. The completed estimates comprised the following: 11 project proposal, 6 comparative, 3 fair cost, 4 for work order purposes, 8 high spot, and 8 miscellaneous.

C. RELATED FUNCTIONS - (Cont'd.)

The Field Surveys group continued checking work in Richland and also furnished preliminary field data on Hanford expansion projects to the Design Section and to off-site architect-engineers. All work is on schedule.

The Project Control Unit continued its routine functions of preparing budgets, coding drawings and requisitions, unitization, and analysis of project costs. The Control group issued unitization reports on Projects CG-445, CG-404, CG-419, CG-403, and CG-420. The History group issued four histories, bringing the cumulative number published to 90. About 100 position descriptions, covering about 200 exempt positions, have been re-written and submitted.

D. CRAFT LABOR

Voluntary termination of construction contractor (Kaiser Engineers and associated contractors) personnel was 4.4%, slightly lower than the preceding month.

Two work stoppages during the month delayed the construction program, particularly in 100-K Area, the 2101 Building, and the 101 Shops at Hanford. There was an estimated five-day delay in construction schedules on the major projects. Various other disturbances caused lesser delays. (The office worker's strike is described in the Summary).

The millwrights-machinists dispute on minor construction work delayed the Ball Third Safety System program for about two days. On April 16 the millwrights accepted a decision that the disputed work, drilling and tapping the step-plugs and hoppers, should be done by machinists; however, the disagreements continue between these two crafts. Seven millwrights filed an Unfair Labor Practice Charge against Kaiser Engineers. (Details were given in the Summary of this report).

Negotiations continue between Kaiser Engineers and the Carpenters Union and Technical Engineers Union. Substantial agreements were made; however, wages, overtime, and some form of tool insurance have not been agreed upon. If negotiations fail, these matters will be submitted to the new Labor Management Relations Panel of the Federal Mediation and Conciliation Service.

The continued agitation between key crafts has showed its effect on construction contractor personnel, particularly in the strike and picket lines which were conducted by the Office Workers Union. On conclusion of the strike on April 20, 1953, about 50% of construction personnel returned. During the five-day interim some had resigned and gone elsewhere. Absenteeism increased from the normal average of 40 to 104 on April 16, and 86 on April 17. The greatest ratio of absenteeism seemed to be among the piping crafts.

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FUEL TECHNOLOGY SUB-SECTION

APRIL, 1953

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VISITORS AND BUSINESS TRIPS

Name	Date	Place Visited	Purpose
R. W. Benoliel	4-1,2,3-53	General Engineering Laboratory	Discussion of fabrication and handling of metals
H. Harty	4-1,2,3-53	General Engineering Laboratory	Discussion of fuel element examination equipment for Hanford
	4-1,2,3-53	Knolls Atomic Power Laboratory	Discussion of fuel element examination
G. E. McCullough	4-1,2,3-53	General Engineering Laboratory	Discussion of fabrication and handling of metals
	4-1,2,3-53	Knolls Atomic Power Laboratory	Discussion of fabrication and handling of metals
W. T. Kattner	4-1,2-53	Fernald	To discuss fabrication of metal - metallurgy of uranium
		New York Operations Office	Same as above
		Argonne National Lab.	Same as above
R. L. Knecht	4-7,11-53	Fernald	Observe fabrication processes.
	4-27,30-53	Fernald	To observe a special fabrication
F. B. Quinlan	4-10-53	Precision Machine Works	To observe machining processes and interpret prints
E. C. Pitzer	4-11,22-53	Knolls Atomic Power Laboratory	To discuss latest KAPL results on coatings of various metals
	4-22,24-53	Battelle	To discuss corrosion problems of interest at Hanford

VISITORS AND BUSINESS TRIPS

Name	Date	Place Visited	Purpose
W. L. Schalliol	4-11,20-53	Brookhaven National Laboratory	To attend Metallurgy Information Meeting
	4-14,15-53	Sylvania Electric Products Co.	Discussion on fuel element development
	4-16-53	Knolls Atomic Power Laboratory	Discussion on fuel element development
D. C. Worlton	4-11,15-53	Brookhaven National Laboratory	To attend Metallurgy Information Meeting
	4-15-53	Sylvania Electric Products Co.	To observe fabrication of uranium
P. D. Wright	4-11,17-53	Brookhaven National Laboratory	To attend Metallurgy Information Meeting
	4-15-53	Sylvania Electric Products Co.	Observe fabrication of uranium
	4-16,17-53	Bridgeport Brass Co.	Discuss uranium fabrication problems
J. W. Lingafelter	4-30-53	Kaiser Aluminum Co.	Welding consultation

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URANIUM DEVELOPMENT

Fabrication of Uranium

Examination of the 50 uranium hydride compact slugs received from Sylvania Electric Products Company was completed. The results of the investigation indicate that the quality of the hydride compact slugs was inferior to the powder metal compact slugs previously examined. Therefore, it was decided not to continue with plans to irradiate these slugs.

During the ball 3X shutdown of H pile, two tubes containing powder metal compact slugs were discharged at exposures of about 570 MWD/T. Visual examination indicated one powder metal compact slug from one of the tubes was distorted in a manner similar to that of the distorted powder metal compact slug discharged at 425 MWD/T. This slug has been transferred to Metallurgy Research for further examination. The balance of the powder metal compact slugs and of the control slugs, with the exception of bumping one triple-dipped canned piece, showed no evidence of distortion under pile irradiation.

Casting of five 6-1/2 inch diameter and five 7-1/2 inch diameter billets by the Metal Preparation Section for extrusion trials at MIT was completed. A second sample of the alpha extruded rod was received from MIT. This rod was extruded in a copper jacket and exhibited a corrugated surface. The corrugation of spline effect on the surface of the rod is attributed to the large grain size of the starting billet.

Following preliminary work at Ames Laboratories, uranium was cast at Hanford directly into one-inch diameter zirconium cans producing a strong bond between the uranium and zirconium. Rolling of one of these canned slugs in oval and rounded roll passes to a total reduction of 90 per cent in the cross-sectional area produced no evidence of zirconium jacket separation from the uranium core.

Uranium Alloys

Salt bath heat treated lead-dip canned uranium plus 0.4 atomic per cent chromium alloy slugs were charged into the pile. Analytical results from the two 250 pound ingots of uranium plus 0.4 atomic per cent chromium alloy indicate that the billets are homogeneous both from top to bottom and from center to edge with respect to chromium content.

Process Tube Metals

Process tubes fabricated from 63S aluminum alloy were completed by ALCOA in April. The manufacture of slugs using 63S cans was performed with an over-all efficiency of 67.5 per cent acceptable slugs. The slugs canned during the first day's operation showed a high frost test rejection rate; however, after modification of the canning, facing and welding techniques under the direction of the Canning Techniques Sub-Unit the balance of the canning operation was conducted with a much lower frost test rejection rate.

Relaxed zirconium process tube and can specifications were written for transfer to the A.E.C. who will arrange for the fabrication of these items.

COATINGS & CORROSION

Building Conversion

All major conversion of 222-B Building has been completed. Room 1 will be decontaminated and used as an office. The equipment for the Flow Cup Laboratory is being installed. Installation of the steam line for the Flow Cup Laboratory and electrical service for the coating equipment is practically complete. The tanks, pumps, and other equipment necessary for the addition of dichromate to the water have been purchased and are being installed.

Electrical Measurements

The electrical resistance of the unirradiated compound layer in a Hanford slug was measured to obtain some data for evaluation of a theory concerned with energy conversion proposed by Dr. K. H. Kingdon. The results indicated specific resistance of 2×10^{-3} ohms-cm. This value may be compared with that for aluminum, 3×10^{-6} ohms-cm, and for a typical semi-conductor germanium, one ohm-cm.

Thermogalvanic Effects

Thermogalvanic corrosion tests have shown that under the conditions employed, if the hot and cold aluminum electrodes are at 96 C and 45 C respectively, a steady state current of 1800 microamperes will be obtained with 200 East tap water; under the same conditions when 2 ppm of dichromate were added to the water, the current measured 100 microamperes. The laboratory studies of the thermogalvanic effect have been completed, and a report will be written.

Anodic Film

Examination of slugs from a production test to determine the value of anodized films as corrosion barriers has indicated that in some cases after 36 days' exposure the anodized film was completely dissolved off. No aluminum was dissolved in this short time, and no pitting was noticed.

Corrosion Studies

Some slugs which had been hot-pressed using a graphite lubricant were tested in the corrosion laboratory. These tests showed that the proposed method of removing the graphite lubricant was unsatisfactory, and that pitting corrosion would be expected.

Coating Studies

Aluminum caps were nickel-plated, etched by different procedures, and test for Al-Si wettability. These results indicate that nickel can be wet by Al-Si at 599 C. Cans have been plated with nickel and with copper in preparation for cold canning tests.

Optimum evaporation rates for coating of uranium wafers with nickel using the DPi unit have been evaluated. Studies on evaporation of copper have been started. Other vacuum equipment designed to analyze coatings for gases and to clean uranium surfaces is being installed.

FABRICATION TECHNIQUES

Hot Press Canning Studies

Canning of Al-Si coated Slugs for Pre-Pile Evaluation

Fabrication of hot-press canned, Al-Si coated, uranium slugs was begun to prepare a quantity of slugs for testing and to evaluate the feasibility of the method. Three types of Al-Si coated material were canned; (1) triple-dip production material with the can walls machined away until the Al-Si was exposed, (2) slugs coated by placing the uranium piece in a steel mold instead of an aluminum can as the final step in the lead dip process, and (3) slugs coated similarly to type 2, except by the triple-dip process. A total of 183 slugs of the three types were canned in a three week period.

It was found that increased pressing time, increased pressing temperature, and the use of a thin zinc deposit over the Al-Si coated slug resulted in increased yields. The thin zinc deposit which was applied by dipping the clean uranium slug in a sodium zincate solution improved the bond formed during hot press canning. By various changes in procedure, canning yields were increased from 10 per cent to 82 per cent as measured by frost test acceptance. These yield figures are based on actual slugs canned and do not take into account the molded slugs which are rejected before canning because of defects in the coating. Forty zinc-coated and hot-pressed-canned slugs have been made available for destructive testing.

Hot Press Canning Equipment

Six new beveled cap punches were designed and fabricated during the month. Hot press furnace controllers were relocated for safer and more efficient operation and to expedite the hot press slug experiments. Work orders for two additional tapered triple-segmented split dies were placed. A 180° split die is being designed as well as the furnace to accommodate it.

Cold Press Canning Studies

Seventeen mechanically-bonded, four-inch uranium slugs have been successfully fabricated and are awaiting testing and further evaluation. The process for obtaining the mechanical bond between the uranium slug and aluminum jacket has been reported in HW-27700. By anodizing the slugs, a matte surface is obtained which can be mechanically keyed to the annealed aluminum jacket by the sizing operation. The soft aluminum is forced into the myriad crevices and pits of the prepared surfaces of the uranium, resulting in a degree of bonding.

Porous alumina wafers were used in five of the end cap assemblies for the mechanically-bonded slugs. Welding difficulties with these five pieces were attributed to the gases evolved from the porous alumina wafer.

Metal Fabrication Laboratory

Activity in all phases of the laboratory continues at a high level. The 400 ton press originally located in the 234-5 Building is completely installed and in operating condition. All necessary specifications in connection with the purchase of a 16" heavy duty lathe has been completed and forwarded to the Appropriation and Budgeting Committee. This unit will greatly assist the laboratory in expediting the precision machining of pile fuels on an experimental basis.

New Facilities

Project CG-530, Revision of 314 Building for Canning Development is reported as 90 per cent completed. The design criteria for the fuel element pilot plant were reviewed and will be prepared for issuance by Minor Projects Sub-Section.

URANIUM QUALITY

Reduction and Casting

Samples from normal uranium slugs reduced from UF_6 to UF_4, prior to being reduced to metal, are being investigated. Preliminary data indicate that these samples are similar to production uranium in chemical composition, in metallurgical structure, and in mechanical properties. The most important difference is a slight increase in mechanical properties, but this does not appear to be significant. Additional samples are being studied to confirm these findings.

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Uranium Rod Quality

A portion of the April rolling of uranium rods for Hanford at the Feed Materials Production Center (FMPC) was observed. This rolling was comparable to previous rollings of Hanford rods at that site. The ingot and billet preheating furnaces are not yet capable of maintaining the desired preheat temperatures in continuous production. Mechanical problems in the rolling mill continue to interfere with production. Routine metallurgical evaluation of uranium rolled at FMPC has been delayed by difficulties in preparing samples for the laboratory. The delay is being overcome.

Approximately 40,000 slugs produced at the Feed Materials Production Center (Fernald) have been canned. These are part of a test lot of 200,000 of the FMPC slugs. Some of these have been charged to the piles.

Intensive study of an ingot which "hot checked", i.e., had a severe surface tear during rolling at Simonds Saw and Steel, indicates that the checking was due to the presence of U_6FE. This intermetallic compound has a melting point near the rolling temperature and is known to cause hot shortness in uranium.

Heat Treatment of Uranium

A formal report on the heat treating of uranium rods and the lead dip canning of slugs from these rods under provisions of two production tests is being prepared. The results of these two small tests, together with improvements in non-destructive testing techniques for estimating completeness of transformation, provide a promising background for the lead-dip canning of 40,000 eight-inch slugs from salt bath transformed rods. The Feed Materials Production Center was informally notified of the possibility that another request for slugs from beta transformed rods would be made by Hanford in the near future. Informal preliminary discussions of the details of this work were held with National Lead personnel.

CANNING TECHNIQUES

Fractured Bond Reject and Compound Layer Investigation

Small groups of slugs were canned under controlled varied conditions of dip bath immersion time, and with and without agitation. Metallographic examination of the compound layers showed that, in general, agitation did not affect the type of layer, i.e., whether segmented or layered, but increased the compound layer thickness. Longer immersion times, as expected, also increased the compound layer thickness.

Sleeveless Canning

The canning of slugs on Production Test 313-105-15-M, "Fabrication and Irradiation of Four-Inch Triple-Dipped Sleeveless-Canned Slugs", was completed. The yield of good slugs for pile testing was extremely low, possibly being around twenty per cent. This low yield was due primarily to a high percentage of non-seats because of too short can preheat specifications. At this date the minimum can-wall thickness data is not available and it is not known whether the average can wall was thicker than when using sleeve canning.

Induction Type Canning Pot - 313 Building

Some tests have been made on the new Ajax induction furnace in the 313 Building to determine if the "A" Process Specifications will be applicable to this unit. No thermal gradients exceeding 1.5 C were found in the bath under either high or low power input. The location of the control thermocouple in the bath does not at this time appear to require specification.

Tru-Line Slugs

Approximately 3,000 experimental Tru-Line cans and caps with interlocking dimple and protrusion on the can bottom and cap end, respectively, were received from ALCOA. One hundred and fifty slugs were canned using these components and appear satisfactory. The interlock will aid in aligning the slugs in the process tubes during the charging operations thereby providing assurance against misalignment of slugs and possible consequent intensification of certain forms of corrosion.

TESTING

Canned Slug Test Components

Radiography

Routine radiographic inspection of the closure and of all P-10 target material and fuel slugs is currently being used. Only minor operational difficulties have arisen, and they have been corrected as they arose.

Al-Si Penetration

Good correlation was obtained in tests of the Al-Si penetration equipment on a slug which was specially prepared by canning at high temperature to have a large number of penetrations. Resolution was greatly improved over previous tests. Equipment is now being made to run a large sample of regular production slugs with this instrument in order to make a production evaluation.

Bonding Test

Correlation of ultrasonic bonding tests with frost test results has been delayed by work necessary to cold test the irradiated slug unit and by the necessity for making improved crystal mounts so that reproducible settings could be achieved. The prototype conveyor for the mechanical testing line to handle slugs through the Al-Si penetration and bonding tests is nearly completed in the vendor's shop at Tacoma and should be delivered in May.

Bare Slug Test Components

Eddy Current Test

The MIZ-2 eddy current instrument for detecting cracks and inhomogeneities in bare uranium slugs was tested with 900 slugs from a single lot of Hanford machined rod this month. Most of the instrument indications fall in a limited range, but indications on some few slugs are definitely outside of this range. Metallographic evaluation is in progress to determine the reasons for these deviations. Preliminary results suggest that inclusions are a contributing factor.

Transformation Test

Circuit diagrams for ultrasonic equipment to test slugs heat treated off-site have been submitted to the Instrument Shop for estimating. This is the equipment which is proposed for use in a production test involving lead-dip canning with 250 tons to be heat treated at the Feed Materials Production Center. Revised drawings for the handling equipment to be used in conjunction with this are now being made.

Quality Evaluation

Routine Testing

Routine evaluation of standard production material continued throughout the month. An effort is being made to find a standard sequence of tests which can be run in a routine manner without the necessity for planning each test individually.

New Evaluation Tests

An effort to develop a bond strength test with a heat shock on the canned surface was not successful in fracturing the bond. The equipment which was used for this is now being arranged as a fast thermal cycling test and will be evaluated as such. Design work on a thermal stress test for bare slug quality evaluation is nearly complete. The test will use an induction heating coil with the Tocco 3,000 cycle equipment now installed in the 304 Building.

Other Work

Induction Heater Control

Electronic units for the Tocco Induction Heater Control were completed in the Electronic Shop, bench tested and installed. Control tests and adjustments are now in progress, and it is expected that the equipment will be delivered in operating condition to the Metal Quality Sub-Unit in May.

Irradiated Slug Inspection

Cold tests continued on the equipment for inspecting the irradiated slugs by ultrasonic methods. Successful grain size measurements were made on known samples and the cold testing is nearly completed.

FUEL EXAMINATION

Slug Examination

Visual inspection in the chutes of several hundred eight-inch normally discharged production pieces from DR Pile on April 7, 1953, revealed some "donuts" on a few of these pieces as well as a general red-brown film on most of the pieces that were examined.

A powder metallurgy slug showed some distortion when profiles of the slug were examined. This slug was discharged from tube 0671-H on April 5, 1953, at an exposure of 572 MWD/T under Production Test 313-105-4-M, "Irradiation of Slugs Produced by Powder Metallurgical Techniques". It had been anticipated by the fabricators that no distortion would occur.

Dish-shaped pits were found on the can ends only of over half the slugs in tube 2574-C, a tube of high specific power discharged on April 1, 1953, at an exposure of 479 MWD/T under Production Test 105-533-A, "Local Controlled Increases in C Pile Tube Powers". Similar, but not as severe, pitting was also found on slugs discharged on the same date from regular tubes in C Pile. This is the first time such pits have been observed and they will be looked for in further examinations.

Slugs from tubes 0574-H and 0565-H were discharged on April 8, 1953, because of high effluent water activity. Examination revealed no ruptured pieces in tube 0574-H, but two ruptured C slugs were found in the charge from tube 0565-H. Both ruptured

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slugs contained enriched metal, had been cold canned, and were charged under Production Test 105-531-A, "Enrichment of the H Pile". The appearance of these slugs suggests a dimensional change in the metal.

Slug Examination Facilities

The General Engineering Laboratory has completed the initial tests on the prototype slug dolly for the 100-C Slug Examination Facility. This dolly provides the means of transporting irradiated pieces from one station to another as well as the means for presenting individual slugs to be measured or examined by other equipment. During testing at GEL several suggestions were made as a guide to making the dolly more suitable for basin use. GEL will alter the slug dolly accordingly. The scheduled date for the completion of the slug dolly modifications corresponds with the date of completion of the prototype measurer, that is, the end of May, 1953. This will conveniently allow testing at GEL of the entire transfer mechanism since all pieces of equipment utilize this basic operation. It is anticipated that additional tests will be made at Hanford in the 189-D Tank prior to installation at 100-C.

From information furnished by Fuel Technology, Design Engineering is writing design criteria for the remainder of the equipment required for this facility. Design Engineering may not be able to commence their portion of equipment design before August, 1953. Consequently, some equipment scheduled for on-site design and fabrication may be released to off-site concerns.

Several items associated with the basin structure require completion prior to the installation of equipment. The date of completion is not firm; however, if these items are not completed by at least June, 1953, use of this facility will be delayed accordingly.

Procurement and fabrication of equipment for the 105-B Slug Examination Facility are continuing. Further tests and modifications to the slug air weigher are in process. Design of the image formation portions of the optical dimensioner has been completed by Optical Instruments; design of the manipulator portion has been undertaken by Equipment Development.

INVENTIONS

All persons engaged in work that might reasonably be expected to result in inventions or discoveries advise that, to the best of their knowledge and belief, no inventions or discoveries were made in the course of their work during the period covered by this report except as listed below. Such persons further advise

that, for the period therein covered by this report, notebook records, if any, kept in the course of their work have been examined for possible inventions or discoveries.

INVENTOR	TITLE
D. C. Worlton	Invention of an ultrasonic method of detecting flaws positioned near the surface of a metal. The technique is to refract an ultrasonic pulse into the metal piece under test and to isolate the flaw reflection from the surface reflection by means of an acoustical shield.

Signed: G E McCullough
G. E. McCullough
MANAGER, FUEL TECHNOLOGY

GEMcC:acj

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MEDICAL DEPARTMENT

APRIL 1953

Personnel Changes
The roll decreased from 257 to 252.
The Hospital Radiologist and Pathologist entered private practice. They will continue to supply industrial medical services on a consultant basis.

Visits
Dr. Sachs attended the Health Officers meeting in Seattle.
The public health nurse supervisor attended a conference on field nurse training in Seattle.
Four members of the nursing staff attended the Washington State Nurses Association meeting in Spokane.
Mr. Bakko and Mr. Kremer attended the midyear meeting of the Washington State Hospital Association in Yakima.
Dr. Norwood and Dr. Weitz attended the National Industrial Health Conference in Seattle. This meeting brings together industrial physicians, nurses, dentists and industrial hygienists for discussion of employee health. Dr. Norwood read a paper, written by Drs. Fuqua, Sachs and him, covering the general medical program at Hanford.
Dr. B. L. Vosburgh, Manager of Health Services for the Company, visited Hanford following the Health Conference in Los Angeles.
A state physical therapy consultant and a representative of the Department of Agriculture, Food and Drug Administration, visited the public health section.

Employee Relations
There was a 291 employee attendance at 31 meetings during the month.

Industrial Medicine
There was a slight decrease in medical examinations and in dispensary treatments.
General Electric employees were treated for 2 sub-major injuries while contractor employees were treated for one major injury.
Sickness absenteeism was 1.67% as compared to 2.28% for March. Total absenteeism was 2.23% as compared to 2.88% for March.

Kadlec Hospital
The average daily census was 101.7. While this was a new high for the hospital, the occupancy percentage of 96.8 for the mixed services was less than that of the previous month.
Thirty patients had to be admitted to hall beds.
The nursing hours per patient per day were low at 2.98 on the mixed service and 3.38 for obstetrics.
The number of in-patient hospital employees per adult patient was 1.66.
A survey of comparable hospitals in the area was started to obtain data on rates, compensation, personnel requirements, etc. and other operating items.

Public Health & Welfare
At a meeting of the Benton-Franklin Counties Public Health Unit, the request that Richland be included in the bi-county unit was rejected.
A food poisoning outbreak affecting 30 people occurred after an Easter egg hunt. Lack of refrigeration of the eggs between time of preparation of the eggs and consumption resulted in bacterial contamination of the eggs.
The first case of dephtheria among residents occurred. The level of communicable diseases remained about the same.

MEDICAL DEPARTMENT

APRIL 1953

Costs - March

Medical Department costs before assessments to other departments were as follows:

	February	March	Mar. Budget
Industrial Medicine (Oper.)	$33,300	$39,[illegible]	$[illegible]
Public Health (Oper.)	10,133	11,273	11,[illegible]
Kadlec Hospital (Net)	11,096	8,150	[illegible]
Hospital Expense Credits	1,[illegible]	[illegible]	[illegible]
Sub-total-Medical Department (Oper.)	$[illegible]	$[illegible]	$[illegible]
Construction Medical (Industrial and Public Health)	10,852	2,650	12,600
Total-Operations and Construction	$69,750	$69,259	$92,[illegible]

The net cost of operating the Medical Department before charges were assessed to other departments for services rendered, was $69,259, a decrease of $471. The decrease was due to increased revenue which more than offset increased costs due to the longer month. The total cost was $23,181 below the budget. The hospital loss of $8,150 was the lowest figure ever attained and was due to high occupancy without a correspondingly high operating cost. The higher Industrial Medical costs for operation was due to the longer month and transfer of some employees from construction to operation medical roll.

MEDICAL DEPARTMENT

APRIL 1951

Industrial Medical Section

Medical examinations completed were [illegible] in April as compared to [illegible] in March. Dispensary visits decreased from [illegible] in March to [illegible]. General Electric employees sustained [illegible] sub-major injuries and no major injuries. Contractor employees sustained one major injury but no sub-majors.

The [illegible] in this principal contractor industrial medical section.

Dr. Harvey and Dr. Weitz attended the 1951 Industrial Health Conference at Los Angeles and attended the meetings of the American Industrial Medical Association.

The Industrial Physicians Scientific Meeting was held on April 29th and a discussion of heart disease was presented by Dr. P. E. Kendall. Discussion of this kind of case as related to industrial medical problems followed.

One information meeting was held during the month for industrial physicians.

Dr. S. T. Cantril, Consultant, visited the section on April 23rd and 24th and present policies and practices were discussed.

Examination frequency schedules were revised and each employee will receive a periodic medical examination every two years. On the in-between year the employee will receive selected laboratory work and examination as indicated. This will permit a better selection of cases where need for medical supervision is the greatest.

The Health Activities Committee met on April 16th and the health topic entitled "Try These For Size" was presented. The topic dealt with the five signs of sanity or adult maturity and was a further attempt to improve human relationships. Material on this subject was prepared for distribution throughout the plant. The plant sickness absenteeism was 1.67% for April as compared to 2.28% for March.

Gross costs for March totaled $41,002 as compared to $34,285 in February, an increase of $7,284. Following are details:

Costs-Operations	March	Feb.	Increase (Decrease)
Salaries	$30,020	$24,394	$ 5,626
Continuity of Service	3,002	2,439	563
Laundry	346	388	(42)
Utilities, Transportation, Maintenance	3,904	3,574	330
Supplies and Other	3,730	3,490	240
Total Gross Costs	41,002	34,285	6,717
Less: Revenue	1,567	985	582
Expense Credits	3,751	4,900	(1,149)
Net Cost of Operation	$35,684	$28,400	$ 7,284

Industrial Medical Section (Continued)

Costs-Operations (Continued)

Actual net costs for fiscal year 1953 to date total $296,379 with a budget of $316,665 or 93.6%.

Costs-Construction

Gross costs in March were $2,676 as compared to $9,977 during February, a decrease of $7,301 detailed as follows.

	March	Feb.	Increase (Decrease)
Salaries	$2,317	$8,305	$(5,988)
Continuity of Service	232	830	(598)
Utilities, Transportation, Maintenance	49	361	(312)
Supplies and Other	78	481	(403)
Total Gross Costs	$2,676	$9,977	$(7,301)

One industrial physician and three medical records employees remained charged to the industrial construction program during March.

MEDICAL DEPARTMENT

APRIL 1953

Industrial Medical Section (Continued)	March	April	Year to Date
Physical Examinations			
Operations			
Pre-employment	71	52	264
Rehire	12	18	69
Annual	392	393	1428
Interim	178	141	669
A.E.C.	36	26	123
Re-examination and rechecks	159	139	529
Termination	129	107	442
Sub-total	977	876	3524
Contractors			
Pre-employment	0	0	665
Rehire	10	10	118
Recheck	1	1	181
Termination & Transfer	75	78	592
Interim	0	0	54
Sub-total	86	89	1635
Total Physical Examinations	1063	965	5159
Laboratory Examinations			
Clinical Laboratory			
Government	153	119	575
Pre-employment, Termination, Transfer	2476	2408	12267
Annual	2463	2399	8795
Recheck (Area)	1133	1050	4378
First Aid	11	15	35
Clinic	432	379	1776
Hospital	5868	5868	21699
Public Health	18	19	48
Total	12554	12257	49573
X-Ray			
Government	22	14	91
Pre-employment, Termination, Transfer	86	85	1165
Annual	415	387	1485
First Aid	101	91	449
Clinic	240	222	979
Hospital	464	437	1698
Public Health	7	2	29
Total	1335	1238	5896
Electrocardiographs			
Industrial	32	42	141
Clinic	5	2	15
Hospital	47	61	218
Total	84	105	374

MEDICAL DEPARTMENT

APRIL 1953

Industrial Medical Section (Continued)	March	April	Year to Date
First Aid Treatments			
Operations			
New Occupational Cases	386	343	1495
Occupational Case Retreatments	1334	1251	5132
Non-occupational Treatments	2972	2492	11182
Sub-total	4692	4086	17765
Construction			
New Occupational Cases	116	121	729
Occupational Case Retreatments	328	370	2352
Non-occupational Treatments	154	131	789
Sub-total	598	622	2870
Facility Operators	32	44	172
Total First Aid Treatments	5322	4752	21807
Major Injuries			
General Electric	3	0	4
Contractors	0	1	2
Total	3	1	6
Sub-major Injuries			
General Electric	1	2	5
Contractors	2	0	11
Total	3	2	16
Absenteeism Investigation			
Calls Made	4	4	30
Employee Personal Illness	4	1	25
No. absent due to illness in family	0	1	1
No. not at home when call was made	0	2	4

MEDICAL DEPARTMENT

APRIL 1953

Hospital Section

The average daily adult census increased very slightly from 101.3 to 101.7, as compared to 89.2 a year ago. This represents an occupancy percentage of 93.3, broken down as follows: Mixed Service (Medical, Surgical, Pediatrics) 96.8%; Obstetrical Service 78.6%. The minimum and maximum daily census ranged as follows:

	Minimum	Maximum
Mixed Service	65	99
Obstetrical Service	11	23
Total Adult	77	117

The average daily newborn census increased from 12.9 to 15.0, as compared to 11.5 a year ago.

Nursing hours per patient per day:

Medical, Surgical, Pediatrics	2.98
Obstetrical	3.38
Newborn	2.40

The ratio of in-patient hospital employees to patients (excluding newborn) for the month of March was 1.66. When newborn infants are included, the ratio is 1.48.

The net expense for the operation of Kadlec Hospital for March was $8,150, as compared to $11,096 for February. Summary is as follows:

Kadlec Hospital net expense $8,150

This is a reduction of $2,946 from the month of February. It is due primarily to increased revenue from a higher patient census and longer month ($9,208) and increased expense credits ($2,382) which more than offset the increased expenses of caring for the higher census ($8,644).

The patient census, as detailed above, remained very high and reached a new peak. It is expected, however, that a gradual decrease to a normally lower summer census will begin soon.

Twenty-three meetings with employees were held in the hospital with about 230 employees attending.

Mr. O. E. Bakko and Mr. C. A. Kremer began a survey of a number of hospitals in Washington to obtain comparative data on rates, salaries, financial questions and personnel requirements. It is expected that all hospitals which will be contacted will have been visited by the end of next month. These men also attended the midyear meeting of the Washington State Hospital Association on April 8th in Spokane.

MEDICAL DEPARTMENT

APRIL 1953

Hospital Section (Continued)

Miss Myrtle Albright, Mrs. Marjorie Rouse and Mrs. Agnes Salansky attended the annual Washington State Nurses Convention in Spokane during the week of April 13th.

In order to reduce soft water costs which have been very high during the summer months, work is underway to limit soft water usage to those places only which absolutely require it in their operations.

In the interest of safety as recommended by the Fire Safety inspectors, the insulation materials which are no longer considered fire resistant are being removed. These materials are under the floor in unsprinklered areas.

MEDICAL DEPARTMENT

APRIL 1953

Hospital Section (Continued)	March	April	Year to Date
Kadlec Hospital			
Average Daily Adult Census	101.3	101.7	97.3
Medical	32.0	29.2	30.9
Surgical	37.7	42.5	38.0
Pediatrics	18.8	13.6	17.0
Mixed	88.3	85.2	83.9
Obstetrical	12.9	16.5	13.5
Average Daily Newborn Census	12.9	15.0	13.0
Maximum Daily Census:			
Mixed Services	103	99	108
Obstetrical	18	23	23
Total Adult Census	115	117	120
Minimum Daily Census:			
Mixed Services	73	65	50
Obstetrical Service	8	11	6
Total Adult Census	84	77	62
Admissions: Adults	690	638	2571
Discharges: Adults	675	640	2533
Newborn	79	92	309
Patient Days: Adult	3141	3051	11677
Newborn	399	449	1560
Total	3540	3500	13237
Average Length of Stay: Adults	4.7	4.8	4.6
Medical	4.5	4.9	4.5
Surgical	5.2	4.9	4.9
Pediatrics	4.1	4.2	4.5
Mixed	4.7	4.8	4.6
Obstetrical	4.3	4.7	4.5
Newborn	5.0	4.9	5.0
Occupancy Percentage: Adults	92.9	93.3	89.3
Medical	86.5	78.9	83.5
Surgical	117.8	132.8	112.5
Pediatrics	98.9	71.6	89.5
Mixed	100.6	96.8	95.3
Obstetrical	61.0	78.6	64.3
Newborn	49.6	57.7	50.0
(Occupancy Percentage based on 109 adult beds and 26 bassinets.)			
Avg. Nursing Hours per Patient Day:			
Medical, Surgical, Pediatrics	2.98		
Obstetrics	3.38		
Newborn	2.40		
Avg. No. Employess per Patient (excluding newborn)	1.66		
Operations: Major	116	112	405
Minor	117	108	372
E.E.N.T.	61	68	272
Dental	1	0	1

MEDICAL DEPARTMENT

APRIL 1953

Hospital Section (Continued)	March	April	Year to Date
Kadlec Hospital (Continued)			
Births: Live	80	94	312
Still	0	1	5
Deaths	5	7	18
Hospital Net Death Rate	.13%	.27%	.18%
Net Autopsy Rate	0	57.1	35.3
Discharged against advice	0	1	1
One Day Cases	148	154	599
Admission Sources:			
Richland	76.2	77.9	78.2
North Richland	10.7	8.3	9.3
Other	13.0	13.8	12.5
Admissions by Employment:			
General Electric	73.2	75.4	74.6
Government	2.2	1.9	2.5
Facility	3.6	3.1	3.5
Contractors	11.9	11.7	10.8
Schools	2.3	1.4	1.9
Military	1.0	.2	.8
Others	5.8	6.3	5.9
Hospital Outpatients Treated	431	410	1728
Physical Therapy Treatments			
Clinic	315	325	1165
Hospital	208	172	828
Industrial: Plant	286	429	1011
Personal	11	15	41
Total	820	941	3045
Pharmacy			
No. of Prescriptions Filled	3102	3095	12787
No. of Store Orders Filled	550	553	2191
Patient Meals			
Regulars	4743	4482	17275
Children under 8	819	436	2600
Specials	1602	1745	6646
Lights	0	4	5
Softs	1255	1315	4465
Tonsils	113	134	540
Liquids	191	275	968
Surgical Liquids	104	135	388
Total	8827	8526	32887
Cafeteria Meals			
Noon	1985	1984	7807
Night	274	295	1116
Total	2259	2279	8923

MEDICAL DEPARTMENT

APRIL 1953

Public Health Section

The first case of diphtheria among residents of the project was recorded. This occurred in a 2½ year old white female who had not completed her series of diphtheria toxoid immunizations. Contacts have been checked and investigation has been instigated to find a human carrier since all other modes of contact have been checked.

Other communicable diseases reported indicates that the disease level remains about the same with chickenpox and mumps leading the list.

There was approximately a 15% reduction in the number of home nursing visits made by the nurses due primarily to shortage of one staff nurse.

A meeting was held with the Richland Community Council in respect to the transfer of public health activities to Benton-Franklin County Health Department sponsorship. Although no commitments were made, they seemed to be in favor of such action. They accepted an invitation to have a joint meeting with the Board of Health of the Benton-Franklin County Health Department next month at which time this matter will be discussed further.

An open house was held for members and representatives of the various churches in Richland. The program was reviewed for them by various staff members, exemplified by various audio-visual aids.

The supervisor of public health nurses attended a meeting in regard to field nurse training in Seattle.

A public health nurse attended the Washington State Nurses Association meeting in Spokane as a delegate from the Richland Nursing District.

Miss Carolyn Bowen, Physical Therapy Consultant of the State Department of Health, visited the department to confer with nursing staff members in regard to physical therapy treatment of local crippled children.

The Health Officer attended the quarterly Health Officers Meeting in Seattle.

Mr. Mel Crawford, representative of the Department of Agriculture, Food and Drug Administration, visited this department as part of the investigation conducted with regard to the food poisoning incident which occurred.

One staff meeting was held with 15 members in attendance. There were three section meetings held with the nurses with 27 different persons in attendance. One meeting was held with two people in respect to job performance.

A food poisoning outbreak affecting 30 people occurred Easter Sunday following an egg hunt. Staphylococcus auereus was the causitive organism. Lack of refrigeration after coloring of eggs allowed toxin to form and upon ingestion produced symptoms of food poisoning within six hours.

MEDICAL DEPARTMENT

APRIL 1953

Public Health Section (Continued)

Routine inspections of food handling establishments showed most to be operating satisfactorily. Plans were inspected and approved for remodeling two kitchens. Due to warm weather, the Richland Bakery will discontinue delivering cream pies to restaurants.

Twenty-five Grade A dairy farms were inspected. One producer's milk supply was degraded for continued insanitary conditions. Bacteriological analysis of milk samples showed all to be satisfactory with the exception of those from one distributor. Samples of this distributor's milk supply are now being analyzed twice a week and degrading will result unless improvement is shown. The State Agriculture Department has been contacted since this plant comes under their jurisdiction.

Twelve dog bites were investigated. Dogs were placed under observation in the homes since most of the dogs had rabies shots.

Two citations were sent to merchants in Uptown business area for dirty premises and improvement was shown.

Water and sewage samples taken during the month were satisfactory.

The burning phase of the mosquito control program was completed early in the month. Larvae were found along Columbia River bank during the last week, and this area was larvicided with diesel oil. Areas are now being checked daily for larvae. A commercial fogger has been procurred for use in residential areas.

The largest proportion of social service time continued to be devoted to problems between parents and their children. A gratifying number of pre-school children were seen during the month. It is expected that the work done now with these children will prepare them to use their school experience more constructively. Early detection of trouble and correction of it are highly important to the community which is interested in controlling the contagion of emotional ill health.

MEDICAL DEPARTMENT

APRIL 1953

Public Health Section (Continued)	March	April	Year to Date
Education			
Pamphlets distributed	10,989	10,989	42,957
News Releases	8	10	53
Staff Meetings	1	1	6
Classes	6	11	41
Attendance	93	184	334
Lectures & Talks	16	14	51
Attendance	383	691	2,392
Films Shown	22	44	93
Attendance	491	1,516	3,031
Community Conferences & Meetings	80	53	198
Radio Broadcasts	1	0	3
Immunizations			
Diphtheria	2	21	78
Diphtheria Booster	133	10	322
Tetanus	0	26	134
Tetanus Booster	136	7	423
Pertussis	0	5	11
Pertussis Booster	1	0	126
Smallpox	32	7	76
Smallpox Revaccination	122	81	762
Tuberculin Test	4	28	48
Immune Globulin	1	3	12
Social Service			
Cases carried over	85	84	330
Cases admitted	14	13	55
Cases closed	15	13	49
Remaining case load	84	84	336
Activities:			
Home Visits	8	10	43
Office Interviews	335	257	1,172
Conferences	27	53	187
Meetings	4	5	26
Sanitation			
Inspections made	120	128	524
Conferences held	20	28	91
Bacteriological Laboratory			
Treated Water Samples	228	216	787
Milk Samples (Inc. cream & ice cream)	36	48	152
Other bacteriological tests	588	672	2,223
Total	852	936	3,162

MEDICAL DEPARTMENT

APRIL 1953

Public Health Section (Continued)	March	April	Year to Date
Communicable Diseases			
Chickenpox	42	33	162
Diphtheria	0	1	1
Erysipelas	0	1	1
Food Poisoning	0	29	29
German Measles	11	4	28
Gonorrhea	5	7	32
Impetigo	2	1	5
Influenza (U.R.I.)	2	0	4
Measles	0	1	4
Mumps	39	39	232
Pinkeye	3	2	8
Poliomyelitis	0	1	1
Ringworm	1	0	5
Roseola	0	0	1
Scabies	0	0	1
Scarlet Fever	6	4	30
Syphilis	5	2	7
Tuberculosis	2	0	2
	118	125	552
Total No. Nursing Field Visits	729	618	3,170
Total No. Nursing Office Visits	133	76	417

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RADIOLOGICAL SCIENCES DEPARTMENT

APRIL 1953

Summary

Twenty-three informal radiation incidents, 10 Class I, and 3 Class II incidents were recorded for an all-time high of total radiation incidents. However, only one of the incidents was potentially serious. This was a case involving inhalation and subsequent transfer, probably to the bones, of several microcuries of mixed fission products. Whether the deposition will actually exceed permanent limits will have to be tested by prolonged bio-assay procedures.

In the control activities of the department, significant findings included a substantial increase in reactor effluent water activity at one location, emission of I^{131} from the Redox plant in excess of permanently desirable limits, and the finding of active particles from the recent Nevada tests.

In research activities, a new technique for injecting plutonium hydroxide colloid into the lung was developed in support of the active particle problem. Measurements of neutron scattering from a source at the meteorology tower were reconciled with the theories of free-air scattering.

Further studies of appropriate cribbing limits led to potential savings of about $1,700,000.

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RADIOLOGICAL SCIENCES DEPARTMENT

APRIL 1953

Organization

The month end force of 372 included 30 supervisors, 102 engineers and scientists, 16 clerical, and 224 other personnel.

Number of Employees on Payroll		
Beginning of month	-	373
End of month	-	372
Net decrease	-	1

In addition, the number of assigned rotational trainees was reduced from 12 to 7.

The Biophysics Section was reorganized to increase span of control and to eliminate one echelon of supervision. The former Environmental Hazards and General Studies Unit was discontinued, and geology-hydrology was combined with soil science under the title "earth sciences". These changes are reflected in the order of presentation of reports for the Biophysics Section.

General

The total number of radiation incidents under the 3 categories of "informal", Class I and Class II reached an all time high of 36. In analyzing this result, it should be noted that only the Class II incidents are unequivocally defined. The Class I incidents are those which carry a reasonable potential of overexposure, and particularly those whose publication may serve as a teaching instrument to eliminate conditions or discourage actions which could otherwise lead to repetition with possibly greater hazard. The remaining incidents, classed as informal, are those off-standard circumstances with respect to radiation control which merit local investigation. Upon such investigation, an incident may be upgraded to Class I or may be rejected as insignificant. For example, in April, 32 informal incidents were recorded, of which 2 were upgraded to Class I, and 7 were discarded for the reported total of 23. The new methods of reporting and investigating incidents, with the cooperation of all interested departments, are now believed to be superior to past methods. This is one factor that leads to high total incidence.

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General (continued)

The indefinite borders of Class I, informal and "insignificant" incidents are no deterrent to effective reporting of radiation protection. To make arbitrary rigid boundaries with attempted definitions of severity would be fatuous in a field as diverse as this; in the long run, it could stifle, in part, the value of incident reporting. An examination of the causes of incidents is more profitable than a numerical count. Here it is seen that an undue proportion resulted from actions of supervisors or other personnel who clearly knew how to perform their tasks in a controlled manner. While it is a function of the Radiological Sciences Department to demonstrate this trend, its correction lies almost entirely with the line operating organizations.

Of the total number of incidents reported this month, the only one of possibly serious consequence was that which involved the inhalation and apparent body deposition of several microcuries of mixed fission products. Whether the body deposition will exceed appropriate limits by a significant margin can only be determined by continued bio-assay tests.

The first general meeting of exempt and non-exempt personnel of the department, this year, was held with an attendance of about 35% of the theoretical limit.

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

Inventor	Title
None	None

RADIOLOGICAL ENGINEERING

Further reconsiderations of appropriate limits for cribbing TBP waste led to a savings estimated at $1,500,000. over a two-year period.

Approval to crib 2 million gallons of first cycle supernate in the 200-E Area should also save about $245,000 for an expenditure of $25,000 on excavation and pumping operation. These savings, reported for radiological

Radiological Sciences Department

Radiological Engineering (Continued)

engineering, are made possible by the increased confidence in recent results from the earth sciences development group.

Revisions to the proposed 100-K waste water system deleted a further $150,000 from anticipated expenditures.

Work started on the biology laboratory addition. The apparatus was ordered for the positive ion accelerator laboratory.

RADIOLOGICAL RECORDS AND STANDARDS SECTION

1. Radiation Monitoring Services

General Statistics

	March	April	1953 To Date
Special Work Permits	445	492	1,895
Routine and Special Surveys	1,482	1,533	4,986
Air Samples	1,214	1,335	4,545
Skin contamination cases	15	16	49

A spill of about 15 mg of plutonium fluoride powder occurred in one of the Applied Research laboratories at 200-E Area. Skin contamination of a chemist involved was removed without difficulty.

Personal clothing of nine persons, including six Minor Construction employees, was impounded temporarily following contamination by effluent vapors at the 1608 auxiliary pump house at 100-H Area.

A chemist in one of the Applied Research laboratories at 300 Area showed an overexposure on his film badge following routine work with high level samples. The total exposure for the week was 595 mrep.

2. Radiological Standards

(a) Exposure Investigation

Three Class II and ten Class I radiation incidents were reported. One of the Class II incidents involved inhalation and body deposition of fission products possibly above the permissible limits during periscope operation at the 104-U waste tank. The other two incidents were overexposures of an electrician in the Redox canyon and of the chemist discussed above.

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Radiological Sciences Department

Exposure Investigation (Continued)

The Class I incidents included the other two incidents discussed above, and three incidents involving unexpected exposure and/or contamination spread from waste tanks; one of these also involved failure to wear personnel meters. Also included were two incidents where personnel were in the reactor discharge area during discharging, one where personnel were unmonitored during discharge area work, a finding of positive plutonium urine samples from a maintenance employee in the 200-W Area, and another case of failure to wear personnel meters.

In addition to the Class II and Class I radiation incidents, twenty-three incidents were investigated informally. These included three fires in radiation zones, emission of 19 curies of I^{131} from the Redox stack in a 24-hour period, reactor effluent water activity of 23 mrep/hr, several skin contamination cases, and several air contamination problems.

(b) Standards Establishment

A revision to the Manual of Radiation Protection Standards was completed. Two new standards were added.

3. Exposure Records

(a) Personnel Meters, and Records and Photometry

General Statistics	March	April	1953 To Date
Gamma pencils read	218,024	239,744	934,602
Potential overexposures	8	9	33
Confirmed overexposures	0	1	1
Slow neutron pencils read	1,066	750	4,964
Potential overexposures	0	2	4
Confirmed overexposures	0	0	0
Beta-gamma film badges processed	35,772	38,338	154,032
Potential overexposures	26	25	179
Confirmed overexposures	2	3*	11
Fast neutron badges processed	506	843	2,044
Potential overexposures	0	0	0
Confirmed overexposures	0	0	0
Lost readings (all causes)	86	26	177

*Includes one potential overexposure from last month now confirmed.

Radiological Sciences Department

Exposure Records (Continued)

(b) Bioassay

1. Plutonium Analyses

	March	April	1953 To Date
Samples assayed	667	700	2,558
Results over detection limit	6	56	70
Resamples assayed	12	13	46
Results over detection limit	12*	9*	21*
Maximum d/m/sample	1.38	2.25	2.25

* High samples are under investigation.

