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HANFORD 52778

MONTHLY REPORT

HANFORD ATOMIC PRODUCTS OPERATION

FOR

OCTOBER 1953

Received JUN 0 4 1992

Compiled By
DEPARTMENT MANAGERS

November 20, 1953

RICHLAND, WASHINGTON

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

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HW 29794

MONTHLY REPORT

HANFORD ATOMIC PRODUCTS OPERATION

OCTOBER 1953

GENERAL SUMMARY

Production Operations

In the Metal Preparation Section production for the month was six percent over the forecast. The overall canning yield for October was 81.6 percent.

The total reactor input production during October was 100 percent of forecast. The reactor output production was 22.1 percent less than forecast due to having discharged October scheduled material during September. The combined output production for these two months, however, exceeded the combined forecasts.

There were ten regular uranium slug failures during the month. In addition, five other ruptures occurred; two enriched aluminum alloy slugs, two enriched aluminum slugs being used for the P-10 program, and one uranium slug jacketed in 63S aluminum.

The Redox production, which established a new record, was 40 percent over the forecast. The T Plant production was 68 percent of forecast. The UO_3 plant established a record production for the month with an output 35 percent over forecast. The over-all commitments for 234-5 production were met during October.

Engineering Technology

A preliminary study of the technical and economic feasibility of a dual-purpose power reactor plant at Hanford was completed. The study provided the basis for formal recommendations made to the Atomic Energy Commission by the General Electric Company that development, design and subsequent construction of such a reactor be authorized.

Design progress on Project CA-512-R, 100-K Reactor Facilities was advanced to 97.4 percent completion during the month. Deisng activity for the 200-Area Expansion was concentrated on the Purex Waste Facility, design of which was advanced to 100 percent completion. Design work on Project CG-551, Expansion of 234-5 Facilities, was advanced to 46 percent completion during the month.

Twenty-nine informal, four Class I and one Class II radiation incidents were reported. The Class II incident concerned high level exposure of a very small area of the body.

Personnel and Services

Two major injuries occurred during October, bringing the total, year to date, to twelve.

Employee separation rate decreased from 2.62 percent for September to .96 percent for October.

The total number of housing applications pending is 332.

General

The Board of Directors of the General Electric Company visited the Hanford Project on October 14 and 15 in conjunction with the Company's observance of its 75th Anniversary. The Board and officers of the Company were conducted on a plant tour and participated in a business meeting during the course of their visit.

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STAFF

General Manager, Atomic Products Division	F. K. McCune
General Manager, Hanford Atomic Products Operation	W. E. Johnson
Manager, Administrative Practices	W. K. MacCready
Counsel	G. C. Butler
Manager, Finance	D. M. Johnson
Manager, Employee and Public Relations	C. N. Gross
Director, Radiological Sciences	H. M. Parker
Director, Medical	W. D. Norwood, MD
Manager, Engineering	A. B. Greninger
Manager, Manufacturing	J. E. Maider
Manager, Plant Auxiliary Operations	H. D. Middel
Manager, Community Operations and Real Estate	L. F. Huck

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HANFORD ATOMIC PRODUCTS OPERATION
NUMBER OF EMPLOYEES
OCTOBER 31, 1953

	EXEMPT		OTHERS		TOTAL	
	10-31-53	9-30-53	10-31-53	9-30-53	10-31-53	9-30-53
Engineering Department						
General	17	17	72	73	89	90
Design	163	161	36	34	199	195
Project	254	248	316	326	570	574
Technical Section						
General	6	6	3	3	9	9
Applied Research	120	122	59	59	179	181
Separations Technology	132	136	42	43	174	179
Pile Technology	103	101	63	62	166	163
Fuel Technology	64	64	62	65	126	129
Advance Technology	12	12	1	1	13	13
Manufacturing Department						
General	16	16	7	7	23	23
Reactor	252	252	1 042	1 033	1 294	1 285
Separations	302	304	1 182	1 186	1 484	1 490
Metal Preparation	90	90	421	426	511	516
Plant Auxiliary Operations Department						
General	1	1	1	1	2	2
Electrical Distribution & Telephone	31	31	137	137	168	168
Transportation	43	43	452	452	495	495
Purchasing & Stores	49	49	224	229	273	278
Plant Protection						
Patrol & Security	59	59	454	457	513	516
Safety & Fire	42	43	112	111	154	154
Office Services	20	21	291	289	311	310
Administration Main. Service	10	10	55	51	65	61
Statistical & Computing	41	41	58	54	99	95
Community Operations & Real Estate Dept.	99	99	330	337	429	436
Financial Department						
General	4	4	8	8	12	12
Accounting	49	47	199	199	248	246
Payroll & Auditing	24	24	52	54	76	78
Employee & Public Relations Department	49	49	148	153	197	202
Radiological Sciences Department						
General	4	4	3	3	7	7
Records & Standards	27	27	138	136	165	163
Biophysics	59	58	56	53	115	111
Biology	37	37	34	35	71	72
Engineering	4	4	-	-	4	4
Medical Department	40	42	212	207	252	249
Law	3	3	2	2	5	5
General	13	13	27	25	40	38
Total	2 239	2 238	6 299	6 311	8 538	8 549

AREA PERSONNEL DISTRIBUTION
OCTOBER 31, 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	41	75	-	12	-	32	73	73	240	325	871
Other	22	35	3	41	-	20	66	27	192	248	654
Total	63	110	3	53	-	52	139	100	432	573	1 525
Manufacturing Department											
Exempt	80	61	43	70	-	6	5	281	90	24	660
Other	253	247	400	158	-	-	107	1 056	421	10	2 652
Total	333	308	443	228	-	6	112	1 337	511	34	3 312
Plant Auxiliary Operations Department											
Exempt	26	9	6	8	-	9	18	19	15	186	296
Other	58	62	99	57	11	62	85	175	118	1 057	1 784
Total	84	71	105	65	11	71	103	194	133	1 243	2 080
Community Operations & Real Estate Dept.											
Exempt	-	-	-	-	-	-	-	-	-	99	99
Other	-	-	-	-	-	-	-	-	-	330	330
Total	-	-	-	-	-	-	-	-	-	429	429
Financial Department											
Exempt	-	-	-	1	-	-	1	1	2	72	77
Other	-	-	2	1	-	-	3	1	1	251	259
Total	-	-	2	2	-	-	4	2	3	323	336
Employee & Public Relations Department											
Exempt	-	-	-	-	-	-	-	-	-	49	49
Other	3	6	6	1	1	2	7	3	22	97	148
Total	3	6	6	1	1	2	7	3	22	146	197
Radiological Sciences Department											
Exempt	1	-	39	-	-	-	2	18	58	13	131
Other	10	-	36	-	-	-	6	14	153	12	231
Total	11	-	75	-	-	-	8	32	211	25	362

	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	-	-	-	-	-	-	-	-	-	40	40
Other	1	4	4	1	-	-	1	6	1	194	212
Total	1	4	4	1	-	-	1	6	1	234	252
General											
Exempt	-	-	-	-	-	-	-	1	2	13	16
Other	-	-	-	-	-	-	-	-	14	15	29
Total	-	-	-	-	-	-	-	1	16	28	45
Total Exempt	148	145	88	91	-	47	99	393	407	821	2 239
Total Other	347	354	550	259	12	84	275	1 282	922	2 214	6 299
Grand Total	495	499	638	350	12	131	374	1 675	1 329	3 035	8 538

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MANUFACTURING DEPARTMENT

OCTOBER 1953

METAL PREPARATION SECTION

The net production of acceptable slugs attained a new record of 258 tons. This production was 6 percent over the forecast. A total of 220 tons was canned as 8-inch material and 38 tons as 4-inch. The canning yield of the 4-inch slugs was 76 percent which was 6.5 percent lower than last month. Increase in number of marred surfaces contributed to this drop in yield. The 8-inch canning yield was 82.6 percent which was an increase of one percent over September. This was due to reductions in non-seating and poor bond type reject items. The over-all canning yield was 81.6 percent.

The oxide burning operation was discontinued as a facility on October 20, 1953.

There were no autoclave failures during the month.

The canning yield for the enriched uranium-aluminum alloy fuel slugs was 92 percent, or 6 percent above the previous month's yield.

All recovered slugs were held for future canning by the use of the lead dip process.

REACTOR SECTION

The total reactor input plutonium production during October was 100 percent of the forecast. The reactor output production was 22.1 percent less than the forecast due to having discharged October scheduled material during September. The combined output production, however, for these two months slightly exceeded the combined forecasts.

The established maximum operating levels of C, B, and F reactors were increased by 25, 5 and 5 units respectively during the month. The increase at C reactor is attributed to additional enrichment and relaxation of graphite temperature limits. The increases at B and F reactors resulted from long-term reactivity gains and operation based on trip-before-boiling panellit settings in the central zones.

There were ten regular uranium slug failures (eight 8-inch and two 4-inch) during the period. The outage time for these failures was 174.7 hours. In addition, five other ruptures occurred (two "C" metal, two "J" metal and one 63-S aluminum jacketed slug) with an outage time of 142.6 hours. The total outage time for all ruptures was 317.3 hours.

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REACTOR SECTION (Continued)

Three process tube leaks were experienced, two at the C reactor and one at the H pile. Also, in addition there were four Van Stone flange failures at the B reactor.

The two tube leaks at the C pile were caused by (1) a ruptured slug and (2) by either corrosion or cavitation. The first one, because of prompt action, permitted only a very small amount of water to enter the moderator while the second failure resulted in 435 gallons of water being collected from the pile. Outage time of 27.0 hours for corrective action and subsequent water removal were charged to this incident. The H reactor tube leak was caused by a ruptured 63-S Al slug. Since this was the third rupture to this type of canned piece, the remaining tubes containing this material were discharged from the pile. The outage time for this ruptured slug removal and moderator drying was 124.7 hours. Also, to assist in minimizing the slug and tube rupture possibilities, a total of 21 tubes of the remaining original "C" metal loading at C pile was discharged.

A total of 31 tubes was charged at C reactor with enriched material in the 3rd lattice space (overall total is 35 tubes). At the H reactor, one tube of "C" material was discharged due to a rupture and this tube was recharged with new "C" material (overall total is 49 tubes). The C material loading in each pile consists of 30 pieces per tube.

In order to minimize the possibility of unnecessarily tripping the Ball 3X system, the pulse integrator circuits of these systems were by-passed on October 2. The system will now trip automatically only when low water pressure is indicated.

During October, 36 reactor scrams occurred. Twenty-eight of these were attributable to normal panellit system difficulties, four to Beckman electrical difficulties at C reactor, three to electrical power supply in the 105 Building and one to partial plugging of a cone screen. Total reactor outage time for all scrams was 18.4 hours.

SEPARATIONS SECTION

The Redox production, which established a new record, was 40 percent over the forecast. The T Plant production was 68 percent of forecast.

The average operating rate at the Redox Plant for the month was 6 tons per day with an efficiency of 94 percent. Only minor shutdowns were needed throughout this period for such items as column flushing, the regeneration of three silver reactors, and a correction of the oxidizer vacuum system.

The TBP Plant operated at an average rate of 7.4 tons per day with an efficiency of 97.8 percent. The output for the month was 15 percent over the forecast. The feed rates to each extraction system varied from 3.5 to 6 tons per day. Minor shutdowns were experienced for replacement of the B-line RC column pulse generator and for flushing of the B-line following the rework of the X-1 tank (UNH storage) collected bottoms. During the last week of the month, it was necessary to reduce feed rates due to the low metal content in the virgin feed and the small amount of feed material available from the tank farms. About 24 tons of Redox UNH were reworked during the month.

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SEPARATIONS SECTION (Continued)

The removal of metal waste was generally good throughout the month. Equipment failures and low metal inventories in the farms somewhat retarded the removal program. Two Nagle and three Johnston pumps failed during the month. Lost time for all causes was 841 hours. Major outages include, 568 hours attributed to transfer of operations from 102 to 101-B, and 174 hours at C farm due to two pump failures.

On October 15 the 102-B tank was declared empty.

The UO_3 Plant established a record production for the month. The output was 35 percent over the forecast as an average rate of 13 tons per day was accomplished. Thirteen cars of powder were shipped offsite.

The October commitment of buttons, shapes and nitrate was delivered to the AEC. The machining of Type 130 shapes started on October 9.

Both East and West Area evaporators operated during the month. TBP waste was the feed to both facilities and a volume reduction of 33 percent in each area was attained.

GENERAL

The Department Manager conducted members of Management and the General Electric Board of Directors on a tour of the plant areas on October 15.

Personnel

Total on Roll October 1, 1953	3317
Accessions	17*
Separations	21*
Total on Roll October 31, 1953	3313

*Does not include intra-department transfers.

J. E. MAIDER, MANAGER
MANUFACTURING DEPARTMENT

[redacted]

HW-29794 [redacted]

MANUFACTURING DEPARTMENT

PATENT REPORT SUMMARY
FOR
MONTH OF OCTOBER, 1953

Richland, Washington
November 10, 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, kept in the course of their work have been examined for possible inventions or discoveries.

INVENTOR	TITLE
NONE	

J. E. MAIDER, MANAGER

MANUFACTURING DEPARTMENT

[redacted]

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11.

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V. D. Donihee

V. D. Donihee

[redacted]

Richland, Washington
November 10, 1953

MANUFACTURING DEPARTMENT
METAL PREPARATION SECTION
OCTOBER, 1953

I. RESPONSIBILITY

There were no changes in responsibility during this period.

II. ACHIEVEMENT

A. Operating Experience

1. Statistics

	October	September	Year To Date
Acceptable Pieces Canned (4")(Tons)Gross	39	32	258
Acceptable Pieces Canned (4")(Tons)Net	38	31	250
Canning Yield (4")(%)	76.1	82.6	69.7
Acceptable Pieces Canned (8")(Tons)Gross	221	209	1 683
Acceptable Pieces Canned (8")(Tons)Net	220	207	1 667
Canning Yield (8")(%)	82.6	81.6	74.8
Total Acceptable Pieces Canned (Tons)Gross	260	241	1 941
Total Acceptable Pieces Canned (Tons)Net	258	238	1 917
Acceptable Pieces Canned (4" and 8") (% of forecast)	106	115	107

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1. Statistics (Continued

	October	September	Year To Date
Autoclave Frequency (4")(No./M)	.00	.06	.03
Autoclave Frequency (8")(No./M)	.00	.04	.02
Oxide Burned (weight out tons)	1	5	45
Poison Canned (number pieces)	0	0	4 450
Chemical 68-56 Canned (number pieces)	0	0	0
Chemical 10-66 Canned (number pieces)	0	0	1 713
"J" Slugs Canned (number pieces)	0	213	12 333
C-3 Slugs Canned (number pieces)	2 118	504	2 622
Special Request (man hours)	393	414	12 812
305 Routine Tests (man hours)	270	147	1 554
305 Special Tests (man hours)	551	1 261	10 439
Average Steam Generated (M lbs/hr)	24.4	23.0	
Maximum Steam Generated (M lbs/hr)	59.0	55.0	
Total Steam Generated (M lbs)	18 200	16 600	
Coal Consumed (Tons)	993	1 108	
Sanitary Water from 3000 Area(million gals)	47.9	53.4	
Total Water Average Rate (gpm)	1 073	1 237	
Chlorine Residual (ppm)	.46	.41	

2. Activities

The net production of acceptable slugs attained a new high of 258 tons with a ratio of 85% eight-inch. The combined canning yields continued at a high level. Reductions in non-seating and poor bond type rejects for eight-inch slugs were compensated by increases in the marred surface and miscellaneous reject categories.

There were no autoclave failures during the month.

During the month all recovered slugs were held, to be canned by the lead dip method as it is believed that slug quality will be improved by cycling only once through the beta phase transformation in the bronze bath. It is expected that sufficient recovered slugs will have been accumulated early in November to warrant canning by the lead dip process.

In the welding of eight-inch slugs, acute cracking of the caps in the preheat puddle path was noted. Cracking is believed to be caused by a low iron to silicon ratio of the aluminum metal in a recent shipment of caps. The vendor has been notified and revised metal specifications submitted. Welding techniques are being revised to permit use of these caps.

Material recovered from ventilation ductwork in conjunction with removal of chip recovery and machining facilities was processed through the oxide burner and the oxide burning operation was discontinued late in the month.

2. Activities (Continued)

Statistical sampling of cans for eight-inch material indicated can wall thickness was varying through a range that, in some cases, exceeded the tolerance limits. Liaison with the vendor is being maintained in an attempt to improve can quality.

In an effort to reclaim sleeves that become slightly undersize in service, a honing machine was procured and used to remove a slight amount of stock from the inner surface of the sleeve. This procedure has extended the service life of undersized sleeves.

In order to control the torque applied to the caps of canned slugs during the facing operation, an alarm device has been installed on the facing lathe. In this way the operator is warned when the torque is approaching a value that might be injurious to the quality of the slug.

3. Special Operations

There were 2118 enriched uranium-aluminum alloy ("C-3") fuel slugs canned with an over-all yield of 92% as compared with 86% for the previous month. The improved canning yield is believed to have resulted from more emphasis on cleanliness throughout the process and improved fabricating techniques.

4. Schedule Variance

Acceptable slug production exceeded forecast by 6%, largely as a reduction of in-process inventory from the previous month.

B. Equipment Experience

1. Operating Continuity

Production time lost due to canning line equipment failures was only slightly higher than in September despite eleven furnace failures. Four of these failures occurred within four days on two furnaces. No definite causes could be determined for this unusual experience.

The automatic bronze agitator was removed from operation to make design changes and modifications aimed at improving its performance.

C. Improvement Experience

1. Production Tests

PT-313-105-8M "Irradiation of Alpha Canned Slugs from High Alpha Rolled Rods" (HW-27817, Supplement A, HW-29163). Three hundred 4-inch pieces have been shipped to Reactor for irradiation. Five hundred slugs were canned on this test. The eight-inch slugs under Supplement A will not be canned until all four-inch pieces have been shipped.

1. Production Tests (Continued)

PT-313-105-19M "Irradiation of Triple Dip Canned Uranium Slugs from Rods Rolled at Fernald" (HW-26851). A total of 9686 four-inch and 7838 eight-inch slugs were shipped to Reactor for irradiation during the month. An approximate total of 157,000 slugs have been shipped to Reactor for pile loading.

PT-313-105-23M "Evaluation of Fillerwelding of Eight-Inch Triple Dip Canned Slugs" (HW-27934). One thousand slugs have been forwarded to Reactor for pile loading.

PT-313-105-24M "Pile Evaluation of Tru-Line Cans and Caps" (HW-28040). Twenty five hundred pieces have been shipped to Reactor for irradiation. No slugs were canned on this test during the month.

PT-313-105-25M "Lead Dip Canning and Irradiation of Uranium Slugs Machined from Salt Bath Heat Treated Fernald Rolled Rods" (HW-28149). During this month 18,812 slugs canned under this test were shipped to Reactor, for a total of approximately 34,000 to date.

PT-313-105-27M "Evaluation of Normal Uranium Produced from UF6 Parent Material" (HW-28605). A total of 1135 eight-inch slugs were canned during the month, with no unusual problems.

2. Process Tests and Revisions

MMP-313-3 "Slug Recovery by the Use of 50% Caustic." In order to provide more adequate boiling of solution, larger steam coils were installed. Some difficulty was experienced in getting the slugs to clean up in 1-1/2 hours and extension of this time resulted in roughened and pitted slugs. It was discovered that closer regulation of solution concentration corrected this difficulty.

An improved type, commercially available welding torch has been installed on all production welders. The torches are easier to adjust, require a minimum of maintenance, improve weld quality and are more economical to replace.

An additional degreaser was installed in the cap and can preparation line to provide additional capacity and to decrease the fumes resulting from excessive amounts of material being processed. Additional exhaust facilities are planned to improve ventilation.

3. Inventions and Discoveries

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

D. Events Influencing Costs

1. Labor Variance

No events occurred during the month to significantly change this item.

2. Material Variance

There were no significant events affecting this item during the month.

3. Other

Eleven canning furnace element failures are expected to increase maintenance cost slightly.

E. Plant Development and Expansion

1. Project Status

Project CA-514 "Expansion of 300 Area Production Facilities." Detailed design of the 313 Building is 69% complete and construction 16%. The placement of steel roof decking on the new section of the building is complete and the installation of insulated metal siding is about 80% complete. Concrete slabs for the furnace and autoclave pits, and storage dock and ramp were poured during the month.

The first phase of construction on the 313 Building addition will be completed in November. Minor Construction has been awarded the second phase contract which includes all work remaining except the built-up roof, structural steel and partitions, for which contracts are being negotiated by the A.E.C. on a lump sum basis.

Work continued on the renovation of existing 313 Building facilities. All machining lathes have been removed and the installation of a concrete storage barricade wall along the west side of the former machining area is about 65% complete. The removal of the chip recovery equipment is essentially complete.

Progress on the Operations Change House remains essentially unchanged. Beneficial occupancy is contingent upon completion of the pipe work insulation.

Design of all other non-process facilities is about 48% complete and construction 5%.

2. Plant Engineering

A pallet conveyor was installed at the final inspection station in 303-A Building so that an electric high lift, which had been used full time in this operation, could be assigned to other material handling in the area. Through this installation it was also possible to release a gasoline driven high lift, thus reducing rental charges by $62 a month.

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2. Plant Engineering (Continued)

Preliminary operating tests were made using a mechanized spray-type quench basket for the canning lines. These tests indicated that some revision was necessary to prevent excess AlSi from seizing in the device. More conclusive results will be obtained as soon as the quench basket is used in a full scale production test.

Fabrication and installation of a semi-automatic welding machine for design verification in connection with project CA-514 was completed. Tests indicate that this machine will contribute very favorably toward controlling uniformity and quality of slug welds. Only minor alterations will be necessary in the final design of the machine.

F. Significant Reports Issued

1. Routine

Number		Author	Date
HW-29509	Monthly Report, Process Sub-Section, Metal Preparation Section, September, 1953	E.W. O'Rorke	10-1-53
HW-29467	Metal Preparation Section Evaluation of FMPC Material for September, 1953	S.M. Gill	10-7-53

2. Non-Routine

HW-29485	A Statistical Weighing Procedure for Incoming Fernald Slugs	R.H. Titman	9-30-53
HW-29549	Process Experience Gained by Ultrasonically Testing Slugs for PT-313-105-25M	D.L. Cornell	10-6-53
HW-29796	Report on Process Test MMP-313-3, Slug Recovery by the Use of 50% Caustic	D.S. Dixon	10-30-53
HW-29528	Project CA-514 "Proposed Change in Scope to Lead Dip Canning Process"	J.W. Nageley	10-2-53
HW-29640	Project CA-514 "313 Building Slug Recovery"	J.W. Nageley	10-14-53

III PERSONNEL

A. Organization

Radiation monitoring responsibilities were assumed by the Process Sub-Section on 10-1-53, involving the transfer of two exempt and one non-exempt persons.

III. PERSONNEL (Continued)

B. Force Summary

	Start of Month	End of Month	Net Change
Section General	4	4	0
Operations	208	205	- 3
Power and Maintenance	252	248	- 4
Process	32	36	4
Plant Engineering	18	18	0
Section Total	514	511	- 3

C. Safety Experience

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

D. Radiation Experience

No exposures in excess of 160 mrep per week were reported during the month. Only ten exposures above 100 mrep per week were reported.

E. Personnel Activities

1. Visits and Visitors

S. M. Gill visited the National Lead Company of Fernald, Ohio to discuss mutual slug fabrication problems.

[redacted]

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Richland, Washington
November 10, 1953

MANUFACTURING DEPARTMENT
REACTOR SECTION
OCTOBER, 1953

I. RESPONSIBILITY

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

II. ACHIEVEMENT

A. Operating Experience

The total reactor input plutonium production during October was 100.0 percent of forecast and 8.6 percent greater than in September. The major difficulties affecting production were slug failures and process tube leaks.

Reactor output production was 22.1 percent less than forecast due to having discharged October-scheduled material during September; the combined output production for these two months slightly exceeded the combined forecast.

The established maximum operating levels of C, B, and F Reactors were increased 25, 5 and 5 units, respectively, during October. The increase at C Reactor is attributed to additional enrichment and relaxation of graphite temperature limits while increases at B and F Reactors resulted from long-term reactivity gains and operation based on trip-before-boiling.

A total of 15 slug failures were experienced during October. Data regarding these failures are given in tabular form below:

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A. Operating Experience (Continued)

Slug Type	Number of Failures by Reactors B	C	DR	F	H	Outage Hours
Regular metal - four inch	1	-	-	1	-	49.4
Regular metal - eight inch	1	7	-	-	-	125.3
"C" Metal	-	1	-	-	4	16.5
"J" Metal	-	-	2	-	-	1.4
63-S Aluminum Canned Uranium (PT-313-105-17-M)	-	-	-	-	1	124.7
Total	2	8	2	1	2	317.3

The water treatment process was changed from ferric sulfate to alum on October 9 at the H Water Plant.

The details of reactor and water plant operation are set forth below:

1. Statistics

	B	C	D	DR	F	H	Total or Average
Reactor Time Operated Efficiency (%)	81.3	71.4	93.4	91.8	95.6	82.4	86.0
Reactor Outage Time (Hrs.)							
Plutonium Production	135.4	183.2	34.4	54.5	33.0	-	440.5
Special Irradiations and Tests	4.0	29.3	14.8	6.4	-	131.0	185.5
Total	139.4	212.5	49.2	60.9	33.0	131.0	626.0
Reactor Unscheduled Outage Time (Hrs.)	139.4	212.5	3.5	6.2	33.0	131.0	525.6
Metal Discharged (Tons)	2.4	70.9	27.2	26.2	5.5	4.4	137
Water Quality (ppm Iron)							
Raw Water - Average	0.06	0.06	0.05	0.09	0.05	0.08	-
Raw Water - Maximum	0.08	0.08	0.07	0.13	0.07	0.10	-
Process Water - Average	0.015	0.011	0.006	0.006	0.005	0.006	-
Process Water - Maximum	0.029	0.090	0.023	0.011	0.014	0.017	-
Water Pumped (MM gals.)							
Bldg. 190 to reactor	1570	2698	2020	1830	1689	2012	11819
Bldg. 182 to 200 Areas	20	-	-	-	-	383	403
Bldg. 181	4940		4715		2024	2678	14357
Steam Generated (MM lbs.)	131		228		127	99	585
Coal Consumed (Tons)	8470		12222		7217	5412	33321

2. Activities

Difficulties due to process tube water leaks increased during October; seven tube leaks were found. At H Reactor approximately 1750 gallons of water entered the moderator when a 63-S slug failed causing the tube

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2. Activities (Continued)

to rupture. Outage time required for slug removal and moderator drying was 124.7 hours. Two outages totaling 76.5 hours were initiated at B Reactor due to water leaks which were caused by tube failure at Van Stone flanges of four tubes. A total of 1184 tubes were hydrostatically tested and 261 gallons of water were removed in connection with these leaks. At C Reactor, two process tube leaks occurred. The first, apparently caused by corrosion or cavitation, required 27.0 hours outage for corrective action and necessitated removal of approximately 435 gallons of water from the moderator. The second leak occurred in connection with a ruptured slug with only an insignificant amount of water entering the moderator.

Two steps were taken during October which should have the effect of reducing the incidence of slug failure; all 63-S canned uranium slugs, charged at H Reactor, were discharged and the remaining 21 original enrichment tubes (C Metal) at C Reactor were recharged. Further details are given under "Improvement Experience."

In order to minimize the possibility of inadvertently tripping the Ball 3X systems, the pulse integrator circuits of these systems were by-passed on October 2. This portion of the circuit guards against functional failure of the VSR's.

By agreement with the Technical Section, the graphite temperature limit for C Reactor was increased to 460° C, effective October 19. Similar relaxation of limits at other reactors is under consideration but is complicated by the presence of the horizontal rod thimbles.

During October, a series of coal combustion tests were inaugurated at all 100 Area power plants to evaluate burning characteristics and costs using coal supplied by the three HAPO vendors.

The Oregon Marine Dredging Company completed removal of the sand bar in the Building 181-H forebay. Approximately 5000 cubic yards of sand were removed.

Irradiation of P-10 material at DR Reactor continued during October. Five additional enrichment tubes were charged during the month to compensate for reactivity losses due to burnout. Two "J" slug ruptures occurred.

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

	Tubes Charged	Tubes Discharged	Casks Shipped
Chemical 10-66	2	1	-
Chemical 72-60	-	9	5
RALA	-	8	4
Production Tests	19	89	9
Total	21	107	18

[redacted]

II. ACHIEVEMENT (Continued)

B. Equipment Experience

During October, 36 reactor scrams occurred. Twenty-eight of these were attributable to normal panellit system difficulties, four to Beckman electrical difficulties at C Reactor (B Reactor was shut down simultaneously through the high level tie circuit in one of three instances), three to two instances of electrical power supply difficulty in 105 Buildings, and one to partial plugging of a cone screen. Total outage time charged to these scrams was 18.4 hours. Seventeen of the panellit scrams occurred at C Reactor where approximately 600 panellit gauges were recalibrated in connection with altering the enrichment pattern.

Failure of a rear face neoprene pigtail at C Reactor resulted in 29.3 hours of outage time. The tube involved was a production test tube operating at higher than standard outlet water temperature. Pigtails on this and eight other high temperature tubes were replaced with the new bellows-type stainless steel pigtails as a precautionary measure pending completion of the pigtail replacement program scheduled for the December extended outage.

At H Reactor, No. 2 horizontal rod continues out of service for repair of a leaking rod tip. Inspection of the thimble revealed it to be partially collapsed, the cause of which has not been determined. At B Reactor, No. 8 horizontal rod was removed to investigate indications of a restriction in water flow. Upon reassembly, the inner 13 inches of rod travel were found to be obstructed for an undetermined reason. At month end, the rod is in limited service pending further investigation.

Failure of a valve on No. 1 sulfuric acid storage tank line at Building 183-C on October 9 caused spillage of approximately 4000 gallons of sulfuric acid.

No. 11 high lift pump at Building 183-C was returned to service on October 15, following an extended outage for motor repairs. The motor had been sent to San Jose, California, during August to enable the vendor to correct lubrication difficulties.

A program under way during the past several months to bring pressure vessel inspections into line with requirements of OPG 07.2, "Inspection of Boilers and Unfired Pressure Vessels," was completed in the Reactor Section during October.

C. Improvement Experience

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

PT-105-4-MR (Evaluation of Poison Column Control Facility)
The charging equipment for this facility at B Reactor was out of service pending design modifications found

C. Improvement Experience (Continued)

PT-105-4-MR (Continued)

necessary as a result of the two incidents which occurred during September. However, manipulation of temporary poison columns is still possible through flushing. Production gains credited to this facility during the month were 1048 MWD.

PT-313-105-12M (Exposure and Behavior of Unbonded "C" Metal Slugs)
The discharge of 21 tubes of this material at C Reactor on October 3 completed this test. Inspection of discharged metal revealed one ruptured piece.

Document HAN-51719, "Enrichment of Hanford Piles," DF Shaw to WE Johnson, August 27, 1953, authorizes further enrichment of Hanford reactors. Accordingly, 31 tubes of "C" Metal were charged at C Reactor in connection with a new enrichment pattern of approximately 70 tubes. At month end, 35 tubes in this new pattern have been loaded, four tubes having been charged during September.

PT-313-105-14M (In-Pile Evaluation of 63-S Aluminum Process Tubes and Slugs)

PT-313-105-17M (Irradiation of 63-S Aluminum Jacketed Slugs)
On October 4, H Reactor was shut down due to a process tube leak caused by the rupture of a 63-S aluminum jacketed slug. Since this was the third rupture of this type material, the remaining 25 tubes were also discharged. Reactor outage time for rupture removal and moderator drying was 124.7 hours. Steps were also taken toward removal of 63-S aluminum tubes installed under the former of these tests.

PT-105-503-E (Supp. C) (The Use of Activated Silica as a Coagulation Aid for Aluminum Sulfate)

PT-105-517-E (100 Area Filter Plant Tests)
The above tests for studying variables in the operation of filters at the D, DR, and F Water Plants was completed. Filtration using all filters was resumed.

PT-105-527-E (Increasing Capacity of the 183-C Activated Silica Facility)
Preliminary results of this test indicate that activated silica can be produced in sufficient quantity at the Building 183-C facility to supply B, C, and H Water Plants.

PT-105-533-A (Local Controlled Increase in C Pile Tube Powers)

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C. Improvement Experience (Continued)

PT-105-549-A (Exposure Increase in High Power Tubes at C Pile)
The first of these tests, providing for maximum tube powers of 820 KW in the "bumper zone", was continued during the month. The discharge of material in these tubes (approximately 220 tubes) will take place at 150% of current goal concentration in accordance with PT-105-549-A.

PT-105-529-E (Increasing Power Levels at H Pile By Raising Permissible Exit Water Temperature)
This production test which permits increasing exit water temperatures from 90° C to 95° C was initiated October 9. However, due to graphite temperatures, advantage could not be taken of this relaxation.

PT-MR-105-14 (Unit Cost Reduction by the Use of Supplemental Orifices)
Preparation for installation of venturis and supplemental orifices on all reactors progressed during the month. Due to equipment procurement problems and Reactor Section maintenance forces being committed to the Building 108-B, P-10 reactivation program, the first installation, at C Reactor, has been postponed from November to December.

Four revised Process Standards - Reactor were approved during October. Titles of the standards involved are: "Make-Up of Uranium and Uranium-Alloy Tube Charges", "Properties of Horizontal Control Rods," "Limitations on Rods Out of Reactor During Shutdown," and "Handling of Irradiated Enriched Slugs." Document HW-29809 gives further details regarding these revisions.

A program has been initiated at D Reactor to reduce the amount of outage time spent in discharging and picking up special irradiation charges. Selective loading of special tubes minimizes the number of rear face entries and necessity for pick-up during the discharge operation. An estimated three hours of shutdown time was saved in this manner during the month.

Use of a specially designed box for storing panellit magnets provides a "keeper" base to maintain magnetism at close to the original levels, thereby improving the performance of these magnets.

Personnel in the Reactor Section engaged in work which might be expected to result in inventions or discoveries have reported that no inventions or discoveries were made during the period covered by this report.

D. Events Influencing Costs

An increase in total process water flow coupled with a seasonally greater heating steam load increased coal costs 8.6 percent or approximately $25,000.

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D. Events Influencing Costs (Continued)

Production increased 8.6 percent during October compared with September. Overtime decreased approximately 50 percent.

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," F. A. R. Stainken to J. H. Warren, Dated October 20, 1953.

CA-431 (100-C Plant)
Principal work performed during the month toward completion of this project was on the metal examination facility at Building 105-C and on remote controls for operating Building 181-C equipment from the Building 183-C Control Room. Planning continued for accomplishment of a number of outage items during the scheduled December outage.

CG-438 (Ball 3X Facilities for B, D, F, DR and H Piles)
Planned modifications to the low pressure trip circuit of the Ball 3X system were completed at DR Reactor during October.

CA-512 (100-K Facilities)
The project has been re-written to cover the project as currently scoped, to show an increase in design power level from 1300 MW to 2000 MW and to cover additions to the plant electrical distribution system. The revised project has been submitted to the A and B Committee for approval. The first primary and secondary process water pumps for installation in Building 190-KW have been received from the vendor. The overall design completion of CA-512-R is approximately 98 percent; that of CA-512-W approximately 87 percent.

CG-519 (Repair of 105-D Reactor Effluent Line)
The new 60-inch steel line, which replaces the lower half of the original concrete line, was placed in service during October. Several auxiliary items in connection with this project remain to be completed.

CG-524 (High Pressure Water Supply to a Single Front Face Tube - 105-B, D, F, DR, and H)
Acceptance testing has been performed satisfactorily at the areas indicated and this equipment is ready for use. This

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1. Project Status (Continued)

facility provides a means of flushing slugs from process tubes by using the solids purge pumps, thereby eliminating the need for starting up Building 190 process pumps for such operations.

CG-558 (Reactor Plant Modification for Increased Production) Liaison continued with Design Engineering forces in their preparation of scope and criteria for this project. A review of the economic justification for this project was completed by the Contact Engineering group.

2. Plant Engineering

A number of engineering and development studies were active in the Section during October. The studies are, in general, aimed at decreasing costs and/or increasing production. Details are given in documents HW-29807 and HW-29809. Several items of interest are reported below.

Tests were initiated at C Reactor to establish pre-shipment "cooling" periods for "C" metal and "J" (enriched) slugs.

An experiment was started to determine the adsorbing power of used versus fresh silica gel. Preliminary results indicate that old silica gel from the Building 115 drying towers will retain nearly as much water as new silica gel but that it requires a longer time to adsorb the moisture.

Modified equipment for discharge of ruptured slugs within scram recovery time was used successfully to discharge a ruptured slug at DR Reactor during the month. Tests of the present design during normal outages are being conducted for training purposes and for proving the design.

F. Significant Reports

1. Routine

Monthly operating reports issued for September were:

HW-29513-A	Reactor Section	JH Warren	10-12-53
HW-29598	Operations Sub-Section	RO Mehann	10-12-53
HW-29505	Process Sub-Section	RO Mehann	10-1-53
HW-29506	Plant Engineering Sub-Section	FAR Stainken	10-1-53
HW-29538	Radiation Monitoring Sub-Section	PC Jerman	10-5-53
--	Maintenance Sub-Section	EE Weyerts	10-5-53
--	Power Sub-Section	JC McLaughlin	10-2-53

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F. Significant Reports (Continued)

1. Routine (Continued)

Other routine reports issued during October were:

HW-29721	"Monthly Progress Report - Reactor Section Expansion - October, 1953"	HT Wells	10-26-53
--	"Status of Reactor Section Projects, Informal Requests and Budget Items"	FAR Stainken	10-20-53
--	"Reactor Section - Process and Cost Improvement Report, July to Sept., 1953"	JH Warren	10-7-53
HW-29539	"Reactor Section Radiation Monitoring Technical Report for September, 1953"	PC Jerman	10-5-53
HW-29643	"Slug Jacket Failures - July, August, September, 1953"	DL DeNeal	10-15-53

2. Non-Routine

--	"Manual of Standard Costs - Reactor Section - Manufacturing Department"	--	10 - 53
--	"A Guide to Calculation of Reactor Section Cost Savings"	FAR Stainken	10-22-53
HW-29636	"Final Report - Process Test MR-105-7 - The Effect of the Iron Content of Process Water Produced by the Ferric Sulfate Process on Over-all Economics of Pile Operation at 100-H Area"	WR Conley	10-28-53
HW-29501	"Final Report - Process Test MR-105-10 and Process Test MR-105-10 - Suppl.A., Filter Capacity Test 100-B Area"	NV Starkebaum	9-30-53
HW-29578	"Meeting Minutes - Justification for Alum-Activated Silica Installation at 105-H by December 1, 1953"	JHM Miller	10-8-53

III. PERSONNEL

A. Organization

Effective October 1, 1953, O. C. Schroeder was appointed Superintendent of the Process Sub-Section. This position was vacant as a result of the organization changes which occurred on September 1.

III. PERSONNEL (Continued)

B. Force Summary

	Beginning of Month	End of Month	Net Change
Section General	3	3	0
Operations Sub-Section	267	265	- 2
Maintenance Sub-Section	478	483	5
Plant Engineering Sub-Section	30	30	0
Power Sub-Section	412	415	3
Process Sub-Section	38	40	2
Radiation Monitoring Sub-Section	58	59	1
Section Total	1286	1295	9

Changes during October consisted of 3 terminations, 1 new hire, 3 transfers out and 14 transfers into the Section.

C. Safety Experience

A Major Injury, No. 101, was sustained by a millwright on October 30 at Building 105-F. The employee's right index finger was partially amputated while he was adjusting a new charging machine head for proper operation.

Two Sub-Major Injuries were sustained by Reactor Section employees. The first, No. 244, occurred at Building 183-H on October 10 when a wrench fell approximately two feet onto the toe of a Power operator causing a fracture. The second, No. 246, occurred at Building 108-B on October 23 when a 500 pound piece of equipment being uncrated toppled onto a carpenter's foot also causing a toe fracture. In the latter incident, the employee was wearing safety shoes.