2. Fission Product Analyses

	March	April	1953 To Date
Samples assayed	650	692	2,138
Results above 10 c/m/sample	0	0	1

3. Uranium Analyses

Results of 298 samples were as follows:

METAL PREPARATION - 300 AREA

	End of 4th Day Exposure µg/liter			End of 2 Days-No Exposure µg/liter		
Job Description	Maximum	Average	Number Samples	Maximum	Average	Number Samples
Canning	7	2	27	19	3	10
Machining	23	8	20	10	5	16
Melt Plant	23	10	27	44	9	27
Material Handling	34	9	34	18	7	29
Testing	11	5	15	20	4	11
305 Building	3	3	3	1	1	1
Coverage	13	8	4	2	2	2
Technical	3	2	2	3	2	3

	Before Job			After Job		
	Maximum	Average	Number Samples	Maximum	Average	Number Samples
Car Unloading	3	2	3	9	5	3
Billet Loading	8	3	4	2	1	4
Rod Unloading	9	5	6	4	2	6

Miscellaneous Samples (µg/liter)

	Maximum	Average	No. Samples
224-U	16	3	41

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Radiological Sciences Department

Exposure Records (Continued)

4. Tritium Analyses

	Activity Density ($\mu c/cc \times 10^3$)				
	<2	2-20	>20	Total	1953 To Date
Number of samples	31	4	0	35	258

(c) Thyroid Checks

All thyroid checks reported were below the warning level.

(d) Hand Score Summary

There were 50,575 alpha and 76,381 beta scores reported. About 0.01% of the alpha and 0.01% of the beta scores were above the warning levels. Decontamination of each of the reported cases above the warning level was attempted and successful.

4. Calibrations

	Number of Routine Calibrations		
	March	April	1953 To Date
Fixed Instruments	212	135	518
Portable Instruments	2,036	2,524	7,642
Personnel Meters	9,931	12,175	33,148
Total	12,179	14,834	41,308

BIOPHYSICS SECTION

CONTROL UNIT

Regional Survey

The general findings are summarized in the following table:

SAMPLE TYPE AND LOCATIONS

Drinking Water	Activity Type	Average Activity Density ($\mu c/cc$)
Benton City Water Co. Well	alpha	8×10^{-9}
Richland, N.Richland, Benton City Wells	alpha	<0.5 to 1.5×10^{-8}
100 Areas	beta	<0.5 to 1.5×10^{-7}
Pasco, Kennewick, McNary Dam	beta	<0.5 to 7.8×10^{-7}
Backwash Solids-Pasco Filter Plant	beta	2.8×10^{-2} $\mu c/gm$
Backwash Liquids-Pasco Filter Plant	beta	9.5×10^{-7} $\mu c/gm$
Sand Filter-Pasco Filter Plant	beta	1.3×10^{-4} $\mu c/gm$
Anthracite Filter-Pasco Filter Plant	beta	2.1×10^{-4} $\mu c/gm$

[redacted]

Radiological Sciences Department

Regional Survey (Continued)

SAMPLE TYPE AND LOCATIONS	Activity Type	Average Activity Density (μc/cc)
Other Waters		
300 Area Wells #1, 2, 3	alpha	0.6 to 4.2×10^{-8}
300 Area Well #4	alpha	1.3×10^{-7}
Well #4 measured as uranium	U	1.2×10^{-7}
Miscellaneous Wells on the reservation	beta	$< 5 \times 10^{-8}$
Columbia River-Hanford Ferry	beta	1.1×10^{-5}
Columbia River-Below reactors	beta	1.2×10^{-5}
Columbia River-Patterson to McNary	beta	7.3×10^{-7}
Columbia River-Shore mud	beta	0.2 to 3.9×10^{-4} μc/gm
Raw Water-Operating areas	beta	< 0.5 to 4.2×10^{-7}
Reactor Effluent retention basins	beta	2.8 to 4.3×10^{-3}
Reactor Effluent retention basins	alpha	$< 5 \times 10^{-9}$
I^{131} in farm wastes	I^{131}	5×10^{-6}
I^{131} in Columbia River-Hanford	I^{131}	1.4×10^{-7}
Atmospheric Pollution		
Gross alpha emitters	alpha	< 0.4 to 2.3×10^{-14}
Gross dose rate-Separations areas	beta-gamma	0.4 to 3.1 mrep/day
Gross dose rate-Residential areas	beta-gamma	0.3 mrep/day
*Filterable beta-Separations areas	beta	0.1 to 1.2×10^{-11}
I^{131}-Separations areas	I^{131}	< 0.4 to 8.5×10^{-13}
I^{131}-Separations stacks	I^{131}	3.4 curies/day
*Active particles-Wash.,Idaho,Ore.,Mont.	--	0.002 to 0.09 ptle/m^3
Active particles-Hanford Operation	--	0.01 to 0.09 ptle/m^3
Tritium (as oxides)-Reactor stacks	T	0.1 curie/day

*Tenfold increases were associated with influx of contamination from Nevada tests.

		μc/gm
Vegetation		
Environs of Separations areas	I^{131}	< 0.3 to 1.2×10^{-5}
Residential areas	I^{131}	$< 3 \times 10^{-6}$
Eastern Washington and Oregon	I^{131}	$< 3 \times 10^{-6}$
Non-volatile beta emitters-Wash.&Ore.	beta	3×10^{-5}
Alpha emitters-Separations areas	alpha	2.0 to 8.4×10^{-7}
Alpha emitters-300 Area	alpha	3.1×10^{-6}

I^{131} emission from Separation facilities increased from an average of 0.85 curie/day during March to an average of 3.4 curies/day during April. Ninety-seven percent of the I^{131} emitted was discharged from the Redox facility where the maximum daily emission was 19.2 curies on April 23.

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Regional Survey (Continued)

Several instances of daily emission in excess of 4 curies/day observed earlier in the month indicated the progressive failure of the A-cell silver reactor; during periods when the B-cell reactor was used, the quantity of I^{131} emitted was somewhat lower but the total emission was generally higher than that observed for similar operations during March.

The average activity density of gross beta particle emitters in 107 Basin effluent water increased from values ranging from 3.4×10^{-3} to 3.9×10^{-3} $\mu c/cc$ at the 107-D, 107-DR, 107-H, and 107-F effluent basins during March to average values ranging from 3.8×10^{-3} to 4.3×10^{-3} $\mu c/cc$ during April. Individual samples, showing maximum values on the order of 5×10^{-3} $\mu c/cc$, were taken during the latter part of the month. These changes reflect increases in the activity density of reactor effluent water somewhat modified by the greater use of retention facilities. A significant portion of the increase in activity density was ascribable to Mn^{56}, one of the less dangerous constituents of the effluent water.

Analytical Control Laboratory

Routine and special analyses were carried out as follows:

Laboratory	Analyses Completed April	Analyses Completed 1953 To Date
Type Sample		
Vegetation	1219	4292
Water	1770	7073
Solids	359	1230
Air samples	483	987
Uranium (fluorophotometer)	796	1632
Oil fog (fluorophotometer)	58	240
Special survey samples (RMSS)	36	104
Special survey samples (RS)	14	443
Phillips Petroleum-Tritium oxide in water samples	0	12
Total	4735	16013
Counting Room		
Beta measurements (recounts included)	6433	23955
Alpha measurements (recounts included)	2745	9998
Control points (alpha and beta)	2590	9925
Decay curve points	4604	17201
Absorption curve points	295	1296
Total	16667	62375

Radiological Sciences Department

Analytical Control Laboratory (Continued)

Results from the analysis of 107 Basin influent water for gross beta particle emitters showed increases in the concentrations, calculated for 4 hours after the water entered the retention basins, by factors as high as 1.4, 2.1, and 1.3 over those observed in March, at 100-C, 100-DR and 100-F, respectively. In all measurements, the noted increase was closely approximated by the increase in concentration of Mn^{56}.

Control Services

Some correlation of I^{131} concentrations on vegetation was shown to exist between various locations within the Hanford Operation boundaries and a reference location near the Redox area. Further delineation of such correlations are necessary before any decrease in vegetation sampling schedules may be made.

Revised detection limits were calculated for the determination of plutonium by the electrodeposition procedure used by Bio-assay.

Synoptic Meteorology

Forecasts	Number made	April Percent reliability
Production	90	85.2
24-hour	60	83.9
Special	98	81.6

Temperatures generally were below normal except for a warm period from April 18 to April 21. The overall monthly average, 51.0°F, was 2.8° below normal. The highest was 78°F on April 20; the lowest was 27°F on April 2.

Precipitation totaled 0.77 inch in comparison with the normal April precipitation of 0.38 inch.

RESEARCH AND DEVELOPMENT ACTIVITIES

Experimental Meteorology

Further modification of the fluorescent pigment field dispenser reduced the variations in the rate of emission to 10%. Both pigment generators are now ready for field testing. Attempts continued to obtain a satisfactory motor for the sampling unit.

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Radiological Sciences Department

Experimental Meteorology (Continued)

The photographic data obtained in six earlier field tests conducted during stable conditions were reviewed. Values of the horizontal diffusion coefficients from both the Roberts and the Sutton hypotheses were computed and related to the mean wind speed at the source. The values obtained compared favorably with those predicted in recent theoretical investigations.

Earth Sciences

A sample of Ravon (napthol), suggested for weed control in swamp areas, was tested for its effect on soil permeability. Complete sealing of the ground will not result, but a reduction in soil permeability may be expected in any area treated with Ravon solution.

Additional studies of the possibility of a Recuplex liquid waste stream forming a self-sealing basin indicated that the maximum precipitation of contained salts resulted from adding caustic to the soil prior to introduction of the liquid waste. While further variables remain to be studied, the specific moisture retention properties of a soil must still be regarded as probably the most important factor determining the final distribution of the waste solution.

Laboratory experiments indicated that the adsorption on soil of trace amounts of cesium from sodium nitrate solutions decreased as the concentration of cesium increased. This decrease with increase of concentration is similar to that observed for higher concentrations indicating that extrapolations of adsorption data for Cs between macro and tracer amounts is valid.

Contamination of the ground water by beta-gamma and alpha emitters in the 241-B second cycle crib and tile field area was confirmed in well 224-B-4, about 250 feet south of the crib, for the first time since the well was drilled in 1947. Presence of contamination at this location suggests a local movement of ground water southward.

Contamination by beta-gamma and alpha emitters in the ground water beneath the 241-T second cycle crib and tile field area continued about as before. Well 241-T-17, about 500 feet east of the 241-TY tank farm, disclosed the presence of beta-gamma emitters in the ground water in concentrations of about 10^{-7} $\mu c/cc$. This suggests a general southeastward movement of the ground water and its contained contamination from the second cycle crib area.

Industrial Hygiene

An analytical method for beryllium was modified for use in the determination of the metal in air sample filters. The method, used in conjunction with spectrography, produced 90% recovery down to 1 microgram Be; a lower recovery was realized down to a lower limit of 0.05 micrograms. The method furnished sufficient sensitivity and accuracy to evaluate the operators' exposures in the 313 building.

Additional work was done to improve the double extraction dithiazone method for Pb determinations. The method was employed in the analysis of respirator testing atmospheres containing tetraethyl lead fume.

A method was developed for the production of a lead fume test aerosol for use in the respirator testing program. Several methods were investigated including the generation of fume from the molten pure metal, from a low-melting lead alloy, and from the combustion of a vapor-laden tetraethyl gasoline atmosphere. The last furnished the most satisfactory control. Relatively uniform test concentrations of about 40 μg per cu.m. of air were maintained in the aerosol chamber.

A constant filter monitor was adapted to utilize molecular filters as air sampling media for the local collection of Nevada fall-out for electron microscope analysis. The method will be considerably simpler than electric precipitation presently used. Attempts were continued to develop a technique for transferring the filter specimens directly onto electron microscope screens.

Thirty-one samples of outdoor air were collected at 329 building to obtain further data on the incidence of spherical particles in the atmosphere. While sufficient data have not been collected to date to determine the applicability of this technique for the local monitoring of Nevada fall-out, considerable variations have been observed above what appears to be a normal Hanford background. During the night of April 7th, the incidence of spheres reached a peak about 20 times background. This occurred after a gradual 24-hour increase, and returned gradually to background in about twenty-four hours.

Methods

Preliminary study of electroplating as an analytical method for Cr^{51} in reactor effluent using inert chromium carrier showed poor recoveries.

Improvements were made in determinations of Ru^{103} to Ru^{106} ratios which are needed in age determinations of waste solutions.

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Methods (Continued)

The recently developed procedure for Mn^{56} determination in reactor effluent was further refined.

In the barium zirconyl fluoride method for Zr^{97} in reactor effluent, it was found that the addition of MnO_2 in macro amounts, following the ion exchange step, greatly reduced the interference from Mn^{56}, presumed to be present as colloidal material. Some Si^{31} was carried with the zirconium.

Well water samples with plutonium spike were analyzed by the "saltless" ether extraction, using optimum concentration of nitric acid as indicated by recent tests. An average yield of 90.2% with a standard deviation of 3.8% was obtained.

Procedures were studied for digesting 50 g vegetation samples to insure solution of radioiodine with inappreciable loss. Sulfuric acid proved to be a promising digestion reagent but some I^{131} loss was indicated from preliminary results. Further studies relating to the determination of I^{131} on asbestos filters impregnated with silver nitrate demonstrated the difficultywith which I^{131} can be removed from this material; carrier recovery of 85% was obtained in several analyses.

Continued effort failed to insure reproducible thorium calibration curves using the one liter internal proportional counter for thoron and its daughters. A chemical Th separation using mesityl oxide was adapted for use on solubilized soil samples as a possible alternate.

Radiochemical Standards

A marked geometry dependence of the absorption coefficient for C^{14} beta particles was established, the coefficient increasing as the source to counter window distance is increased. This effect has not been satisfactorily explained.

The absolute disintegration rates of several Co^{60} sources were measured using coincidence counting.

Additional studies of self-absorption and self-scatter were made using the aerosol technique. Special care was taken in these experiments to eliminate sources of error which had been giving inconsistent results. For P^{32} in sodium chloride, a maximum self-scatter correction of 10% was indicated over the range 5 to 14 mg/cm^2.

Radiochemical Standards (Continued)

The change in geometry with sample diameter was determined using P^{32}. Results checked previous measurement with other isotopes for flat sources; however, the presence of a rim on a counting dish was shown to produce a flattening of the response vs. position curve of a point source.

The backscatter factor of Rh^{103} mounted on platinum and counted in the 50% geometry proportional counter was inferred by comparing the disintegration rate of the Ru^{103} parent determined with a mica window counter with the observed counting rate in the 2 π chamber.

Physics

A monitoring chamber for the K source was built and installed. Its use will permit correcting for variations in intensity of the primary X-rays during use. The materials of the chamber absorb negligible amounts of radiation at energies down to 8 Kev.

The circuits built for use with the proportional thimble chamber performed satisfactorily up to 1 mr/hr but above that level responded nonlinearly. The counting properties of nitrogen at low pressures were investigated; the gas amplifications obtained were too low for consideration of nitrogen as a filler for such chambers in the absence of suitable amplifiers.

A very small ion chamber was made for a study of the effects of tritium absorbed on the central electrode during measurements of the activity of tritium water samples.

Investigations of molded scintillation materials resulted in the preparation of an optically clear terphenyl-polystyrene block. It was found possible to press anthracene flakes into fairly coherent tablets which had good scintillating properties. Such a tablet was mounted on a photomultiplier tube and tested with radium and with the K source in a study of the light emission vs. the dose rate. Performance was fairly satisfactory except in the low energy, less than 50 Kev, region where the anthracene does not respond in proportion to the energy released in the crystal. A test was performed to measure the intensification of film darkening produced by such a tablet placed in front of a bare X-ray film; an increase by a factor of 2.4 was found.

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Radiological Sciences Department

Physics (Continued)

Neutron age theory techniques were applied to the electron penetration problem of calculating the dose in a thin sheet of emitting material sandwiched between 2 semi-infinite media of a different emitting and scattering material. This had direct application to the interpretation of the photographic action of high energy photons where the electrons result from photon absorption in the film and in the surrounding shield.

The results of neutron scattering measurements in the free air experiment at the Meteorology Tower (November 1952) were shown to be in satisfactory agreement with theoretically determined values assuming neutron scattering by the air only.

Instrument Development

Designs for a 25 channel analyzer using cathode ray deflection as the means for discrimination were nearly completed. The equipment, considerably less costly than an exclusively vacuum tube instrument, will permit more rapid energy analysis than single channel instruments and will be particularly useful for comparatively short half-life elements.

Study of the advantages and weaknesses of using gamma ray energy analysis for identifying certain 107 Basin effluent contaminants was started. This approach is planned for integration with chemical techniques in a continuous water analyzer.

Design of the radiation detecting and indicating portion of the monitor for pig thyroids was completed, and the working model used successfully on one experimental animal.

Transistor studies yielded a univibrator useful for pulses from G.M. counters or photomultipliers. A high voltage supply was devised for producing 1000 volts at 10 ua. from 5 volts input to a transistor oscillator.

Development of a very low background counting system for tritium was started. The instrument is intended to detect trace amounts of tritium in the waters underlying this site and, thereby, to trace the movement of certain wastes. Counter background will be reduced by a coincidence technique which will employ an envelope of liquid scintillator surrounding the tritium counter.

Radiological Sciences Department

BIOLOGY SECTION

AQUATIC BIOLOGY UNIT

Biological Chains

No progress other than routine sampling of P^{32}-dosed aquaria.

Ecology

Survey of the Columbia River

Although the river level remained virtually unchanged during the month, it was sufficiently high to restrict littoral zone collection of bottom organisms. Other sampling was completed as scheduled. With minor exceptions, the activity density of river organisms decreased substantially from last month. Average values for samples collected from the Hanford station were 2.3×10^{-4} μc/g of small fish, 1.5×10^{-2} μc/g of plankton, and 4.4×10^{-3} μc/g of bottom algae. For large fish a maximum activity density of 2.1×10^{-3} μc/g was found in the liver of a sucker collected near Hanford. Sampling of game fish was intensified, and a maximum of 2×10^{-5} μc/g of liver, and 4×10^{-6} μc/g of flesh, was observed in bass caught near Hanford. The maximum activities in whitefish from the Priest Rapids area were 4.7×10^{-4} μc/g of bone, and 6×10^{-5} μc/g of flesh. The abundance of juvenile chinook salmon along the shore line fluctuated considerably during the month. The average activity densities of specimens collected near Hanford, 300 Area, and Richland, were 2.9×10^{-4} μc/g, 6.5×10^{-4} μc/g, and 2.8×10^{-4} μc/g, respectively. These values are $1\frac{1}{2}$ to 2 times higher than averages for March.

Effluent Monitoring

Routine monitoring of the area effluent with juvenile chinook salmon continued. Addition of dichromate to the process water at the rate of 2 ppm was resumed on April 10. Fish held in this undiluted but charcoal-filtered reactor influent water have since shown a loss of appetite and vigor. In unfiltered reactor influent, dilution to 25% caused mortality rates significantly greater than normal. Similar results were observed at the 5% area effluent level. On April 15, all lots were reduced to 250 fish each to prevent overcrowding. The young salmon held in temperatures simulating river and higher temperature levels again suffered no unusual mortality during the month. Adverse effects resulting from higher temperatures during the incubation of the eggs seem to be limited to the first 4 months.

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BIOLOGY CONTROL UNIT

Biological Monitoring

Rodents collected from Separation Areas had thyroid activity densities increased more than 5-fold over last month's average activity. One rodent was apparently receiving 200 mrep/day to the thyroid.

Canada goose eggs collected from within plant boundaries had an activity density of 5×10^{-5} $\mu c/g$.

Clinical Laboratory

In addition to the 973 routine analyses, there were 27 special determinations of I^{127} in tissues, soil and salt, by a technique in microchemistry more accurate than methods previously employed.

Microscopy

Routine histologic preparations of 54 thyroid tissues and 31 other tissues were made for Toxicology.

The electron microscope was moved to the vault annex of the 1704-F building without incident.

Radiochemistry

A procedure was developed for plating out extremely thin Cr^{51} sources in preparation for vegetation analyses.

Services included 73 TTA extraction determinations of Pu in biological samples, the preparation of 30 isotope solutions, and the analysis of special and routine samples involving approximately 4850 alpha and beta counts.

METABOLISM UNIT

Animal Metabolism

Approximately 200 rats involved in the high-level chronic plutonium absorption and deposition experiment were sacrificed during the month.

Of 36 rats injected with zirconium malate, zirconium citrate, and Ca EDTA,

Radiological Sciences Department

Animal Metabolism (Continued)

27 survived for 30 days and were sacrificed. Analytical data are not available, but judging from survival data, zirconium malate appears to be more toxic than zirconium citrate.

Collagen fractions isolated from the muscle of rats killed 4 months and 8 months after tritium administration showed no appreciable change in bound tritium content over the 4-month interval. Water soluble and 0.1 N NaOH soluble fractions showed biological half-lives of 50 and 55 days, respectively, during the 4-month interval.

Microbiology

Dosimetry experiments with P^{32} and H^{3} solutions, using the ferrous-ferric and benzoic acid-phenol systems, were started during the month.

The ability of cell-free supernatants from E. coli and Proteus vulgaris cultures to remove plutonium from platinum disks was tested. Significant removal of plutonium occurred but variations observed between runs on the same supernatant solution require further explanation.

E. coli was grown in cultures containing levels of tritium oxide varying from 0 to 21 mc/ml. The activity of three enzyme systems in these cultures was then measured. The enzymes studied were hydrogenase, formic acid hydrogen lyase, and formic acid decarboxylase. For all three of these enzymes, an increase in enzymatic activity was noted with increase in tritium up to approximately 10 mc tritium oxide/ml. At higher concentrations of tritium oxide the activity declined.

Plant Nutrition

The effect of concentration, pH, and species on the uptake of chromium by plants was investigated but final results are not yet available. A Neubauer experiment employing barley grown in Wheeler loam indicated a concentration factor for ruthenium of 0.018, in essential agreement with previous data obtained for ruthenium in an Ephrata fine sandy loam.

The outdoor plots, used to study the effect of reactor effluent on barley plants, were irrigated twice during the month. The reactor was inoperative during the first irrigation. Control, 5% effluent, and 100% effluent water plots are growing with equal vigor.

Bean plants were grown from seed for a period of 26 days, in a sealed chamber, in nutrient solutions containing deuterium oxide and tritium

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Radiological Sciences Department

Plant Nutrition (Continued)

oxide. Analyses of plant water from various tissues taken at intervals during the growth period showed no significant difference in tritium and deuterium uptake. The level of tritium oxide and deuterium oxide attained in the plant water, however, was from 5% to 20% lower than the level of deuterium oxide and tritium oxide present in the nutrient solution.

Plant Metabolism

Algae grown in the presence and absence of tritium oxide (20 mc/ml) were stored in the refrigerator for 32 and 53 days prior to subculture and plating on inactive media. The storage period had no effect on subsequent results. Approximately 5 times as many colonies were obtained from the control cells as from experimental cells.

Analyses of lipid and non-lipid fractions from algae grown in the presence of tritium oxide indicated that 58 $\pm$ 4% of the theoretical tritium uptake (assuming no isotope effect) occurred in lipid fractions as compared with 35 $\pm$ 6% of the theoretical uptake in non-lipid fractions.

Work continued on the testing for biochemical mutants from previous experiments on the transmutagenic effects of P^{32} on Neurospora.

TOXICOLOGY UNIT

Experimental Animal Farm (Toxicology of I^{131})

Lambing and shearing are complete.

I^{131} administration was discontinued in the 1952 offspring of the original 0.15 μc I^{131}/day ewes.

The ratios for I^{131} in thyroid to I^{131} fed daily (Q/q) in April for all animals were as follows:

	30 μc/day	15 μc/day	5 μc/day	0.15 μc/day
Original ewes			1.9	1.9
1950 offspring		0.7	0.6	2.2
1951 offspring	1.0		1.6	1.9
1952 offspring		1.0	1.3	2.5
1953 offspring	0.3	0.6	0.8	1.2

[redacted]

Experimental Animal Farm (Toxicology of I^{131}) (Continued)

This represents a considerable drop from the March values in most groups.

An analysis procedure was inaugurated for measuring activity densities in the two most easily separated components of milk - cream and skim milk. Preliminary results indicate that essentially all I^{131} is found in the skim milk portion.

Pathologic effects that were suggestive of specific tissue damage were observed in thyroids of two animals that were sacrificed after receiving 5 μc I^{131}/day.

Physiology

A radioactive colloid was prepared that contained 1.9 μg Pu/ml by peptizing about 5 mg of a plutonium hydroxide. The probable particle size was estimated at 0.1 micron or less. The colloid was used in some preliminary tests on the lung distribution in mice at intervals after intratracheal injection.

Progress continued in the measurement of the efficacy of Zr salts and the EDTA compounds in the removal of injected plutonium.

FINANCIAL DEPARTMENT MONTHLY REPORT
APRIL, 1953

Preparation of the budget for the FY 1955 and revision of the budget for the FY 1954 was completed in April, the final budget letter being transmitted to the Atomic Energy Commission on April 24. The documents delivered to the Commission during April included the Plant and Equipment Program on the 8th; the Community Program on the 9th; Net Working Capital on the 15th; Inventories on the 16th; all department detailed budgets not previously submitted, on the 18th; the A.E.C. Consolidated Schedules (E-1 through E-7) on the 20th; and Revised Manpower Requirements on the 21st.

A forecast of manpower requirements to the end of the fiscal year 1956 was prepared for the Commission in accordance with its request, being transmitted on April 29.

The first series in a continuing program of management information meetings for Financial Department employees was completed in April except for Auditing Unit personnel. A meeting was held on the 2nd for Engineering Cost employees; one on the 10th for General Accounting employees; one on the 14th for General Cost, Reimbursement and Appropriations personnel; and one on the 16th for Payroll employees.

On April 10, 1953, the Atomic Energy Commission issued a Reimbursement Authorization, with respect to employees represented by unions, covering the general salary increase of 1.79% effective March 16, 1953. Payment of the increase to employees represented by unions was scheduled to be made in May after ratification of acceptance of the increase by unions affiliated with the Hanford Atomic Metal Trades Council. The other unions had already accepted the Company's offer. Payment of the increase to employees not represented by unions was included in April salary checks.

Request for approval of reimbursement for the Hanford Atomic Products Operation cost of the Pension Plan for the year 1952 ($1,523,313) was submitted to Hanford Operations Office, Atomic Energy Commission, in April, together with certification by the actuarial firm of Towers, Perrin, Forster and Crosby, Inc.

The following physical inventories, representing portions of the program for taking physical inventories of all materials (excluding SF Materials) by June 30, 1953, were taken during April:

1. Stand-by materials in the custody of the Electrical Distribution Unit were inventoried as of April 16, and those in the custody of the Telephone Unit were inventoried as of April 7. These inventories, representing approximately 3,500 items, were taken by 10 Financial Department employees and 39 employees of the Electrical Distribution and Telephone Section.

2. General Maintenance materials in the custody of Stores Unit were inventoried as of April 30, 1953. This inventory, representing approximately 35,000 line items stored in 12 locations, required the participation of 38 Financial Department employees and 135 employees of the Purchasing and Stores Section.

Statistics

A summary of cash disbursements and receipts (excluding reimbursements by AEC) for the months of April and March, 1953, is shown below:

Disbursements	April	March
Payrolls (net)	$2 598 156	$2 584 326
Materials and Freight	1 365 568	1 454 564
Payroll Taxes	764 446	684 653
U. S. Savings Bonds	256 880	109 047
Payments to Subcontractors	897 758	103 612
Group Insurance Premium	131 950	126 169
Pension Plan--Employees' Portion	90 895	97 982
Stock Bonus Plan	-0-	131 232
Other	163 124	117 986
Total	6 268 177	5 449 571
Receipts		
Rents	101 864	114 135
Hospital	81 886	87 864
Sales to AEC Cost-Type Contractors	49 947	58 690
Electricity	67 116	91 260
Telephone	39 275	26 432
Bus Fares	7 990	8 658
Scrap Sales	119	273
Refunds from Vendors	578	8 376
Other	30 438	30 373
Total	379 213	426 061
Net Disbursements	$5 888 964	$5 023 510

Advances as of April 30 and March 31 may be summarized as follows:

	April	March
Cash in bank--contract accounts	$3 436 036	$4 301 490
Cash in bank--salary accounts	50 000	50 000
Travel advance funds	125 000	125 000
	3 611 036	4 476 490
Disbursements not reimbursed	5 888 964	5 023 510
Total	$9 500 000	$9 500 000

Personnel and Organization

	Current Month	Prior Month
Personnel Changes during Month		
Employees at beginning	344	343
Additions and transfers in	4	7
Removals and transfers out	(6)	(6)
Employees at end of month	342	344
Personnel by Unit at Month-End		
General	8	9
Reimbursement Unit	4	4
General Accounting Unit		
General Accounts	24	24
Plant Accounts	30	29
Accounts Payable	35	35
Accounts Receivable	20	22
General	3	3
	112	113
General Cost Unit		
Consolidated Costs and Budgets	6	7
Plant Auxiliary Operations	16	16
Community Operations and Real Estate	11	11
Radiological Sciences and Other	7	7
Medical	3	3
General	2	2
	45	46
Manufacturing Cost Unit		
Costs and Budgets	35	35
General	7	7
	42	42
Engineering Cost Unit		
Project Section Costs	19	19
Design Section Costs	7	7
Technical Section Costs	9	9
General	5	5
	40	40
Payroll Unit		
Preparation and Employee Records	43 *	36
Confidential Payroll Records	7	14
Employee Benefit Plans and Payroll Reports	22	22
IBM Procedures	1	1
General	2	2
	75	75
Internal Audit Unit	14	14
Rotational Trainees	2	1
Total	342	344

* Increase in Preparation and Employee Records personnel and decrease in Confidential Payroll Records due to reassignment of seven employees in connection with shift of preparation of monthly roll from the Confidential Payroll group to Preparation and Employee Records.

Section Reports

The monthly reports of the three sections of the Financial Department, as listed below, are shown on the following pages:

Accounting Section	
General Accounting Unit	Ia-1 through Ia-10
General Cost Unit	Ib-1 through Ib-3
Manufacturing Cost Unit	Ic-1 through Ic-2
Engineering Cost Unit	Id-1 through Id-3
Appropriations Section	Ie-1
Payroll and Auditing Section	
Payroll Unit	If-1 through If-9
Internal Audit Unit	Ig-1

GENERAL ACCOUNTING UNIT
MONTHLY REPORT - APRIL, 1953

ACCOUNTS PAYABLE

For the second successive month Accounts Payable volume continued to increase, with 3,912 vouchers, totaling $3,497,116, being entered this month, as compared with 3,852 vouchers, totaling $2,799,461, entered in March. The amount of cash disbursed increased accordingly to $3,413,141 in April, as compared with $2,756,198 in March. The number of freight bills and new purchase orders received remained approximately the same during both months.

During the month 195 letters were prepared and directed to vendors. These letters may be classified subjectively as follows:

Price adjustments	60
Expediting vendors' invoices	44
Transportation charges billed by vendors	33
Vendors' statements	21
Authorizations to pay subvendors	10
Requests for vendors' refunds	7
Expediting shipment of material	6
Other	14
Total	195

Cash discount earned in April amounted to $3,593. Fiscal year to date total of earned cash discount is $40,911, representing a monthly average of $4,091.

Two purchase orders totaling $120,977 which were placed in February, 1953, for construction materials were assigned this month to Blaw-Knox Company.

Invoices totaling $1,090,474 have been received from National Carbon Company covering shipments of graphite. As of April 30, 1953, invoices totaling $853,369 had been paid, and invoices totaling $237,105 are being withheld pending completion of supporting data.

Payment in the amount of $28,272 was issued this month in final settlement of Subcontract G-303 with Morrison-Knudsen Company.

In reply to a suggestion from the Purchasing Unit that copy of vendors' quotations no longer be furnished Accounts Payable, Purchasing Unit was advised that the value of these documents to Accounts Payable outweighed the slight additional cost in furnishing them.

General Accounting Unit

ACCOUNTS PAYABLE (CONTINUED)

Procedures were modified to the extent that journalization of freight costs which had been prepared throughout the month would be consolidated and issued at the month end only. Details will be furnished to Cost personnel currently, but the number of journal entries will be reduced considerably.

As a result of changes made effective April 1, 1953, in distribution of copies of accounts payable vouchers and the discontinuance of the file for the Atomic Energy Commission, meeting was held with members of the Atomic Energy Commission Finance Division to discuss the necessary revisions in the Atomic Energy Commission audit procedure.

ACCOUNTS RECEIVABLE

The gross accounts receivable balance at April 30, 1953, amounted to $396,343, an increase of $6,001 from the balance at March 31, 1953. This increase results from the following changes:

Hospital accounts increased . . . . . due to the fact that amount of invoices issued reached an all-time high of $89,110	$ 3 944
Telephone accounts increased . . . . . due to the fact that collections through payroll deduction were discontinued April 1, 1953	7 317
Atomic Energy Commission cost-type contractor accounts decreased . . . . . due to increased collections	(8 468)
All other accounts increased . . . . . primarily due to increased billings to Dow Chemical for cost of training employees	3 208

Out-patient invoices issued in April at Kadlec Hospital numbered 1,828 and totaled $11,204, as compared to 1,978 in March, amounting to $9,584. In-patient revenue totaled $77,906, which is the highest sales month in the operation of Kadlec Hospital. Collections during the month totaled $86,527, representing payroll deductions of $4,641 and cash collections of $81,886.

Cash collection of all telephone accounts was initiated in April, replacing the former procedure of collecting accounts of General Electric employees through payroll deduction. Procedures regarding collection policies and issuance of statements were printed in the Hanford Works News.

General Accounting Unit

ACCOUNTS RECEIVABLE (CONTINUED)

Procedures were established in April for billing of water charges to Bauer-Day, Incorporated, covering water consumption in occupied Bauer-Day houses. Water charges will be made on the basis of a flat monthly charge per dwelling unit. The flat monthly charge, as established by the Atomic Energy Commission, is $1.25 per month for a two-bedroom unit, $1.50 for a three-bedroom unit, and $1.75 for a four-bedroom unit. Similar billing procedure will be established for billing of water charges to Spokane Housing, Incorporated, when houses are completed and occupied.

At the beginning of the month, 212 accounts, representing $14,045, were in the hands of collection agencies. During April, 9 additional accounts, amounting to $356, were forwarded for collection, and partial collections in the amount of $35 were made on 2 accounts. At April 30, 221 accounts, in the total amount of $14,366, are at collection agencies.

GENERAL ACCOUNTS

Work continued in connection with the standardization of journal entries and assignment of permanent numbers to all entries issued regularly each month. Journal entries for the months of February and March were listed by accounting unit preparing the entry, and these lists were reviewed by the accounting units and used as the basis for consolidation of entries and issuance of standard numbers. Numbers have been assigned effective with May entries.

The Continuity of Service Expense Accrued account was reviewed this month, and a report was prepared showing certain pertinent data for calendar year 1952 as compared with calendar years 1949, 1950, and 1951. The per cent of accrual to gross payrolls amounted to 9.75% for calendar year 1952. Charges during the year amounted to 8.67%, resulting in an overaccrual of 1.08%, or $502,469

Considerable time was spent during the month in reviewing documents affecting the Expendable Office Equipment account. A journal entry was prepared in the amount of $13,651.20 to adjust the balance of this account, covering activity dating back several years. Expendable office equipment that had been scrapped or sent to salvage or excess had not been processed for journalization, which resulted in an overstated amount in the Expendable Office Equipment account.

A total of 307 travel advances amounting to $68,121 were issued during April, as compared with 358 travel advances amounting to $55,312 issued during March. Travel activity has been increasing for the past several months, and indications

GENERAL ACCOUNTS (CONTINUED)

are that activity will continue to increase due to the recruiting of technical graduates and attendance of employees at meetings of societies and associations.

As a result of the discontinuance of payroll deductions for telephone accounts, approximately 3,800 additional collections were handled by the Cashier's Office in April. This additional work load was handled without having to add another employee, although approximately twenty hours of overtime were worked. During April the Cashier's Office handled in excess of 12,500 individual cash collections aggregating $446,163.

PLANT ACCOUNTS

Close liaison continued this month with Engineering Department personnel who are assisting with the unitization of completed projects as they are transferred from construction work in progress to completed plant accounts. A review of the status of this work indicates that at June 30, 1953, costs of all projects financially completed at this date will be classified by plant record unit and entered in plant accounts.

Project costs which were segregated into units of plant and transferred to property in service accounts this month totaled $381,898, and are itemized below:

CG-404	Primary Electric Power Lines - Hanford Laboratory Area	$ 55 723
CG-419	Experimental Induction Heating - Building 3732	46 941
CG-420	CO_2 Bulk Storage Facilities	55 798
CG-425	Park Development Program - Fiscal Year 1951	153 269
CG-445	BY Telephone Exchange Additions and Changes	38 933
CG-503	Waste Storage Hutment - 234-5 Building	21 666
L-608	Elimination of Odors - Sewage Lift Station	2 980
L-662	Mansfield Street Improvement	4 468
L-911	Resurface Parking Lot Between Campbell's Food Store No. 2 and Village Pharmacy	2 120
	Total	$381 898

Descriptions and inventories of capital assets in the 100 C Area were completed during the month. This information has been forwarded to the Engineering Department for use in the unitization of Project C-431 - New Production Facility.

General Accounting Unit

PLANT ACCOUNTS (CONTINUED)

A proposal was presented and reviewed in detail which provided for major revisions in present plant accounting procedures. Under this proposal, custodians of plant and equipment are to be provided with information as to items for which they are responsible and will be in a better position to measure utilization and to justify additions or replacements. Both plant accounting and property management personnel made initial contacts with operating personnel regarding the installation of this revised procedure.

During the month discussions were held with the Atomic Energy Commission in an attempt to simplify and reduce number of reports they have requested regarding our investment in plant and equipment. As a result of these discussions, consolidations of reports have been made, and certain reports previously prepared for their use have been discontinued.

Statements were prepared showing estimated depreciation expense for fiscal years 1954 and 1955, applicable to total plant assets recorded at this date, and anticipated additions for the next two fiscal years. Depreciation estimates submitted totaled $58,217,643 for fiscal year 1954, and $68,839,548 for fiscal year 1955.

General Accounting Unit

	April	March
Accounts Payable		
Balance at Beginning of Month	$ 398 217	$ 346 578
Vouchers Entered	3 497 116	2 799 461
Cash Disbursements	3 413 141 DR	2 756 198 DR
Cash Receipts	578	8 376
Balance at End of Month	$ 482 770	$ 398 217
Number of Vouchers Entered	3 912	3 852
Number of Checks Issued	2 199	2 355
Number of Freight Bills Paid	1 241	1 486
Amount of Freight Bills Paid	$ 277 831	$ 321 969
Number of Purchase Orders Received	1 816	1 961
Value of Purchase Orders Received	$1 418 962	$2 896 864
Cash Disbursements		
Payrolls (Net)	$2 598 156	$2 584 326
Material and Freight	1 365 568	1 454 564
Lump Sum and Unit Price Subcontracts	897 758	103 612
Payroll Taxes	764 446	684 653
United States Savings Bonds	256 880	109 047
Group Insurance Premium	131 950	126 169
Pension Plan - Employees' Portion	90 295	87 982
Stock Bonus Plan	-0-	181 232
All Other	163 124	117 986
Total	$6 268 177	$5 449 571

General Accounting Unit

	April	March
Cash Receipts		
Prior Month's Expenditures Reimbursed by Atomic Energy Commission	$5 023 510	$5 902 381
Rents	101 864	114 135
Hospital	81 886	87 864
Electricity	67 116	91 260
Sales to Atomic Energy Commission Cost-type Contractors	49 947	58 690
Telephone	39 275	26 432
Sundry Accounts Receivable	21 042	11 890
Bus Fares	7 990	8 658
Refunds from Vendors	578	8 376
Surplus, Salvage, and Scrap Sales	119	273
Other	9 396	18 492
Total	$5 402 723	$6 328 451

Bank Balances at End of Month		
Chemical Bank and Trust Company - New York Contract Account	$ 840 950	$1 182 676
Seattle-First National Bank - Richland Contract Account	1 877 132	2 239 445
United States Savings Bonds Account	267 164	152 454
Salary Account No. 1	20 000	20 000
Salary Account No. 2	30 000	30 000
Travel Advance Account	50 862	61 095
National Bank of Commerce - Richland Contract Account	717 954	879 369
Total	$3 804 062	$4 565 039

General Accounting Unit

	April	March
Accounts Receivable		
Hospital	$ 148 147	$ 144 203
Atomic Energy Commission Cost-type Contractors	100 396	108 864
Sundry	59 117	52 108
Equipment Sales to Facilities	37 460	38 012
Electricity	30 087	22 693
Telephones	19 652	12 335
Rents	10 519	10 863
Safety Shoes	728	943
Loans to Employees	237	321
Subtotal	396 343	390 342
Reserve for Bad Debts	37 812 CR	37 966 CR
General Ledger Balance	$ 358 531	$ 352 376
Hospital		
Number Out-patient Invoices Issued	1 828	1 978
Charges During the Month	$ 89 110	$ 85 553
Collections - Cash	81 886	87 864
- Payroll Deductions	4 641	4 989
Atomic Energy Commission Cost-type Contractors		
Number Invoices Issued	55	53
Amount of Invoices Issued	$ 41 480	$ 63 488
Cash Received	49 947	58 690
Sundry		
Number Invoices Issued	412	502
Amount of Invoices Issued	$ 28 851	$ 22 133
Cash Received	21 042	11 890
Electricity		
Number of Bills Issued	6 165	6 159
Amount of Bills Issued	$ 64 266	$ 69 714
Cash Received	67 116	91 260
Telephones		
Working Telephones (excludes official telephones)	5 959	5 959
Telephone Work Orders Processed	300	295
Charges During the Month	$ 47 500	$ 48 114
Collections - Cash	39 275	26 432
- Payroll Deductions	-0-	24 143

General Accounting Unit

	April	March
Accounts Receivable		
Rents		
Houses		
Number Houses Occupied	6 045	6 046
New Leases and Lease Modifications	105	106
Lease Cancellations	98	89
Charges During the Month	$ 245 440	$ 245 716
Collections - Cash	41 633	46 644
- Payroll Deductions	204 738	205 598
Dormitories		
Number Rooms Occupied	1 028	1 042
New Assignments	75	61
Removals	89	73
Charges During the Month	$ 15 808	$ 16 018
Collections - Cash	3 811	3 847
- Payroll Deductions	12 526	12 764
Facilities		
Number Facility Leases	142	141
Revenue	$ 56 420	$ 63 644

	Number	Amount
Uncollectible Accounts (Total to Date)		
Accounts Forwarded to Collection Agencies	494	$ 43 083
Accounts Returned as Uncollectible	130	22 093
Collections	172 -1)	6 624 -2)
Balance at Collection Agencies April 30, 1953	221	$ 14 366

(1- Includes 143 accounts collected in full and 29 accounts partially collected.

(2- Represents total collections, half of which is remitted to General Electric.

General Accounting Unit

	April	Total to Date
Surplus, Salvage, and Scrap Sales		
Number of Sales	1	594
Revenue (excluding Sales Tax)		
Materials or Equipment	$ 119	$ 644 630
Tract Houses		
Revenue to Atomic Energy Commission	-0-	36 174
Revenue to General Electric	-0-	15 773
Total	$ 119	$ 696 577

	April	March
Travel Advances and Expense Accounts		
Cash Advances - Beginning of Month	$ 46 731	$ 46 545
Advances During the Month	68 121	55 312
Expense Accounts Submitted	45 985 CR	43 880 CR
Cash Refunded	13 384 CR	11 246 CR
Cash Advances - End of Month	$ 55 483	$ 46 731
Outstanding Cash Advances		
Current	$ 45 472	$ 39 773
Over 30 Days	10 011	6 958
Total	$ 55 483	$ 46 731
Travel and Living Expenses		
Paid Employees	$ 42 016	$ 38 936
Billed to Government	40 536	36 851
Balance in Variation Account at End of Month	18 655 DR	17 174 DR

GENERAL COST UNIT
MONTHLY REPORT
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Additional budget documents transmitted to the Atomic Energy Commission included Community Program on April 9, 1953; Net Cash Working Capital on April 15, 1953; Inventories on April 16, 1953; All Department detailed budgets, not previously submitted, on April 13, 1953; Atomic Energy Commission Consolidated Schedules (E-1 through E-7) on April 20, 1953; Revised Manpower Requirements on April 21, 1953 and the final budget transmittal letter on April 24, 1953.

Based on changes made by management prior to final submittal of the budget to AEC, supplemental information was developed to support these changes in expenditure patterns and was provided to management to assist in their review of various programs.

Consolidated Costs and Budgets

The final consolidation and transmittal of the Budget for FY 1955 and FY 1954 progressed as shown above.

A forecast of manpower requirements as outlined in GM-PER-40 was prepared as requested by the Atomic Energy Commission. This was transmitted to the Commission on April 29, 1953, and included the indicated requirements to the end of FY 1956.

After submission of budget documents to the AEC a large amount of time was expended by personnel in this group to clarify specific items and prepare or obtain additional justifications in some instances. As a result of this cooperation the local budget office is recommending only minor changes from the General Electric Company requests in budgets for Inventories and Equipment Not Included in Construction Projects. It is expected that assistance will also be required on other budget programs.

Considerable effort is also being expended to assist Plant Auxiliary Operations Cost Group in establishing rental rates on office equipment and an analysis of IBM utilization for cost work.

Plant Auxiliary Operations

Transfer of the Procedures Unit from the Plant Protection Section to the Statistical and Computing Section on April 13 required transfer of budgeted funds and establishment of new codes. This has been, or will be, accomplished before future cost reports are issued.

As discussed in staff and cost meetings in recent months, a uniform numbering system for all journal entries of a repetitive nature is being established, with lists being prepared for the General Accounts Group.

Plant Auxiliary Operations (Continued)

In order to establish better control of rental charges on IBM equipment, we are adopting a memorandum ledger card record for each piece of equipment which will enable us to determine the type of machine, base rental rate, liquidation rate and other pertinent data.

An organization chart and a job write-up for each nonexempt position has been completed. This will assist in establishing satisfactory job rates and will also be an aid in setting comparable rates for comparable work through the various Cost Units.

Results of a study undertaken to determine reasons underlying the failure of the 20% factor added to the cost of withdrawals of stores materials to liquidate costs of the Stores Unit were discussed with the manager of the Purchasing and Stores Section on April 30. Because of increased costs applicable to this operation, a percentage factor of 23% appears necessary to successfully liquidate these costs. However, because of the many factors affecting this liquidation and recent developments, it was mutually agreed that the decision to increase the percentage factor would be deferred until the experience of April and May could be evaluated. Following issuance of May reports, another conference will be held and a definite course of action decided upon.

Community Operations and Real Estate

Work on necessary procedures in connection with the transfer of Richland Electrical Distribution System to Community Operations was completed. The transfer was effective on April 27, 1953.

The unitization of four construction projects to Plant Accounts was completed during the month.

Staff

Additional analysis work was done on the budget overrun existing in Biology Section Research and Development costs and several meetings were held with Radiological Sciences personnel in order to explain and devise means of reducing the budget overrun. In this connection a lot of effort was expended in verifying charges from the Technical Section for spectrochemical analyses, combustion analyses, analytical services and special glass blowing work. Biology Section has instituted a system of control over all work requests sent to other Departments in an effort to reduce charges to Research and Development.

Staff (Continued)

A complete study of Control Laboratory unit costs was made in April and several revisions were made which will result in better unit cost information for control and analysis purposes. The units handled during the month will be reported on a basis more nearly comparable to the basis of reporting costs. Such studies will be made, of all other unit cost procedures and routines used in Radiological Sciences Department, during the following months.

Medical

Effective May 1, 1953, the Radiologist and Pathologist will transfer to private practice. X-ray and some Laboratory fee schedule adjustments have been submitted to the Atomic Energy Commission for approval. The result of this change to private practice will probably result in a reduction of approximately $2,000 per month in Kadlec Hospital revenue and a slight decrease in operating cost.