A Near-Serious Accident, No. 53-25, occurred outside 100-B Area on October 21, involving two exempt Reactor Section employees. Several large stones dropped from a Pre-mix truck and struck the windshield of the car in which they were riding.

D. Radiation Experience

There were no Class I or Class II Radiation Incidents in the Reactor Section during October.

An unusual occurrence was experienced at DR Reactor when highly radioactive gas from a ruptured "J" slug contaminated the discharge and storage areas. This same phenomenon occurred at H Reactor during September in connection with a "C" Metal slug. In neither instance did personnel meters indicate significant exposure. Personal clothing contamination dissipated itself very quickly.

D. Radiation Experience (Continued)

The 24-hour effluent water activity at the exit of Building 107-DR consistently exceeded 360 mrep during the month. The maximum 24-hour dose was 636 mrep at a time when only one retention basin was in use. This activity was tolerated with the concurrence of the Radiological Sciences Department.

E. Personnel Activities

At month end, 19 employees are receiving on-the-job training for engineering or supervisory assignments in the Section; 14 of these are on assignment under the rotational training program.

In an election on October 20 and 21, HAPO radiation inspectors, including those in the Reactor Section, voted in favor of representation through the HAMTC.

Principal items of interest during October aimed at increased employee communications were the initiation of a series of meetings on labor relations for Maintenance Sub-Section supervision, several meetings for Radiation Monitoring Sub-Section and Electrical Unit employees on organizational plans and the Company supervisory selection program, and general information meetings of a training or informational nature for Power Sub-Section and Mechanical Unit non-exempt personnel.

W. J. Scheiber of the General Electric KAPL organization visited the Operations Sub-Section for three days during October to discuss reactor operational problems.

L. J. Cohan and T. J. Gettle, Combustion Engineering representatives, New York City, visited the Power Sub-Section on October 14 to consult with supervision on Building 184 boiler performance.

E. W. Baker and C. J. Williams visited Portland during the period October 19-22 in connection with establishing spare parts and maintenance procedures for primary and secondary pumps at Building 190-KE and KW.

R. E. Dunn attended the AEC sponsored Reactor Information Meeting at Argonne National Laboratory October 7-9.

Richland, Washington
November 10, 1953

MANUFACTURING DEPARTMENT
SEPARATIONS SECTION
OCTOBER, 1953

I. RESPONSIBILITY

Responsibilities of the Separations Section were essentially unchanged during the month of October.

II. ACHIEVEMENT

A. Operating Experience

1. Statistics

a. Bismuth Phosphate Operations

	October		September	
	Normal	Acid Wash	Normal	Acid Wash
Charges started in Canyon Bldgs.	25	1	26	0
Charges completed in Conc. Bldgs.	21	0	30	0
Special charges - Conc. Bldgs.	38		17	
Charges completed - Isolation Bldg.	278	0	199	0
Average Waste Loss, %	2.3		2.4	
Special charges - Isolation Bldg.	52		42	
Material balance, %	97.9		101.3	
Yield through Process, %	95.6		98.9	
Average cooling time (days)	70		74	
Minimum cooling time (days)	56		65	

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1. Statistics (Continued)

b. Redox Operations

	October	September
Equivalent charges started	259.4	173.1
Charges completed	267.9	165.8
Tons Uranium delivered to storage	186.4	118.9
Average Production Rate per operating day, Tons	6.4	6.2
Average Daily Operating Rate for the month, Tons	6.0	3.96
Average yield, %		
Uranium	99.25	97.9
Plutonium	99.88	98.0
Total Waste Loss, %		
Uranium	0.89	1.43
Plutonium	0.79	1.53
Average cooling time, days	76	83
Minimum cooling time, days	67	77
Percent down time	6.0	36.4

c. 234-5 Operations

	October	September
Batches completed through Task II	276	329
Runs completed through Task III	182	303
Reduction yield, RM	95.2	93.9
Waste Disposal, units	6.39	5.44

d. UO_3 Operations

	October	September	To Date
Uranium drummed, Tons	404	320	4035
Uranium shipped, Tons	422	334	3997
Average cooling time, days (Redox)	84	88	
Minimum cooling time, days (Redox)	71	80	
Waste loss, %	0.1	0.1	

e. TBP Operations

	October	September	To Date
Tons received from Metal Removal	230	216	2290
Tons shipped to UO_3 Plant	230	210	2188
Average Production Rate per operating day, Tons	7.58	7.11	

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1. Statistics (Continued)

e. TBP Operations (Continued)

	October	September	To Date
Average Daily Operating Rate for the month, Tons	7.42	6.99	
Average yield, %	99.39	95.79	
Total Waste Loss, %	1.91	3.58	
Ratio Waste Volume returned to Volume removed	1.38	1.28	
Percent Down Time	2.19	1.72	

f. Power

	200 East	200 West
Raw water pumped, gpm	1 484	7 243
Filtered water pumped, gpm	453	951
Steam generated, lbs/hr	51 075	166 303
Maximum steam generated, lbs/hr	97 000	217 000
Total steam generated, M lbs.	38 000	123 729
Coal consumed, tons (est.)	2 642	8 537

g. Waste Storage

	Equivalent Tons U
Metal Waste reserve storage capacity - T Plant	294
1st Cycle reserve storage capacity - T Plant	279
Metal Waste reserve storage capacity - B Plant	145
1st Cycle reserve storage capacity - B Plant	4
Redox Waste reserve storage capacity	315

2. Activities

a. Redox Processing

The Redox Plant operated at a record average rate of 6.0 tons per day with operations continuing throughout the month without a shutdown period extending beyond 24 hours. Feed rates were increased from 5 tons per day to 7 tons per day on October 2 and the latter rate was maintained for the balance of the month except during minor shutdown periods for column flushes, correction of the oxidizer vacuum system, and regeneration of all three silver reactors. Poor decontamination performance following the shutdowns resulted in rework of minor amounts of product, but did not hinder throughput rates appreciably.

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2. Activities (Continued)

b. TBP Processing

The TBP Plant operated at an average rate of 7.4 tons per day with feed rates to each extraction system varying between 3.5 and 6 tons per day, and RA column waste losses averaging 1.4%. Minor shutdowns were experienced for replacement of the B Line RC column pulse generator on October 17, and decanting and rework of the X-1 Tank (UNH Storage) organic. During the last week in October, it was necessary to reduce feed rates since the quality and quantity of feed supplied by the tank farms was somewhat lowered.

c. UO_3 Processing

Plant operations were essentially normal in the UO_3 Plant with a record production of 404 tons of powder being produced. An organic phase was detected in the X-1 (UNH Feed) tank twice during the month, and the material was returned to the TBP Plant for reprocessing.

d. Waste Metal Removal

Production was, in general, good throughout the month with the principal producers being the 107-U, 104-C, 102-T tanks. However, lost operating time was significant during the month in spite of the near record over-all production. Equipment failures occurring at all four facilities involving sluice and sludge pumps were costly and time consuming. Tank 102-B was emptied during the month. Current inventories remaining in U, B, T, and C tank farms are low and indicate difficulty will be experienced in maintaining the required production output until new sources of supply in BX and TX farms can be tapped.

e. T Plant Processing

T Plant production was curtailed when it became evident that the Redox Plant could process any excess metal that was available, and this resulted in the T Plant producing only 68% of forecast.

f. 231 Processing

The necessity for processing maximum Redox production on a sustained basis resulted in the working of eight overtime shifts during the month of October. The monthly average for 231 production was 13 runs per day with production exceeding all previous records for the Isolation operation.

g. 234-5 Processing

The October commitments of buttons and final shapes were processed in the RMA Line and delivered to the AEC. While changing the Hood 200-A panel on October 19, gross plutonium contamination of Room 233 occurred,

2. Activities (Continued)

g. 234-5 Operations (Continued)

and delayed production for the 24 hour period required for decontamination work. The incident can be attributed to the room to hood air pressure differential proving less than anticipated during the panel changing operation.

3. Special Operations

a. Waste Evaporation

October operating data for the 242-B and 242-T waste evaporators are as follows:

Evaporator	Gallons Feed	Gallons Bottoms	Gallons Condensate	% Volume Reduction
242-B	604 312	404 937	199 375	33.0
242-T	491 563	329 313	162 250	33.0

Feed for both evaporators was current TBP wastes from Tanks 109-BX and 105-TY.

b. Pu Recovery - 234-5

The equivalent of 10.8 bottles of product was processed in Metal Recovery (Hood 40), 8.7 bottles were processed in Powder Recovery (Hood 41), and 23.9 bottles of material were transferred to the Concentration and Isolation Buildings for reprocessing.

c. Regeneration of Silver Reactors - Redox

The A-3, B-3, and C-3 silver reactors were regenerated on October 24, 23, and 29, respectively. Approximately 7.8 curies of I^{131} per day were emitted from C-2 dissolver and 9-10 curies per day from A-2 dissolver during dissolution of batches charged prior to regeneration. In order to minimize loss of production time, a one-shot addition of silver nitrate was used in place of the normal two shots for each regeneration. The B-3 reactor had not failed, but since B-2 dissolver had processed 145 tons of metal subsequent to the previous regeneration, it was considered advisable to complete the work at this time in accordance with a proposal to regenerate reactors after processing 140 tons of metal.

d. 241-S Swamp Treatment - Redox

241-S swamp treatment was continued to discourage wildfowl from feeding in this contaminated area. The swamp periphery to approximately 50 feet from the edge of the water was sprayed with duPont CMU soil sterilizer, and 2-4-D was added to the swamp water to kill vegetation.

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A. Operating Experience (Continued)

4. Schedule Variance

Redox plutonium and uranium production were both records with 140% and 136%, respectively, of the amount forecasted for October.

T Plant production was 68% of the forecast. The combined plutonium production of the two plants was 132% of the forecast.

The TBP Plant produced 115% of the October forecast.

The UO_3 Plant production was a record with 135% of the forecast being produced.

B. Equipment Experience

1. Operating Continuity

The Redox down time of 48 hours was essentially due to the need for column flushes, replacement of the waste receiver (D-13) agitator, and correction of oxidizer (H-4) vacuum difficulties.

The A Line in the TBP Plant experienced no down time and B Line was down for 34 hours, due primarily to the need for replacement of the RC column pulse generator, and for column and vessel flushes.

2. Inspection, Maintenance and Replacement

a. Waste Receiver (D-13) Agitator - Redox

The waste receiver agitator shaft sheared on October 7 and was replaced on October 9. This was the first agitator failure in D-13 since start-up.

b. Nagle Pump Failures - Tank Farms

Two Nagle pump failures which occurred on October 5 and 11 were caused by loss of the shaft alignment bearing. Replacement was made with spare units.

c. Johnston Pump Failure - Tank 001-BXR

The upper motor bearing in 125 hp motor on the Johnston pump in Tank 001-BXR failed on October 23. This is the third failure of this type that has occurred to these pump motors since start-up. Investigation has disclosed that three of the 125 hp motors provided by the vendor were designed for a 800 lb. thrust load on the bearings instead of 3800 lbs. The Johnston Pump Company is

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2. Inspection, Maintenance and Replacement (Continued)

c. Johnston Pump Failure - Tanm 001-BXR (Continued)

supplying replacement motors at 25% of cost for these three motors, with the first scheduled for arrival November 1, at which time it will be installed on the BXR pump. No other pumps are affected by this situation.

d. Process Pump Failures - TBP Plant

A total of ten Johnston pumps failed during the month in the TBP canyon building. One failure was due to electrical motor trouble; five to shafts and bearings; and four undetermined. Replacements were made with spare units. New bearings for the failed units are being fabricated from pile graphite which has proven to be superior to the "graphitar" material formerly used.

e. Cell 15 Corrosion - TBP Plant

Cell 15 (Section 8 evaporator) was opened during the period for installation of thermohms in E-8-1. Extensive corrosion to all steel components in the cell was noted with severe pitting being observed on jumper support brackets and steel work, necessitating replacement of connector bolts and skirts. The Amercoat finish on the walls of the cell had also deteriorated badly. It is fairly well established that the corrosion took place sometime shortly after the first of September, and it appears that the seal gasket between the T-8-4 seal pot and the ventilation duct work failed, permitting nitric acid fumes to be released into the cell.

f. Filter Replacements - UO_3 Plant

The X-3 primary filter bag was replaced three times during the month. Fourteen bags were replaced in the X-11-1 and X-11-2 secondary filters and the X-12 fiberglass off-gas filter was replaced three times.

g. TD-4 Fractionator - UO_3 Plant

The reboiler coil of the TD-4 nitric acid fractionator was replaced when leaks developed in the tube welds. This unit, which had been in service four months, was fabricated of type 347 stainless steel while the replacement unit was fabricated of 304-L (low carbon) stainless steel in an effort to prolong its life.

h. Task II Filter Boats - 234-5

In 234-5 Building, Task II, an inspection of the 1A platinum lined filter boats revealed that the liners are in such poor condition that it will be necessary to replace much of the lining, as well as most of the sintered filter discs.

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C. Improvement Experience

1. Process Tests and Revisions

a. Improvement in Waste Metal Removal Rate

The rate of uranium sludge removal from the 104-C tank was increased from 2 to 5 tons of uranium per day by water sluicing the tank and blending the slurry with supernate from 106-C. Nitric acid consumption for this process is essentially the same as for supernate sluicing and the lowered salt content of the 221-U feed results in lower waste losses for the 221-U Building.

b. T-D-4 Fractionator Reflux Water - UO_3 Plant

The nitric acid overhead losses to the condenser have been reduced from 0.169 lbs. per gallon of condensate to less than 0.001 lbs. per gallon of condensate, by increasing the reflux water from 2 to 5 gallons per minute. This results in an additional recovery of approximately 300 lbs. of 100% HNO_3 per ton of uranium processed.

c. Semi-Continuous Dissolving - Redox

The semi-continuous dissolving technique was adopted for all dissolvers and the resultant feed solution has indicated normal behavior in the solvent extraction cycles. In spite of relatively large metal heels, the procedure has permitted easy control of the reaction without requiring the use of cooling water. Time cycles as short as 7.5 hours per 2.5 ton cut have been achieved while the over-all acid saving for the month averaged 12% per ton of metal dissolved.

d. Sulfate Adjustment in T Plant Material - 231

Reduction of first cycle sulfate adjustment on T Plant runs from 0.2 molar to 0.1 molar was adopted on October 26. In eleven test runs using 0.1 molar sulfate, there was no apparent effect on either recycle loss or AT sulfate concentration. The first cycle 0.1 molar sulfate adjustment on T Plant runs is considered advantageous in that it permits uniform sulfate additions on all first cycle processing in the Isolation Building.

e. Oxalate Slurry Filtration - 231

Use of filter sticks in the precipitator tanks to supplement filter boats in filtration of oxalate slurries was adopted on October 15. The slurry is reduced to 1/3 of its original volume by filtration through the filter stick prior to boat filtration. This makes possible a time saving of approximately 30 minutes per run with no adverse effects on the material being processed.

C. Improvement Experience (Continued)

1. Process Tests and Revisions (Continued)

f. $HF-O_2$ Admission Point - Task II, 234-5

In order to determine the minimum $HF-O_2$ admission point, the temperature of admission was progressively reduced from 500° C to 250° C (baffle temperature). Since the refluorination rate remained almost constant between 350° C and 250° C, the lower admission temperature was incorporated as standard procedure, thus increasing the fluorination time by approximately 15 minutes without increasing the over-all time cycle.

g. Mixed Gas Heater - Task II, 234-5

The evaluation of pre-heating the Task II process gases (air, HF, and O_2) to approximately 475° C has been completed. Out of fifty runs processed through test furnace #2, only two required refluorination. The test pre-heater is presently being re-designed so that it will be able to heat the process gases to 600° C. This newly designed pre-heater will be installed on the furnaces as soon as possible.

h. Pooled Aqueous Waste Scavenging - TBP

Approximately 515,000 gallons of dilute waste was scavenged with nickel ferrocyanide (0.005 molar) in a test to determine the feasibility of cribbing the resulting supernate. Laboratory determinations indicate that cesium can be decontaminated by a factor of 1000 to 3000 by controlling the strike pH between 8 and 10. Soil adsorption tests using synthetic waste indicate that as much as 3000 gallons of scavenged waste per square foot of crib bottom can be tolerated. Further testing and evaluation of the scavenged waste must be done before firm recommendations can be made.

i. In-Line Continuous Monitors - TBP Plant

The three uranium monitoring instruments installed on A Line have operated satisfactorily in October, and results reflected changing column conditions very well, permitting some operational changes to be made before analytical results were received on samples sent to the laboratory.

2. Inventions or Discoveries

Personnel in the Separations Section engaged in work which might be expected to result in inventions or discoveries have reported that no inventions or discoveries were made during the period covered by this report.

D. Events Influencing Costs

1. Labor Variance

Total force of the Separations Section dropped by seven, due to termination and transfer.

2. Material Variance

Up to 300 lbs. of 100% HNO_3 per ton of uranium processed in the UO_3 Plant is being recovered by increasing the reflux water on the T-D-4 fractionator.

The substitution of commercial methane for 99% methane in the ASP counting instruments used in the analytical laboratories will result in annual savings to the plant of nearly $14,000 per year, since commercial methane is $0.32/cu. ft. cheaper.

3. Other

In the Standards Laboratory, many minor improvements and reductions in work requests, coupled with a time study of calibration work which indicated available spare time, have brought about a reduction in work force of one person. Efficiency has been improved by combining glass calibration work with counting standards work. Indicated savings to the Standards Laboratory, and thus to their customers, amount to $5,000 annually.

Increased efficiency resulting from straight-day operation in the 234-5 Building Spectrographic Laboratory (as proposed by the Plant Engineering Sub-Section) resulted in a reduction in the work crew of one person for a savings of $5,000 annually. This person was assigned to general laboratory work, and the number of additional people needed for forecast increased production will thus be reduced by one.

As a result of Analytical Unit efforts and the cooperation of Plant Auxiliary Operations Department, janitor service to the 222-S Building was curtailed to the extent that one and one-half janitors were released for re-assignment to other areas. This change will result in an annual savings of $9,600 to the Analytical Unit, effective October 19.

E. Plant Development and Expansion

1. Project Status

The Purex ventilation system design will be based on the installation of a filter. However, the Design Council has deferred decision on filter requirements until the first of the year when more data on the Redox ventilation air conditions become available. The Design Section is studying fibreglass and sand filters to determine which is most suitable for Purex use.

E. Plant Development and Expansion (Continued)

1. Project Status (Continued)

Construction of the Recuplex Facilities was suspended on October 31, 1953, due to the shortage of construction materials. It is anticipated that construction on this project will resume approximately January 1, 1954, when the material procurement problem is resolved. This rescheduling of construction forces should not delay the over-all project completion date if additional procurement problems are not encountered.

A decision was reached for Minor Construction to fabricate critical equipment required for the Redox Phase II Capacity Increase. Current plans embrace fabrication of vessels for the waste concentration and organic recovery systems.

Construction of the SX Tank Farm is slightly ahead of schedule.

The work underway to revise the TBP Plant for series operation of larger columns was on schedule at the end of the month.

The revised Project Proposal for Reactivation of the P-10 Facilities was approved by the A & B Committee and submitted to the AEC for approval.

Installation of the on-line sampling system for P-10 was completed and testing started. Cold runs for testing and calibration of extraction line equipment were continued in October with synthetic extraction runs being initiated on October 23. Leaks in the Skinner valves which control process flow prevented normal operation, and repairs and modifications to these valves have not met with success. Orders have been placed for replacement valves of a pneumatic type, but delivery before start-up is doubtful.

2. Plant Engineering

The development of a procedure for the washing, sanitization, drying, inspection, and repair of masks used for radiological protection by the Separations Section was completed. The proposal embraces the establishment of a central mask station for the above functions at an estimated cost of $18,000. Operating methods were devised to conform to standards specified by Public Health and Safety authorities.

A preliminary outline of an exempt employee work simplification course consisting of ten 2-hour instruction and work sessions has been completed. The initial rough draft of one of the four work simplification pamphlets for non-exempt employees has been completed. Target date for initiation of both the exempt and non-exempt programs is January 4, 1954.

Plans are being completed with representatives of the Financial Department and the Applied Mathematics Group of the Statistics Unit to establish routine procedures for calculation of monthly standard costs through the use of IBM equipment.

F. Significant Reports Issued

1. Routine

Doc. No.	Title	Author
HW-29836	Separations Section - Operations Sub-Section Monthly Report	V. R. Chapman
HW-29837	Separations Section - 234-5 Operations Monthly Report	V. R. Chapman
HW-29860	Separations Section - Plant Engineering Sub-Section Monthly Report	C. P. Cabell
HW-29861	Separations Section - Process Sub-Section Monthly Report	W. N. Mobley
HW-29858	Separations Section - Radiation Monitoring Sub-Section Monthly Report	A. R. Keene
Restricted	Separations Section - Power & Maintenance Sub-Section Monthly Report	R. T. Jessen
HW-29844	Separations Section - P-10 Extraction Unit Monthly Report	O. V. Smiset
HW-29812	Monthly Progress Report, Separations Section, Plant Engineering Sub-Section, October, 1953	F. A. Hollenbach
HW-29841	Separations Section - Essential Materials	J. P. McBride
HW-29649	Separations Process Committee Minutes	O. F. Beaulieu

2. Non-Routine

Doc. No.	Title	Author
Restricted	Redox Plant Operating Continuity Versus Process Line Failures	L. D. Gustafson
Restricted	Suggested Methods of Increased Production-WMR Program	W. O. Clark
P.E. Report #10	Standard Cost Program, Separations Section	C. P. Cabell F. A. Wonn
HW-29633	Utilities Costs in 224-U (Rough Draft), P. E. Report No. 92	R. H. Silletto

F. Significant Reports Issued (Continued)

2. Non-Routine (Continued)

Doc. No.	Title	Author
HW-29705	Radiation Incident, Class II, No. 21	A. R. Keene
HW-29508	Radiation Incident, Class I, No. 83	D. R. Koberg
HW-29857	Radiation Incident, Class I, No. 85	D. R. Koberg
HW-29747	Isolation and Metal Fabrication Test Program Authorization	E. G. Pierick
HW-29754	Minutes of Meeting on Methods of Increasing Waste Metal Production	W. G. Browne
HW-29587	Use of Commercial Grade Methane in ASP Counting Instruments	M. J. Rasmussen
HW-29704	Accountability of PuF_4	L. M. Knights

III. PERSONNEL

A. Organization

There were no significant organizational changes in the Separations Section in October.

B. Force Summary

	Start of Month	End of Month	Net Change
Section General	5	5	0
Operations Sub-Section	587	585	- 2
Power and Maintenance Sub-Section	566	560	- 6
Process Sub-Section	200	201	1
Radiation Monitoring Sub-Section	73	73	0
Plant Engineering Sub-Section	30	30	0
P-10 Extraction Unit	30	30	0
Section Total	1491	1484	- 7

C. Safety Experience

There was one major injury and no sub-major injuries in the Separations Section in October.

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C. Safety Experience (Continued)

Major Injury No. 100 was sustained by a Plumber-Steamfitter on October 28 in the UO_3 Plant when hot water solution sprayed onto his back, and resulted in the employee's hospitalization for first and second degree burns which covered a large portion of the back area. The accident occurred during attempts to unplug a process line with hot water under pressure. The plug gave way unexpectedly, and hot water erupted from a break point in the line and sprayed the injured's back.

On October 17, a small fire occurred in the auxiliary X-11-1 filter in the UO_3 Plant, and was apparently caused by the high operating temperature of the filter system igniting the wooden beams of the filter unit. The charred filter bag was replaced, and the wooden components were removed from both X-11-1 and X-11-2 filters.

The 1953 Separations Safety Stampede closed on October 31 and final tabulations of "Tribal" standings are in progress at the end of the month. Presentation of awards to the winning "Tribe" will be made at ceremonies scheduled for 3:15 p.m. on November 6 in the 200 West Area.

D. Radiation Experience

Two Class I Radiation Incidents were experienced during October. One occurred where a Chief Operator exposed himself to UO_3 contaminated air while wearing a mask which he failed to equip with a filter cartridge. The second occurred in connection with Major Injury No. 100 as UNH solution was involved as well as hot water. Uranium deposition in both incidents was significantly less than the permissible limit.

One Class II Radiation Incident occurred when undetected spot contamination on the coverall of a Laboratory Assistant resulted in an estimated localized beta exposure to the skin of 60 to 240 rep.

In the Redox Plant, extensive plans were completed for decontamination of the canyon deck, crane and craneway surfaces during the scheduled shutdown in early November. The decontamination efforts planned include: spraying cell surfaces; hosing canyon walls and deck; vacuuming the craneway, followed by sealing of cracks and joints; hosing canyon rafters and roof; and steam-cleaning the crane, replacing equipment as necessary to maintain operable conditions.

Failure of the A-3 and C-3 silver reactors at Redox resulted in a maximum emission of 10.5 curies I^{131} per day. Regeneration of both reactors kept the average emission rate down to 2.9 curies I^{131} per day. Ruthenium emission averaged less than 1 curie per day.

E. Personnel Activities

1. Non-Exempt Information Meetings

The eighth and ninth of the scheduled series of non-exempt information meetings were held in October with a total attendance of 250.

E. Personnel Activities (Continued)

2. G.E. Supervisory Selection Program

Evaluation was completed for eight Operations Sub-Section personnel during the month.

3. Conference Leading Program

On October 19, twelve Separations Section personnel completed the Conference Leading Training course conducted by Training and Development personnel.

4. Laboratory Instruction Program

The Laboratory Instruction Program was formally completed with the meeting held on October 23.

5. Emergency-Disaster Training

Initial training of Separations Section personnel in Basic Rescue Training procedures was completed during the month. The Technical Rescue Training course will be presented in November to selected personnel.

Installation of emergency equipment in the Rescue Trailer was completed in October, and the unit is considered ready for use.

6. P-10 Training Program

A training program conducted by P-10 Extraction Unit Supervision for Utility Operators was completed during the month.

7. Radiation Monitoring Supervision Union Relations

Radiation Monitoring supervision of both the Manufacturing and the Radiological Sciences Departments met with Union Relations management on October 27 to discuss the union relations aspects in dealing with the Radiation Inspectors under HAMTC representation. These employees voted for this union affiliation in an NLRB election on October 20 and 21.

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ENGINEERING DEPARTMENT

OCTOBER 1953

TECHNICAL SECTION

The buckling has been measured in several lattices in which hollow slugs with the internal hole filled with water were used. Slug dimensions were 0.81", I.D., and 1.66", O.D., the latter permitting insertion into the present graphite tube bore. The 7½" lattice gave buckling values of 92.7 and 97.9 microbucks for wet and dry values, respectively. The wet value is high enough for use in H or K-type piles and the reactivity gain on loss of cooling water is small.

The work on the energy variation of the ratio of the fission cross section of Pu-239 to that of U-235 in the region 0.0225 to 0.100 e.v. is now complete. Although the determination of the absolute values of this ratio awaits the accurate weighing of the foils by KAPL personnel, conclusions that are dependent on relative values of the data can be drawn at this time. A value of 0.995 was obtained for f, the correction factor for departure from 1/v dependence of σ_f (49). This is to be compared with the accepted value of 1.06 in BNL-221. A value of 702 barns is indicated for the fission cross section of Pu-239 over a Maxwellian spectrum with a most probable energy of 0.0253 e.v. This is about 5% lower than previously thought. The temperature coefficient of η (49) (neutrons produced per neutron absorbed in Pu-239) appears to be about $-7 \times 10^{-5}/^{\circ}C$ over the range of 0.0253 to 0.04 e.v. This is to be compared to a previously assumed coefficient of about $-20 \times 10^{-5}/^{\circ}C$.

The creep of 2S aluminum thimbles was investigated under loads ranging from 0 to 12 inches of water at temperatures ranging from 400 to 600°C. Unsatisfactory service conditions were zero inches of water at 600°C, one inch at 550°, three inches at 500° and 12 inches at 400°.

Radiometallurgical examination of recent split-type ruptures from C Pile is in progress. Macroscopic examination of a transverse split revealed a very poor quality of uranium and it is possible that the transverse cracks which are observed resulted from rolling partially in the beta phase and were responsible for the cleavage normal to the slug axis.

The rates of corrosion of 304L and 309SCb stainless steels in boiling simulated Redox waste solution were found to be decreased by factors of nine and 2.5, respectively, if the dichromate was first reduced by treatment with ferrous ion.

Type 304L stainless steel is being evaluated as a fabrication material for the new RM Task III reduction bombs. Stress rupture studies indicate that bombs fabricated from this steel should last at least 10 times and possibly 100 times as long as the mild steel units formerly used in 234-5 RG Line operations.

An in-line monitor for plutonium content of Recuplex waste has been successfully demonstrated in the laboratory. The instrument is based on absorption photometry and activates an alarm signal if the plutonium content of the waste exceeds the selected 1 g/l threshold.

The nickel ferrocyanide procedure for scavenging of cesium and strontium from waste solutions was tested on a plant scale during the month. The over-all plant decontamination factors for the entire run are not yet available; however, grab samples obtained at various times during the test showed factors of 4000-10,000 for cesium and 35-45 for strontium when the pH had been controlled within the specified range of 8 to 10.

Initial studies of the separations handling of zirconium clad uranium slugs were conducted. An Al-Si bonded, zirconium clad slug was sawed in half, then treated with 60% nitric acid. Uranium dissolution proceeded at a rate not appreciably slower than that of a bare slug. Visual inspection indicated some possible attack on the zirconium can.

Based on recent in-pile graphite oxidation experiments, the process specification for maximum allowable graphite temperature was raised from 410°C to 460°C. This temperature may be utilized immediately at the C Pile and later at the other piles following horizontal rod thimble removal.

Twelve slug ruptures occurred in normal uranium slugs during the month. Eight of these occurred in the central orifice zone of C Pile, and all were apparently cleavage failures.

At C Pile, operation of 50 to 100 central tubes at levels up to 820 KW per tube continues under conditions of low rupture rate. The slugs in this "Hot Spot" zone will be exposed to 900 MWD before discharge.

New maximum monthly production rate in the Redox Plant equivalent to 200 percent of instantaneous or 250 percent of the sustained rate design basis was established. This achievement was due to unusually high mechanical or "on-stream" efficiency, equipment changes and flowsheet changes. Operation of three U and three Pu cycles was employed throughout the month. Difficulties with the centrifuge feed system necessitated complete dissolution of the MnO_2 precipitates, formed by head-end treatment, and thereby reduced the probability of adequate Zr and Nb removal by two-cycle operation. Temperature levels were reduced to minimize corrosion attack by nitric acid-dichromate systems and intensive efforts were applied to reduce corrosion attack in other points in the process not amenable to reduction in temperature.

The Metal Recovery Plant operated with adequate decontamination of the product and exhibited a significant reduction in waste losses, less than 2 percent for the month; the three months averaged waste losses dropped from 4.0 to 3.2 percent. This improvement can be attributed to better feed composition, i. e., lower $PO_4^{=}$ and $SO_4^{=}$ concentrations and higher NO_3^- concentrations relative to the uranium concentration, and to modifications in the flowsheet. Modifications to the operating conditions employed in the uranyl nitrate concentration step permitted restoration of satisfactory

levels of metallic impurities in the UO_3 product.

Testing of the Purex prototype installation for operability and capacity characteristic studies was completed for all Purex solvent extraction systems excepting the 1BS column. It appears that at least twice the design basis capacity may be obtained from the components tested.

The Hot Semiworks completed the campaign of runs on the Redox process with run HR-12 which demonstrated the feasibility and practicability of back-cycling 2DW and 2AW streams (2nd U and Pu cycle waste) to the 1A column (1st decontamination cycle) when employing a dual scrub system. Decontamination of equipment is in progress in preparation for the conversion to Purex process type equipment.

Eleven nickel-plated uranium slugs were vacuum canned with good results. Complete bonding was obtained between the nickel and Al-Si in all cases. Penetration test results on two of the slugs showed minimum can wall thicknesses of 0.030 inches (0.035 inch initial can wall). The vacuum canning techniques used should be readily adaptable to the canning of hollow slugs.

A preliminary calibration of the eddy current Al-Si penetration detection equipment, MIZ-1, has been made using slugs selected in pairs for equal indications on the equipment. One of each pair of selected slugs was stripped electrolytically and the actual minimum wall thickness determined. A mate to the stripped slug which most closely approximated 20 mils of minimum aluminum thickness is now being used for a standard to test accepted production pieces and segregate 5000 slugs acceptable under this limit. To date, approximately 900 slugs have been selected out of 1500. There are indications, however, that the calibration of the 20 mil standard may be in error and that the reject limit used in the testing so far is actually greater than 20 mils. Slugs are being stripped to establish the actual reject point and determine the minimum thickness accepted and the maximum thickness rejected.

DESIGN SECTION

During the month direct engineering effort for the Section was distributed approximately 54% to Expansion Program activities, 21% to research and development studies and 25% to other projects and design orders.

Over-all design on Project CA-512-R, 100-K Reactor Facilities was advanced to 97.4% an increase of 0.9% during the month. Of the 1903 drawings which

have been approved to date, 23 were approved during the month. Funds expended to date are approximately $1,835,800 against a revised estimate of $2,425,000.

Detail design of the 200 Area Expansion Program, Project CA-513, was concentrated on the Purex Waste Facility. Detail design of this facility is 100% complete, an advance of 7% during the month. The design of the Outside Facilities is 95% complete and design of the Metal Conversion Plant Expansion was advanced 1% during the month to 100% completion. Design of the Hot Semiworks Conversion is 68% complete, an advance of 33% during the month.

Detail design of the 300 Area Expansion Program, Project CA-514, was advanced 9% during the month to 72% complete. Revised design progress and drawing schedules were issued. Design activity continued to be concentrated on the 313 Building process equipment.

Detail design of the Project CG-496, Recuplex Installation, 234-5 Building was advanced 2% during the month to 100% complete.

Design work on Project CG-551, Expansion of Building 234-5 Facilities, was advanced 10% during the month to 46% complete. Purchase requisitions and specifications issued for procurement of critical materials and equipment now total $23,715.

Scope design work on Reactor Plant Modification for Increased Production, Project CG-558, has proceeded during the month with principal emphasis on the preparation of scope drawings and design criteria for the 100-B-C Area and flow diagrams for other areas. A comparative evaluation of various degrees of plant modification was prepared for transmittal to the Atomic Energy Commission by Management. Over-all project scope design is 30% complete, an increase of 24% during the month.

Design work on Reactivation of P-10 Facilities, Project CG-550, is 98% complete, an advance of 9% during the month. Of the 108 drawings required, 107 have been approved.

Design work on TBP Plant revision for series operation of the process line was completed during the month.

A project proposal, CG-562, Revision 1, was prepared for the fabrication and installation of new columns and associated TBP Plant revisions and funds were authorized by the Commission on October 5, 1953. Design of this project is 100% complete. The design of these two phases completes the presently scheduled changes necessary for processing of younger wastes.

A project proposal was completed during the month for the design and construction of facilities for installation of alum-activated silica water treatment in the 100-B, D, F and H Areas. It is proposed, as the first phase of this program, to haul activated silica to B and H Areas and to make minor

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improvements to the existing D, DR and F Area test installations.

A preliminary study of the technical and economic feasibility of a dual-purpose power reactor plant at Hanford was completed. This study provided the basis for formal recommendations made to the Atomic Energy Commission by the General Electric Company that authorization be granted for development, design and subsequent construction of such a reactor.

PROJECT SECTION

At the end of the month, completion status of major projects was as follows: CA-187-D-II, Redox, 7%; CA-431-A, 100-C Waterworks, 99.9%; CA-431-B, 100-C Reactor, 99.9%; CG-438, Ball Third Safety System, 97.5%; CG-496, Recuplex, 27%; CA-512, 100-K Area Facilities - Water Plants, KW, 34.7%, KE, 26.4% - Reactor Buildings 105-KW, 34.2%, KE, 10%; CA-513, Purex Facility, Part "A," overall, 12.09%, Part "B," 80%; CA-514, 300 Area Expansion, overall, 19%.

With about 90% of the equipment orders for K Reactor now placed and in production, the inspection staff is spread thinly throughout the country. At the close of the month, there were 193 requisitions for items which will require inspection. There are increasing problems on inspection of reactor process tubes, gun barrels, nozzles, and other reactor equipment. Procurement of items for water plants is generally satisfactory, as is fabrication of reactor biological shields and part of the blocks for thermal shields. The vendor for base blocks is attempting to solve problems of casting and also to repair blocks which were rejected previously. The production of limonite has reached the satisfactory rate; there was produced during October about 450 tons of grout sand and 1500 tons of coarse aggregate.

There were relatively few interruptions of work during the month by jurisdictional disputes. The charge of unfair labor practices filed by machinists against Kaiser engineers was withdrawn. Little progress was made on insulation work because the Asbestos Workers' Union continued to withhold men. Negotiations with this Union have reached a stalemate on the question of a subsistence allowance increase. The decision of the arbitrator between Kaiser and the Technical Engineers' Union was set aside in Washington, D. C. A tripartite Committee was appointed to study wages in the Northwest, and Kaiser has submitted additional information to the arbitrator. The Boilermakers have reached an agreement applicable to the Seven Western States Agreement involving basic wage increase, subsistence allowance increase, and a classification of Boilermaker-Blacksmith.

The Industrial Electric Company began its functions as the electrical subcontractor for J. A. Jones Construction Company on October 19, 1953.

The Mechanical Development Building of the Laboratory Area was ready for occupancy except for minor clean-up items representing about 1% of construction. Punch list items for the 100-C Water Plant are substantially complete,

and the 100-C Reactor Facility was essentially completed except for gas analysis equipment and further work on the metal examination facility. Structural work on both KW and KE Water Plants is progressing satisfactorily.

Completion of construction of 2101 Building was delayed by lack of insulation mechanics. The quality of graphite has improved, particularly regarding the percentage of cracked blocks. The pre-shop work is now proceeding on three shifts, but fabricating shop is only operating one shift. The first group of 30 layers has been removed to finished storage. It now appears that graphite production and fabrication is adequate to meet the newly-established packing date of January 15, 1954.

The rate of placing concrete in 202-A Building was increasing. Of the 910 monoliths required, 250 have been completed. Piping work was continued in the process cell walls, canyon walls, and floor areas. The modification of 272-E Building was slightly ahead of schedule, as was the contractor for 2901 Export Water Line. Design of 224-U Expansion was completed during the month, and full scale construction was resumed. The 40" development centrifuge for Purex has been shipped to Hanford for testing with semi-process solutions. A 100-hour test run of the prototype model of the pulse mechanism was continued during the month. It is believed that minor defects revealed by the test can be corrected on production models.

ORGANIZATION & PERSONNEL

Total on Roll, October 1, 1953	1,530
Accessions	20
Separations	25
Total on Roll, October 31, 1953	1,525

A. B. Greninger

A. B. GRENINGER, MANAGER
ENGINEERING DEPARTMENT

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ENGINEERING ADMINISTRATION SUB-SECTION

OCTOBER 1953

On October 28 and 29, negotiations for the price redetermination under Special Agreement G-5 with the National Carbon Company were conducted in New York City. Representatives of General Electric and the Commission were present. The price agreed to by the parties for the delivery of the second increment of graphite under the contract (40% to 70% delivery points) was $0.34442 per pound. This price for acceptable graphite is approximately 8 cents per pound less than the price paid for graphite produced during the first increment under the contract and is about 4 cents a pound less than the price which National Carbon had originally proposed as the second increment price.

The program for distribution of technical publications and information from Schenectady to a Technical, Scientific and Engineering Distribution List was activated during the period. A description of the program procedures was sent to all persons on the distribution list, together with agreed upon procedures for handling reference requests resulting from the program. The first publications from Schenectady distributed were "Library Service" and "TIS Briefs." Gauged by the number of requests for reference material which resulted, recipients are finding the information distributed very useful.

The transfer to the General Engineering Laboratory, Schenectady, of accountability for classified documents charged directly from Hanford to personnel of the Laboratory was completed during the month. These documents were charged out from Hanford prior to the setting up of a classified document Transfer-Accountability Station at the General Engineering Laboratory. A number of previous reports have covered the history of this transaction. The job involved reviewing receipt files and listing all Hanford documents charged to General Engineering personnel; inventorying these documents at the General Engineering Laboratory by personnel of the GEL Transfer-Accountability Station; preparing new receipts transferring accountability for the documents from Hanford to the GEL Transfer-Accountability Station; and charge-out of the documents to GEL personnel from their own Transfer-Accountability Station.