MANUFACTURING COST UNIT
APRIL, 1953

GENERAL

A discussion of "Distribution of Costs" was conducted by the Manufacturing Accountant at area cost meetings of Metal Preparation and Separations Sections. A special meeting is being scheduled for the Reactor Section.

As a part of the Manufacturing Cost Unit policy of giving employees as comprehensive a knowledge of all phases of manufacturing cost as possible, a cost clerk was transferred to the Reactor Section and a Business Graduate was transferred to Analysis and Studies.

One rotational trainee received training in the Manufacturing Cost Unit this month.

PRODUCT COST ACCOUNTING

Standard billing prices on Plutonium were again decreased this month to bring them more in line with our current unit costs.

The photostated "Product Cost Report" was issued at an earlier date than any previous report. A ten percent reduction in size of the positive prints made possible an approximate forty-five percent savings in reproduction expense, and reduced the photostating time approximately fifty percent.

BUDGETS

A breakdown by months of the fourth quarter FY 1953 budget was completed during April. Revisions, based on the organization changes, were included.

MAINTENANCE AND PLANT IMPROVEMENT

A memorandum on "Preparation of Work Order Forms" was issued to the Section Managers with copies to all interested parties in the Areas. It is believed this will aid in eliminating errors in their preparation.

Larry Bradley of the Labor Standards Group gave an interesting talk to the Manufacturing Cost Personnel on his interpretations of the O.P.G.'s that effect Work Order and Project Costs.

REPORTS AND RECORDS

Reactor Section's Space Occupancy Costs were reviewed and billings prepared using the new standard rates in accordance with "Accounting Methods and Procedures - Space Occupancy" dated 4-23-53.

P-10 Codes were opened as follows:

Separations Section, Unit Code 6220-P-10 Extraction
Reactor Section, Process Code 601-R-10 Irradiation

Final journal entries to General Accounts for the Month of March were made April 10. Operating reports were issued April 13.

METAL PREPARATION SECTION ACCOUNTING

Preliminary standards for preparation of slugs by the triple dip process have been completed. Reports and charts are being prepared as an approach for utilizing the standards as a basis for analyzing cost, comparing trends, forecasts, budgets, etc.

A chart has been prepared that shows comparison of actual costs and production with forecasted costs and production.

SEPARATIONS SECTION ACCOUNTING

The accomplishments for the 1st Quarter of Calendar Year of 1953 was compiled for the Separations Section Quarterly Savings & Improvement Report.

Unit cost explanation and forecast covering the period April through September for BiPO-4, Redox, 234-5, TBP, and UO-3 were prepared and submitted at the monthly cost meeting held on April 24, 1953 in the 200-W Area.

Monthly variance reports covering those portions of Separations Section Costs under the Standards Program were prepared. These reports cover labor and material for the 221-T, 224-T, 231, 202-S and 222-S Buildings.

A report covering the evaluation of the Separations Section Safety Stampede was prepared.

REACTOR SECTION ACCOUNTING

An accounting procedure for "Space Occupancy" was issued and revised rates were put into effect for April billing to tenants. The rates as established are the same for like buildings receiving like services.

The "Statement of Operating Costs" for the Section was revised to summarize the cost incurred by area by each sub-section and comparison to previous month and budget.

Cost reports for the sub-sections were revised to present to superintendents their controllable costs. This report shows current and previous month compared with budget.

ENGINEERING COST UNIT
MONTHLY REPORT - APRIL, 1953

DESIGN COST

The number of cost transfers to and from Kaiser Engineers decreased during the period; however, the dollar volume increased. This reflects a sharp increase in stores transfers with a greater consolidation of billings.

	Number of Invoices		Total Cost Billed	
	To Kaiser	From Kaiser	To Kaiser	From Kaiser
April	52	17	$159 831.07	$132 747.66
March	63	20	$132 492.32	$111 175.20

Cost transfers to Kaiser Engineers from General Electric include:

	April	March
Stores Issues Other Than Excess	$ 78 571.54 (1)	$ 16 225.84
Major Construction Program Equipment - Net Book Value	45 499.22	49 260.07
Services - Clerical, Patrol, Fire, Electricity	36 469.15	37 290.90
Excess Material Withdrawals	7 296.35	11 579.04
Coal		6 185.22
Railroad Car Handling	3 960.00	5 280.00
Work Order Costs	2 754.37	2 937.57
Other	2 074.47	2 482.47
Major Equipment Overhaul and Repair - Monthly Accrual	(15 955.47)	(11 389.11)
Charges for Major Equipment Overhaul and Repair	1 305.12	12 883.14
Kaiser Engineers Inventory Declared Excess	(2 143.68)	(242.82)
	$159 831.07	$132 492.32

(1) Transfers of stores other than excess to Kaiser Engineers include credits to the following jobs and accounts:

25.3-1	Project Section Costs	
	CG 431-B	$(52 624.68)
	Minor Projects	(6 497.76)
	CA 431-A	(661.50)
10.1	Inventories - Standby	(9 826.04)

Cost Transfers from Kaiser Engineers to General Electric:

	April	March
Stores Issues	$ 75 020.80	$ 43 328.84
Graphite Fabrication	33 486.74	27 614.53
Transfer of Major Construction Program Equipment		23 609.35
Work Order Costs	22 489.44	10 832.25
White Bluffs Utilities and Services Costs	1 750.68	4 061.28
Transfer of Office Equipment		1 728.95
	$132 747.66	$111 175.20

Engineering Cost Unit

DESIGN COST (Continued)

Cost Transfers to Blaw-Knox from General Electric include:

	April
Excess Material Withdrawals	$ 25 377.99
Stores Issues Other Than Excess	3 897.44
Major Construction Program Equipment - Net Book Value	1 791.39
Other	606.64
	$ 31 673.46

Design Section cost statements for the month of March were issued April 10, 1953. The Managers Booklet was issued April 15, 1953. Efforts are being made to speed the issuance of weekly cost reports. The present date is Wednesday covering the previous week with an occasional report as late as Thursday.

PROJECT COST

Consolidation of the Engineering Department Fiscal Year 1955 Budget and Revision of Fiscal Year 1954 Budget was completed early in the month. Considerable time was spent recasting Project Section Fourth Quarter Fiscal Year 1953 Budget to conform with the reorganization on March 1, 1953 of the Section. Work was started on the recasting of Fiscal Year 1955 Budget and Revision of Fiscal Year 1954 Budget.

A new form and system of reporting time distribution for personnel was placed in effect on April 20, 1953. This new form shows in one report for each employee the information necessary to record expenses and effect liquidations to end functions.

Financial Closing Statements were issued covering the following projects during the month:

CA-199	Expansion of 300 Area Sanitary Sewage Disposal System
CG-433	Expansion of 300 Area Power House and Pumping Station Facilities
CA-452	Meteorology Tower Elevator
CG-493	Safety Showers for the Duct Level Floor, 234-5 Building

Construction Work in Progress - Engineering report for the month of March was furnished the Atomic Energy Commission on April 11, 1953. All other financial statements were issued on April 13, 1953.

TECHNICAL COST

Monthly operating cost reports were issued to the Manager, Technical Section and the Manager, Engineering Administration Sub-Section on April 13, 1953. Research and Development detailed reports were issued on April 11, 1953 and the monthly cost analysis letter on April 14, 1953.

The Budget for FY 1955 and Revision of Budget for FY 1954 was completed during April and submitted for consolidation prior to submittal to the Atomic Energy Commission. Also, scheduling was begun for a second revision of the FY 1954 budget to conform with the revised Technical Section organizational structure.

Engineering Cost Unit

TECHNICAL COST (Continued)

Standard liquidation rates for the Section were reviewed to determine their adequacy and the rates in Separations Technology and Applied Research Sub-Sections were revised to permit distribution of prior month's over or underliquidations by the end of June, 1953.

It now appears that Technical Section will be within the authorized amount for Research and Development for this fiscal year and that there will also be an underrun of the Process Assistance budget.

During April Separations Technology Sub-Section requested that additional organizational cost segregations be provided effective May 1, 1953. In addition, Technical Information Unit requested that Classified Files costs be segregated into three parts beginning May 1, 1953, as follows:

300 Area Files
700 Area Files
Inter-Area Services

Plans for these additional cost breakdowns were completed during the month.

APPROPRIATIONS SECTION
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The Plant and Equipment Program was reviewed in considerable detail by the Appropriations and Budget Committee and submitted, on a preliminary basis, to the Atomic Energy Commission on April 8, 1953. Construction data sheets have been submitted on a continuing basis to the Commission since March, 1953, in accordance with request of D. F. Shaw. As of the end of April, substantially all of the construction data sheets have been completed and forwarded to the Commission. A few minor changes still remain to be completed in data sheets already submitted.

Projects Approved By The Appropriations And Budget Committee In April

	Project Title (Appropriation Request)	Amount
CG-549	Activate Task I, RMA Line, Bldg. 234-5	$240,000
CG-550	Reactivation of P-10 Facilities	150,000
CG-551	Expansion of Building 234-5 Facilities	400,000
CA-364	Aquatic Biology Laboratory	Change in scope
53-S-7	Procurement of Twenty-Two 41-Passenger Suburban Type Motor Coaches	484,000
53-S-17	Procurement of 24 Additional Sedan Delivery Trucks	36,000

No project proposals or informal requests were approved by the Appropriations Sub-Committee in April. Equipment approvals amounted to $103,000; approvals to date, plus expenditures and commitments of prior periods amount to $756,000 of the total available from the Financial Plan of $970,000. As of April 30, it appears as though the total FY 1953 funds will be spent.

T. G. LaFollette and P. E. Lowe resigned as members of the Appropriations Sub-Committee. D. W. Haught was appointed as a new member.

Assistance was rendered to Engineering Department in both preparing and evaluating Research and Development accomplishments, both past and future, in order to provide supplementary data to the Atomic Energy Commission in support of budget requests for development funds.

There were two business graduates on rotating assignment at April 30; R. E. Cain who is approaching completion and I. L. Burnett recently returned from the Air Corps.

PAYROLL UNIT
MONTHLY REPORT

APRIL, 1953

The general salary increase of 1.79 per cent effective March 16, 1953, to weekly-paid employees not represented by unions was included in salary checks distributed to employees on April 10, 1953. The payment included the retroactive portion of the increase. Payment of the increase (including the retroactive portion) was made to monthly-paid employees in salary checks distributed on April 30, 1953.

Reimbursement Authorization was requested on April 10, 1953, from the Atomic Energy Commission to cover the general increase of 1.79 per cent of base salary rates for employees represented by unions. The Commission issued Reimbursement Authorization No. 202 on the same day, authorizing the increase effective March 16, 1953. Payment of the increase to employees represented by unions will be made in May, after notification of acceptance by the unions affiliated with the Hanford Atomic Metal Trades Council.

The payroll procedure for payment of planned overtime worked by monthly-paid employees was changed during the month of April so that effective with overtime worked in April, 1953, payment will be included in salary checks for the month following the month in which the overtime was worked. Announcement of this change was made in Office Letter No. 172 on April 17, 1953.

In connection with the case of Rivers v. General Electric Company and the case of Connoly and Black v. General Electric Company, schedules were prepared in April indicating certain payroll data for each of the complainants in these two cases. The schedules were submitted to the Legal Department in accordance with its request.

In April, work was begun on calculation of retroactive vacation payments for the year 1952, to employees who worked extended schedules during the twelve months' period ended March, 1952. It is expected that this work will be completed so that payment can be made to weekly-paid employees early in June and to monthly-paid employees in salary checks for the month of June, 1953. This work is being performed on an overtime basis. These calculations are necessary as a result of the change in the vacation plan, retroactive to January 1, 1952, which provides that vacation payments to employees working extended schedules will be based on the average number of hours worked per week for the 12-month period ending with the last fiscal week in March rather than on the eight-week period immediately prior to the vacation. Vacation payments for the year 1953 are being made currently on the new basis.

Five Payroll employees were loaned to the Internal Audit Unit for the period April 29 to May 2 and one was loaned on April 29 and 30, to assist with physical inventory work.

Seven employees were transferred from Confidential Payroll Records to the Preparation of Payroll group effective April 1 when preparation of the monthly payroll was transferred to the latter group.

Request for reimbursement of the Hanford cost of the Pension Plan for the year 1952 ($1,523,313) was submitted to Hanford Operations Office, AEC, in April, together with certification by the actuarial firm, Towers, Perrin, Forster & Crosby, Inc.

A Management Information meeting for all employees of the Payroll Unit was held on April 16, 1953. The meeting was conducted by E. F. Charette, Accountant, Payrolls, with the participation of W. W. Smith and J. P. Holmes. Questions presented by employees were answered by Mr. Charette.

The first quarterly Hanford Atomic Products Operation Suggestion Report for the period ended March 31, 1953, was forwarded to the Comptroller's Office on April 21, 1953. This report was issued annually in prior years.

Arrangements were made with Employee Services Section for coordination of their "Separations Statistics and Turnover Report" with the Turnover Report furnished monthly by Payroll Unit to the Accounting Services Division, Schenectady. As a result, statistics given in these two reports in the future will be on a comparable basis.

Payroll Unit (continued)

STATISTICS	Total	Monthly Payroll	Weekly Payroll
Employees on Payroll at beginning of month	8 708	2 283	6 425
Additions and transfers in	78	7	71
Removals and transfers out	(118)	(12)	(106)
Transfers from weekly to monthly payroll		11	(11)
Transfers from monthly to weekly payroll		(1)	1
Employees on payroll at end of month	8 668	2 288	6 380

Number of Employees	April	March
Bargaining group - HAMTC	3 460	3 471
- Building Services	67	66
- Two Platoon Firemen	46	46
- Hanford Guards	486	494
Other weekly - non-bargaining	2 367	2 394
Executive, administrative and operating	1 755	1 751
Professional	486	485
Other Monthly	1	1
Total	8 668	8 708

Number of Employees		
Engineering	1 519	1 520
Manufacturing	3 305	3 310
Plant Auxiliary Operations	2 178	2 216
Community Operations and Real Estate	439	419
Financial	342	344
Employee & Public Relations		
Technical Personnel	94	103
Other	117	117
Radiological Sciences	372	373
Medical	252	257
General	18	18
Law	5	5
Accountability	23	21
Property Management and Control	4	5
Total	8 668	8 708

Overtime Payments		
Weekly Paid Employees	$71 507 (a)	$ 84 963 (b)
Monthly Paid Employees	4 838 (c)	33 204 (d)
Total	$76 345	$118 167

Number of Changes in Salary Rates And Job Classifications	1 396	1 441

(a) Includes 4 weeks ended 4-19-53.
(b) Includes 4 weeks ended 3-22-53.
(c) Payments cover adjustments for prior months only. In accordance with new procedure overtime will be paid in month following actual performance.
(d) Payments cover period March 1 through March 31, 1953. Includes overtime for the month at the rate of time and one-half on the first $7 500, and straight time on the balance, of annual base compensation.

Payroll Unit (continued)

Gross Amount of Payroll	April	March
Engineering	$ 730 331	$ 722 828
Manufacturing	1 476 766	1 489 838
Plant Auxiliary Operations	836 013	852 372
Community Operations & Real Estate	167 087	161 074
Other	496 508	495 188
Total	$3 706 705 (a)	$3 721 300 (b)

Annual Going Rate of Payroll		
Base Plus Overriding Adjustment	$43 472 367	$42 735 855
Overtime	1 108 237	1 354 463
Isolation Pay and Area Differential	1 916 220	1 921 242
Shift Differential	446 630	446 991
Other	38 288	34 120
Total	$46 981 742	$46 492 671

Average Hourly Base Rates (includes overriding adjustment)		
Bargaining group - HAMTC	$2.265	$2.226
- Building Services	1.741	1.711
- Two Platoon Firemen	2.193	2.159
- Hanford Guards	1.974	1.942
Other Weekly - non-bargaining	1.925	1.896
Executive, administrative and operating	3.172	3.077
Professional	3.461	3.410
Other Monthly	2.550	2.525
Total	$2.403	$2.352

	April (c)			March (c)		
Average Earnings Rate Per Hour	Weekly	Monthly	Total	Weekly	Monthly	Total
Engineering	$2.073	$3.336	$2.758	$2.066	$3.265	$2.717
Manufacturing	2.488	3.339	2.654	2.477	3.243	2.629
Plant Auxiliary Operations	2.147	3.092	2.279	2.140	3.006	2.260
Community Operations & Real Estate	2.187	2.811	2.399	2.159	2.724	2.356
Other	1.965	3.512	2.355	1.950	3.428	2.321
Total	$2.257	$3.294	$2.524	$2.245	$3.211	$2.494

(a) Includes payments for four-week period ended April 19, 1953 in the case of weekly paid employees.

(b) Includes payments for four-week period ended March 22, 1953, in the case of weekly paid employees.

(c) Includes shift differential and isolation pay in the case of weekly paid employees and area differential in the case of monthly paid employees. Excludes overtime premiums, commissions, suggestion awards, etc.

Employee Benefit Plans	April	March
Pension Plan		
Number participating at beginning of month	7 559	7 587
New participants and transfers in	46	56
Removals and transfers out	(63)	(84)
Number participating at end of month	7 542	7 559
% of eligible employees participating	95.2%	95.0%

Payroll Unit (continued)

Employees Retired	April	Total to Date
Number	10	270 (a)
Aggregate Annual Pensions Including Supplemental Payments	2 018	$62 062 (b)
Amount contributed by employees retired	5 175	78 463

(a) Includes 14 employees who died after reaching optional retirement age but before actual retirement. Lump sum settlements of death benefits were paid to beneficiaries in these cases.

(b) Amount before commutation of pensions in those cases of employees who received lump sum settlement.

	April	March
Number who became eligible for participation	48	46
Number who applied for participation	44	43
Number who elected not to participate	4	3

Insurance Plan (c)		
Personal Coverage		
Number participating at beginning of month	8 771	8 805
New participants and transfers in	56	72
Cancellations	(17)	(15)
Removals and transfers out	(93)	(91)
Number participating at end of month	8 717	8 771
% of eligible employees participating	98.9%	98.8%
Dependent Coverage		
Number participating at beginning of month	5 741	5 735
Additions and transfers in	41	54
Cancellations	(10)	(14)
Removals and transfers out	(41)	(34)
Number participating at end of month	5 731	5 741

Claims - Disability Benefits (d)		
Number of claims paid by insurance company:		
Employee Benefits		
Weekly Sickness and Accident	222	252
Daily Hospital Expense Benefits	262	235
Special Hospital Services	309	272
Surgical Operations Benefit	187	171
Physicians' Attendance	194	170
Dependent Benefits		
Daily Hospital Expense Benefits	407	288
Special Hospital Services	506	340
Surgical Operations Benefits	383	239
Amount of claims paid by insurance company:		
Employee Benefits	$ 64 262	$51 773
Dependent Benefits	58 174	39 537
Total	$122 436	$91 310

(c) Current month statistics include 160 insured employees not active on the payroll while prior month statistics include 174 insured employees not active on the payroll.

(d) Statistics cover only claims paid and not all claims incurred during the month.

Payroll Section (continued)

Number of Disability Claims Forwarded to Insurance Company	April	March
Hospital Benefits		
Kadlec Hospital	737	644
Other Hospitals	129	119
	866	763
Weekly Sickness and Accident Benefits	198	261
Total	1 064	1 024

Claims - Death Benefits (a)	April	Total to Date
Number	6	121
Amount	$40 500	$737 513

Group Life Insurance

The Group Life Insurance Plan was discontinued November 30, 1950. As of April 30, 1953, 4 employees who are absent due to total disability are still participating in the Group Life Insurance Plan. They were not actively at work December 1, 1950, and therefore were not eligible to participate in the new Insurance Plan. However, they will become eligible upon their return to work.

Claim Payments	April	March
Number of Checks	1 919	1 513
Number of Claims	1 382	1 104
Amount of Benefits	$122 436	$91 310
Total benefits paid since December 1, 1950 to date	$1 819 778	$1 697 342

Vacation Plan

Number of employees granted permission to defer one week of their 1953 vacation to 1954

	April			Year to Date		
	Weekly	Monthly	Total	Weekly	Monthly	Total
Engineering	2	16	18	9	30	39
Manufacturing	1	7	8	134	42	176
Plant Auxiliary Operations	4	0	4	121	16	137
Community Operations & Real Estate	0	1	1	7	6	13
Financial	7	3	10	12	3	15
Employee and Public Relations	1	2	3	1	2	3
Radiological Sciences	0	2	2	2	3	5
Medical	0	0	0	3	1	4
General	0	0	0	0	0	0
Total	15	31	46	289	103	392

(a) Total to date includes all claims under the old and new Insurance Plans and 10 deaths on which accidental death benefits were paid.

Payroll Section (continued)

Employee Benefit Plans (continued)

U. S. Savings Bonds	April	March
Number participating at beginning of month	4 332	4 356
New authorizations	102	64
Voluntary cancellations	(39)	(61)
Removals and transfers out	(25)	(28)
Transfers in	0	1
Number participating at end of month	4 370	4 332
Percentage of Participation		
G. E. Employees Savings and Stock Bonus Plan	44.3%	43.6%
G. E. Savings Plan	10.9%	11.1%
Both Plans	50.5%	49.8%
Bonds Issued		
Maturity Value	$246 200	$187 575
Number	4 324	3 855
Refunds Issued	49	83
Revisions in Authorizations	53	35
Annual Going Rate of Deductions		
G. E. Employees Savings and Stock Bonus Plan	$1 660 809	$1 669 795
G. E. Savings Plan	462 281	483 255
Total	$2 123 090	$2 153 050

Withdrawal of U. S. Savings Bonds From G. E. Employees Savings and Stock Bonus Plan	April	Year to Date
Number of participants withdrawing Bonds	111	491
Maturity value of U. S. Savings Bonds withdrawn	$40 391	$213 266

Check-Off of Union Dues

Number of Payroll Deduction Authorizations in Effect	3-31-53	Cancellations And Terminations	Additions	4-30-53
Hanford Atomic Metal Trades Council	1 470	11	43	1 502
Building Service Employees International Unit, Local 201 (Medical Department Employees)	26	1	1	26
Hanford Guards Union, Local 21, of the International Guards Union of America	227	7	1	221
Total	1 723	19	45	1 749

Special Absence Allowance Requests	April	March
Number submitted to Pension Board	3	4

Military Allowance Payments	April	Total to Date
Number	2	55
Amount	$984.96	$19 787.74

Payroll Unit (continued)

Employees Who Have Entered Military Service

	Total to Date				
	Called to Duty	Volunteered for Duty	Number Reactivated	Number Resigned -a)	Total
Reserve Officers	39	3	(4)	(1)	37
Enlisted Reserve	56	6	(23)	(2)	37
National Guard	6	0	(4)	0	2
Selective Service	74	0	(22)	0	52
Voluntary Enlistments	0	117	(3)	(1)	113
Total	175	126	(56)	(4)	241

-a) Employees who were removed from the roll to enter Military Service and subsequently had their continuous service broken.

Number of Rent, Telephone and Hospital Deductions from Salaries	April	March
House Rent	5 088	5 067
Dormitory Rent	823	826
Barracks Rent	50	55
Trailer Space Rent	184	191
Telephone	2	3 933
Hospital	446	451
Total	6 593	10 523

Annuity Certificates (for duPont Service)	April	Total to Date
Number Issued	0	96

Suggestion Awards		
Number of awards	72	1 996
Total amount of awards	$765	$39 885

Employee Sales Plan

	April		
	Major Appliances	Traffic Appliances	Total
Certificates Issued	48	327	375
Certificates Voided	3	6	9
	Certificates Issued	Certificates Voided	Net Sales
Aggregate Sales of Major Appliances	$14 527.65	$549.85	$13 977.80

	April	Year to Date
Applications for normal retirement pensions	2	11
Applications for optional retirement pensions	2	5

Patent Award Payments		
Number of award	1	3
Amount	$25.00	$75.00

% Absenteeism	April	March
Weekly - Men	2.21%	2.99%
Weekly - Women	3.52%	4.27%
Total Weekly	2.54%	3.31%
Monthly	1.42%	1.50%
Grand Total	2.23%	2.88%

Payroll Unit (continued)

Salary Checks Deposited	April Weekly	April Monthly	March Weekly	March Monthly
Richland Branch - Seattle-First National Bank	729	928	734	936
North Richland Area Office - Seattle - First National Bank	9	4	9	4
Richland Branch - National Bank of Commerce	539	392	560	402
Out of state banks (Schenectady Staff)	0	1	0	1
Total	1 277*	1 325	1 303**	1 343

Preferential Rates	April	March
Number Eliminated	0	6
Number Currently in effect	804	804

* Week ended 4-19-53
** Week ended 3-22-53

INTERNAL AUDIT UNIT
MONTHLY REPORT - APRIL 1953

Work continued on the program for taking physical inventories of all Hanford Atomic Products Operation materials (excluding SF material) by June 30, 1953. The principal activities during the month were:

1. Stand-by materials in the custody of the Electrical Distribution Unit were inventoried as of April 16, 1953 and those in the custody of the Telephone Unit were inventoried as of April 17, 1953. These inventories, representing approximately 3500 line items, were taken by 10 Internal Auditors and 59 employees of the Electrical Distribution and Telephone Section.

2. General maintenance materials in the custody of Stores Unit were physically inventoried as of April 30, 1953. This inventory, representing approximately 35,000 line items stored in 12 locations, required the participation of 38 Financial Department employees and 135 employees of the Purchasing and Stores Section. Withdrawals from Stores (other than emergency withdrawals) were discontinued on April 30 and May 1 in order to take the inventory. The completion of the physical count, records posting, and rechecking by Saturday night, May 2, required overtime work by some of the inventory personnel on Thursday and Friday nights, April 30 and May 1, and on Saturday, May 2.

3. Reports issued in April of two of the physical inventories taken in February showed the following results:

Material	Physical Inventory	Book Inventory	Overage
Bulk Steel	$115,437	$114,290	$1,147
Medical Supplies	34,040	33,457	583

PLANT PROTECTION SECTION

MONTHLY REPORT - APRIL 1953

ORGANIZATION AND PERSONNEL

Number of employees on payroll:

	Beginning of Month	End of Month	Increase	Decrease
Staff	2	2		
Administration Area Maintenance	68	68 (a)		
Security and Patrol	549	541		8 (b)
Safety and Fire Protection	153	151		2 (c)
Office Unit (Laundry and Building Services, Clerical and Records Control)	337	322		15 (d)
TOTALS	1,109	1,084		25

NET DECREASE: 25

(a) - Administration Area Maintenance

3 - Transferred in
2 - Transferred out
1 - Termination

(b) - Security and Patrol

2 - Reactivated
2 - Transferred out
4 - Deactivated
4 - Terminations

(c) - Safety and Fire Protection

1 - Deactivated
1 - Terminated

(d) - Laundry and Building Services

1 - Deactivated
1 - Transferred out

Clerical

4 - New Hires
1 - Reactivated
4 - Transferred out
2 - Deactivated

NOTE: Procedures Analysis group was transferred to Statistical and Computing Section. Transfer involved 12 employees.

SAFETY AND FIRE PROTECTION UNIT

	MARCH	APRIL	YEAR TO DATE	COMPARATIVE PERIOD, 1952
Major Injuries	3	0	5	5
Sub-Major Injuries	1	2	5	11
Minor Injuries	373	325	1,392	1,581
Exposure Hours	1,482,345	1,462,185	5,822,494	6,043,116
Major Injury F/R	2.02	0.00	0.86	0.83
Major Injury S/R	0.10	0.00	0.038	0.022
Penalty Days	75	0	75	75
Actual Days Lost	80	60	157	134
Minor Injury F/R	2.52	2.22	2.39	2.62
Estimated Medical Treatment Time Required	1,500 hours	1,308 hours	5,610 hours	6,412 hours

Industrial Fires

Department	Area	No. of Fires	Cause	Loss
Manufacturing Dept. (Separations - Operations)	200-W	1	Spontaneous Ignition	Nil
Manufacturing Dept. (Separations - Process Anal.)	200-W	1	Flammable liquids too near heat	Nil
Manufacturing Dept. (Separations - Operations)	200-W	1	Flammable liquids and gases	$23.90
Manufacturing Dept. (Separations - Power & Maint.)	200-E	1	Combustibles too near heat or flame.	Nil
Manufacturing Dept. (Metal Prep. - Operations)	300	1	Process	15.00
Manufacturing Dept.	300	1	Spontaneous Ignition	$4,500.00
TOTAL		6		$4,538.90

Safety Activities

A special meeting of the committee appointed to draw up Manufacturing Department's Maintenance Safety Rules met with a representative of Safety and completed Section III, the final section, of these important rules. The Committee is recommending that the rules be posted in the various buildings in the manufacturing areas for the purpose of securing observance of same. The approved Section III will be inserted along with Sections I and II in the Safety Bulletin Handbook.

The office of the Safety Supervisor, Safety Records, and Outer Areas Safety Engineer was moved from Hanford Hi School to Rooms 22 and 23 in the 2704-E Building in the 200-East Area.

The Supervisors' Training Program is still being continued in the 100 Areas.

An improvement in complying with safety rules and practices was observed throughout the 100 Areas during the last two weeks of April. The records also show a reduction in the number of injuries.

The 300 Area Accident Prevention Committee is sponsoring a limerick contest to be used in conjunction with their second annual 300 Area "S" Day. 'Lucky' pocket pieces were distributed on Friday, April 24. Appropriate publicity was given same in the Works NEWS.

The Safety and Fire Protection Unit has been furnished new quarters in 2719-W Building in the 200-West Area. This building also contains a conference room used jointly by all groups in 200-West Area. It is planned that Safety and Fire orientations will be conducted every Tuesday at 8:15 A.M.

Fire Protection Activities

A fire causing $4,500 damage occurred in the 313 Building on April 27. A wooden platform was ignited by a flash fire from hot asphalt that was being poured on the floor of an acid and caustic pump pit. The rapidity and intensity of the fire was increased by the sodium nitrate that was stored on the platform. The wooden platform is to be replaced with one of steel. Good work by the Fire Department prevented work stoppage and more extensive loss.

Fire Protection Surveys were completed on Buildings 1717-F, 2704-Z and 329.

Two groups of men, 31 in all, from the Power Section were given instruction in the use of the Chemox Mask.

Spring Clean-Up posters were displayed throughout the plant.

An automatic fire detector system was recommended for 2704-Z in the 200-West Area.

Fire safety meetings were conducted with 40 Stores employees and 35 Pile Fuels employees.

OFFICE UNIT

Laundry and Building Services

200-West Laundry	March	April
Pounds Delivered	270,321	308,122
Pounds Rewashed	5,496	6,571
Total Dry Weight	275,817	314,693
Monitoring Section		
Poppy Check - Pieces	157,502	185,083
Scaler Check - Pieces	345,101	405,750
Total Pieces	502,603	590,833
Rewash Pieces	6,340	7,027

700 Area Laundry	March	April
Flatwork - Pounds	34,863	46,977
Rough Dry - Pounds	21,126	23,275
Finished - Pounds	2,738	3,349
Total Weight	58,727	73,601
Estimated Pieces	76,932	96,417

The extremely heavy volume of work done in the 200-West Laundry the past month was due to the heavy loads coming from the Minor Construction crews in the 100 Areas. This is the most poundage the laundry has processed since the laundry has been in operation. Approximately one-third of the volume was done for minor construction. Since the construction work in the 100 Areas is scheduled to be completed towards the latter part of May, plans are now being formulated to reduce the laundry personnel accordingly.

The increased volume of work done in the 700 Area Laundry was caused by the heavy demands of the Kadlec Hospital during the past month.

Clerical Services

Central Mail and Addressograph

Special assignments were numerous and included the preparation of mail for Civil Defense, the preparation, sorting and delivery to Payroll of the Cancer pins and pamphlets for the Good Neighbor Fund.

The distribution of Organization and Policy Guides, management notices and addressographed mail volume exceeded last month's.

Addressograph volume of work increased through April. Two new files were added ---one requiring 1700 plates for survey work for Meteorology to be run weekly and one for Radiological Monitoring Unit with approximately 2600 plates to be run in sections on a monthly basis.

Types and Pieces of Mail Handled	April	March
Internal	1,636,958	1,243,981
Postal	87,106	75,780
Special	2,421	1,842
Total Mail Handled	1,726,485	1,321,603
Total Postage Used	$3,344.08	$2,392.91
Total Teletypes Handled	3,654	3,089
Total Store Orders Handled	340	269

Addressograph

Type of List	April Number of Runs	April Total Copies	March Number of Runs	March Total Copies
Plant Name List	112	196,531	103	191,843
Housing List	5	29,325	14	28,654
Payroll List	9	32,397	9	32,996
Total New Plates	4,835		3,645	
Total Corrected Plates	986		396	
	5,821		4,041	

Office Equipment - Furniture

The inventory of office furniture in Warehouses 12 and 13 was completed on April 30, 1953. Inventory record keeping and warehousing of furniture has been transferred to the Stores Unit as of this date.

Two loads of refinished office furniture were received and two loads were sent out for refinishing.

Office Machine Repair

Office machine requirements for Blaw-Knox and Kaiser Engineers for the FY 1953 and 1954 budget have been received from the AEC Property Branch Office. Their requirements will be filled with surplus manual typewriters and adding machines now in our warehouse stock. Other arrangements must be made with the Atomic Energy Commission to procure other office machines.

A continued flow of requests are being received from the using sections for electric typewriters. Their justifications are in most cases above the standard requirements warranting these machines. To date, these justified requirements have been filled with machines being picked up from the Utilization Survey now in progress.

	April	March
Office Machines Repaired in Shop	169	205
Office Machine Service Calls	563	484
Machines Picked Up By Survey	34	38
Total	766	727

Central Printing

Central Printing produced 18% more orders this month than was produced last month. The commercial value of this output was $5,221.88 over the value of last month's production. This printing was produced at an actual cost of 1¢ per copy. A large percentage of this printing was halftone and two run color work.

The General Manager's Annual Report "1952 at Hanford", was completed five days prior to the deadline of 2-15-53. Central Printing also turned out three other orders totaling 150,000 copies.

	April	March
Orders Received	459	376
Orders Completed	436	343
Copies Printed	1,488,342	1,239,979
Back Log	94	69
Negatives Masked	936	819
Negatives Processed	1,252	930
Litho Plates Processed	970	829
Photo Copy Prepared	399	281

Stenographic Pool

The work load during the first part of April was light, and during the latter part of the month was very heavy. Loan requests through the month were heavy, however all work is current at month's end.

Work was largely routine throughout the month being divided among forty-four cost codes representing as many different work groups. Productive hours increased by 351 over the previous month.

Breakdown of Hours	April	March
Dictation and transcription	14	2.5
Letters	10	26.5
Rough Drafts	26	71
Duplimats, Xerography	188.5	254.5
Miscellaneous	333	220
Training Time	376.5	162.5
Meeting Time	8	0
Unassigned Time	32	8
Absenteeism	1.5	19.5
	989.5	838
Employees loaned to other departments	1,358.5	995
Total Hours Available	2,348	1,833

Area Mail and Duplicating

Work loads in both mail and duplicating showed a sharp increase this month. Total mail handled was 169,274 pieces greater than for the previous month. Copies duplicated were 299,097 impressions above last month's total.

Arrangements were made which permitted the stationery dispersing function of 760 Mail and Duplicating to be discontinued. Stationery supplies required by personnel in 760, 761 and 762 Buildings will in the future be ordered direct from Stores. Drafting supplies bought on direct purchase will be stored and dispersed by drafting personnel.

This change has permitted a reduction of space utilized with consequent savings in rental, light and heat costs. One less person is now required at this location, and the Mail Room has been moved adjacent to the Duplicating Office for greater efficiency.

Duplicating and Mail Statistics	April	March
Orders received	3,352	2,496
Orders completed	3,251	2,533
Orders on hand	121	87
Offset plates	18,124	13,696
Offset copies	975,219	686,457
Stencils	678	102
Stencil Copies	14,689	3,585
Ditto Masters	385	535
Ditto Copies	14,268	15,037
Zerox Plates	1,388	1,055
Total Internal Mail	380,986	247,649

Records Control

Quantity of records received, processed and stored:

Employee and Public Relations Department	27	Standard	Storage	Cartons
Engineering Department	62	"	"	"
Financial Department	54	"	"	"
Manufacturing Department	51	"	"	"
Medical Department	24	"	"	"
Plant Auxiliary Operations Department	107	"	"	"
Radiological Sciences Department	32	"	"	"
Total	357	Standard	Storage	Cartons

Persons provided records service:	775
Records Destroyed:	640 Cartons
Records cartons issued:	265

Percentage of the Records Service Center vault occupied by records is 100% plus excluding Civilian Defense portion.

Thirty-two requests for file cabinets were received, 24 requests were filled. Nineteen requests for file cabinets are pending. Six fireproof combination locked cabinets were picked up in exchange for key locked cabinets resulting in a savings of $750.00 ($200.00 cost of combination cabinet minus $75.00 cost of key locked cabinets equals $125.00 savings per cabinet exchanged.) Ten key locked cabinets were picked up with no exchange resulting in a savings of $750.00. Ten orders for file cabinets were cancelled through standardization and more efficient use of cabinets in service.

Uniform filing was established in two offices during the month, a total of 419 offices have installed the uniform filing system to date.

Remington Rand, Inc. have microfilmed, developed and returned as completed 769 reels or 2,571,110 images to date.

Nine evaluations of records for disposal were approved by the Records Committee. Eleven requests for authorization for records disposal were submitted to the Atomic Energy Commission. Atomic Energy Commission and Congressional approval was given to 23 requests for authorization for records disposal. Twenty-one additional evaluations of records for disposal were developed and submitted for internal departmental approval.

ADMINISTRATION AREA MAINTENANCE UNIT

Status of Work Progress:

CA-504 Lighting Improvements - 700 Area Buildings: Rescoping to come within budgeted funds. Final design should be complete May 12.

-- New Administration Building (AEC): Informed by AEC that funds for office building construction limited to $630,000. At request of AEC, made recommendation on location of building of approximately 35,000 square feet.

CA-525 Conversion of Basement, Fifth Wing, 703 Building to Civil Defense Auxiliary Center: Being handled by Civil Defense and Atomic Energy Commission. Prints approved.

-- New Transportation Facilities (AEC): No information from AEC on preliminary drawing approvals. Design progressing satisfactorily.

IR-154 Alterations - 729 Building: AEC is returning Informal Request with understanding that we will resubmit a request to remodel Building 744 for use by telephone and radio repair shops.

-- Alterations - 713 Building: Revising office space in northeast and northwest sections of building for occupancy by Statistical personnel. Working on preliminary plans for converting remainder of building for use by Statistical and Computing Section, if FY 1954 budget funds are approved.

IR-150 Electrical and Telephone Outlets - Central Stores Warehouse: If remaining funds permit, plan to install portion of partitioning originally contemplated in the Receiving Area.

B-1335 Alterations to 713-A Building: Consideration being given to request from Engineering for semi-temporary use of this building to provide enlarged drafting room facilities in connection with assistance contract.

Building 713 in process of being vacated by Stores.

Ether vault space in 713-A Building and Buildings 734, 713-B and 713-X have been assigned to Stores for ether, acidand ammonia storage until permanent space outside 700 Area is available.

The following 700 Area Buildings were vacated by Stores during the month: 713-A, 729, 713-C, 744 and 1125 Area structures.

General Maintenance

Hutment 713-C, formerly used by Stores, was renovated as office space for AEC personnel after being moved to the AEC airport.

Two openings were cut in outside wall of 703 Building and windows installed for office with no windows.

The screens on 700 Area Buildings have now been secured on the outside with turn button fasteners. This should prevent screen damage and reduce maintenance expense.

A new plywood floor was laid in 1131 Riggers Hutment and 1131-B. Partition installed and celotex repaired in 1131-B.

The breezeway of 734 Building was closed in to make additional room for acid storage from 712-B hutment.

Renovation of 701-B for AEC is complete except for painting.

Center striping of village streets has been completed and work started on area roads.

New cabinets and counters were made and several old ones renovated.

Five General Electric signs were repainted in compliance with Division title changes.

Numerous small signs were made, including 97 street signs for Public Works.

All domestic water used for irrigation was turned on. Seasonal air cooler renovation is 95% complete. A Farr Rotor Cooler was installed on an experimental basis in the northwest section of 713.

Remodeled the incinerator at hospital so that ash door is opposite feed hopper for safety purposes.

Number 4 boiler is being overhauled after being on the line constantly for almost seven and one-half months. Several weak tubes will be replaced.

Installation of warning horns for fire alarm ware completed in 722 Hangar. They are now audible in all parts of the building.

Rekeyed set of eighteen door locks at 100-K. Remastered locks at hospital.

Steam Operation

Boilers 1 and 2 were in service for the entire month, with No. 3 in reserve and No. 4 being repaired.

The quantity of steam generated was 11.3% greater than for the same month of the previous year.

Sixty-seven truck loads of coal screenings, a total of 349.3 tons, were received from the Richland Fuel and Lumber Company on April 14, 15, 16 and 17.

A carload of Sulphuric Acid was received at 784-A Water Softening Plant on April 14, identified and assayed by the 300 Area Laboratory on the 15th and unloaded on the 16th.

No sulphuric acid was sent to the 100 Areas, as they have now completed their facilities for handling sulphuric acid and will no longer draw upon the supply at 784-A Building. One load of acid was sent to 300 Area, which will continue to receive acid from 784-A storage tank. In the past the quantities disbursed to 300 Area have not been large, and the labor involved is offset by the fact that 300 Area supplies 784-A Water Softening Plant with bagged rock salt.

Soft water usage at Kadlec Hospital increased to an average of approximately 48,000 gallons per day.

Operations at 1131 Heating Plant were normal throughout the month; on several warm days it was possible to bank the fires during daytime hours.

One load of fuel oil of approximately 5,550 gallons was received at Central Stores on April 3. With increasingly warm weather, the hours of boiler operation required are steadily falling off.

Coal consumed: 1,227.25 Net Tons.

Steam Generated	18,506.7 M/lbs.
Steam Leaving Plant	15,730.7 M/lbs.
Steam Delivered	13,606.7 M/lbs.
Total Water Softened	3,673,700 gallons
Total Soft water sent to Kadlec Hospital	1,438,570 gallons
Total Soft water sent to 784 Heating Plant	2,235,130 gallons
Soft water served to Kadlec Hospital:	719 hours

SECURITY AND PATROL

Document Report

Number of classified documents unaccounted for as of April 1, 1953: 376

(155 of the above 376 documents are chargeable to E. I. du Pont de Nemours & Co.)

Number of classified documents reported as unaccounted for during April: 0

Number of classified documents recovered during April: 18

Number of classified documents remaining unaccounted for as of May 1: 358

(155 of the above 358 documents are chargeable to E. I. du Pont de Nemours & Co.)

The Non-Technical Document Review Board held two meetings during the month of April, 1953, and it reviewed a total of 83 classified documents. Of this number -

19 were downgraded to "Restricted"
1 was downgraded to "Official Use Only"
16 had their classification retained and
47 were declassified.

Security Education

Four items appeared in the Works NEWS concerning the subject of Security.

There were 346 security meetings held and attended by 4,594 employees. A representative of Security showed one of the security films at some of these meetings as shown below:

"Signal 99" was shown at ten meetings, each with an average attendance of thirty employees.

"The Defense Rests" was shown at three meetings, each with an average attendance of 26 people.

"Only The River" was shown at four meetings, each with an average attendance of twenty-three employees.

"The Man on The Left" was shown at three meetings, each with an average attenance of twenty-five employees.

"The Case of the Smokeless Chimney" was shown at two meetings, each with an average attendance of eighteen people.

"Sabotage" was shown at one meeting with twenty-two people present.

"On Guard" was shown at three meetings, each with an average attendance of twenty-nine people.

GE Security Bulletin No. 74, entitled "He Is Ours" was distributed April 24.

Two-hundred large posters with the slogan "Before You Leave - Remember Me" were posted during the month of April.

Sixty-four employees of the General Electric Company received a "Q" security orientation talk from either a representative of Security or an Area Patrol Captain during the month.

In a letter dated April 10, 1953, from D. F. Shaw, Manager of the Hanford Operations Office, Atomic Energy Commission, addressed to W. E. Johnson, General Manager of the General Electric Company, Hanford, was a request that one copy of a completed supplemental Personnel Security Questionnaire form be obtained from each employee and consultant who currently had a "Q" security clearance issued by the Hanford Operations Office on the basis of a Personnel Security Questionnaire form executed prior to January 1, 1950.

The purpose of this request is to bring personnel histories of people currently employed on Atomic Energy Commission work up to date. The letter was received by H. D. Middel, Manager of the Plant Auxiliary Operations Department, on April 13, and on this same date the Security Office distributed the necessary forms and instructions to the various plant departments.

The completed questionnaire forms began arriving in the Security Office on April 16, where they were checked to determine that all necessary questions had been answered satisfactorily, then posted on a master list, stamped with the General Electric Company's address, checked for access to "exclusion" areas and/or "Restricted Data", numbered and marked "sensitive" if the employee is assigned to a sensitive position.

As of April 30, 3,967 Personnel Security Questionnaire forms had been forwarded to the Atomic Energy Commission; 554 had been returned to the various departments for corrections or additional information as they were incomplete.

The Operations Master Evacuation Plan and Practice Master Evacuation Plan were both revised and distributed April 30 by the Security and Patrol Unit.

Statistical Report of Security Patrol Activities

	100-B	100-D	100-F	100-H	200-E	200-W	300
Pat Searches	90	90	90	90	11	42	4
Escorts	23	27	8	42	21	29	47
Ambulance Runs	4	2	1	4	0	14	7
Passes Issued:							
One day temporary	68	27	4	11	5	65	39
Travel	8	0	0	0	0	0	63
Red Tag	221	163	24	83	136	512	158
Telephonic	8	5	0	0	0	0	13
Supervisor's post contacts	593	536	535	333	433	1,057	736

Other Security Patrol Activities:							300 & 700
Security File Check (Hours)	130	196.5	339.2	352	109	317	2,880
Security Building Check	308				106		135

Other Security Patrol Activities:

Buildings and Doors opened:	205
Railroad Gates Opened:	208
Master System Keys issued:	60
Operation Gas Pumps:	97

Arrest Report

Violation	Number of Violations	Cont. Cases from March	Cases Cleared	Pending	Fined	Dismissed
Speeding	4	1	5	0	4	1
Negligent Driving	1	0	1	0	1	0
Reckless Driving-Liquor Involved	1	0	1	0	1	0
Carring Concealed Weapon in Motor Vehicle	1	0	1	0	1	0
	7	1	8	0	7	1

Criminal Offense: 1
Citation Tickets Issued: 6

Patrol Training Activities

Security Patrolmen attending firearms training during April: 248
Security Patrolmen attending classroom instruction during April: 204

Training Courses received during the month were as follows:

Safety Class	1/2 hour
Security Class	1 hour
Operations Class	1/2 hour
Employee Relations Class	1/4 hour
Firing of .38 Cal. Revolver	1/2 hour

Security Patrol Post Changes

A new post (one man) was established around-the clock in the 2101 Building, 200-E Area, on April 7, 1953, to prevent unauthorized personnel from entering certain portions of the building.

On April 23, orders were revised regarding the post operated around the clock at the 2101 Building, 200-E Area, so that this post will be manned only on the day shift until further notice.

On No. 1 shift, April 15, the 105-DR Badge House, 100-D Area, resumed its former operating schedule of being open only at shift change and emergencies (shut-down) only.

Security Field Inspection Activities

Contacts made to locate unaccounted for documents:	53
Searches conducted to locate unaccounted for documents:	15
File combinations changed:	26

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HANFORD WORKS
General Electric Company
Richland, Washington

REPORT OF VISITORS FOR PERIOD ENDING APRIL 30, 1953

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
MEDICAL DEPARTMENT							
I. Visitors to this Works							
S. T. Cantril Tumor Institute Swedish Hospital Seattle, Washington	Medical consultation	W. D. Norwood, M.D. P. A. Fuqua, M.D.	4-23-53	4-24-53	X		300 XXX
B. L. Vosburgh General Electric Company New York, New York	Problems pertinent to the practice of industrial medicine and audit for Safety Dept.	W. D. Norwood, M.D.	4-30-53	5-3-53	X		100-F 105 100-H XXX 200-W 231, 234, Redox 300 303
ENGINEERING DEPARTMENT - TECHNICAL SECTION							
I. Visitors to this Works							
E. C. Anderson Los Alamos Scientific Lab. Los Alamos, New Mexico	Work on neutrino program	J. A. Berberet	2-20-53	6-2-53	X		100-B 105-B, 105-C 100-H XXX 300 XXX; 700
C. A. Bruch Knolls Atomic Power Lab. Schenectady, New York	Discuss irradiation experimental work	J. A. Berberet	4-22-53	4-23-53	X		100-B 105-C 100-D 105 100-H 105 300 XXX; 700
G. H. Cady University of Washington Seattle, Washington	Discuss fluorine chemistry applications to separations processes	F. W. Albaugh L. L. Burger	4-15-53	4-15-53	X		200-W 202-S 300 XXX

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
A. E. Denton General Electric Company Schenectady, New York	Establish procedures for accountability station set up at Schenectady	C. G. Stevenson M. G. Freidank	4-22-53	4-29-53	X		300-L XXX 700
E. Fast Phillips Petroleum Company Idaho Falls, Idaho	Reactor materials analysis	J. F. Music	4-13-53	4-17-53	X		300 XXX
C. L. Cowan, Jr. Los Alamos Scientific Lab. Los Alamos, New Mexico	Work on neutrino program	J. A. Berberet	2-25-53	6-2-53	X		100-B 105-B, 105-C 100-H XXX 300 XXX; 700
C. R. Goetjen Air Reduction Pacific Co. Seattle, Washington	Instruction in operation of certain equipment	F. W. Albaugh W. R. Smith	4-23-53	4-23-53		X	300 XXX 200-W 272-W
F. B. Harrison Los Alamos Scientific Lab. Los Alamos, New Mexico	Work on neutrino program	J. A. Berberet	2-25-53	6-2-53	X		100-B 105-B, 105-C 100-H XXX 300 XXX; 700
F. N. Hayes Los Alamos Scientific Lab. Los Alamos, New Mexico	Work on neutrino program	J. A. Berberet	2-15-53	6-2-53	X		100-B 105-B, 105-C 100-H XXX 300 XXX; 700
W. Henson Norton Company Worchester, Massachusetts	Consultation on refractories and ceramic ware	R. J. Anicetti J. C. Wood	4-15-53	4-15-53	X		200-W 234
C. W. Johnstone Los Alamos Scientific Lab. Los Alamos, New Mexico	Work on neutrino program	J. A. Berberet	4-9-53	6-2-53	X		100-B 105-B, 105-C 100-H XXX 300 XXX; 700
D. F. Klimas General Engineering Lab. Schenectady, New York	Consultation on assembly of magnetic ball conveyor	W. K. Alexander	3-18-53	4-3-53	X		100-D 189-D
V. N. Krivobok International Nickel Company New York, New York	Problems on stainless steel hoods	L. D. Turner	4-22-53	4-22-53	X		100-B 105-B 200-W 221-U, 202-S 300 XXX

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Ja-15

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Restricted Data Areas
R. E. Kupel Aircraft Nuclear Propulsion Project Lockland, Ohio	Laarn operation of auto-matic columetric titration and discuss mass spectrometry	W. N. Carson R. D. Tillson	4-14-53	4-17-53	X		100-B 108-B 200-W Redox 300 XXX
B. P. Moore Greer Hydraulics Company Brooklyn, New York	Discuss remote hydraulic manipulators	J. F. Gifford	4-10-53	4-10-53		X	700 760 Bldg.
F. Reines Los Alamos Scientific Lab. Los Alamos, New Mexico	Work on neutrino program	J. A. Berberet	2-25-53	5-25-53	X		100-B 105-B, 105-C 100-H XXX 300 XXX; 700
R. L. Schuch Los Alamos Scientific Lab. Los Alamos, New Mexico	Work on neutrino program	J. A. Berberet	2-15-53	6-2-53	X		100-B 105-B, 105-C 100-H XXX 300 XXX; 700
E. M. Shank Oak Ridge National Lab. Oak Ridge, Tennessee	Obtain information of Thorex Pilot Plant, uranium slug dissolution, metal recovery, Purex process, pulse columns, etc.	V. R. Cooper	4-14-53	4-18-53	X		200-E 201-C 200-W Redox, 221-U 300 XXX
C. M Slansky American Cyanamid Co. Idaho Falls, Idaho	Discuss slug dissolution	F. W. Albaugh	4-6-53	4-8-53	X		100-B 111-B 200-W Redox 300 XXX
G. W. Watt University of Texas Austin, Texas	Technical consultations on separations processes	V. R. Cooper	4-6-53	4-10-53	X		200-E 201-C 200-W 221-U, Redox, 234, 235 300 XXX; 300-L XXX
M. P. Warren Los Alamos Scientific Lab. Los Alamos, New Mexico	Work on neutrino program	J. A. Berberet	2-25-53	6-2-53	X		100-B 105-B, 105-C 100-H XXX 300 XXX; 700
T. J. White Los Alamos Scientific Lab. Los Alamos, New Mexico	Work on neutrino program	J. A. Berberet	3-26-53	6-2-53	X		100-B 105-B, 105-C 100-H-XXX 300 XXX; 700

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Restricted Data Areas
J. G. Winston Los Alamos Scientific Lab. Los Alamos, New Mexico	Work on neutrino program	J. A. Berberet	4-13-53	6-2-53	X		100-B 105-B, 105-C 100-H XXX 300 XXX; 700
II. Visits to other Installations							
G. J. Alkire to: American Cyanamid Co. Arco, Idaho	Discuss mass spectrometers	R. J. Fracel	4-27-53	4-28-53	X		
M. Altman to: Argonne National Lab. Chicago, Illinois	Heat transfer aspects of new reactors	J. P. Silvers	4-20-53	4-30-53	X		
M. Altman to: Brookhaven National Lab. Upton, Long Island, New York	Heat transfer aspects of new reactors	O. H. Dwyer	4-27-53	5-10-53	X		
M. Altman to: Knolls Atomic Power Lab. Schenectady, New York	Heat transfer aspects of new reactors	T. Trocky	5-1-53	5-10-53	X		
R. H. Beaton to: Knolls Atomic Power Lab. Schenectady, New York	Discuss research and development programs	J. Marsden	4-17-53	4-17-53	X		
B. J. Borgmier to: Tech. Information Div. Library of Congress Washington, D. C.	Workshop on production and use of technical reports	- -	4-13-53	4-18-53		X	
J. J. Cadwell to: Brookhaven National Lab. Upton, Long Island, New York	Attend matallurgy information meeting	D. Gurinsky	4-13-53	4-15-53	X		
J. J. Cadwell to: Sylvania Electric Products New York, New York	Consultation on metallurgy problems	H. Hausner	4-14-53	4-15-53	X		

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
J. J. Cadwell to: Knolls Atomic Power Lab. Schenectady, New York	Consultation on metallurgy problems	J. Burke	4-16-53	4-17-53	X		
A. B. Carson to: Oak Ridge National Lab. Oak Ridge, Tennessee	Consultation on recycle specifications	W. B. Humes	4-15-53	4-17-53	X		
A. B. Carson to: E. I. du Pont de Nemours Savannah River Plant Aiken, South Carolina	Discussion on reactor design and technology	M. H. Wahl W. P. Overbeck	4-20-53	4-21-53	X		
V. R. Cooper to: Dow Chemical Company Rocky Flats Laboratory Denver, Colorado	Discuss product shipment; process and equipment technology	I. B. Venable	4-20-53	4-21-53	X		
V. R. Cooper to: Oak Ridge National Lab. Oak Ridge, Tennessee	Discuss product specifications inter-relationship of Hanford and K-25 processing	F. W. Hurd	4-23-53	4-24-53	X		
V. R. Cooper to: E. I. du Pont de Nemours Savannah River Plant Aiken, South Carolina	Discuss plutonium processing and recovery from by-products wastes	M. H. Wahl E. R. Gilbert J. K. Lower	4-24-53	4-27-53	X		
E. A. Eschbach to: Knolls Atomic Power Lab. Schenectady, New York	Consultation on fuel element development program	J. E. Burke	4-1-53	9-30-53	X		
E. A. Eschbach to: Battelle Memorial Inst. Cincinnati, Ohio	Consultation on fuel element development program	H. R. Nelson	4-1-53	9-30-53	X		
E. A. Eschbach to: Ames Laboratory Ames, Iowa	Consultation on fuel element development program	F. H. Spedding	4-1-53	9-30-53	X		

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass	Areas
E. A. Eschbach to: Sylvania Electric Products New York, New York	Consultation on fuel element development program	H. H. Hausner	4-1-53	9-30-53	X		
J. E. Faulkner to: Oak Ridge National Lab. Oak Ridge, Tennessee	Discuss cross section measurements	S. Bernstein A. R. Brosi	4-28-53	4-29-53	X		
H. Harty to: General Engineering Lab. Schenectady, New York	Discuss fuel element examination equipment for Hanford	C. W. George	4-1-53	4-3-53	X		
H. Harty to: Knolls Atomic Power Lab. Schenectady, New York	Discuss fuel element examination equipment for Hanford	K. H. Kingdon	4-1-53	4-3-53	X		
W. T. Kattner to: Simonds Saw and Steel Lockport, New York	Observe metal fabrication	A. D. Potts C. H. Emery	6-18-52	6-30-53	X		
W. T. Kattner to: Feed Material Production Center Fernald, Ohio	Consultation on metallurgy of uranium	J. Cibojski	8-1-52	6-30-53	X		
W. T. Kattner to: Argonne National Lab. Chicago, Illinois	Metallurgical consultation	F. G. Foote	9-1-52	6-30-53	X		
W. T. Kattner to: Aircraft Nuclear Propulsion Project Lockland, Ohio	Metallurgical consultation	J. S. Parker	10-7-52	6-30-53	X		
J. M. Lutton to: Columbia University New York, New York	Discuss internally heated tube-mock-up developed for Dupont at Savannah River Plant	A. J. Bendler	4-16-53	4-17-53	X		
E. C. Pitzer to: Knolls Atomic Power Lab. Schenectady, New York	Discuss latest results on coatings of various metals	C. E. Lacy	4-17-53	4-21-53	X		

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Restricted Data Areas
E. C. Pitzer to: Battelle Memorial Inst. Cincinnati, Ohio	Discuss corrosion problems	H. R. Nelson	4-22-53	4-24-53	X		
P. H. Reinker to: E. I. du Pont de Nemours Savannah River Plant Aiken, South Carolina	Discuss reactor design and technology	M. H. Wahl W. P. Overbeck	4-20-53	4-21-53	X		
P. H. Reinker to: Knolls Atomic Power Lab. Schenectady, New York	Discuss reactor design and technology	K. H. Kingdon J. Marsden	4-22-53	4-24-53	X		
R. B. Richards to: E. I. du Pont de Nemours Savannah River Plant Aiken, South Carolina	Discuss reactor design and technology	M. H. Wahl W. P. Overbeck	4-20-53	4-21-53	X		
R. B. Richards to: Knolls Atomic Power Lab. Schenectady, New York	Discuss reactor design and technology	K. H. Kingdon J. Marsden	4-22-53	4-24-53	X		
M. J. Sanderson to: Brookhaven National Lab. Upton, Long Island, New York	Attend metallurgy information meeting	D. Gurinsky	4-13-53	4-15-53	X		
M. J. Sanderson to: Sylvania Electric Products New York, New York	Consultation on metallurgy problems	H. H. Hausner	4-14-53	4-15-53	X		
M. J. Sanderson to: Knolls Atomic Power Lab. Schenectady, New York	Consultation on metallurgy problems	J. Burke	4-16-53	4-17-53	X		
W. L. Schalliol to: Brookhaven National Lab. Upton, Long Island, New York	Discuss fuel element development program	D. H. Gurinsky	4-13-53	4-15-53	X		

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
W. L. Schalliol to: Sylvania Electric Products New York, New York	Discuss fuel element development program	H. H. Hausner	4-14-53	4-15-53	X		
W. L. Schalliol to: Knolls Atomic Power Lab. Schenectady, New York	Discuss fuel element development program	J. Burke	4-16-53	4-16-53	X		
R. J. Schier to: National Carbon Co. Clarkesburg, West Virginia	Administration of Special Agreement G-5	- -	4-13-53	4-14-53	X		
R. J. Schier to: National Carbon Co. Cleveland, Ohio	Administration of Special Agreement G-5	T. R. Beatty	4-15-53	4-15-53	X		
R. E. Smith to: Dow Chemical Company Rocky Flats Laboratory Denver, Colorado	Discuss product shipment, process and equipment technology	I. B. Venable	4-20-53	4-21-53	X		
R. E. Smith to: Oak Ridge National Lab. Oak Ridge, Tennessee	Discuss product specifications inter-relationship of Hanford and K-25 processing	F. W. Hurd	4-23-53	4-24-53	X		
R. E. Smith to: E. I. du Pont de Nemours Savannah River Plant Aiken, South Carolina	Discuss plutonium processing and recovery from by product wastes	M. H. Wahl E. R. Gilbert J. K. Lower	4-24-53	4-27-53	X		
D. F. Snoeberger to: Carbide & Carbon Oak Ridge, Tennessee	Discuss combined operations of recycle operations	W. B. Humes	4-14-53	4-17-53	X		
D. F. Snoeberger to: Argonne National Lab. Chicago, Illinois	Heat transfer aspects of new reactors	J. P. Silvers	4-20-53	4-30-53	X		
D. F. Snoeberger to: Brookhaven National Lab. Upton, Long Island, New York	Heat transfer aspects of new reactors	O. H. Dwyer	4-27-53	5-10-53	X		

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
D. F. Snoeberger to: Knolls Atomic Power Lab. Schenectady, New York	Heat transfer aspects of new reactors	T. Trocky	5-1-53	5-10-53	X		
H. L. Sterling to: National Carbon Co. Clarkesburg, West Virginia	Administration of Special Agreement G-5	- -	4-13-53	4-14-53	X		
H. L. Sterling to: National Carbon Co. Cleveland, Ohio	Administration of Special Agreement G-5	T. R. Beatty	4-15-53	4-15-53	X		
R. Ward to: Brookhaven National Lab. Upton, Long Island, New York	Attend AEC meeting	H. Gurinsky	4-13-53	4-15-53	X		
R. Ward to: Knolls Atomic Power Lab. Schenectady, New York	Metallurgical consultation	J. E. Burke	4-16-53	4-17-53	X		
R. Ward to: Aircraft Nuclear Propulsion Project Lockland, Ohio	Metallurgical consultation	A. E. Focke	4-20-53	4-20-53	X		
A. T. Whatley to: Knolls Atomic Power Lab. Schenectady, New York	Discuss electron microscopy of graphite	E. Fullam	4-16-53	4-17-53	X		
A. T. Whatley to: Argonne National Lab. Chicago, Illinois	Obtain information on cyclotron exposure experiments	H. D. Young N. Hilberry	4-13-53	4-13-53	X		
W. K. Woods to: Knolls Atomic Power Lab. Schenectady, New York	Discuss assistance to Hanford Programs	K. H. Kingdon	4-17-53	4-17-53	X		
W. K. Woods to: Brookhaven National Lab. Upton, Long Island, New York	Attend metallurgical information meeting	D. Gurinsky	4-13-53	4-14-53	X		

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
P. D. Wright to: Brookhaven National Lab. Upton, Long Island, New York	Attend metallurgy information meeting	D. H. Gurinsky	4-13-53	4-15-53	X		
P. D. Wright to: Bridgeport Brass Company New York, New York	Discuss uranium fabrication problems	R. M. Treco	4-16-53	4-17-53	X		
D. C. Worlton to: Brookhaven National Lab. Upton, Long Island, New York	Attend metallurgy information meeting	D. H. Gurinsky	4-13-53	4-15-53	X		
R. W. Benoliel to: General Eng. Lab. Schenectady, New York	Discuss fabrication and handling of metals	C. W. George	4-1-53	4-3-53	X		
L. P. Bupp to: Oregon State College Corvallis, Oregon	Recruit technical personnel	- -	4-2-53	4-3-53		X	
M. R. Cain to: Allen Eng. Corp. Los Angeles, California	Negotiate contract for drafting assistance	A. A. Allen	4-23-53	4-29-53		X	
M. R. Cain to: Frank Mayer Eng. Co. Los Angeles, California	Negotiate contract for drafting assistance	F. Mayer	4-23-53	4-29-53		X	
T. R. Cartmell to: Pasadena, California	Attend electronics components symposium	- -	4-29-53	4-30-53		x	
R. L. Knecht to: Feed Materials Production Center Fernald, Ohio	Observe special fabrication and its processes	J. M. Cibojski	4-27-53 4-7-53	4-30-53 4-11-53	X X		
J. W. Lingafelter to: Kaiser Aluminum Co. Seattle, Washington	Welding consultation	L. Cook	4-30-53	4-30-53		X	

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
F. B. Quinlan to: Precision Machine Works Spokane, Washington	Observe process	E. Gazecki	4-10-53	4-10-53		X	
N. G. Wittenbrock to: Stearns-Rogers Mfg. Co. Denver, Colorado	Consultation on pulse generator	M. S. Rosengren	4-6-53	4-7-53		X	
ENGINEERING DEPARTMENT - DESIGN SECTION							
I. Visitors to this Works							
K. E. Atwood Bailey Meter Company Cleveland, Ohio	Consultation on power calculator equipment for CA-512-R and inspect faulty equipment on CA-431-A	E. S. Day, Jr.	4-8-53	4-8-53	X		100-B 105-C, 190-C
Mr. Borst Western Gear Company Seattle, Washington	Discuss canning machine gear boxes for delivery	E. Hollister	4-17-53	4-17-53		X	
R. B. Clendening Bristol Company San Francisco, California	Repair instruments provided by firm	E. S. Day, Jr.	4-28-53	5-11-53	X		100-B 105-C
H. W. Cooper Superior Tube Company Norristown, Pennsylvania	Discuss zirconium process tubing	V. D. Nixon	4-8-53	4-9-53	X		100-H 105 300 303
D. R. Edwards Coast Paint & Chemical Co. Seattle, Washington	Inspect scalants that are deteriorating	P. J. O'Neil	4-23-53	4-24-53		X	100-B XXX 100-D XXX 100-H XXX
A. W. Friedman Products Research Company Glendale, California	Consultation on defective paints	P. J. O'Neil	4-9-53	4-10-53		X	100-D XXX 100-H XXX
E. M. Greer Greer Hydraulics, Inc. Brooklyn, New York	Hydraulic pile charges for 100-K Area	J. R. Fritz	4-30-53	5-1-53	X		100-D 105 100-H 105 700

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Restricted Data Areas
A. J. Hornfeck Bailey Meter Company Cleveland, Ohio	Consultation on power calculat r equipment for CA-512-R and inspect faulty equipment on CA-431-A	E. S. Day, Jr.	4-8-53	4-8-53	X		100-B 105-C, 190-C
J. Kendall Greer Hydraulics, Inc. Brooklyn, New York	Hydraulic pile charges for 100-K Area	J. R. Fritz	4-30-53	5-1-53	X		100-D 105 100-H 105 700
E. L. Knoedler Steppard T. Powell Baltimore, Maryland	Consultation on corrosion studies and inspect re-circulating flow laboratory	J. M. Atwood N. O. Strand	4-13-53	4-17-53	X		100-D 105 100-H 105
B. P. Moore Greer Hydraulics, Inc. Brooklyn, New York	Hydraulic pile charges for 100-K Area	J. R. Fritz	4-30-53	5-1-53	X		100-D 105 100-H 105 700
R. W. Moulton University of Washington Seattle, Washington	Discuss experimental program at University	C. W. Sege G. M. Roy	4-22-53	4-22-53	X		700 762 Bldg
A. F. Sperry Panellit, Inc. Chicago, Illinois	Consultation on pressure monitor details for CA-512-R	E. S.Day, Jr.	4-6-53	4-11-53	X		100-B 105-C
G. H. Taylor Moffat, Nichol and Taylor Portland, Oregon	Discuss structual review contract agreement # 105	J. E. Love	4-1-53	4-1-53	X		700 76 Bldg.
H. S. Wong Moffat, Nichol and Taylor Portland, Oregon	Discuss structual review contractual agreement #105	J. E. Love	4-1-53	4-1-53	X		700 762 Bldg.
II. Visits to other Installations							
C. O. Clemetson to: Charles T. Main, Inc. Boston, Massachusetts	Design consultation on 100-K	R. K. Patterson	4-13-53 4-21-53	4-15-53 4-22-53	X X		
C. O. Clemetson to: Builders Providence Provid e, Rhode Island	Project CA-512-W Water Plant		4-14-53	4-14-53	X		

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass	Areas
C. O. Clemetson to: Selas Corp. of America Philadelphia, Pennsulvania	Project CA-513-B	Mr. MacFadden	4-16-53	4-17-53		X	
C. O. Clemetson to: Brown Instrument Co. Philadelphia, Pennsylvania	Expedite instruments for Project CA-513-B	H. Schmit	4-18-53	4-18-53		X	
C. O. Clemetson to: Vitro Corporation New York, New York	Confer on redox expansion general engineering and instrument engineering problems	J. C. Tourek S. L. Stoler	4-20-53	4-20-53	X		
C. O. Clemetson to: Panascan, Inc. Chicago, Illinois	Inspect temperature monitor components	R. A. Anderson	4-24-53	4-24-53		X	
C. O. Clemetson to: Claude S. Gordon Co. Chicago, Illinois	Inspect resistance thermometer conductors	W. Hammond	4-23-53	4-23-53		X	
R. H. Beaton to: Knolls Atomic Power Lab. Schenectady, New York	Discuss research and development programs	J. Marsden	4-17-53	4-17-53	X		
R. H. Beaton to: Ann Arbor, Michigan	Nuclear energy committee meeting	- -	4-18-53	4-18-53		X	
H. J. Bellarts to: Bingham Pump Company Portland, Oregon	Consultation regarding special pump they are building	J. Rayner	4-14-53	4-15-53		X	
E. Hollister to: Cleveland Equipment Works Cleveland, Ohio	Consultation on canning mechanization	J. Flaws	4-2-53	4-5-53	X		
E. Hollister to: Puget Sound Navy Shipyard Bremerton, Washington	Inspect canning machine and fabrication work	S. L. Allison S. L. Allison	4-16-53 4-8-53	4-17-53 4-9-53	X X		

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
J. W. Kolb to: General Electric Co. Schenectady, New York	Consultation on expansion and mechanization of 313 Bldg.	B. Welborne	4-4-53	4-11-53		X	
L. E. Kusler to: General Electric Co. Schenectady, New York	Consultation on expansion and mechanization of 313 Bldg.	B. Welborne	4-4-53	4-11-53		X	
G. L. Locke to: Bingham Pump Co. Portland, Oregon	Discuss pump design	J. T. Rayner	4-14-53	4-17-53		X	
A. J. McCrocklin, Jr. to: Charles T. Main, Inc. Boston, Massachusetts	Confer on "K" water plant facilities	R. K. Patterson	4-27-53	5-2-53	X		
E. P. Peabody to: Charles T. Main, Inc. Boston, Massachusetts	Confer on "K" water plant facilities	R. K. Patterson	4-27-53	5-2-53	X		
E. L. Reed to: Cleveland Equipment Works Cleveland, Ohio	Consultation on canning mechanization	J. Flaws	4-2-53	4-5-53	X		
C. W. Sege to: University of Washington Seattle, Washington	Discuss graphite drying tests	R. W. Moulton	4-6-53	4-6-53		X	
J. C. Wood to: Aluminum Company of America Lafayette, Indiana	Inspect fabrication of aluminum tube	J. C. Finley	4-29-53	4-30-53		X	

ENGINEERING DEPARTMENT - PROJECT SECTION

I. Visitors to this Works

C. R. Goetjen Air Reduction Pacific Co. Seattle, Washington	Consultation on gas manifold system	W. Seeburger R. C. Sievers J. E. Boyd	4-23-53	4-23-53		X	

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
A. Ammerson Bouillon & Griffith Seattle, Washington	A-E work on 313 addition CA-514	P. J. O'Neil	4-8-53 4-15-53	4-10-53 4-16-53		X X	700 Area 700 Area
D. R. Edwards Coast Paint & Chemical Co. Los Angeles, California	Review sealant problem in 107-B basin - CG-506	J. J. O'Neil	4-23-53	4-23-53		X	100-B 107-B 100-H 107-H
Mr. Fargo Bouillon & Griffith Seattle, Washington	A-E work on 313 addition CA-514	P. J. O'Neil	4-23-53	4-24-53		X	700 Area
Mr. Fisher Bouillon & Griffith Seattle, Washington	A-E work on 313 addition CA-514	P. J. O'Neil	4-6-53 4-15-53 4-23-53	4-10-53 4-15-53 4-24-53		X X X	700 Area 700 Area 700 Area
A. W. Friedman Products Research Co. Los Angeles, California	Review setting up problem of thiokol in 107-DR and H - CG-506	P. J. O'Neil	4-9-53	4-10-53		X	100-D 107-DR 100-H 107-H
F. P. Robinson, Jr. General Electric Company Pasco, Washington	Inspect GE pump in 183-C Bldg.	J. R. Kelly	4-1-53	4-3-53		X	100-B 183-C
	Supervise overhaul of three motors in 187-C	J. R. Kelly	4-8-53	4-10-53		X	100-B 187-C
	Supervise inspection of motors in 183-C	J. R. Kelly	4-13-53	4-17-53		X	100-B 183-C
	Supervise inspection of motors in 183-C for tests	J. R. Kelly	4-21-53	5-23-53		X	100-B 183-C
II. Visits to other Installations							
H. E. Hanthorn to: Vitro Corporation New York, New York	Design liaison	J. C. Tourek	4-27-53	4-27-53	X		
R. C. Hollingshead to: Vitro Corporation New York, New York	Design consultation on process cells	S. M. Stoller	4-23-53	4-24-53	X		

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
H. P. Shaw to: General Engineering Lab. Schenectady, New York	Consultation on metal examination facility, CG-431	C. W. George	4-1-53	4-3-53	X		
M. E. Yates to: Vitro Corporation New York, New York	Design consultation on process cells	S. M. Stoller	4-23-53	4-24-53	X		
F. H. Ames to: A. F. Holden Co. Detroit, Michigan	Consultation on gas-fired furnaces	A. F. Holden	4-3-53	4-8-53		X	
F.H. Ames to: Selas Corporation Philadelphia, Pennsylvania	Consultation with furnace vendor	Mr. McFadden	4-14-53	4-19-53		X	
J. W. Brands to: Iron Fireman Mfg. Co. Portland, Oregon	Final inspection of materials for project	T. Bryant	4-21-53	4-21-53		X	
J. W. Brands to: Con. West Steel Co. San Francisco, California	Final inspection of pipe for project	Mr. Cole	4-22-53	4-22-53		X	
J. W. Brands to: Kaiser Engineers Oakland, California	Discuss expediting procedure in regard to material inspection	K. Andresen	4-22-53	4-22-53		X	
J. W. Brands to: Tech. Associates Los Angeles, California	Inspection of instruments for project	R. H. Clarkston	4-23-53	4-23-53		X	
J. W. Brands to: X-ray Products Corp. Los Angeles, California	Regarding X-ray inspection of materials for project	J. Schneeman	4-23-53	4-23-53		X	
J. W. Brands to: Magna Mill Products Los Angeles, California	Inspect machined parts for project	Mr. Dietrich	4-23-53	4-23-53		X	

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
D. A. Conley to: Allen Engineering Corp. Hollywood, California	Interview prospective draftsmen and designers being placed under contract	Mr. Allen	4-23-53	4-25-53		X	
D. A. Conley to: Frank Mayer Eng. Co. Los Angeles, California	Interview prospective draftsmen and designers being placed under contract	Mr. F. Mayer	4-23-53	4-25-53		X	
J. B. Fecht to: Stearns Rogers Co. Denver, Colorado	Design consultation	M. S. Rosengren	4-4-53	4-7-53		X	
F. C. Fisher to: Puget Sound Navy Shipyard Bremerton, Washington	Design conference on Project CA-512-R	S. L. Allison	4-20-53	4-21-53	X		
J. C. Hamilton to: Iron Fireman Mfg. Co. Portland, Oregon	Final inspection of materials for project	T. Bryant	4-21-53	4-21-53		X	
J. C. Hamilton to: Con. West Steel Co. San Francisco, California	Final inspection of pipe for project	Mr. Cole	4-22-53	4-22-53		X	
J. C. Hamilton to: Kaiser Engineers Oakland, California	Discuss expediting procedure in regard to material inspection	K. Andresen	4-22-53	4-22-53		X	
J. C. Hamilton to: Tech. Associates Los Angeles, California	Inspection of instruments for project	R. H. Clarkston	4-23-53	4-23-53		X	
J. C. Hamilton to: X-ray Products Corp. Los Angeles, California	Regarding X-ray inspection of materials for project	J. Schneeman	4-23-53	4-23-53		X	
J. C. Hamilton to: Magna Mill Products Los Angeles, California	Inspect machined parts for project	Mr. Ditrich	4-23-53	4-23-53		X	

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
C. W. Harrison to: Puget Sound Navy Shipyard Bremerton, Washington	Design conference on Project CA-512-R	S. L. Allison	4-5-53 4-20-53	4-7-53 4-21-53	X X		
R. C. Hollingshead to: Stearns Rogers Co. Denver, Colorado	Design consultation	M. S. Rosengren	4-4-53	4-7-53		X	
C. E. Love to: Puget Sound Navy Shipyard Bremerton, Washington	Design conference on Project CA-512-R	S. L. Allison	4-5-53 4-20-53	4-7-53 4-21-53	X X		
D. J. Quigley to: Charles T. Main, Inc. Boston, Massachusetts	Design conference on Project CA-512-W	R. K. Patterson	4-4-53 4-23-53	4-9-53 5-2-53	X X		
W. A. Siegel to: Allen Engineering Corp. Hollywood, California	Interview prospective draftsmen and designers being placed under contract	Mr. Allen	4-23-53	4-25-53		X	
W. A. Siegel to: Frank Mayer Eng. Co. Los Angeles, California	Interview prospective draftsmen and designers being placed under contract	F. Mayer	4-23-53	4-25-53		X	
R. L. Sohler to: Puget Sound Navy Shipyard Bremerton, Washington	Design conference on Project CA-512-R	S. L. Allison	4-5-53 4-20-53	4-7-53 4-21-53	X X		
R. C. Walker to: Kincaid Machine Works Portland, Oregon	Tooling inspection on Project CA-512-R	Mr. Kincaid	4-13-53	4-14-53		X	

MANAGEMENT

I. Visits to other Installations

W. E. Johnson to: U. S. Atomic Energy Comm. Washington, D. C.	Discuss prime contract of GE with AEC	R. W. Cook	4-15-53	4-15-53	X		

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
MANUFACTURING DEPARTMENT							
I. Visitors to this Works							
T. C. Allen National Lead Company Fernald, Ohio	Discuss briquetting press	E. W. O'Rourke S. M. Gill	4-8-53	4-10-53	X		300 303
K. E. Atwood Bailey Meter Company Cleveland, Ohio	Consultation on 313 Building	E. Bilgeman	4-6-53	4-10-53	X		300 303
R. P. Best Wallace and Tiernan Seattle, Washington	Check operation of chlorinators in 183-C	H. G. Harder	4-23-53	4-23-53		X	100-B 183-C
M. S. Bloomsburg E. I. du Pont de Nemours & Co. Wilmington, Delaware	Observe and discuss fuel and target slug fabrication	E. W. O'Rorke	4-20-53	4-22-53	X		300 303
J. T. Brock E. I. du Pont de Nemours & Co. Wilmington, Delaware	Six weeks training program, observe and discuss 100 Area Operations	J. H. Warren	3-3-53	4-9-53	X		100-B 105-B, 105-C 100-D 105 100-F 105 100-H 105
R. D. Caldwell E. I. du Pont de Nemours & Co. Savannah River Plant Aiken, South Carolina	Health physics training	A. R. Keene	4-12-53	5-22-53	X		100-B 108, 105-B, 105-C 100-D 105, 189-D 100-F 105 100-H 105 200-E 201-C 200-W Redox, 221-T, 231 234, 235 300 303
J. E. Eggert E. I. du Pont de Nemours & Co. Wilmmington, Delaware	Six weeks training program, observe and discuss 100 Area Operations	J. H. Warren	3-3-53	4-9-53	X		100-B 105-B, 105-C 100-D 105 100-F 105 100-H 105

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
P. M. Engle Monsanto Chemical Company Miamisburg, Ohio	Survey problems of remote controlled operations of highly contaminated areas	H. A. Moulthrop	4-9-53	4-10-53	X		200-W 231, 234, 235
E. E. Hayes E. I. du Pont de Nemours & Co. Wilmington, Delaware	Observe and discuss fuel and target slug fabrication	E. W. O'Rorke	4-20-53	4-22-53	X		300 303
A. J. Hornfeck Bailey Meter Company Cleveland, Ohio	Consultation on 313 Building	E. Hilgeman	4-6-53	4-10-53	X		300 303
J. E. Johnson E. I. du Pont de Nemours & Co. Savannah River Plant Aiken, South Carolina	Health physics training	A. R. Keene	4-12-53	5-22-53	X		100-B 108, 105-B, 105-C 100-D 105, 189 100-F 105 100-H 105 200-E 201-C 200-W Redox, 221-T, 231, 234, 235 300 303
G. E. C. Kauffman E. I. du Pont de Nemours & Co. Savannah River Plant Aiken, South Carolina	Health physics training	A. R. Keene	4-12-53	5-22-53	X		100-B 108, 105-B, 105-C 100-D 105, 189 100-F 105 100-H 105 200-E 201-C 200-W Redox, 221-T, 231, 234, 235 300 303
R. W. Keiser E. I. du Pont de Nemours & Co. Wilmington, Delaware	Six weeks training program, observe and discuss 100 Area Operations	J. H. Warren	3-3-53	4-9-53	X		100-B 105-B, 105-C 100-D 105 100-F 105 100-H 105
S. H. Kiser E. I. du Pont de Nemours & Co. Wilmington, Delaware	Six weeks training program, observe and discuss 100 Area Operations	J. H. Warren	3-3-53	4-9-53	X		100-B 105-B, 105-C 100-D 105 100-F 105 100-H 105

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass	Areas
E. C. Laing E. I. du Pont de Nemours & Co. Savannah River Plant Aiken, South Carolina	Discuss canning methods	E.W. O'Rorke	4-27-53	5-1-53	X	300 303	
J. C. McMillan E. I. du Pont de Nemours & Co. Savannah River Plant Aiken, South Carolina	Health physics training	A. R. Keene P. C. Jerman L. I. Cobb J. G. Myers	4-12-53	5-22-53	X	100-B 108,105-B,105- 100-D 105, 189 100-F 105 100-H 105 200-E 201-C 200-W Redox, 221-T, 231, 300 303	
W. L. Marter E. I. du Pont de Nemours & Co. Savannah River Plant Aiken, South Carolina	Health physics training	A. R. Keene P. C. Jerman L. I. Cobb L. V. Barker	4-12-53	5-22-53	X	100-B 108,105-B,105- 100-D 105, 189 100-F 105 100-H 105 200-E 201-C 200-W Redox, 221-T, 231 300 303	
M. R. Myers International Business Machines Richland, Washington	Service IBM equipment	E. T. O'Sullivan	4-23-53	4-23-53		X 100-D 105-DR	
J. E. Ross E. I. du Pont de Nemours & Co. Wilmington, Delaware	Observe and discuss fuel and target slug fabrication	E. W. O'Rorke	4-19-53	4-23-53	X	300 303	
R. J. Richards E. I. du Pont de Nemours & Co. Wilmington, Delaware	Six weeks training program, observe and discuss 100 Area Operations	J. H. Warren	3-3-53	4-9-53	X	100-B 105-B, 105-C 100-D 105 100-F 105 100-H 105	
L. K. Simpson E. I. du Pont de Nemours & Co. Savannah River Plant Aiken, South Carolina	Observe maintenance work in 200 Areas	R. S. Bell	4-13-53	4-25-53	X	100-B 108-B 200-W 221-T, 231, 221-U, 234, 235 200-E 201-C, 221-B	

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
B. R. Tarrant Ingersoll Rand Company Seattle, Washington	Maintenance work in 384 Building	E. Hilgeman	4-15-53	4-17-53		X	300 XXX
J. R.Whitman International Business Machines Richland, Washington	Servie IBM equipment	E. T. O'Sullivan	4-28-53	4-28-53		X	100-H 105
II. Visits to other Installations							
J. M. Blackburn to: Dow Chemical Company Rocky Flats Laboratory Denver, Colorado	Consultation on manpower, maintenance problems and inspection of mechanical facilities similar to 234-5 at HW	F. H. Langell I. B. Venable B. Weidenbaum	4-13-53	4-17-53	X		
S. M. Gill to: National Lead Company Fernald, Ohio	Discuss uranium slug manufacturing problems	C. H. Welden	4-28-53	5-1-53	X		
T. W. Hauff to: Dow Chemical Company Rocky Flats Laboratory Denver, Colorado	Discuss product shipment, process, and equipment technology	I. B. Venable	4-20-53	4-21-53	X		
T. W. Hauff to: Carbide and Carbon Co. Oak Ridge, Tennessee	Discuss product specifications, inter-relationship of Hanford and K-25 processing	F. W. Hurd	4-23-53	4-24-53	X		
T. W. Hauff to: E. I. du Pont de Nemours Savannah River Plant Aiken, South Carolina	Discuss metal fabrication, reactor and separations processes and inspect facilities	M. H. Wahl E.R. Gilbert J. K. Lower W. P. Overbeck	4-27-53	4-28-53	X		
T. W. Hauff to: National Lead Company Fernald, Ohio	Discuss metal preparation and fabrication processes	D. J. Blythe	4-29-53	4-30-53	X		
C. E. Hirsch to: Aircraft Nuclear Propulsion Project Lockland, Ohio	Discuss transfer	R. C. Mark	4-1-53	4-2-53		X	

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
C. E. Hirsch to: Knolls Atomic Power Lab. Schenectady, New York	Discuss transfer	R. F. Stearns	4-2-53	4-2-53		X	
W. N. Mobley to: Dow Chemical Company Rocky Flats Laboratory Denver, Colorado	Consultation on process and specifications for 234-5	I. B. Venable	4-20-53	4-21-53	X		
W. N. Mobley to: Carbide and Carbon Co. Oak Ridge, Tennessee	Consultation on processes and specifications on UO_3	F. W. Hurd	4-23-53	4-25-53	X		
W. N. Mobley to: E. I. du Pont de Nemours Savannah River Plant Aiken, South Carolina	Discuss process technology and review plutonium recovery problems	M. H. Wahl J. K. Lower E. R. Gilbert	4-27-53	4-28-53	X		
T. Prudich to: Dow Chemical Company Rocky Flats Laboratory Denver, Colorado	Consultation pertaining to problems on operation and maintenance of 234 Bldg. equipment	I. B. Venable F. H. Langell B. Weidenbaum	4-13-53	4-17-53	X		
G. H. Temple to: Dow Chemical Company Rocky Flats Laboratory Denver, Colorado	Consultation on cost and accounting matters on 234-5 operation	I. B. Venable F. H. Langell B. Weidenbaum	4-13-53	4-17-53	X		
RADIOLOGICAL SCIENCES DEPARTMENT							
I. Visitors to this Works							
L. R. Gibbs R. C. A. Services San Francisco, California	Service electron microscope	H. A. Kornberg	4-20-53	4-23-53		X	100-F 108
S. T. Cantril Tumor Institute Swedish Hospital Seattle, Washington	Radiation hazards discussion	D. W. Pearce	4-23-53	4-24-53	X	300 XXX	

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
II. Visits to other Installations							
F.E. Adley to: University of California W. Los Angeles, California	Consultation on electron microscopy	F. W. Bishop	4-20-53	4-24-53	X		
D. C. Fleckenstein to: U. S. Atomic Energy Comm. Bureau of Standards Washington, D. C.	Consultation on radiation instruments	R. L. Butenhoff	4-27-53	5-22-53	X		
J. J. Fuquay to: Las Vegas, Nevada	Participate in Test Program 27	K. H. Larson	3-13-53	5-10-53	X		
J. F. Honstead to: Las Vegas, Nevada	Participate in Test Program 27	K. H. Larson	3-13-53	5-10-53	X		
H. A. Kornberg to: Argonne National Lab. Chicago, Illinois	Discuss problems in radiation hazard research	A. M. Brues	4-6-53	4-9-53	X		
D. W. Pearce to: Las Vegas, Nevada	Official observe in Test Program	- -	4-16-53	4-19-53	X		
H. G. Ruppert to: Las Vegas, Nevada	Participate in Test Program 27	K. H. Larson	3-13-53	5-10-53	X		
J. M. Smith, Jr. to: Dow Chemical Company Rocky Flats Laboratory Denver, Colorado	Inspect operating facilities and consult on radiation protection features and procedures	F. H. Langell	4-20-53	4-22-53	X		
J. M. Smith, Jr. to: Carbide and Carbon Co. Oak Ridge, Tennessee	Consultation on uranium oxide specifications and radiation protection	F. W. Hurd	4-23-53	4-24-53	X		
J. M. Smith, Jr. to: Knolls Atomic Power Lab. Schenectady, New York	Consultation on radiation protection program	L. L. German	4-15-53	4-17-53	X		

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
EMPLOYEE AND PUBLIC RELATIONS DEPARTMENT							
I. Visitors to this Works							
D. F. Saunders Dept. of Chemistry University of Wisconsin Madison, Wisconsin	Employment interview	K. V. Stave	4-6-53	4-7-53		X	
II. Visits to other Installations							
R. C. Grant to: Brookhaven National Lab. Upton, Long Island, New York	Conduct national salary survey	L. R. Swart	4-6-53	4-6-53		X	
D. W. McLenegan to: Argonne National Lab. Chicago, Illinois	Attend committee meetings	J. Boyce	4-20-53	4-21-53	X		
W. D. Smyth to: U. S. Atomic Energy Comm. Washington, D. C.	Insurance conference	W. J. Satterfield, Jr. L. F. Spalding	4-9-53	4-16-53	X		
I. Visitors to this Works (cont'd)							
J. Manley University of Washington Seattle, Washington	Confer with physics instructors in School of Nuclear Eng.	R. E. Curtis J. E. Faulkner	4-23-53	4-23-53	X	300-L XXX	
H. W. Bennett General Electric Company New York, New York	Discuss employee education matters	G. G. Lail H. E. Callahan	4-14-53	4-15-53		X	700 Area
W. V. Merrihue General Electric Company New York, New York	Discuss employee relation matters	G. G. Lail H. E. Callahan	4-19-53	4-21-53		X	700 Area
PLANT AUXILIARY OPERATIONS DEPARTMENT - PURCHASING AND STORES SECTION							
I. Visitors to this Works							

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
I. Visitors to this Works							
R. J. Bledsoe General Electric Company Seattle, Washington	Install new Geiger Tube in X-ray machine	W. T. Vestal	4-9-53	4-9-53		X	300 XXX
B. D. Stanley Liquid Carbonic Corp. Seattle, Washington	Deliver liquid carbon dioxide on order HW 28298	J. I..Goodrich	4-1-53	4-1-53		X	100-F 105
	Deliver liquid carbon dioxide on order HW 29799	J. L..Goodrich	4-13-53	4-13-53		X	100-D 105-D
	Deliver liquid carbon dioxide on order HW 29799	J. L. Goodrich	4-15-53	4-15-53		X	100-B 105-B
	Deliver liquid carbon dioxide on order H_w 29799	J. L. Goodrich	4-29-53	4-29-53		X	100-B 105-B
J. L. Verschueren Liquid Carbonic Corp. Seattle, Washington	Deliver liquid carbon dioxide on order HW 29799	J. L. Goodrich	4-16-53	4-16-53		X	100-F 105
	Deliver liquid carbon dioxide on order HW 29799	J. L. Goodrich	4-22-53	4-22-53		X	100-B 105-B
	Deliver liquid carbon dioxide on order HW 29799	J. L. Goodrich	4-24-53	4-24-53		X	100-D 105-D
	Deliver liquid carbon dioxide on order HW 29799	J. L..Goodrich	4-30-53	4-30-53		X	100-H 105
R. L. Bagby West Coast Fast Freight Kennewick, Washington	Deliver cylinders	H. L. Morgan	4-15-53	4-15-53		X	100-B 185-C 100-D 185-D
	Deliver material on order HWC 2508	H. L. Morgan	4-24-53	4-24-53		X	100-H 105
	Deliver material on order HWC-2109	H. L. Morgan	4-27-53	4-27-53		X	200-W 277-U (XXX)
	Deliver material on order HWC 2109	H. L. Morgan	4-28-53	4-28-53		X	200-W 277-U
F. F. Smith Inland Motor Freight Kennewick, Washington	Deliver material on order 32628	H. L. Morgan	4-16-53	4-16-53		X	200-W XXX
G. Zank Lee and Estes Kennewick, Washington	Deliver cylinders	H. L. Morgan	4-22-53	4-22-53		X	100-D 105-D

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
G. Martell Consolidated Freightways Kennewick, Washington	Deliver material on order HW 31999	H. L. Morgan	4-30-53	4-30-53		X	200-W 221-U
C. Shannon Lee and Estes Kennewick, Washington	Deliver material on order 21740	H. L. Morgan	4-30-53	4-30-53		X	100-B 105-B 100-D 105-D
II. Visits to other Installations							
G. B. Krausher to: Electric Steel Foundry Portland, Oregon	Procurement of operational material	R. W.DeWeese	4-14-53	4-14-53		X	
G. B. Krausher to: Huntington Rubber Mills Portland, Oregon	Procurement of operational material	Mr. Hodel	4-14-53	4-14-53		X	
G. B. Krausher to: Woodbury & Company Portland, Oregon	Procurement of operational material	G. H. Michalcik	4-15-53	4-15-53		X	
G. B. Krausher to: R. S. Peters Sales Service Portland, Oregon	Procurement of operational material	R. S. Peters	4-15-53	4-15-53		X	
G. B. Krausher to: Northwest Tube & Metal Fab. Portland, Oregon	Procurement of operational material	Mr. Yager	4-15-53	4-15-53		X	
G. B. Krausher to: Paulson Machine Works Portland, Oregon	Procurement of operational material	W. Paulson, Jr.	4-15-53	4-15-53		X	
G. B. Krausher to: Bettcher Plastics Portland, Oregon	Procurement of operational material	R. Parlier	4-16-53	4-16-53		X	
G. B. Krausher to: General Electric Co. Portland, Oregon	Procurement of operational material	Mr. Loy	4-16-53	4-16-53		X	

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
G. H. Wright to: Bingham Pump Company Portland, Oregon	Purchase pump equipment	Mr. Rayner	4-14-53	4-14-53		X	

PLANT AUXILIARY OPERATIONS DEPARTMENT - STATISTICAL AND COMPUTING SERVICES SECTION

I. Visitors to this Works

E. Laing E. I. du Pont de Nemours & Co. Savannah River Plant Aiken, South Carolina	Discuss metal quality control	R. F. Cell D. O. Richards	4-30-53	4-30-53	X	700	722-A Bldg.
W. R. Gorvey Washington State College Pullman, Washington	Inspect IBM machines	P. M. Thompson	4-24-53	4-24-53		X 700	722-A Bldg.
J. M. McCorkill Washington State College Pullman, Washington	Inspect IBM machines	P. M. Thompson	4-24-53	4-24-53		X 700	722-A Bldg
D. S. Ross Washington State College Pullman, Washington	Inspect IBM machines	P. M. Thompson	4-24-53	4-24-53		X 700	722-A Bldg.
W. T. Southworth Washington State College Pullman, Washington	Inspect IBM machines	P. M. Thompson	4-24-53	4-24-53		X 700	722-A Bldg.
J. Amon International Business Machines Richland, Washington	Service IBM equipment	P. M. Thompson	4-1-53	4-30-53		X 700	722-A Bldg.
D. F. Crumb International Business Machines Richland, Washington	Service IBM equipment	P. M. Thompson	4-1-53	4-30-53		X 700	722-A Bldg.
J. E. Elliott International Business Machines Richland, Washington	Service IBM equipment	P. M. Thompson	4-1-53	4-30-53		X 700	722-A Bldg.