During the month the following major contract activities were handled:

1. Two bids covering the work of processing, editing and finishing motion picture films were received and publicly opened October 27. Telefilm, Incorporated of Hollywood, California was low bidder in the amount of $21,183.80. Palmer Films, Incorporated of San Francisco bid $29,947.50. One late bid was received from Northwest Pictures Film Company of Seattle, Washington and is being held unopened. This bid was mailed from Seattle five hours after the time set in the Bid Invitation for opening of the bids. The Photographic Unit advises that approximately 15,000 feet of exposed motion picture film is now on hand which is in danger of deteriorating before security clearance can be obtained on Telefilm personnel.

SECRET

The Photographic Unit is preparing a letter to AEC recommending that the work of processing and furnishing lighted work prints on 15,000 feet of film be removed from the proposed Telefilm contract and that work negotiated with another studio who has "Q" cleared personnel. This office is withholding recommendation of award pending settlement of this problem.

2. Special Agreement No. G-32 between General Electric and Teaching Film Custodians, Inc. was approved by AEC October 7 and conformed copies have been distributed.

3. Special Agreement No. G-31 between General Electric and Abadan-Spokane covering the quarterly servicing of Ozalid equipment was approved by the Commission October 5 and conformed copies have been distributed.

4. Modification No. 4 to Special Agreement No. G-21 between General Electric and Bird Machine Company covering an extension of time to the Agreement for redesign and modification of a centrifuge was approved by AEC October 1 and conformed copies have been distributed.

5. Modification No. 1 to Special Agreement No. G-13 between Battelle Memorial Institute and General Electric covering an extension of time of the Agreement was approved by the Commission October 6 and conformed copies have been distributed.

6. Modification No. 2 to Special Agreement No. G-22 between General Electric and Future Farmers of America, Inc. covering the transfer of title of certain sheep was approved by the Commission October 28 and conformed copies have been distributed.

7. Modification No. 6 to Special Agreement No. G-5 between General Electric and Union Carbide and Carbon Corporation covering changes in process specifications was approved by the Commission October 20 and conformed copies have been distributed.

8. Modification No. 4 to Special Agreement No. G-12 between General Electric and Union Carbide and Carbon Corporation covering changes in process specifications was approved by the Commission October 20 and conformed copies have been distributed.

9. Rental Agreement No. G-33 between General Electric and The McBee Company covering the rental of a Key Sort machine was approved by the Commission October 19 and conformed copies have been distributed.

10. Modification No. 2 to Subcontract No. G-396 between General Electric and Reed College covering an extension of time of the Agreement was executed by the College October 8 after having received prior approval of the Commission on September 25. Conformed copies have been distributed.

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11. Consultant Agreement No. 117 between General Electric and Joseph P. Dieves covering consultant services in connection with motion picture filming was executed by General Electric on October 6, by the Consultant on October 22 and approved by the Commission on October 28. Conformed copies have been distributed.

12. As of October 31 the cataloguing of all records and indexes has been completed and only minor work relatively to cataloguing, boxing and shipment remain to be performed. It is expected that the File Section will be completely disbanded during November, and the office space and equipment released. Signed copies of all General Electric contracts which were held in the office of the Contract File Group have been boxed for shipment to Schenectady but are being temporarily stored in the Record Center at Richland pending resolution of space requirements in Schenectady.

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HW-29794

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PILE TECHNOLOGY SUB-SECTION

MONTHLY REPORT

OCTOBER, 1953

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VISITORS AND BUSINESS TRIPS

T. F. Fisher visited here September 28 through October 9, 1953, from Knolls Atomic Power Laboratory, Schenectady, New York, for consultations on KAPL-108 irradiation.

J. M. Frame visited here October 5 through 7, 1953, from General Electric Company, Arco, Idaho, for discussions of the effects of radiation on materials.

F. Reines visited here October 27 through 29, 1953, from Los Alamos Scientific Laboratory, Los Alamos, New Mexico, to consider feasibility of K Pile location for continuation of Neutrino studies.

J. C. Ballinger visited Brookhaven National Laboratory, Long Island, New York, October 18 through 24, 1953, to witness Brookhaven reactor experiment, and Brown Instrument Company, Philadelphia, Pennsylvania, October 26 and 27, 1953, for technical conferences.

J. A. Berberet visited Phillips Petroleum Company, Idaho Falls, Idaho, September 30 and October 1, 1953, for consultations regarding MTR slug exposure facility.

A. B. Carson, R. S. Paul, and L. H. McEwen attended the Reactor Information Meeting at Argonne National Laboratory, Lemont, Illinois, October 7 through 9, 1953.

L. H. McEwen visited Oak Ridge National Laboratory, Oak Ridge, Tennessee, October 5 and 6, 1953, to discuss utilization of sweetened uranium at Hanford.

J. F. Music and W. C. Riley visited National Carbon Company, Clarksburg, West Virginia, October 5 through 7, 1953, for technical discussions of G-5 and G-12 production.

G. E. Wade visited Phillips Petroleum Company, Idaho Falls, Idaho, September 30 and October 1, 1953, for consultations regarding MTR slug exposure facility.

ORGANIZATION AND PERSONNEL

Personnel totals are as follows:

	September	October
Administrative	4	4
Pile Engineering	78	81
Pile Materials	60	60
Special Irradiations	24	24
Total	166	169

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Pile Engineering: One Engineering Assistant was hired, one Chemical Engineer transferred in from Separations Technology Sub-Section, one Technical Graduate - Rotational transferred in from Radiological Sciences-Biophysics, and one Technical Graduate was converted to Junior Engineer.

PROCESS TECHNOLOGY

Power Level Limits

Power levels were limited during the month by vapor binding, outlet temperature and graphite limits except at C and D Piles. C Pile operated on a maximum output per tube basis and D Pile operated under production test conditions and was limited by tube outlet water temperatures. B and F Piles were limited by vapor binding or corrosion limits, DR by maximum tube limits for the DR-10 Program, and H by graphite temperature limits, even with 30 per cent helium addition.

Process Changes

The specification covering maximum pile graphite temperature was revised allowing 460 C instead of 410 C from graphite burnout considerations. 430 C is now permitted for the graphite adjacent to uncooled aluminum thimbles if the pressure differential across the thimble is limited to three inches of water.

Slug Rupture Experience for October

Twelve slug ruptures occurred in normal uranium slugs during the month. Two of these occurred in central orifice zone tubes at B Pile, one a four-inch slug failure and the other an eight-inch slug failure. These pieces have not been examined, so that metal groups and types of failure are not known. One cap failure occurred in a Group Eight Metal piece in the central orifice zone at F Pile. Eight slug ruptures occurred in central orifice zone tubes at C Pile, four uranium cleavage failures of Fernald-rolled eight-inch slugs, one uranium cleavage failure of an eight-inch piece whose source is unknow, one failure of a Group Eight Metal piece in a "C" enrichment tube and two failures of eight-inch slugs which were stuck and have not yet been inspected. The Group Eight slug failure was the fifth within approximately one-half month to occur under these conditions. As a consequence, the remaining "C" columns, which had been under irradiation since November and December, 1952, were discharged and new tubes were charged with enrichment columns.

One side failure occurred in a 63-S aluminum jacketed slug in the central orifice zone at H Pile. This failure was accompanied by a process tube leak. Subsequently the remaining charges of 63-S aluminum jacketed pieces were discharged.

The normal uranium slug rupture rate at C Pile is substantially higher than that at any other area for recent operation.

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At C Pile the rupture rate of Fernald-rolled eight-inch metal is several times higher than that of the Group Nine Metal charged during the same period. No comparison can, as yet, be made for these slugs at the other piles because of lack of ruptures and because of the small numbers of equivalent tubes of Fernald Metal that have been irradiated.

(NOTE: The two ruptured pieces which were listed in the September report as Fernald Metal were subsequently discovered to have been from metal rolled at Simonds, although machined at Fernald. The ruptured pieces listed this month as Fernald Metal were from metal both rolled and machined at Fernald.)

Al-U^{235} Alloy Slug Failures: One ruptured "C" piece was discharged from a central orifice zone tube at H Pile. This piece exhibited cracks in a swollen area of the can wall.

Two ruptured "J" pieces were removed from a central orifice zone tube at DR Pile. One of these exhibited cracks in two badly swollen areas of the can wall. The other had a "pin hole" at the cap, from which bubbles were observed intermittently.

Higher Specific Power Operation

Production Test 105-532-A-2, "Irradiation of Enriched Uranium Slugs": Increased specific slug powers were obtained by the irradiation of slugs enriched to 1.75 per cent U^{235}. In September, six tubes of "E" slugs were discharged following ruptures which occurred in two tubes. Separation of this material from the regular metal discharged at the same time was completed during the month, but no inspection has been made.

Production Test 105-532-A-3: A pilot charge of three enriched slugs located so as to exceed the alpha-beta transition temperature at the slug core has been operating successfully since September 3. The output of the highest power piece is calculated to be 70 KW/ft. of uranium. Based on the methods of calculation shown in HW-27146, the core temperature exceeds the transition point. Slug exposure is now about equivalent to that of the central slug in a tube of 400 MWD/T concentration.

Production Test 105-533-A: Fifty tubes are now being operated at from ten to 17 per cent above the 700 kw per tube limit outside the experimental zone. Visual inspection of a process tube and slugs discharged from this zone did not show any deleterious effects from the higher tube powers. Rupture experience to date is given below:

Dates	Limits	EN	Ruptures*
4-1-53 thru 8-4-53	700 kw	154	1
8-4-53 thru 10-3-53	820 kw	86	0
8-4-53 thru 11-1-53	820 kw	100**	0

* Only regular metal considered
** Estimated between 10-3 and 11-1

Operation of D Pile with Maximum Panellit Protection

Production operation with the reduced trip ranges continued to be satisfactory during October under Supplement A to Production Test 105-534-A. Recent results of the monitoring program indicate no undue damage to the slugs or tubes at the increased water velocities and tube powers, but do indicate that the graphite may be expanding along the entire length of the tube at a rate comparable with expansion rates in 1946-1947. A further indication of graphite damage is the apparent necessity of adding more and more helium to maintain constant maximum graphite temperature at constant power level. At the present time, the helium concentration at D Pile is about 40 per cent whereas three months ago about 25 per cent helium was all that was required. In addition, the graphite mining data from two central zone tube channels tend to confirm the deleterious effects of helium addition. These developments are being followed closely and will be rechecked at following shutdowns.

PILE PHYSICS - REACTIVITY AND CONTROL STUDIES

Review of Hanford Control Philosophy

The present basis for specifying control requirements at Hanford is that the vertical safety system itself be capable of shutting down the pile and holding it sub-critical under all conceivable circumstances. The amount of available control in the 29-rod piles is not great enough to permit operation at significantly increased levels (brought about partially by enrichment) within this control philosophy. A critical examination of control philosophy with respect to the conditions actually to be encountered is therefore being made.

Fringe Poisoning

One-group flux calculations have been made to determine the effect on the shield flux load of fringe tube poisoning. These calculations indicate that in reducing the entire shield flux load a factor of two in a pile enriched in the fifth lattice unit from the reflector the pile power level would be reduced approximately ten per cent if no additional enrichment were added. Although the potential loss in level is not unreasonable should this approach become necessary in order to prevent shield damage, experimental verification would be relatively costly in an operating pile. It may be possible to plan flux traverse tests for K Pile start-up which will provide sufficient experimental data prior to the time when such techniques might be required.

K Pile Start-Up Planning

A broad outline of the start-up tests at K Pile has been drawn up and a start-up council consisting of interested technical representatives has been established to scope the start-up activities and to coordinate the technical effort required to obtain significant results.

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The use of steam in the process tubes surrounding the dry critical region and the use of fission heating are approaches currently under consideration for conducting a dry pile temperature coefficient test. The mechanical and corrosion aspects are yet to be investigated.

Scram Transient Studies

Analysis of the seven horizontal safety rods and six vertical safety rods scram transient measurements made in the test pile during September show good reproducibility in the case of preceding rising transients as well as equilibrium conditions prior to scramming. Employment of the exact solution for various time intervals from five seconds to 30 seconds following the scram also yields consistent results.

A production test for establishing the feasibility of this method in the production piles is now in rough draft form.

Exposure Calculations

Various methods of measuring the metal exposure in the production piles and of measuring the reactivity base points in the test pile are being investigated prior to circulating the long-term exposure production test for final approval.

The formulae for predicting the Barium 140 and Lanthanum 140 activities were re-examined in an effort to discover the reason for the rather large discrepancy between the activity predicted by Hanford and the lower activity measured by the customer on the last shipment. No basic errors were found in the formulae. It appears currently that either the fission yield factor is incorrect or the customer has erred in activity measurements.

"Ink" Facility Calibration - Production Test 105-529-A

A danger coefficient type test made just prior to starting up at the DR Pile October 14, indicates a maximum control strength for the ink facility in tube 2488 of approximately 17 in-hours. The effect measured was the difference in control strength of a solid water column and a ten per cent potassium tetraborate solution. The rod configuration and temporary poison column locations were such that the measured control should be as great or greater than would ever be observed under equilibrium conditions with the facility in this location.

SHIELDING STUDIES

Attenuation Measurements

Ionization chamber measurements in both magnetite and oven-dried iron limonite slabs in the DR Test Facility appear to agree with previous measurements which indicate that the gamma relaxation length is inversely proportional to the density of the biological shield material. These results coupled with the thermal neutron measurements, which showed a significant increase due to reduced water content, indicate that the capture gammas produced in the Hanford biological shield are of secondary importance to the gamma activity entering the biological shield from the thermal shield. Fast neutron detectors were removed from these slabs during the month and are now being counted.

Radiation Damage Studies

Compressive strength measurements on heated masonite samples indicate the deterioration rate due to temperature effects is less than would be expected on the basis of first order effects. It is quite possible that the strength of the carbon residue, the end result of masonite burnout, must be considered in evaluating any temperature-dependent deterioration constants. Two groups of samples were tested: one over a range from 50 C to 300 C for 5.9 days and the second over a range from 50 C to 250 C for 21.7 days. Previous temperature exposure data had been obtained from samples exposed to 100 C and 150 C over extended periods of time.

Selected samples from this experiment will be analyzed for hydrogen and carbon composition and for density.

Detection Techniques

Casting of hot sulfur for fast neutron detection foils has proven unsuccessful largely because of the voids which result following cooling. Formation of disks by compression means is being considered.

A manual is being written on beta counting techniques to be used as a guide for counting room personnel on the methods required in order to obtain accurate data from neutron-activated detectors.

HEAT STUDIES

Tube Flow Studies

The initial results of flow tests with enlarged tube fittings were reported in "Process Tube Flow Rates Using Standard and Enlarged Fittings - Status Report No. 1", H. H. Greenfield and W. D. Gilbert, HW-29484, October 1, 1953. As reported previously, these tests indicate that very significant flow increases can be obtained through the use of larger fittings. The results reported deal primarily with the B, D, F, and C Pile fittings. Additional tests have been performed for the DR and H Pile cases. Similar results were obtained, and these latter data are being prepared for issuance in a second report. The conclusions will be, for the most part, similar to those formulated on the use of fitting changes at the older piles.

A mock-up of the K Pile tube inlet fitting assembly has been constructed in the 105-F Hydraulics Laboratory. This equipment will be used to determine the size of double orifices to be used in the fringe zones of K Pile. In addition, the proper location of the Panellit pressure tap between the two orifices to permit detection of flow changes with the required sensitivity is being determined. These tests were requested by the Process Engineering Sub-Section, and it is anticipated that they will be completed in November.

Flow-pressure drop studies on two types of nozzle venturis are currently being conducted in the Hydraulics Laboratory. They are aimed at determining a relatively optimum design for use in H Pile. This work is being performed in conjunction with the Process Analysis Sub-Unit.

The difference in pressure drop across the active zone between a tube charged with eight-inch slugs and one charged with four-inch slugs is being studied. Since there will be twice as many slug junctions for the four-inch slug case, it is anticipated that a greater pressure drop will exist for that case than for the eight-inch case. Preliminary data indicate that the pressure drop across the four-inch slugs is about five per cent greater than that across eight-inch slugs at a constant flow rate and for the C Pile annulus. For a constant header pressure at C Pile, this would imply a difference of about 0.5 gpm between tube flows.

Preparation of the design requirements to provide a hydraulics or flow laboratory in the 189-D Building were continued by the Design Engineering Sub-Section. It is estimated that the design will be completed by December 1. The necessary directive to permit procurement of equipment was received at the end of October and a pump was immediately ordered. It was requested that all critical items be on order by November 15. Delivery time for the pump is expected to be about four months, and it is hoped that all other components can be procured during that time.

A study is being made to determine what Panellit trip settings will be required to permit pile operation at tube outlet temperatures up to 105 C. The present operating philosophy requires that the Panellits be set to trip generally before boiling can commence in the tube, and it may be shown that the permissible outlet temperatures increase as the Panellit trips are set closer and closer to the actual Panellit pressure. However, in practice, it has not been possible to set the Panellit trips closer together than about 40 to 50 psi. Consequently, other avenues of approach must be considered. For example, it may prove necessary to install orifices in the rear headers in order to increase the saturation temperature of the water at that location. Supplementary experiments are being carried out on the full-scale process tube mock-up equipment. Process tube power excursions are also being simulated on the process tube mock-up. These tests are aimed at determining the extent to which the tube power would have to be increased before the upper Panellit trip would operate. Experimental difficulties have been encountered, but some preliminary data were obtained which indicate that relatively large excursions would be required before unstable flow conditions would be reached. If these data can be verified, the probability of the tube burnout due to a power excursion appears to be much less than previously believed.

A document reporting the results of flow studies of the outlet Parker fittings is being prepared. The studies were performed to determine the consequences of subatmosphere boiling within the fitting. It was found that such boiling has little effect on flow.

Mock-up tests are also being conducted to determine more precisely the effect of rear header pressure on tube pressure drop for two phase flow. These tests are being conducted to obtain a better understanding of the boiling range flow phenomena.

The 22 Melatron Pressure Switches which have been monitoring pressures of selected tubes at H Pile for three months were recalibrated. It was found

that the calibrations had shifted about one per cent, and this shift is attributed to creep of the stainless steel bourdon tubes. The shift is not considered serious. Further attention is being given to the contact resistance of the Microswitch portion of the Meletrons. Hook-up difficulties could be encountered unless this attention is given.

"Preliminary Study of the Pile Effluent Piping System", S. S. Jones, HW-29022, October 20, 1953, issued this month, contains a preliminary analysis of the effect of proposed increases in pile water flow on the pile effluent piping. The study indicates that the systems at B and D Piles are being operated at above design capacity and that modifications to these systems are desirable.

Fuel Element Studies

Test equipment to permit thermal stress cycling of slugs at surface temperatures of about 200 C was installed and pressure tested during the month. Other work was concentrated on arranging for procurement of additional test specimens which will probably be tested during the coming month.

Modifications were made to the equipment for measuring bond conductivity and several tests were attempted. However, it was found that the specimens were defective and no reportable results were obtained. Additional samples are being prepared.

The readings on all three thermocouples installed on a slug in tube 1586-F continued to be erratic. Consequently, the slug will be discharged and examined during the next pile outage. The information obtained from the examination should aid in the fabrication of a more rugged speciment which will be inserted into a pile later.

Two eight-inch "Ike" slugs having axial holes for thermocouples were canned. However, examination showed that Al-Si had penentrated through the can wall, and the slugs were sent through the recovery process. After recovery, the uranium appeared to be extremely porous and it is unsuitable for use. Consequently, arrangements are being made to have more slugs drilled. The goal of the work is to install such slugs in C Pile and to measure axial temperatures in the range of 600-700 C.

Moderator and Other Studies

Calculations have been made and a report is being written on lattice temperatures and tube powers as a function of helium concentration at H Pile. Other calculations were made to determine the approximate temperatures in the graphite of a lattice adjacent to a horizontal safety rod thimble. It was found that the presence of a thimble and void in place of a filler block had little effect on graphite temperatures as long as the horizontal safety rods were removed. Separate calculations were made to compute the temperature drop from the thimble to the graphite. It was concluded that the maximum thimble temperature is probably about 15 C above the local graphite temperatures for 1000 MW operation. However, the 15 C figure would be appreciably larger if poor contact existed between the thimble and the graphite.

Final reports are being prepared on two old production tests, Production Test 105-104-P, "Heat Generation in the Graphite", and Production Test 105-168-P, "Replacement of the Pile Helium Atmosphere with Carbon Dioxide", Supplements A through I.

MECHANICAL DEVELOPMENT

Horizontal Rod Studies

Early this month a critical review was made of the various methods under investigation for converting the horizontal control rods and removing the internal thimbles. It was felt that the program had reached the point where one definite course of action could be decided upon, and work initiated on the preparation of the project proposal. Document HW-29673, "Process and Engineering Specifications - Horizontal Control Rod Conversion and Thimble Removal", was issued which outlines in detail the proposed conversion program. In brief, it is recommended that the thimbles be removed, a new rod tip connected directly to the present rack and drive mechanism, and the pile atmosphere sealed at the pile face.

The collapsible sphincter seal to be used on the new rod tip was received during the month, mocked up and tested. After 30,000 cycles the seal was disassembled and examined. No ill effects from the cycling were noted.

A washer type seal also suitable for use with the new rod tip is being fabricated and will be tested on the cycling machine in the 189-D Laboratory. If this seal operates satisfactorily it will permit further simplification in the conversion program.

At the request of the Process Sub-Section an attempt is being made to provide a seal for the present rods that will permit pressurizing the horizontal thimbles. This is admittedly a temporary measure but it is hoped that it will provide operating data at increased graphite temperatures in anticipation of Project Water Power.

Arrangements are being made for the design test of the horizontal rods for the K Piles. The necessary alterations to the full-scale mock-up are being prepared in order that the design test can proceed immediately following the conversion program.

Vertical Rod Studies

The silicone washer seal to be tested under Pile Technology Development Test 105-547-A, was installed on C Pile early this month. The data obtained since installation indicate satisfactory performance. Further data are being recorded.

A report is being prepared discussing the results of the test on an air-accelerated K-type rod. The Ball 3X tie-in switch has been modified and the new switch is currently under test. The initial results are satisfactory.

A molded washer seal for the K Pile vertical rods was received during the month and will be tested in the laboratory to determine leakage and wear rates.

Supplemental Control

A two-tube mock-up was prepared during the month for the BF_3 control system. The pressure regulating equipment is being tested for reliability, and improvements are being made. An automatic scram feature is being adapted to the system.

A test is being performed to determine the problems involved in inserting the heater tubes to be used for the BF_3 system into deflected process tubes. The heater tubes are also being tested to determine their ability to withstand both internal and external pressures at elevated temperatures.

The scope of the study of tamper-proof reactor safety devices has been expanded to include flooding of the reactor core under variously assumed conditions of loss of cooling water.

Process Tube Assembly and Piping

The program to establish allowable tube inlet pressures was continued during the month. Test equipment has been designed, tube samples obtained, and bursting tests performed under various conditions of deflection and internal and external corrosion.

The design and development of equipment to perform pressure testing of irradiated tubes is being continued. Preliminary tests have shown that these tubes can be tested to failure successfully. Modifications are being made to improve the methods used.

Materials Testing Reactor Test Facility

The design of the Materials Testing Reactor Test Facility was presented to the Phillips Petroleum personnel early this month. In general, their comments on the design were favorable. Modifications are being made to the instrumentation in conformity with their suggestions. Fabrication was started on the aluminum "A" pieces, various components have been ordered, and a mock-up of the test facility is being prepared and will be installed in the water tank in the 189-D Laboratory. The formal request to proceed on the test facility is being submitted to the Atomic Energy Commission by Applied Research personnel.

Physical Constants Measurements Reactor

The fabrication of prototype components for the testing reactor was continued during the month. Drawings for the vertical safety disk, disk thimble, holding magnets and magnet hoist, and electrical diagrams for the control panel were submitted to the shop for fabrication. Drawings are being prepared of the components of the Physical Constants Measurements Reactor to be included in the report to be submitted to the Advisory Committee on Reactor Safeguards.

Other Engineering Development Work

The television equipment has been used quite extensively this month on the rear face of B Pile as a supplementary viewing facility during start-up and poison column discharging. Operations personnel were instructed in the use of the equipment and in general, operated it themselves. On one occasion, the television equipment was found to be helpful in the removal of a tube containing a stuck ruptured slug. The location of the rupture was easily identified and the ruptured section of the tube readily obtained as a result of using this equipment. The camera has now been removed from the rear face of B Pile and will be installed on the X-1 level at H Area to observe the removal of a test hole thimble and permit inspection of the thimble for damage while it is being removed.

The rubber samples which were being tested under Production Test 105-505-SI were examined after one month's exposure and were found to have deteriorated completely. All of the samples have been discharged and a supplementary production test will be issued to test other compositions of rubber. The initial results are exactly the reverse of what had been expected according to previously recorded data. A report is being prepared discussing the results obtained.

EXPERIMENTAL PHYSICS

Slug Rupture Detection

The prototype two channel gamma ray spectrometer slug rupture detector continued to operate satisfactorily at H Pile. Three ruptures were detected by the system during the month. A natural uranium rupture in 2881-H was detected via riser sampling, giving a larger signal than the beta system despite a 23-fold sample dilution in the riser samples. A natural uranium rupture in 2174-H was detected by the gamma system at least three hours prior to shutdown; this rupture was not detected by the beta system and resulted in a severe water leak which a gamma system could have prevented. The signal given by the gamma system was not impaired by transients accompanying the return to power following two scrams which preceded the detection of water in the pile. In addition to these natural uranium ruptures, a C slug rupture was detected in 0568-H.

Cleavage Type Rupture Failure Detection

A review of the performance of the C Pile beta system in detecting cleavage type ruptures experienced at that pile has shown the system performance to be inadequate. The recorded signals from the beta system were reviewed after the fact for each of the cleavage type failures. Several of the ruptures were never positively detected by the beta system, and in nearly every case of detection, the rupture had progressed sufficiently to emit copious quantities of fission products. It has been postulated that this type of failure results from internal stresses within the slug and no warning prior to the burst and copious fission product discharge was given. However, in every case a short period of advance warning, ca. several minutes to one hour,

was evident as the radiation level increased slowly as the rupture progressed. The beta systems do not have adequate sensitivity to capitalize upon this low intensity emmission period. It is hoped that in at least a portion of the instances the gamma system would detect the rupture before it advanced to the "burst" stage.

Neutron Distribution in a Hanford Lattice Cell

A program of measurements to determine the physics constants of various lattices through the determination of neutron distributions has progressed as scheduled. The objectives of the present phase are: (1) to develop and demonstrate techniques which will yield meaningful values for lattice conversion ratio, thermal utilization and fast effect, and (2) to determine these physics constants for the present lattices and for any modified configurations developed to permit higher power levels or power recovery.

Measurements of the thermal neutron flux distribution in a moderator and fuel element assembly have utilized fission in U^{235} as the detector. These measurements were repeated using copper as the detector to investigate the contribution from resonance capture in U^{235}. The thermal neutron intensity was found to be about two per cent less at the slug surface than had been previously thought.

The distribution of thermal and total fissions and of plutonium were ascertained in an internally cooled natural uranium slug lattice which was mocked up in the Test Pile. The data may be of qualitative interest in any programs for utilizing hollow fuel elements.

Gamma Ray Absorption Coefficient Measurements

The measurement of the absorption coefficients of materials of ranging atomic number for 6.13 Mev. gamma radiation in good geometry has been completed. The materials studied include carbon, water, aluminum, copper, cadmium, tin, lead, uranium, and sodium-iodide. In the cases of low atomic number materials the experimentally determined coefficients for Compton interactions agree well with theory, i.e. within an estimated experimental error of ±.5 per cent - the absolute error is now being calculated. These are the most accurate measurements made at energies of about 6 Mev. and the good agreement with theory at low atomic number will permit very good pair production cross sections to be determined at higher atomic numbers through determining the difference between the measured total cross section and the calculated Compton cross section.

Distribution of Fast Neutrons in the Hanford Lattice

The distribution of neutrons possessing energies greater than 8 Mev. in a pile reflector was determined in the E Test Facility at F Pile. The threshold reaction Al^{27} (n, α) Na^{24} was successfully employed in this work. The observed distribution is now being compared with theoretical predictions.

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The necessary instrumentation to determine neutron spectra through the measurement of proton recoils in thick emulsions has been requisitioned. The preliminary phases of this work will be conducted in the Test Pile.

Instrument Development

Performance testing of the Log N amplifier which is to be utilized in K Pile as an intermediate power level safety circuit sensitive to the rate of power increase, has been suspended temporarily. It has not yet been possible to devise an external signal which increases exponentially over the entire range and with the short period which is desired.

The process tube ion chambers for the F Pile galvanometer system failed sometime ago. Assistance is being given to Reactor Section in obtaining a suitable replacement. An experimental thermopile is being charged into F Pile to test the quality of thermopile response to pile flux transients; it is believed that time lags in the response will negate its value as a neutron sensitive detector. Concurrently a design for small ionization chambers of process tube dimensions is being developed.

The gas "control rod", i.e. a thimble containing BF_3 of variable pressure, was successfully installed in the Test Pile. This facility yields very accurate control and should appreciably enhance the precision of measurement. The total control strength is 0.7 in-hours or 1.8×10^{-5} in K as the gas pressure is varied through one atmosphere. The precision of setting within the range is expected to be $\pm .001$ in-hours or $\pm 2.6 \times 10^{-8}$ in K.

Measurement of the Neutron Diffusion Length in K Pile Graphite

Plans are being made to determine the quality of the K Pile graphite after the packing is complete and the process tubes are in place. The primary purpose of the measurement is to detect the presence of contamination, should it exist, prior to attempts to effect a pile start-up. Similar measurements were made during the final phases of construction at DR, H, and C Piles.

In this work the graphite quality is determined by measuring the distance thermal neutrons diffuse from an artificial source. This distance, the diffusion length, is then related to the effective graphite absorption cross section. The presence of contaminate is established if the diffusion length measurements do not agree with functional test results from the Test Pile.

Automatic Tube Outlet Water Temperature Recording Facilities

The Flexowriter automatic outlet water temperature recording facilities at B, H, and C Piles operated routinely. Assistance as requested has been given Reactor and Design Section personnel in preparing specifications and detailed design of systems to be installed by the Reactor Section in D, DR, and F Piles.

Test Pile - Routine Tests

Regular metal testing proceeded routinely. Twenty-one lots of billet eggs were run with HDS values ranging from 12 to 15.

Test Pile - Graphite Tests

The over-all quality of National Carbon TS-GBF production has remained high during the month. The density, in particular, has increased substantially while good purity has been maintained. Zoning indices have been modified to provide sufficient "blue" material and at present all materials with a dih $\leq$ 0.98 is graded blue. Occasional heats testing as high as 1.03 have been down graded to complete the blue allocations.

The Speer graphite submitted for testing continues to show a quality quite comparable to that of National Carbon material.

Test Pile - Special Tests

The metal testing stringers have been calibrated for impurities at the surface of the test material. The tests yield impurity coefficients of -0.510 in-hours per cm^2 and -0.521 in-hours per cm^2 for bare and canned slugs respectively.

The cross section of nickel as electroplated from a boron containing solution was measured to determine the extent of boron contamination, if any. The measured cross section was 4.40 $\pm$ 0.15 barns as compared with the accepted literature value of 4.5 $\pm$ 0.2 barns.

Physical Constants Measurements Reactor

The project proposal to provide housing for the Physical Constants Measurements Reactor and the Thermal Test Reactor has been submitted to the A & B Committee for approval. A joint study with Applied Research is progressing in an evaluation of reactor hazards for presentation to the Reactor Safeguard Committee. The design of reactor control components is proceeding.

SPECIAL IRRADIATIONS

The experimental assembly for studying the release of fission gases from an 0.085 gr., 93 per cent U^{235} enriched, six mil. foil (KAPL-108) was discharged from DR Pile on October 12. Calculations show the amount of free fission gases collected represent a high percentage of the total amount. Post irradiation gas release is now being investigated.

Germanium crystals bombarded with fission fragments (KAPL-115) continue to exhibit similar electrical characteristics. A new experiment (KAPL-118) is being prepared for charging to continue these studies. This experiment will be included with a new assembly for studying the creep rate of nickel pins (KAPL-105).

Due to the failure of the flowmeter, the high pressure - high temperature recirculation loop (KAPL-120) was returned to process water October 8. Extended repairs will be made before recirculation operation is resumed. Test sections for WAPD in the loop will not be discharged until the scheduled date.

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Continued operation of the experimental assembly of control rod and shield cans for STR (KAPL-111) has been maintained. Preparations for discharge in November are essentially complete.

The stressing mechanism in the assembly for studying the creep rate of zirconium (WAPD-111) has been observed to fail at operating temperatures during out-of-pile tests. In view of this difficulty, work on this experiment has been temporarily discontinued.

A third thermocouple assembly is being designed to further evaluate the performance of thermocouples at temperatures up to 600 C and at different radiation intensities. Using the melting point of an aluminum-magnesium eutectic, thermocouples of varying material and wire size will be calibrated in pile at 451 C.

Studies pertaining to the temperature distributions in a magazine facility have been completed at DR Pile. Magazine facilities for test holes in B, D, and H Piles are being fabricated and tested. Additional facilities for C Pile are being designed.

Pre-post irradiations in support of isotope production and general radiation damage studies for off-site customers continue. Extended assistance has been given to irradiations pertaining to plant assistance programs, particularly those of Graphite and Metallurgy groups.

GRAPHITE STUDIES

Stored Energy

Based upon all available stored energy data, a re-evaluation has been made of the process specifications which designate methods of power increases which are safe from uncontrolled stored energy release. The basis for a new and relaxed specification has been determined and is being circulated in rough draft form.

Speer Graphite

Upon request of the Atomic Energy Commission, graphite made by the Speer Carbon Company is being evaluated for possible use in the K Piles. Samples, which have been designated as representative of future production, have been charged into Hanford test holes and the Materials Testing Reactor at Arco. Because of the limited time which remains before possible utilization in KE Piles, it will be possible to evaluate the Speer graphite only for the bottom or top reflector or for use as green zone filler material.

K Pile TS-GBF Graphite

As reported earlier, uncracked graphite is being scheduled for tube blocks in the upper regions of KW. It is now expected that the upper 60 per cent of the tube blocks in the KW Pile will be crack free. This should provide a satisfactory pile structure.

New Pile Atmosphere

A program is under way to find a pile atmosphere more satisfactory for high power levels than is CO_2, helium, or mixtures of the two. Experimental work is under way which will determine whether a relatively high percentage of carbon monoxide in the pile atmosphere will materially reduce the burnout rate at high temperatures. It is known that carbon monoxide will decompose in the presence of irradiation to form solid carbon suboxides. Tests are being initiated to determine expected rates of deposition and to examine operational difficulties that might result.

Studies are being completed which will determine whether nitrogen is suitable as an alternate pile atmosphere.

Various other possibilities are being considered.

Enrichment

Experiments are in the planning stage which will determine whether enrichment is effective for the annealing of graphite damage.

Pile Monitoring

Data obtained from D Pile on October 19, confirmed the expansion trends that have been previously noted. Operation of D Pile under conditions of 40 per cent helium and maximum graphite temperatures of 410 C have been definitely shown to result in increased rates of pile distortion. Mining and tube traverses made on the shutdown of October 19, indicate that expansion is occurring in the central as well as the fringe zones. Rates of expansion in the vertical height traverses as high as 0.1 inches per month have been observed. While these rates of distortion are disturbing, the magnitude of the expansion has not changed appreciably. D Pile will continue to run under conditions of Phase I of Production Test 105-534-A, Supplement A, until the next shutdown at which time a new production test is planned. This production test proposed to operate D Pile at a maximum of 40 per cent helium and a maximum horizontal rod thimble temperature of 470 C with a pile gas pressure equivalent to two inches of water or less. Under these conditions, it is expected that graphite temperatures will be 450 C or higher. Under these conditions, it is expected that physical expansion will cease or anneal and that the presently observed decreased lattice conductivity will likewise anneal. If the above conditions fail to arrest the graphite damage trends sufficiently, then D Pile will be returned to process specifications.

Graphite Burnout

Burnout data recently obtained on in-pile experiments have indicated that the rate of burnout under present pile conditions may be less than that obtained by previous conservative extrapolations. Since pile gas composition, temperature, and power level conditions vary for each pile, a production test has been prepared and is currently being circulated for approval which will authorize routine monitoring of burnout at each pile. Data to be obtained from this production test in conjunction with laboratory information now being obtained will provide additional information necessary for the evaluation of the present maximum graphite temperature limit.

WATER PLANT DEVELOPMENT

Flow Laboratory Studies

The in-pile test of "floating" pH water was discharged and the slugs are now being examined for corrosion information. The caustic pH adjustment test continued to operate. Radiochemical analyses showed that effluent manganese activity is reduced approximately one-half by the elimination of lime; addition of caustic causes an increase in sodium activity in proportion to the amount added.

A flow laboratory mock-up tube is being operated at 120 C. This temperature will be used to compare in-pile and mock-up tests of process water, low pH water, and raw water.

Further information was obtained on raw water corrosivity and filming properties. Coupon and mock-up tests showed that aluminum corrosion rates in raw water with pH 7.5 and 5 ppm dichromate are about the same as in normal process water. Standard purging methods were found to remove film very readily.

The K model downcomer was tested for a short period with a flow rate of 350 GPM and a water temperature of 80 C. Tests at higher water temperatures are now under way to determine if cavitation phenomena will affect the downcomer performance. Stability tests of the K rear face thermometers under high flow rates continued.

Detailed design of the 100-K Flow Laboratory continued; about 60 per cent of the drawings have been issued and comments have been made.

Water Quality Evaluation Tests

The plant test at 100-F in which lime is eliminated from one side of the water plant and pile operated satisfactorily. Higher alum dosages were required on the lime-free side in the early phases of the test. At month's end, alum feed rates were approximately equal on the two sides; minimum pH on the lime-free side was about 7.4.

period, the filter will be replaced with porous silica block (Filtros, E Grade) identical to those in other cells.

A process change authorizing loading of a maximum of 400 grams of plutonium in sample cans for off-site shipment and loading of estimated amounts of plutonium for temporary storage is being issued (HW-29691, Authorization for a Process Change - 231-Z Building - Loading, Identification, and Storage of Sample Cans Containing 400 Grams of Plutonium as Liquid Plutonium Nitrate Solution).

Dry Chemistry (Task II)

Based on fluoride color 25.1 per cent of all runs required refluorination. This is comparable to 20.8 and 18.6 per cent in September and August, respectively. All runs this month were processed using the "fast cycle". Testing of the gas preheater was continued with excellent results. Out of a total of 50 runs, included in the above figures, only four per cent required refluorination. It is now planned to equip all Task II furnaces with gas preheaters.

Reduction (Task III)

The average reduction yield for this period was 95.3 per cent as compared with 94.1 per cent and 96.9 per cent for August and September, respectively. Six out of 151 runs had low reduction yields (ca. 63 per cent) because of powder hold-up in the equipment leading to the mixer. Since the quantity of chemicals to be added and the calculation of reduction yield are based upon the weight of fluorides leaving Task II, such a hold-up of powder can introduce a significant error. The exclusion of the six low yield runs gives an average reduction yield of 96.8 per cent for the report period.

This month's production includes double-batch reductions made in accordance with Production Test 235-10, "Evaluation of Large Batch Reductions of Plutonium Tetrafluoride". The average reduction yields of these did not differ significantly from those of normal reductions and were included in the reported value.

Because of iodine in the powders which were held-up, corrosion products from the stainless steel equipment, namely iron, chromium, and nickel, appeared in the process material and caused rejection of one machined piece because of high impurity content. Two other pieces contained impurities approaching the maximum allowable. Plastic equipment has been used to replace the stainless steel here as a corrective measure against further occurrence of this problem.