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Unclass.	Areas
J. McCormick International Business Machines Richland, Washington	Service IBM equipment	P..M. Thompson	4-1-53	4-30-53		X	700 722-A Bldg.
M. R. Meyers International Business Machines Richland, Washington	Service IBM equipment	P. M. Thompson	4-1-53	4-30-53		X	700 722-A Bldg
N. E. Norby International Business Machines Richland, Washington	Service IBM equipment	P. M. Thompson	4-1-53	4-30-53		X	700 722-A Bldg.
J. R. Whitman International Business Machines Richland, Washington	Service IBM equipment	P. M. Thompson	4-1-53	4-30-53		X	700 722-A Bldg
II. Visits to other Installations							
D. D. McCracken to: International Business Machines New York, New York	Attend IBM training course on high speed stored program computor	C. C. Hurd	4-12-53	5-12-53		X	

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PURCHASING AND STORES SECTION
PLANT AUXILIARY OPERATIONS DEPARTMENT
SUMMARY - APRIL 1953

Extended forecasts covering requirements for Nitric Acid and Aluminum Nitrate have been received from Manufacturing. Indications are that the capacity of our two suppliers will be adequate to cover our requirements barring unforeseen process changes, etc.

Deliveries of electrical material and supplies for Stores stock (Caption 903-6) have been very poor resulting in an unsatisfactory stock position. This has been due primarily to the fact that the majority of such items are purchased by the Commission, and the pressure of work has caused lengthy delays in placement of orders. Assurance has been given by A.E.C. that every effort will be made to rectify this condition.

Effective April 8, motor carriers were granted approximately a 6% freight rate increase on commodities transported between California and Washington.

Defense Materials System Regulations have been analyzed, bulletins written, and management advised of its effects and functions. Mechanics of operation under this new material control system have been worked out and are in effect.

Planned and anticipated procurement activity in connection with the present expansion program is approximately $10,000,000 according to the most recent figures. This increased work load will extend the operations of the Construction Procurement through FY 1954 or longer.

Failure of solenoids in the B and F Area Ball 3X Systems caused two Pile shutdowns and necessitated emergency action in securing replacement solenoid coils. A new designed coil has been developed and complete replacement of the old coils will be made immediately.

The physical inventory of Account 10.2, General Supplies, was made in one 8-hour shift on April 30. General Supplies Warehousing and Records were closed only for the actual counting of material on April 30 and for posting and rechecking work on May 1. Thus, inconvenience to the project was held to an absolute minimum.

An Open House was held at Central Stores on April 17. Supervisory personnel had the opportunity to view material handling methods, record keeping routines, and to become more familiar with the Stores' operation.

A storeroom, to be operated by Stores, is being planned for the 722 Combined Shops Building to serve the Community Real Estate Section and the Administration Area Maintenance Unit.

Material and equipment disbursed from Stores Unit inventories, General Supplies (Account 10.2), Standby (Account 10.1), and Spare Equipment Held in Storage (Account 29) were valued at $228,891.04, $43,564.09, and $28,223.95 respectively for a total of $300,679.08.

Organization and Personnel

	3-31-53	4-30-53	Change
Employees on Roll	303	298	-5

PURCHASING AND STORES SECTION
GENERAL

Defense Materials System Regulations have been analyzed, bulletins written and management advised of its effects and functions. Mechanics of operation under this new material control system have been worked out and are in effect.

Letters were written to 32 supplies, identified through our files as "A" product producers for the Hanford Atomic Products Operation, detailing certain of their functions under the Defense Materials System. Their cooperation was requested in continued care in identification of "A" products under NPA Regulations.

The volume of vendor inquiries regarding renegotiable business has been heavy as they prepare their government reports required by the Renegotiation Act.

The following table shows the dollar value of business, by cost category, and the number of procurement actions placed with different types of vendors. Dollar amounts are based on the net value of purchase orders and alterations as transmitted to A.E.C.:

April 1953	VENDOR TYPE			
Cost Category	Government Agency	Small Business	Big Business	Educational and Other
$0 - $ 9.99	$ 11.40	$ 782.79	$ 361.69	$ 1.80
$10 - $ 499.99	2,939.23	137,391.40	81,649.30	28.00
$500 - $9,999.99	6,500.00	151,976.16	94,353.04	2,000.00
$10,000 - Up	93,600.00	70,083.55	685,951.50	
	$103,050.63	$360,233.90	$862,315.53	$2,029.80
Number of Actions	16	1133	623	5
Requisitions on hand 4-1-53		G	D	Total
Operations Procurement		811	0	811
Construction Procurement		0	111	111
A.E.C. Procurement		85	18	103
	Total	896	129	1025
Requisitions Assigned during April				
Operations Procurement		2230	0	2230
Construction Procurement		0	192	192
A.E.C. Procurement		249	35	284
	Total	2479	227	2706
Requisitions Placed during April				
Operations Procurement		2161	0	2161
Construction Procurement		0	213	213
A.E.C. Procurement		245	30	275
	Total	2406	243	2649
Requisitions on hand 4-30-53				
Operations Procurement		880	0	880
Construction Procurement		0	90	90
A.E.C. Procurement		89	23	112
	Total	969	113	1082

PURCHASING AND STORES SECTION
GENERAL

Purchase Orders Placed	HW	HWC
Operations Procurement	1443	
Essential Material	34	
Construction Procurement		167
Local Purchase	6	2
	1483	169

Value of Purchase Orders Placed		
Operations Procurement	$ 562,561.49	$
Essential Material	481,809.90	
Construction Procurement		281,660.47
Local Purchase	15.18	35.60
Total	$1,044,386.57	$ 281,696.07

Alterations Issued	Increase	Decrease	No Change	Total
HW Operations	49	34	4	87
Essential Material	4	2	1	7
HWC Construction	6	20	5	31
Total	59	56	10	125

Value of Alterations Issued	Increase	Decrease	Total
HW Operations	$ 3,972.59	$ 8,977.19	$12,949.78
Essential Material	1,901.97	6,407.46	8,309.43
HWC Construction	13,128.38	2,071.07	15,199.45
Total	$19,002.94	$17,455.72	$36,458.66

Government Transfers	OR	ORC
	1	0

Vendor Contacts	188
Claims Processed	3
Damage Reports Processed	17
Over & Short Reports Processed	3
Accounts Payable Requests Handled	369
Difference Slips Processed	66
Clearance Slips and Purchase Order Change Approvals	227
Material Exception	165
Return Orders Issued	150

Organization and Personnel	3-31-53	4-30-53	Change
Employees on Roll	35	32	-3

PURCHASING AND STORES SECTION
CONSTRUCTION PROCUREMENT UNIT
APRIL, 1953

One order for a forty-ton crane is still to be assigned to Blaw-Knox. Assignment of this order is being held pending receipt of revised specification from the Architect Engineering firm.

A $49,000 order was placed with Nagle Pump Company for six additional slurry pumps on a required design basis. These pumps are replacement pumps to be used in the TBP tank farm. Another $19,000 order was placed with Bingham Pump Company for a special design pump to be tested for pumping slurry from the TBP tanks. This order resulted from the need of a more durable type of pump than originally designed and presently being used.

Planned and anticipated procurement activity in connection with the present expansion program is in the neighborhood of $10,000,000 according to most recent figures. This increased work load will extend the operation of the Construction Procurement Unit thru the fiscal year 1954 or longer.

The failure of solenoids in the B and F Area Ball 3X Systems caused two Pile shutdowns and necessitated emergency action in securing replacement solenoid coils. A new designed coil has been developed and complete replacement of the old coils will be made immediately. Replacement of the coils is on a complaint basis and has not involved any new purchases to date. All replacement coils and resistors have been shipped and will be on the project May 4.

Approximately 150 tons of Bentonite and 21 cars of cement have been ordered during the month on emergency requisitions. Each order was for 25 tons of Bentonite and one to five cars of cement. This material is being used in connection with a Minor Construction Project of repairing the backwash basin in H Area.

Organization and Personnel

	3-31-53	4-30-53	Change
Employees on Roll	14	14	0

PURCHASING AND STORES SECTION
OPERATIONS PROCUREMENT UNIT
APRIL -- 1953

Statistical and General

Extended forecasts covering the requirements for Nitric Acid and Aluminum Nitrate have been received from Manufacturing, and indications are that the capacity of our two suppliers will be adequate to cover our requirements, barring unforeseen process changes, etc.

Deliveries of Stores' Caption 6 material (electrical material and supplies) have been very poor and the stock position is unsatisfactory. This has been due, primarily, to the fact that the majority of such items are purchased by the Commission, and the pressure of work on their Procurement Review Section has caused lengthy delays in the placement of orders. This matter has been discussed at length with the Commission, and we have been assured that every effort will be made to shorten the interval and to simplify the internal A.E.C. procedure. In some cases, it has taken as long as nine weeks from the original date of a requisition to the actual placement of an order.

Essential Materials contracts in process are as follows:

1. Aluminum Sulphate -- Approved by the A.E.C. and in force.
2. Ferric Sulphate -- Approved by the A.E.C. and in force.
3. Sulphuric Acid -- Approved by the A.E.C. and in force.
4. Sodium Silicate -- Approved by G.E. and the vendor; at A.E.C. for final approval.
5. Rock Salt -- Bids have been received and evaluated; record of purchase at Commission for approval.
6. Sodium Carbonate -- Request for quotation in the hands of vendors.
7. Tributyl Phosphate -- Request for quotation in the hands of vendors.

Organization and Personnel

	3-31-53	4-30-53	Change
Employees on roll	33	33	-0-

PURCHASING AND STORES SECTION
STORES UNIT
APRIL, 1953

Statistical and General

The physical inventory of Account 10.2, General Supplies, was made in one eight-hour shift on April 30 as planned. This task was accomplished by scheduling 110 counters in organized crews at the overall Central Warehouse locations and simultaneously at nine separate area stores. The successful completion of the count was made possible by (1) good advance planning and preparatory work, (2) close cooperation between Internal Audit and Stores Unit personnel, and (3) diligent effort on the part of each supervisor and counter.

General Supplies (Warehousing and Records) were closed only for the count on April 30 and for the posting and rechecking work on May 1. Thus, the inconvience to the project was held to an absolute minimum. Emergency disbursements were made both days when required. Approximately 3000 store orders were backlogged during this period.

Preliminary work for the inventory of Surplus Materials is in full swing. All available personnel is being assigned to assist in preparing for this inventory, the first of its kind at Hanford.

An Open House was held at Central Stores on the afternoon of April 17. Our work proceeded as usual during the period so that all visitors could view the material handling methods, record keeping routines, and determine for themselves how our system operates.

The project proposal (ER-A-748) for laboratory storeroom in the 3706 Building, 300 Area, is being written now by the Project Section of the Engineering Department. This storeroom will provide 7000 square feet of space for warehousing and will alleviate most of our problems in the 300 Area.

A storeroom is being planned for the 722 Combined Shops Building. This will be operated by Stores Unit to serve jointly the Community Real Estate Section and the Administration Area Maintenance Unit of Plant Protection Section. The existing stocks of these sections will be turned over to Stores after inventory by Internal Audit. This store would have been required, even though the 700 Area Store in 713 Building which was discontinued in March had been maintained.

Materials and equipment disbursed from active inventories included the following principal items:

General Supplies (Account 10.2) ----------	$ 228,891.04
Standby Materials (Account 10.1) ----------	43,564.09
Spare Equipment Held in Storage (Account 29) -	28,223.95
Total ------	$ 300,679.08

PURCHASING AND STORES SECTION
STORES UNIT
APRIL, 1953

In Surplus Materials, the following items are worth noting:

Disbursements by Store Order and Transfer	$ 80,460.64
Amount included in above furnished for New Construction	44,278.20
Offsite Shipments Billed	298,157.53
Inventory Balance April 30, 1953	3,322,425.06
Value of Excess Lists Awaiting A.E.C. Disposition	2,929,552.18
Receipts of Surplus Material	45,416.22

Organization and Personnel

	3-31-53	4-30-53	Change
Employees on Roll	210	208	-2

PURCHASING & STORES SECTION

TRAFFIC UNIT

April, 1953

STATISTICAL AND GENERAL

The Eastern rail lines, and all of the scheduled airlines, revised their train and flight schedules in the latter part of April, to coordinate with the summer use of Daylight Saving Time.

Effective April 8, the motor carriers were granted approximately a 6% freight rate increase on commodities transported between California and Washington.

As a result of rate reductions obtained from the carriers, there was a total savings in freight charges for the month of April amounting to $1,071.63. This makes a total savings from September 1, 1946 to date of $1,740.457.32.

Savings Report

1. Rate reductions obtained from carriers:

Commodity	Origin	Savings for April, 1953	Savings from 9-1-46 thru March, 1953	Savings from 9-1-46 to date
Empty Steel Cylinders	Richland, Wash.	$ 24.64		
Gases, Compressed	Yakima, Wash.	8.86		
Phosphoric Acid	Newark, Calif.	418.14		
Silicate of Soda	Tacoma, Wash.	614.67		
Section 22 Carloading	Various	5.32		
		$ 1,071.63	$ 1,739,385.69	$ 1,740,457.32
2. Freight Bill Audit		722.73	108,435.30	109,158.03
3. Loss & Damage & Overcharge Claims		384.62	125,260.14	125,644.76
4. Ticket Refund Claims		427.36	30,363.12	30,790.48

PURCHASING & STORES SECTION
TRAFFIC UNIT
April, 1953

Savings Report (continued)

5. Household Goods Claims	$ 15.86	$ 17,165.91	$ 17,181.77
	$ 2,622.20	$ 2,020,610.16	$ 2,023,232.36

Work Volume Report

Reservations Made	Rail	111
	Air	268
	Hotel	297
Expense Accounts checked		195
Household Goods & Automobiles	Movements Arranged Inbound	4
	Movements Arranged Outbound	2
	Insurance Riders Issued	5
	Insurance Bills Approved	3
	Requests for Claim Billing	2
	Claims Filed	3
	Claims Collected - Number	2
	Claims Collected - Amount	$15.86
Ticket Refund Claims	Filed	13
	Collected - Number	18
	Collected - Amount	$427.36
Freight Claims	Filed	8
	Collected - Number	9
	Collected - Amount	$384.62
	Over and Shorts Processed	12
	Damage Reports Processed	7
Freight Bill Audit Savings		$722.73
Freight Shipments Traced		67
Quotations	Freight Rates	214
	Routes	240
Bills Approved	Air Freight	7
	Air Express	15
	Boat	2
	Carloading	62
	Express	177
	Rail	684
	Truck	320
Carload Shipments	Inbound	658
	Outbound	16

PURCHASING & STORES SECTION
TRAFFIC UNIT
April, 1953

Report of Carloads Received

Commodity	CMSTP&P	NP	UP	Total
Acid Condensing Rings			1	1
Aluminum Ingots			1	1
Aluminum Sulphate	6			6
Asphalt		1		1
Caustic Potash	1			1
Caustic Soda	12	19	11	42
Cellulose Wadding			1	1
Cement	8	11	2	21
Chlorine	1		1	2
Clay	3			3
Coal	94		435	529
Ferric Sulphate	1	1		2
Ferrous Ammonium Sulphate	1		1	2
Furnace Liners			8	8
Lacquer Solvent			2	2
Lime		1		1
Machinery		1		1
Methanol		1		1
Methyl Isobutyl Ketone			1	1
Nitric Acid		6	6	12
Petroleum Naptha	1			1
Phosphoric Acid	1			1
Salt		2	2	4
Silicate of Soda	4	1		5
Soda Ash		1	1	2
Steel Containers			3	3
Sulphuric Acid			1	1
Merchandise	1	1	1	3
Total	134	46	478	658

Organization & Personnel	3-31-53	4-30-53	Change
Employees on Roll	11	11	0

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U. S. ATOMIC ENERGY COMMISSION
HANFORD OPERATIONS OFFICE
RICHLAND, WASHINGTON

DATE: June 15, 1955

TO: [illegible]

Subject: NOTICE OF CHANGE IN CLASSIFICATION

Notice has been received from the General Electric Company Non-Technical Document Review Board, Hanford Atomic Products Operations, Richland, Washington covering the following change in classification action effective April 12, 1955.

Hanford Document No. [illegible] G. E. Document No. [illegible]

Doc. Date 5-[illegible]-53 Original Classification Unlimited

Title or Subject: Transportation Section Monthly Report - April 1953

Author(s) or Originator [illegible]

Pages [illegible] thru [illegible]-6 (X) Downgraded to Official Use Only

( ) Classification Cancelled

According to our records you have copy(ies) [illegible] of [illegible] Series [illegible]

INSTRUCTIONS

Block out all present classification markings, which may be inconsistent with the changed classification indicated above, and re-mark in accordance with existing AEC Security Regulations.

REMARKS: This action applies only to the "Transportation Monthly Section" portion of Doc. No. [illegible] and does not affect the classification of any other parts of the report.

This document was transmitted to you 5-[illegible]-53
from Hanford on _____
Registry No. _____

Lee E. Spreer

LEE E. SPEER, Chief
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Date 6-[illegible]

TRANSPORTATION SECTION
MONTHLY REPORT
April 1953

GENERAL

Transportation Section personnel forces increased from 522 to 523 by 8 new hires, 6 transfers in, 2 reactivations - personal illness, 8 terminations, 6 transfers out and 1 deactivation - personal illness.

The Manager completed the series of sixteen informational meetings with all employees which were begun in March.

Satisfactory progress continued on the New Consolidated Transportation Facilities. The preliminary plans were approved on April 6 and it appears that the final plans can be completed on schedule.

RAILROAD ACTIVITIES

Commercial cars handled during April increased 4.8% over March as receipts of construction materials for Kaiser Engineers were somewhat higher plus initial shipments for Blaw-Knox. The following recapitulation indicates the distribution of commercial cars handled.

Carload Movements -	Loads In	Empties In	Loads Out	Empties Out
General Electric Company	711	22	22	724
Blaw-Knox	17	-	-	15
Browne-Morris	1	-	-	1
Kaiser Engineers	118	-	-	108
A. R. Neiman Co.	1	-	-	1
Packard Pipe Co.	1	-	-	1
Steel Construction Co.	28	-	-	29
U. S. Army	7	-	-	7
A.E.C. - Kaiser	69	-	-	59
	953	22	22	945

Process service continued at a high level during April although actual cars handled decreased 5% over March.

Car movements including process service totaled 2,278 in April compared to 2,314 in March, 2,691 in February and 2,730 in January.

Work train service was rendered for track maintenance forces on March 30, April 1 and 23 and required the handling of 11 ballast cars.

Replaced two cracked cylinder heads on locomotive 39-3726.

Overhauled the throttle assemblies and synchronized the engines on locomotives 39-3719, 39-3722 and 39-3726.

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Overhauled the distributing valve, feed valve, reducing valves, automatic and independent brake valves on locomotives 39-3725, 39-3729 and 39-3731.

Completed annual inspections on flat cars 10A-3610, 10A-3611, 10A-3615, 10A-3616, 10A-3620, 10A-3621, 10A-3622, 10A-3626 and 10A-3627.

Railroad track maintenance forces completed the rehabilitation of the Station "Susie" Crossing on April 2 which was begun on November 17, 1952.

Other track maintenance activities included the lining, surfacing and dressing of trackage required 4,110 man-hours. Installation of ties, rail and other track materials required 372 man-hours. Distribution and handling of track materials required 980 man-hours. Sand removal and stabilization work required 250 man-hours. Special work orders for the Atomic Energy Commission required 268 man-hours.

AUTOMOTIVE ACTIVITIES

The Plant Bus System transported 9.9% more passengers in April than in March. The following statistics indicate the magnitude of service rendered:

Passenger volume	150,448
Revenue - bus fares	$ 7,522.42
Earnings - transit advertising (March)	$ 259.72
Bus trips	6,538
Bus miles - passenger carrying	195,044
Passenger miles	4,833,712

The following is a comparative breakdown of average daily round trips to the Plant Areas:

Passenger buses - 100-B	11
Passenger buses - 100-D	12
Passenger buses - 100-F	11
Passenger buses - 100-H	8
Passenger buses - 100-K	3
Passenger buses - Hanford	1
Passenger buses - 200-West	31
Passenger buses - 200-East	5
Passenger buses - 300 Area	6
Passenger buses - Riverland	2
Passenger buses - White Bluffs	1
Passenger buses - North Richland	4
700-300 Area Shuttle	16
Inter-Area Passenger Shuttle & Express	2

Effective April 14 the North Richland to 700 Area straight day bus service was rerouted in North Richland to travel the regular shuttle bus route.

Transportation Section

The Richland Bus System transported 3.4% more passengers in April than in March. The following statistics indicate the volume of service rendered:

Total passengers including transfers	13,515
Revenue - bus fares	$ 888.81
Earnings - transit advertising (March)	$ 12.82
Bus trips	1,245
Bus miles - passenger carrying	6,599
Passenger miles	34,238

Off Plant chauffeured automobile trips (Company business and/or official visitors) totaled 166 which were rendered to the following locations as indicated:

Benton City, Washington	7
Finley, Washington	1
Grandview, Washington	3
Hinkle, Oregon	21
Kennewick, Washington	9
Moxee, Washington	1
Pasco, Washington	84
Pendleton, Oregon	24
Prosser, Washington	1
Sunnyside, Washington	4
Walla Walla, Washington	2
Yakima, Washington	9

The following tabulation indicates the volume of Drivers Test Service rendered:

Applicants:	Male	39	Number tests given	51
	Female	12	Number rejected	1

Permits issued:	Limited to driving with glasses	19
	Unlimited	31

Permits reissued: Routine 28

The following tabulation indicates the volume of fuel distribution by Equipment Maintenance personnel:

	Gasoline	Diesel Fuel	50 Cetane	Kerosene	White Gas
Stock at start of month	43,945	25,600	17,400	3,212	94
Received during month	114,000	13,550	24,400	1,327	212
Dispensed during month	109,205	17,750	27,000	2,821	63
Stock at end of month	48,740	21,400	14,800	1,718	243

Transportation Section

The following tabulation indicates the volume of inspection and maintenance service rendered to Hanford Atomic Products Operation automotive and heavy equipment by Equipment Maintenance personnel:

Motor overhauls	49
Class A Inspections and Repairs	148
Class B Inspections and Lubrications	1214
Other routine maintenance repairs and service calls	2548
Accident repairs and paint jobs	96
Tire repairs	611
Wash jobs	532

The following tabulation indicates the Plantwide usage of automotive equipment:

Code	Type	No. of Units	Total mileage
1A	Sedans	336	514,943
1B	Buses	100	201,610
1C	Pickup Trucks	461	255,470
1D	Panel,Carryall,Sta.Wagon	131	129,346
1E	Armored Cars	2	269
1G	Jeeps	2	675
68 Series	Trucks	212	78,172
		1,244	1,180,485

Installation of steam cleaning facilities for the 100-H Area Garage is complete except for the insulation of approximately 75 feet of one inch steam pipe.

Final inspection and acceptance of the new lubrication facilities inside the 1716-D and 1716-F Buildings was made on April 23. Lubrication service had been previously performed on outside racks for both of these areas.

The conversion of the former men's rest room to a ladies rest room in the 716 Building is virtually complete except for painting and is now in use.

Boat 81-4894 assigned to the Aquatic Biology Unit at Hanford was resealed and repainted inside and out plus replacing the propeller and propeller shaft rear bearing before being returned to service on April 20.

Major heavy equipment repairs were made to one rock crusher, one oil distributor, four caterpillar units, one crane, one air compressor and one tractor truck.

A credit adjustment of $16,452.71 was made to the 10.13 Fuel and Lubricants Inventory Account on March 31 with a corresponding debit to the 10.30 Reserve For Miscellaneous Inventory Adjustment Account. This represented the variance between the ledger value and the physical inventory that was conducted on January 23. Transportation Section expense was not charged for this variance since presumably it had accumulated over a period of several years and the loss was relatively low in comparison with the average annual usage of $350,000.

Transportation Section

Continued preparatory work for the coming physical inventory of automotive repair parts. Inventory cards for all items have been prepared of which 6,500 have been placed in the respective parts bins with approximately 9,000 still to be located.

Purchase requisitions are in process for all items approved by the Appropriations and Budget Committee and covered by the additional allocation of funds for automotive equipment.

Bids for the 22 replacement buses were to be opened May 6 in Washington, D.C.

The Appropriations and Budget Committee approved the procurement of twenty-four additional sedan delivery trucks.

LABOR ACTIVITIES

The following tabulation indicates in gallons the volume of road asphalt material handled by Transportation Services personnel:

	MC 1	MC 3	Mc 4	Mc 5
Stock at start of month	0	7,595	0	0
Received during month	0	9,320	0	0
Used during month	0	8,023	0	0
Stock at end of month	0	8,892	0	0

The following tabulation indicates the volume of road aggregate material handled by Transportation Services personnel:

	3/4" to 0 Pre-mix Tons	½" to 0 Pre-mix Tons	5/8" Chips Cu.Yd.	1/4" Chips Cu.Yd.
Stock at start of month	11	74	65	6,250
Made during month	510	209	1,020	510
Used during month	223	145	0	132
Stock at end of month	298	138	1,085	6,628

Maintenance of primary roads required 556 man-hours; secondary roads 134 man-hours; Manufacturing Area walkways, parking areas and other related work 279 man-hours; patrol roads and trails 269 man-hours.

Handling of electrical materials required 276 man-hours.

Administration Area maintenance services required 859 man-hours.

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Transportation Section.

Handling of materials and equipment for the Stores Unit at White Bluffs, Hanford, 700, 1100 and 3000 Areas included 14 carloads and 245 truckloads and required 4,017 man-hours.

The daily trucking service between Richland and the manufacturing areas handled 425 cases of acid, 2,128 cylinders of compressed gas and 816 tons of operational supplies requiring 2,083 man-hours.

The handling of office furniture, equipment and records involved 512 moving jobs requiring 1,492 man-hours.

Miscellaneous labor and equipment services for the 300 Area required 510 man-hours.

Movement of equipment and material, and other miscellaneous labor services for the 100 and 200 Areas required 517 man-hours.

Mosquito control activities required 211 man-hours.

Weed control activities required 226 man-hours.

Re-striping of Richland streets required 112 man-hours.

Special work orders for the Atomic Energy Commission required 143 man-hours.

The White Bluffs Heavy Equipment and Material Handling Crew and the 700 Area Furniture and Area Delivery Crew were moved to the 1131 Area. These moves resulted from the virtual completion of the White Bluffs excessing program and the centralizing of Stores functions in their new facility at the 3000 Area.

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HW-27932-D[redacted]

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May 6, 1953

ELECTRICAL DISTRIBUTION AND TELEPHONE SECTION

MONTHLY REPORT

April 1953

GENERAL

The Section work backlog, as of April 30, totaled 3436 man days distributed as follows:

	Days per Craftsman	Total Man Days	Net Change Man Days
Line Maintenance	47	1087	110 decrease
Substation Maintenance	31	405	17 decrease
Telephone Unit	45	1944	480 decrease

The reduction in work backlog results from transferring Richland Village electrical distribution responsibilities to the Community Operations and Real Estate Department, and a review of Telephone Unit Projects and Work Orders.

Section total work force was reduced to one hundred and seventy-five as of April 30 by transfer of 17 Distribution Unit employees to the Community Operations and Real Estate Department.

Electrical power peak demands for April were:

	Date	April KW Demand	March Comparative KW Demand
Process Load	4-8-53 (11:30 am-12:00N)	108300	102,200
Richland Load	4-7-53 (5:30 pm-6:00 pm)	19520	23,360

The all time high process demand of 108300 kw on April 8 was created by apparently unusual operating conditions in 100H Area. A previous all time high demand which approached this figure on April 3 was caused by returning

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equipment to service following a protracted shutdown in the 100DR Area. A measure of control of peak demands will be provided following installation of totalizing demand metering equipment now approved for purchase. Demands are consistent with a previous forecast for FY 1953 fourth quarter.

Richland Village demand and consumption are seasonably normal and revenue from this source may exceed the fiscal year estimate by five per cent.

ELECTRICAL DISTRIBUTION UNIT

Maintenance and Operation

No unscheduled power interruptions occurred during the month.

System Expansion and Planning

Carrier frequencies of 220,235 and 250KC have been established for the 100K Area section of the Hanford 230kv system. The Electrical Distribution Unit relay engineer is participating at Schenectady in calculating board studies relative to this system addition.

A general study and review of the present substation maintenance program is in progress. The Atomic Energy Commission has been requested to prepare a contract for Doble testing service to provide a sound economical testing program and performance records, for aging equipment.

The Hanford 115kv transmission system was inspected jointly by the BPA and AEC preliminary to negotiations for its probable disposal to BPA.

The Community Operations and Real Estate Department assumed responsibility for Richland Village electrical distribution facilities on April 27, 1953. The transfer of these functions involved seventeen (17) employees and sixteen (16) miscellaneous vehicles and pieces of mobile equipment. The change has proceeded smoothly and all minor details should be adjusted in thirty days. All Richland distribution system maps and drawings were revised to date as of April 27, 1953.

TELEPHONE UNIT

Maintenance and Operation

A summary of telephone subscriber service is as follows:

	Subscriber Stations In Service		Line Available For Service	Sides Available For Service	Exchange Lines In Service
	Res. & Misc.	Official			
Richland	5851	984	62	250	3904
N. Richland	314	298	96	44	504
Process Areas	58	1437	496	---	1436
Total	6223	2719	654	294	5844

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Maintenance and Operation (continued)

Richland Exchange four-party service:

	April 30, 1953	March 31, 1953
Number of lines, complete fill	142	124
Partial fill with three subscriber	58	63
Subscribers	814	758

Sixty-four requests were received for residential telephone service leaving a backlog of one hundred and sixty-eight (168) as of April 30.

The telephone cable lashing program (Project M-849) has been completed and all ring supports have been eliminated in Richland and plant areas.

System Expansion and Planning

A directive has been issued by the AEC for purchase of the proposed official telephone exchange equipment, Project CG-533. Equipment specifications for purchase have been prepared and delivered to the AEC.

A preliminary cost estimate and telephone cable layout were prepared for the planned addition to the Uptown Commercial Area, between Symons and Van Giesen Streets.

Work was begun on testing and tie-in of a new 303 pair telephone cable installed for service to the new laboratory building in 300 Area.

Testing, balancing and loading was started on the new 52 quad underground telephone cable installed on George Washington Way. This cable was installed to replace an existing aerial trunk cable.

ELECTRICAL DISTRIBUTION
AND TELEPHONE SECTION

FJ Mollerus:HAR:rba

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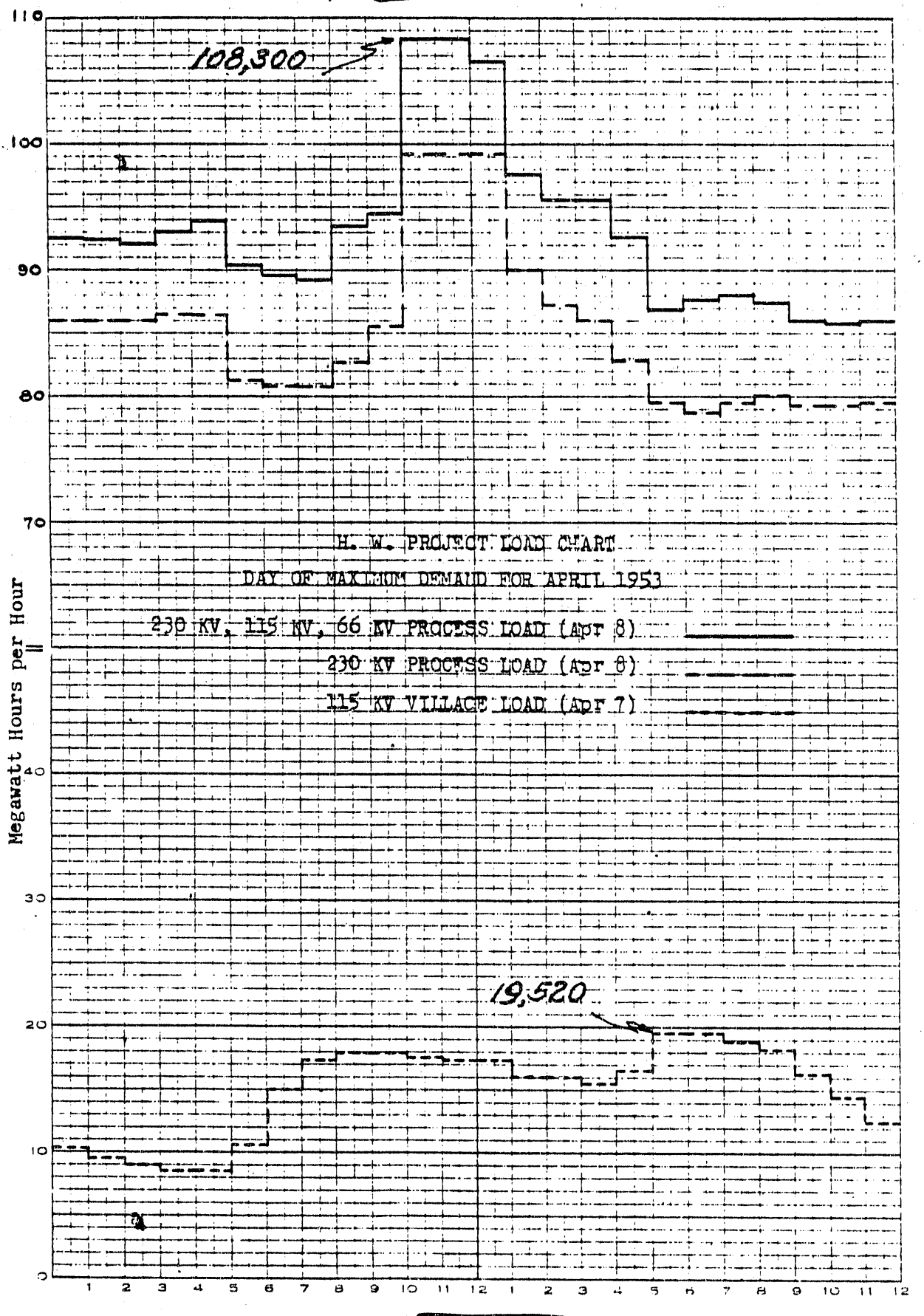
POWER STATISTICS
ELECTRICAL DISTRIBUTION AND TELEPHONE SECTION
FOR MONTH ENDING April 30, 1953 720 Hours

	ENERGY - MW HRS.		MAXIMUM DEMAND - KW		LOAD FACTOR - %	
	Last Month	This Month	Last Month	This Month	Last Month	This Month
230 KV System						
A-2 Out (100-B)	28175	26310	42300	40600	89.5	90.0
A-4 Out (100-D)	7900	15510	22400	25000	47.4	86.2
A-5 Out (100-H)	12276	2880	22650	14550	72.9	27.5
A-6 Out (100-F)	8615	7850	15200	13000	76.2	83.9
A-8 Out (200 Area)	5256	5040	8640	8640	81.8	81.0
TOTAL OUT	62222	57590	111190**	101790**	75.2	78.6
MIDWAY IN	62560	59015	92400 *	99200 *	91.0	82.6
Transm. Loss	---					
Per cent Loss	---					
115 KV System						
B1-S5	122	101	518	518	31.6	27.1
B1-S4 Out (N. Rich.)	2246	1891	3802	3974	79.4	66.1
Richland	9912	8874	19800 *	19520 *	67.3	63.1
BB3-S4 Out (300 Area)	1352	1288	2720	2800	66.8	63.9
TOTAL OUT	13632	12154	26840**	26812**	68.3	63.0
Benton In	13560	12240	31200 *	31600 *	54.9	53.8
So. Richland In	100	0	9200 *	0 *	14.6	—
TOTAL IN	13660	12240	42400**	31600**	43.3	53.8
Transm. Loss	---					
Per cent Loss	---					
66 KV System						
B9-S11 Out (100-K)	378	402	937	1120	54.2	49.8
B9-S10 Out (W.Bluffs)	423	381	1057	1035	53.8	51.1
Hanford Out	230	202	400**	400**	77.3	70.1
TOTAL OUT	1031	985	2394**	2555**	57.9	53.5
HANFORD IN	1021	970	2300 *	2500 *	59.7	53.9
Transm. Loss	---					
Per cent Loss	---					
Project Total						
230 KV Out	62222	57590	111190**	101790**	75.2	78.6
115 KV Out	13632	12154	26840**	26812**	68.0	63.0
66 KV Out	1031	985	2394**	2555**	57.9	53.5
TOTAL OUT	76885	70729	140424**	131157**	73.5	74.9
230KV In	62560	59015	92400 *	99200 *	91.0	82.6
115 KV In	13660	12240	42400**	31600**	43.3	53.8
66 KV In	1021	970	2300**	2500**	59.7	53.9
TOTAL IN	77241	72225		133300		75.3
Transm. Loss	---					
Per cent Loss	---					

* Denotes Coincidental Demand
** Denotes Non-Coincidental Demand

Average Power Factor - 230 KV System 91.7
Average Power Factor - 115 KV System 91.2
Average Power Factor - 66 KV System 88.4

[redacted]


108,300
19,520
H. W. PROJECT LOAD CHART
DAY OF MAXIMUM DEMAND FOR APRIL 1953
230 KV, 115 KV, 66 KV PROCESS LOAD (Apr 8)
230 KV PROCESS LOAD (Apr 8)
115 KV VILLAGE LOAD (Apr 7)
Megawatt Hours per Hour
110
100
90
80
70
40
30
20
10
0
1 2 3 4 5 6 7 8 9 10 11 12 1 2 3 4 5 6 7 8 9 10 11 12

PLANT AUXILIARY OPERATIONS DEPARTMENT
STATISTICAL AND COMPUTING SECTION

MONTHLY REPORT - APRIL, 1953

Personnel Statistics

Following is the month end summary of personnel:

Statistical and Computing Section

	As of 3-31-53			As of 4-30-53			Net Change		
Unit	Ex	Non-Ex	Total	Ex	Non-Ex	Total	Ex	Non-Ex	Total
General	1	1	2	1	1	2	0	0	0
Statistics	8	4	12	8	4	12	0	0	0
Computing	24	44	68	20	42	62	-4	-2	-6
Graphics	1	6	7	1	5	6	0	-1	-1
Procedures	0	0	0	9	5	14	+9	+5	+14
TOTAL	34	55	89	39	57	96	+5	+2	+7

Statistics Unit

	As of 3-31-53			As of 4-30-53			Net Change		
	Ex	Non-Ex	Total	Ex	Non-Ex	Total	Ex	Non-Ex	Total
Staff	1	1	2	1	1	2	0	0	0
Administrative Statistics	2	0	2	2	0	2	0	0	0
Precision & Quality Control	2	3	5	2	3	5	0	0	0
Technical Statistics	3	0	3	3	0	3	0	0	0
TOTAL	8	4	12	8	4	12	0	0	0

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Computing Unit

	As of 3-31-53			As of 4-30-53			Net Change		
	Ex	Non-Ex	Total	Ex	Non-Ex	Total	Ex	Non-Ex	Total
Staff	2	2	4	2	2	4	0	0	0
Analysis and Programming	15	5	20	11	5	16	-4	0	-4
Operation	7	36	43	7	34	41	0	-2	-2
Rot. Training	0	1	1	0	1	1	0	0	0
TOTAL	24	44	68	20	42	62	-4	-2	-6

Four IBM procedure analysts were transferred from the Computing Unit to the newly organized Procedures Unit within the Statistical and Computing Section effective 4-15-53. Two tabulating machine operators terminated effective 4-10-53 and 4-21-53 respectively.

Mr. Daniel D. McCracken is attending the IBM World Headquarters, International Business Machines Corporation, in New York City from April 12 through May 12, 1953 for the purpose of using the new 701 electronic data processing machines on a Monte Carlo study of blackness calculation of a uranium slab for the Engineering Department.

Graphics Unit

	As of 3-31-53			As of 4-30-53			Net Change		
	Ex	Non-Ex	Total	Ex	Non-Ex	Total	Ex	Non-Ex	Total
Staff	1	1	2	1	0	1	0	-1	-1
Illustrators	0	5	5	0	4	4	0	-1	-1
Graphic Designer	0	0	0	0	1	1	0	+1	+1
TOTAL	1	6	7	1	5	6	0	-1	-1

One general clerk was transferred from the Graphics Unit to the Engineering Department, effective 4-6-53 and one graphic illustrator was terminated effective 4-24-53. One graphic designer was transferred from the Engineering Department to the Graphics Unit effective 4-6-53.

Procedures Unit

	As of 3-31-53			As of 4-30-53			Net Change		
	Ex	Non-Ex	Total	Ex	Non-Ex	Total	Ex	Non-Ex	Total
Staff	0	0	0	1	2	3	+1	+2	+3
Clerical	0	0	0	0	3	3	0	+3	+3
Procedure Analysts	0	0	0	8	0	8	+8	0	+8
TOTAL	0	0	0	9	5	14	+9	+5	+14

Four IBM procedure analysts from Computing Unit; six procedure analysts from the Plant Protection Section were transferred to the newly established Procedures Unit effective 4-15-53 with Mr. Harrison Tellier installed as Head, Procedures. Also transferred from the Plant Protection Section were one secretary, one steno-typist, and three general clerks, effective 4-15-53. One procedure analyst terminated effective 4-17-53.

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FOR THE MANUFACTURING DEPARTMENT

Data were analyzed from the reactivity testing of lithium-aluminum alloy slugs in the 305 Test Pile. It was found that the variation of reactivity within the heats has remained relatively constant, and can be assumed to be well known. This permitted the institution of a new type sampling plan, which calls for the testing of five pieces for an initial sample and ten pieces for a second sample if required. The former plan called for eight and sixteen pieces respectively. In addition to the reduction in sample size, the computations necessary to reach a decision have been greatly simplified. A document is being issued covering the analyses and new sampling plan.

A monthly report was issued on Metal Preparation Section results from machining, canning, autoclave, test pile, melt plant, and oxides. (Document HW-27654, "Statistical Quality Report - 300 Area - March, 1953", from R. F. Cell to W. W. Windsheimer.)

Computations were made of flux values at points within a slug. The work involved integrating numerically the product of an empirical function and an analytic function.

A statistical method of evaluating the relationship between the power of adjacent tubes in the 105-C pile was prepared to assist the Manufacturing Department in seeking the highest safe operating level for the pile. (Memorandum from R. F. Cell to R. Bloomstrand.)

Calculations were made to determine new graphite temperature limits for one of the piles. This problem was assigned top computational priority to provide information rapidly enough to prevent a power cut-back and a resulting production loss.

The routine for calculation of heat conductance through the lattice has been completely revised and new procedures written. An IBM report was prepared from C-Reactor data for the months of February, March and April. Tube factors were calculated for F-Reactor. IBM board wiring and programming have been completed for the DR P-10 panellit studies.

A study was made, and reported in rough draft form, providing a number of hand and shoe counting plans for use by the Radiation Monitoring Sub-Section of the Separations Section. In these plans, the warning level of each counter is periodically and individually adjusted according to observed background count. This was necessary because significant variability in background rates for different counters was found for both alpha and beta counters.

Further statistical assistance was given the Plant Engineering Sub-Section, Separations Section, on various aspects of the problem of maintenance standards. (Letters from L. W. Smith to F. A. Wonn, "Standards for Maintenance Liquidations to Separations Manufacturing Cost", and "Dollar Standards for Separations Maintenance Account 6275". Further statistical studies are planned which will consider maintenance liquidations of labor, material, and IME to various facilities and accounts.

A scoping report was issued in the statistical study to be conducted for the Manufacturing Department Staff. The general purposes of this study are: (1) Determine methods of predicting manufacturing costs for each major product, taking into account all major factors affecting these costs. (2) Put statistical control limits about each predicted value to allow the intelligent comparison of actual and predicted costs. (3) Study the behavior of major components of manufacturing costs to determine if they are fixed, variable with production, seasonally variable, etc. (Scoping Report from L. W. Smith to G. R. Moore, "Manufacturing Cost Study".)

Graphic work for the Reactor Section included preparation of two plates for slides on "River Flow at Richland" - 16 year average and "Run Off-Columbia River above Richland"; for the Separations Section consisted of photo-retouch and overlay work for plates to be used in Document HW-27401 on process equipment; and preparation of two absenteeism rate charts; and for the Administrative Sub-Section included preparation of the HAPO Cost Flow Chart; posting and inking the Manufacturing Department control charts; and preparation of a series of lecture charts.

FOR THE ENGINEERING DEPARTMENT

The statistical study of the rho values measuring uranium orientation is being concluded. The degree of randomness of the crystal structure of the metal caused by various process conditions is one of the several variables under surveillance. It has been found that with one possible exception (the 002 plane) the rho values have a logarithmic-normal distribution and can be dealt with statistically.

A report on the data from Red Tag lots is forthcoming. This study includes the relationships between physical and chemical properties, rolling variations, and orientation rho values.

More recent data were analyzed in the study to relate the degree of preferred orientation in fabricated uranium slugs to the number of cleavage failures induced by subjecting sampled slugs to various special treatments and then autoclaving. In view of the inability to gain any great amount of information out of the existing data a new experimental design was suggested for future observations. (Note to R. Socky from Virginia Clark and F. H. Tingey, "Tests for Effects of Uranium Orientation on Destruction by Autoclaving of Lead Dipped and Al-Si Triple-Dipped Slugs".)

A computational problem for laboratory equipment development involves the tracing of light beams through a set of six 5° prisms having specified (distinct) indices of refraction. In future computations the number of prisms will be extended and their common vertex angle made smaller.

A numerical correction of X-ray line studies for the Metallurgy Sub-Unit involves the determination of a Fourier series for each of two empirical curves and, from them, the calculation of a third Fourier series.

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Statistical analysis has begun on spectroscopic data to determine which carriers give the optimum emission of various impurities in uranium at different levels of current and carrier concentration. Under consideration will be the conditions which afford the highest maximum emission at any time, and also the largest total emission both over long and short periods of time, for each of the impurities. The results obtained from a mixture of carriers will also be compared with the results of its components.

Two lines of the form $R_t = R_o(1 + \alpha t)$ were fitted between the resistance in ohms and the centrigrade temperature of uranium bars, one for irradiated material and the other for beta heat-treated production material. The corresponding limits were also computed. (Letter from Virginia Clark and F. H. Tingey to R. S. Kemper, "Equation of Resistance Versus Temperature for Uranium Bars".)

One-hundred-forty cases were calculated on the problem of the distribution of temperature in a slug, using a new value for the conductivity of uranium.

Further calculations were made for Theoretical Physicists on the Hollow Slug Problem. Approximately 200 separate cases were considered. In particular, fluxes, power limits and stresses were studied.

An attempt was made to relate number of rejects (voids) per truck as detected by a high frequency sound detector (sonizon) to the number of regular canning rejects. No relationship was detected. Data are now being kept on each individual slug for further study.

Analysis of the canning data was completed in connection with the study of fabrication and irradiation of triple-dip slugs in an Al-Si bath with impurity levels above normal. A logarithmic curve with appropriate limits was fitted for the percent tin versus the number of slugs canned in the Al-Si bath. No significant difference could be detected between the percent of rejects for this study and percent of rejects from normal canning. (Letter from Virginia Clark and F. H. Tingey to W. K. Kratzer, "Percent Tin in Bath and Comparison of Canning Reject Rates".)

A statistical study was concluded on the dih values of metal processed through the 305 Test Pile each month for the past fourteen months. A report was issued. ("Average dih for Slugs Tested by Months", Document HW-27671, from D. O. Richards to H. L. Mars.)

Data pertinent to the corrosive and pitting properties of four different types of aluminum subject to various operating conditions were analyzed to determine significant factors affecting these properties. The factors studied were water, temperature of water, flow rate, type of aluminum and water treatment. (Letter from Joan Cannon and F. H. Tingey to W. C. Houck, "Statistical Analysis of the Corrosive Properties of Aluminum Under Various Operating Conditions".)

An extensive study is being undertaken to systematize and organize all aspects of the data collection and subsequent analysis to be associated with the proposed routine examination of irradiated slugs in the 105-C test basin. A preliminary report outlining suggested procedures and methods will be forthcoming shortly.

During the recent shutdown of H Area, the entire reactor was re-orificed and the panellit gages reset. The gages are now equipped with limit switches which scram the pile if the variation in panellit pressure exceeds pre-determined limits. In order to calculate the initial individual panellit gage settings the root of a difficult transcendental equation had to be found for each gage. Through advanced IBM circuit design a method was devised to find each root by iteration at electronic speeds. The roots were located at the rate of approximately 6 per minute.

A flow lab and in-pile experiment is being designed to assess the effect of such variable operating conditions as water treatment, turbidity and pH on corrosion and film formation in process tubes.

An experiment was designed to determine the effect of plutonium concentration and valence state, hydrogen ion concentration, light, pressure head, and metal type on pressure buildup in storage cans in the 234-5 Building process.

Investigations were initiated to determine the temperature operating range in which the use of the magne-gauge calibration curve for the determination of the thickness of chrome plate on the plutonium pieces fabricated in the 234-5 Building is valid.

Data from the 235 Building process are being analyzed to determine the effect of turnings on the reduction yield and on the casting yield. The reduction in casting yield as a result of briquetting, as compared to yield using re-cycle, is also being studied.

Discussions were held, and an experimental design tentatively agreed upon, in connection with the determination of the operating characteristics of the proposed tube monitors for K reactors. The behavior of the devices for various temperature settings after being subjected to various treatments simulating actual pile conditions will be investigated. A sampling plan is being formulated for determining whether the monitors meet specification requirements.

Methods of detecting outliers in small numbers of observations, along with the necessary tables, were provided to members of the Pile Technology Unit. (Letter from F. H. Tingey to S. Goldsmith, "Tests for Outliers", dated April 7, 1953.)

A set of three equations in five variables, expressed as 3 x 3 determinants equated to zero were furnished by the theoretical physicists. It was requested that these equations be reduced to polynomial form in the variables. The computations included the evaluation of 100 numerical 3 x 3 determinants.

The problem of the buckling in a cube is nearing completion, barring unforeseen difficulties. Final numerical calculations are in the process of being performed.

Routine calculating for the Engineering Department included Group Nine Metal Studies, Graphite studies for B and H Reactors, DR Lattice Conductance Studies,

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Curve Fitting on P-12 data, and tube factor calculations for H and C Reactors.

The following is the current status of a procedure analysis being made of the problems of the Classified Files.

1. A statistical study of author data and age of documents used data is nearly complete and a report scheduled for release in May.
2. Assistance was rendered on the problem of operating statistics report forms of a classified nature and the general problem of properly classifying and accounting for these reports in the 100 and 200 areas.
3. A report is in process on the savings which would result from centralization of files in the 300 area.

Eight master plates for the Technical Section were prepared by the Graphics Unit and expedited for processing into slides to be used by the Section Manager.

Graphic work for the Applied Research Unit included touch-up and art work on three photos for a report titled "Double Crystal X-Ray Spectrometer"; preparation of three charts on "Composition of UNA-ANN Solutions"; and preparation of five schematic illustrations to be used as slides for off site lecture.

Graphic work for Pile Technology Unit included layout, preparation of drawings, sub-titles and descriptive information, photo-retouch, overlay work, etc., for the following:

1. HW-27647, "Use of Lead to Decrease Extraction Losses of Tritium From Irradiated Lithium Aluminum Alloy"
2. HW-27297, "Slug Weld Studies"
3. HW-27855, "Solid Phase Dip Line of Al-Si"
4. A report titled "Non-Destructive Testing of Hot Canned Slugs"
5. HW-27778, "Primary Pump Speed vs. Total 190-B Process"
6. HW-27559, preparation of 16 plates including extremely delicate touch-up on 31 photos for a report on Radiography Production
7. HW-27574, preparation of twenty-five charts on range, trend and costs
8. HW-27646, preparation of six schematic drawings; preparation of four detailed charts for a report titled "Hanford Ruptures vs. Machine Slug Quality"
9. HW-25080, "Reactivity Changes - H Pile" consisting of twelve charts and graphs.

Graphic work for Technical Services Unit included preparation of twelve plates requiring photo-retouch, schematic drawings, and overlay work for a report titled "Hanford Slave Manipulator"; and preparation of one schematic drawing and touch-up of two photos of a Decontamination Sandblaster.

FOR THE PLANT AUXILIARY OPERATIONS DEPARTMENT

Most of the analytical work on the Industrial Injury Study (formerly called the Accident Cost Study) has been completed. A summary of the results to date was issued in rough draft form (Highlights of Findings - Industrial Injury Study", by L. W. Smith, April 23, 1953). This is a study of data on all known industrial injuries at the Hanford Atomic Products Operation from October, 1951 through September, 1952. From these data the distribution of injuries among employees

was studied. In particular, the effects of age and length of service were studied and some significant effects were found. The times at which injuries occurred and the delays in reporting injuries were studied and definite patterns were found. The use of prescribed cause codes on injury reports was analyzed. Finally, an attempt was made to get reliable data on the direct costs of industrial injuries to determine if any significant patterns could be formed. The results of this part of the study were largely negative.

A report was prepared for Security and Patrol of all employees hired prior to July 1, 1950.

Preliminary Analysis was started on a system of office machine inventory and billing for the Office Services Unit.

A study is being made of the 200 West Laundry Operations to determine what internal improvements can be effected by the laundry and assistance can be rendered by the customer units. The current status is:

1. A committee including representatives of the Manufacturing and Radiological Sciences Departments has been organized to study the laundry problems.
2. Customer Units have agreed to certain changes in service which will bring about a reduction in operating costs
3. Instrument Development of Radiological Sciences is starting the construction of a new monitoring device that is expected to increase monitoring production substantially, and will minimize the human error in monitoring.
4. Several other changes are being made in the laundry to speed-up production.

For the first time a complete set of procedures were available for the IBM operation of billing of elctric energy. These procedures were supplemented by a time-table and procedure sequence chart for use as a visual procedure flow chart to reflect the sequence of operations required to build up and process the billing operation.

Routine transportation reports were prepared.

New Graphic work for the Department included preparation of six absenteeism charts, one for each section and one for the department total; preparation of two large full color illustrated visual aids for Records Control; preparation of eight control charts for the Statistical and Computing Section; and preparation of two plates to be used as slides by the Statistics Unit. Other work included revisions and posting latest data to the monthly Accident Statistics Report.

FOR THE RADIOLOGICAL SCIENCES DEPARTMENT

An experiment was designed to detect the effect of dosage, age of animal, lactation age, and number of lambs nursing, on the level of activity found in the milk of radioactive iodine fed sheep.

Tables were compiled for the Biology Unit indicating sample sizes necessary to estimate the true mean level of response with a given precision when the biological variation between animals is a known amount.

Consultations and discussions were held pertient to a proposed experiment involving the feeding of several different levels of dosage of radioactive arsenic to rats. Deposition in the various body tissues after prolonged feeding will be determined.

Confidence limits were determined on the true mean deposition of radioactive iodine in blood, feces, urine, and milk for each group of sheep for the year 1952.

Data were analyzed incidental to the determination of the effect of feeding iodized salt concurrently with the radioactive iodine on the deposition of the radioactive iodine in the thyroid of sheep. (Note from F. H. Tingey to D. Warner, April 30, 1953.)

A critical examination of the data was made, and tests of significance were constructed, to determine whether a concentration effect existed in the experiment dealing with the deposition of Pu in body tissues of rats. (Letter from F. H. Tingey to J. Katz, "Concentration Effect in Pu Fed Rats", April 20, 1953.)

Routine computational work for the Radiological Sciences included monthly meteorological studies, sheep thyroid and radio analysis calculations, aquatic biology calculations, and sheep blood count reports.

FOR THE MEDICAL DEPARTMENT

Absenteeism control charts have been prepared for various units, sections and departments throughout the plant. Each chart shows the monthly expected values for the absenteeism rate of the group of employees considered, and the limits of the expected variation of these monthly rates. These expected values and limits are based on the existing plant-wide rates for men and women and are adjusted to apply to a particular group by taking into account its size and its proportion of men and women. The actual monthly absenteeism rates starting with January of 1952 were also plotted on the chart. These charts serve as a basis of comparing actual monthly rates with their corresponding expected rates. By plotting each month's absenteeism rate on the chart, one can determine when the situation warrants investigation. A chart and an accompanying letter explaining its use and interpretation were sent to the following groups requesting this service.

Plant Auxiliary Operations Department
Purchasing and Stores Section
Transportation Section
Electrical Distribution & Telephone Section
Statistical and Computing Section
Plant Protection Section
Community Real Estate Section
Separations Section
Analytical Control Unit - Separations Section
Operations Sub-Section - Separations Section
Financial Department
Medical Department

Routine public health reports were prepared on IBM equipment.

FOR THE EMPLOYEE AND PUBLIC RELATIONS DEPARTMENT

Tables of employee separation rates for the various organizational groups used in the Hanford Works attitude survey were prepared at the request of the Employee Relations Section. These tables were prepared to assist Richardson, Bellows, Henry and Company in relating separation data with attitude survey data (letter from L. G. Waters to G. D. Barr, "Separation Rates").

The analysis of the results of the recently conducted attitude survey on the Sheldon-Claire poster series was completed. The purpose of the survey was to ascertain the attitude of employees toward the present poster series with the objective of determining whether or not these series should be continued. (Letter from L. G. Waters to E. T. Murphy, "Attitude Toward Sheldon-Claire Poster Series".)

A new semi-annual AEC manpower report was prepared for the first time. This report shows the amount of manpower by occupational classifications subject to draft calls and military recalls. In addition to this report, four special listings of personnel by broad occupational classification were prepared.

A scoping report was issued which gives the methods of data handling, IBM tabulation, and statistical analysis, for the first phase of the 1953 salary survey. The first phase under consideration is assisting the Salary Administration Section in the preparation of the two booklets "National" and "West Coast" comparative salary survey for exempt employees. (Letter from L. G. Waters to G. C. Swanson, "Scoping Report - 1953 Salary Survey".) Thirty percent of the data from the current salary survey has been keypunched.

FOR THE FINANCIAL DEPARTMENT

A more efficient method of calculating non-exempt payroll earnings was developed. This new method consolidates 13 separate IBM machine operations into 5 operations and will result in an estimated savings of 25 machine hours and 50 man hours per month. This new method will be installed for the payroll ending May 3rd.

A new system of preparing a Paid-up Insurance Register was developed and installed. This register will record the amounts of insurance premium payments withheld from weekly payroll checks or paid in cash for purchase of paid-up insurance.

Non-exempt personnel not members of bargaining units were paid a 1.79% base rate increase in checks for the week ending April 5th and at the same time retroactive payment was made effective March 16th. This was the first time that retroactive payments have been made concurrently with the change of rates.

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A new procedure for recording payroll deductions for savings and stock bonus bond purchases was installed.

A policy change in method of computing vacation hours to be paid has necessitated the calculation of an average weekly hours worked during the base period of April 1, 1952 thru March 31, 1953. This calculation requires the processing of some 300,000 IBM cards. A procedure was developed for this problem using the Card Programmed Electronic Calculator which will result in a savings of some 70 machine hours and $200.00 over a procedure using the conventional IBM machines.

Routine IBM computations relative to payroll and costs were completed on schedule. The cost of the IBM work necessary to provide non-exempt paychecks, earning statements, payroll registers, and over 100 payroll reports per month has decreased from 40.6 cents per check for the first quarter FY 1953, to 28.4 cents per check for the second quarter, and to 26.3 cents per check for the third quarter.

Graphic work for the Financial Department included preparation of budget review charts; a Financial Department Absenteeism chart; and a Manufacturing Cost Unit Organization Chart. Other work consisted of making revisions and plotting current figures to the following master plates:

1. "Average Contract Bank Account Balances"
2. "Report of Cash Expenditures"
3. "R&D Operating Costs and Budgets"
4. the "Employee and Payroll Statistics Absenteeism" chart.

FOR ADMINISTRATIVE PRACTICES

The number of discs that it would be necessary to measure the amount of U^{235} received in a lot of fuel discs for test reactor use has been determined. Consideration was given both to variations due to measurement error and to expected variations in the quantity of material in each disc. It is anticipated that a graph will be provided for estimating the sample size required to obtain a given evaluation error.

Another study nearing completion concerns material remaining as slag and crucibles after fabrication of plutonium buttons in Building 234-5. Investigation is being made of the sample sizes necessary in order to achieve various degrees of precision in estimating the total quantity of plutonium in this material.

A study was completed to determine the precision of statements of plutonium content of shapes. (Document HW-27799, "Statistically Determined Precision of Plutonium Content of Shapes", from N. D. Peterson to C. J. Shortess, Jr., April 21, 1953.) Included was an evaluation of the constant factor applied to scale weights to correct for impurities in the content of shapes. As incidental results, the precision of measurement of the two major impurities was reported. Data were taken from the records of the 234-5 analytical laboratory.

The probability distribution of daily and weekly attendance, in the event that exempt employees were to be scheduled to attend a given program when their birthdays came due, was obtained theoretically to ascertain the feasibility of adopting such a program.

Graphic work for Administrative Practices included completion of a rush request for organization charts and overlay work comparing HAPO-GE with HOO-AEC functions. Also included was a request to make latest changes to the directory organization charts.

FOR THE ATOMIC ENERGY COMMISSION

A large percentage of Graphics time allocated to the AEC was spent in preparation of material requested by the Engineering and Construction Office on the expansion program. This work included preparation of a revised 100-K site plan showing facilities, power lines, water and sewage lines, etc.; revising the 300 Area Site Plan; preparation of charts and tables; and start up of work on a site plan of the Purex Plant and facilities. Other work for the Commission included completion of a Hanford Site Plan.

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Department Serviced	Percent of Services Rendered				
	Units				Statistical & Computing Section
	Statistics	Procedures	Computing	Graphics	
Manufacturing	24	0	5	9	7
Engineering	26	14	24	49	25
Plant Auxiliary Operations	9	56	7	12	12
Community Operations & Real Estate	1	1	0	1	-
Radiological Sciences	10	0	2	2	3
Medical	1	0	-	1	-
Employee & Public Relations	9	2	4	1	4
Financial	0	27	56	5	43
Administrative Practices	12	0	0	2	2
Atomic Energy Commission	8	0	2	18	4
TOTAL	100	100	100	100	100

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EMPLOYEE AND PUBLIC RELATIONS DEPARTMENT

SUMMARY -- APRIL, 1953

The number of applicants interviewed in April was 1,066 as compared with 1,199 for March. In addition, 83 new applicants applied by mail. Open, nonexempt nontechnical requisitions increased from 149 at the beginning of the month to 217 at month end. Seventy-seven employees were added to the roll and 113 removed during the month. Separation decreased from 1.37% in March to 1.35% in April. During April, 36 new requests for transfer to other type work were received by Employment and 42 transfers were effected. Attendance recognition awards were distributed to 206 employees in April, including 53 employees who qualified for three-year awards.

Five employees died during the month and five employees retired. Two hundred and thirty-four visits were made to employees confined to Kadlec Hospital and 108 checks were delivered to employees confined at the Hospital or at home. At month end, participation in the Pension Plan was 95.2%, in the Insurance Plan 98.9%, and the Employee Savings and Stock Bonus Plan 44.3%. At month end there were 841 registered under Selective Service and 766 military reservists were on the roll. Since August 1, 1950, 279 employees have terminated to enter military service, of which 59 have returned, 4 have not claimed reemployment rights, leaving 216 still in military leave status.

Orientation of new employees was presented daily throughout the report month. A total of 55 employees attended this program. Of this number, 100% have signed up to participate in the Pension Plan, 96.3% in the Insurance Plan, and 87.2% in the Good Neighbor Fund.

Seventy-three adopted suggestions were approved by the Suggestion Committee for awards during the month totaling $1,980.

The revised and modified manpower inventory required by the Atomic Energy Commission reflecting the status as of the end of March, 1953, was completed and transmitted to the Commission April 21, 1953.

Three representatives of the Personnel Practices Unit attended a regional workshop in Chicago on April 14 and 15 sponsored by the New York Office concerning "Better Selection and Placement of Personnel".

An open house for all GE men and women was held Tuesday evening, April 14, by the local GE dealer.

Five copies of the report to employees entitled "How Hanford Looks To You" prepared by Richardson, Bellows, Henry, and Company, were received and the reports for all employees were shipped April 24.

The drive for new members in the Good Neighbor Fund has resulted in 635 new participants which brings the participation up to about 60%.

Employee and Public Relations
Summary

Training and Development programs and activities for April, 1953, were as follows: Management Orientation was presented on Monday, April 6, with 22 new exempt personnel in attendance. Supervisors 40-Hour program was presented during the week of April 27 through May 1 with 12 new supervisors in attendance. Policy Panel Seminar, scheduled to be presented at Hanford High School during the week of April 27-May 1, was canceled due to insufficient enrollment. Conference Leading was offered in April with 23 supervisors in attendance. Management Conferences on Human Relations was conducted again this month to five groups of approximately 20 supervisors each. Professional Management Development -- On Tuesday evening, April 7, a review of our "Customer Relations" program was offered, with 28 exempt personnel attending; and on Tuesday evening, April 21, a PMS refresher highlight program was offered with 10 exempt personnel taking advantage of this opportunity to review the methods. Management Panel Forum -- On Thursday evening, April 2, the subject of "Philosophy of Company Policy" was discussed, with 31 supervisors attending; on Thursday evening, April 16, the subject was "Social Responsibility of Business" with 28 supervisors present; and "Developing Tomorrow's Leadership" was the subject discussed on April 30 with 18 supervisors present. Supervisor's Handbook -- Sixteen revised pages were distributed to handbook holders during April. Customer Relations program was presented to 15 non-exempt employees of Radiation Monitoring Unit on March 30, and April 1 and 2. Steno-Secretary Personnel program is ready for a test presentation on May 12. SAGE -- Supervisor and General Electric bulletin was again distributed to Lists 1, 2 and 3 on April 10 and April 30. HOBSO II -- Mr. Howard Bennett, Manager of Economic Training for the General Electric Company, visited this Operation on April 14 and 15 and presented a preview of HOBSO II to managers of HAPO.

Copy for the first issue of a forthcoming Management News Bulletin was written, and letterhead prepared. The bulletin will be distributed to all exempt employees periodically; and will contain news items of interest to Hanford Management. First issues of this publication will cover significant changes in the GE-HAMTC Agreement now under negotiation.

Revisions to "1952 at Hanford Works" required alteration of five pages, and consequently the reprinting of a total of ten pages in the report. Completion of the revisions was achieved on Thursday, April 23.

Publicity for the open house by the local GE dealer, Pleiss-Davis, consisted of a letter to management; and a news story and photographs in the GE News; and follow-up photographs in the plant paper. Approximately 1000 persons attended.

At the request of Radiological Sciences, a four-color poster presenting the new radiation symbol and signs was prepared. Copies of the poster were sent to Minor Construction, Kaiser Engineering, and the U.S. Army. In addition, these posters have been placed in all main and exclusion area badge houses.

The sixth in a series of 9-full-page GE messages on the 9-Point Job Program was prepared on the subject "Job Satisfaction."

Employee and Public Relations
Summary

Copy for the booklet on the exempt salary plans, "Your Salary Plans," was approved by the Salary Committee and the General Manager. Additional copies were prepared and distributed to department managers for their review prior to preparation of final art work.

Transfers of exempt people from Hanford to other GE plants are being publicized to emphasize opportunity for advancement exists in other parts of GE. Three transfers were publicized during the month in the GE News.

Full page GE News feature on a Biology Section "Climitizer" explained how plants are grown under controlled conditions for experimental purposes. The feature was picked up by the Hanford News Bureau for distribution to all national Farm magazines.

75th Anniversary publicity in the GE News included the first in a series of syndicated articles on Company history; GE dealer's open house; and editorial cartoon promoting the Savings and Stock Bonus Plan, with syndicated editorial.

A total of 61 releases were distributed during the month. Of these, 28 were sent to the local list and radio stations. Two were sent to media throughout the Northwest, 14 to hometown papers, 2 to trade journals and 15 received special distribution.

Three feature stories were written and distributed during the month.

The local reporter for the Columbia Basin NEWS is working on a series of articles about services offered to residents in Richland by the General Electric Company. His series will be based on interviews with the persons in charge of Municipal Services, Public Health, and the Hospital.

A member of Public Relations attended two meetings at Our Lady of Lourdes Hospital in Pasco to advise representatives of the three hospitals in the Tri-Cities concerning methods for publicizing and promoting observances of National Hospital Week as a joint effort between the three towns.

A feature writer of the Walla Walla Union-BULLETIN, Vance Orchard, is writing a special story on Hanford's motion picture production activities. It will appear in one of the future issues of the paper. Special emphasis is being given to the 16mm color motion picture that features Orientation subjects presently being produced for Employee Relations Section.

The Community Newsletter and the March-April News Digest were mailed to all community leaders in Pasco, Kennewick and Richland.

Eight letters were received from students and teachers during the month asking for information on atomic energy or Hanford. All requests were filled.

Sixteen papers were cleared for presentation and/or publication during the month, seven of which were in abstract form.

Employee and Public Relations
Summary

On Saturday, April 24, 1953, the General Manager addressed 150 members of DeMolay at the district conclave held in the Masonic Temple in Richland.

A total of 189 photography assignments were filled during the month, producing a total of 17,358 prints, of which 15,153 were "A" and "B" badge prints. Area and news work accounted for 2,205 prints.

Over 4000 feet of classified motion picture footage taken in a "critical" phase of the 100-C area construction was submitted to this Section. A special project has been set up and cost estimates submitted for editing and adding narration to this footage for production of a 30-minute training film to be used in conjunction with similar work at 100-K area.

Photography on the 16mm black and white training-documentary film for Minor Projects was completed this month.

H. B. Butler of W. A. Palmer Films, San Francisco, one of the pioneers in the field of 16mm motion picture production, visited the Public Relations Section on April 16 and 17. Meetings were held with members of AEC Engineering and Construction Division, GE Design Section, Minor Projects Section, Employee Relations Section and Purchasing Section representatives.

The local chapter of the American Chemical Society has requested use of the GE produced motion picture "A is for Atom" for showings to High School science classes. They were informed that it had been proposed by another source that a print of this film be presented by the General Manager to the Science Instructor at Columbia High School who would arrange showings to all students.

Eleven motion pictures were procured for plant training group showings.

May 25, 1953, will mark the first anniversary of the Hanford SCIENCE FORUM. During the year, 52 regularly scheduled broadcasts have reached the public over Radio Station KWIE. The SCIENCE FORUM will continue to be broadcast at the regular time, 8:00 p.m. Tuesdays, until June 16, at which time the program will take a summer hiatus until September.

Evaluation to establish all positions and to consolidate in accordance with announced organization as listed in the organization directory has been the major effort of the Salary Administration Section during April. This is a continuation from last month. The heavy load of this type of work is brought about by the revision of the "Position Description Manual" which is to be prepared in the near future.

The contacts for the national salary survey have been completed. A few contacts for the West Coast survey are still outstanding. Salary data is coming in at a good rate

from participants and preparation of the data for the national report is now underway. Comments on the brochure "Your Salary Plans" have been received from department managers. The release of copy for publication will be delayed pending resolution of differences of opinion on the kinds and amount of information to be released.

All open offers to technical graduates were quickly converted to Schenectady offers with the approval of Mr. Boring. This move was also explained in general terms to appropriate engineering deans and placement officers, to preserve good will at the colleges.

Ph.D. recruiting is reduced to manning a very few positions, for whom high grade candidates are being considered. A very few specific needs still exist for engineers with experience in industry. It is anticipated that some of these needs can be met by transfers within the Company.

The number of trainees has dropped during April from 85 to 73. The change of 12 represents 8 placements in departments, 3 resignations and 1 transfer.

Transfers to other GE plants were arranged during April for 5 exempt engineers, all with the concurrence of suitable managers here. We have also dealt with 4 men who resigned during this month to insure that good will was preserved. In the Separations Process Unit of Manufacturing, discussions with supervisors indicated that 16 chemists could be spared. Firm placements have been arranged for 8 and negotiations are underway toward filling 9 other plant openings with these men. Discussions are underway with a considerable number of other Hanford employees and we believe most of them can be shown that they have a continuing opportunity here.

Of 130 students who paid tuition fees in the School of Nuclear Engineering, only 3 so far have abandoned their courses. Closer follow-up of students and instructors is raising the level of work and participation in the School. Close contact with the four affiliated colleges has improved our working relationship.

About 70 percent of our students are registered for graduate credit with the colleges, and 6 men will attain the MS degree this year based largely on study here. To insure adherence to policy and security restrictions in all thesis research conducted here, an instruction has been developed and circulated.

University contacts during the month included participation in the Northwest meeting of the American Society for Engineering Education, the national A.S.E.E.--A.E.C. Committee on Nuclear Engineering Education, and contacts with a number of educational authorities who have visited Richland.

Formal sessions with full negotiating committees present were held on April 1, 3, and 7, with agreement in principle on a new GE-HAMTC Contract being reached on the 10th. A final draft was submitted on April 17 to the HAMTC for review and comments and on April 29, the parties met in order to make minor clarifications of intent. The HAMTC, Guards and Building Service Employees Unions accepted the Company's 1.79% wage offer

on April 10 and 13. GE Plumbers expressed reluctance to perform work in connection with tying in water lines (installed by a nonunion contractor) to existing water mains. Judge Horrigan, Benton County Superior Court, has sustained the Company's Demurrer to the amended complaint of the HAMTC in the R. E. Mercer case. The Guards Union has notified the Company of their desire to schedule for arbitration a grievance arising from a recent force reduction in Patrol. A petition for certification election involving all Reactor and Separations Chief Operators was received on April 20 from the NLRB.

A strike involving the office employees of Kaiser Engineers occurred from April 15 to April 19. A picket line effectively halted most of the construction projects. Subsequent negotiations resulted in wage increases of approximately $6.00 a week. Kaiser has reached substantial agreement in negotiations with Technical Engineers and Carpenters. The Carpenter-Millwright Local has filed unfair labor practice charges against Kaiser, charging interference, restraint and coercion because of their membership and activities in behalf of the Millwrights Local Union.

The annual Northwest Area Wage Rate study was completed during the month, after a series of plant visitations. A special survey revealed that our present rate for Dispatcher (Electrical) to be below the area average. Meetings were held with Separations Section and the HAMTC for discussion of proposed job descriptions for the "U" plant, as well as classifications and crew sizes.

EMPLOYEE AND PUBLIC RELATIONS DEPARTMENT

APRIL, 1953

ORGANIZATION AND PERSONNEL

General

There were no organizational changes during April.

Employee Relations

Effective April 1, 1953, Paul L. Stoddard, Publicity Writer, was assigned to Employee Communications Unit.

Effective April 13, 1953, Lola Livengood, General Clerk C. transferred to the Manufacturing Department from the Suggestion System and Insurance group.

Effective April 20, 1953, Genevieve Berst, Stenographer, was assigned to the Suggestion System to replace a stenographer who will terminate May 1, 1953.

Public Relations

Effective April 30, 1953, Rodney L. Weston, Chief Warden, transferred to the Separations Section, Manufacturing Department.

Salary Administration

There were no organizational changes during April.

Technical Personnel

Trainees - Beginning of Month 85 - End of Month 73

Net Change:	Placements in departments	8
	Resignations	3
	Transfer	1

Union Relations

Effective April 15, 1953, Marjorie H. Stocker, General Clerk B, added to Wage Rates Unit (temporary).

Number of Employees on Roll	April, 1953
Beginning of Month	218
End of Month	207
Net Change	-11

Employee and Public Relations

EMPLOYEE RELATIONS

ACTIVITIES

General

All of the employees in the Employee Relations and Public Relations Sections who had not previously made a tour of the process areas have now been taken on such a tour. The reaction from these employees was extremely favorable. It is planned to arrange to take any new employees on a similar tour of the plant at such time as there is sufficient number to justify making the tour.

The first of a series of Regional Workshops sponsored by the New York Office concerning "Better Selection and Placement of Personnel" held in Chicago April 14 and 15 was attended by three members of the Personnel Practices Unit. The philosophy and long range goals to be achieved through utilization of the formalized GE Personnel Selection Program being introduced throughout the Company, together with the exchange of information in such mutual areas of interest as employment records, employee turnover, employee upgrading, orientation programs, rating plans, and grievances for non-organized employees, were the most significant experiences gained through attendance of this excellent series of meetings.

Five copies of the report to employees entitled "How Hanford Looks To You" prepared by Richardson, Bellows, Henry, and Company, were received and the reports for all employees were shipped on April 24.

Personnel Practices

Employment	March, 1953	April, 1953
Applicants interviewed	1,199	1,066

357 of the applicants interviewed during April were individuals who applied for employment with the Company for the first time. In addition, 83 applications were received through the mail.

Open Requisitions	March, 1953	April, 1953
Exempt	0	3
Nonexempt	149	217

Of the 149 open, nonexempt, nontechnical requisitions at the beginning of the month, 78 were covered by interim commitments. Of the 217 open, nonexempt, nontechnical requisitions at month end, 103 were covered by interim commitments. During April 104 new requisitions were received requesting the employment of 150 nonexempt, nontechnical employees.

	March, 1953	April, 1953
Employees added to the rolls	86	77
Employees removed from the rolls	124	113
NET GAIN OR LOSS	-38	-36

Employee and Public Relations

EMPLOYEE RELATIONS

Of the 113 employees removed from the rolls, none were removed due to lack of work.

Separation data is now being accumulated on a Company wide basis and is calculated by fiscal months rather than calendar months. Hanford separation experience henceforth will be reflected on a fiscal month rather than a calendar month basis, so comparisons can be made.

Separation:	March, 1953		Fiscal Month April, 1953	
	Male	Female	Male	Female
Including employees who were laid off for lack of work	.88%	3.39%	1.04%	2.64%
Excluding employees who were laid off for lack of work	.72%	3.27%	1.04%	2.64%

Over-all Separation:

	March, 1953	Fiscal Month April, 1953
Including employees who were laid off for lack of work	1.37%	1.35%
Excluding employees who were laid off for lack of work	1.26%	1.35%

During April, 29 employees left voluntarily to accept other employment, 5 left to enter military service, and 8 left to enter business for self.

Transfer Data

Accumulative total of requests for transfer received since 1-1-53	201
Number of requests for transfer received during April	36
Number interviewed in April, including promotional transfers	32
Transfers effected in April, including promotional transfers	42
Transfers effected since 1-1-53, including promotional transfers	142
Transfers effected in April for employees being laid off	2
Number of stenographers transferred out of steno pool in April	3
Transfer requests active at month end	276

ADDITIONS TO THE ROLLS

	Exempt	Nonexempt	Community Firemen	Total
New Hires	5	47	--	52
Re-engaged	--	1	--	1
Reactivations	1	22	--	23
Transfers	1	--	--	1
TOTAL ADDITIONS	7	70	--	77

Employee and Public Relations

EMPLOYEE RELATIONS

TERMINATIONS FROM THE ROLLS

	Exempt	Nonexempt	Community Firemen	Total
Actual Termination	6	71	--	77
Removals from rolls (deactivations)	--	33	--	33
Transfers	2	1	--	3
TOTAL TERMINATIONS	8	105	--	113

GENERAL

	3-1953	4-1953
Photographs taken	171	318
Fingerprint impressions	168	114

PERSONNEL SECURITY QUESTIONNAIRES PROCESSED

	3-1953	4-1953
General Electric Cases	80	105
Facility cases	28	24
TOTAL	108	129

INVESTIGATION STATISTICS

	3-1953	4-1953
Cases received during the month	158	112
Cases closed	137	179
Cases found satisfactory for employment	157	121
Cases found unsatisfactory for employment	2	1
Cases closed before investigation completed	4	3
Special investigations conducted	3	14

PERFECT ATTENDANCE RECOGNITION AWARDS

Total one-year awards to date since January 1, 1950	4861
One-year awards made in April for those qualifying in March	72
Total two-year awards to date since January 1, 1950	1442
Two-year awards made in April for those qualifying in March	81
Total three-year awards to date	358
Three-year awards made in April for those qualifying in March	53

During April, 63 people whose continuity of service was broken while in an inactive status were so informed by letter.

Employee and Public Relations

EMPLOYEE RELATIONS

The revised and modified manpower inventory required by the Atomic Energy Commission reflecting the status as of the end of March, 1953, was completed and transmitted to the Commission April 21, 1953.

The long range program designed to the end of orderly transfer of Community Operations and Real Estate Department personnel to other departments as openings develop has resulted in 20 transfers being effected to date and this includes the transfer of two exempt people.

Employee Benefits

The following visits were made with employees during the month:

Employee contacts made at Kadlec Hospital	234
Salary checks delivered to employees at Kadlec Hospital	108
Salary checks delivered to employees at home	9

At month end participation in Benefit Plans was as follows:

	March	April
Pension Plan	95%	95.2%
Insurance Plan	98.8%	98.9%
Employee Savings and Stock Bonus Plan	43.6%	44.3%

Five employees died during April, namely:

Bart D. Hogan, W-4898-616, Manufacturing
Raymond M. Banks, W-3237-946, Plant Auxiliary Operations
John Newton Hall Wallace, W-5562-627, Manufacturing
Erma C. Jervis, W-3950-HO, Radiological Sciences
Edward N. Livingston, W-2136-976, Plant Auxiliary Operations

Forty-five letters were written to deceased employees' families during April, concerning payment of monies due them from the Company, and also to answer their questions.

Since September 1, 1946, 119 life insurance claims have been paid totaling $723,000.

Five employees retired during April, namely:

Fred L. Clark, W-6060-XW, Normal Retirement
William Damschen, W-5136-UB, Normal Retirement
Leah M. Hurley, W-9259-HO, Normal Retirement
Clara M. Messner, W-5947-B, Optional Retirement
Maggie S. Wingfield, W-9445-C, Optional Retirement

During April, 23 letters were written to retired employees providing them with information of general interest. To date 251 employees have retired at Hanford, of which 131 are continuing their residence in the vicinity.

Employee and Public Relations

EMPLOYEE RELATIONS

Orientation of new employees was presented daily throughout the report month. A total of 55 new employees attended this program. Of this number, 100% have signed up to participate in the Pension Plan, 96.3% in the Insurance Plan, and 87.2% in the Good Neighbor Fund.

The drive for new members in the Good Neighbor Fund has resulted in 635 new participants, which brings the participation up to about 60%.

An open house for all GE men and women was held Tuesday evening, April 14, by the local GE dealer. This open house was designed to further GE's 75th Anniversary observance by acquainting employees with the new 1953 GE appliances and by reminding them of the benefits available under the Employee Purchase Plan. This was reported to be a very successful undertaking and it is our understanding that the local dealer has tentative plans to hold such an open house on an annual basis for the purpose of introducing new models. Three representatives from the GE Supply Company at Portland assisted the GE dealer with this undertaking.

Effective May 1, 1953, the radiologist and pathologist assigned to the Medical Department will establish private practice. Heretofore charges for special services performed by these professional people have reflected in charges being made direct by Kadlec Hospital, and as such posed no problem with respect to reimbursement to employees covered by the GE Insurance Plan. Effective May 1 without any change in the existing policy the Company has with Metropolitan, the Insurance Company is agreeable to recognizing as a charge reimbursable under the hospital expense provision of the Insurance Plan the billings which will be rendered by Dr. James in interpreting or taking x-ray pictures providing the x-rays are actually taken at the hospital, and the Insurance Company is also agreeable to recognizing charges to be made by Dr. Marks, the pathologist, for work done at the hospital, provided of course other eligibility requirements are met. This will make a change in the method of billing for this type of special services. The details of which have now been worked out. This change was brought to the attention of our people through publicity in the GE NEWS.

Military Reserve and Selective Service

Statistics with respect to employees who are members of the military reserve are as follows:

Number of reservists on the rolls		766
Number of reservists classified in Category A	122	
Number of reservists classified in Category B	56	
Number of reservists classified in Category C	79	
Number of reservists classified in Category D	509	
Number who returned to active duty to date		216
Number who returned to active duty in April		2
Number of reservists for which delays have been requested		46
Number of reservists classified in Category B	4	
Number of reservists classified in Category C	3	
Number of reservists classified in Category D	39	

Employee and Public Relations

EMPLOYEE RELATIONS

Delays requested (including renewals)	114
Delays granted	106
Delays pending	0
Delays denied	5
Delay requests recalled	3

The statistics with respect to employees registered under Selective Service are as follows:

Employees registered		841
Employees registered who are veterans		300
Employees registered who are non-veterans		541
Deferments requested to date (including renewals)		944
Deferments granted		727
Number of employees for which deferments have been requested		279
Number of employees classified in Category B	9	
Number of employees classified in Category C	7	
Number of employees classified in Category D	263	
Deferments denied and appealed at state levels		10
Deferments denied and appealed at local levels		0
Deferments denied and held pending appeal at national level		3
Deferments denied by local board and not appealed		2
Deferments denied by state board and not appealed		16
Deferments denied at national level (by Gen. Hershey's office)		3
Deferments denied at national level (by President)		4
Deferments requested, employees later reclassified		79
Deferments requested, later withdrawn		69
Deferments pending		31

Military terminations since 8-1-1950 are as follows:

Reservists recalled	125
Selective Service	150
Female employees enlisted	4
TOTAL	279

Employees returned from military service:

Reservists	46
Selective Service	13
TOTAL	59

Known number not claiming reemployment rights	4
Number of employees still in military leave status	216

Suggestion System

There has been considerable increase in suggestion activity for the first four months of 1953. Two hundred and thirty-seven suggestions were adopted for this period as compared to 150 adopted for the first four months of 1952; and total awards of $4405 as compared to $3350 for a comparable 1952 period.

Employee and Public Relations

EMPLOYEE RELATIONS

Suggestion System, Workmen's Compensation and Liability Insurance

Suggestion System	March	April	Total Since 7-15-47
Suggestions Received	261	180	11409
Acknowledgements to Suggesters	234	188	
Suggestions Pending Acknowledgement	46	38	
Suggestions Referred to Departments for Investigation	234	188	
Suggestions Pending Referral to Departments	46	38	
Investigations Completed & Suggestions Closed	185	305	
Suggestions Adopted - No Award	0	5	
Adopted Suggestions Approved by Committee for Award	46	73	
Total Net Cash Savings	$6,399.32	$12,870.52	
Total Cash Awards	730.00	1,980.00	

As of month end there were 707 suggestions out for investigations.

The highest award of $500 was made to an employee in the Plant Protection Section for his suggestion regarding a tank and wringer for use in flame proofing coveralls with duPont "CM" Fire Retardant. This suggestion resulted in a savings of materials.

An employee in the Metal Preparation Section received the second highest award in the amount of $200 for his suggestion regarding a die for the straightening of "P" slugs after they have been properly sized. This suggestion resulted in a reduction in cost of off-plant reclaiming.

The third highest award in the amount of $185 was made to an employee in the Metal Preparation Section for his suggestion regarding the use of powdered graphite in billet molds. Savings were labor and material.

Workmen's Compensation

Three cases under litigation were closed during the month of April.

Liability Insurance

Food Poisoning Claim, B-6835709

Twenty-five cases of food poisoning have been reported by persons who ate Easter eggs distributed in Riverside Park by the Richland Kiwanis Club and the General Electric Recreation and Civic Affairs Unit. All of the cases were considered minor and the incident was reported to the Travelers Insurance Company in order that the persons involved could be contacted.

Life Insurance

Code information which is known only to Home Office Life Underwriters Association has been furnished 59 insurance companies and investigation agencies during the month of April, 1953. This is in accordance with an arrangement with the Underwriters whereby employees on this project might be insured on the same basis as those working elsewhere.

Employee and Public Relations

EMPLOYEE RELATIONS

Insurance Statistics

	March, 1953	
	Long Forms	Short Forms
Claims reported to Department of Labor and Industries	50	467

	April, 1953	
	Long Forms	Short Forms
	44	371
Total Since September, 1946	15,363	

	March, 1953	April, 1953
Claims reported to Travelers Insurance Company	10	* 12
Total Since September, 1946	719	

* Of the claims reported to Travelers Insurance Company during the month ten were property damage and two were bodily injury.

Training Program - Collateral Contractors

During the month of April five duPont trainees reported here for a six weeks training period in the Radiological Sciences Department. One duPont trainee spent a two weeks training period with the Separations Section.

General

At the request of the Atomic Energy Commission, W. D. Smyth met with AEC Insurance Examiners in Washington, D. C. on April 9 and 10 to discuss matters relative to obtaining a Standard Commercial Comprehensive Public Liability Policy for Hanford. This conference was requested in order that Hanford Insurance Personnel could become familiar with other types of insurance arrangements in effect at other AEC locations.

Employee and Public Relations
Employee Relations

TRAINING AND DEVELOPMENT

Training and Development programs and activities for April 1953 were as follows:

MANAGEMENT AIDS:

MANAGEMENT ORIENTATION was presented on Monday, April 6, with 22 new exempt personnel in attendance. This 8-hour program includes the welcoming of new exempt employees to the management team and a broad over-all review of management responsibilities. Dr. W. I. Patnode, Chairman of the Education Committee, was a guest at an informal luncheon held in conjunction with this program.

SUPERVISORS 40-HOUR program was presented during the week of April 27 through May 1 with 12 new supervisors in attendance. This 40-hour program is designed to assist new supervisors to apply successful human relations and to effectively handle their day-to-day problems of management. An informal luncheon was held Friday noon. Dr. Vosburgh, Manager of Health Services for the General Electric Company, was a guest of Dr. Norwood at our 40-hour program and made a few remarks relative to G.E.'s industrial health program.

POLICY PANEL SEMINAR was scheduled to be presented at Hanford High School during the week of April 27 through May 1, but was canceled due to insufficient enrollment. This comes about because of unusual activity in the areas at this time. Supervision concerned has been contacted to re-schedule their personnel for the next presentation on June 8-12.

MANAGEMENT SKILLS:

PRINCIPLES AND METHODS OF SUPERVISION was again presented concurrently to groups at Hanford High School and in Richland, on a one-half day basis, from April 13 through April 24. Forty-one supervisors completed this management skill program during these sessions. A completion dinner meeting was held for Groups 44,45, 46 and 47 on Wednesday evening, April 29. Managers of the various departments and sections were guests at this meeting and Mr. W. E. Johnson, General Manager, was guest speaker.

CONFERENCE LEADING — This 8-hour (full day) program was offered on April 8 with 23 supervisors in attendance. This program is designed to assist exempt personnel to conduct successful conferences and to gain the necessary experience in conference leading skill by participation in role playing.

MANAGEMENT DEVELOPMENT:

MANAGEMENT CONFERENCES ON HUMAN RELATIONS — This program, introduced in

February of this year, was conducted again this month since each conference group meets three times in succession to complete the study. Group #1 — Meeting 3 was held on April 21; Group #2 — Meeting 3 was held on April 23; Group #3 — Meeting 2 was held on April 2 and Meeting 3 on April 30; Group #5 — Meeting 2 was held on April 8; Group #7 — Meeting 2 was held on April 15. Approximately 20 supervisors are enrolled in each group. This management development program is based on the principle that learning is accomplished by doing and affords each participant the opportunity to broaden his knowledge of human relations through the experiences and exchanged ideas of others in the group. The result of such experience is to gain willing, intelligent cooperation of a work unit through a better understanding of people.

PROFESSIONAL MANAGEMENT DEVELOPMENT — These meetings, which are held in the evening, are voluntarily attended and are presented in order that supervisors who have not had the opportunity to attend our regular presentations may also have the benefit of this information, or they may serve as "refreshers" for those persons who have attended the regular sessions in the past. On Tuesday evening, April 7, a review of our "Customer Relations" program was offered, with 28 exempt personnel attending. This program brings out the importance of each G.E. employee being a salesman for the Company and consideration of the other person's viewpoint. On Tuesday evening, April 21, a PMS refresher highlight program was offered with 10 exempt personnel taking advantage of this opportunity to review the methods. Regular PMS refresher programs are scheduled throughout the year so that each supervisor having completed the methods should be able to keep himself constantly aware of these valuable methods.

MANAGEMENT PANEL FORUM meetings are held on subjects which it is felt will be interesting and educational to every exempt person at this plant. The subject material is entirely unrehearsed and information is gained from guest panelists by direct questioning. On Thursday evening, April 2, Mr. G. G. Lail, Manager of Employee and Public Relations, and Mr. H. D. Middel, Manager of Plant Auxiliary Operations, were guest panelists and discussed the subject of "Philosophy of Company Policy". Thirty-one supervisors attended this meeting. On Thursday evening, April 16, Mr. L. F. Huck, Manager of Community Operations and Real Estate, and Mr. W. A. Watts, Supervisor of Public Information, were guest panelists who discussed the subject of "Social Responsibility of Business". There were 28 supervisors present at this meeting. "Developing Tomorrow's Leadership" was the subject discussed on April 30 with D. W. McLenegan, Manager of Technical Personnel, and J. A. Wood, Supervisor of Training, as guest panelists. Eighteen supervisors were present.

OTHER TRAINING ACTIVITIES:

SUPERVISOR'S HANDBOOK — Following is a summary of handbook distribution to date:

Employee and Public Relations
Employee Relations

Number issued prior to April -	1342
Number issued during April -	15
Number returned during April -	13
Number issued end of April -	1344
Number on hand end of April -	156
Total number of handbooks -	1500

Of the 156 handbooks on hand 35 are not usable as they lack too many pages, while 108 are ready for issuance and 13 have to be checked for completeness before reissuance. Sixteen revised pages to the handbook were distributed to handbook holders during April.

CUSTOMER RELATIONS PROGRAM was requested by Radiation Monitoring Unit and was started on March 30 but continued through April 1 and 2. Fifteen non-exempt employees were in attendance at this presentation. This program is designed to assist employees in their contacts with others and stresses the importance of considering the other person's viewpoint when "selling" one's plan, idea or method.

STENO-SECRETARY PERSONNEL PROGRAM -- This program was created at the request of P. A. Bundy, Employment Supervisor, and is ready for a test presentation on May 12. This is an 8-hour program designed for present personnel and those who will be employed during the next several months. This program incorporates our already existing 2-hour Office Personnel Relationship program and is not an orientation but rather a personality factor presentation.

ECONOMIC STUDY GROUP -- A discussion group to study Haney's book "How You Really Earn Your Living" was begun on January 19 and completed the discussion on Monday evening, April 27. This group is comprised of eight exempt personnel and it is expected that the group will continue to meet and discuss further economic material, with the possibility of each participant starting his own discussion group this fall.