H Pile is currently operating under Production Test 105-529-E although the 95 C outlet water temperature limit has not been reached. Graphite limits have been relaxed under Production Test 105-530-A to aid in reaching a 95 C outlet water temperature, but it is anticipated that thimble temperature will become limiting before the 95 C water temperature is obtained. When the thimble temperature limit is more definitely established, corrosion data under Production Test 105-529-E will be obtained.

Tube Examination

The equivalent of eight process tubes were examined during October. For the first time corrosion product barnacles were found in the rear section of the tubes. Barnacles were noted in tube 0961-H which had operated with dichromate-free recirculating steam condensate at temperatures between 50 and 60 C for six months. Barnacles were also noted in tube 1468-DR which had operated as a poison tube (cold water) continuously since August, 1951, except for the period between July and August, 1953, when it was in normal productive service. These data are not inconsistent with flow laboratory experience where barnacles have been found in low velocity dichromate-free water at temperatures up to 65 C.

Examination of tubes from D, DR, F, and H revealed the usual amount of 72-S removal and slug junction pitting. A minimum wall thickness of 39 mils was observed in tube 1178-D. The outside of 3282-F was so severely corroded that the corrosion product had visibly depressed the tube wall. Metallographic examination of the rupture area on tube 2483-H (63-S slug in standard alclad 2-S tube) showed no evidence of melting or annealing in the vicinity of the hole. Several varieties of ink were tested in the 305 Pile and are being exposed in F Pile to determine their suitability for labeling tubes before they are inserted into the units.

Laboratory Corrosion Studies

The high temperature apparatus to determine corrosion rates and film forming properties of 2-S aluminum under heat transfer conditions was discharged after 32 days operation with an outlet water temperature of 138 C. A calcium carbonate scale up to 6 mils thick had formed on the heated tube at calculated surface temperatures of 125 to 130 C and above. Corrosion of the tube was severe, with the maximum corrosion rate being 1.1 mg/cm^2/day. Metal areas which were completely covered by the scale were not pitted.

The tungsten rods for contacts on the electrically heated apparatus were received and this apparatus should be ready to start operation during November. Calibration and shakedown tests are now in progress on the small tube apparatus to obtain corrosion data up to 180 C.

Various etchants were tested for their effect on the quality of the autoclave coat produced after etching. "Diversey-514" appears to give results as good as nitric-hydrofluoric acid mixtures and would be more acceptable in a production operation.

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Further work on the use of low dichromate concentrations is being done to determine the effect of 0.1 ppm dichromate on erosion-corrosion of aluminum. Impingement tests and electrolytic measurements are being used to evaluate this effect.

INVENTIONS

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

R. B. Richards

R. B. Richards, Manager
Pile Technology Sub-Section

RBR:mvt

[redacted]

SEPARATIONS TECHNOLOGY SUB-SECTION

MONTHLY REPORT

OCTOBER, 1953

VISITORS AND TRIPS

C. T. Runyon visited here from National Lead Company, Fernald Plant, Cincinnati, Ohio, on large pulse column.

J. S. Breitenstein visited here from National Lead Company, Fernald Plant, Cincinnati, Ohio, October 5 and 6, on process consultations.

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J. C. Barton and B. H. Thompson visited here from Oak Ridge National Laboratory, Oak Ridge, Tennessee, on specification analyses.

T. E. Hicks visited here from California Research and Development, Livermore, California, on consultation on Separations Technology.

R. B. Lemon visited here from Phillips Petroleum, Arco, Idaho, October 8 and 9, to discuss separations processes.

H. K. Jackson, R. H. Rainey, F. M. Browder, and W. H. Lewis visited here from Oak Ridge National Laboratory, Oak Ridge, Tennessee, October 19 through 23, to discuss waste recovery processes and shipment of classified material to Oak Ridge National Laboratory and purex processes.

R. J. Anicetti visited Oak Ridge National Laboratory, Oak Ridge, Tennessee, October 28 and 29, to attend a ceramic information meeting.

W. S. Figg visited New Brunswick Laboratory, New Brunswick, New Jersey, October 1 and 2, to discuss continuous fluorination methods.

ORGANIZATION AND PERSONNEL

Personnel totals are as follow:

	September	October
Administrative	2	2
Chemical Development	90	87
Plant Processes	53	53
P-10 Process Studies	10	6
Analytical Laboratories	39	39
Total	194	187

Chemical Development: One Technical Graduate - Rotational was transferred in from Medical - Public Health, one Technical Graduate - Rotational was transferred in from Manufacturing - Radiation Monitoring Unit, one Technical Graduate - Rotational was transferred to Technical Personnel, one Technical Graduate - Rotational was transferred to Radiological Sciences, Records and Standards, one Technical Graduate - Rotational was transferred to Manufacturing - Reactor Operations, one Technical Graduate - Rotational was transferred to Manufacturing - Metal Preparation, Process, and one Chemical Engineer was transferred to Design Section - Separations Design and Development Unit.

Plant Processes: One Stenographer was promoted to Secretary "C".

P-10 Plant Processes: One Engineer was transferred to Pile Technology, one Engineer was transferred to Fuel Technology, one Junior Engineer was transferred to Design Section - Inspection, Drafting and Estimating Sub-Section and one Stenographer was terminated.

PUREX DEVELOPMENT

Purex Plant Design Liaison

Revised specifications for Purex "A", "C", and "O"-type, and IBX Columns were issued to the Purex Project Unit. The new specifications provide for incorporation of louver-plate redistributors in the cartridge design for the "A"-type and IBX Columns and minor modifications to certain feed distributors. Over-all column heights and diameters remain as previously specified.

Recommendations were transmitted to the Design Section providing for a cadmium-lead shield surrounding the PR solution containers (plutonium product). This recommendation was made to prevent nuclear interaction between vessels in the event that an excessive number of loaded containers in jackets were stored together in an accidental configuration potentially nuclearly unsafe in the absence of this additional safeguard.

The radiation effects on the life of fluorothene sieve plates used in Purex "C"-type Columns have been reviewed. Based on physical observations of laboratory-scale mixer-settler units constructed of fluorothene and exposed to dissolver solution with no apparent damage, the life of the HC Column sieve plate material is conservatively estimated to be five to ten years. This confirms earlier estimates (Document HW-28312).

Chemical Engineering Development

Prototype Pulse Column Tests - Twenty-two Purex process test runs with "cold" uranium in a full-scale (24-inch diameter) prototype HA Column and associated HC Column were carried out during the month. The HA Column was equipped with 15 per cent free-area louver-plate redistributors as described last month. These runs included two in which the HA Column was operated under IB Extraction Column conditions and one run in which the HC Column was operated under IO Column conditions, as well as 19 runs in which the two columns were operated as a uranium cycle extraction-and-stripping column battery (variously HA-HC, IA-IC, and 2D-2E). In addition to the tests carried out in the "A"-type and "C"-type Columns, the testing of a full-scale prototype of the 2A Column was initiated. This initial series of 2A Column tests included 12 experimental runs. Stream compositions and flow ratios approximating those of Purex Chemical Flowsheet HW #2 were employed, with uranium used as a stand-in for plutonium in the 2A Column studies. The highlights of the new findings are as follows:

1. The stability of the HA Column equipped with 15 per cent free-area louver plates (as described in last month's report, Document HW-29534) upon prolonged operation was demonstrated in an 83-hour continuous run at uranium processing rates in the neighborhood of ten tons/day (ranging from 9 to 13 tons/day). There were no visual or other evidences of instability during the 83-hour operating period. At solvent-to-uranium ratios of approximately 105 per cent of the HW #2 Flowsheet values or greater, uranium losses from the column (having a 13.5-ft.-high extraction section) ranged from 0.001 to 0.02 per cent.

2. The HA Column equipped with the 15 per cent free-area louver plates performed satisfactorily at a uranium processing rate as high as 20 tons/day, the uranium loss at this rate (at 0.92-inch amplitude, 60 cycles/minute) amounting to only 0.001 per cent.

3. In dual-scrub 2D Column tests iron carry-over into the product (2DU) stream was negligible (less than 10 parts/10^6 parts U) when the ferrous reducing agent was introduced with the intermediate scrub stream, as well as when introduced with the feed (2DF) stream.

4. Highly satisfactory performance was obtained in a series of 27-inch diameter "C"-type Column tests employing a fluorothene sieve-plate cartridge of the type specified for the Purex Plant (3/16 inch holes, 23 per cent free area, 4 inch plate spacing). Uranium losses from the 17.8-foot-high plate section ranged from 0.003 to 0.02 per cent at superficial uranium processing rates equivalent to 4 to 20 tons U/day in a plant-size (34-inch diameter) "C"-type Column.

5. In an 8-inch diameter prototype of the 2A Column packed with 1-inch fluorothene Raschig rings and operated with the interface at the bottom, waste losses ranging from 0.003 per cent to 0.03 per cent were obtained at superficial flow rates equivalent to 3 to 10 tons U/day based on a plant-size (7-inch diameter) 2A Column. At 10 tons U/day a 0.003 per cent loss was obtained with the column not pulsed; at 3 tons/day, a pulse amplitude of 1 inch and the frequency of 80 cycles/minute were employed when a 0.03 per cent loss was determined.

6. A 24-inch diameter IB Extraction Column with 15 per cent free-area louver plates located 14, 40, 80, and 120 inches below the top of the 13.5-foot-high plate section operated stably at 14 tons U/day at a frequency of 40 cycles/minute at a 0.92-inch amplitude when the organic-phase uranium concentration was approximately 90 per cent of the HW #2 Flowsheet value, but not when it was about 105 per cent of the flowsheet value. The superficial processing rate used in the 24-inch diameter column corresponds to 18 tons U/day in a plant-size (27-inch diameter) IB Extraction Column.

7. A IO Column with a 27-inch diameter 17.8-foot-high fluorothene sieve-plate section (with 3/16-inch perforations, 23 per cent free area, 4-inch plate spacing) operated stably at a superficial rate corresponding to a 19-ton U/day processing rate based on a plant-size (34-inch diameter) IO Column. A pulse amplitude of 0.5 inch, a frequency of 60 cycles/minute, and an aqueous-to-organic flow ratio of about 1:3 were employed.

Process Studies

Studies are being made to determine the modifications required in the Purex Plant to permit operation at twice the 8.33 tons U/day design processing rate. Results of these studies are to be presented in Report HW-29792, "Processing Capacity of the Purex Plant". Among the conclusions reached in this survey are the following:

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1. Inaccessible plant piping, i.e. piping buried in concrete, and trench piping have been designed for processing rates at least 2.2 times the nominal design rate. A few minor changes may be required in "cold" piping and canyon jumpers (e.g., orifices in utility lines; HCP, ICU, 2EU jumpers; HCX, ICX, and 2EX supply lines) to attain the 16.7 ton/day processing rate.

2. Although short runs have been made in the 321 Building Purex prototype columns at plant processing rates equivalent to as high as 18 tons/day, satisfactory solvent-extraction column operation at twice normal plant design rates is not assured. Actual plant operation with radioactive feed solutions and plant solvent will be required to define the maximum processing capacities of the columns. For those columns which in the light of pilot-plant findings to date are likely to be limiting at processing rates of less than 16 to 18 tons/day (viz., the IB Scrub and 2A Columns) additional development studies are still in progress.

3. By operating the three Purex dissolvers simultaneously, the required 16.7-ton/day dissolution rates may be easily attained. However, problems are expected to be encountered in the dissolver charging operations. At the high processing rates the canyon crane will be required 15 hours or more every day for charging operations, leaving 9 hours or less for other plant operations requiring the crane.

4. As presently designed, the Acid Fractionator may prove limiting at processing rates below 16.7 tons U/day. Modifications are being considered (reference: letter from H. G. Johnson to W. B. Webster "Purex Facility - Project CA-513-A, Fractionator Design") which, if incorporated, would increase the fractionator processing rate to at least 16.7 tons/day.

5. Plant "hot" pumps, rotameters, and tankage should prove adequate for 16.7-ton/day processing rates.

Mechanical Development

A Peerless 4 LA (P-5A) deepwell turbine pump with a 5-foot drive shaft has operated for 1450 hours pumping 6 M nitric acid at a rate of 45 gallons/minute against a head of 7.5 feet. The shaft of this pump is guided by 5 pile graphite bearings (Gulf Cleaves Coke - CSGBF graphite, recommended Purex-plant bearing material). Inspection after 860 hours operation revealed only slight wear on the bearings and journals. Combined bearing and journal wear ranged from 0.002 to 0.004 inch.

A Johnston 6 AC, 5-stage, deepwell turbine pump, Uranium Recovery Plant pump P-19-7, has operated on life test for 86 hours pumping 2 M nitric acid and 180 hours pumping 60 per cent nitric acid at approximately 70 gallons/minute against a 10-foot discharge head. This pump is equipped with pile graphite bearings (Gulf Cleaves Coke - CSGBF graphite, recommended Purex-plant bearing material).

The Johnston 7BS, 8-stage, deepwell turbine pump with a 17-foot - 5-inch shaft guided by 11 Pyrex No. 7740 glass bearings was dismantled for inspection after operating smoothly for 1990 hours. No unusual behavior had been noted prior to shutdown and the shut-off head remained at 193 feet throughout the life test. The foot bearing was found to be cracked and a piece of welding slag was lodged between this bearing and the shaft. The lower five bowl bearings were in good condition and were worn very slightly (maximum wear was 0.0007 inch). The top three bowl bearings were fragmented. Failure of the bearings was attributed to loosening of the two-piece threaded shaft during operation and by the presence of weld slag.

Bearing Development - Gold bearings fabricated from three different alloys, 75 per cent gold-25 per cent silver, 75 per cent gold-25 per cent copper, and 75 per cent gold-15 per cent silver-10 per cent copper, have been tested on the bearing test machines against Stellite No. 1 journals. With the Stellite journals there was no tendency for the bearings to bind as was observed when running the bearings against stainless-steel journals. Each of the bearings was subjected to a start-stop test, consisting of five starts and stops with only residual lubricant on the bearing, followed by an extended period of dry running. None of the bearings or journals were worn or scored after this test; only a slight polishing of the gold bearings and the journals was observed.

Pile Graphite (CSGBF) has been immersed in HAX (30 per cent TBP in Shell Deodorized Spray Base) for 35 days. A weight gain of about 10 per cent has been observed, but there has been no significant change in dimension nor any indication of chemical attack on the pile graphite.

Instrumentation - Purge-type column interface control instrumentation has not satisfactorily controlled the interfaces of the Purex HA and HC prototype pulse columns. Tests have shown that the interface indication is sensitive to the pulse frequency. At frequencies from 40 to 70 cycles/minute the interface chart indication depresses to indicate that the interface has fallen below the dip tubes whereas the interface position actually remained unchanged. This phenomenon is being investigated in the prototype HA and HC Columns and in a 3-inch diameter column. To date, studies designed to define and correct the erratic interface control have included: 1) the geometry of the dip tubes, 2) the location of the dip tubes in the column, 3) the length and capacity of the air transmission lines, 4) the characteristics of the pressure transmitters, and 5) the effect of dampening the pressure wave in both the liquid and air system.

By venting the prototype HA Column directly to the atmosphere with no direct connection to the HC Column, and by locating the dip tubes in the top disengagement section at a point farthest removed from the bore of the column, no serious deviation of interface indication was obtained over a frequency range of 30 to 90 cycles/minute. The problem of erratic interface control at the bottom of a column using air purge instruments is still being investigated.

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Capacitance-type instruments, using capacitance probes at the interface, have performed satisfactorily in preliminary tests in the Purex prototype HC Column (bottom interface position). These tests have employed both a Fielden Tolstop indicator and recorder, and a capacitance bridge developed at Hanford Atomic Products Operation by the Instrument Development group of the Design Section. Reproducibility of readings for the Fielden system was within ± 2 per cent and for the Instrument Development system was within ± 4 per cent. Over an 180 hour period, while monitoring a stagnant interface, the chart indication of the Fielden system did not vary by more than 1 per cent of chart and the Instrument Development system chart reading varied by ± 5 per cent of chart. Tests are continuing on these instruments under conditions of pulsing interface and using process solutions.

Materials Testing

Kel-F Sheet (U.S. Gasket Co. Raschig ring material) was statically immersed at room temperature in 10, 20, 40, and 60 per cent nitric acid, 50 per cent NaOH, CCl_4 plus 30 per cent TBP, Shell Deodorized Spray Base plus 30 per cent TBP, and hexone. After 82 days the samples of Kel-F showed no visible surface attack or significant dimensional change.

REDOX DEVELOPMENT

Process Studies

A third-plutonium-cycle flowsheet has been developed which appears capable of producing 3BP solution with a HNO_3-to-plutonium ratio considerably lower than that presently obtained. The 3BP obtained with the "low-acid" flowsheet would, after batch concentration, be acceptable for processing in the Task I facilities of the 234-5 Building without HNO_3 removal during the concentration step.

Laboratory tests employing the "low-acid" flowsheet are currently being made by Process Chemistry.

Process Chemistry

Effects of Head-End MnO_2 Dissolution by Oxalic Acid - The conclusion that chromic nitrate could be successfully replaced by oxalic acid for use in head-end treatment has been confirmed by two-cycle continuous solvent-extraction runs in a Mini (miniature mixer-settler). Decontamination was unchanged by the substitution. Engineering considerations have not been applied to this process modification, hence implications upon plant operation are not completely established.

Entrainment and Radioactivity in U Cycle Organic Streams - Examination of Redox Plant samples has given further information about entrainment of aqueous phase and solids in uranium-cycle organic streams. From the new information it appears that the trouble stems largely from the IB Column and is transmitted to the 2D Column in the form of either a semi-stable emulsion or the emulsifying agents themselves entrained in the IBU.

An intensive study of the IB system is currently under way in the laboratory. Redox Plant operation has temporarily reverted to the use of ferrous ammonium sulfate in IBX in place of ferrous sulfamate.

URANIUM RECOVERY DEVELOPMENT

Process Chemistry

Feed Pretreatment - Various feed pretreatment tests, primarily designed to adjust the valence of ruthenium to a less extractable state, were made during the month. Of the treatments tried, only contact with urea at an elevated temperature gave promising results. This will be investigated further. It is of interest to note that no appreciable ruthenium volatilization occurred when TBP-process feed was subjected to a Redox-type head-end treatment.

Solvent Extraction: ANN Flowsheet - Additional runs have been made in a Mini mixer-settler to study the use of aluminum nitrate in RAS. The D.F. with "neutral" 1 M ANN in the scrub approximately equaled that obtained with 2 M HNO_3.

Mechanical Development

Continuous Calcination

The pilot-model screw calciner has been modified to incorporate adjustable paddle agitation and bellows-mounted labyrinth seals to protect the bearings from overheating. To date, five runs have been made that show that the screw will calcine 60 per cent UNH with a powder-to-UNH ratio of ten to one.

HOT SEMIWORKS

The current series of Redox runs was completed during the month, the last run being HR-12, and decontamination of the equipment is in progress prior to conversion of the Hot Semiworks to the Purex process. Construction work for this conversion is scheduled to start about December 1, 1953, with cell work to start about January 4, 1954.

Run HR-12 indicated the process feasibility of using concentrated second-cycle wastes as scrub solution for the IA Column when operating on a dual-scrub flowsheet. Run 12A used concentrated second-cycle salt wastes from Run HR-11 as the salting agent for the IA Column (as originally used in HR-11 this material was chemically pure crystalline aluminum nitrate), while Run 12B used new acid-deficient aluminum nitrate as received from the General Chemical Company. Uranium and plutonium losses to the IAW were good in both portions of the run (0.2 per cent or less), and first-cycle decontamination factors for both uranium (log DF = 4.1) and plutonium (log DF = 3.3) were virtually identical for the two portions. While this uranium decontamination factor is virtually identical with that obtained in Run HR-11, the plutonium decontamination factor is poorer than that obtained in HR-11 by a factor of about four. It cannot be established with

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certainty whether this effect is the result of back-cycling second-cycle wastes, with new General Chemical aluminum nitrate being comparable with the back-cycled (originally crystalline) salting agent, or whether this effect is the result of updraft, rather than downdraft, dissolving, or possibly a combination of these variables.

A review of all of the data obtained in Hot Semiworks Runs HR-5 through 12 has resulted in the following new conclusions:

1. Within the limits of analytical error, no difference in decontamination efficiency was found between the O.R.N.L. June, 1949, and the dual-scrub flowsheets.

2. Uranium solutions prepared by downdraft dissolving are decontaminated by Redox solvent extraction at least as well as, and perhaps slightly better than, those prepared by updraft dissolving.

3. The plutonium loss to the IAW appears to be very sensitive to the organic/aqueous flow ratio in the dual-scrub flowsheet.

Conversion to Purex

Design for the conversion of the Hot Semiworks to Purex is 75 per cent complete.

URANIUM RECOVERY PROCESS TECHNOLOGY

Summary

Tank farm uranium recovery operations were carried out in four farms with about 29 per cent over-all down-time due to equipment failure. Waste metal uranium aged 4.3 to 7.7 years provided approximately 87 per cent of the solvent extraction feed, the balance being largely 224-U and Redox rework. Essentially TBP HW #4 Flowsheet solvent extraction conditions were employed, using 20 volume per cent TBP - hydrocarbon diluent extractant, and dual-scrub RA Columns. The average processing rate was 120 per cent of the nominal design capacity. For the latter half of the report period, the A-line RA Column feed (RAF) was maintained at 60 C to test the effect of elevated column temperature on extraction performance. A plant-scale test was carried out to determine the effectiveness of nickel ferrocyanide precipitate in scavenging Cs^{137} and Sr^{90} from plant "hot" waste. UNH concentration and calcination was routinely carried out, processing both waste metal and Redox uranium at 130 per cent of the design capacity. An over-all uranium recovery waste loss of 2.0 per cent (waste metal basis) was sustained.

TANK FARM ACTIVITIES

Metal Removal

Approximately 4700 gallons of stored metal waste per ton of uranium processed were removed by supernatant or water sluicing, and direct transfer

of supernatant. Water sluicing increased the volume of feed by approximately 3300 gallons per ton of uranium. Minimum age since pile discharge of metal processed was 4.3 years (10 per cent of total). Average operating efficiency for all tank farms was 71.5 per cent. Clean-out of tank 102-B was completed and clean-out of tanks 102, 103-T is essentially complete. Final clean-out of 101-B is currently in progress.

Feed Preparation

Routine acidification of the above feeds required about 12,550 pounds of 100 per cent nitric acid per ton of uranium. An average boil-off of 54 volume per cent in the 221-U concentrators gave an average concentrated feed composition as follows:

	Components (a)					
	U	SO_4	PO_4	HNO_3 (b)	Na	$K^{1/2}(NO_3)^{-}$ (c)
Average: Feed	0.256 (d)	0.199	0.244	2.7	3.43	3.8 to 6.0
TBP HW #4	0.27	0.26	0.26	2.7	4.06	5.5

(a) Balance of anion is NO_3^-.
(b) Titratable, includes two H^+ ions each from $SO_4^{=}$ and $PO_4^{\equiv}$.
(c) Not an average. Range is given to indicate variation.
(d) Includes rework U (13 per cent of total) from RCU, and 60 per cent UNH.

Waste Handling

Approximately 5030 gallons of neutralized waste per ton of waste metal processed (including 506,000 gallons unconcentrated from the nickel ferrocyanide scavenging test) was returned to underground storage to give approximately 115 per cent of the volume removed. Uranium content was about 1.9 per cent of the waste metal processed. The pH was routinely controlled at 8 to 9 with an average of 9.3.

The cribbed (low activity) waste volume was about 18,100 gallons per ton of waste metal processed, and uranium content amounted to 0.1 per cent loss.

Waste Scavenging Test

A plant-scale test (HW-29383) to determine the effectiveness of nickel ferrocyanide precipitate in scavenging Cs^{137} and Sr^{90} from TBP Plant "hot" waste to produce a cribbable supernatant liquid was carried out October 11 to October 18. Batchwise chemical additions to form the precipitate in the alkaline dilute waste were made in the 221-U Building. A total of 506,000 gallons were treated and transferred to underground storage tank 101-T without concentration. Approximately the first 250,000 gallons contained excess caustic, with a pH of 11.5, whereas pH ca. 10 is maximum for optimum scavenging. Decontamination factors on grab samples (pH 12.5) were 2 or less for cesium and 200 for strontium, whereas 1000 and 100 were desired.

To reduce the alkalinity of the entire test volume, the balance was neutralized to pH 5.6 to 10. Decontamination factors for grab sample at pH 10 were 3400 to 10,000 for cesium and 37 to 47 for strontium.

Five days after transfers to Tank 101-T were completed, 3 samples taken at levels of 3 feet, 8 feet, and 13 feet, below the liquid surface gave pH values of 9.74, 9.73, and 11.95, respectively.

SOLVENT EXTRACTION

Operating Conditions

The uranium processed by the solvent extraction batteries was 120 per cent of the nominal design input. Of the total uranium processed, 11 per cent was Redox rework, 1 per cent RCU rework and 0.5 per cent rework from 224-U Building. The over-all solvent extraction waste loss was 1.9 per cent of the new feed uranium.

Essentially HW #4 TBP Flowsheet conditions were employed using 20 volume per cent TBP in hydrocarbon diluent as the organic phase. Deviations from this flowsheet included:

1. Dual-scrub RA Columns;

2. An RC Column L/V from 0.8 to 1.0, considerably lower than the flowsheet value of 1.28;

3. "A" Line RAF at 60 C during the last two weeks of the period;

4. An RCX nitric acid specification reduced from 0.01 to 0.002 M during the last week of the report period to prevent over-addition of acid in the RCX which would result in high-acid RCU; and

5. ROW flows at 75 per cent of the flowsheet value.

General Performance

The operation during the report period included relatively few column upsets or changes and used old, low-activity feed with low sulfate and phosphate but high nitric acid and sodium nitrate concentrations. The waste losses were generally low and decontamination good. Both lines operated at about 50 per cent of RA extraction section "pinching L/V" on feed with an average $K^{1/2}(NO_3)$ of 4.8 M. Blending of concentrated rework uranium with waste metal feed otherwise low in uranium was effective in reducing the RAW loss by as much as 50 per cent of the probable value.

A test was performed to determine the effect of increasing the temperature of the RAF stream from 35 C to 60 C, since laboratory data had indicated that operation of the column at elevated temperature resulted in improved performance with decreased waste losses and improved decontamination. However, with only the RAF being increased to 60 C, the RAW losses and decontamination were commensurate with feed composition and no significant effect of RAF temperature was indicated.

The RCW losses were significantly low (0.2-0.3 per cent), since the RC Column was generally operated at aqueous to organic phase ratios of 0.8 to 1.0; considerably less than the flowsheet value of 1.3. This good performance was probably made possible by frequent organic phase washing and replacement.

Solvent Treatment

Solvent losses amounted to about 9.1 gallons of TBP and 37.4 gallons of diluent per ton of uranium processed, the increased losses probably due to more frequent batch-washing. Solvent quality has been satisfactory as evidenced by dilute RC $E^{o/a}$ values, low residual gamma activity, and satisfactory solvent extraction performance.

An accelerated program of supplamentary batch solvent washing allowed 17 RAX changes in each extraction battery. On October 17, 1953, batch solvent treatment was changed from two successive washes with five weight per cent sodium carbonate solution at ambient temperature to a single wash since little or no quality improvement was noted after the first wash.

Operation of A line using 60 C RAF appears to have had no effect on solvent quality.

Equipment

Equipment failure during the report period resulted in 2.6 hours of unscheduled down time on "B" line only. Corrosion of the "B" line RC Column (17-2) pulser motor generator set electrical switch caused failure on October 17, 1953.

Design work is 95 per cent complete and construction approximately 80 per cent complete for initial series operation.

Construction of the "B" line RA replacement column (17-8) is about 8 per cent complete. A shortage of welding rods, 1/2-inch S.S. plate, and tube turns has caused some delay; however, delivery is still expected by the middle of November, 1953.

The continuous RAF and RAW uranium monitors and the RCU gamma monitor have operated satisfactorily. All three monitors are now in good calibration and on some standard solutions have given more accurate results than the control laboratory. Final testing and complete turn-over of the instruments to Manufacturing is expected early in November. Similar uranium and gamma monitors, but of a simplified design, are expected to be installed on "B" line.

URANIUM PRODUCT PROCESSING - ACID RECOVERY TECHNOLOGY

Summary

Calcination operations produced UO_3 at 130 per cent of the processing design capacity. Specifications for plutonium and beta activity (fission product basis) were consistently met for all the UO_3 produced, however, 42 per cent

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of the product exceeded 100 per cent of the gamma activity of aged natural uranium by 5 to 33 per cent. Total metallic impurities averaged 260 parts per million parts uranium.

Steam Stripping

Available steam supply to the stripper continued to limit production when operating 60 per cent UNH Primary Concentrator ED-1 alone. The steam header for the stripper also supplies the 100 per cent UNH concentrator and the acid fractionator. When all units are on the line at high rates, feed to ED-1 is limited to approximately 32 gallons per minute. (ca. 6 T/D at TBP HW #4 RCU composition).

60 Per Cent UNH Concentration

Process solution monitoring again confirmed lower impurity pickup operating Primary Concentrator ED-1 alone (vice operating Primary Concentrator EB-1 alone). Samples revealed that 100 to 150 parts metallic impurities per million parts uranium may normally be expected in RCU. UNH processing using EB-1 alone (some nitric acid reflux) added from 100 to 170 parts, while using ED-1 alone (no nitric acid reflux) added only 50 parts metallic impurities per million parts uranium.

100 Per Cent UNH Concentration

The heat transfer coefficient in the 100 per cent UNH Concentrator has dropped from 130 to 90 Btu/(hr.)(sq.ft.)(deg. F.) since August 27, 1953. With this heat transfer value, the unit can concentrate only 10 tons of uranium per day from 60 to 100 per cent UNH. A hydrofluoric acid flush for scale removal is planned.

UO_3 Conversion

Calcination rates ranging from 57 to 135 per cent of the instantaneous design processing capacity. The average pot charge was 92 per cent of the nominal charge size. Oxides of nitrogen escaping during calcination to the pot-room atmosphere may present a health hazard. Correction of this condition by mechanical system modifications is being studied.

New Equipment

Construction of the F cell Annex facilities is approximately 75 per cent complete and is expected to be ready for tie-in with existing equipment on November 16, 1953.

The installation of a parallel 100 per cent UNH Concentrator (E-D-6) is essentially complete and ready for shakedown with water feed.

PROCESS CHEMISTRY

Uranium Decontamination: Effect of Solvent History - A series of batch decontamination runs were made, primarily to study the effect of the

history of the solvent and its residual fission-product content on the decontamination of uranium. The following inferences are drawn from the results:

1. New solvent used in a normal run (i.e., high U saturation) with 1.5-year old waste, will give acceptable ROU in subsequent runs even when washed only with Na_2SO_4 as ROS (Runs 1 and 2). The effect of repetitive runs and possible radiation damage is not known.

2. Solvent in which a high fission-product content is allowed to build up, e.g. through operation at low U saturation, will not give satisfactory ROU on subsequent use, even when washed thoroughly with Na_2CO_3 and used only for extraction of 7-year old waste.

3. An apparent beneficial effect of quinhydrone is not understood, but may have been due to Ru reduction, if real. This point will be investigated further.

Solvent Treatment: Solvent Washing Agents - An HCW solution was obtained from a Mini mixer-settler run made under Purex HW #2 Flowsheet conditions, and its decontamination characteristics were determined as a function of washing agent employed. This HCW is similar to the RCW which will be produced in the Uranium Recovery Plant when processing current metal waste. Aqueous Na_2SO_4 and $Na_2C_2O_4$ solutions were relatively ineffective as washing agents, giving decontamination factors of about 2 and 5, respectively, at 25 C. Both Na_2CO_3 and NaOH, however, reduced the solvent activity to an insignificant level (D.F. approximately 100) when contacted at 25 C for 5 minutes. A two-fold increase in decontamination resulted, regardless of the washing agent, when the reaction temperature was increased from 25 to 50 C. It is of interest to note that 1 per cent NaOH was more effective than 5 per cent NaOH. (A similar effect has been found for Na_2CO_3.) From the activity level of the HCW it may be concluded that the replacement of Na_2SO_4 by Na_2CO_3 as the ROS (solvent washing agent) may become imperative when processing current metal waste due to radiation limitations in the solvent handling facilities in Building 276.

ROS Filtration - As reported last month, the plant ROS stream has been found to contain about 0.05 weight per cent of water-insoluble solids, which effectively scavenge fission-product activity (particularly ruthenium) and which partially accompanies the solvent on its return to the process. This solid was found to be largely Fe_3O_4. From further studies it is concluded that the ROS solution can be filtered only with the aid of a scavenging agent, and consequently the laboratory investigation is being directed toward filtration of the ROO stream instead (see below).

ROO Filtration - A filter bed of Pyrex glass wool packed to a density of about 15 lb./cu.ft. was found to effectively remove the solids and colloidal materials entrained in the ROO (washed solvent) stream.

Uranium Concentration Corrosion Inhibitors - The investigation of corrosion inhibitors under conditions simulating the concentration to 100 per cent UNH (E-D-2 Concentrator) was continued. These results confirm the previously

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determined corrosion inhibiting action of formaldehyde and isophorone, although it must be recognized that there is no assurance that these agents will be effective under plant conditions.

Quality of Recovered HNO_3 - A program for evaluating the characteristics of the acid recovered in the UO_3 Plant (Building 224-U) is in progress. Results so far obtained on disengaging times, dispersion times, rate of uranium transfer, decontamination characteristics, and hydraulic behavior of process solutions prepared from the recovered acid, have shown no adverse effects which might be attributed to poor acid quality.

Recovery of UO_3 from Wool Filter Bags - A sample of UO_3-impregnated filter bag received for laboratory tests had the following approximate composition:

Weight of uranium oxide per sq. ft. of filter area	≅ 0.13 lb.
Weight per cent dry wool	41.5
Weight per cent UO_3	50.5
Weight per cent moisture (removable at 110 C)	8.0

Mechanical and chemical methods (including incineration) have been considered as possible means of recovery. Sixty per cent of the uranium oxide is easily removed by ball mill treatment. Leaching agents such as H_2SO_4, HCl, HNO_3, NaOH, H_2O, and $(NH_4)_2CO_3$, are being evaluated. Incineration of one sample left a residue of 50.5 per cent of the charge. This compares favorably with the above figure for uranium oxide content of the wool. The investigation has been suspended until it is determined that recovery by K-25 is the logical solution to this problem.

Waste Treatment: $Ni_2Fe(CN)_6$ Scavenging - On a test basis, approximately 500,000 gallons of aqueous waste (produced October 10 to 18, 1953), have been scavenged with $Ni_2Fe(CN)_6$, and stored in Tank 101-T.

Samples of this scavenged supernatant were obtained from the 101-T Tank on October 21 at 3, 8, and 13-foot depths, about 15 feet from the inlet. These should be representative of the tank contents. The pH of the solutions, as received in the laboratory from the stated depths were 9.74, 9.73, and 10.88, respectively.

Titration of the 13-foot sample indicated that one gallon of 13 M HNO_3 (60 per cent) would be required per 45 gallons of waste to reduce the pH to 9.63. However, since the over-all pH is approximately in the optimum range of 9 to 10, the adjustment of the acidity of Storage Tank 101-T is not deemed necessary.

REDOX TECHNOLOGY

Summary

Operation for the entire month was with a permanganate head-end oxidation of IAF, three Uranium Cycles, and three Plutonium Cycles. Elimination of one

Uranium Cycle was not permitted because of continued entrainment of activity, primarily zirconium-niobium, from the extraction columns to the stripping columns. However, the over-all performance has been improved since August as indicated by the approximate monthly averages below:

	Gamma Decontamination Factors (dF)		Per Cent to Waste	
	U	Pu	U	Pu
August	6.5	7.2	1.22	1.22
September	6.6	7.1	1.30	1.07
October	6.6	7.4	1.05	0.65

For the majority of the month, an instantaneous rate of 7.0 tons of uranium per day was sustained; an instantaneous rate of 7.5 tons of uranium per day was demonstrated for two days with good performance. Two 3BP batches produced immediately following column start-ups were reworked through the Plutonium Cycles, and 20.2 tons of uranium required rework through the RA Column in the Metal Recovery Plant because of high zirconium-niobium activities.

Process Performance

The solvent extraction performance for plutonium and uranium decontamination was similar to that reported for the last two months. Plutonium decontamination was good (ca. 7.4) except for periods immediately following column start-ups when five to ten-fold increases in fission product activity were experienced; this activity was apparently caused by entrainment from the 3A Column interface to the 3B Column. A 2BP gamma decontamination factor greater than 6.5 was maintained for approximately one week. The uranium decontamination performance has been lowered by approximately a factor of ten because of entrainment of aqueous phase and/or of solids from extraction column interfaces to the stripping columns; thus, operation of three Uranium Cycles has continued to be necessary. Preliminary studies point to the IB Column as the origin of the difficulty; the ferrous sulfamate used in IBX is currently under scrutiny as a potential source of an emulsifier since iron has been a primary component of solids accompanying the entrained aqueous phase. Uranium and plutonium waste losses have been lower than normal as a result of prolonged periods of steady-state operation.

The following table summarizes decontamination performance data by solvent extraction cycle and over-all waste losses for the period indicated:

Period covering October 10, 1953, to October 15, 1953; nominal production rate of 7 tons of uranium per day, processing 86-day "cooled" metal with $KMnO_4$ oxidation of IAF and no scavenging of Zr-Nb on MnO_2.

	Gamma Decontamination Factors (dF)		Per Cent to Waste	
Cycle	U	Pu	U	Pu
Feed Prep.	0.1	0.1	0.03	0.12
1st	3.9	4.4	—	—
2nd	1.8	2.0	—	—
3rd	1.0	1.0	—	—
Over-all	6.8	7.5	0.67	0.49

Feed Preparation

The dissolvers were charged during the month with 4.95-ton charges of uranium having an average pile exposure of 606 (567 to 626) MWD/T. Thirty-two lead-dip (vice triple-dip) slugs were charged during the month. The newly developed technique of dissolving has been used to good advantage throughout the month on all three dissolvers. Because of the elimination of the peak reaction period by this type of dissolving, continued dissolving has been permitted on both A-2 and B-2 Dissolvers without equipment replacement which would have been required if the conventional dissolving technique were used. Off-gas rates on these dissolvers have necessarily been limited because of an air leak into A-2 (presumably at charging opening) and apparent failure of two of the B-3 Silver Reactor heaters. Average nitric acid consumption figures for the month indicate a 12 per cent reduction for this technique of dissolving; approximately 2.2 pounds of 60 per cent nitric acid are required for dissolving one pound of uranium.

All IAF batches were oxidized by a permanganate head-end treatment procedure using chromic nitrate as the reductant. The first 13 batches were prepared by using the original permanganate head-end procedure without the "catalytic kill" technique and with an estimated 0.008 M MnO_2 scavenging; normal performance was obtained. However, because of jet pluggage and difficulty of control of jetting rates after installation of a new jet from the H-4 Oxidizer to the H-2 Centrifuge, and because it has not been possible to empty the H-4 Oxidizer below a 250-gallon heel with the new jet, complete dissolution of manganese dioxide has been necessary. Nevertheless, a study of the effectiveness of the "catalytic kill" technique was made. In order to obtain the most information, the maximum feasible permanganate concentrations (0.02-0.05 M) were used.

Conclusion reached from the head-end testing program of the past several months is summarized as follows:

1. Minimum permanganate concentrations of 0.01 M for the "sacrificial kill" and 0.02 M for the oxidation have yielded adequate ruthenium decontamination factors in the range of 5 to 20, with an average of approximately 10. No effect of permanganate concentration has been noted on approximately 0.01 M MnO_2.

2. Adequate ruthenium removal has been reached at acidities up to 0.15 M HNO_3. The higher acid concentrations do not appear to affect scavenging on manganese dioxide. The higher nitric acid concentrations are being studied since laboratory studies indicate the formation of a more readily centrifuged manganese dioxide cake.

3. The "sacrificial kill" has been adequate to permit sufficient permanganate stability during the oxidation period. Reduction of the oxidation period from two hours to one hour indicated a slight decrease in ruthenium removal. The use of the "catalytic kill" procedure results in more uniform scavenging. Either 0.01 M $Cr(NO_3)_3$ for two hours or 0.02 M $Cr(NO_3)_3$ as the "catalytic kill" for one hour has been adequate for complete dissolution when employing five per cent excess chromic nitrate.

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4. Ruthenium decontamination increases with increasing temperature.

5. No significant effect of air sparge rate on ruthenium removal has been indicated within the range of 75 to 150 c.f.m. (0.3 to 0.6 volumes of air per minute per volume of solution).

6. Feed rate below 90 pounds per minute appear to be satisfactory for centrifugation of the MnO_2 cake. Recent studies have not included this variable since feed rates below 100 pounds per minute, with the present faulty jet, have been difficult to maintain regularly.

Uranium Extraction and Decontamination

In general, nominal conditions of the ORNL June, 1949, (acid-deficient) Flowsheet were employed for the First Extraction Cycle. Substitution of ferrous ammonium sulfate and sulfamic acid in the IBX for ferrous sulfamate has just recently been made on a test basis. The purpose of the test is to determine whether the ferrous sulfamate solution made in the plant is contributing to the entrainment problem. The concentrated 2.45 M UNH Flowsheet has been adopted for the Second and Third Uranium Cycles.

The 3D Column flow ratios were adjusted in order to increase the capacity to 7.5 tons of uranium per day; no decrease in efficiency of the column could be detected.

Z-PLANT, ISOLATION, PURIFICATION AND FABRICATION PROCESS TECHNOLOGY

Isolation Building

The aluminum concentration of F-10-P solution was routinely adjusted to 1.0 g/l by addition of aluminum nitrate. The loss to recycle averaged 4.7 per cent as compared to greater than 10 per cent losses when aluminum is not added.

S-Plant product solutions are routinely being processed through the plutonium (IV) oxalate precipitation and filtration cycle in four hours, no abnormally long cycles for individual runs were encountered during this report period. The loss to recycle averaged 1.3 per cent.

Preliminary tests to determine the feasibility of reducing the plutonium(IV) oxalate solids hold-up in the P-1, P-2 precipitation tanks by using an axial flow propeller in place of the disc agitator have been made, using a slurry of unelutriated Dicalite 4200 filter aid. After settling, mixing was complete in 30 seconds. A test installation will be made in process equipment at an early date.

The sintered stainless steel filter plate (20 micron porosity) installed as the N-1 filter of Cell 4, during February, 1953, disintegrated after eight months service. The failure was similar to that experienced with the filter sticks installed in the P-1 and P-2 Tanks. Since this filter plate was originally intended for testing the filtering of S-Plant runs having unusually high silica solids, and since the silica occurrence has been nil for extended

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period, the filter will be replaced with porous silica block (Filtros, E Grade) identical to those in other cells.

A process change authorizing loading of a maximum of 400 grams of plutonium in sample cans for off-site shipment and loading of estimated amounts of plutonium for temporary storage is being issued (HW-29691, Authorization for a Process Change - 231-Z Building - Loading, Identification, and Storage of Sample Cans Containing 400 Grams of Plutonium as Liquid Plutonium Nitrate Solution).

Dry Chemistry (Task II)

Based on fluoride color 25.1 per cent of all runs required refluorination. This is comparable to 20.8 and 18.6 per cent in September and August, respectively. All runs this month were processed using the "fast cycle". Testing of the gas preheater was continued with excellent results. Out of a total of 50 runs, included in the above figures, only four per cent required refluorination. It is now planned to equip all Task II furnaces with gas preheaters.

Reduction (Task III)

The average reduction yield for this period was 95.3 per cent as compared with 94.1 per cent and 96.9 per cent for August and September, respectively. Six out of 151 runs had low reduction yields (ca. 63 per cent) because of powder hold-up in the equipment leading to the mixer. Since the quantity of chemicals to be added and the calculation of reduction yield are based upon the weight of fluorides leaving Task II, such a hold-up of powder can introduce a significant error. The exclusion of the six low yield runs gives an average reduction yield of 96.8 per cent for the report period.

This month's production includes double-batch reductions made in accordance with Production Test 235-10, "Evaluation of Large Batch Reductions of Plutonium Tetrafluoride". The average reduction yields of these did not differ significantly from those of normal reductions and were included in the reported value.

Because of iodine in the powders which were held-up, corrosion products from the stainless steel equipment, namely iron, chromium, and nickel, appeared in the process material and caused rejection of one machined piece because of high impurity content. Two other pieces contained impurities approaching the maximum allowable. Plastic equipment has been used to replace the stainless steel here as a corrective measure against further occurrence of this problem.

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Crucible Shop Services

Four MgO molds for casting 1/2 cm x 2 cm x 4 cm bars were fabricated by the tamping technique for Applied Research.

A number of MgO LHS-115 crucibles, 1-1/2 inches O.D. x 2-3/4 inches high with pouring lip and dross retainer, were slip-cast and fired for Applied Research.

One hundred CD-1301 crucibles were fabricated and packaged for off-site shipment.

RECUPLEX CONSTRUCTION

Construction of the Recuplex facilities in Rooms 221 and 337 of the 234-5 Building has progressed to approximately 31 per cent completion. The decision has been made, however, to halt the construction phase of the project temporarily (effective October 30, 1953) with resumption probably occurring in early January, 1954. The action was necessitated by the vessel vendor's failure to supply the process vessels according to their previous schedule and the consequent inability to maintain an efficient construction program. This decision was concurred in by members of Project and Technical Sections. It is the concensus of opinion of personnel in Engineering Planning and Minor Construction, Project Section that if sufficient materials are available in early January to permit the efficient use of construction manpower the beneficial occupancy date of September 1, 1954, will not be delayed.

Prior to the shutdown of construction activities, the installation of the Reception-and-Blending vessel supports, the Solvent Extraction platform in the duct level, and the Slag-and-Crucible hood pan was completed and erection of the Slag-and-Crucible vessel supports was begun.

234-5 DEVELOPMENT

Task I - Plutonium Purification

Sludge in Redox PR Can

The sludge removed from the PR can which had contained Run S-53-09-L-134 was found by spectrochemical analysis to consist of a mixture of aluminum, iron, chromium, nickel, and manganese (probably present as silicates and oxides) and silica. The fission product activity was 70 per cent zirconium-niobium and 30 per cent ruthenium.

Plutonium(IV) Oxalate Precipitation

Laboratory studies of the precipitation of plutonium(IV) oxalate have shown the following:

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1. Anionic impurities may markedly affect precipitate quality. "Milky", finely-divided precipitates were formed in Redox PR solution (0.055 M Pu (IV-VI), 4.4 M H^+) to which had been added, prior to the valence adjustment with H_2O_2, 0.055 M oxalate, 0.055 M tartrate, or 0.3 M sulfamate. Neither 0.055 M sulfate nor 0.055 M isobutyrate produced a noticeable effect.

2. Slow agitation, which produces thorough mixing, is somewhat preferable to rapid agitation, giving fewer fines and slightly shorter filtration times.

3. Precipitation from a feed solution originally containing 60 g/l Pu and 12 M HNO_3, after reduction of the acidity to 5 M with NaOH solution, produced a thixotropic cake which could be filtered only very slowly. By washing the cake its appearance was improved and the sodium content was reduced to 6 ppm.

Filter Cloth Tests

A piece of 100 x 950, twilled Dutch weave, metal cloth, used as a filter medium for the filtration of Plutonium(IV) oxalate, retained all particles in a normal slurry, and also was found to retain PuO_2 particles. A piece of 30 x 400 cloth, reduced 25 per cent by calendering, passed 5.3 weight per cent of the solid in a oxalate slurry for which it was used.

Plutonium(III) Oxalate Precipitation

Attempts to prepare a plutonium(III) solution, by reduction with H_2O_2 in the presence of sulfamic acid, have given poor results with Redox PR solution. At room temperature, the reduction is very slow, and at higher temperatures, the reduction is incomplete.

Calcium Plutonium Fluoride Precipitation

Using Task I-type feed (Redox PR solution concentrated to 65-70 g/l Pu, 3.2-5 M HNO_3), conditions have been found for the room temperature precipitation of granular, nonthixotropic calcium plutonium(IV) fluoride, which may be air dried to an easily powdered cake.

Task II

Continuous Process

Re-evaluation of the plutonium oxalate calciner and plutonium oxide fluorinator designs, on the basis of information received from personnel at the University of Iowa and at Mallinckrodt, has resulted in the decision to change these reactors from a rotating tube to a vibrating tube design. The use of a vibrating tube, in which the reacting solid is transferred through the reaction zone by the periodic oscillation of the reactor bed, offers the advantages (as compared with the rotating tube) of: 1) probable reduction in the entrainment of fines in the effluent gases and 2) simpler design; the use of bellows in place of packing glands, and location of the transfer machanism completely inside the hood.

Approximately 25 per cent of the equipment and materials have been ordered. Assembly and detail drawings are approximately 10 per cent complete.

Since it is anticipated that the filtered cake must be dried before calcining to prevent caking in the feed conveyor and calciner tube, and to prevent spattering due to minor steam explosions when the wet cake comes in contact with hot surfaces, preliminary drying tests using infra red and dielectric heating have been made. These studies have been promising. Further work is planned using infra red heating. Because of the cost of dielectric heating equipment it will not be considered further unless infra red is found unsuitable.

Dry Chemistry Studies

Thermal decomposition of plutonium(IV) oxalate in argon at 200 C has been found to yield a compound or mixture of compounds which contains carbonate as well as oxalate. The color indicates the material to contain predominately plutonium(III). Evidence was also obtained for the formation of the tri-and mono-hydrates of plutonium(IV) oxalate as stable intermediates in the drying process.

Recuplex

Evaporation of Plutonium Nitrate Solutions

To procure information for the operation of the Recuplex product evaporator, the approximate boiling points of solutions of plutonium nitrate in nitric acid have been measured as a function of plutonium and nitric acid concentrations. Denitration was observed to commence at a temperature of 135 C, at which point the solutions contained more than 650 g/l plutonium and ca. 6 M HNO_3. The necessity of adjusting the nitric acid concentration of the feed to the evaporator to a minimum of 1.5 M was shown by the formation of solids (plutonium polymer), and consequent foaming, when evaporation of Recuplex-type product (80 g/l Pu, ca. 1 M HNO_3) was attempted. Solid formation did not occur at any plutonium concentration up to 200 g/l when the initial solution contained a minimum of 1.2 M HNO_3.

Compound Plate Testing

Eleven fluorothene-coated, pulse column plates, which were fabricated at Hanford, have been under life-expectancy test for five months, under conditions which simulate those at the feed plate of the Recuplex extraction column. Only seven small areas, distributed between three plates, have peeled. The plates fabricated by the Chemical Proof Construction Company have been under test for 2-1/2 months, and one of the 11 has peeled very slightly at the edge.

Solvent Stability

Chloride and dibutyl phosphate analyses of the solutions used in the life test of the compound pulse column plates have shown that, under Recuplex feed plate conditions, free chloride forms at a rate of ca. 750 parts per

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day per million parts CCl_4 in the system, and that DBP forms at a rate of ca. 2 mg per day per gram of tributyl phosphate. The solvent in the tests was 15 per cent TBP in CCl_4 and contained 58 g/l plutonium. The aqueous phase contained ca. 10 g/l plutonium.

Crucible Shop Development

A pattern to make plaster-of-Paris molds for slip-casting the RCDS-1302 crucible, to be used in mock-up studies of the new Task III, was designed.

Tensile specimen molds prepared last month by investment casting techniques were successfully fired at 1370 C and at 1850 C. Shrinkages of ten specimens fired at 1370 C ranged from 2.0-2.6 per cent and averaged 2.3 per cent, and when fired at 1850 C, ranged from 3.5-4.6 per cent and averaged 4.0 per cent.

"Z" Area Technical Manual

The preparation of the Plutonium Purification and Fabrication Technical Manual is estimated to be 42 per cent complete.

P-10 PROCESS STUDIES

P-10 Process Studies shift assistance to the P-10 Extraction Unit was reduced to five days per week and to the XYZ shift schedule effective October 19, 1953. Effective November 1, 1953, the sub-unit staff will consist of three exempt Junior Engineers, one exempt Chemist and one exempt Chemical Engineer full time and one exempt Junior Engineer part time.

Orally, approval has been received from the Atomic Energy Commission, Hanford Operations Office regarding the HAPO request for a modified product specification.

ANALYTICAL LABORATORIES

The Chemical Research and Development Service Laboratory continued the analyses of samples in support of Chemical Research and Chemical Engineering Development activities. About 25 per cent of the "active" work applied to the Waste Treatment Problem. Fission product determinations including cesium and strontium in particular, were requested to evaluate the merit of ferrocyanide scavenging of cesium and strontium from plant RAW. Numerous plant RAW samples were evaluated by the chromous sulfate titration and, in some instances, by coulometric titration to assist the Physical Methods Group in checking the in-line polorograph set up to monitor the RAW stream with respect to uranium.

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The Spectrochemical Laboratory rendered service to all Technical Sub-Sections in support of their problems and investigations. Work continued in an effort to transfer all work normally performed on the B & L Spectrograph to the Jaco Spectrograph as the former instrument will be transferred to the 325 Building when it is occupied by Technical. The present effort concerns the 200 Area essential materials. To date it appears that some difficulty may be encountered in the determination of the elements, boron and beryllium, on the Jaco, at levels equal to or less than the permissible maximum. This condition has been brought to the attention of the Manufacturing Department. If the necessary limits cannot be reached on the spectrograph in the 234-5 Laboratory, then Technical will perform the few analyses involved on the B & L Spectrograph.

The Special Analytical Laboratory has been rendering considerable support to the analyses of the various uranium alloys. The determination of the boron content of sintered aluminum and boron carbide specimens required considerable analytical time.

The Water Quality Laboratory work volume has been low, due to continued shutdown of Water Plant Development facilities at both 100-H and 100-F. This work is scheduled to resume the first week in November. A study is under way to evaluate a scavenger method for determining small amounts of iron in process water.

The Mass Spectrometer Laboratory is checking the in-line sampling system installed as a part of the P-10 program. The installation of the line and the valve panel is complete. Applied Research's program for pile gas analyses was terminated this month. Pile gas analyses will be continued on a reduced scale as samples are submitted by other interested groups.

Work volume statistics for the Analytical Laboratories are as follows:

	September		October	
	Number of Samples	Number of Det'ns.	Number of Samples	Number of Det'ns.
Research and Development				
Applied Research	1015	2430	647	1613
Pile Technology	272	962	337	474
Fuel Technology	90	740	91	1500
Separations Technology	314	557	240	377
Process Assistance	1314	1346	843	959
Others	102	488	89	534
Total	3107	6523	2247	5457

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Standards and Calibrations	September	October
Number of standard solutions prepared	20	36
Stock solutions dispensed	57	34
Number of calibrations performed	4	7
Number of calibrated glassware dispensed	7	16
Number of checked glassware dispensed	116	46
Total	204	139

INVENTIONS

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

V. R. Cooper

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

November 12, 1953

VRC:mvt

[redacted]

November 9, 1953

APPLIED RESEARCH SUB-SECTION

October, 1953

VISITORS AND BUSINESS TRIPS

A. F. Scott, Reed College, Portland, Oregon, visited Hanford on October 1 to discuss analytical chemistry.

E. K. Hulet, Radiation Laboratory, University of California, Berkeley, spent October 1-14 working on a chemical separation problem.

L. R. Hayworth, Air Reduction Pacific Corporation, Seattle, was here October 23 and 29, and E. W. Connor, Miller Electric Manufacturing Company, Spokane, Washington, was here October 23 discussing welding problems.

[redacted]

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O. J. Wick gave a talk at the AIME Meeting in Seattle, Washington, On October 15-16.

M. T. Walling spent October 1-2 at Oak Ridge National Laboratory, Oak Ridge, Tennessee, discussing separations chemistry.

E. D. Clayton, D. E. Davenport, D. J. Donahue, H. Neumann, W. A. Horning and M. T. Walling, attended the AEC Reactor Information Meeting at Argonne National Laboratory, Lemont, Illinois, on October 7-9. Papers were presented by all except Horning and Walling.

W. J. Ozeroff spent October 12-14 at Chalk River, Ontario, Canada, attending the Tripartite Reactor Safety Conference.

W. A. Horning spent October 12-13 at Knolls Atomic Power Laboratory, Schenectady, New York, discussing reactor physics.

S. H. Bush and M. J. Sanderson visited Knolls Atomic Power Laboratory, Schenectady, New York, on October 15-16 to discuss reactor metallurgy. October 19-23 was spent in Cleveland, Ohio, attending the National Metals Congress.

G. M. Muller spent October 29 at the California Research and Development Corporation, Livermore, discussing reactor physics.

M. J. Sanderson attended the Metallography Steering Committee Meeting at the Batelle Memorial Institute, Columbus, Ohio, on October 14.

A. H. Bushey spent October 21-23 at Ohio State, Columbus, Ohio, recruiting technical personnel.

S. H. Bush spent October 13-14 at Argonne National Laboratory, Lemont, Illinois, discussing reactor metallurgy.

J. J. Cadwell and F. J. Leitz visited the U. S. Bureau of Mines, Albany, Oregon, on October 16 to discuss zirconium metallurgy.

ORGANIZATION AND PERSONNEL

Personnel totals as of October 31 were as follows:

	Exempt	Technical Graduates		Non-exempt	Total
		Permanent	Rotational		
Physics Unit	23	3	1	7	34
Metallurgy Unit	42	3	-	22	67
Chemistry Unit	48	1	-	15	64
Equipment Design	6	-	-	3	9
Administration	1	-	-	5	6
Total	120	7	1	52	180

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PHYSICS UNIT

Lattice Physics

The buckling was measured in several lattices loaded with hollow slugs with the internal hole filled with water. Measurements on these lattices with no water had been done earlier. The results are summarized below.

Slug Dimensions: I.D. = 0.81", O.D. = 1.66"

Lattice Dimension	Dry Buckling	Wet Buckling
6 3/16"	-66.5	-52.6
7 1/2"	97.9	92.7
12 3/8"	51.1	35.0
15"		-41.2

Buckling is given in units of 10^{-6} cm^{-2}. Of these lattices, the most interesting for Hanford's purposes, seems to be the 7 1/2". It has a buckling high enough to be used in either H or K-type piles and gains little reactivity upon loss of cooling water. The O.D. was tailored to Hanford process tube dimensions.

Cell traverses, from which the thermal utilization is to be estimated, were made for the 6 3/16" and 7 1/2" lattices. A measurement was also made of the neutron flux distribution in a hollow slug with its central hole filled with water. According to this traverse, the thermal flux fell from a value of 1.4 at the outer surface of the slug to 0.8 at a point very near the inner surface, and then rose slightly at the inner surface.

The hollow slugs are now being remachined to an internal hole of 1.1"; experimentation with them will be resumed when this is completed.

The first measurements involving slugs of 1.17" diameter were made this month. A preliminary value for the dry buckling of these slugs in the dry 7 1/2" lattice was obtained. This value, about 120 x 10^{-6} cm^{-2}, appears to be the highest observed to date.

In connection with the future program of investigating a wider variety of lattices, an attempt was made to measure the (known) buckling in a smaller exponential experiment. A 4' x 4' x 4' stack of 6 3/16" lattice was laid up. Into this were inserted tubes filled with hollow slugs. These tubes were 8' long and so projected from each end of the stack to the extent of 2'. The relaxation length up the stack was measured, and from this and the known buckling of this lattice, an attempt was made to determine the extrapolation length in this pile. Values from 1 1/8" to 1 1/2" were obtained. An uncertainty of this magnitude (3/8") in the extrapolation length leads to an uncertainty of about 35 x 10^{-6} cm^{-2} in the buckling - an intolerably large one. It is believed that the perturbations of the extra uranium in the tubes may be the source of the uncertainty. The experiment will be repeated using standard slugs which will fill the tubes to the required length. It appears

that bucklings can be measured this way to an accuracy of perhaps $\pm 7 \times 10^{-6}$ cm^{-2} --a satisfactory value for exploratory purposes.

The possibility of building a thermal column into the bulk shielding facility at C Pile has been briefly investigated. Such a thermal column could be used as a source for exponential experiments. Calculations indicate that a neutron flux of ca. 10^6 $n/cm^2/sec$ would be available to a test lattice 5' x 5' x 6' in dimensions. This is an increase in flux by a factor of one hundred over that available with present exponential pile sources. Measurements which might be made at this facility include diffusion length, thermal utilization, conversion efficiency, and blackness. Little advantage over the exponential experiments would be gained in measurements of buckling.

One method of interpreting data from the lattice testing reactor involves using the reactor to determine three slug constants which are independent of lattice dimensions and then using these to compute the buckling of lattices of interest. The slug constants are: $h = \eta\epsilon$, the number of fast neutrons produced per thermal neutron absorbed in the slug; β, the thermal blackness or probability that a thermal neutron entering the process tube assembly, will be captured; and γ, a similar quantity for resonance energy neutrons. An equation, connecting κ^2, the buckling, and the above three constants, is available. This equation, together with measured values of κ^2, have been used to determine values of β and γ. The values obtained in this way are in rather good agreement with other estimates made of these constants.

Nuclear Physics

Analysis of data obtained on a method of measuring the relative conversion efficiencies of lattices shows already that an accuracy of ca. 3% can be obtained without difficulty.

A test irradiation of the Au-Cd alloy foils which are to be used in measuring the temperature of neutrons, has been completed and shows that the alloy is homogeneous to at least 1%.

The foils will be used in obtaining a neutron temperature in the 305 Pile graphite and the beam at DR. A scheme for irradiating these foils in a 105 pile process tube in such a way that the effective temperature of the neutrons passing through the water annulus is obtained, is under study. This measurement, besides being of interest for comparision with theoretical spectrum calculations, is of great interest in checking the hypothesis that part of the large discrepancies found in graphite temperature coefficients and $\frac{1}{\eta}\frac{d\eta}{dT}$ are due to inadequate knowledge of neutron spectra in the graphite and metal.

The work on the energy variation $\frac{\sigma_f(49)}{\sigma_f(25)}$ in the region 0.0225 to 0.100 e.v. is now complete. This is being presently extended to higher energies (0.10 to 1.00 e.v.). The determination of the absolute value of this ratio awaits the accurate weighing of the foils by personnel at KAPL. Meanwhile the data obtained to date have been

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worked up and some points of interest have been developed. It is assumed that the values of $\sigma_f(25)$ are correct. With this assumption, one can compute a value of f, the correction factor for departure from 1/v dependence of cross section. This is 0.995 and is to be compared to the accepted value of 1.06 in BNL-221. From this f and an experimental determination of $\overline{\sigma_f(49)}/\overline{\sigma_f(25)}$, where the bars mean average over a Maxwellian spectrum, one obtains for the fission cross section of 49:

$$\overline{\sigma_f(49)} = 702 \text{ barns}$$

$$\text{and} \quad \sigma_f(49) = 796 \text{ barns at } 0.0253 \text{ e.v.}$$

If one further assumes that $\overline{\sigma_a(49)}$ is well known in the thermal range, then an average of $\eta(49)$ (η = no. of neutrons per neutron absorbed) over the thermal range can be found, viz.:

$$\overline{\eta(49)} = 2.022$$

This result agrees well with the accepted value of $\overline{\eta(49)}$ of 2.01 ± 0.03 and indicates that the value chosen above for $\sigma_f(49)$ is correct. The data allow the evaluation of $\overline{\sigma_f(49)}$ at 0.04 e.v. and the combination of this result with the one at 0.0253 e.v. gives a value for $\frac{1}{\overline{\eta}(49)} \frac{d\overline{\nu}(49)}{dT}$ of -7×10^{-5}/degree C. The previously accepted value has been of the order of -20×10^{-5}/degree C.

Plant Physics

A calculation was made to determine the optimum flat zone in a cylindrical pile when the buckling is varied. For a buckling of 50×10^{-6} cm^{-2}, the optimum is only 2% better than for the case where all the flattening is radial. However, for a buckling of 80×10^{-6} cm^{-2}, the optimum is a combination of radial and longitudinal flattening and leads to a pile power that is 14% higher than if the flattening were entirely radial.

Several critical limits were estimated for process tanks in the Redox Separation Plant and are being issued in document HW-29758. The critical mass study of the Recuplex Process has been completed in detail.

The problem of sample can storage in the 234-5 Building was considered. It is estimated that six sample cans, each containing 400 grams of plutonium, can be safely stored in each cubicle of the storage vault, providing only that two cans are placed on each of the three shelves in the cubicle. If the sample cans are to contain up to 1000 grams of plutonium, then only two of these cans could be placed together in each cubicle and remain safe.

METALLURGY UNIT

Production Tests

Fifty-nine preformed uranium specimens were charged into two centrally located

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process tubes of 100-H Pile on October 9, 1953. The purpose of this test is to determine the effect of irradiation on the mechanical and physical properties of normal beta heat treated uranium. The post-irradiation data to be obtained from this material will include: thermal and electrical conductivity, thermal expansion, density, crystallography, metallography, hardness, tensile and impact strengths. A comparison of these data with the pre-irradiation data will give a quantitative measure of the effect of irradiation on these properties.

The machining of specimens and canning assemblies for a proposed irradiation of cold-worked zirconium samples has been completed. This test is designed to determine the effect of exposure time and prior cold work on the mechanical properties of zirconium. Pre-irradiation hardness and metallographic studies have been completed and the canning of the specimens is in progress.

Twelve specimens of uranium-chromium alloys were charged in 100-B Pile on October 23. These alloys contain 0.0, 0.2, 0.4, 0.6, 0.8, and 1.0 atomic per cent chromium and the purpose of the test is to explain the dimensional stability of the alloys during irradiation.

The high temperature test specimens made up and canned during September were not irradiated on schedule because of failure of the poison column facility in which the irradiation was to be made. The irradiation is now tentatively scheduled for November 3. Post-irradiation examination of the specimens will begin the same week.

A production test is being written for irradiation of a four-inch cored slug. The purpose of the irradiation is to test the dimensional stability of an externally cooled hollow slug operating at high specific power. In the initial test a four-inch Eisenhower slug with a 3/8-inch hollow core will be irradiated at a specific power of about 75 kw/foot. According to calculations by D. E. Amos[1] the maximum internal temperature in this slug will be about 570 C. In later tests hollow slugs will be irradiated with surface temperatures of 250 C and internal temperatures above 660 C. Two natural uranium slugs are now being machined which will be used to test the proposed canning technique.

Mechanical Properties

Uranium sheet was prepared by hot-rolling a 1.5-inch diameter rod to 0.085 inch and finished rolled to 0.055-inch sheet. The material has been beta heat treated and will be machined into tensile and electrical resistivity specimens for irradiation at or near pile water temperature.

Work is continuing on the vacuum dilatometer to eliminate hysteresis at the heating - cooling turn around point and on the vacuum system for the thermal conductivity unit.

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(1) Amos, D. E., Maximum Temperatures in a Hollow Externally Cooled Slug, HW-27918, May 1, 1953 (Secret)

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MTR Irradiation Facilities

The design of the testing facility is nearing completion. The reserve pressure tank and instrument panel designs await final approval by Phillips Petroleum Company. Purchase requisitions and work orders are being issued for the remainder of the components. The flux depression to be expected in the loaded A block is being calculated by the Physics Unit.

Work is continuing on the assembly of equipment and materials for canning uranium irradiation specimens in zirconium cans with NaK alloy as heat transfer medium. A supply of NaK has been obtained. Equipment and methods for analysis for oxygen in NaK are under study by analytical personnel. The vacuum chamber for filling the capsules with NaK is now under construction. Design of the rest of the vacuum system is under consideration.

Electron Microscopy

Faxfilm replication of non-irradiated uranium surfaces and compound layer surfaces formed during the triple dip process is continuing. Cathodic etching of uranium has been successfully employed and will be applied to the compound layer. Various chemical and electrolytic etchants are being surveyed in order to provide a more satisfactory method for developing the metallographic structural characteristics of the compound layer.

Heat transfer calculations and canning considerations are in progress for the proposed irradiations of uranium metallographic specimens, compound layer metallographic specimens, and uranium fractographic specimens.

Reactor Materials

In the event of slug rupture in a power pile, the hot fuel material may be exposed directly to the action of 250 C water. The resulting reaction might be explosive, excessively rapid, or sufficiently slow that the pile can be scrammed before undue damage ensues. A literature search is being conducted for data on high temperature reactions. No directly applicable data has been found. However, it should be pointed out that excessively high temperatures were achieved in the Chalk River incident and no explosion occurred. Reactions up to 450 C with steam show reaction rates which follow a straight line log 1/T vs. rate curve and do not lead to explosive rates. Direct experimental measurements with uranium at 300 C vs. water have been made by R. Neidner, Pile Technology, whose tests will now be extended to include metal temperatures up to 650 C.

Calculations for the stresses, strains, and displacements of solid and cored externally cooled, and internally cooled fuel elements are initiated which use the temperature dependence of the uranium strength properties. The plastic analysis is for slugs which have a maximum uranium temperature of 600 C and are infinite in length (end effects are disregarded).

A fuel material prepared by dispersing uranium shot in a magnesium matrix has been proposed by G. A. Last. This material would be useful wherever high fuel temperature or radiation damage are limiting factors. It would also operate to reduce

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thermal stress gradients in a slug. A letter (HW-29766, October 27, 1953) has been circulated describing the proposal.

The creep of 2S aluminum thimbles was investigated under loads simulating 12, 3, 1 and 0 inches of water at temperatures of 600, 550, 500, 450 and 400 C. Not all conditions were investigated since it was obvious that when creep did not occur at some load and temperature a lower load at the same temperature would have no effect. Loads of three inches of water at 500 C, 12 inches at 400 C, one inch at 550 C, and zero inches at 600 C are believed to be unsatisfactory. An interim report has been completed, and a final report will be written.

A literature survey is being made of reactor structural materials suitable for high temperature operation, specifically for coolant temperatures up to 300 C. Metallurgical factors are primarily emphasized with some reference to engineering and nuclear physics considerations.

Corrosion Studies

Type 304L and 309SCb stainless steels and titanium are being corrosion tested in simulated D-12 solution at boiling temperatures. These metals are also being tested in D-12 solutions which have been treated with ferrous sulfate and hydrogen peroxide. In both treated solutions the dichromate is reduced to chromic ion by the reducing agent. The corrosion rates experienced by types 304L and 309SCb stainless steels after 144 hours exposure in D-12 solution treated with ferrous sulfate are 0.00014 and 0.0006 inches per month, respectively. The corresponding corrosion rates of these metals in untreated D-12 solution are 0.0012 and 0.0015 inches per month, respectively. Ferric hydroxide is noted to precipitate from the boiling solutions; however, the simultaneous addition of small quantities of nitric acid with the ferrous sulfate prior to boiling may avoid iron precipitation.

The corrosion rate calculated for titanium after 144 hours exposure in normal D-12 solution was 0.00004 inches per month. The corrosion rate of titanium in the ferrous sulfate treated D-12 solution cannot be calculated because of a slight gain in specimen weight; however, the corrosion rate experienced by this metal is considered to be extremely small.

Corrosion data of the various metals in D-12 solutions treated with hydrogen peroxide are not as yet available.

Corrosion tests of material of construction for two new RA columns for the TBP plant are approximately 50% completed. Corrosion rates of specimens are being determined from weight losses suffered during five 48-hour boiling periods in simulated RAF solution. Twenty-four samples have been tested thus far. Sample No. 562-20, representing 110 feet of 1 inch schedule 40 type 347 stainless steel pipe, exhibited a high unacceptable corrosion rate, namely, > 0.003 inches per month.

Service Failures

The ruptured slug problem appeared to be concentrated at the C Pile where 11 ruptures and suspected ruptures occurred. The one rupture at H was a 63S canned slug

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and the other was a C slug. The two ruptures at DR were from J-2 material. Observation of the available failures showed them all to be of the split type and one to have a transverse split. A macroscopic examination was made of the fractured rupture #262 that was discharged from 2671-C on June 27, 1953 after a tube exposure of 455 MWD/T. The examination revealed a very poor quality of uranium and it is possible that the transverse cracks which were observed resulted from rolling partially in the beta phase and oriented the break normal to the slug axis. A report on this examination has been issued by L. J. Chockie as Document No. HW-29818. Five additional slugs containing transverse failures have been selected from C Pile and will be examined as soon as delivery to the Radiometallurgy Building can be effected.

A second vertical safety rod broke in position 35 at the 105-B Area. Preliminary examination shows the break to be transverse through a hole in a manner similar to the failure which occurred in March. It is again reported that the braking mechanism was defective. Hardness measurements show that the section is above specifications by 10 R_C points. A report on the first failure is reported by W. S. Kelly in Document HW-29779.

The ruptured receptacle slug which held the stainless steel sample for KAPL-113 was processed and the sample recovered. On September 29, 1953 a letter was written to Mr. C. A. Binch at KAPL by W. H. Clark of the Special Irradiations Sub-Unit requesting shipping instructions. A teletype was received requesting that the sample be buried since the contamination resulting from the rupture made it too hot to handle. The slug examination cave in 111-B is still being cleaned up as a result of this service job.

Facilities and Equipment

The move from 111-B to 327 Building is complete except for the heavy equipment and stored radioactive samples. Activation of the Radiometallurgy Building has reached the point where ruptured slug examinations, molding of canned slugs, dejacketing, and limited metallography can be accomplished. The double crystal x-ray spectrometer is being reassembled in the 327 Building. The control console and mounting table for the shielding cell have been installed on permanent bases. To enable the control of possible contamination, provisions are being made to provide for a constant air flow through the cell. Revised techniques are being employed in the preparation of a new monochromating crystal in an effort to increase the resolution and over-all versatility of the instrument. In addition, other minor modifications are in progress.

Installation of equipment and laboratory facilities for the welding laboratory in 328 Building is now in progress. Most of the electrical wiring has been completed. The welding machines are installed, but the auxiliary equipment is as yet not ready for operation. Work benches and storage shelves will not be available until laboratories in 3706 Building are vacated. About one-half of the capital equipment is on hand, about one-fourth is scheduled to be shipped in the next month, and about one-fourth is out for bids.

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234-5 Chemistry Research

The preparation of plutonium fluoride from plutonium oxide appears feasible by treating the oxide with solid ammonium bifluoride at temperatures between 200 and 400 C. The details of this procedure are as follows: 1) plutonium oxide is intimately mixed with a 33% excess of ammonium bifluoride and heated for two to three hours at 200 C, 2) the temperature is increased to 400 C, and the excess ammonium bifluoride, which is volatile at this temperature, is swept out of the furnace tube by a stream of argon. This procedure was tested using ceric oxide as a plutonium "stand-in." The ceric oxide-ammonium bifluoride mixture was free flowing and had no tendency to cake at 200 C or 400 C. The cerous fluoride product which was obtained at 400 C was also free flowing and appeared to be of good quality as determined by visual examination. The cerous fluoride was reduced in a sealed bomb using calcium as a reductant and a calcium-iodine booster. A poorly shaped button having a yield of about 60% was obtained. The preparation of plutonium fluoride by this process is now under way.

Previous precipitations of calcium plutonium (IV) fluoride have been carried out using equimolar calcium and plutonium concentrations. One experiment has been carried out wherein the calcium ion concentration was adjusted to one-half the plutonium concentration prior to precipitation. The precipitate which was formed settled faster and filtered more easily than precipitates obtained using one mole of calcium per mole of plutonium. The composition of the dried solid was found to be $PuF_4.1/2CaF_2$. A bomb reduction using this material produced a poorly shaped button of low yield, namely, 73%. The substitution of strontium for calcium in the normal preparation of strontium plutonium fluoride (equimolar strontium and plutonium concentrations) resulted in a precipitate which settled very slowly and had a low bulk density. The reduction of this material to metal produced a well shaped button; however, the button yield was only 64%. A series of experiments to determine the solubility and physical characteristics of calcium plutonium fluoride as a function of nitric acid has been performed. Quite surprisingly, the supernatant solution waste losses were found to be extremely low at high acidities; solubilities the order of 0.04 to 0.06 g/l Pu were measured in solution up to 11 M HNO_3. Initial settling rates were observed to decrease with increasing nitric acid concentrations; however, the settling rates increased markedly when the precipitates were water-washed.

The reduction of plutonium oxide by aluminum in an open crucible to produce a plutonium-aluminum alloy has been demonstrated off-site. Since the plutonium reduction yield is quite high, this system offers a possible means of preparing pure plutonium metal from the oxide if a good procedure for the separation of plutonium and aluminum can be developed. Further, the high temperature preparation of plutonium fluoride which is currently a prerequisite for plutonium production at Hanford is eliminated. Laboratory investigations have been initiated to determine the maximum plutonium concentration which can be tolerated in the production of plutonium-aluminum alloys without sacrificing the plutonium yield and to investigate means of separating pure plutonium from plutonium-aluminum alloys.

The feasibility of preparing plutonium trichloride by phosgene in 234-5 operations depends in part upon the proper choice of material for equipment fabrication. The

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Hastelloy alloys appear to be the most resistant to phosgene at operating temperatures. The corrosion rates of Hastelloys A, B, and C may be estimated using the following formulas:

$$\text{Hastelloy A:} \quad \log_{10} C.R. = 0.00849T - 6.49$$

$$\text{Hastelloy B:} \quad \log_{10} C.R. = 0.00655T - 5.72$$

$$\text{Hastelloy C:} \quad \log_{10} C.R. = 0.00951T - 6.81$$

C.R. is the corrosion rate in inches per month, and T is the temperature in degrees Centigrade. The corrosion rates calculated by the above formulas are only valid in the range of 300 C to 550 C. Hastelloy B appears to be the best material for equipment which is exposed to phosgene gas.

234-5 Metallurgy

A study has been initiated to determine the α phase recrystallization temperature and the amount of cold working necessary for a given grain growth. Severely cold worked specimens of a 0.5 weight percent gallium-plutonium alloy have been heat treated at 50, 75 and 100 C for 30 minutes. Hardness measurements taken prior to and after heat treatment indicate that recrystallization had not occurred at the test temperatures.

Type 304L stainless steel is being evaluated as a fabrication material for the new RM Task III reduction bombs. One specimen of this steel was stressed to 4540 psi, heated to 750 C in 15 minutes and allowed to cool for 1 1/4 hours. The temperature cycle was repeated until the specimen ruptured. The load applied to the test piece is related to the maximum bomb pressure that has been observed in plant practice (450 psig) and the particular bomb design currently being considered for RM Line use. The 304L stainless steel test piece failed after 103 cycles and the elongation at rupture was 6.2% in a four inch gage length. Bombs fabricated from this steel should last at least 10 times and more likely 100 times longer than the mild steel that was formerly used in 234-5 RG Line operations.

An elastic stress analysis was made for the reduction bomb which is used in the separations area for plutonium production. Bending stresses, hoop stresses, and axial compressive stresses are considered. The tensile stress is given for an experimental program to determine the operating life of the reduction bomb. A report containing the results of these calculations will soon be published as HW-29820.

Three samples of the 234-5 hydrofluorination product, all of which were characterized by a blue color in contrast to the usual salmon pink color, were analyzed by x-ray diffraction techniques. These off-standard products, so-called blue powders, were found to be mixtures of plutonium tri- and tetrafluorides. One sample was mostly plutonium tetrafluoride while the two others contained PuF_4 and PuF_3 in the ratio of approximately 1:4. This ratio, estimated from the relative intensities of the diffraction patterns, agrees well with that calculated from a chemical determination of total fluoride.

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Investigation of lattice parameters of uranium inclusions for the Chemistry Unit has been completed. X-ray analysis of two different inclusion samples showed one to contain UN only while the second was found to be composed entirely of UC.