REQUESTS FOR MATERIAL -- During the month requests for 108 transcripts of program attendance were made by various sections, along with 337 blank transcript sheets so that the sections and units may have their own records of their personnel attendance at training programs. Several requests for "The Unwritten Laws of Engineering" were filled, along with a number of requests for Training Objectives for 1953.

SAGE -- Supervisor and General Electric bulletin was again distributed to Lists 1, 2 and 3 on April 10 and April 30. This information media, created and distributed by Training and Development, contains meeting information, training highlights and human relations items of general supervisory interest.

HOBSO II -- Mr. Howard Bennett, Manager of Economic Training for the General Electric Company, visited with this operation on April 14 and 15 and presented a preview of HOBSO II to managers of HAPO. He also made a special presentation to members of Training and Development and discussed a background for presentation of this program.

Employee and Public Relations

EMPLOYEE RELATIONS

EMPLOYEE COMMUNICATIONS

Copy for the first issue of a forthcoming Management News Bulletin was written, and letterhead prepared. The bulletin will be distributed to all exempt employees periodically, and will contain news items of interest to Hanford Management. First issue of this publication will cover significant changes in the GE-HAMTC Agreement now under negotiations.

Revisions to "1952 at Hanford Works" required alteration of five pages, and consequently the reprinting of a total of ten pages in the report. Completion of the revisions was achieved on Thursday, April 23.

Two papers prepared by the Records Control supervisor for presentation before a Records management meeting in New York City were edited prior to presentation and publication.

Publicity during the month for the forthcoming Kadlec Hospital Open House, which Special Programs is coordinating, consisted of a news story and two photographs in the GE NEWS, and a news story released by the News Bureau to the local press. In addition, a two-color poster has been prepared and will be distributed throughout the plant and community. An invitation was printed and will be mailed to approximately 150 community leaders.

Publicity for the Open House by the local GE dealer, Pleiss-Davis, consisted of a letter to Management; and a news story and photographs in the GE NEWS; and follow-up photographs in the plant paper. Approximately 1000 persons attended.

The health bulletin for May, "Try These For Size," and the Safety Topic for the month, "Cause For Alarm," were written, printed and distributed.

At the recommendation of Special Programs a two-color poster was prepared for Safety and Fire Protection Unit. This poster, when supplemented with printed inserts, will indicate month after month the current winner of the Area Injury Reduction Contest.

At the request of Radiological Sciences, a four-color poster presenting the new radiation symbol and signs was prepared. Copies of the poster were sent to Minor Construction, Kaiser Engineering, and the U.S. Army. In addition, these posters have been placed in all main and exclusion area badge houses.

Final copy and a rough layout of a booklet describing the new Radiometallurgy Building in the Laboratory Area were forwarded to the customer--Technical Services--for approval.

Approximately 1000 copies of the 1952 Company annual report were distributed through the employee information racks.

As a service to Technical Information, a special letterhead, "For Your Technical Information," was prepared. It will transmit information about Technical Library and Classified Files to Hanford Management.

Employee and Public Relations

EMPLOYEE RELATIONS

The sixth in a series of nine full-page GE NEWS messages on the 9-Point Job Program was prepared on the subject "Job Satisfaction."

Recruitment advertising for the month consisted of an advertisement for nurses in two issues of the "Journal of the American Medical Association" and in two issues of the "American Journal of Nursing."

Copy for an exempt salary plan booklet, "Your Salary Plans," was approved by the Salary Committee and the General Manager. Additional copies were prepared and distributed to Department Managers for their review prior to preparation of final art work.

As a service to the GE NEWS, 18 news stories and 12 photo captions on miscellaneous subjects were prepared by Special Programs.

Posters distributed during the month included two sets of the GE photo news service (90 copies each), 110 copies of an AEC Property Management poster, 150 copies of a Savings and Stock Bonus Plan poster, 66 Suggestion System posters and approximately 150 "GE Firsts" posters, in addition to the new radiation signs and symbol poster.

Good Neighbor Fund agencies were publicized in the GE NEWS during the month. The current Cancer Drive was publicized through news stories and pictures. Boy Scout activities were publicized through story and picture of employees who would accompany scouts on their trip to the 1953 jamboree. GE NEWS policy calls for publicizing Fund agencies at least twice a month.

Transfers of exempt people from Hanford to other GE plants are being publicized to emphasize opportunity for advancement exists in other parts of GE. Three transfers were publicized during the month in the GE NEWS.

New Stores Building Open House was publicized through arrangements made with the Plant Auxiliary Operations manager, and in cooperation with Special Programs. Follow-up photo was published. Information of this type aids in bringing improved facilities and working conditions to all employees' attention.

Full-page GE NEWS feature on a Biology Section's "Climitizer" explained how plants are grown under controlled conditions for experimental purposes. The feature was picked up by the Hanford News Bureau for distribution to all National Farm magazines.

75th Anniversary publicity in the GE NEWS included the first in a series of syndicated articles on Company history; GE dealer's open house; and editorial cartoon promoting the Savings and Stock Bonus Plan, with syndicated editorial.

At press time, the New York announcement concerning changing the Nucleonics Division to Hanford Atomic Products Operation was included in the GE NEWS. Mastheads and all stet heads in the paper were changed the following week to comply with the new name of the project.

First of a series of articles on Company policy was prepared for publication in the first issue in May. It deals with vacations.

Employee and Public Relations

EMPLOYEE RELATIONS

Art work developed by Employee Communications illustrator for the GE NEWS during the month included four editorial cartoons, and layout and art work for two full-page GE NEWS messages on the 9-Point Job Program, which were developed by Special Programs.

Layout and illustrations were developed for the May Safety Topic for the month and for the May health bulletin. In addition art work for a two-color safety poster and a Kadlec Hospital Open House poster was developed.

A 16-page color visual for the booklet on the Radiometallurgy Building was developed.

Layout and art work for two letterheads were provided: a Library and Files letterhead and a Management NEWS Bulletin letterhead.

Layouts were developed for the new GE blue and GE buff stationary, reflecting the name change to "Hanford Atomic Products Operation."

The illustrator attended a one-day Civil Defense school and became an "Unexploded Ordinance Reconnaissance Agent" for the north wing of the 705 Building. This is in line with his other duty as fire warden for that wing.

PUBLIC RELATIONS

During the month of April, the News Bureau issued 61 releases. The breakdown, by category, distribution, and content, was as follows:

Plant or Company	
Administration and Law	1
Plant Services	6
Pay and Benefits	14
Employment Services	10
Union Relations	3
Health and Sanitation	4
Education	1
Technology and Science	3
Richland & Other Communities	8
Good will Stories	11
	61

Distribution	
Local	28
Daily	2
Home or College	14
Trade Journals and/or Co.	2
Special	15

Content	
Information	11
Pictures with Captions	2
Short News	29
Long News	16
Feature	3

The local reporter for the Columbia Basin NEWS is working on a series of articles about services offered to residents in Richland, by the General Electric Company. His series will be based on interviews with the persons in charge of Municipal Services, Public Health, and the Hospital. Public Relations secured approval for the series, and has been arranging interviews and accompanying the reporter for each interview and clearing the individual articles as they are written.

A representative of Public Relations acted as one of two panel members who conducted a discussion on the subject of social responsibilities of business. This was an evening meeting arranged by Training Development for any exempt employee wishing to attend. Approximately 40 people attended.

A member of Public Relations attended two meetings at Our Lady of Lourdes Hospital in Pasco to advise representatives of the three hospitals in the Tri-Cities concerning methods of publicizing and promoting observances of National Hospital Week as a joint effort between the three towns.

A medium-length feature story on plant nutrition work with the Climatizer operated by Radiological Sciences was completed. This has been sent to 39 publishers who put out 43 farm publications which have a circulation of about 4,000,000. So far two of the magazines, with a combined circulation of about one-half million, have indicated they will use the story.

A short feature story, written at the request of a local paper for use in connection with stories concerning J. Gordon Turnbull's death, was largely devoted to a description of the Richland Master Plan.

Another feature story on the Richland Recreation Program was sent to the National Recreation Association at their request. This is the last of a backlog of requested features on recreation that were pending at the time the News Bureau cut down on its service to the recreation group.

A feature writer of the Walla Walla Union-BULLETIN, Vance Orchard, is writing a special story on Hanford's motion picture production activities that will appear in one of the future issues of the paper. Simulated "on location" photographs of the production staff were taken at the Perimeter Barricade and in front of the Employment Building. Special emphasis is being given to the 16mm color motion picture that features Orientation subjects currently being produced for Employee Relations Section. Orchard was very complimentary in his comments regarding the interest taken by the Company to produce a modern medium for orienting new employees and is highlighting this production in addition to other training-documentary films being produced for operating departments at Hanford.

Public Relations Services Division in New York requested the opinion of Public Relations at Hanford concerning the newspapers being reviewed for information that serves as a basis for the Company's monthly Press Intelligence Report. It was found that the only Washington paper being reviewed is the Seattle Post INTELLIGENCER. It was recommended that inclusion of the Spokesman REVIEW and either the Tri-City HERALD or Columbia Basin NEWS would provide a more accurate check on the amount of publicity the Company is receiving from the press in the State of Washington.

The Community Newsletter and the March-April News Digest were mailed to all community leaders in Pasco, Kennewick and Richland.

Twenty-three releases were written to publicize the Cancer Drive and a representative of Public Relations acted on the committee for the promotion of Kadlec Hospital Open House and Hospital Week.

Eight letters were received from students and teachers asking for information on atomic energy or Hanford. Two of them displaying considerable misunderstanding of the whole subject, required a substantial amount of thought and work to answer. While our fact sheets are satisfactory for general questions about the plant and the General Electric comic book, "Adventures Inside the Atom," is all right for grade school students asking about atomic energy, we still need something between the comic book and the Smythe Report for school teachers and high school students who want material on atomic energy, but are only slightly interested in Hanford. This problem is getting more acute each year because high school teachers and students are becoming increasingly aware of, and curious about, atomic energy.

Sixteen papers were cleared for presentation and/or publication during the month, seven of which were in abstract form. They are as follows:

"Selection of Materials and Equipment for Reactors: Section IV Radiation Safety for Reactors", by James M. Smith, Jr., for publication in Nucleonics at a later date.

"Proposed Pumping Equipment for No. 16 Pump House", by W. D. Richmond, to be used in support of application for professional Engineering License.

"Evaluation of Alpha Counting Instruments" by D. G. Miller and M. B. Leboeuf, for publication in Nucleonics at a later date.

"Re-evaluation of Indefinite Retention or Permanent Retention Type Records", by S. B. Badgett for presentation at the Atomic Energy Commission and Contractor Records Management Conference in Chicago, Illinois, April 27 through April 29, 1953.

"Objectives and Accomplishments of General Electric's Records Control Program at Hanford", also by S. B. Badgett for presentation at the same meeting.

"Testing Respiratory Devices," by Frank E. Adley, for presentation at the annual meeting of the American Industrial Hygiene Association, Los Angeles, California, April 24, 1953.

"A Historical Record of the Use of Snow-Cover Forecasts in the Mid-Columbia Area", by Harry A. Kramer, for presentation at the Western Snow Conference meeting, Boise, Idaho, April 20 through April 22, 1953.

"Statistical Control in the Laboratory", by C. A. Bennett, for presentation at the first Northwest Conference on Quality Control at the University of Washington, Seattle, Washington, May 9, 1953.

"The Uptake and Translocation of Cesium by Plants", by J. H. Rediske and A. A. Selders, for publication in Nucleonics at a later date.

"A Fluorometric Method for Oil Fog Determination" by W. G. Silker and H. G. Rieck; "Techniques in the Determination of the RU^{103} to RU^{106} Activity Ratio in Fission Products" by C. W. Thomas, G. R. Quimby and D. L. Reid; "An Atomospheric Pressure Hydrogen Counter", by P. L. Koehmstedt, L. C. Schwendiman, and J. W. Healy; and "Organo-Phosphorus Derivatives as Solvents" by L. L. Burger, B. R. Jones, and R. M. Wagner, all for presentation at the American Chemical Society Northwest Regional Meeting, Pullman, Washington, June 12-13, 1953.

"Geology of the Columbia Basin", by R. E. Brown, for presentation at the Fourth Annual Regional Fertilizer Conference at Pullman, Washington, June 30, July 1-2, 1953.

"The Analytical Chemistry of Americium and Curium", by A. Chetham-Strode, Jr., for presentation at the Summer Symposium on Analytical Chemistry, Rensselaer Polytechnic Institute, Troy, New York, June 19-20, 1953.

"The Less Familiar Elements in the Atomic Energy Program" by A. H Bushey, for presentation at the Summer Symposium on Analytical Chemistry, Rensselaer Polytechnic Institute, Troy, New York, June 19-20, 1953.

On Saturday, April 24, 1953, the General Manager addressed 150 members of DeMolay at the district conclave held in the Masonic Temple in Richland. Mr Johnson's talk consisted of three parts: "The Overall Atomic Energy Program and What it Means to the Average Citizen", "Hanford's Part in the Atomic Energy Program", and "Why What We Do (at Hanford) is Important to you."

A total of 189 photography assignments were filled during the month, producing a total of 17,358 prints, of which 15,153 were "A" and "B" badge prints. A total of 2,205 were area and news work.

Motion Picture film exposed to date on three individual motion pictures is as follows: 7,100 feet, 16mm (B&W) for Minor Construction; 5,200 feet, 16mm (B&W) for 100-K Construction; and 100 feet, 16mm color for orientation.

Photographic supplies are being set-up as Store Stock items. To date, Stores has been asked to stock 48 different items of photographic supplies. It is estimated that another 20 items will be requested.

Photographic equipment records are being compiled in compliance with Organization and Policy Guide 02.5. Lists of photographic equipment have been received from several Units, Sections, and Departments to date.

May 25, 1953 will mark the first anniversary of the Hanford SCIENCE FORUM. During the year, 52 regularly scheduled broadcasts have reached the public over Radio Station KWIE. The SCIENCE FORUM will continue to be broadcast at the regular time, 8:00 p.m. Tuesdays, until June 16, at which time the program will take a summer hiatus until September. Geologist Randall Brown, has been added to the regular panel of experts, and may be heard on programs being broadcast during May and June. The popularity of the program is being proved by the fact that an average of five listeners per week submit questions of a scientific nature.

Preliminary talks and script conferences were held with Public Health regarding a proposed radio program series that will utilize the techniques of on-the-spot interviews and documentation of local doctors and medical facilities. The program will stress current public health topics and be aired as a public service for 13 weeks. This Section is providing production supervision, talent, engineering and equipment for the series. On May 3, a half-hour dramatic playlet, produced, directed, and narrated by a member of Public Relations for Public Health, will be broadcast.

Over 4000 feet of classified motion picture footage taken in a "critical" phase of the construction of the 100-C Area was submitted to this Section. A special project has been set up and cost estimates submitted for editing and adding narration to this footage for production of a 30-minute training film to be used in conjunction with similar work at 100-K Area. This entails reviewing film, writing script and editing--all to be completed and delivered on or around June 15, 1953. Delays in receiving clearances for the processing studio may necessitate revising the completion date.

Photography on the 16mm black and white training-documentary film for Minor Projects, Engineering Department, was completed this month. Of the approximately 7000 feet photographed, 3200 feet of "Restricted" footage has been processed and a work print produced. The "Secret" footage is being retained until the processing studio has received proper security clearances. A ten-minute documentary film which will be taken from the "Secret" portions of this footage is being indefinitely delayed because of clearance delays.

Production is continuing on the photography for the 16mm black and white training-documentary film on construction and equipping of the 100-K Area. A proposal for a contract to execute processing and finishing operations on this film for the Design Section has been drawn up and submitted to Administrative Contract Services for approval. It stipulates that we require a suitably equipped studio to process and finish the 4000-foot film being produced.

Pre-scheduling of scenes and sequences for the 16mm Orientation motion picture being produced by this Section in color for Employee Relations Section is being done to expedite production of this motion picture. One hundred feet of test film has been taken in preparation for intensive shooting on this film next month.

H. B. Butler of W. A. Palmer Films, San Francisco, one of the pioneers in the field of 16mm motion picture production, visited Public Relations on April 16 and 17. Meetings were held with members of AEC Engineering and Construction Division, GE Design Section, Minor Projects Section, Employee Relations Section and Purchasing Section representatives. Discussions were held relating to problems in producing the 100-K training-documentary film, the Minor Projects training film, the AEC Expansion training-documentary film, and the Orientation film, as well as problems involving contracts for the 100-K and AEC films, being produced by this Section. Mr. Butler's visit here was in an advisory capacity only and not as a representative of the Company with which he is associated. His background of experience in the 16mm sound-on-film field, and his reputation as a pioneer and expert in the industrial motion picture business provided us with helpful and valuable information for use on future productions.

A special meeting was arranged by management of Plant Security and Services Section with AEC and GE supervisory personnel to review the slidefilm, "It's Just Knowing How" which was recently produced by this Section. The results: a wider use of audio-visual aids will be introduced to plant personnel in special training programs by this Section.

The local chapter of the American Chemical Society has requested use of the GE produced motion picture "A is for Atom" for showings to High School science classes. They were informed that it had been proposed by another source that a print of this film be presented by the General Manager to the Science instructor at Columbia High School who would arrange showings to all students. The film is available to us for shipment June 8 at a cost of about $100 and the proposal will be submitted by the Section Manager in the near future.

The General Electric film, "...by their Works" was obtained for a showing at a District Meeting of the American Society of Civil Engineers. During the month eleven motion pictures produced by General Electric and Encyclopedia Britannica were obtained for plant training group showings.

Public Relations personnel accompanied the Supervisor of Radio Maintenance on an inspection of the public address facilities in the conference room of the Plant Technical Library, 300 area. Shortcomings of the room and the sound system were assayed, and steps taken to improve the quality of sound amplification for the General Manager's monthly meetings held in the conference room.

See attached statistical report of Photography Unit work during April.

MONTH OF APRIL, 1953	X 2"	X 4"	X 7"	X 10"	E G.	X 5"	MM	Color Slide	(B&W) Slides	Ekta-Chrome	X 18"	X 11"
COMMUNITY REAL ESTATE & SERVICES												
Parks & Recreation			12		10							
Police		25	158	7	197	55						
Public Library				23	14							
Engineering				10	6							
EMPLOYMENT & PUBLIC RELATIONS												
Employment	720				144							
News Bureau		8	31	148	47							
Special Programs				27							2	
Radio & Special Events			4	4	4							
Training			46	10	24	23						
Works News		46	193	228	305							
Photography				32	16							
ENGINEERING DEPT.												
Applied Research									5	7		
Design & Construction									5			
Project				32	2							
Technical				14					8	10		
Technical Library				13	2							
Pile Technology				369	94	134						
Process				35	4							
MEDICAL								7	3			
MANUFACTURING												
Plant Engineers				4	2							
Reactor Section				35	18							
Process			28	31	39					4		32
RADIOLOGICAL SCIENCES DEPT.									5			
Survey				2					2			
Biology							400'					10
Records & Standards				44								
UTILITIES & GENERAL SERVICES												
Reproduction				68	7							
Stores Unit			8							4		
Security	7,154	7,159		5	419	12						
Fire & Safety				84	6							
Procedures & Analysis					4	6						
Statistical & Computing									2			
MISCELLANEOUS												
A.E.C.SAFETY			18	117	89							
A.E.C.SECURITY	120				6							
Financial						12						
TOTAL:	7,994	7,238	498	1,342	1,459	242	400'	7	30	25	2	42

	February	March	April
Total Assignments	146	158	189
Total Negatives	1,375	1,516	1,459
Tot[illegible] nts	24,660	19,533	17,358

K-27

Employee and Public Relations

SALARY ADMINISTRATION

GENERAL

During the month of April the Salary Administration Section continued to consolidate and evaluate new or modified positions preparatory to the issuance of a revised "Position Description Manual" which will be published shortly. Toward the end of the month the number of conferences and arrangements reached a peak due to the deadline set for submitting these modifications which are to be incorporated in the revision.

ORGANIZATION ANALYSIS

An exploratory report was prepared, analyzing the organization of one of the Sections of a major Department in detail. This analysis also involved the intimate study of specific positions relative to their position descriptions. The findings of this analysis will be explored with Management to establish the degree of action which this function should recommend on both the long and short range scope of future studies. Following the resolution of these questions, future studies and recommendations can be initiated in other Departments.

ANNUAL SALARY SURVEY

Field contacts have been completed during April with those companies who will participate in the current national salary survey. An estimated 40% of the salary data had been received at month end. A concentrated effort will now follow to expedite submission of outstanding data and to assemble this data into the survey report at the earliest possible date. Some West Coast contacts yet remain to be made before preparation of the 1953 salary ranges and guide curves can be commenced.

BROCHURE ON SALARY ADMINISTRATION PLANS

Comments on this brochure have been received from most of the Departments at month end. It will be necessary to resolve a few basic questions on the amount of information to be included in this brochure before copy can be released for publication. The material for the brochure is in such shape that it should be possible to review and release it shortly following the resolution of these questions.

Employee and Public Relations

TECHNICAL RECRUITING

For M.S. and B.S. Candidates

Our spring recruiting at 30 schools brought 23 acceptances up to April 10, at which time it was decided to withdraw the 70 offers which were still outstanding. Rather than cancel our proposals to these men and lose the good will which we have established at the colleges, permission was obtained from Schenectady to convert these offers to apply to the Company's eastern training programs which serve the Knolls Atomic Power Laboratory, the Aircraft Nuclear Propulsion Project, etc. The advisability of this move was also explained in general terms to appropriate engineering deans and placement officers, and we believe that our good standing at the colleges has been preserved.

We are continuing to meet the outlined quota of 5 men to be trained at Hanford for the Aircraft Nuclear Propulsion Project.

Offers made to outstanding junior engineering students for summer work at Hanford brought 8 acceptances (the original quota was 12) and all open offers have been withdrawn.

For Ph.D. Candidates

Our negotiations with a large number of selected doctoral candidates in science and engineering have been terminated with the exception of a very few outstanding men. From this group we hope to fill two positions in the Engineering Department, as authorized by A. B. Greninger, and two in the Radiological Sciences Department.

Experienced Engineers

At present there are about 5 openings which call for engineers of substantial industrial experience. We are continuing to look for qualified candidates outside the Company and also inquiring for qualified men within the Company.

TECHNICAL PERSONNEL TRANSFERS AND LOSSES

Resignations	8
Transfers to other Divisions	5

Discussions with 5 other employees have resulted in either internal transfers or a more favorable attitude toward their present employment.

As regards the excess chemists in the Separations Process Unit of Manufacturing, discussions with supervisors indicated that 16 could be spared, although we were given a larger number from which to select. Firm placements have been arranged for 8 and negotiations are underway toward filling 9 other plant openings with these men, so that all will be suitably taken care of.

Employee and Public Relations

Discussions are underway with a considerable number of other Hanford employees and we believe most of them can be shown that they have a continuing opportunity here.

EDUCATION

Of 130 students who paid tuition fees in the School of Nuclear Engineering, only 3 so far have abandoned their courses. Closer follow-up of students and instructors is raising the level of work and participation in the School. Close contact with the four affiliated colleges has improved our working relationship. About 70 percent of our students are registered for graduate credit with the colleges, and 6 men will attain the MS degree this year based largely on study here. To insure adherence to policy and security restrictions in all thesis research conducted here, an instruction has been developed and circulated which satisfied both security requirements, the college authorities, and the supervisors who have countenanced most of the thesis research.

To meet demands within the plant we have assisted the State College of Washington in developing substantial program of extension courses in college chemistry, mathematics, statistics and quality control, etc. We are now working on a new method of offering this service, since curtailment of the State College budget will limit their activity next fall.

We are cooperating with Miss Lomen who is surveying the activities of the School of Nuclear Engineering on behalf of the Educational Committee.

UNIVERSITY CONTACT

The following participation was called on during April:

1. Committee of American Society for Engineering Education and A.E.C. representatives on nuclear engineering -- D. W. McLenegan.

2. Northwest Regional Meeting, Amercian Society for Engineering Education.

3. Visit at Richland with Science and Engineering Department Heads, University of Washington.

4. Visit at Richland with Dean G. W. Gleeson, Oregon State College.

5. Visit at Richland with Dean W. R. Woolrich, University of Texas.

ROTATIONAL TRAINING PROGRAM

Mr. Curtis is working with several college alumni groups at Richland to activate their associations, and thereby provide a welcome for the new graduates who will be joining us in June. An effort is also being made to group more closely the technical graduates now in the dormitories so that these young men will have the company of others of similar age, education, and interests.

ORGANIZATION

Placements of trainees are proceeding slowly and a great deal of effort is being made by Mr. Curtis to meet each departmental need with the best qualified man available.

Plans for internal transfer are being made whereby the exempt members of the Technical Personnel Section will be reduced from six to five, and the non-exempt from ten to eight (tentative).

Employee and Public Relations

Union Relations

UNION RELATIONS - OPERATIONS PERSONNEL

Formal sessions with full negotiating committees present were held on April 1, 3, and 7, with agreement in principle on a new GE-HAMTC Contract being reached on the 10th. On April 17, the Company submitted a final draft of the Contract to the HAMTC for review and comments so as to minimize the possibility of ambiguities, typographical errors, etc. On April 29, the parties exchanged comments which, for the most part, were insignificant and limited to minor clarification of intent.

The new Contract preserves all the desirable features of the old Agreement, including the "no strike" clause and incorporates in one document all the supplemental agreements which have accumulated over the years. It establishes separate seniority groups for the Metal Preparation and Reactor Sections and rates of pay in the 300 Area corresponding with rates in other production areas. Such demands as union shop, elimination of "no strike" clause, severance pay, guaranteed 40-hour week, hazard pay, expansion of insurance and benefit plans, cumulative sick leave, etc., were successfully resisted.

Cost items include an increase in shift differential for swing shift from ten to fifteen cents per hour, time and one-half as such for hours worked by shift workers on their first day of rest within their workweek, double time as such for their second day of rest and double time between the hours of 11:48 p.m. and 7:48 a.m. on call-in time. (A provision reducing the required notice from 48 to 16 hours should restrict call-in to only bona fide emergencies.)

It appears that Agreements with the Guards and the BSEIU can be accomplished on essentially the same terms.

On April 10, the Company received a letter from the HAMTC accepting the 1.79% wage offer, subject to ratification by its membership, and on April 13, acceptance of the wage offer was received from the Hanford Guards Union and the Building Service Employees Union. Notification was received on April 27, from the HAMTC indicating that the various locals had ratified acceptance of the offer. Modifications to all union Agreements have been drawn up. The wage increase, including the retroactive portions, will appear on pay checks of May 8.

On April 20, the first of eight tie-ins of water lines installed by Cisco Construction Company (nonunion contractor) to existing water mains was scheduled to be performed by GE forces. In view of the "unfair" status of the Cisco job, GE Plumbers were reluctant to make the tie-ins. When the issue threatened to interfere with the progress of the work, the union was advised that they could not demand tie-ins on a selective basis and that hereafter the manner in which such work would be accomplished would be at the sole discretion of the Company. The tie-ins in question were assigned to Cisco.

Employee and Public Relations

The issues created by the fine line to be drawn between the work properly within the jurisdiction of Maintenance forces and the work required to be performed by Technical people doing research work are of long standing and have been the subject of numerous discussions with the Council. A recent letter distributed by the Separations Technology Unit gave rise to certain questions regarding the thinking in this regard within this Unit. A meeting for the purpose of discussing the matter was held on April 3, attended by representatives of Separations Technology, the three area Maintenance superintendents and this office.

It appears that no basic differences of opinion exist between the parties and that the wording of the letter did not factually present the Unit's thinking in this regard or the method actually employed in the assignment of work.

E. F. Fitzmaurice was named Manager, Union Relations, effective May 1, 1953, vice J. N. Dupuy, who has been assigned as Regional Manager, GE Union Relations in New York.

Judge Horrigan, Benton County Superior Court, has sustained the Company's Demurrer to the amended complaint of the HAMTC in the R. E. Mercer case. It is anticipated that the ruling will successfully resolve this issue. The Company is now in a very favorable position to move for a dismissal of the complaint.

The Guards Union has notified the Company of their desire to schedule for arbitration a grievance arising from a recent force reduction in Patrol. There is some indication that the Union will not pursue the matter further unless additional pressure from the membership is brought to bear upon the Business Representative.

A petition for certification election involving all Reactor and Separations Chief Operators was received on April 20 from the NLRB. The petition is allegedly supported by pledge cards signed by 25 of the 66 employees in this unit. This number satisfies the NLRB requirement that a substantial number (usually 30 per cent) of the employees sign up in the unit before they will order an election.

A similar election involving Chief Operators in the "P" and "S" Divisions on September 11 and 12, 1951 resulted in a vote of 17 for and 32 against HAMTC representation.

Grievance Statistics:

Three meetings were held during the month for the purpose of processing grievances at the Step II level.

Status of Grievances

	1953 Unit	1953 Nonunit
Received this month	26	14
Received this year	119	17
Settled at Step I this month	7	7
Settled at Step I this year	43	8
Pending settlement at Step I at end of month	5	8
Settled at Step II this month	21	0
Settled at Step II this year	58	1
Pending settlement at Step II at end of month	200*	0
Brought to arbitration during the month	1	0
Pending settlement by arbitration	10**	0
Total number pending settlement	215	8

*Includes 169 bargaining unit grievances brought to Step II by the Union prior to January 1, 1953, but not scheduled for Step II processing by the Union to date.

**Includes 8 grievances brought to the arbitration level by the Union prior to January 1, 1953, but no further action has been taken by the Union to date.

Analysis of Grievances Received this Month

Department	Unit	Nonunit
Manufacturing Department		
Reactor Section	4	0
Separations Section	11	0
Metal Preparations Section	1	0
Total for Department	16	0
Plant Auxiliary Operations Department		
Plant Protection Section	7	0
Transportation Section	1	0
Purchasing and Stores Section	1	0
Total for Department	9	0
Community Operations & Real Estate Department		
Community Services Section	1	0
Total for Department	1	0
Engineering Department		
Technical Section	0	9
Total for Department	0	9
Financial Department		
Accounting Section	0	5
Total for Department	0	5
Radiological Sciences Department	0	0

Employee and Public Relations

	Unit	Nonunit
Medical Department	0	0
Legal Department	0	0
Employee and Public Relations Department	0	0
GRAND TOTAL	26	14

Subject Unit Grievances		Subject Nonunit Grievances	
Jurisdiction	12	Wage Rates	5
Overtime Rates	2	Wage Rates and Overtime Rates	2
Sick Leave	1	Work Assignment	2
Seniority	1	Working Conditions	5
Wage Rates	7		
Subjects not covered by Contract	3		
TOTAL	26		14

CONSTRUCTION LIAISON

Kenneth McCaffree, Executive Secretary of the Hanford Contractors Negotiating Committee, has established an office on Stevens Drive in the concrete block guard house outside the fence but near the west entrance to the 700 Area. The building is being remodeled to serve as a permanent headquarters, easily accessible to outside contractors, union representatives, etc.

A strike involving the Office Employees of Kaiser Engineers occurred on April 15. Pickets placed at all entrances to the construction bus lot and other entrances to the plant effectively halted most construction projects. Pickets were removed on Sunday, April 19, at which time negotiations were resumed. The settlement provides for a general increase of $6.00 per week, with $11.50 per week accruing to the employees in Group I (typists, messengers, etc.). Demands for a Health and Welfare plan were successfully resisted.

Agreement has been reached, subject to ratification by the membership, on the terms of agreement between the Technical Engineers and Kaiser. Wages continue in dispute but an understanding has been reached postponing further discussions on this matter pending the results of a survey to determine prevailing rates in the Northwest. If agreement cannot be reached within two weeks following the completion of the survey, or June 15 at the latest, the matter will be submitted to the new Labor-Management Relations Panel of the FMCS.

Substantial agreement has been reached between Kaiser and the Carpenters. The issue involving a 12:00 - 12:30 lunch period with overtime rates to apply to work performed during this period will be referred to the new Labor-Management Relations Panel.

Employee and Public Relations

During the recent Machinist strike in 101 Building, Kaiser endeavored to man the job with Millwrights. At the termination of the strike, the Millwrights were laid off due to lack of work and replaced by the striking Machinists. The seven men involved have filed an Unfair Labor Practice Charge with the NLRB, alleging that Kaiser by refusing to reinstate them has interfered with, restrained and coerced them "...because of their membership and activities in behalf of Millwrights Local Union 1699 and because of their failure to attain membership or clearance of Machinists Local 1743...".

It is of interest to note that a personnel inquiry from Peter Kiewit & Sons' Construction Company, Portsmouth, Ohio, was received concerning V. K. O'Connor who had applied for employment with that contractor. We were later informed that O'Connor has been employed by Newbery Electric at the same location.

WAGE RATES

The annual Northwest Area Wage Rate study was completed during the month, after a series of plant visitations. The study includes all former participating firms, as well as two additional concerns. As of this date, the results of the survey are in the process of printing and will be distributed within the next two weeks to participants and others eligible for the information. The completed study reveals General Electric Company's average pay scales to be well above the average rates paid for similar work throughout the Northwest Area, with the exception of a few classifications. Necessary steps will be taken immediately to increase the rates for those classifications found to be lower than the area averages.

The opening of new electrical power consuming facilities and others which are scheduled, prompted a review of the classification, Dispatcher (Electrical). In addition to this review, a special survey of the power companies of the Northwest Area was completed revealing that our present rate for Dispatcher (Electrical) to be below the area average. Necessary action will be taken to correct this inequity.

A request for Reimbursement Authorization was submitted to the Atomic Energy Commission covering the establishment of a new classification "Financial Analyst".

Wage Rates Unit met with supervision of the Separations Section and members of the HAMTC in a series of meetings for the purpose of discussing proposed job descriptions for the "U" plant, as well as classifications and crew sizes for this location. Agreement was reached on some points and the few remaining differences of opinion are expected to be resolved in the near future.

Proposed Appendix "A" to the HAMTC Agreement now in the process of negotiations was prepared. This included new titles for jobs in the Metal Preparation and Separations Sections, and new progression schedules for jobs in Metal Preparations, Separations, and Reactor Sections.

Employee and Public Relations

An increase of 1.79% was added to rates paid nonexempt employees, effective March 16, 1953. This increase was the result of a company-wide offer. The new rates were added in April, retroactive to the effective date.

As a result of this rate increase, a complete revision of the wage rate records of some 6,000 employees became necessary. Revised postings to reflect these changes were in progress at the month's end.

Revision of the Non-Unit Job Classification Manual, reflecting the new rates, was completed and distributed to eligible holders.

The Unit's campaign to train supervision in Wage Rate policies and procedures was reflected in meetings held throughout the month with supervision for counciling purposes in addition to a talk given before members of a 40-hour supervisors' group.

Four hundred sixty-seven (467) automatic and merit increases were processed during April. Requisitions for one hundred twenty-three (123) prospective employees and Additions to the Payroll for forty-one (41) new employees were approved. Review for proper classification, rate, etc., was made for twenty-four (24) reactivations, one hundred fifty-one (151) reclassifications, ninety-one (91) transfers, eighty-seven (87) temporary reclassifications, and one (1) transfer from the exempt roll.

COMMUNITY OPERATIONS AND
REAL ESTATE DEPARTMENT
MONTHLY REPORT SUMMARY
APRIL, 1953

ORGANIZATION AND PERSONNEL

Number of employees on roll:	SUFFIX	BEG. OF MONTH	END OF MONTH
General Administration	310	5	5
Community Operations Section			
Administration	320	3	3
Public Works	321	72	77
* Electrical	324	-	18
Engineering	326	8	9
Recreation & Civic Affairs	327	5 3/4	5 1/2
Library	327	10 1/2	10 1/2
Fire	328	68	68
Police	329	52	51
Sub-Totals		219 1/4	242
Community Real Estate Section			
Administration	330	3	3
Housing Rental	331	24	24
Maintenance	333	150	147
Commercial Property	337	13	12
Sub-Totals		190	186
Civil Defense Program	360	2	2
GRAND TOTALS		416 1/4	435

* The responsibility for electrical distribution in Richland was transferred to the Community Operations Section April 27, 1953. The new Richland Electrical Unit presently has eighteen employees.

There was an increase of eighteen and three-quarters employees in the Department during the month of April, 1953.

GENERAL

The Richland Fire Department and the Greater Richland Chamber of Commerce received from the U. S. Chamber of Commerce a distinguished service certificate for fourth place in a nation wide contest for fire prevention activities during 1952. Competition was between cities of the same class.

Six subleases for space in the Automatic Laundry Company buildings were approved for the following types of establishments: Music instruction, men's wear, household furnishings and appliances, law and business office, and department store.

Total housing applications pending - 699.

HARoot/jak
5/12/53

COMMUNITY OPERATIONS SECTION

SUMMARY

APRIL 1953

ORGANIZATION & PERSONNEL:

	BEGINNING OF MONTH		END OF MONTH	
	Exempt	Non-Exempt	Exempt	Non-Exempt
PUBLIC WORKS	14	58	14	63
RECREATION & CIVIC AFFAIRS	3	2 3/4	3	2 1/2
LIBRARY	4	6 1/2	4	6 1/2
POLICE	18	34	18	33
FIRE	68	0	68	0
ENGINEERING	6	2	6	3
ELECTRICAL			4	14
	113	103 1/4	113	122

The Richland Electrical Unit was established on April 27 and the responsibility for electrical distribution in Richland was transferred to the Community Operations Section on that date. The Unit will utilize as its headquarters the building and equipment yard at 910 Spengler Road. Eighteen men were brought into the Unit and the total force is eventually planned at twenty-one.

The Unit will be responsible for the following functions:

1. Proprietary and maintenance responsibility for the entire electrical distribution system in Richland and the surrounding area.

2. Responsibility for all meter reading, installation, and repair.

3. Responsibility for all customer relations and contacts.

4. Maintenance responsibility for the Richland fire alarm system, the traffic signal system, and the electrical equipment in the sewerage and water utilities.

5. Responsibility for providing electrical maintenance service on a work order basis whenever possible to other groups.

COMMUNITY OPERATIONS AND REAL ESTATE
PUBLIC WORKS UNIT
April 30, 1953

ORGANIZATION AND PERSONNEL

	Exempt	Non-Exempt
Employees Beginning of Month	14	58
Transfers Out	--	2
Transfers In	--	3
New Employees	--	4
Terminations	--	--
Total End of Month	14	63

SANITATION

Waste material collected and disposed of during April weighed approximately 1200 tons. A change in policy, which was approved by the Community Council, eliminates the twice weekly collection schedule which in past years was in effect from the first of May through September, and residential collections will be continued on a once weekly basis throughout the year.

ROADS AND STREETS

The first course of a double course light bituminous surface was laid on Spengler Road from George Washington Way to Stevens Drive, and on Newton Street from a point between George Washington Way and the dike to the Columbia River on 4-30-53. The second course will be applied in approximately one week. A light bituminous surface will also be laid on Kadlec Road from Van Giesen to McMurray Road; McMurray Road from Stevens Drive to Jadwin Avenue; and on Mansfield Street from Stevens Drive to the Columbia Playfield parking lot, during the latter part of May.

General repair and preparatory work is now in process on approximately 10 miles of streets to be treated with a seal-coat during June.

All storm water catch basins on Cottonwood Drive, which formerly had gutter inlets only, have been converted to provide curb inlets in addition to the gutter inlets. This alteration was made to minimize a drainage problem on Cottonwood Drive.

Approximately 50 replacement street identification signs were installed during the month.

Seasonal routine maintenance of streets, drainage systems, municipal parking lots and sidewalks was continued.

Community Operations - Public Works Unit

PARKS AND PUBLIC GROUNDS

All picnic tables and benches have been placed in assigned areas with exception of Riverside Park where the full compliment has not been set up, but will be placed as soon as utilitzation indicates the need.

Play equipment has been inspected and repaired as necessary to place in satisfactory and safe condition.

Fertilizer and a second treatment of 2-4-D were applied to all grassed areas, and routine irrigation and mowing have commenced and will continue throughout the summer season.

Utilization of ball diamonds has been at a high level and scheduled maintenance of these areas has been placed in effect.

Shelterbelt and tree nursery irrigation systems have been activated and water has been turned into the rills.

Routine seasonal maintenance of all Parks properties and public grounds was continued. Grounds maintenance as required by Real Estate, Medical, Plant Auxiliary Operations, and AEC, within the confines of Richland, are provided by this sub-unit, and all necessary hoses and sprinklers have been placed, and irrigation and mowing operations are in effect on a scheduled basis.

DOMESTIC WATER

Normal seasonal operation and maintenance were continued. Average daily water consumption for the month was 10.06 million gallons, with a maximum usage of 14.33 million gallons occurring on 4-15-53.

A leak developed, and was repaired, in a section of 10" schedule 40 steel pipe on the east side of Building 713. This pipe was installed as a replacement during 1948 and was tarred in place. Indications are that a small area on the bottom of the pipe, possibly where a block had been used, was not tarred, and severe deterioration had taken place at this point.

Progress in the Water Development Project has been rather slow this past month. Pouring of the anchor blocks at each end of the pipe under the Yakima River, and installation of the altitude valve at the new reservoir have been completed. The pipe under the river has yet to be tied to the installed lines on both sides of the river.

Normally, the tie-in of new water lines to the existing distribution system is performed by G.E. employees so that adequate control of the system may be maintained. However, due to the objection of G.E. employees to working on a line which was installed by a non-union contractor, it was necessary to have a contract negotiated with the company that laid the line to also perform the tie-in work. This work is now in process, and experience to date indicates that satisfactory control of operations cannot be maintained when a contractor makes taps into existing lines. Failure to commence, or to complete the taps at scheduled times has resulted in prolonged and serious drops in pressure.

DOMESTIC WATER (Continued)

Production and consumption records for the month of April are as follows:

DOMESTIC WATER

	Well Production Million Gallons	Av. Daily Production	Total Consumption Million Gallons	Av. Daily Consumption
Richland	99.1138	3.3079	224.3271	7.4776
North Richland	117.6940	3.9231	36.7936	1.2265
Columbia Field	85.3380	2.8446		
300 Area			40.7574	1.3586
TOTAL	302.1458	10.0756	301.8781	10.0627

SEWERAGE

The lines which carry water from the irrigation canal to the north and south trunk sewers were placed in service, and a total of about one million gallons per day are now being added to the sewage through these lines and the line flowing to the North Richland trunk. This flow of irrigation water into the collection system is to increase the dissolved oxygen content of the sewage and control odors at the treatment plant.

Routine seasonal operation and maintenance of the collection system, lift stations and treatment plant were continued, and average daily flow of sewage for April was 3.6 million gallons. Flow meter recordings at the treatment plants was as follow:

SEWAGE

	Total Sewage Flow Million Gallons	Average Daily Flow Million G.P.D.	Average Rate of Flow Gallons Per Minute
Plant No. 1	33.590	1.120	778
Plant No. 2	74.473	2.482	1724
TOTAL	108.063	3.602	2502

IRRIGATION SYSTEM

Irrigation systems 1, 3, and 4 were in full operation and the major parts of 2 and 5 were in service at the end of the month. The remainder of 2 and 5, and 6 will be in service the first week of May.

Normal operation and maintenance of the canal system was continued.

RECREATION AND CIVIC AFFAIRS UNIT

MONTHLY REPORT

APRIL, 1953

ORGANIZATION AND PERSONNEL

	Exempt	Non-Exempt
Beginning of Month	3	2-3/4
New Hires	0	0
Terminations	0	-1/4
Transfers - IN	0	0
- OUT	0	0
	3	2-1/2

SCHOOLS

The following is a tabulation of full-time paid School District #400 personnel as of April 30, 1953:-

Administration	7
Principals & Supervisors	14
Clerical	24
Teachers	287
Health Audiometer	1
Cooks	44
Nursery School and Extended Day Care	0
Bus Drivers	1
Maintenance	17
Operations	42
	437

CLUBS AND ORGANIZATIONS

As of April 30, 1953, the employees of the listed organizations, exclusive of those included in the Real Estate, Commercial and Other Properties Unit Report, include:-

Youth Council - Chest	1
Boy Scouts	1
Campfire Girls	1
Hi Spot Club	2
Girl Scouts	2
Justice of the Peace	1
Y.W.C.A.	2
Chamber of Commerce	1
	11

Recreation and Civic Affairs Unit Monthly Report (Continued)

The number and types of organizations presently served by the Recreation and Civic Affairs Unit include:-

Business and Professional Organizations		23
Churches and Church Organizations		27
Civic Organizations		19
Schools		10
Fraternal Organizations		25
Political Organizations		5
Recreation and Social Clubs -	Alumni	3
	Arts, Music, Theater	11
	Bridge	3
	Dance	5
	Garden	3
	Hobby	9
	Social	11
	Sports	19
Veteran and Military Organizations		14
Welfare Groups		7
Youth - Boy Scouts		20
Girl Scouts		49
Campfire Girls		36
Miscellaneous		15
		314

RECREATION

The regular monthly meeting of the Parks and Recreation Board was held on April 14, 1953, at the Community House. It was moved, seconded and the motion passed that the Board recommend to the Community Operations Section that the Richland Yacht Club be allowed to operate through October, 1953 utilizing the waterfront adjacent to Riverside Park and running approximately East and West 300 feet North of the centerline of Lee Boulevard and North to Newton Street Extended and to construct docks at this point of a permanent but movable construction. It was also moved, seconded and the motion passed that the Constitution of the Board be amended to read that future meetings would be held on the first Wednesday of each month. The next regular meeting of the Board is scheduled for May 6, 1953.

On April 6th, 7th, 8th, and 9th, a Table Tennis Tournament sponsored by the Unit, was held in the Games Room at the Community House. The tournament was divided into five divisions with trophies being presented to the first and second place winners in each division. One hundred thirty-eight (138) persons participated in the tournament which was attended by approximately five hundred sixty-five (565) spectators.

A Civil Defense Training Program was held throughout the month, twice weekly at the Community House with a total attendance of approximately 136 persons.

Recreation and Civic Affairs Unit Monthly Report (Continued)

On Saturday, April 18, 1953, the National Federation of Federal Employees held a banquet in the Social Hall at the Community House in conjunction with the State Convention being held by them in Richland.

The Annual Marble Tournament, co-sponsored by the V.F.W. and our Unit, continued during the month with the school finals completed on April 30 and the City Championship to be held on May 9, 1953. Approximately 615 children participated in the tournament.

On Easter Sunday, April 5, the Annual Easter Egg Hunt, sponsored by the Richland Kiwanis Club and assisted by our Unit, was held at Riverside Park with approximately 1400 children and adults in attendance.

The Girl Scouts of Richland on April 11, 1953 had an outing at Burlin Camp which included a work program of giving the exterior of the building at the Camp, a thorough cleaning.

Plans have been made by the Unit to have the floodlights on the Tennis Courts at Columbia Playfield in operation on May 1, 1953.

Arrangements were made with the Grounds Maintenance Unit to maintain the Park's ball diamonds on Tuesday and Thursday of each week throughout the season.

Two members of the Recreation and Civic Affairs Unit staff attended the Northwest District Recreation Conference at Great Falls, Montana on April 13, 14, and 15.