The α to β, β to γ, and γ to δ phase transitions in pure plutonium metals are found to be rapid upon either heating or cooling the metal sample. When 0.5 weight percent gallium is alloyed with plutonium, it is frequently observed that the plutonium is stabilized in the δ phase. The δ phase stabilization prevents the detection or determination of the α to β, β to γ, or γ to δ transition temperatures. Detection of these transition temperatures is a prerequisite for the establishment of the plutonium-gallium phase diagram. Heat treatment studies have been carried out to find means of initiating α growth in the δ stabilized alloys. The heat treatment of cast or cold worked 0.5 weight percent gallium-plutonium alloy for 48 to 240 hours at 110 to 115 C failed to produce any α growth. Heat treatment of the alloy in the region of γ stability (216 C) for 120 hours followed by cooling to room temperature resulted in the formation of detectable quantities of α phase material. This heat treatment procedure should permit the determination of the gallium-plutonium diagram when partially δ stabilized alloys are being analyzed.

CHEMISTRY UNIT

In-Line Analysis

The Metal Recovery Process in-line monitors for feed, waste, and product operated continuously during the month with only normal maintenance. During testing it was frequently shown that a condition of high feed concentration was associated with high waste loss. At month's end the plant was operating on the basis of results from the monitors and in one case the waste loss was rapidly and efficiently reduced from 5% to 1% on the basis of monitor results. Manufacturing personnel have been trained in application of the instruments; blue cover reports describing the development work are being prepared, and instructions for operation, installation and maintenance are being issued.

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The colorimetric monitor for uranium in feed was improved by water-proofing the phototube housing and electrical leads; monitor versus laboratory analyses continue to show an agreement of about ± 5%, although laboratory testing with the monitor instrument shows a precision of ± 0.5%. The polarographic monitor for uranium in waste has yielded results slightly higher than those in the laboratory; a thorough review of procedures by laboratory personnel have uncovered several modifications that tend to eliminate the bias. The monitor for gamma activity in product was made more rugged by eliminating Tygon connections, and performance was improved by introducing a cesium standard of optimum activity.

Two other monitoring techniques deserve comment. Application of the photometer to provide an alarm system in the event of high plutonium content of Recuplex waste has been successfully demonstrated in the laboratory. The work included design and testing of the photometer unit, the installation, and the circuitry. The system can be set at the desired 1 g/l threshold and will provide an alarm signal if the concentration is within ± 0.1 g/l of this setting. The analysis is predicated on the presence of Pu(IV); the chemistry of the system assures that no appreciable quantity of Pu(VI) can be present. The second item involves the determination of low level plutonium in waste streams where the high concentrations of beta-gamma activity, salt, and Am-Cm preclude the possibility of the direct alpha determination. A promising solution to the problem involves application of a remotely operated unit for extracting plutonium; one such unit was constructed and has operated successfully for one week in the laboratory.

The system for continuously sampling P-10 product in waste streams was installed in the process. Present work consists of leak testing and calibration of the mass spectrometer to which the samples are fed.

Instrumental Analysis

Past reports have referred to the effort to establish mass spectrometric determinations of plutonium isotopes and have referred to instrument modifications and tests with stand-ins to establish optimum filament conditions and geometry to effect thermal volatilization and ionization of plutonium. During the present reporting period plutonium was first used with the instrument. The response obtained was quite low; however, exceptionally small samples were employed as a precaution against unexpected hazardous conditions.

There has been some concern that the U-236 in Hanford UO_3 product provides a small but consistent bias in the determination of U-235 content. As a result, a series of mass spectrometric analyses was made which showed the U-236 content to be about 0.002%. Since only a portion of this isotope peak appears in the U-235 peak, it is concluded that no bias results. It is of interest to note that the U-236 content of Hanford product as calculated from pile data is about 0.007%, which is significantly higher.

A survey was made and reported during the month to evaluate the applications of direct reading emission spectrometers to Hanford analyses. Such instruments have the advantage of speed, accuracy, and low operation cost but have the disadvantage

of high installation cost. It was concluded that there is not a sufficient number of repetitive analyses in the 300 laboratory to justify an instrument but that there is a definite possibility of advantage in the 234-5 laboratory. The information was transmitted to Manufacturing laboratory personnel for their consideration.

Reference was made in the last report to spectrograms taken off-site with the echelle spectrograph. This unit is an interferometer attachment to a normal spectrograph that increases the dispersion 40-to 50-fold and thereby offers the definite possibility of direct analysis of uranium, plutonium, and other heavy metals having a large number of emission lines. The spectra were obtained on standard samples of graphite and uranium. Examination of the plates shows that gadolinium in graphite may be detected with a sensitivity of 1-10 ppm, whereas normal spectrographic analysis yields a lower limit of 1000 ppm. There is ample room to lower the sensitivity of the former since excitation conditions were chosen at random and cannot be expected to be optimum. Work is continuing to interpret and evaluate the entire group of spectra.

A promising solution to the determination of phosphate in Metal Recovery feed is that involving treatment with an exchange resin to remove cations and subsequent coulometric titration of the phosphoric acid in the effluent. An accuracy of ± 5% is obtained in the analysis of ul of solution having phosphate molarity of 0.27. The entire analysis consumes about 20 minutes.

A development in the field of radiochemical instruments involves construction of a shielded, directional, scintillation counter survey head that has proven of considerable value in locating regions of high activity during cleanup of the Hot Semi-Works. A second item of interest is adaptation of a proportional counter to the gamma spectrometric determination of low energy x- and gamma-rays. The unit is not responsive to high energy radiation, and as a result, the Compton background is essentially eliminated from the low energy region. The system will be employed in continuing work attempting to use low energy radiations for analytical purposes.

Chemical Analyses

The availability of a supply of americium allowed studies of the behavior of this element during electrodeposition. From acid-oxalate solutions, such as those employed for plutonium electroplating, it was found that americium does plate, thus establishing the fact that it tracks with plutonium. Further work established optimum conditions for preparation of americium-plated discs. A somewhat parallel line of work with curium established the fact that the previously established TTA extraction procedure does in fact provide a separation for combined americium-curium.

Waste Treatment

Successful laboratory studies on the scavenging of cesium led to conduct of a production test during the month. The test involved treatment of 100,000 gallons of unconcentrated Metal Recovery waste and consisted of treatment with potassium

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ferrocyanide, neutralization and addition of nickel to precipitate nickel ferrocyanide and scavenge cesium. The test called for a pH of 9.5 ± 1 in the neutralized solution. In practice, however, a large part of the solution was neutralized to pH 12, a condition under which poor scavenging was obtained. Grab samples obtained at different times during the test showed the following pH versus decontamination relationship:

pH	DF Cs	DF Sr
8.75	4000	35
9.75	10,000	37
10.2	3400	47
12.5	1.2	200

The waste tank in which the suspension is retained is shown to have a pH of 9.8 in the upper level and a pH of 13 in the bottom. It is planned to remove the upper portion and improve cesium decontamination in the remainder by partial acidification.

Separations Processes

In consideration of the prospective use of zirconium canned slugs, a series of tests was initiated to find methods for handling the slugs after irradiation. The initial test involved the rate of dissolution of uranium from an Al-Si bonded zirconium-clad slug that had been sawed in half; in 60% nitric acid the uranium dissolves at a rate that is not appreciably less than that of a bare uranium slug. Preliminary inspection indicated that there was some attack on the zirconium can.

Previously reported work defined the effect of fluoride catalyst on the dissolution of aluminum cans in acid. Further experiments involved study of the dissolution rate in uranium nitrate-fluoride containing solutions; the rates were unaffected by the presence of uranium.

Tests continue to show that the presence of NO_2 in dissolver solution has an influence in subsequent extraction operations. It was previously shown that introduction of NO_2 during slug dissolving lowered the decontamination factor in subsequent Redox or Purex type extractions but that if the solution were sparged before extraction, there was no deleterious effect. Further studies during the month were carried out to determine the effect of NO_2 addition after slug dissolving under normal conditions. In this case the NO_2 resulted in a six-fold lowering of ruthenium DF and a 190-fold lowering of Zr-NB DF for the Redox type extraction. Unexplained is the observation that the presence of NO_2 under these conditions had no effect on Purex decontamination.

Continued study of the physical chemistry of extraction processes included, during the month, the measurement of the self-diffusion of the uranium-TBP complex. Of the various systems studied to date, it is of interest to note that this yields the lowest diffusion coefficient, thus lending additional support to the growing belief that the removal of the uranium complex from the interface is the limiting step in the extraction mechanism. The data obtained to date are as follows:

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Component	System	Diffusion Coefficient
TBP	100% TBP	2.29×10^{-6} cm^2/sec.
TBP	30% TBP	4.3×10^{-6} " "
UN-$(TBP)_2$	100% TBP + UN	0.13×10^{-6} " "
UN-$(TBP)_2$	71% TBP + UN	0.36×10^{-6} " "
UN-$(TBP)_2$	30% TBP + UN	1.25×10^{-6} " "
UNH	Aqueous UNH-2.3 M HNO_3	4.3×10^{-6} " "

Upon completion of the installation and testing of an electrochromatographic unit, a series of experiments has been carried out in an attempt to gain an understanding of the chemistry of ruthenium. The compound $K_4Ru(NO_2)_6.H_2O$ was employed in the first test since it is believed to be a source of ruthenium species that is troublesome in the separations processes. When solutions of the compound were subjected to electromatographic separations in acid and ammoniacal media, and after treatment with peroxide, extremely diverse behavior of ruthenium was noted. Further work will involve treatment of dissolver solution in an attempt to establish similar or different electrochromatographic ruthenium behavior. Infrared analysis of the compound tentatively established an ether type linkage (e.g., Ru-O-Ru), thus suggesting the validity of an alternate structure indicated in the literature $[Ru_2O(NO_2)_6.6KNO_2.2H_2O]$. Parallel work with RuO_4 which is also suspect as a misbehaving ruthenium species or precusor of one has definitely established the tetrahedral structure of the compound but has failed as yet to prove or disprove a symmetrical arrangement.

The prospects of employing electrochromatographic treatment to effect isotope separations has given an indication of success when applied to uranium. Treatment of UNH with a formic acid medium yielded a slight but apparently significant enrichment. Parallel isotope separation studies involve a technique in which a molten zone is carried repeatedly along the length of a column of UNH. The procedure, which has been successfully employed with lighter elements, is predicated on the enrichment of the heavy isotope in the solid and the consequent movement of the lighter isotope along the tube in the molten zone. A rough laboratory mock-up has not yet demonstrated an isotope separation but has shown a three-fold enrichment of UX_1 when treating UNH in this manner.

Two other process studies bear reference. The first involves batch Metal Recovery and Purex extractions which show that butanol formed as a TBP degradation product is removed with the aqueous wastes and consequently is not subject to concentration buildup. The second problem is a continuation of previous work which defined the hydrolysis half-life of monobutylphosphate. The present work with dibutylphosphate showed the half-life at 100 C in 6 and 0.2 M nitric acid, respectively, to be 3.5 and 50 hours. Under existing conditions it is concluded that no appreciable loss of DBP occurs between sampling and laboratory analyses.

Previous experience with Purex pilot runs indicated a poor uranium extraction efficiency unless higher extractant flow rates were used. Although the use of swirler plates appears to have solved the problem, it was of interest to complete a laboratory run designed to evaluate the behavior of a system having low feed-point saturation. One hundred-day old dissolver solution was employed in two Mini

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countercurrent extractions representing the HA and 1A columns. Fifty percent organic saturation was employed rather than the normal 75%. The ruthenium content of uranium product was found to be higher than normal in accord with previous findings that ruthenium extraction is inversely related to the degree of feed-point saturation. Zirconium-niobium contamination of plutonium product was increased, probably as a result of increased nitric acid concentration resulting from reflux action. The study was continued with batch extractions simulating the third uranium cycle and yielded a uranium product that was slightly out of specification. The conclusion is that a slight decrease of saturation is acceptable over the three-cycle operation but that counter-measures would be required if it were reduced to 50%.

Successful operation of a Redox plutonium reflux run in the Mini unit, as previously reported, indicated the need for additional equilibrium data to allow greater flexibility in designing altered flowsheets. To this end data were obtained showing that nitric acid extraction is somewhat dependent on the concentration of both tetravalent and hexavalent plutonium; although the effect is small, it would require consideration in a column with many nitric acid stages. Continued work will include studies of the extraction of plutonium as a function of nitric acid, ANN, and sulfate concentrations.

A small amount of attention is being paid to radically different separations process schemes. The dry fluoride process which is being pursued actively elsewhere presents some major problems in slug dissolution and plutonium separation. To avoid these problems, a modified scheme is under study involving aqueous systems for slug dissolving and plutonium separation; this to be followed by dry fluoride treatment of the uranium. Phenylarosnic acid, a selective plutonium extractant, exhibits a low diluent solubility, an aqueous solubility sufficiently high for process application, and an adequate solubility of the plutonium complex in organic phase. Of the diluents tested, the most satisfactory in regard to the U-Pu separation factor was butyl acetate (70%)-ethyl acetate. Plutonium distribution (E_a^o) was found to range from 1.4 in 1 M HNO_3 to 0.6 at 2.15 M HNO_3.

Laboratory Waste Disposal

Approximately 1,200,000 gallons of retension waste from the Works Laboratory Area were processed to ground. Fifty gallons of organic and aqueous low level UNH waste was disposed of by transporting to the 300 Area pond. Eight trips were made to 222-S, 200 West Area, for the disposal of 40 gallons of liquid waste in various sized bottles and shielding containers. Twenty-seven waste cartons from 3706 Building, requiring special handling, were disposed of via the 300 Area burial ground.

Activity in the crib waste tanks at 340 Building necessitated the removal of a temporary line which had been used to direct crib waste analyzing less than retention limits to the retention system. This line had been installed in July as a temporary expedient to provide for the disposal of crib tank liquid directly, in those cases where 300 Area retention limits are not exceeded. The increase in activity now makes it necessary to truck all crib tank liquid to 200 West Area for disposal. Approximately 10,000 of the 18,000 gallons collected during the month were diverted to retention before the line was removed.

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The first pre-formed concrete shielding barrel for use in the Radiometallurgy Building was made by waste disposal personnel. This barrel will be used as a shielding medium for a one gallon glass container used to collect high activity waste. After the gallon container is filled, it will be broken and the core of the barrel will then be filled with cement. This type of barrel is disposed of by burying. Tests established methods for handling various types of waste.

A study of the cost of glassware discarded in 3706 Building for a two-month period showed that it is economical to decontaminate only certain types of glassware (mainly calibrated pieces) and that the rest should be discarded. Plans for glassware decontamination in the Radiochemistry Building are being predicated on this study.

Both samplers in 340 Building failed during October necessitating removal and cleaning. This was attributed to the pick-up of dirty, rusty water which may have gotten into the system from construction flushing operations in some of the uncompleted buildings.

Two mandays were spent doing special decontamination within laboratories of 3706 Building. One more day was spent doing special decontamination in Room 1E, 222-S Building. One serviceman was on loan to Material Control, Applied Research, one-third of the time, to aid in material inventories. Other building laundry and service functions were accomplished in a routine manner.

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 October, 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
E. E. Voiland	Use of Ion Exchange Membranes in the Electrolytic Separation of Isotopes
W. B. Tolley	Preparation of Plutonium Trichloride with Carbon Tetrachloride
W. B. Tolley	Preparation of Plutonium Trichloride with Phosgene

Signed: F. W. Albaugh
Manager, Applied Research
ENGINEERING DEPARTMENT

FWA:ltc

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MONTHLY REPORT
DESIGN SECTION

VISITORS AND BUSINESS TRIPS

F.W. Davis, Chairman, AEC Welding Committee, visited here September 28 through October 5 to discuss Hanford welding problems.

R.L. Olson and G.H. Syrovy of North American Aviation, Inc., Downey, California visited here October 5 - 7 to discuss the design, construction and costs of reactor components and welding techniques employed on stainless steels used in the chemical separations areas.

E.L. Frost of the Instrument Laboratory, Inc., Seattle, Washington visited here October 15 to inspect a location for CA-512-R Position Indicators.

H.S. Davis visited Pickands Mather and Company, Caspian, Michigan, October 2 to inspect limonite ore.

G.M. Roy, G.L. Locke and E.L. Armstrong visited ORNL, Oak Ridge, Tenn., and ANL, Chicago, Illinois, October 3 - 10 to discuss new reactor design and attend Reactor information meetings.

L.M. Keene visited the General Electric Company, Phildelphia, Pa., October 5 - 10 to inspect switchgear being manufactured by General Electric for "K" Water Plant.

T.H. Edwards visited the Seattle engineering office of the Puget Sound Naval Shipyard, Seattle, Washington, October 12 to contact engineers concerning specifications on electrical cable.

J.D. Fogelquist visited the Instrument Laboratory, Inc., Seattle, Washington, October 12 - 14 to inspect CA-512-R Rod Position Indicator Prototype.

G.R. Wilde visited the Pacific Scientific Company, Portland, Oregon, October 13 - 16 to assist in testing Gas Analysis Equipment on Project CA-531-B.

J.K. Flickinger visited Hoke, Inc., Englewood, New Jersey; The Bristol Company, Waterbury, Conn.; and Panellit, Inc., Chicago, Illinois, October 13 - 20 to clarify Pressure Monitor details on Project CA-512-R.

H.S. Davis visited the North Pacific Division Laboratory, U.S. Corps of Engineers, Troutdale, Oregon, October 15 to discuss techrical features of test program on high density concrete.

J.F. Nesbitt visited the Precision Machine Works, Tacoma, Washington, October 23 to inspect jigs and fixtures used to fabricate connectors, and to discuss problems concerning centering flanges.

B.R. Elder visited Aluminum Company of America, Pittsburgh, Penn., October 22 to discuss aluminum fabrication.

C.R. Bergdahl left to attend the American Public Works Association 95th Congress, New Orleans, La., and to attend the AIEE Fall General Meeting, Kansas City, Mo., October 23 - November 8.

ORGANIZATION AND PERSONNEL

Personnel Statistics:

	September 30			October 31		
	Exempt	Non Exempt	Total	Exempt	Non Exempt	Total
Design Management	2	1	3	2	1	3
Process Engineering Sub-Section	54	12	66	60	10	70
Design Planning	17	12	29	17	13	30
Design Engineering Sub-Section	85	12	97	84	12	96
Total Section Personnel	158	37	195	163	36	199
Technical Graduates (Rotational)	-	7	7	-	6	6
TOTAL	158	44	202	163	42	205

Accessions - 4
Separations - 1

GENERAL

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

	Man Months Expended	% of Total
1952 Expansion Program	85.5	54.2
Research and Development	32.7	20.7
Other Projects and Design Orders	39.6	25.1
	157.8*	100.0

* Equivalent man months expended includes 1.3 man months of overtime.

DESIGN DEVELOPMENT

Statistics:

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

	Man Months Expended	% of Total
RDS-D-10 Reactor Design Development	7.5	22.9
RDS-D-11 Water Plant Design Development	9.1	28.1
RDS-D-12 Separations Design Development	5.0	15.2
RDS-D-13 Mechanical Design Development	6.9	21.0
RDS-D-14 Utilities & Services Design Development	.5	1.5
RDS-D-15 Engineering Standards and Materials Development	3.7	11.3
	32.7	100.0

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RDS-D-10 - Reactor Design Development

A visit was made to the vendor's plant to review the various types of imperfections that have been discovered in K-type process tubes which have been fabricated to date and to evaluate the seriousness of these flaws. The production run submitted to G-E inspection October 19 was accepted as the experimental order. This tubing, despite minor defects, is suitable for all test purposes except corrosion experiments. A new improved extrusion die lubricant is being used and should eliminate the graphite removal treatment which has caused unsatisfactory finish in the past.

A visit was made to the North Pacific Division Laboratory, U.S. Corps of Engineers, Troutdale, Oregon to inspect the concrete testing activities. Specimens for concrete F were pumped satisfactorily at that time.

RDS-D-10 and D-11 - Reactor Plant Development

A preliminary study of the technical and economic feasibility of a dual-purpose power reactor plant at Hanford was completed. The study provided the basis for formal recommendations made to the Atomic Energy Commission by the General Electric Company that authorization be granted for development, design and subsequent construction of such a reactor.

An engineering study was carried forward to determine the best means of increasing existing water plant capacities in order to allow an increase in the power level. Several alternatives have been proposed of which two appear to be the most feasible. One involves modification to achieve maximum flows without extensive water plant pumping changes while the second proposal involves increasing coolant water flows to the maximum permitted by process tube pressure limitations. Based on the assumption that there is a demand for all the plutonium that can be produced at or below unit cost, design is going forward on development of the second alternative, which will provide for the greatest possible increase in water flow, and thus capacity increase, under present conditions.

Work was continued during the month on the study of a low-cost single-purpose reactor. No additional design factors which would limit the original intentions of the development have occurred. Design development work has included work on a charging machine, front nozzle and crossheader design which include an oval-shaped crossheader and a nozzle containing a flapper valve, building lay-out, pump requirements and plant lay-out. Refinements of preliminary cost estimates indicate a $63,000,000 investment.

RDS-D-12 - Separations Design Development

A study was started on the separations plants actual capacities and possible future capacities. These investigations are being made in light of the 100 Area projected actual and possible future capacities.

A fibre glass filter is being scoped for potential application in the Purex Plant ventilation exhaust system. Recent experience at the Redox Plant indicates that the radioactive particulate matter entering the sand filter has increased such that some filtration may be requied at the Purex Plant. Substitution of

a fibre glass filter design for a sand filter design might reduce the capital investment, if filtration is required in the Purex Plant, by approximately $400,000.

The design of silica-gel process for decontamination of uranium from the Redox Plant is being scoped. Such a process should eliminate most of the reprocessing of uranium which fails to meet decontamination standards and may permit the realization of a two uranium cycle Redox process. The latter would simplify the requirements of the Phase II backcycling operation.

RDS-D-13 - Mechanical Design Development

The installation in Building 314 of the prototype fuel element canning machine is nearing completion. Mechanical shakedown of the machine continued without heat in the furnace. Operation at low speed with all tools installed was possible with difficulty because of malfunctioning of certain parts of the auxiliary program. Effort was concentrated on eliminating these defects in order that hot testing might be started in six weeks.

Work continued on an automatic sampling counter for alpha radiation and drafting is approximately 80% complete. A survey is being made to accumulate enough data to make a realistic estimate of potential operational savings which would be effected by use of such an instrument.

RDS-D-14 - Utilities and Services Design Development

Work on emergency cooling water for reactors in case of a major disaster was continued during the month. Indications are that any method to supply reliable emergency cooling water to the reactor will involve considerable expense. The heat evolved following a reactor shutdown may be controlled by slug discharge and/or some other simple heat dissipating operation.

RDS-D-15 - Engineering Standards and Materials Development

Cost plus estimated commitments to date for development of engineering standards for the current FY is $34,500.

The following standards and revisions to standards were approved by the Standards Representatives during October:

HW-5305-S	Standard Specification for Oxalic Acid Etch Testing of Stainless Steels.
D-1-6a	Instrumentation Receptacle
B-4-12	Pipe Supports, Rev. 2
DG-100-M	Design Guide for Process and Service Piping, Rev. 3
HW-5301-S	Standard Specification for Austenitic Stainless Steel-Type 304 and 304L, Rev. 2

The progress on standards for October is as follows:

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a. A new standard for stainless steel welding electrode and filler rod is 90% complete, an advance of 5% during the month.

b. New standards are being prepared on instrument symbols and panels and were advanced 5% during the month to 60% complete.

c. Major revisions are being made to the standards for welding aluminum and aluminum alloys, stainless steels, and carbon steels.

DESIGN PROJECTS

Statistics:

Design effort on projects by the Section for the month of October was expended in the following categories.

	Man Months Expended	% of Total
CA-512-R 100-K Reactor	43.9	35.1
CA-512-W 100-K Water Plant	2.6	2.1
CA-513 Purex Separations Facility	20.8	16.6
CA-514 300 Area Expansion	11.3	9.0
CG-551 Expansion of Bldg. 234-5 Facilities	6.9	5.5
CG-558 Reactor Plant Modification	10.7	8.6
CG-562 TBP Plant Modifications	1.4	1.1
Major Projects - Other than Expansion Program	20.3	16.2
Minor Projects and Design Orders	7.2	5.8
Total	125.1	100.0

CA-512-R - 100-K Reactor Facilities

Design progress on the 100-K Reactor Facilities was advanced to 97.4% complete, an increase of 0.9% during the month. Of the 1903 drawings which have been approved to date, 23 were approved during the month.

Expenditures to date are approximately $1,835,800 against a revised estimate of $2,425,000. Of the 1066 requisitions to be prepared, 1023 have been issued by the Design Section for procurement of engineered items for 105-KW and 105-KE Facilities. The total value of this equipment is approximately $16,634,900.

The design of the Water Studies Semi-Works is approximately 62% complete, an advance of 37% during the month. Tunnel piping is being held up because of lack of information from the architect-engineer. Rubber lined pipe is being considered for use in transporting the floc water from the sedimentation basin.

The checking of reinforcing steel placing drawings and structural steel fabrication drawings for the 105-K and 115-K Buildings continued during the month. A total of 10 structural steel fabrication drawings and 8 reinforcing steel placing drawings were received and checked during the month.

Arrangements were made to test one set of twelve prototypes for the Temperature Monitor. Revisions will be made to the equipment to permit its use on the 105-H

reactor. Shipments of the two sets of twelve prototypes is being delayed pending relay delivery.

A fifty foot length of dual line hose for horizontal control rod cooling water was received. This will be installed on a hose-reel and the combination will be checked for satisfactory operation before the balance of the hose-reel order will be released.

CA-512-W - 100-K Water Plant Facilities

Detail design of the 100-K-B-C telephone exchange was advanced to approximately 92%, an increase of 2% during the month. Construction specifications for the tank and exchange cables are 50% complete. Additional refrigerating equipment will be installed in the "B-Y" tandem telephone exchange in order to keep summer temperatures within the limits specified by the vendor.

The scope of the emergency crib has been changed from a ten-foot bed of screened Gable Butte sand of 1 to 2 mm grain size to a ten-foot bed of unscreened Gable Butte sand. The Radiological Sciences Department prefers unscreened sand for filter material, the filtering rates are adequate and the fact that screened sand is more costly all contribute to the decision for the change.

A review of electrical and instrument drawings and specifications submitted by the architect-engineer continued through the month.

CA-513 - Purex Facility

Detail design of the Purex Waste Facility is 100% complete, an advance of 7% during the month. All work including drawings and specifications required for the bid package was completed. Certain minor revisions and scope changes were made after the submission of the bid package.

Review of process and engineering flow diagrams submitted by the architect-engineer continued through the month.

Over-all design of the Purex Outside Facilities is approximately 95% complete. Five drawings were approved for construction, two drawings were approved and four drawings were issued for approval. Design was started on the coal handlers warming shelter. A short circuit study was prepared to determine the available short circuit current at the 202-A Building.

Design work on CA-513-B, Metal Conversion Plant Expansion, is 100% complete, an advance of 1% during the month. Two prints were approved for construction and five were revised.

Design of the Hot Semiworks Conversion was advanced to 68% complete, an increase of 33% during the month. Design reviewed and approved 37 out of 53 equipment drawings produced by the Technical Section. All A, B and C cell piping drawings have been issued for comment and stripping drawings for C cell service piping have been completed. The design of a demineralization building has been added to the original work.

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CA-514 - 300 Area Expansion

Detail design of the 300 Area Expansion Program was advanced 9% during the month to 72% complete. Revised design progress and drawing schedules were issued. The slug recovery process was modified to use a sodium hydroxide bonding layer stripping bath instead of hydrofluoric and nitric acid baths. Testing of the experimental spray cleaning unit has demonstrated that this method of cleaning is entirely adequate for slug pickling and probably for other component preparation processes.

The final drawings and specifications of the 313 Building structures and equipment prepared by the architect-engineer required considerable revision to make them acceptable. The necessary corrections have been completed on both the A-E and G-E second phase drawings and specifications to form a complete design. Design will prepare specifications for the fabrication and erection of structural steel, roofing, and movable partitions by lump sum contractors.

CG-431-B - 100-C Area Production Facilities

Revision of 698 drawings has been completed and these drawings have been returned to files. An additional 429 drawings have been revised by the drafting room but remain to be checked. A design representative visited a vendor to witness testing of gas analysis equipment. The tests indicated that the equipment can be calibrated satisfactorily.

CA-431-C - Metal Examination Facility Equipment

Design work on the underwater metal examination equipment at 105-C was advanced 18% during the month to 55% complete. Twelve drawings were issued for approval to make a total of 29 drawings which have been issued for approval out of a total of 84 required drawings. Material requisition preparation for critical items is in progress.

CG-496 - Recuplex Installation - 234-5 Building

Detail design of the Recuplex Installation is 100% complete, an advance of 2% during the month. The main effort involved minor revisions to previously approved drawings and completion of drawings for the chemical storage facilities.

CA-535 - Redox Capacity Increase, Phase II

Final design for Redox Capacity Increase, Phase II was advanced 10% during the month to 75% complete. Ten drawings were completed and issued for approval. Instrument drawings submitted by the Vitro Corporation on the product concentration building were reviewed and comments were transmitted to the Project Section.

CA-549 - Activate Task I, Building 234-5

Design work on the Activation of Task I, Building 234-5 is approximately 31% complete, an advance of 9% during the month. Seven drawings were issued for comment for a total of twenty to date out of 112 required drawings. A special effort is being made to complete initial design and test of a reactor which will be the crucial item in the Task I.

CG-550 - Reactivation of P-10 Facilities

Detailed design of the Reactivation of P-10 Facilities was advanced 9% during the month to 98% complete. Of the 108 drawings required, 107 drawings have been approved, an increase of 18 drawings during the month. Requisitioning of instruments was completed.

CG-551 - Expansion of Building 234-5 Facilities

Design work on Expansion of Building 234-5 Facilities was advanced 9.7% during the month to 46% complete. It was decided that the final inspection facility be moved to the present machine shop area, which is to be made available by the removal of machine tools and machine shop equipment to other locations. Investigation was started on new type and new location of thermocouple well.

CG-558 - Reactor Plant Modification for Increased Production

Scope design work on Reactor Plant Modification for Increased Production is 30% complete, an advance of 24% during the month. Principal emphasis was placed on the perparation of scope drawings and design criteria for the 100-B-C Area and flow diagrams for other areas. Scope design is proceeding based on increased coolant water flows which are limited only by maximum permissible process tube pressures. These inlet tube pressures would be 450 psig at all existing reactors except at 105-C where it would be 500 psig. The calculated discharges are 71,000 gpm in the former case and 73,000 gpm in the latter case based on the use of eight inch fuel elements in the central zones. Consideration is being given to the possibility of placing the new process pumps in additions to the present structures instead of inside the existing 190 Buildings.

Data are being accumulated and tabulated in preparation for the AC Network Analyzer Study to be conducted in Schenectady. This study will consider the effect of synchronous motors on the Hanford system and the problems associated with them. The addition of a third 230 KV line will also be studied.

CG-562 - Waste Metal Recovery Plant Modifications

A project proposal, revision 1, was prepared for the fabrication and installation of new columns and associated TBP Plant revisions and funds were authorized by the Commission on October 5, 1953. Design of this project was advanced to 100% complete.

D.O. 100329 - New 2101 Fabrication and Storage Facility

Design of the new 2101 Fabrication and Storage Facility is complete.

D.O. 100473 - Hot Ball Detection, Ball 3-X System

Design drawings were issued for comment on the mechanical design of a "hot" ball separator which can be coupled into the vacuum line at any point. A prototype will be made in an on-site plant machine shop.

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D.O. 100529 - Ball Third System - Ball Recovery System

Additional work and funds on the Ball 3X Safety System Modification were received. This work includes the purchase and installation of a ball washer in the 105-F Building. A ball washer specification was issued for approval. A total of four mechanical and two electrical drawings will be required.

D.O. 100549 - Redox Back-Cycle

Detailed design of the jumpers, vessels modification, and sample gallery ventilation in connection with back-cycling of 2DW and 3DW to earlier cycles as scrub is 45% complete. Thirty-five drawings have been completed out of the 60 required drawings.

D.O. 100577 - Gamma Monitor Chambers - 107 Basins

Design of the gamma monitor chambers was advanced 35% during the month to 85% complete. All drawings are out for comment and approval.

D.O. 100630 - Fuel Element Pilot Plant

The revised architect-engineer drawings for Phase I have been reviewed and comments were made and returned. Final Phase II drawings have not been received for checking.

D.O. 100638 - Gamma Type Water Monitoring Improvements

Work on scope and preparation of a project proposal was started. The project proposal is complete except for signatures. The design criteria, material list and list of critical material were prepared. The scope drawings of the 105-B, D, DR, F, and H Areas are in the final stages of drafting.

D.O. 100646 - TBP Plant Modifications to Maintain Capacity

The design of the TBP Plant Modifications to permit a two-cycle series operation of the process line is 100% complete.

D.O. 100656 - 202-S Building, Cell Layout As-Builts

Work on the program to bring the drawings of the 202-S Building process equipment and piping to the as-built status was continued and is approximately 70% complete. Twenty-eight layout drawings were checked, three equipment drawings were revised and 16 drawings remain to be checked.

D.O. 100663 - Alum-Activated Silica Facilities for 100-B, D, F and H Areas

The preparation of a project proposal was completed during the month for the design and construction of facilities for installation of alum-activated silica water treatment in the 100-B, D, F and H Areas. It is proposed, as the first phase of this program, to haul activated silica to B and H Areas and to make minor improvements to the existing D, DR and F Area test installations.

D.O. 100675 - X-Level Flow Equipment, 105-C

Design work was started on flow controlling and recording equipment for the 105-C test hole facilities. Ten drawings are required of which one was issued for approval.

D.O. 100677 - Portable Meteorological Mast

The program of revising drawings for the portable meteorological mast to the as-built status is approximately 75% complete. Ten drawings were brought to the as-built status and three new drawings were made to take care of newly designed circuits. These drawings were issued for approval.

D.O. 100679 - Fiscal Year 1954 Water Tank Replacement

Design was started with the completion of two required stress analyses. Information was furnished to the drafting room.

D.O. 100680 - Remodeling 100-B First Aid Station

Design was started on the remodeling of the 100-B First Aid Station. A preliminary architectural design for expansion of this building was completed.

D.O. 100682 - Redesign of H-4 Oxidizer - 202-S

Mechanical design of the H-4 Oxidizer was started and completed.

D.O. 100686 - Process Tube Flow Facility (CG-559)

Design was started on a process tube flow facility for installation in the 189-D Building. Ten drawings are required and design is scheduled to b completed by January 1, 1954.

D.O. 100689 - Outlet Tube Temperature Monitoring System (CG-553)

Design was requested to prepare specifications, purchase requisitions, acceptance test procedures, review vendor bids, and perform design field liaison as required for installation of a temperature monitoring systems at 105-D, DR and F. Two drawings were completed and sent out for comment.

D.O. 100700 - Design Scope - Central Mask Station 2123-W

Design was started and one drawing was prepared for a central mask station.

Design Section Work in the Closing Stages or Completed During October

*100217	Electrical Equipment for Recording Turbidimeter
*100237	Mercury Jet Switch
*100371	Gable Butte Railroad
*100425	Poison Tubes in 100-B Reactor
100476	Positive Ion Acceleration Laboratory
100501	Balancing Unit and Amplifier for Strain Gage Recorder
*100526	(CG-520) P-13 Pressure Assembly Removal
*100539	New Facility for Lattice Testing (326 Building)

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*100596 (CG-545) Soil Science Laboratory Facilities
*100631 Redox Waste Water Disposal Basin
*100639 First Cycle Waste Supernatant Cribbing Facilities
*100642 Jumper Design (241-WR)
*100646 TBP Plant Revisions to Maintain Capacity (221-U)
*100654 Poppy Amplifier Test
*100657 Jumper - 115 TX Pit (200-W)

* Design work completed during October

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. 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.

P H Beaton
Manager - Design
ENGINEERING DEPARTMENT

DESIGN SECTION WORK STATUS

PROCESS ENGINEERING SUB-SECTION
ENGINEERING MAN MONTHS *

Description	Backlog Start of Month	Orders Received During Month	Time Spent During Month	% of Total Effort	Backlog End of Month	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	Balance
CA-512-R	297.7		16.1	29.3	281.6	13	12	11	10	10	10	215.6
CA-512-W	30.4				30.4	.5	.5	.5	.5	.5	.5	27.4
CA-513	37.2		3.0	5.5	34.2	4	4	4	4	4	4	10.2
CA-514	6.3		1.6	2.9	4.7	1	1	1	0	0	0	15.3
CG-551	30.4		3.1	5.7	27.3	4	3	2	1	1	1	15.3
CG-558	111.0		7.1	13.0	103.9	10	10	10	10	10	10	43.9
RDS Program	362.1		21.4	39.0	340.7	19.5	22.5	24.5	27.5	27.5	27.5	191.7
Minor Design Orders	31.7		2.5	4.6	29.2	3	3	3	3	3	3	11.2
TOTALS	906.8		54.8	100.0	852.0	55	56	56	56	56	56	517.0

DESIGN ENGINEERING SUB-SECTION
ENGINEERING MAN MONTHS *

CA-512-R	83.3	20	22.0	28.0	81.3	20	17	14	11	8	5	6.3
CA-512-W	25.6		2.1	2.7	23.5	2	1.5	1	1	1	1	16.0
CA-513	52.3		15.1	19.2	37.2	10	7	5	2	1	1	11.2
CA-514	47.1		8.9	11.3	38.2	9	7	6	5	4	2	5.2
CG-551	6.7		2.3	2.9	4.4	1	1	-	-	-	-	2.4
CG-558	116.3		2.7	3.4	113.6	7	9	11	11	11	11	53.6
RDS Program	208.8		3.8	4.8	205.0	7	11.5	14	19	25	28	95.5
Major Projects - Other	59.0	60	15.8	20.1	83.2	15	15	15	14	13	13	18.2
Minor Projects & Design Orders	64.4	4.0	6.0	7.6	62.4	7	7	7	7	7	7	20.4
Future Work							2	5	8	8	10	
TOTALS	663.5	84.0	78.7	100.0	648.8	78	78	78	78	78	78	228.8

Present Total Backlog is distributed over the five engineering branches in terms of man months as follows:

	Authorized Projects	Anticipated Future Work	Totals
Architectural & Civil	89.2	20.4	109.6
Mechanical	211.1	40.1	251.2
Electrical	165.9	32.2	198.1
Instrument	145.4	24.2	169.6
Standards	37.2	10.1	47.3
TOTALS	648.8	127.0	775.8

*Ex sive of Technical Graduates

Design Section

HW-29794

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MONTHLY NARRATIVE REPORT - OCTOBER 1953

PROJECT SECTION

I. SUMMARY

A. ORGANIZATION AND PERSONNEL

On October 15, 1953 Engineering Planning of Minor Projects Sub-Section was dissolved as an organization unit, and personnel were re-assigned.

The numbers of Project Section personnel and Technical Graduates - Rotational remained at 573 and 13, respectively. The end-of-month status involved these changes:

	Project Section Personnel	Tech. Grad - Rotational
Payroll Additions	1	
Payroll Removals	9	
Transfers into Section	13	1
Transfers from Section	5	1
Tranfers within Section	5	

B. SCOPE OF ACTIVITIES

At the end of the month, completion status of major projects was as follows: CA-187-D-II, Redox, 7%; CA-431-A, 100-C Waterworks, 99.9%; CA-431-B, 100-C Reactor, 99.9%; CG-438, Ball Third Safety System, 97.5%; CG-496, Recuplex, 27%; CA-512, 100-K Area Facilities - Water Plants, KW, 34.7%, KE, 26.4% - Reactor Buildings 105-KW, 34.2%, KE, 10%; CA-513, Purex Facility, Part "A", overall, 12.09%, Part "B", 80%; CA-514, 300 Area Expansion, overall, 19%.

C. MATERIAL PROCUREMENT

Except for pulse generators, little progress was made on Purex vessels.

The quantity and rate of production of P-10 pots were satisfactory. The fabricator of Recuplex vessels has been delayed because some materials have been very difficult to procure.

With about 90% of the K Reactor work now in production, the inspection staff is spread thinly throughout the country. Continued efforts are being made to supplement the staff of inspectors. There are increasing problems on inspection of reactor process tubes, gun barrels, nozzles, and other reactor equipment. Procurement of items for water plants is generally satisfactory, as is fabrication of reactor biological shields and part of the blocks for thermal shields. The vendor for base blocks is attempting to solve problems of casting and also to repair blocks which were rejected previously. The production of limonite has reached the satisfactory rate; there was produced during October about 450 tons of grout sand and 1500 tons of coarse aggregate.

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D. CRAFT LABOR

There were relatively few interruptions of work during the month by jurisdictional disputes. The charge of unfair labor practices filed by machinists against Kaiser Engineers was finally withdrawn. Little progress was made on insulation work because the Asbestos Workers' Union continued to withhold men. Negotiations with this Union have reached a stalemate on the question of a subsistence allowance increase. The decision of the arbitrator between Kaiser and the Technical Engineers' Union was set aside in Washington, D. C. A tripartite committee was appointed to study wages in the Northwest, and Kaiser has submitted additional information to the arbitrator. The Boilermakers have reached an agreement applicable to the Seven Western States Agreement involving basic wage increase, subsistence allowance increase, and a classification of Boilermaker-Blacksmith.

E. SAFETY AND SECURITY

Eight regular meetings for discussion of safety and security, and health topics were attended by about 400 personnel. In addition there were four "tool box" meetings, two foreman's meetings and one special hazards meeting conducted during the month. There were no security violations during the month.

F. HIGHLIGHTS

Inspection, Drafting and Estimating Sub-Section

Inspection was completed on 76 orders, and 170 new orders which will require inspection were received. At the close of the month, there were 193 requisitions for items which will require inspection. Drafting production was 281 new drawings, 24 charts and graphs, and 414 revisions. Drafting work on several major projects has fallen behind schedule; however, ways and means are being arranged to overcome this temporary loss. Reproduction output for the month was 665,824 square feet. The Estimating group completed 30 estimates, including 15 project proposals. Field Surveys group completed the monument survey for 100 Areas as well as other preliminary surveys for Engineering and Manufacturing Departments.

Minor Projects Sub-Section

Minor Projects Sub-Section worked on 48 project items and 5 informal requests, representing an estimated total of $20,747,400. The Sub-Section completed work on two engineering requests. Important projects now in progress include Recuplex, 300 Area Expansion Program, Fuel Element Pilot Plant, Reactivation of P-10 Facilities, and Hot Semi Works Conversion. The Industrial Electric Company began its functions as the electrical subcontractor for J. A. Jones Construction Company on October 19, 1953.

[redacted]

Reactor Projects Sub-Section

The Mechanical Development Building was ready for occupancy except for minor clean-up items representing about 1% of construction. Punch list items for the 100-C Water Plant are substantially complete, and the 100-C Reactor Facility was essentially completed except for gas analysis equipment, and further work on the metal examination facility. Structural work on both KW and KE Water Plants is progressing satisfactorily.

During the latter part of the month the first primary and secondary pumps for 190-KW were received at the job site.

All crates for 105-KW have been received, plus 80% of the inlet and outlet crates for 105-KE. Five tiers of crates have been placed and packed in 105-KW. Production of limonite sand and aggregate met all requirements during October.

Completion of construction of 2101 Building was delayed by lack of insulation mechanics. The quality of graphite has improved, particularly regarding the percentage of cracked blocks. The pre-shop work is now proceeding on three shifts, but fabricating shop is only operating one shift. The first group of 30 layers has been removed to finished storage. It now appears that graphite production and fabrication is adequate to meet the newly-established packing date of January 15, 1954.

Separations Projects Sub-Section

The rate of placing concrete in 202-A Building was increasing. Of the 910 monoliths required, 250 have been completed. Piping work was continued in the process cell walls, canyon walls, and floor areas. The modification of 272-E Building was slightly ahead of schedule, as was the contractor for 2901 Export Water Line. Design of 224-U Expansion was completed during the month, and full scale construction was resumed. The 40" development centrifuge for Purex has been shipped to Hanford for testing with semi-process solutions. A 100-hour test run of the prototype model of the pulse mechanism was conducted during the month. It is believed that minor defects revealed by the test can be corrected on production models. The project proposal for Redox Capacity Increase - Phase II is being revised by a letter proposing that all construction be assigned to service contractor forces. This change was necessitated by local contamination. Construction of the 241-SX Tank Farm is progressing ahead of schedule.

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

October 31, 1953

J. S. McMahon, Manager - Projects

[redacted]

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II. STATISTICAL AND GENERAL

A. SIGNIFICANT ASSIGNMENTS

1. Initial Reporting

ER-2746 - Replacement of Catch Tanks 311-ER and 302-BR - 200-E and W

Design was 20% complete. A rough draft of the project proposal is being routed for comments concerning the replacement of underground catch tanks. It is proposed that Minor Construction forces perform the work because of health hazard conditions. The total estimated project cost is $42,000, and existing stainless steel tanks in the chemical storage areas of the 221-B and T Plants are to be used for replacements.

2. Final Reporting

ERA-750 - Metal Stock Storage, Building 3717

With design at 30% the A&B Sub-Committee returned the informal request with the suggestion that the work be handled on a work order basis. The Manufacturing Department is proceeding accordingly.

ERA-1204 - Panellit Gauge Testing Facilities - Cancelled at request of Reactor Section.

3. Current Projects

CA-192 - Remodeling Building 108-F for Biology Laboratory

Overall completion status remained at design 100%, construction 94%. Construction of Parts III and IV progressed 3% to a total of 49%. Construction work has progressed as far as possible until insulation work is completed. Since settlement of strike at General Electric X-Ray Plant, shipment of the Maxitron has been scheduled for December 26, 1953.

CA-431-A - New Reactor - 100-C Plant (Waterworks)

Completion status remained at design 100%, construction 99.9%. Substantially all punch list items have been completed except for running the acceptance test on remote control of Building 181. A method of repairing 107-C tank baffles is being prepared.

CA-431-B - New Reactor - 100-C Plant (Reactor)

Completion status remained at design 100%, construction 99.9%. Minor Construction continued work on completion of various minor items. The Design Section has requested additional funds for design and purchase of a new seal for the metal examination facility. The water level in the storage basin is set at about 4-1/2" higher than original design.

CA-431-C - Metal Examination Facility 105-C

Design progressed 10% to a total of 80%; construction began and progressed to 3% complete. Fabrication at Hanford was started October 12, 1953. Design work at General Engineering Laboratories was virtually completed, and assembly of some components has been started there.

Procurement of engineered items was begun with the issue of several requests for bids.

CG-438 - Ball Third Safety System

Design completion status remained at 100%; construction progressed .5% to a total of 97.5%. Directive #HW-230, Modification #7, dated September 24, 1953 was received during the month. This directive authorized an additional $250,000.

Purchase requisitions have been issued for the additional 30,000# of boron alloy steel balls, a ball washer and several electric components. Work orders have been prepared to cover modifications to the separation and recovery systems. Design of ball recovery improvements was 85% complete.

The Manufacturing Department reports that the pulse integrator systems are by-passed in the B, D, F, DR and H Areas. This has not been established as a future operating policy.

CG-496 - Recuplex Installation, 234-5 Building

Design progressed .5% to completion; construction progressed 5% to a total of 27%. Construction is proceeding on service facilities and supports for the main vessels. Since it is not practical to continue construction without major equipment, work at the 234-5 Building was stopped October 29 to await the delivery of sufficient materials and equipment.

Delivery of the vessels from the fabricator has become the critical factor. Since some materials are extremely difficult to procure, eight vessels cannot be delivered until the months of January, February and March, 1954. Strong expediting efforts are being exerted to improve the delivery schedule.

The stopping of construction will not delay the final completion date if construction can be resumed during early January, 1954.

The revised project proposal has been prepared with the total project cost estimated to be $1,560,000.

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CA-512 - 100-K Area Facilities

100-KW and 100-KE Water Plants

Overall design of water plants progressed 1-1/2% to a total of 99.5%. Construction progress was as follows: KW progressed 2.7% to a total of 34.7%; KE progressed .4% to a total of 26.4%; general facilities progressed 4.2% to a total of 43.2%. These percentages are the revised completion figures.

Work was continued on installation of equipment in the 183-KE Filter Plant. During the latter part of the month the first primary and secondary pumps for 190-KW were received at the job site. The cumulative total of concrete placed to date was: KW water area, 75,100 yards; KE water area 59,300 yards.

Structural work on both KW and KE water areas progressed satisfactorily, and it now appears that this phase of both jobs will be completed approximately the same time. Erection of structural steel has been started for 190-KE pump house, and work was begun on the foundation for 107-KE retention basin.

105-KW and 105-KE Buildings

Overall design progressed .5% to a total of 99%. Construction completion was as follows: KW gained 5.4% to a total of 34.2%; KE was revised downward from 14% to 10% complete. The revised schedule did not affect the ready-for-use dates, July 1, 1954 for 105-KW and November 1, 1954 for 105-KE.

Cumulative total of concrete placed was: 105-KW, 23,000 yards; 105-KE, 20,800 yards. The cumulative total of structural and miscellaneous steel placed was 2400 tons for 105-KW and 2100 tons for 105-KE. An outlet crate for 105-KE, which was previously damaged in a highway accident, was repaired and returned to Hanford by October 30, 1953. All crates for 105-KW have been received, plus 80% of the inlet and outlet crates for 105-KE. Side crates and top shields for 105-KE are in satisfactory condition. Five tiers of crates in 105-KW have been placed and packed. The production of limonite sand and aggregate met all requirements during October, and it now appears that shortage of this material will not interfere with construction of the 100-K Reactors.

A final inspection of the ventilation stack in both KW and KE Areas was held, and the subcontractor was released on October 30, 1953.

There was little progress on manufacture of pigtails, gun barrels, or process tubes. However, the initial order of 100 process tubes was completed. A total of 25 crossheader units have been finally accepted, and others are being fabricated. The production jig for downcomers was set up in the White Bluffs boiler shop, and one assembly was about 60% welded.

Installation of corrugated siding was continued both on 105-KE and 105-KW.

2101 Building - 200-E Area (A.E.C. Administered)

The graphite program in 2101-M Building proceeded with few interruptions caused by labor disputes; however, the 2101-M Building remained incomplete for lack of insulation mechanics.

The National Carbon Company has continued its schedule of deliveries. The problem of cracked graphite is within the 12-1/2% allowed in the contract. The packing date for 105-KW has been rescheduled to January 15, 1954. The first group of 30 layers was removed to finished storage on October 31, 1953, and work began immediately with the mock-up of the second group.

CA-513-A - Purex Facility

Overall design for Purex progressed 3.3% to a total of 82%; overall construction progressed about .5% to a total of 12%. The rate of placing concrete in 202-A Building was improved, there being placed during the month 97 monoliths in the canyon walls. This brings the total completed monoliths to 250 as compared to the 910 required. The cumulative total of concrete placed in 202-A Building was 26,694 cu.yds. Work on piping and service facilities was continued in the process cell walls, canyon walls, and floor areas. Excavation for the 216-A-5 proportional sampler was started October 21, 1953.

Modification of 272-E Building and construction of 2901 Export Water Line were ahead of schedule.

The 40" centrifuge for Purex has been shipped to Hanford for testing with semi-process solutions. With the development work completed, the Bird Machine Co. has begun work on the 48" Purex centrifuges.

A 100-hour test run of the prototype model of the pulse mechanism was conducted during the month. These tests indicated that all minor defects can be corrected in the production model.

CA-513-B - Uranium Oxide Conversion Facility

The approval of three drawings completed design for the expansion of 224-U, and construction progressed 30% to a total of 80%. The resumption of full-scale construction was made possible by the arrival of some major equipment and the assurance that other parts had been shipped.

CA-513-D (ERA-747) - Hot Semi Works Conversion

Design progressed 28% to a total of 78%. The Technical Section has requested the replacement of the existing in-tank turbine pumps by five new Chempump centrifugal pumps.

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The Purchasing Section has assigned expeditors to the material required by this project.

The work release to Minor Construction was issued October 30, 1953.

CA-514 - 300 Area Expansion Program - Production Facilities

Detailed design progressed 5.5% to a total of 68%; overall construction progressed 5.5% to a total of 19%. A revised project proposal is being routed for approval on an estimated project cost of $5,085,000, and an estimated expenditure by General Electric of $4,481,000. A.E.C. has authorized performance of construction of the second phase of the 313 Building by construction service contractor with the exception of certain items reserved for the fixed price contractors.

A. Process Facilities

Detailed design progressed 6% to a total of 69%; construction progressed 2.8% to a total of 16%. The sheetmetal roof deck has been completed, and some progress was made on installation of siding. The A.E.C. is expediting this construction. Bids have been received for the furnace area conveyor system, dry room monorail, methanol still, and miscellaneous items. Specifications and requisitions have been issued for bids on induction furnaces, automatic spray booth equipment, facing machines, and other related equipment. Purchase specifications are being prepared for the radiographic machines, conveyor system, frost test machine, and stamping machines.

B. Acid, Caustic and Methanol Facilities

Detail design progressed 3% to completion. Material take-offs are being made, and purchase requisitions are being written.

E. Decontamination Station

Detailed design progressed 3% to completion. The drawings have been released to the field.

G. Railroad

Completion status remained at design at 100%, construction 97%.

K. Manufacturing Office Building, Gate House, and Parking Lot

Detailed design progressed 1% to a total of 36%. The A.E.C. is reconsidering the proposal that 3706 Building be used for office facilities, and that 3702 and 3703 Buildings be abandoned. Further work awaits decision on this problem.

L. Change House Renovations 3707-A and B

Detailed design began and progressed to 3% complete.

M. Oil and Paint Storage

Detailed design began and progressed to 3% complete.

N. Steam and Water Facilities

Detailed design progressed 25% to a total of 55%. The comment prints have been forwarded to Design Section.

P. Hutment Removal

Detailed design began and progressed to 25% complete.

Q. Fire Alarm System

Detailed design progressed 63% to a total of 90%, and the drawings have been released to the field for start of construction.

R. 3506 Telephone and Security Alarm

Detailed design progressed 10% to a total of 50%.

CG-550 (ERA-746) - Reactivation of P-10 Facilities

Design progressed 8% to a total of 98%; construction progressed 10% to a total of 73%. By agreement with Manufacturing Department, the ready-for-use date was extended to December 1, 1953. Revision #2 of the project proposal was forwarded to A.E.C. the week of October 12, 1953, with the hope of approval by November 6, 1953 so that construction of the burial vaults may be completed by December 1, 1953.

B. OTHER ASSIGNMENTS

CG-187-D-II - Redox Production Plant

Design progressed 2% to a total of 44%; construction progressed 1% to a total of 7%. The shop work on sample gallery hoods and duct work was essentially completed, and installation has begun. Design emphasis has been shifted to the related Project, CA-535, Redox Capacity Increase - Phase II.

CA-187-D-III - Redox Cooling Water Disposal Basin

Design progressed 20% to completion; construction remained at 3% complete. Bid drawings and specifications were issued on October 15, 1953, and the date for bid opening was set at November 10, 1953. A letter was written to A.E.C. suggesting that the contractor be allowed 120 days to complete the work. An addendum to the original work release to Minor Construction was issued October 22, 1953, and it outlined the release of work to conform to the lump sum contractor's construction schedule.

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CA-406 - Phase II - Mechanical Development Building

Design had been completed previously; construction progressed 1% to a total of 99%. Only minor clean-up work remains; however, Technical Section has requested some additional items which are under consideration.

CA-434 - New Bio-Assay Laboratory

Design had been completed previously; construction of Phase II progressed 18% to a total of 48%. The Phase I construction work is behind schedule, chiefly because delivery dates for Laboratory furniture have not been established. It now appears certain that late delivery of furniture will delay completion past the date of November 18, 1953.

The successful bidder for Phase II of this project offered $79,623, approximately $14,000 less than the fair cost estimate. The Notice to Proceed was issued on October 26, 1953.

CA-441 - Solvent Building

Design progressed 5% to a total of 30%. Detailed design has been authorized to General Electric, and design is scheduled for completion by January 1, 1954.

CG-447 - Portable Meteorological Mast

Design was completed previously; construction progressed .9% to a total of 99.9%. Clearing of the exceptions was 95% complete, and a final inspection was scheduled for November 4, 1953. As-built drawings were about 80% complete.

CA-455 - Replace Two Elevated Water Tanks in 200-E Area

Design had been completed previously; construction progressed 17% to a total of 75%. The tank at 200-E Area Power House was complete except for painting, and the sides of the tank at 221-B Area were completed. The physical completion date was extended to December 31, 1953.

CG-477 - Building 284-W - Fifth Boiler Addition

Both design and construction had been completed previously. Official completion is awaiting a contract modification for replacing the existing boiler feed pump turbine with another turbine equipped with carbon seal rings. This replacement has been approved by both the Manufacturing Department and the construction contractor.

CA-489 - Neutron Monitoring Calibration Facilities

Design had been completed previously. Construction by the lump sum contractor progressed 37% to a total of 42%. The accelerator order was 90% complete, and the machine is now being tested. The vendor is fabricating auxiliary equipment as provided for in the revised purchase order. The completion date is scheduled for February 23, 1954.

CG-511 - Completion of Minor Construction Fabricating Shops

Design completion remained at 95%; construction progressed 13% to a total of 95%. Additional funds have been authorized to the field to complete the work according to original scope. The rough draft of the revised project proposal is being reviewed with the intention of submitting to the A&B Sub-Committee in November, 1953.

CA-516 - Gable Butte Railroad

Design progressed 40% to completion on October 21, 1953, about one month ahead of schedule. The bid assembly is being prepared by A.E.C.

CG-519 - Replacement of 100-D Reactor Effluent Line

Design had been completed previously; construction progressed 7% to a total of 97%. The flow of effluent water has now been diverted through the new 60" line as a part of normal reactor operations. Completion of the project was awaiting authorization of an $8,000 over-run. Remaining work consists of installing signal cable, radiation barricade fencing, and removing of temporary construction facilities.

CA-525 - Permanent Auxiliary Combined Civil Defense and Plant Disaster Control Center

Design had been completed previously; construction progressed 13% to a total of 93%. The heating and cooling units are scheduled for delivery about November 15, and the official completion date remained at December 24, 1953.

CA-529 - Personnel Meter Gatehouse Facility Improvements

Completion status remained at design 100%, construction 0%. The contract was awarded on October 5, 1953 for the low bid of $26,106, and the Notice to Proceed was issued October 15, 1953. Construction work began October 28, 1953.

CA-532 (ER-2737) - Fiscal Year 1954 Water Tank Replacements

Design progressed 10% to a total of 30%. Design work progressed as scheduled for preparation of drawings and specifications for lump sum bidding, as well as detailed design for work to be performed by plant forces.

CA-533 (ERE-479) - Hanford Works Official Telephone Exchange

Design progressed 18% to a total of 30%. The successful bidder on the telephone equipment was Stromberg-Carlson with a bid price of about $265,000 for fabrication and installation of the automatic dial exchange. The equipment contract was signed October 17, 1953, which also began the date of Notice to Proceed. A work order for $4900 has been issued to the Telephone Unit for tie-in of the new telephone exchange to the existing system. It has been agreed that the new exchange is to be located at the old Bio-Assay Building (706). The A.E.C. has requested a revision to the project proposal for changing scope and obtaining a new estimate.

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CA-535 - Redox Capacity Increase, Phase II

The actual completed design percentage was again revised downward to 32%. The General Electric portion of design was 68% complete, and the architect-engineer portion of design was 21% complete. Construction progressed 1.5% to a total of 3% and was on schedule. Because of contamination, a revision to the project proposal has been prepared to provide for performance of construction by service contractor personnel.

CG-538 - (ER-2734) - Install Underground Waste Line Between "S" Area and "U" Area 200-W

Design had been completed previously; construction progressed 6% to a total of 93%. The ready-for-use date of October 15, 1953 was met on the waste lines proper. The revised project proposal has been prepared to request permission to install crib facilities at the 241-U Tank Farm. This change will require no increase in project funds. One condenser has been installed at 241-U Tank Farm, but the other two installations must await lifting of restrictions by Manufacturing Department.

CA-539 - Additional Waste Storage for Redox

Design completion status remained at 94%; overall construction progressed 12% to a total of 29%. The portion of construction assigned to Minor Construction was 61% complete and ahead of schedule. The work assigned to the construction contractor was 26.2% complete and was ahead of schedule. Concrete has been placed in 14 bases; waterproofing has been applied to 11 bases; and steel liners have been placed on 9 bases. Excavation has been completed with the exception of backfill.

CA-543 - (ER-2733) - Replace Sanitary Tile Field 200 West Administration Area

Design remained at 40% complete. The project proposal has been revised to incorporate additional justification for replacement of the 200-U Area tile field. The proposal was resubmitted to the A&B Committee for review.

CA-544 - (ERA-661) - Central Distribution Headquarters

Design completion status remained at 27%. A rough draft of the proposal is being reviewed, although the Plant Auxiliary Operations Department has been informed that the proposal does not fulfill the A.E.C. requirements of essentiality.

CA-545 - (ERA-724) - Soil Science Laboratory Facilities

Design progressed 5% to a total of 95%; construction remained at 30% complete. The mechanical portion of design was completed, and drawings have been issued to the field. An estimate to complete is being prepared by the Estimating group because it appears that total project funds are inadequate.

CA-546 (ER-3099) - Fuel Element Pilot Plant

Detailed design progressed 3% to a total of 40%. Final drawings for the first phase were returned to the architect-engineer for correction. The A.E.C. requested consideration for locating the proposed facilities in existing 300 Area structures. Following the review, a letter was issued indicating that the existing structures would not be suitable.

CG-549 (ER-2731) - Activate Task I, RMA Line - Building 234-5

Design progressed 1% to a total of 36%; construction remained at 6% complete. Progress was delayed by higher priority work. The A.E.C. has been requested to authorize the use of procurement funds for on-site fabrication of some specialized equipment.

CG-551 - Expansion of Building 234-5 Facilities

Design progressed 6% to a total of 42%; construction began and progressed to 1% complete. Construction consisted of limited shop work on hood fabrication. A regular two-shift shop schedule has been arranged, pending receipt of material.

CA-555 (ERA-735) - Graphite Hot Shop and Storage Building

Completion status remained at design 50%, construction 0%. The project proposal has been returned by the Commission with the suggestion that this facility be located in an existing building. The Pile Technology Sub-Section is studying locations in the 325 or the 326 Buildings.

CG-556 (ERA-1201) - X Level Controlling and Recording Equipment

Design progressed 11% to a total of 15%. Design is being based upon use of the standard test hole pigtail and nozzles which are to be installed on the K Area Reactors.

CG-558 - Reactor Plant Modification for Increased Production

The scope of this project has not been established. Studies are being made of replacing or adapting reactor fittings and also of the proposed method of increasing pumping capacity of the 190 Building. The studies also are including cost of possible damage to equipment and possible affect on production rates.

CG-559 (ERA-1200) - Heat Transfer Laboratory

Design began and progressed to 10% complete. The work authority, PM-2770, dated October 27, 1953 has been received. This authorizes $79,000 construction funds in addition to the $11,000 in design funds previously authorized. The 250 H.P. centrifugal pump and motor combination has been ordered. Other critical items are also being advance-ordered.

CG-560 - (ER-2743) - First Cycle Waste Supernatant Cribbing Facilities

Design progressed 5% to a total of 95%; construction progressed 57% to a total of 58%. All wells have been drilled in 200 East and West Areas. The 200 East excavation and barricade have been completed. The pipe line was assembled and ready for connection to the pump. 200 West Area excavation started on October 23, 1953.

CG-562 - Waste Metal Recovery Plant Modifications

Design progressed 25% to completion; construction began and progressed to 9%. Fabrication of the 17-8 column started October 6, 1953. Fabrication work is progressing on the extraction box, the scrub box, and internal piping.

CG-563 (ERA-3100) - Modifications to 314 Building and Installation of Electroplating Pilot Plant

Design completion status remained at 10%. The project proposal had been held by the A.E.C. pending investigation of the overall 300 Area Expansion Program. A Directive, HW-315, dated October 29, 1953 authorized the $75,000 originally requested, the funds to be taken from those previously authorized for the 300 Area Expansion Program.

CG-564 (ER-1209) - Installation of Additional Ball 3X Equipment, 105-C Building

Design progressed 50% to a total of 75%. Directive, HW-314, dated October 14, 1953 authorized $62,500 for completion. Purchase requisitions have been released for the additional balls and replacement solenoids. The work has been assigned to plant forces.

IR-116 (AEC-P-138) - Combined Civil Defense and Plant Disaster Control Center

Design had been completed previously; construction progressed 10% to a total of 20%. Installation of the perforated masonite was completed, and work was started on the static ventilators. Furniture and fixtures have been delivered to the plant site. The emergency equipment has been ordered from the U. S. Army, Office of the Quartermaster General.

IR-159 (ER-2742) - Improved Ventilation Facilities, 201-C

Completion status remained at design 100%, construction 60%. Work has been stopped pending a review of the financial status of this informal request; however, it is now planned to resume work about January 1, 1954.

IR-160 (ERA-753) - Asbestos Shakes, 100-B, D, and F Buildings

Design progressed 25% to a total of 70%; construction began and progressed to 15% complete. Application of asbestos shakes was begun in 100-D Area on October 19, 1953. The 1713-D Building has been completed, and work has been started on the 1707-A and 1734 Buildings. Work on the Area Badge Houses is being delayed until completion of improvements to gate houses.

IR-162 - Fire Protection Buildings, 272-E and W

Design was 30% complete. This work was previously reported as CA-517. The informal request was approved by A.E.C. on October 9, 1953, and this work will be combined with other programs for providing fire protection in the White Bluffs Area. The bid assembly is being prepared, with construction to begin about January 15, 1954.

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The following studies and Engineering Requests, involving preparatory work and scoping of future projects, were active during the month:

ERA-725 - Particle Problem Animal Exposure Equipment

Design completion status remained at 10%. A rough draft of the project proposal is being prepared for review.

ERA-727 - 313 Building Roof Repair or Replacement

Design completion status remained at 50%. Further work awaits completion of 313 Building.

ERA-736 - Transportation Garage and Facilities 2713-E

Design completion status remained at 10%. The project proposal for a total estimated project cost of $28,600 is being routed for signatures.

ERA-742 - Remodeling First Aid Buildings 100-B, D and F

Design progressed 5% to a total of 10%. A rough draft of the proposal for remodeling the 100-B First Aid Station is being prepared for review and submittal to the A&B Committee on December 1953.

ERA-748 - Laboratory Supply Space, 3706 Building

Design progressed 5% to a total of 30%. A study was made of the comparative costs of storing Caption 10,Laboratory Supplies and Chemicals,in the 3706 Building and in the 325 Building. On the basis of lesser cost, the 325 Building was selected, and the project proposal is being prepared for that work.

ERA-751 - Facilities for Special Pile Measurement

Design completion status remained at 2%.

ERA-752 - Removal of Demineralization Equipment, 186-D Building

With design completed, the invitations to bid were sent out on October 5, 1953. This engineering request was inadvertently reported as completed during August.

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ERA-1205 - Building for Prototype Physical Constants Test Reactor

Neither design nor construction has begun. The project proposal has been submitted to the A&B Committee. The project cost has been estimated at $91,500, of which $21,500 is being requested for expenditures by General Electric.

ERA-1208 - Activated Silica Facilities - 100 Areas

Final preparation of the project proposal is awaiting decision on whether to provide separate facilities or to transport activated silica by trucks.

ERA-3098 - Cobalt 60 Source for Radiation Studies

Design completion status remained at 50%.

ERA-3101 - Electroplating Facility for Fuel Development

The Technical Section is investigating the possibility of performing this work on Equipment Appropriations and Work Orders.

ER-2744 - New Dry Waste Crib, 222-S Building

Design completion status remained at 2%. Work has been delayed pending resolution by the Separations Section of alternate methods of handling contaminated waste materials from the 222-S Building.

C. RELATED FUNCTIONS

Minor Construction Contract

On October 19, 1953, the Industrial Electric Company became active as the electrical subcontractor for the J. A. Jones Construction Company.

Inspection, Drafting and Estimating

With about 90% of the K Reactor work now in production, the inspection staff is expending less effort throughout the country. There was particular emphasis on inspection of process tubes, gun barrels, nozzles, and other reactor equipment. Production of limonite was raised to a satisfactory rate. The vendor of recuplex vessels is still having great difficulty in procuring some special items.

The following is a resumé of inspection activities during the month:

ITEM	NUMBER
Open requisitions requiring inspection	193
Orders assigned to inspectors	225
New orders received	170
Orders completed	76
Sub-vendors orders assigned to inspectors	38
Total requisitions for Program "X" transmitted	291
Total orders for Program "X" placed - Engineered Equipment	251

At the end of October there had been grand totals of 2,026 Program "X" requisitions transmitted and 1,816 Program "X" orders placed for engineered equipment.

Drafting production for the month was 281 new drawings, 24 charts and graphs, and 414 revisions. The drafting room average was 6.6 man-days per drawing.

In preparation for transfer of drafting from Project Section to Design Section on November 9, 1953, the drafting workload for the next twelve months was studied and evaluated. It now appears that proposed work, plus research and development work, would justify maintaining the present drafting force. During this same review of work, methods were arranged to overcome the temporary lag in drafting work.

The Reproduction group output was 665,824 square feet during the twenty regular working days. The two largest orders processed during October were 16,652 prints for Purex, and 6,910 prints for 100-K Reactor. There were only thirty-two hours of overtime worked during the month.

The Estimating group completed thirty estimates during the month. The completed estimates comprised the following: project proposals - 15, comparative - 2, fair cost - 3, high spot - 2, scope - 3, miscellaneous - 5. Field Surveys completed the 100 Area Monument Survey and other miscellaneous surveys.

Project Control Unit continued its routine functions. The History group published one A.E.C. history, CA-421, Library and Files Building.

D. CRAFT LABOR

Voluntary terminations of construction contractor personnel decreased substantially during the month. Percentages of terminations from the employers were: Kaiser Engineers and associates, 5.3%; Blaw-Knox and associates, 6.4%; and from J. A. Jones Construction Company, with an average of 332 employees on the payroll during October, there was only one termination.

The jurisdictional dispute between machinists and millwrights in the 2101-M Building was gradually reduced to negotiations between the International Presidents of each Union. One outbreak concerning the alignment of "V" belts on electric motors caused almost a day of delay in the pre-fabrication operation.

The charge of unfair labor practice filed by machinists against Kaiser Engineers was finally withdrawn. The Asbestos Workers' Union continued to withhold mechanics from Hanford because of no contract. Negotiations were stalemated on the question of subsistence allowance vs. a set wage plus isolation pay. Since several projects, notably Biology Laboratory, 2101-M Building, and 300 Area Expansion Program, are being delayed for lack of insulation mechanics, consideration is being given to assigning the work to laborers or non-union mechanics.

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Wage negotiations between Kaiser and the Technical Engineers' Union progressed enough to prevent a threatened strike. The arbitrator's award was set aside in Washington, D. C. The Kaiser negotiators submitted new evidence to the Arbitrator, Father Carmody of Seattle University; but a tripartite committee was selected to re-survey the Northwest to determine the proper rate. A.E.C. has agreed to reimburse according to the recommendations of this committee, which is composed of one union representative, one Kaiser representative, and one neutral member.

The boilermakers have reached an agreement applicable to the Seven Western States Agreement involving basic wage increase (to $3.05), a 50¢ increase of subsistence allowance, and a classification of boilermaker-blacksmith requiring the new rate of $3.05 per hour. These terms are believed acceptable with the possible exception of the increase in subsistence allowance. This problem may be avoided by initiating a vacation plan which would equal the proposed subsistence increase.

The Painters' Union has requested a Schedule "A" opening to negotiate a "package increase" of 10¢ per hour which they claim was granted the general area. The 10¢ is divided into 7-1/2¢ for a health and welfare plan, and 2-1/2¢ for wage increase.

The construction contractors have received notice from the Building Trades Council of a desire to open the Master Agreement for negotiation to begin November 2, 1953, although the anniversary date of the Master Agreement is January 1, 1954.

G-1532, 1-D

GENERAL ELECTRIC COMPANY

[redacted]

HW-29794

RICHLAND, WASHINGTON . . . . . HANFORD ATOMIC PRODUCTS OPERATION

November 6, 1953

MONTHLY REPORT

FUEL TECHNOLOGY SUB-SECTION

OCTOBER, 1953

[redacted]

A PRIME CONTRACTOR FOR THE U.S. ATOMIC ENERGY COMMISSION

VISITORS AND BUSINESS TRIPS

Name	Date	Place Visited	Purpose
O. W. Rathbun	10-7,22-53	New York Operations office	Fabrication of uranium
		Bridgeport Brass	Same as above
		Battelle Memorial Institute	Same as above
		National Lead Co.	Same as above
W. T. Kattner	10-7,19-53	Same as above	Same as above
D. C. Worlton	10-14,24-53	General Engineering Laboratory	Visit ultrasonic facilities
P. J. Pankaskie	10-19,23-53	Revere Copper and Brass Company	Observe alpha extrusion of uranium
P. A. Carlson	10-25,31-53	Ames Laboratory	Fuel element development program
		Oak Ridge National Laboratory	Ceramic information meeting
G. E. McCullough	10-31,11-10-53	Argonne National Lab.	Consultations on fuel element development program
		Battelle Memorial Institute	Same as above
		Westinghouse Atomic Power	Same as above
		Massachusetts Inst. of Technology	Same as above
		Bridgeport Brass Co.	Same as above
J. W. Riches	10-30,11-10-53	Same as above	Same as above
P. J. Pankaskie	10-30,11-10-53	Same as above	Same as above
T. G. Marshall	10-31,11-7-53	Oregon State College Seattle, Washington	Recruiting ASME meeting

URANIUM QUALITY

Uranium Quality

Electrical induction equipment for the testing of the hypothesis that slugs split due to differential thermal expansion causing strains that exceed the transverse ultimate strength of the uranium core is now set up. This induction equipment is designed to hold slugs at higher temperatures than the resistance heating equipment that has previously been used in thermal experimentation with slugs.

A test is being made to determine whether axial voids or other weaknesses develop in uranium cores in the course of repeated processing through triple dip canning baths. This work is pertinent to the examination of reasons for the recent apparent preferential failure of Z slugs.

Uranium Reductions and Casting

Approximately 1400 eight-inch slugs from uranium hexafluoride parent material have been triple dip canned. These will be shipped to the 100 Areas for charging in the piles and test irradiation.

Rolling Processes

Five eight-inch slugs of Fernald material split in the "C" pile during October. Since no failures have occurred among Fernald slugs in the other piles, it is suspected that the more rigorous pile environment in "C" is an important factor in the cause of these failures. All of the slugs in the production test lot of Fernald material are stamped with the parent ingot number on one end of the core. The ends of the rupture pieces are being removed to determine the ingot number so the rolling history and chemical composition may be checked in an effort to determine any reasons that these particular slugs failed.

Heat Treatment of Uranium

One pair of small grain size standards to be used at Fernald and Hanford as a basis for determining completeness of transformation in slugs from beta heat treated rods were prepared in October. The standards for large average grain size are being prepared.

Finishing Processes

The cold drawing of uranium rod to slug diameter was discussed with individuals who have done similar work at Bridgeport Brass and at the Battelle Memorial Institute. Further discussions were held with the technical personnel at Fernald and at the New York Operations Office. The general consensus is that considerable savings in the manufacture of the core might be made by cold drawing. In addition to the advantage of producing uranium with an oriented fine grained surface that can be expected to be less conducive to bumping under pile irradiation, a considerable savings in uranium fabrication cost should be realizable through cold drawing to size in not having to handle uranium machining scrap. A development program is being proposed.

URANIUM DEVELOPMENT

Uranium Alloys

Any average grain size one-fourth that of present production slugs can be obtained by the addition of 1.5 atomic per cent silicon to natural uranium. Furthermore, the silicon alloy does not have the few large grains that are commonly in beta transformed unalloyed uranium that are associated with grain growth and bumping under irradiation. Difficulties with segregation of the silicon near the top of 500 pound ingots were overcome by adding finely divided silicon near the bottom of the crucible charge prior to melting. Ingots will be sent to Fernald for evaluation of their behavior in the standard rolling, salt bath heat treating and machining operations.

Fabrication of Uranium

Some variation in jacket thickness of rolled zirconium clad ingots was revealed by microscopic examination. Attempts to fracture the uranium-zirconium bond on the clad rods have been unsuccessful. Exceptional ductility of a one-half inch diameter roll clad rod was demonstrated by bending it through 180 degrees over a one-fourth inch radius. A similar rod from which the zirconium jacket was removed by machining was bent through 180 degrees over a one-half inch radius. Uranium rolled bare will usually bend through only a few degrees before breaking. It is suspected that greater ductility of uranium charged to the piles may reduce the tendency to certain types of rupture.

Seventeen uranium rods were successfully alpha extruded at Revere Copper and Brass Incorporated under the direction of MIT. These rods will be heat treated at Fernald and shipped to Hanford for in-pile testing.

A simple test has been devised to determine the properties of uranium subjected to internal pressure. A uranium sleeve is fitted with a lead core and two steel plungers. The first test produced a longitudinal failure of a four-inch slug at a pressure of 50,000 psi exerted by the lead.

Process Tube and Can Metals

A contract has been let to fabricate approximately 3,000 zirconium cans with an initial shipment of 250 cans expected by November, 1953. The contract for the fabrication of 30 zirconium process tubes was to have been signed on October 23, with an estimated delivery date of February, 1954.

Coupons are being prepared on the corrosion resistant, high purity aluminum base alloys containing zirconium or magnesium to determine the effect of the heat treatment received during canning and autoclave cycles on the corrosion resistance.

Following the third rupture of the 63S aluminum jacketed slug in a 2S-72S clad process tube, all the remaining 29 tubes of 63S jacketed slugs were discharged from the pile. The condition of the 63S process tube, 2881-H, removed from H-Pile was judged excellent. Corrosion of the 63S jacketed slugs in the three months of pile exposure was found to be less than would have occurred with 2S jacketed slugs at the same power level. This was anticipated from corrosion tests made in the flow cup laboratory. A report is being prepared summarizing the information pertinent to the in-pile corrosion of 63S aluminum jacketed slugs and discussing the investigations which are being undertaken to establish the reasons for the three side blow out type jacket failures.

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CANNING TECHNIQUES

Lead Dip Canning

The study towards reducing the amount of porosity in lead-dip canned slugs was continued. No differences considered significant were found in gas contents as a result of use of different quenching media - air, water, molten lead - after salt-bath heat treatment. Approximately the outer one-eighth inch of the surface of slugs from salt-bath heat-treated rod was found to have a higher gas content than the inner portion of the slug, apparently as a result of the heat treatment; the gas content of the inner portion being equivalent to that of the non-heat-treated slug. The study is continuing.

Vacuum Canning

Eleven nickel-plated uranium slugs were vacuum canned with good results. Complete bonding was obtained between the nickel and Al-Si in all cases. Penetration test results on two of the slugs showed minimum can wall thicknesses of 0.030 inches (0.035 inch initial can wall). The vacuum canning technique used should be readily adaptable to the canning of hollow slugs.

Spray Cleaning

The continuous pickling of bare uranium slugs in a spray cleaning unit with recirculated hot (70 C) concentrated nitric acid was satisfactorily performed by a small spray type cleaning machine on test. Modifications in design are required for further testing due to deterioration of pump seals by the nitric acid.

"C" and "J" Type Slug Canning

Two process changes for improving "C" process canned "C" slugs are under active investigation; the use of Fillerwelding, and the use of thick wall cans. The two changes would provide ten additional mils of protective aluminum for the jacket and end closure. An evaluation of the hot-pressed slug technique and the Sevac vacuum canning technique as possible substitutes for the "C" process has been initiated.

FABRICATION TECHNIQUES

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usual thirty minutes. As anticipated, satisfactory bonding was indicated by the frost test, but water autoclaving showed these slugs to have less undercutting resistance than slugs pressed for longer times.

Inspection of hot-pressed slugs exposed to pile water for six weeks showed no corrosion effects different from those found on regular production material. In addition to this test, corrosion-erosion tests have been started to test the integrity of the pressure welded closure.

The new fifty ton capacity hot-press assembly (including dies) is being readied for experimental hot-pressing of eight-inch slugs.

The difference in the thermal expansion of die steels and uranium has suggested that this property might be used to apply the pressure required in hot-pressing slugs. An Al-Si coated slug was pressed in this manner to give a completely bonded surface. Stripping tests disclosed indications of a cracked bonding layer, however. Further investigations will be made with this technique.