ATTENDANCE - OTHER THAN COMMUNITY HOUSE

	Children	Adults	Total
Sponsored Programs		19	19
Special Events	1,002	800	1,802
Permit Groups	2,722	1,475	4,197
Totals For Month	3,724	2,294	6,018
Fiscal Year Totals To Date	47,402	43,001	90,403

ATTENDANCE - COMMUNITY HOUSE

Sponsored Programs	7,794	2,234	10,028
Special Events	200	238	438
Permit Groups	42	2,306	2,348
Totals For Month	8,036	4,778	12,814
Fiscal Year Totals To Date	58,784	31,032	89,816

GRAND TOTALS		This Month	Cumulative To-Date
I.	Outside Total	6,018	90,403
II.	Community House	12,814	89,816
III.	Grand Total	18,832	180,219

RICHLAND PUBLIC LIBRARY

APRIL 1953

ORGANIZATION AND PERSONNEL	Exempt	Non-Exempt
Employees - Beginning of Month	4	6½
Transfers In	0	0
Transfers Out	0	0
New Hires	0	0
Terminations	0	0
End of Month	4	6½

GENERAL

Circulation

Books	14,457	(Adult - 8,292; Juvenile - 6,165)
Magazines	453	
Pamphlets	71	
Records	959	
Interlibrary Loan	79	
Grand Total	16,019	

Current Book Stock

Books added this month	707
Books dropped this month	0
Grand Total	24,365

Registration

Adult	147
Juvenile	50
Total	197
Total Registered Borrowers	12,784

Children's Story Hour Attendance 271 (Pre-school - 144; Record Story Hour - 120; Girl Scouts - 7)

Approximately seventy librarians and library trustees attended a Washington State regional meeting in North Hall, April 21st. The cities represented at the meeting included Ellensburg, Yakima, Walla Walla, Washtucna, Ritzville, Prosser, Dayton, Wapato, Toppenish, Pasco, Kennewick, Goldendale and Richland, Washington. This meeting was part of the Washington State Library regional meeting program. Members of the Washington State Library present at the meeting were Miss Maryan Reynolds, State Librarian, Miss Bernice Gantt and Miss Dorothy Cutler, State Field Librarians. The program for the meeting included a demonstration of book and magazine mending by Miss Carol Trimble, Librarian, Yakima Valley Regional Library and Mrs. Harry Raymond of the Yakima Valley Regional Library staff; a talk to the library trustees on the Washington Association of Library Trustees, the Yakima Valley Regional Library and trustees problems by Mr. James Garretson, a member of the Yakima Valley Regional Library Board of Trustees; a discussion of problems of library budgeting and municipal finance by Mr. Howard Albert, Washington State Auditor's Office; and a discussion of children's books and school library problems for the school librarians by Miss Bernice Gantt, Washington State Field Librarian. At the school librarians section of the meeting, Mrs. Carol Stringer, Librarian, Spalding School also showed slides on library activities in the school. The social activities in connection with the meeting consisted of morning coffee provided and served by members of the Richland Public Library Board and a luncheon arranged and attended by members of the Community Operations Section's staff at the Camp Hanford Officers' Club at 1 P.M.

Twenty-two additional meetings were held in North Hall during April.

Paintings by two Spokane artists were on display in North Hall this month. The display, sponsored by the Richland Allied Arts Association was arranged by Mr. Jim McGrath.

The regular meeting of the Richland Public Library Board was held April 1, 1953.

RICHLAND POLICE DEPARTMENT

APRIL 1953

ORGANIZATION

	Exempt	Non-Exempt
Employees - Beginning of Month	18	34
Transfers In	0	0
Transfers Out	0	0
New Hires	0	1
Terminations	0	2
Total - End of Month	18	33

GENERAL

The Richland Police Department, in cooperation with the Richland Junior Chamber of Commerce and the Richland Public School system, conducted the annual bicycle safety campaign during the month of April. Members of the Traffic Section gave bicycle safety talks before members of the local schools, cooperated in the showing of traffic safety films, and participated in the annual bicycle safety parade. A current effort is being carried on throughout the schools to register all bicycles now operated by children of school age.

A new clerk's table has been placed in the lobby of Police Headquarters near the police desk to be utilized as a place where members of the public may complete accident reports, etc., in view of the Desk Officer.

New grey metal desks have been installed in the Records Section, replacing old or obsolete wooden type desks.

All officers have completed the Explosive Ordnance Disposal School which has been conducted by an Army instructor during the past several weeks. Officers were issued certificates as "Reconnaissance Agents" following completion of the course.

A total of three bicycles were impounded during this past month for operating without proper lights after the hours of darkness on the streets of Richland.

Thirty-six prisoners were processed through the Richland Jail during the month of April, 8 of which were from North Richland, and one was a prisoner of the Security Patrol.

Eleven guns and 226 bicycles were registered with the Police Department during the month of April.

A total of 345 police and traffic reports were processed through the records section of the Police Department, consisting of reports originating from both Richland and North Richland.

TRAFFIC

There were 30 reportable accidents this month in Richland as compared to 20 last month and 22 for April of 1952. This brings the total accidents this year to 92 as compared to 114 for the same period last year.

There were 4 injury accidents this month which resulted in injury to 4 persons. There were only 3 persons injured last month, but there were also 4 persons injured in April of 1952. The total injuries this year to date are 9 and one fatality, as compared to one fatality and 20 persons injured for the same period last year.

Fifteen of the above accidents occurred in the business district, 13 were in the residential district and 2 were in open areas outside the residential district. There were 17 accidents during daylight hours and 13 after dark.

Property damage as a result of accidents this month amounted to $5,239.21, or an average of $174.64. This is an increase of $9.13 per accident over the previous month. Property damage for April of 1952 averaged $207.73.

Members of the Richland Police Department were called to investigate 22 of the above accidents and these investigations resulted in criminal complaints being signed against 19 drivers.

Traffic violations which contributed to accidents this month were:

Negligent Driving	8	Reckless Driving	1
Failure to Yield Right-of-Way	7	Fell Asleep	1
Following too Closely	3	Inattention to Driving	1
Drunk Driving	1	Unsafe Speed	1
Pedestrian Violation	1		

There were 5 traffic safety meetings conducted this month; one was at Jason Lee School and the others for plant forces. These meetings had a total attendance of approximately 585.

A traffic light was installed at the intersection of George Washington Way and Van Giesen which would greatly facilitate the movement of traffic at this point and make pedestrian crossing safer, but due to a mechanical defect, it was necessary to put it out of operation for some time. The light was first placed in operation on April 17.

There were a total of ten reportable accidents in North Richland during the month of April, with one injury reported.

TRAINING

There was no range activity by members of the Richland Police Department during the month of April.

ACTIVITIES AND SERVICES

	March		April	
	Richland	No.Richland	Richland	No.Richland
Doors and windows found open in facilities	33	10	55	44
Children lost or found	15	0	14	1
Dogs, cats reported lost or found	5	0	8	0
Dog, cat, loose stock complaints	7	2	5	0
Persons injured by dogs	2	0	5	0
Bank escorts and details	1	4	2	4
Fires investigated	11	1	11	2
Miscellaneous escorts	13	6	9	3
Complaints investigated (no enforc.action)	31	1	25	3
Deaths reported	1	0	1	0
Property lost or found	25	1	24	1
Records inquiries	93	0	91	0
Letters of inquiry	72	0	97	0
Law enforcement agencies assisted	5	0	1	1
Private individuals assisted	11	2	4	1
Plant departments assisted	13	2	17	3
Emergency messages delivered	11	72	14	82
Street lights out reported to Electrical	85	15	87	39
Totals	434	116	470	184

MONTHLY REPORT
RICHLAND POLICE DEPARTMENT
(RICHLAND - NO. RICHLAND)
APRIL 1953 T

OFFENSES	KNOWN Rich.	KNOWN No. Rich.	UNFOUNDED Rich.	UNFOUNDED No. Rich.	CLEARED OTHER* Rich.	CLEARED OTHER* No. Rich.	CLEARED ARREST Rich.	CLEARED ARREST No. Rich.
PART I								
1. Murder								
2. Rape								
3. Robbery								
4. Aggravated Assault								
5. Burg.-Break.&Entry	6	-	-	-	-	-	5	-
6. Larceny Over $50.00	3	1	-	1**	-	-	-	-
Under $50.00	15	9	1	1	1	4	3	1
7. Auto Theft	-	-	-	-	-	-	-	-
TOTAL PART I CASES	24	10	1	2	1	4	8	1
PART II								
8. Other Assaults	3	3	-	-	-	-	3	3
9. Forgery&Counterfeit	--	-	-	-	-	-	-	-
10. Embezzlement & Fraud	-	-	-	-	-	-	-	-
11. Stolen Prop:Buy:Rec.	-	-	-	-	-	-	-	-
12. Weapons:Carry:Poss.	-	-	-	-	-	-	-	-
13. Prostitution	-	-	-	-	-	-	-	-
14. Sex Offenses	-	-	-	-	-	-	-	-
15. Offenses Ag.Fam.&Child	-	-	-	-	-	-	-	-
16. Narcotics-Drug Laws	-	-	-	-	-	-	-	-
17. Liquor Laws	-	-	-	-	-	-	-	-
18. Drunkenness	14	1	-	-	-	-	14	1
19. Disorderly Conduct	-	-	-	-	-	-	-	-
20. Vagrancy	3	-	-	-	-	-	3	-
21. Gambling	-	-	-	-	-	-	-	-
22. Driving While Intox.	7	1	-	-	-	-	7	1
23. Viol. Rd.&Dr. Laws								
Fail. to St.&Ident.	6	-	-	-	-	-	3	-
Speeding	23	4	-	-	3	-	20	4
Stop Sign	19	3	-	-	2	-	17	3
Reckless Driving	4	4	-	-	-	-	4	4
Right of Way	8	2	-	-	-	-	8	2
Negligent Driving	25	3	-	-	-	-	25	3
Defective Equip.	8	-	-	-	4	-	4	-
Illegal Passing	4	-	-	-	1	-	3	-
Improper Turn	2	-	-	-	-	-	2	-
Fail. to Dim Lights	-	1	-	-	-	-	-	1
24. Parking	16	48	-	-	5	32	11	16
25. All Other Traff. Viol.	7	4	-	-	1	-	6	4
26. All Other Offenses:								
Malicious Mischief	10	-	-	-	6	-	1	-
Vandalism	4	3	-	-	4**	1	-	-
Disturbance	1	-	-	-	1	-	-	-
Bike Violations	1	-	-	-	1	-	-	-
Dest. of Pers. Prop.	2	-	-	-	1	-	-	-
Investigation	4	1	-	-	4	1	-	-
Family Disturbance	5	1	-	-	5	-	-	1
Carried forward to page LF-5 TOTALS	176	79	-	-	38	34	131	43

OFFENSES	KNOWN Rich.	KNOWN No. Rich.	UNFOUNDED Rich.	UNFOUNDED No. Rich.	CLEARED OTHER* Rich.	CLEARED OTHER* No. Rich.	CLEARED ARREST Rich.	CLEARED ARREST No. Rich.
Totals brought forward from page LF-4	176	79	-	-	38	34	131	43
26. All Other Offenses:								
Illegal Entry	1	-	-	-	-	-	-	-
Juvenile Delinq.	2	-	-	-	1	-	1	-
Runaway Juvenile	2	-	-	-	-	-	2	-
Neighborhood Trouble	2	-	-	-	1	-	1	-
Illegal Use of Guns	1	-	-	-	1	-	-	-
Viol. Dog Ordinance	2	-	-	-	-	-	2	-
Fire	2	-	-	-	2	-	-	-
Cont. to Del. of Minor	1	-	-	-	-	-	1	-
Indecent Liberties	1	-	-	-	-	-	1	-
Child Neglect	1	-	-	-	1	-	-	-
27. Suspicion								
TOTAL PART II	191	79	-	-	44	34	139	43
PART III								
28. Missing Persons	10	1	-	-	10	1	-	-
Lost Persons	12	2	-	-	12	2	-	-
Lost Animals	8	-	-	-	1	-	-	-
Lost Property	23	2	-	-	19	-	-	-
29. Found Persons	-	-	-	-	-	-	-	-
Found Animals	-	-	-	-	-	-	-	-
Found Property	18	-	-	-	10	-	-	-
TOTAL PART III	71	5	-	-	52	3	-	-
PART IV								
30. Fat.M.V.Tr.Acc.								
31. Pers.Inj.M.V.Tra.Acc.	4	1						
32. Prop.Dam.M.V.Acc.	26	8						
33. Other Traffic Acc.								
34. Public Accident)								
35. Home Accidents)	No Accurate Statistics Kept							
36. Occupational Acc.)								
37. Firearms Accidents								
38. Dog Bites								
39. Suicides								
40. Suicide Attempts								
41. Sud.Death&Bod. Found	1							
42. Sick Cared For								
43. Mental Cases								
TOTAL PART IV	31	9						
COMPOSITE TOTALS PART I,II,III,IV CASES	317	103	1	2	97	41	147	44

*Cases listed under "Cleared Other" are those cleared by various means other than arrest, such as; orders from prosecutor, juvenile probation officer or other situations in which a mutual agreement is obtained. They are definitely "cleared" cases and differ from the arrest column only in that there was no arrest. **One larceny and one vandalism cleared this mo. which occurred in previous month.

Property reported stolen	Richland	$1,463.36
Property reported stolen	No. Rich.	$ 689.98
Property recovered	Richland	$ 174.00
Property recovered	No. Rich.	$ 819.98

MONTHLY REPORT RICHLAND POLICE DEPARTMENT JUVENILES INVOLVED APRIL 1953

OFFENSE	NO. CASES	JUVENILES	SEX	5	9	10	11	12	13	14	15	16	17
RICHLAND													
Larceny	2	3	2-M									2	
			1-F						1				
Disturbance	2	3	2-M									2	
			1-F										1
Malicious Mischief	5	8	M			1	4	1		2			
Assault	1	2	M								2		
Juvenile Delinquency	2	2	1-M										1
			1-F								1		
Burglary	4	10	M		1	1					3	3	2
Fire	2	2	M				2						
TOTALS	18	30			1	2	6	1	1	2	6	7	5
NORTH RICHLAND													
Larceny	1	1	M								1		
Vandalism	1	3	M	1	1	1							
TOTALS	2	4		1	1	1					1		

RICHLAND POLICE DEPARTMENT
(COMMUNITY OF RICHLAND)

Number of offenses known to police per 25,000 inhabitants in cities of 25,000 persons:

Wash. Ore. & Calif. Six Months (Jan.-June 1952)		One Month Average	1952 Jan. - June	1953 March	1953 April
Murder	.405	.067	-	-	-
Robbery	10.850	1.808	-	-	-
Agg. Assault	8.500	1.416	-	-	-
Burglary	67.975	11.329	8	2	6
Larceny	210.800	35.131	163	22	18
Auto Theft	34.475	5.745	4	-	-

Number of offenses known to police per 25,000 inhabitants regardless of whether offenses occurred in cities or rural districts.

State of Washington Six Months (Jan.-June 1952)		One Month Average	1952 Jan. - June	1953 March	1953 April
Murder	.355	.059	-	-	-
Robbery	10.000	1.666	-	-	-
Agg. Assault	2.650	.441	-	-	-
Burglary	62.575	10.429	8	2	6
Larceny	209.125	34.854	163	22	18
Auto Theft	31.650	5.275	4	-	-

The percentage of offenses committed by persons under the age of 25 years is shown:

National Average Percentage of Cases Jan. - June 1952		Richland 1952 Jan. - June	Richland 1953 March	Richland 1953 April
Robbery	55.1	-	-	-
Burglary	60.2	38%	50%	83%
Larceny	43.4	12%	18%	17%
Auto Theft	69.4	75%	-	-

Note: Statistics of juvenile offenses throughout the United States were taken from the Uniform Crime Report published by the Federal Bureau of Investigation, which states: "It should be remembered that the number of arrests recorded is doubtless incomplete in the lower group because of the practice of some jurisdictions not to fingerprint youthful offenders."

RICHLAND POLICE DEPARTMENT
(Community of North Richland)

Number of offenses known to police per 10,000 inhabitants in cities of 10,000 persons:

Wash.Ore. & Calif. Six Months (Jan.-June 1952)		One Month Average	1952 Jan. - June	1953 March	1953 April
Murder	.162	.027	-	-	--
Robbery	4.34	.723	-	-	-
Agg. Assault	3.40	.566	-	1	-
Burglary	27.19	4.531	1	-	-
Larceny	84.32	14.053	45	7	10
Auto Theft	13.79	2.298	2	-	-

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

State of Washington Six Months (Jan.-June 1952)		One Month Average	1952 Jan. - June	1953 March	1953 April
Murder	.142	.023	-	-	-
Robbery	4.01	.668	-	-	-
Agg. Assault	1.06	.176	-	1	-
Burglary	25.03	4.171	1	-	-
Larceny	83.65	13.941	45	7	10
Auto Theft	12.66	2.111	2	-	-

The percentage of offenses committed by persons under the age of 25 years is shown:

National Average Percentage of Cases Jan. - June 1952		No. Richland 1952 Jan. - June	No. Richland 1953 March	No. Richland 1953 April
Robbery	55.1	-	-	-
Burglary	60.2	-	-	-
Larceny	43.4	-	14%	20%
Auto Theft	69.4	-	-	-

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 remembed that the number of arrests recorded is doubtless incomplete in the lower age group because of the practice of some jurisdictions not to fingerprint youthful offenders."

RICHLAND POLICE DEPARTMENT
RICHLAND JUSTICE COURT CASES
APRIL 1953

VIOLATION	NO OF CASES	NO OF CONV.	NO OF FORF.	CASES CONT.	CASES DISM.	WARR ISS.	SENT JAIL	SENT SUSP.	LIC. REV.	CASES ORIG. PREV. MON.	CASES INCL. OTHER VIOL.	BAIL FORF.	FINES	FINES SUSP.
DEFECTIVE EQUIPMENT	7	4	1	2						2	3	$	$ 8.50	$
DRIVERS LICENSE	10	5	3	2						1	9		7.50	7.50
DRUNKEN DRIVING	5	4		1					4				230.00	5.00
FAILURE TO SIGNAL	1	1								1			7.50	
F.T.S. & I.	1	1									1			
F.T.Y.R.O.W.	10	6	2	1	1							25.00	60.00	
FOUR IN FRONT SEAT	1	1											5.00	
HIT AND RUN	1	1					1		1					
ILLEGAL PARKING	8	3	5									17.50	10.50	
ILLEGAL PASSING	2	1	1									7.50	5.00	
ILLEGAL TURN	2		1	1								7.50		
IMPROPER PLATES	3	2	1								1	5.00	3.50	
NEGLIGENT DRIVING	26	15	2	6	3				2	7		40.00	252.50	51.50
NO REGISTRATION	1			1							1			
PERMITTED UNLIC. OPER. TO OPER. VEH.	1	1											10.00	
RECKLESS DRIVING	3			3						1				
SPEEDING	20	4	13	3						5		125.00	45.00	
STOP SIGN	20	5	11	4						2	2	58.50	25.00	
ABANDONMENT & NON-SUPPORT	1			1						1				
C TO D OF A M	1				1									
DISTURBANCE OF PEACE	1	1					1				1			
DOG ORDINANCE	1			1										
INJURY TO ANOTHER'S PROPERTY	1	1					1	1		1				
PETIT LARCENY	1			1						1				
PUBLIC INTOXICATION	15	2	13				1					172.50	12.50	
THIRD DEG. ASSAULT	1	1											27.50	27.50
VAGRANCY	2	2					2	2						
TOTAL	146	61	53	27	5		6	3	7	22	18	$458.50	$710.00	$91.50

THREE RECKLESS DRIVING CASES AMENDED TO NEGLIGENT DRIVING.

RICHLAND POLICE DEPARTMENT
NORTH RICHLAND JUSTICE COURT CASES
APRIL 1953

VIOLATION	NO OF CASES	NO OF CONV.	NO OF FORF.	CASES CONT.	CASES DISM.	WARR. ISS.	SENT JAIL	SENT SUSP.	LIC. REV.	CASES ORIG. PREV. MON.	CASES INCL. OTHER VIOL.	BAIL FORF.	FINES	FINES SUSP.
DEFECTIVE EQUIPMENT	1	1										$	$ 7.50	$
DRIVERS LICENSE	7	2	2	3							4	7.50		
DRUNKEN DRIVING	1			1										
DRVG WHILE LIC. REV	1			1										
F.T. DIM LIGHTS	1		1									7.50		
F.T.Y.R.O.W.	3	3											30.00	
ILLEGAL PARKING	16	10	6									21.00	35.00	28.00
NEGLIGENT DRIVING	7	3		3	1					2			95.00	
NO REGISTRATION	1	1									1			
RECKLESS DRIVING	1	1							1				35.00	
SPEEDING	7	2	5							1		67.50	20.00	
STOP SIGN	6	1	4	1						1	1	15.00	5.00	
ATTEMPTED THEFT	2			2										
PUBLIC INTOXICATION	1		1									12.50		
THIRD DEG. ASSAULT	3	3					3			1				
TOTAL	58	27	19	11	1		3		1	5	6	$131.00	$227.50	$28.00

ONE SECOND DEGREE ASSAULT CASE AMENDED TO THIRD DEGREE ASSAULT.
ONE RECKLESS DRIVING CASE AMENDED TO NEGLIGENT DRIVING.
ONE DRUNKEN DRIVING CASE AMENDED TO NEGLIGENT DRIVING, LIQUOR INVOLVED.
ONE DRUNKEN DRIVING CASE REFERRED TO SUPERIOR COURT.
ONE DRIVING WHILE LICENSE REVOKED CASE REFERRED TO SUPERIOR COURT.

POLICE DIVISION - TRAFFIC CONTROL STATISTICS
APRIL, 1953

MOTOR VEHICLE ACCIDENTS REPORTABLE:

	Total Number		Fatilities		Major Injuries		Minor Injuries	
	Mar.	Apr.	Mar.	Apr.	Mar.	Apr.	Mar.	Apr.
Richland	20	30	0	0	0	0	2	4
North Richland	10	10	0	0	0	0	2	1

ACCIDENT CAUSES:

	Negligent Driving		Failure to Yield Right of Way		Reckless & Drunken Driving		Other Cases	
	Mar.	Apr.	Mar.	Apr.	Mar.	Apr.	Mar.	Apr.
Richland	4	8	3	7	1	2	13	13
North Richland	3	1	2	3	0	1	6	5

PLANT WARNING TRAFFIC TICKETS ISSUED:

	Speeding		Stop Sign		Parking		Imp. License		Def. Equipment		Other V.		Totals	
	Mar	Apr	Mar	Apr	Mar	Apr	Mar	Apr	Mar	Apr	Mar	Apr	Mar	Apr
Richland	0	3	0	2	5	5	2	0	1	4	0	2	8	16
North Richland	0	0	1	0	53	32	7	0	8	0	0	0	69	32

TRAFFIC CHARGES AND COURT CITATION TRAFFIC TICKETS ISSUED:

	Speeding		Stop Sign		Drunken Dr.		Reckless Dr.		Right of Way V.		Neg. Drvg.		Parking V.		Other V.		Totals	
	Mar	Apr	Mar	Apr	Mar	Apr	Mar	Apr	Mar	Apr	Mar	Apr	Mar	Apr	Mar	Apr	Mar	Apr
Richland	22	15	12	18	3	5	4	2	2	10	9	19	17	8	33	26	102	103
No.Richland	4	6	6	5	0	1	1	2	1	3	5	5	9	16	9	11	35	49

TRAFFIC VOLUME: Average 24-Hour Traffic Volume Count for week ending April 24, 1953, Symons east of Jadwin - 4,081 cars.

NOTE: TRAFFIC CONTROL STATISTICS SHOW ORIGINAL CHARGES ONLY.

COMMUNITY OPERATIONS

RICHLAND FIRE DEPARTMENT

APRIL 1953

Organization and Personnel	Exempt	Non-Exempt
Employees - Beginning of Month	68	0
Transfers In	0	0
Transfers Out	0	0
New Hires	0	0
Terminations	0	0
End of Month	68	0

Fire Protection		Richland	North Richland
Fire Loss (Estimated):	Government	$1,928.00	$ 0.00
	Personal	575.00	60.00
	April Total	$2,503.00	$ 60.00
	1953 Total	$3,791.00*	$2,603.63

* Not including February 18th loss on Bauer Construction Warehouse fire. Awaiting salvage figures on contents.

Response To Fire Alarms	26	14
Investigations of Minor Fires & Incidents	1	0
Ambulance Responses	52	
Inside Schools or Drills	25	10
Outside Drills	7	5
Safety Meetings	8	2
Security Meetings	5	2
Fire Alarm Boxes Tested	168	96

Eight Fire Department officers and 20 firemen attended the Explosive Ordnance Disposal School conducted by U. S. Army personnel.

A safety meeting was conducted at the Central Fire Station on April 21st for 16 Real Estate Section employees.

Thirteen Cub Scouts and 10 Bluebirds, accompanied by four adults, were conducted on tours of the Central Fire Station.

Two Boy Scouts were examined for their Firemanship Merit Badge.

Fire Prevention

A total of 310 fire inspections were made during April, resulting in 23 hazard reports. Four hundred forty nine fire extinguishers, 89 fire hose standpipes and 12 fire doors were inspected. A hundred and fifty fire extinguishers were removed and 91 installed. Eighteen fire extinguishers and 7 fire hose standpipes required servicing.

The Assistant Fire Marshal attended the regular monthly meeting of the Richland Traffic Control Committee.

Word was received during April that Richland has been awarded 4th place in its population class in the U. S. Chamber of Commerce National Fire Waste Contest for 1952 fire prevention activities. This is the 4th successive year Richland has been awarded national honors in this contest and the 9th such award since 1948 in the two nation-wide contests.

The Fire Department assisted in a variety of ways with the Richland Chamber of Commerce sponsored Clean-Up Week conducted April 20-26 inclusive. Posters, news releases, special inspections, lapel tags, merchant displays, newspaper display advertising and roving photographer activities were included in the campaign. Special effort was made to bring about improved trash conditions in the Uptown Commercial area.

Fire extinguisher demonstrations were given for Heavy Duty Garage and Kadlec Hospital employees.

Final arrangements were made for the annual testing and back-flushing May 9th of the 703 Building sprinkler systems.

COMMUNITY REAL ESTATE AND OPERATIONS DEPARTMENT
ENGINEERING UNIT

APRIL - 1953

PERSONNEL	Exempt	Non-Exempt*	Total
Employees - Beginning of Month	6	2	8
Employees - End of Month	6	3**	9

* One Employee on permanent loan
One Employee on Temporary loan
** Return of permanently assigned employee

The Status of Active Projects is as Follows:

K-713 - Vehicle Activated Traffic Light, George Washington Way & Van Giesen - 100% complete.

C-486 - 1952 Street Improvement Program - 99% complete.

C-488 - Additional Erosion Control and Development, Public Areas, F.Y. 1952 - Shelterbelt 30% complete. Bid assembly for Jason Lee Playground being prepared.

Status of Active ESR's:

396-CA - Site Map CAP Field - Deferred for other work pending decision by others on land to be included on map.

510-M - Roads and Streets Drawings, 1950 Construction - Cancelled April 30, 1953.

544-SD - Tree Planting for Schools - Work complete until fall 1953. ESR Cancelled.

565-RC - Site South of Tract House 0-1224 - Deferred for other work.

571-M - Free Methodist Church - Progressing slowly. 98% complete.

572-M - First Baptist Church - Progressing slowly. 75% complete.

574-M - Assembly of God Church - Progressing slowly. 51% complete.

579-M - Goethals Drive to Williams, Study of Intersection - Cancelled April 30, 1953.

581-RC - "As Built" Plans for LDS Church - Plans received for checking. Deferred for other work.

588-RC - Alteration Permits - An open active file.

591-M - Preparation of Advice Pamphlet for Contractors - Deferred for other work.

612-RC - "As Built" Plans for Richland Thrifty Drug - Received for checking. Deferred for other work.

ENGINEERING UNIT

628-M - Prepare "As Built" Plans for Richland Fire Alarm System - Given to Engineering Department for completion with other work.

630-M - Correction of Master Plan - Open active file.

631-M - "As Built" Plans for Sewer System - Work progressing.

632-M - "As Built" Plans for Water System - Work progressing.

633-M - "As Built" Plans for Streets - Work progressing.

634-M - Engineer Liaison, Richland Water Expansion - Work progressing. Following construction closely be inspections and preparing data as requested.

663-M - Plan Checking, Richland Development Co., Block 5, North Commercial Area - 99% complete. Final inspection to be made.

674-RC - Uptown Parking Lot Study - Temporarily deferred for more urgent work.

686-RC - Utility Lines, Vacant Commercial Sites - Open active file.

689-RC - "As Built" CD Joseph Building #2 - Awaiting "As Built" plumbing plans.

697-M - Plans, Specifications, and Inspections Drive-In Theater - 99% complete. Final inspection to be made.

698-RC - Plans, Specifications, and Inspections Rug Cleaning Plant - 99% complete. Final Inspection to be made.

705-RC - Field Supervision, Parking Lots, Chief Joseph Jr. High School - 99% complete.

706-RC - Plans, Specifications, and Inspections Medical-Dental Properties, Inc. - Construction progressing. 99% complete. Building open for business.

711-PW - Study and Estimate, Sewer Main, Swift Boulevard - Deferred for other work.

712-M - Survey of Richland, Washington, Liaison and Assistance - Work continuing.

715-M - Television Antennae - An open active file.

722-M - Erosion Control & Development of Public Areas, F.Y. 1953 - Being reviewed.

724-M - Preliminary Engineering - Hospital Grounds Improvements - Work in progress.

725-M - Plans, Specifications, and Inspections McVicker Bldg., Lee & Goethals - Leasee withdrew, so ESR is cancelled.

726-M - Plans, Specifications, and Inspections CD Joseph Bldg. #4, Richland Realty Co. - Construction progressing - 90% complete.

729-M - Plans, Specifications and Inspections, Grace Bacon Bldg. - Waiting resubmission of plans by leasee.

ENGINEERING UNIT

730-M - Plans, Specifications, and Inspections Richland Realty Co., Symons & Jadwin - Construction progressing. 10% complete.

731-M - Plans, Specifications, and Inspections, Richland Gas Company - 100% complete.

742-M - Plans, Specifications and Inspections Addition to Standard Oil Company Bldg. - 99% complete. Final inspection to be made.

746-M - Preparatory Engineering, Rebuild Parshall Flume at 1182 Reservoirs - 100% complete.

747-M - Preparatory Engineering - Float Control Valve at Sewage Lift Station - 95% complete.

749-M - Installation of Radio Equipment, North Richland Fire Apparatus - Temporarily withheld awaiting decision by others.

750-M - Preparatory Engineering, Alterations to Richland Public Library - Project proposal prepared.

751-M - Preparatory Engineering, Increased Turning Radii, Knight & Goethals, - Proposal submitted for approval.

753-M - Preparatory Engineering, Flow Control Valve, Sewage Treatment Wet Well - 100% complete.

754-M - Preparatory Engineering, Air Conditioner, Columbia Playfield Shelterhouse - Project Proposal being prepared.

755-M - Preparatory Engineering - Tie-in Richland & N. Richland Fire Alarm Systems - Scoped. Project estimate submitted.

756-M - Preparatory Engineering, Installation of Traffic Light, George Washington Way & Symons - Scoped. Project Proposal submitted.

759-RC - "As Builts" Richland Investment Company - Being completed.

760-RC - Sewer Extension to Labor Temple, Preparatory Engineering Design - 100% complete. Plans and specifications have been submitted for contract.

765-RC - All Saints Episcopal Church, "As Built" Plans - Deferred for other work.

767-M - Plans, Specifications, and Inspections Cannon-Joseph Bldg. Lee & George Washington Way - 45% complete. Work progressing.

768-M - Plans, Specifications and Inspections, Carl Peterson Bldg., Lee & Gillespie - 70% complete. Work progressing.

770-M - Latter Day Saints Storehouse, West Jadwin Street - 20% complete. Work progressing.

772-M - Alterations to Diettrich's Grocery - 51% complete. Work progressing.

774-M - Rennovation of Structures Below Flood Elevations - Riverside Park & vicinity - Held open for further study.

ENGINEERING UNIT

775-RC - Legal Description, Randolph Insurance - 25% complete.

777-RC - Kennell-Ellis Site, Revised Legal Description - 75% complete.

779-M - Plans, Specifications, and Inspections Richland Labor Temple - Work progressing. 25% complete.

781-RC - American Legion, Utility Extension - Work order issued. Work not started.

782-RC - Legal Description, 1125-2B Excess Building - 100% complete.

783-M - Plans, Specifications, and Inspections, American Legion Building - 30% complete. Work started.

785-RC - McVicker Bldg. #4, "As Built" Plans - Deferred for other work.

787-RC - Tastee-Freez Bldg., "As Built" Plans - 100% complete.

789-RC - Extend Water Service to Richland Labor Temple - Work order issued. 10% complete.

790-M - "As Builts" General - Work progressing.

791-M - Irrigation System Disposal, Estimate - Estimate completed and submitted to Atomic Energy Commission.

REAL ESTATE SECTION

SUMMARY

MARCH 1953

ORGANIZATION AND PERSONNEL:

	BEGINNING OF MONTH		END OF MONTH	
	Exempt	Nonexempt	Exempt	Nonexempt
Real Estate Section				
330	2	1	2	1
Housing & Maintenance Unit				
331	5	19	5	19
333	13	137	13	134
Commercial Property Unit				
337	7	6	6	6
	27	163	26	160

Decrease in number of employees 4

GENERAL

A fire which occurred at 1209 Acacia Street, resulted in damage to the extent of $900.00

HOUSING & MAINTENANCE UNIT

April, 1953

ORGANIZATION AND PERSONNEL

Number of employees on payroll:

Beginning of month:	18 exempt	
	156 nonexempt	
	174	174
End of month:	18 exempt	
	153 nonexempt	
	171	171

RICHLAND HOUSING

HOUSING UTILIZATION AS OF MONTH ENDING APRIL 30, 1953

HOUSES OCCUPIED BY FAMILY GROUPS

	Conventional	A&J	T	Precut	Ranch	Prefab	Dorm Apts	A&J Apts	2BR Apts	4th Housing	Tracts	Total
G.E.Employees	2215	258	9	380	808	1175	10	51	59	197	35	5197
Commercial Facilities	109	15	1	34	82	55		5	5	9	3	318
Community Activities	9			1	7	5					1	23
Medical Facilities	3	17			3	1			1	3		28
Post Office	6				2	12				1	3	24
AEC	82	26		22	61	14		5	2	16	3	231
Other government	6	2			5	2					1	16
Schools	53			6	10	57		1	1	2		130
Charles T. Main	1			3	5	11				1		21
Kaiser Engineer	6	8			5			1	1			21
Atkinson Jones	2	3		1	4	1						11
Vitro Corporation	4	2			2			1				9
P.S.Lord	1				2					1		4
Minor Construction						3						3
Vernita Orchards											5	5
Newberry Neon	1	1										2
Urban-Smythe-Warren					2							2
Blaw-Knox		1		1								2
Universal Foods						1						1
Total	2498	333	10	448	998	1337	10	64	69	230	51	6048
Houses assigned leases written	1				1	1						3
Houses assigned leases not written	1			2	1	4			1			9
Houses available for assignment												
Total	2500	333	10	450	1000	1342	10	64	70	230	51	6060

	Begin Month	Moved In	Moved out	End of Month	Difference
Conventional type	2495	31	28	2498	Plus 3
A&J type	333	2	2	333	
"T" type	10			10	
Precut type	444	11	7	448	Plus 4
Ranch	999	11	12	998	Minus 1
Prefab type	1334	21	18	1337	Plus 3
Dorm Apts	10			10	
A&J Apts	64	6	6	64	
2BR Apts	70	2	3	69	Minus 1
Fourth Housing	229	1		230	Plus 1
Tracts	51			51	
Total	6039	85	76	6048	Plus 9

May 1, 1953

DORMITORY

Dormitories:

		Beds Available	Vacant Beds	Occupied Beds
Men	15	616	1	615
Women	12	481	52	429*
TOTAL	27	1097	53	1044*

*Includes 2 beds used for Dorm Office Space

Waiting Lists

	Single Rooms	Double Rooms
Men	35	0
Women	67	0

HOUSING
CANCELLATIONS AND ALLOCATIONS

STRAIGHT CANCELLATIONS

Voluntary terminations	17
R. O. F.	0
Discharge	0
Transfers	5
Retirement-divorce-misc.	5
Move off project	6
Deaths	2
Wherry housing	2
Total	37

ALLOCATIONS

Houses allocated to new tenants	43
Exchanged houses	24
Moves	7
Turnovers	7
Total leases signed	81
Total cancellations	75
Houses assigned "As Is"	19
Houses sent renovation	25
Applications pending	699

TENANT RELATIONS PROGRESS REPORT

	Orders Incomplete as of March 28	Orders Issued 3-28-to 4-30	Total Orders Incomplete as of April 30
Service Orders	287	1796	297
Work Orders	581	564	728
Service Charges		286	

Principal work order loads

	Incomplete as of March 28, 1953	Incomplete as of April 30, 1953
Laundry tub replacement	30	12
Bathroom renovations (tub, tile, linoleum)	65	107
Tileboard - bathroom	0	11
Kitchen floor linoleum	114	166
Kitchen cabinet linoleum	113	181
Shower stall	10	1

85 alteration permits were issued, as compared to 84 permits issued during March.

Install fence	21	Remove shelves in utility room	1
Install dryer	10	Install concrete strips	1
Install automatic washer	8	Install fireplace	5
Remove broom closet	2	Install air conditioner	6
Install 110 v receptacle	1	Basement excavation	2
Install water softener	4	Install basement partition	1
Install tool shed	3	Install driveway	1
Construct patio	5	Install additional hose bibs	1
Install wiring in basement	3	Sand and refinish floors	1
Install TV antenna	4	Install walks and porch	1
Install back door	3	Install clothes poles	1

1612 inspections were made as compared to 1391 inspections made during March.

Alteration permits	90	Shower stalls	35
Bathtubs	32	Sidewalks	61
Cupboards	4	Sinks	40
Drainage	2	Tileboard	24
Floor boards	12	Toilet seats	49
Grass seed	7	Topsoil	49
House siding	4	Dormitories	158
Jack and shim	3	Walls	10
Leaking basements	16	Windows	2
Linoleum	262	Cancellations	70
Paint	94	Shows (new tenants)	58
Porch and steps	34	Renovations	93
Screen doors	6	Miscellaneous	390
Shades	7		

REAL ESTATE MAINTENANCE PROGRESS REPORT

MAY, 1953

WORK SUMMARY

JOB TYPE	ISSUE DATE	BACKLOG	JOBS COMP.	COMP. TO DATE F. Y. 1953
BATHTUBS	1-29-53	114	0	262
KITCHEN FLOOR TILE	11-10-52	177	45	293
BATHROOM TILE	12-17-52	13	3	41
KITCHEN SINK TOP	2-17-53	204	103	542
PREFAB FLOOR LINOLEUM	None			
SHOWER STALLS	4-16-53	6	26	197
LAUNDRY TUBS	4-23-53	6	53	251
MAJOR SEWER STOPPAGES	None	0	43	234
REPLACE OIL TANKS	None			
ROOF COATING	10-21-52	29	2	106
RANCH HOUSE HOT WATER LINE	None			
REMOVE TREES	2-11-53	18	24	122
RENOVATION	4-24-53	6	25	228
WATER HEATERS	None	0	10	181
REBUILD PORCHES	10-22-52	47	5	158
ASPHALT SERVICE WALKS	10-2-52	34	21	57
ASPHALT STEPS	10-23-52	2	29	145

MONTHLY PROGRESS REPORT
INTERIOR REDECORATING REPORT
FISCAL YEAR - 1953

TYPE UNIT	NO. UNITS SCHEDULED	COMPLETED THIS MONTH	COMPLETED TO DATE	BALANCE TO BE PAINTED
A	201	23	113	89
B	359	27	159	201
C	0	0	0	0
D	4	0	1	3
E	33	2	14	19
F	103	9	35	68
G	3	0	1	2
H	74	8	27	47
K	0	0	0	0
L	3	0	1	2
M	16	1	15	1
Q	110	1	105	5
R	124	0	118	6
S	12	0	12	0
T	6	0	0	6
U	17	1	14	3
V	101	2	90	13
Y	776	156	553	225
Z	42	10	30	12
1 BR.	4	0	2	2
2 BR.	9	0	9	0
3 BR.	4	0	3	1
TRACT	7	0	4	3
1 BR. APT	35	1	34	1
TOTAL:	*2,049	241	1,340	709

Scheduled Hours: 13,113
Actual Hours: 11,515

* 1437 units scheduled for interior redecoration, Fiscal Year, 1953

PLUMBING SHOP (10 employees)

JOB DESCRIPTION	NUMBER COMPLETED
Replacements - Major fixtures:	
Laundry tubs	42
Electric Water Heaters	12
Shower Stalls (Plumbing For Sheet Metal)	24
Routine Plumbing Repairs	35
Cleared major sewer stoppages caused by tree roots	41
Steam Work Orders	16

In addition, all faucets and valves in Dorms were completely overhalled or replaced where necessary. Domestic irrigation water turned on throughout village.

SERVICE ORDER CREW (10 employees)

The following is a status report on Service Orders:

A.	On hand at the beginning of the month:	287
B.	Received during the month:	1,568
C.	Completed during the month:	1,707
D.	On hand at the end of the month:	128

E. A total of 259 man hours were spent on work orders aside from the Housing Routine work orders.

RENOVATION & LABOR CREW (14 employees)

JOB DESCRIPTION	NUMBER COMPLETED
Housing units renovated	33
Dormitory rooms redecorated	30

Performed miscellaneous work including assisting the Plumbing Shop in sewer repairs. Also routine work in repairing side walks, removing trees, constructing steps, repairing compound, picking up drain oil from service stations, etc. The paint crew in the renovation group painted rooms at the Medical Dental Building and the rest rooms at Anderson's Department Store.

LINOLEUM CARPENTRY CREW (8 employees)

JOB DESCRIPTION	NUMBER COMPLETED
Repair bathroom wall tile - Dorms	5
Replace kitchen floor tile	41
Repair kitchen floor tile	3
Replaced kitchen sink top linoleum	47
Repaired kitchen sink top linoleum	30
Replace work bench linoleum	4
Replace floor tile - Medical Dental Bldg.	3
Replace Kitchen sink	4
Chempoint	167

In addition for miscellaneous work are repairs to porches, stairways, windows, doors, roofs, fire damage, and other miscellaneous carpentry items.

CARPENTER SHOP (15 employees)

JOB DESCRIPTION	NUMBER COMPLETED
Paint Touch-ups	98
Interior Carpentry Repair for Paint (Housing Units)	232
Ranch House Screen Doors Repaired (Exterior Carpentry Repair Progress)	278
Ranch House Screen Doors Replacement - New (Exterior Carpentry Repair Progress)	13
Exterior Main Doors Repaired (Shop)	62
Cabinet Doors Replaced	143
Cabinet Drawers Repaired (Shop)	31
Time Spent On Office Equipment, Etc. (Man hours)	84.5
Precutts - Carpentry Repair For Paint (Exterior Carpentry Repair Progress)	165
"K" Houses - Screen Door Hardware Installed	7
"C" Houses - Screen Door Hardware Installed	21

MECHANICAL SHOP

A. Millwright Crew: (4 employees)

JOB DESCRIPTION	NUMBER COMPLETED
Furnace Service Orders	152
Routine furnace inspection & lubrication	496

GENERAL: All A & J type house furnace fans have been inspected and lubricated—filter pads have been replaced as required, and about 50% of the blowers on the burners in these houses have been removed, cleaned, and reassembled. Routine is now about 65% complete on the C & K type houses.

B. Sheetmetal Crew: (2 employees)

Replacement of shower stalls	36
Replacement of gutters	16
Flashing coal hatches (ranch house)	14

COMMERCIAL PROPERTY - REAL ESTATE SECTION
April, 1953

PERSONNEL - COMMERCIAL PROPERTY:

	April
Beginning of month	13
End of month	12
Net difference	1

PERSONNEL - COMMERCIAL AND NONCOMMERCIAL FACILITIES:

	Commercial		Noncommercial		Total	
	Richland	North Richland	Richland	North Richland	Richland	North Richland
March	1,484	178	123	1	1,607	179
April	1,500	166	122	1	1,622	167
Net change	+ 16	- 12	- 1	0	+ 15	- 12

SUMMARY OR ROUTINE ITEMS PROCESSED:

	Commercial		Noncommercial		Total		
	Richland	North Richland	Richland	North Richland	Richland	North Richland	Total
Work Orders	44	18	3	0	47	18	65
Back Charges	1	0	0	0	1	0	1
FY Work Order Total	471	223	50	0	521	223	744
FY Back Charge Total	36	0	15	0	51	0	51

CONTRACTS AND NEGOTIATIONS:

A. Commercial:

1. Leases:

a. Dr. L. B. Harville - a month-to-month lease of space in a government-owned building.

b. FrancesM. Love, M.D., - a month-to-month lease of space in a government-owned building.

2. Lease Assignment:

a. Richland Investment Company, a Corporation, assigned its Commercial Facility Lease, dated December 8, 1950, to Richland Investment Company, a Partnership.

COMMERCIAL PROPERTY

3. Bid Openings:

a. Bids were read in the Commercial Property Unit office on April 23, 1953, for the plots advertised in March. Eleven bids were received on the two sites in the Uptown Area, twenty-four on the four sites in the Light Industrial Area, seven on the Duportail and Hartford site, four on the two Downtown sites, two for the site in the Heavy Industrial Area and two for the Veterinary site. On April 27, 1953, six bids were opened and read for the government-owned building located at 710 The Parkway.

GENERAL:

A. Commercial:

1. Mayo Coffard opened for business in Automatic Laundry Company Building, Block 5.

2. Wayne Gladstone opened for business in Automatic Laundry Company Building, Block 5.

3. Rita Kay Launer terminated her sublease with Automatic Laundry Company.

4. H. A. Sowell was authorized to sell his business to Gordon Hanna, who will continue to operate the malt shop as sublessee of Sowell & Ethington, Inc.

5. Herman's Men's Wear opened for business in the Automatic Laundry Company Building, Block 5.

6. Selden's, Inc. opened for business in the Automatic Laundry Company Building, Block 5.

7. J. C. Penney Company opened for business in Automatic Laundry Company Building, Block 5.

B. Noncommercial:

1. Two pasture permits were issued.

COMMERCIAL PROSPECTS:

Inquiries were received during the month concerning the establishment of the following types of commercial enterprises:

Richland	North Richland
Certified Public Accountants Office	Legal Office
Drive-in Restaurant	
Fuel and Ice	

SUMMARY OF OCCUPANCY AND EXPANSION STATUS

A. COMMERCIAL

	MARCH			APRIL		
	Richland	North Richland	Total	Richland	North Richland	Total
1. Number of Government-Owned Buildings	36	8	44	36	8	44
a. Number of Prime Lessee Businesses	39	9	48	39	9	48
b. Number of Sublessee Businesses	17	0	17	18*	0	18
c. Total Businesses in Government-Owned Bldg.	56	9	65	57	9	66
2. Doctors and Dentists in Private Practice	27	0	27	27	0	27
3. Number of Privately-Owned Buildings	50	7	57	50	7	57
a. Number of Prime Lessee Businesses	41	9	50	40	6	46
b. Number of Businesses operated by Sublessees	63	2	65	69	2	71
c. Total Businesses in Privately-Owned Bldg.	104	11	115	109	8	117
4. Privately-Owned Buildings Under Construction	8	0	8	8	0	8
5. Total Number of Businesses in Operation	160	20	180	166	17**	183

B. NONCOMMERCIAL

1. Government-owned Buildings				
a. Churches	4		4	
b. Clubs and Organizations	8		8	
c. Government Agencies	3		3	
Total	15	Total	15	
2. Privately-owned Buildings				
a. Completed and in Use	10	1	11	10	1	11
b. Under Construction	6		6	6		6
Total	16	1	17	16	1	17
3. Pasture Land Permits	88		88	90		90

*To include Messrs. J.W. Freeze, W.V. Drinkard and F.G. Richards who are subleasing the service department in Paul's, Inc. as of March 23, 1953.

**Corrected total to omit three prime lessees erroneously reported in previous month.

END

DATE
FILMED
5/18/92