Mechanically Bonded Canning

Six nickel-plated slugs were cold sized to establish the feasibility of mechanically keying a rough nickel layer to an aluminum can. Frost test results showed burnout areas ranging from less than 5 per cent on one slug to 60 per cent on the worst slug.

Fabrication of Components

A number of copper clad 2S aluminum blanks of 0.050 inch thickness were successfully formed to can dimensions by four drawing and three wall thinning operations. Surface finishes were satisfactory and wall thicknesses were uniform.

Fuel Feasibility Studies

Metallographic results of nickel coated zirconium and nickel coated uranium wafers pressed at 575 C/12tsi/20 minutes showed diffusion occurring between the Zr and Ni. Bonding between the Ni/Ni was apparent also.

TESTING

Al-Si Penetration - MIZ-1

A preliminary calibration of the eddy current Al-Si penetration detection equipment, MIZ-1, has been made using slugs selected in pairs for equal indications on the equipment. One of each pair of selected slugs was stripped electrolytically and the actual minimum wall thickness determined. A mate to the stripped slug which most closely approximated 20 mils of minimum aluminum thickness is now being used for a standard to test accepted production pieces and segregate 5000 slugs acceptable under this limit. To date, approximately 900 slugs have been selected out of 1500. There are indications, however, that the calibration of the 20 mil standard may be in error and that the reject limit used in the testing so far is actually greater than 20 mils. Slugs are being stripped to establish the actual reject point and determine the minimum thickness accepted and the maximum thickness rejected.

Stability of the equipment still remains a problem and testing is slowed from its peak, possible rate of about 400 slugs per hour, because of the necessity for frequent readjustments. It is planned, however, to continue operating in the present manner until 5000 pieces have been obtained before dismantling the equipment to make changes designed to improve the stability.

Ultrasonic Non-Seat Test

Development work has been concluded on the ultrasonic non-seat test and the equipment is now being tested in the 313 Building. It appears from laboratory tests that the equipment is sufficiently sensitive and reliable for production application; however, this will be confirmed by more thorough testing in the 313 Building before it is placed on the production line.

Eddy Current Detection of Flaws and Inclusions in Uranium - MIZ-2

Preliminary evaluation of the experimental eddy current instrument being developed for detection of flaws and inclusions in uranium indicates that it will be desirable to rebuild the equipment as a high speed production prototype incorporating improvements which were developed during the laboratory testing. In this form it will be possible to test a sufficiently large volume of slugs to establish the effect of the sorting which this equipment can do on the quality of slugs to be loaded into the piles.

COATINGS AND CORROSION

Corrosion Studies

Some cap ends from lead-dip slugs which had been rejected for poor bonds were tested for corrosion tendencies. The results indicated that corrosion was apt to occur in the weld bead of slugs having black areas.

Results from flow laboratory tests indicate that any variation in tin content of Al-Si between 0.2 per cent and 2.0 per cent has no effect on weld bead or slug corrosion.

The pulse polarizer, rotating disk equipment, and alternate immersion test equipment are being assembled to test the value of these instruments for evaluating the corrosion-resistance of alloys.

An extension of the Flow Cup Laboratory to permit corrosion testing of irradiated materials has been designed. This facility will be necessary for studies of irradiated "C" and "J" metal and for evaluation of corrosion-resistance of uranium alloys.

Autoclave Studies

The reproducibility of measurements that have been made of the abrasion resistance of autoclave films is not sufficient to determine difference between the resistance of films formed in steam autoclaving and those formed in water autoclaving. The averages for the electrical breakdown potentials of both films are approximately equal; there is, however, a much wider range of values obtained for the film formed in the steam autoclave.

DE[redacted]

Coatings

Several types of anodized films have been prepared and are being tested for hardness, abrasion resistance, and coefficient of friction.

The electroplating equipment has been moved to the 314 Building. With the additional space and power supply available, additional equipment has been set up, making it possible to electroplate approximately twenty slugs per eight-hour day. Nickel-plated slugs are being given to other groups for testing or for experimental canning by any of several methods. Some of the slugs are being heat treated to determine the effect of time and temperature on the diffusion of the nickel and the uranium.

FUEL EXAMINATION

Fuel Examination

No defects were noted or significant changes in dimensions observed on ten stripped irradiated enriched uranium slugs from C Pile.

As a result of three ruptures during the last two months, all of the production test material using 63S aluminum as jackets were discharged from H Pile. Two of these ruptures were contained in 72S clad 2S tubes which also ruptured allowing water entry into the pile. The discharged slugs are presently being examined, weighed and measured in hopes of locating a precursor to these failures.

During the month, eight ruptures of triple-dip canned slugs from Fernald rolled rods occurred at C Pile. In addition one of these pieces ruptured at B Pile. Examination of these side split failures and other pieces contained in these tubes indicated that the uranium could have cleaved before the can wall split. Selected pieces were turned over to Radiometallurgy for further examination and consideration of this possibility.

Examination Facilities

Fabrication has been started of a crane to move slug cartridges, a viewer and a slug cartridge loading station for use in the 100-C underwater examination basin. The design has been completed of a prototype unit for use in the underwater examination basins for ultrasonic measurement of the grain size of uranium after irradiation. Construction of the unit will be started promptly.

LABORATORY ENGINEERING

Buildings & Grounds

Construction on the remaining Laboratory Area buildings is progressing satisfactorily. The Radiochemistry and Pile Research and Development Buildings are both now better than 98 per cent complete. Air balancing in these two structures is the remaining major item before acceptance.

The office section and glass shop of the Mechanical Development Building were occupied during the month. The details of moves into the remaining buildings are being planned.

Phase I drawings and specifications on the Fuel Element Pilot Plant were reviewed and comments forwarded to the A-E, Bouillon & Griffith in Seattle through the Project Section. The architect engineer is proceeding with preliminary drawings on the interior finishing (Phase II).

Glass & Photography Shops

Major effort of the glass shop was consumed in moving to the new quarters in the Mechanical Development Building.

The work volume in the Technical Photo Laboratory reached an all-time peak and print finishing was up 30 per cent over any previous month.

INVENTIONS

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

GE McCullough
Manager - Fuel Technology
ENGINEERING DEPARTMENT

GE McCullough:acj

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MEDICAL DEPARTMENT

OCTOBER 1953

General

Personnel Changes

The roll increased from 249 to 252.

Visits

Doctors Fuqua and Norwood attended the A.E.C. meeting for Directors in Biology and Medicine and the Industrial Physicians meeting held on the preceding day at Berkeley, California. Each presented a paper at the latter meeting. Dr. Riordan attended the annual meeting of the American College of Surgeons in Chicago.
A nurse supervisor attended the annual meeting of the Washington State Nurses' Association in Seattle.
Public Health nursing consultants for the State of Washington and the United States visited in reference to our maternal and child hygiene nursing program. Dr. McIntyre, State Consultant in Obstetrical services, reviewed our obstetrical program here.

Employee Relations

Employee attendance at 18 employee relations meetings was 201.

Industrial Medicine

Medical examinations dropped from 1126 to 713 due to vacations and attendance at scientific meetings by physicians. Dispensary visits increased from 4485 to 5083.
Two major and four sub-major injuries of General Electric employees were treated.
Contractor employees receiving our services sustained no major or sub-major accidents.
The health topic of the month was "Sore Throats."

Absenteeism %

	1953		1952	Year to Date	
	Oct.	Sept.	Oct.	1952	1953
Sickness	1.68	1.24	1.86		
All Causes	2.33	1.91	2.55	2.43	2.35

Kadlec Hospital

A recent survey of 14 hospitals in this state, of comparable size to Kadlec, revealed such interesting facts as the following:

	Kadlec	11 other Washington Hospitals
1. Employees per adult patient day	2.0	2.2
2. Gross operating cost per adult patient day	$34.18	$23.23
3. Gross revenue per adult patient day	$24.01	$24.73
4. Rate of pay for employees	Kadlec 38% higher	
5. Continuity of service benefits	Kadlec much higher	

Since this study Kadlec rates have been increased to equal the average of the other hospitals.
It may be readily seen that the higher cost per patient day is due to the higher salaries paid, which accounts for about two-thirds of the total hospital cost.
The average daily adult census increased from 78.8 to 81.3. The comparable census a year ago was 86.6. The occupancy percentage on the mixed services was 74.6.
Nursing hours per patient day were 3.8 on the mixed services.

MEDICAL DEPARTMENT

OCTOBER 1953

General (Continued)

Public Health & Welfare

While no deaths have been caused by "Polio" this year, two of the ten reported cases will require months and even years of rehabilitation at the larger Polio centers and will probably leave severe permanent disability.

The first crippled children's clinic in Richland was conducted by an orthopedic surgeon with an attendance of 44 handicapped children.

A survey of milk shippers under our inspection control was conducted by a representative of the State Health Department. The rating was 91 as compared to 81 in 1950.

Our social service counsellors began a program of consultation with elementary school teachers. Twenty-nine teachers discussed behavior problems of thirty-three children and received advice in recognition and handling these problems in the lower grades.

Costs-September

Medical Department Costs before assessments to other departments were as follows:

	Aug.	Sept.	Sept. Budget
Industrial Medicine (Oper.)	$43,682	$43,595	$42,033
Public Health (Oper.)	12,455	11,453	11,768
Kadlec Hospital (Net)	17,165	19,492	19,633
Hospital Expense Credits	4,795	3,094	3,333
Sub-total-Medical Department (Oper.)	78,097	77,634	76,767
Construction Medical (Industrial and Public Health)	1,778	1,821	943
Total-Operations & Construction	$79,875	$79,455	$77,710

The net cost of operating the Medical Department before charges were assessed to other departments was $79,555, a decrease of $420. This was $1,745 above the budget.

Kadlec Hospital net expense was up $2350, due largely to a reduction in revenue and expense credits. Industrial Medical expense change was negligible, while the thousand dollar improvement in Public Health was largely due to giving credit to an erroneous charge of about $600 for the previous month.

Net cost of operating the Medical Department for the first quarter of fiscal year 1954 was $215,512, which was $1795 (1%) below the budget figure. The original 1954 budget has been increased by $40,000 for Kadlec and Public Health to compensate for the difference between increased revenue and increased salary costs.

MEDICAL DEPARTMENT

OCTOBER 1953

Industrial Medical Section

The number of examinations decreased from 1126 to 713 in October as a result of vacations and attendance of physicians at scientific meetings. Dispensary visits increased from 4485 to 5083. General Electric employees sustained two major injuries and four sub-major injuries. Contractor employees sustained no major or sub-major injuries during the month. Two new industrial nurses joined the Industrial Medical staff as replacements.

One information meeting was held for industrial physicians and the scientific meeting for industrial physicians was scheduled with our safety engineers to inform them of our activities in the identification and treatment of accident proneness in employees.

Doctors Norwood and Fuqua attended the A.E.C. general information meeting for Directors in Biology and Medicine in Berkeley, California, and also the A.E.C. meeting for Industrial Physicians of the various A.E.C. installations. Dr. Riordan attended the meeting of the American College of Surgeons in Chicago.

Dr. M. L. Weitz left the Industrial Medical staff to return to Portland.

The Chemical Hazards Committee met on October 30th and further discussed the noise hazard and the present status of the noise measurement studies.

The Health Activities Committee met on October 15th and the health topic on "Sore Throats" was presented. Material on this subject was prepared for distribution throughout the plant. The sickness absenteeism was 1.68% as compared with 1.24% for the previous month. For the year to date the absenteeism, all causes, was 2.35% as compared with 2.42% for 1952.

Net costs for September totaled $34,885 as compared with an expenditure in August of $35,846. This was a decrease of $961, or nearly 3%, from the August level. Cash revenue increased $541 in September over August and expense credits, or charges to other departments, increased $874. Increased charges to the Atomic Energy Commission accounted for the major portion of the increase in expense credits.

Costs-Operations	Sept.	August	Increase (Decrease)
Salaries	$32,659	$33,108	$ (449)
Continuity of Service	3,266	3,310	(44)
Laundry	294	275	19
Utilities, Transportation, Maintenance	3,795	4,006	(211)
Supplies and Other	5,048	3,909	1,139
Total Gross Costs	45,062	44,608	454
Less: Revenue	1,467	926	541
Expense Credits	8,710	7,836	874
Net Cost of Operation	$34,885	$35,846	$ (961)

Actual net expenses incurred during September were $2,740 less than budgeted expectations. With the first quarter of fiscal year 1954 just concluded, Industrial Medical has a net budget underrun of $4,351, or approximately 4%.

MEDICAL DEPARTMENT

OCTOBER 1953

Industrial Medical Section (Continued)

Costs-Construction

Gross costs incurred during September amounted to $626 as compared with August costs of $669. All expenses incurred resulted from preparation of records for storage.

	Sept.	Aug.	Increase (Decrease)
Salaries	$ 556	$ 562	$ (6)
Continuity of Service	57	56	1
Supplies and Other	13	51	(38)
Total Gross Costs	$ 626	$ 669	$ (43)

MEDICAL DEPARTMENT

OCTOBER 1953

Industrial Medical Section (Continued)	September	October	Year to Date
Physical Examinations			
Operations			
Pre-employment	52	56	813
Rehire	16	14	174
Annual	322	187	3379
Interim	336	179	2167
A.E.C.	19	22	322
Re-examination and rechecks	209	171	1560
Termination	172	84	1194
Sub-total	1126	713	9609
Contractors			
Annual	42	20	108
Pre-employment	5	13	716
Rehire	0	0	121
Recheck	13	17	248
Termination and Transfer	46	42	949
Interim	0	0	87
Sub-total	106	92	2229
Total Physical Examinations	1232	805	11838
Laboratory Examinations			
Clinical Laboratory			
Government	79	75	1344
Pre-employment, Termination, Transfer	2060	1100	25506
Annual	1841	1122	21310
Recheck (Area)	1522	977	11664
First Aid	0	4	67
Clinic	321	303	3797
Hospital	4650	4783	49324
Public Health	0	17	94
Total	10473	8381	113106
X-Ray			
Government	13	15	253
Pre-employment, Termination, Transfer	124	103	2039
Annual	697	413	4988
First Aid	89	98	1021
Clinic	318	186	2228
Hospital	282	305	3417
Public Health	12	14	73
Total	1535	1134	14019
Electrocardiographs			
Industrial	52	69	538
Clinic	2	0	22
Hospital	35	49	483
Total	89	118	1043

MEDICAL DEPARTMENT

OCTOBER 1953

Industrial Medical Section (Continued)	September	October	Year to Date
First Aid Treatments			
Operations			
New Occupational Cases	369	393	3744
Occupational Case Retreatments	1310	1391	12747
Non-occupational Treatments	2534	3032	26727
Sub-total	4213	4816	43218
Construction			
New Occupational Cases	68	61	1204
Occupational Case Retreatments	165	154	3534
Non-occupational Treatments	21	16	1008
Sub-total	254	231	5746
Facility Operators	18	36	384
Total First Aid Treatments	4485	5083	49348
Major Injuries			
General Electric	0	2	10
Contractors	0	0	2
Total	0	2	12
Sub-Major Injuries			
General Electric	2	4	16
Contractors	0	0	11
Total	2	4	27
Absenteeism Investigation			
Calls Made	11	7	75
Employee Personal Illness	5	5	58
No. absent due to illness in family	0	0	1
No. not at home when call was made	6	2	15

MEDICAL DEPARTMENT

OCTOBER 1953

Hospital Section

The average daily adult census increased from 78.8 to 81.3, as compared to 86.6 a year ago. This represents an occupancy percentage of 74.6, broken down as follows: Mixed Service (Medical, Surgical, Pediatrics) 76.1; Obstetrical Service 64.8. The minimum and maximum daily census ranged as follows:

	Minimum	Maximum
Mixed Service	42	87
Obstetrical Service	6	24
Total Adult	58	102

The average daily newborn census increased from 12.3 to 13.1, as compared to 15.3 a year ago.

Nursing hours per patient per day:

Medical, Surgical, Pediatrics	3.79
Obstetrical	4.04
Newborn	2.74

The ratio of inpatient hospital employees to patients (excluding newborn) for the month of September was 2.10. When newborn infants are included, the ratio is 1.82.

The net expense for the operation of Kadlec Hospital for September was $19,492, as compared to $17,165 for August. Summary is as follows:

Kadlec Hospital net expense $19,492

This represents an increase of approximately $2,350. Gross Costs decreased about $450, but revenue decreased approximately $1,100 and expense credits were reduced about $1,700. Although patient census averaged the same for September as for August, there was one less day which largely accounted for the reduced revenue.

Miss Myrtle Albright, R.N. attended the annual meeting of the Washington State Nurses' Association in Seattle.

An excellent film on the nursing care of poliomyelitis patients was shown to approximately seventy of our nursing employees.

There were eighteen employee relations meetings held during October with an attendance of 201. These meetings are summarized as follows:

	Meetings	Attendance
Hospital	7	110
Industrial Medicine	2	10
Public Health	4	56
General	5	25
Total	18	201

MEDICAL DEPARTMENT

OCTOBER 1953

Hospital Section (Continued)	September	October	Year to Date
Kadlec Hospital			
Average Daily Adult Census	78.8	81.3	85.6
Medical	21.9	23.2	25.6
Surgical	30.0	29.2	33.1
Pediatrics	13.5	14.6	13.7
Mixed	65.4	67.0	72.4
Obstetrical	13.4	13.6	13.2
Average Daily Newborn Census	12.3	13.1	12.4
Maximum Daily Census:			
Mixed Services	85	87	108
Obstetrical	22	24	24
Total Adult Census	102	102	120
Minimum Daily Census:			
Mixed Services	42	42	35
Obstetrical Service	7	6	6
Total Adult Census	53	58	43
Admissions: Adults	544	540	5775
Discharges: Adults	515	550	5762
Newborn	76	98	810
Patient Days: Adult	2364	2519	26035
Newborn	369	406	3781
Total	2733	2925	29816
Average Length of Stay: Adults	4.6	4.6	4.5
Medical	4.7	4.6	4.5
Surgical	4.6	4.4	4.7
Pediatrics	4.4	5.3	4.3
Mixed	4.6	4.7	4.5
Obstetrical	4.8	4.2	4.4
Newborn	4.8	4.1	4.7
Occupancy Percentage: Adults	72.3	74.6	78.5
Medical	59.5	62.7	69.2
Surgical	93.8	91.3	103.4
Pediatrics	71.0	76.8	72.1
Mixed	74.3	76.1	82.3
Obstetrical	63.8	64.8	62.9
Newborn	47.3	50.4	47.7
(Occupancy Percentage based on 109 adult beds and 26 bassinets.)			
Avg. Nursing Hours per Patient Day:			
Medical, Surgical, Pediatrics	3.79		
Obstetrics	4.04		
Newborn	2.74		
Avg. No. Employees per Patient (excluding newborn)	2.10		
Operations: Major	78	87	940
Minor	106	99	980
E.E.N.T.	59	50	589
Dental	0	2	9

MEDICAL DEPARTMENT

OCTOBER 1953

Hospital Section (Continued)	September	October	Year to Date
Kadlec Hospital (Continued)			
Births: Live	88	91	810
Still	0	2	13
Deaths	6	3	45
Hospital Net Death Rate	.34%	.15%	.18%
Net Autopsy Rate	33.3	33.3	26.7
Discharged against advice	0	0	5
One Day Cases	130	142	1403
Admission Sources:			
Richland	74.6	75.6	76.4
North Richland	12.0	11.1	10.8
Other	13.4	13.3	12.8
Admissions by Employment:			
General Electric	68.4	69.3	72.6
Government	2.8	3.8	2.9
Facility	4.8	5.4	4.1
Contractors	16.9	15.0	12.9
Schools	1.8	1.5	1.8
Military	.0	.0	.4
Others	5.3	5.0	5.3
Hospital Outpatients Treated	594	500	4918
Physical Therapy Treatments			
Clinic	180	327	2551
Hospital	108	181	1526
Industrial: Plant	303	232	2653
Personal	0	0	60
Total	591	740	6790
Pharmacy			
No. of Prescriptions Filled	2400	2299	27275
No. of Store Orders Filled	449	494	5201
Patient Meals			
Regulars	3776	3958	39302
Children under 8	550	602	5012
Specials	884	1276	13953
Lights	0	0	8
Softs	1076	848	10607
Tonsils	102	108	1093
Liquids	196	182	2154
Surgical Liquids	96	106	1071
Total	6680	7080	73200
Cafeteria Meals			
Noon	1699	1956	18947
Night	322	333	3065
Total	2021	2289	22012

MEDICAL DEPARTMENT

OCTOBER 1953

Public Health Section

Of the communicable diseases reported, the cases of poliomyelitis were of significance. One was a mild case and the other a moderately severe case which needed the respirator because of paralysis of the intercostal muscles.

The large number of immunizations recorded was due to the fact that immunization clinics were held in the schools at which time booster shots for diphtheria, tetanus and re-vaccinations for smallpox were being given.

A visit was made by Miss Hazel Furman, Public Health Nursing Consultant, State Department of Health and Miss B. Church, Nursing Consultant, U. S. Public Health Service, in regard to our maternal and child hygiene nursing program.

The first crippled children's clinic in the Richland area was held by Dr. C. Don Platner, at which time 44 children with handicapped conditions were seen. Diagnosis and recommendations were made for further care.

A tuberculosis clinic was held for medical supervision of patients living in the area. Dr. Donald M. McIntyre also visited the area in relation to obstetrical consultation services. He interviewed the local obstetricians and our health personnel. His commendations were generally favorable and he was highly impressed by our program and services conducted here.

Food handling establishments received their regular inspection. Proper cleaning of garbage cans is being stressed as a means of controlling the flies which were found to be more prevalent in the restaurants. Plans for a new restaurant were inspected. A letter was sent to the architect recommending some alterations in the kitchen which would facilitate better sanitation. One other new restaurant was approved for operation.

A milk survey of shippers under our jurisdiction was conducted by a representative of the State Health Department. A rating of 90.82 was obtained. This shows an improvement over the 1950 survey at which time our rating was 81.38. Bacteriological results of pasteurized milk samples were satisfactory.

A two and one-half day course on sanitizers and detergents was held in Richland for sanitarians in this area of the state. The course was sponsored by the State Health Department and proved to be very informative.

Information relative to the control of insects, principally the carpet beetle, was given to several residents. Silverfish continue to be a problem in the record center. Plans are being formulated to fumigate the building in the near future. The area by the river in North Richland, where indiscriminate dumping has occurred, has been cleaned up and posted. Signs are being made directing people to the sanitary land fill in North Richland.

Recommendations regarding washing and sanitizing of salt masks in the production areas were forwarded to the plant engineering group.

Water and sewage samples were satisfactory.

Public Health Section (Continued)

As a preventive measure, our Social Service counselors began a program of consultation with elementary school teachers. By helping teachers to recognize and properly deal with behavior problems appearing in lower grade children, more serious problems can be prevented from developing. During the month 29 teachers discussed their problems involving 33 children.

Individual requests for help with behavior problems of children and adolescents continued high. These requests come directly from parents, from physicians, from ministers and from other community resources.

MEDICAL DEPARTMENT

OCTOBER 1953

Public Health Section (Continued)	September	October	Year to Date
Education			
Pamphlets distributed	11,988	9,090	110,017
News Releases	12	12	106
Staff Meetings	1	1	12
Classes	10	7	101
Attendance	47	74	724
Lectures & Talks	12	5	108
Attendance	348	734	4,811
Films Shown	11	30	195
Attendance	286	1,033	5,826
Community Conferences & Meetings	75	29	428
Radio Broadcasts	0	0	9
Immunizations			
Diphtheria	1	19	114
Diphtheria Booster	58	341	905
Tetanus	1	19	169
Tetanus Booster	59	670	1,306
Pertussis	1	5	31
Pertussis Booster	56	8	331
Smallpox	61	125	362
Smallpox Revaccination	31	342	1,358
Tuberculin Test	6	16	133
Typhoid	0	0	3
Typhoid Booster	0	0	1
Immune Globulin	3	7	55
Other	0	0	53
Social Service			
Cases carried over	93	80	852
Cases admitted	11	15	146
Cases closed	24	11	140
Remaining case load	80	84	858
Activities:			
Home Visits	6	5	112
Office Interviews	300	295	2,949
Conferences	53	48	508
Meetings	7	8	65
Sanitation			
Inspections made	155	176	1,698
Conferences held	35	25	243
Bacteriological Laboratory			
Treated Water Samples	294	190	2,240
Milk Samples (Inc. cream & ice cream)	30	36	378
Other bacteriological tests	365	455	4,650
Total	689	681	7,268

MEDICAL DEPARTMENT

OCTOBER 1953

Public Health Section (Continued)	September	October	Year to Date
Communicable Diseases			
Chickenpox	5	0	241
Kerato-conjunctivitis	6	0	6
Diphtheria	0	0	2
Erysipelas	0	0	1
Food Poisoning	0	0	29
German Measles	14	12	91
Gonorrhea	15	6	99
Impetigo	0	0	7
Infectious Hepatitis	0	1	1
Influenza (U.R.I.)	0	0	4
Measles	0	0	74
Mumps	6	0	299
Pinkeye	0	0	9
Poliomyelitis	3	2	7
Ringworm	0	0	8
Roseola	0	0	1
Salmonellosis	0	0	4
Scabies	0	0	1
Scarlet Fever	3	4	61
Syphilis	3	1	17
Tuberculosis	1	2	8
Vincents Angina	0	1	1
Whooping Cough	0	0	18
Total	56	29	989
Total No. Nursing Field Visits	581	564	7,170
Total No. Nursing Office Visits	38	67	720

Radiological Sciences Department

RADIOLOGICAL SCIENCES DEPARTMENT

OCTOBER 1953

Summary

Twenty nine informal, four Class I, and one Class II radiation incidents were reported. The Class II incident concerned high level exposure of a very small area of the body.

The average daily emission of I^{131} from separations stacks continued to exceed values that would be comfortable for indefinite operation.

The concentration of radioactive particles in the environs, due to external causes, generally fell to normal levels. Sporadic high levels near the separations plants continued.

Research and development items of interest included a test of a Sr^{90} applicator for sheep exposure which supported an ingenious new theory of beta ray dose calculation, successful operation of a much improved proportional sampler for liquid waste streams, and increase in sensitivity of plutonium detection by plating on areas about one-fifth of those previously achieved. The successful recovery of eggs and sperm from local salmon opened the way to direct test of temperature sensitivity of the local strain. Substantial species difference in the uptake of ruthenium by plants was unexpected, and will complicate hazard appraisal.

A brief discussion of some of the economic aspects of radiation protection is included. This was a major topic at a recent radiation protection panel meeting.

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RADIOLOGICAL SCIENCES DEPARTMENT

OCTOBER 1953

Organization

The month end force of 364 included 28 supervisors, 103 engineers and scientists, 18 clerical, and 215 other personnel.

Number of Employees on Payroll		
Beginning of month	-	361
End of Month	-	364
Net Increase	-	3

General

There were 29 Informal radiation incidents, four Class I, and one Class II incident. The Class II incident involved an extremely high exposure (60 to 240 rep) over a very small area. Such exposures are troublesome in three ways:

(1) dosimetry is difficult.*

(2) there is no absolute assurance that all the cases are detected, because their recognition depends on rather complete survey of protective clothing.

(3) realistic appraisal of the hazard is difficult when the radiation is of low penetrating power and is limited to a small area. At the worst, a small area of skin would be damaged, and even this severity is improbable. The doses given are comparable with those that qualified radiotherapists freely administer to non-malignant skin conditions, even on the hands of persons occupationally exposed to radiation.

If the work situation were such as to permit repetition of such exposures in the same location, late skin damage would be probable. Therefore, a study is being attempted to ascertain the frequency and location of these hot spots of contamination. The installation

*eg: In a case from the previous month, the dose could have ranged from less than 1 rep to 2,000 rep, depending on the extent to which a droplet of active fluid spread over a glove.

General (Continued)

of equipment to assure infallible detection of all cases would be a costly procedure.

At a radiation protection panel in Berkeley, a principal topic was the matter of economics in protection. The local organization was obliquely criticized for over-conservatism, leading to excessive costs. At the same time, in the operation of film badges, where the local system is demonstrably efficient and the most economical among principal contractor organizations, the application of "peculiar" bookkeeping and the advantages of large scale operation were mentioned as reasons for this.

The facts of the case are that the local organization in this area of activity, as well as in many others, directed its attention to economical operation long before the compelling need for this was appreciated elsewhere. Three items in recent monthly reports are indicative of the current degree of conservatism:

(1) Incidents involving potential or actual deviation from good control are reported at the rate of about one per day.

(2) There are 19 cases of plutonium deposition, none locally produced being in excess of the permissible limit. There is no generally effective method of reducing a body burden of plutonium if it did exceed limits.

(3) In a typical recent major structure, reduction of protection by a factor of 100 would only have saved about 1% of construction cost and would have introduced troublesome operational problems.

Nevertheless, a continued drive for economy is in order, and to discourage complacency two fertile fields are mentioned:

(1) Operation under very short time limits (say less than 10 minutes) was not originally contemplated, but has become fairly general. This can be avoided by:

(a) taking advantage of a longer integrating period (say up to 13 weeks) for exposure. Experience has shown that this can be an invitation to a general lowering of protection standards; or

Radiological Sciences Department

General (Continued)

(b) engineering appropriate protection methods. This appears to be the preferred course in some present cases.

(2) Permissible contamination levels are in many cases quite arbitrary, and potential savings exist where limits can be realistically increased. ORNL has started some sound studies in this field; these will be followed and supplemented as needed by local studies with other contaminants.

The Columbia River Advisory Group met here this month for an interchange of ideas on river pollution. Of special interest was mention of increasing industrial pollution above the reservation, which may ultimately affect water quality control and the radioactivity of the reactor effluent.

In the personnel field, all planned or foreseeable reductions of force to adapt to revised research and development programming were completed. This should lead to substantial improvements in morale of those subdivisions that have been affected, and which rather naturally may have anticipated further reductions.

During the period covered by this report, all persons in the Radiolocal 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

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RADIOLOGICAL ENGINEERING

Construction of the trainshed addition to the Biology Laboratory was resumed. Favorable bids were received for Phase 2 of the Bioassay Laboratory construction. The Positive Ion Accelerator Laboratory made good progress.

Design liaison studies in support of modifications to the 234-5 RMA line, the slug jacket dissolution operation at the Metal Examination Facility, and the relocation of hot graphite handling facilities were made.

Agreement on filtration of Purex ventilation air was not reached; further experimental work on the analogous Redox system is being expedited so that a final decision (for a January deadline) can be based on the fullest possible information.

The value of the new organization for research and development in radiological engineering will be tested by "semi-works" scale testing of the cribbing of troublesome TBP wastes, which has already been tested in Biophysics in laboratory column scale. Current excellent collaboration between Engineering Department forces and the several sections of Radiological Sciences Department involved should materially promote the best possible integrated application of HAPO's forces in this type of problem. Similar studies are to be made for decontamination room waste from the Redox Laboratory.

Work on hazards aspects of the use of reactor effluent for boiler feed continued.

The hazard consequences of a single reactor tube failure were reexamined, since revised Engineering Department calculations affected the earlier bases.

Radiological Sciences Department

RADIOLOGICAL RECORDS AND STANDARDS SECTION

1. Radiation Monitoring

General Statistics

	September	October	1953 To Date
Special Work Permits	393	470	4,762
Routine and Special Surveys	1,294	1,430	13,154
Air Samples	1,558	1,888	13,356
Skin Contamination	30	27	217

Failure of the compressed air system in the Redox laboratory caused a suck-back of dissolver solution into the operating panel board at the 1-F cubicle in the multicurie wing. Personnel evacuated the room before large exposure occurred. On another occasion, dissolver wash solution was forced out of the cubicle and contaminated one employee. Release of 200 ml of dissolver solution from the 1-E cubicle produced dosage rates up to 425 r/hr on the waste line in the tunnel. Analysis and study of glove contamination of a chemist involved in the September incident at the 1-F cubicle indicates that very localized exposure to one hand was between 700 and 2100 rep.

Several spills and process leaks at the Hot Semi-Works resulted in high level contamination spread in B-cell, the B sample gallery, and the control room. In one case, 200 to 500 μg of plutonium was involved. Personnel contamination was negligible.

A spill of 350 mg of plutonium oxalate occurred in a Technical research laboratory at the 222-T Building. No personnel contamination was reported. The work was being performed without an approved procedure, and the plutonium was being transferred outside a hood, a practice contrary to recognized control methods.

2. Radiological Standards

One Class II, four Class I, and twenty-nine Informal radiation incidents were reported.

The Class II incident was a localized skin overexposure (60 to 240 rep)

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2. Radiological Standards (Continued)

of a laboratory worker at the Redox laboratory. The Class I incidents included: inhalation of an estimated 6 mg of uranium by an operator at the UO_3 plant; improper storage of radioactive material in a Technical laboratory; the skin contamination and contamination spread at the 1-F cubicle in the Redox laboratory reported above; and the spill of plutonium oxalate at the 222-T laboratory, also reported above.

3. Exposure Records

During the first nine months of 1953, 250 employees showed an accumulated whole body gamma exposure of more than 1 roentgen, 15 more than 2 roentgens, and 1 more than 3 roentgens. The annual "bogey" exposure is 3 roentgens, which is 20% of the semi-official national limit.

A review of all plutonium deposition cases since the start-up of operations was made. There are 19 cases with measurable deposition; the only one demonstrably above the permissible limit is that one inherited from another site. However, several cases involve lung deposition which is currently not amenable to quantitative analysis.

(a) Personnel Meters, and Records and Photometry

General Statistics	September	October	1953 To Date
Gamma pencils read	211,588	198,442	2,196,274
Potential overexposures	12	7	90
Confirmed overexposures	0	0	6
Slow neutron pencils read	1,324	1,386	11,822
Potential overexposures	1	1	13
Confirmed overexposures	0	0	0
Beta-gamma film badges processed	38,865	32,963	375,675
Potential overexposures	20	59	392
Confirmed overexposures	1	0	19
Fast neutron badges processed	505	489	5,125
Potential overexposures	0	0	0
Confirmed overexposures	0	0	0
Lost readings (all causes)	21	45	229

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(b) Bioassay

1. Plutonium Analyses

	September	October	1953 To Date
Samples assayed	302	569	6,210
Results above detection limit*	0	44	125
Resamples assayed	4	9	142
Results above detection limit*	1	8	50
Maximum d/m/sample	0.75	1.78	2.25

*Detection limit was 0.05 d/m.

2. Fission Product Analyses

	September	October	1953 To Date
Samples assayed	365	614	6,978
Results above 10 c/m/sample	4	5	41

Two of the five results above 10 c/m were for routine samples and are under investigation. Three samples above 10 c/m were associated with Class I radiation incidents, numbers 296 and 312, and are also under investigation.

3. Uranium Analyses

Results of 325 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	7.0	2.6	26	10.5	2.5	23
Slug Recovery	3.1	3.1	1			
Melt Plant	11.2	4.4	8	6.8	3.0	6
Material Handling	7.9	3.2	7	4.9	2.7	3
Testing	18.0	3.5	33	2.3	1.3	6
305 building	4.1	4.1	1	1.4	1.4	1
Coverage	12.1	4.8	7	11.5	4.8	4
Special Products	8.5	3.9	7	3.8	1.8	7
Finishing	3.8	2.0	9	2.5	1.2	4
Technical	39.3	8.6	29	34.9	4.3	25

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3. Uranium Analyses (Continued)

	Before Job		
	Maximum	Average	Number Samples
Random Samples	2.0	1.0	17

	Miscellaneous Samples (μg/liter)		
	Maximum	Average	Number Samples
224-U	186.30	6.7	101

4. Tritium Analyses

	Activity Density ($\mu c/cc \times 10^3$)						
	< 2	2-20	20-35	35-75	> 75	Total	1953 To Date
Number of Samples	290	26	0	0	0	316	1,472

(c) Thyroid Checks

All thyroid checks reported were below the warning level.

(d) Hand Score Summary

There were 39,554 alpha and 52,180 beta scores reported. About 0.007% of the alpha and 0.05% of the beta scores were above the warning level. Decontamination of all high cases was attempted and successful.

4. Calibrations

	Number of Routine Calibrations		
	September	October	1953 to Date
Fixed Instruments	120	69	1,202
Portable Instruments	3,422	3,251	25,488
Personnel Meters	6,073	16,393	101,658
Total	9,615	19,713	128,348

Radiological Sciences Department

BIOPHYSICS SECTION

CONTROL UNIT

Regional Survey

The general findings are summarized in the following table:

SAMPLE TYPE AND LOCATIONS	Activity Type	Average Activity Density (μc/cc)
Drinking Water		
Benton City Water Co. Well	alpha	No sample.
Richland, N.Richland, Benton City Wells	alpha	$<5 \times 10^{-9}$ to 1.0×10^{-8}
100 Areas	beta	<0.5 to 4.4×10^{-7}
Pasco, Kennewick, McNary Dam	beta	<0.5 to 4.1×10^{-7}
Backwash Solids-Pasco Filter Plant	beta	5.3×10^{-2} μc/g
Backwash Liquids-Pasco Filter Plant	beta	1.3×10^{-6}
Sand Filter-Pasco Filter Plant	beta	1.0×10^{-4} μc/g
Anthracite Filter-Pasco Filter Plant	beta	No sample
Other Waters		
300 Area Wells #1,2,3	alpha	0.5 to 8.2×10^{-8}
300 Area Well #4	alpha	1.5×10^{-7}
Well #4 measured as uranium	U	1.9×10^{-7}
Other wells on the reservation	beta	<0.5 to 1.8×10^{-7}
Columbia River-Hanford Ferry	beta	1.2×10^{-5}
Columbia River-Below reactors	beta	9×10^{-6}
Columbia River-Patterson to McNary	beta	2.6×10^{-7}
Columbia River-Shore Mud	beta	0.2 to 1.9×10^{-4} μc/g
Raw Water-Operating Areas	beta	<0.05 to 1.3×10^{-6}
Reactor effluent retention basins	beta	3.3 to 6.7×10^{-3}
Reactor effluent retention basins	alpha	$<5 \times 10^{-9}$
I^{131} in farm wastes	I^{131}	7×10^{-7}
I^{131} in Columbia River-Hanford	I^{131}	1.2×10^{-7}

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Regional Survey (Continued)

SAMPLE TYPE AND LOCATIONS	Activity Type	Average Activity Density (μc/cc)
Atmospheric Pollution		
Gross alpha emitters	alpha	< 0.4 to 3.6×10^{-14}
Gross dose rate-Separations areas	beta-gamma	0.5 to 2.7 mrep/day
Gross dose rate-Residential areas	beta-gamma	0.3 to 0.7 mrep/day
Filterable beta-Separations areas	beta	0.2 to 1.1×10^{-11}
I^{131}-Separations areas	I^{131}	0.1 to 1.5×10^{-12}
I^{131}-Separations stacks	I^{131}	3.4 curies/day
Active particles-Wash.,Ida.,Ore.,Mont.	-	0.18 to 0.96 ptle/m^3
Active particles-Hanford Operation	-	0.09 to 1.4 ptles/m^3
Tritium (as oxides)-Reactor stacks	T	0.34 curie/day
Vegetation		μc/g
Environs of Separations areas	I^{131}	3 to 8×10^{-6}
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	0.4 to 2.1×10^{-4}
Alpha emitters-Separations areas	alpha	2 to 7×10^{-7}
Alpha emitters-300 Area	alpha	1.0×10^{-6}

Emission of I^{131} from Separation facilities increased to an average of 3.4 curies/day in October. Decreased efficiency of two silver reactors at Redox allowed 36 curies to be discharged from that facility over a four-day period, with maximum daily emission of 11 curies. Maximum daily emission from T-Plant was 2.3 curies.

Average daily emission of ruthenium from Separation plants decreased to an average of 1 curie/day with a maximum of 3.2 curies/day.

Concentrations of airborne particulate material decreased by October 16 to weekly averages of less than 0.1 particle/cubic meter at all locations except those in the vicinity of 200-W where concentrations fluctuated widely with operation.

Concentrations of alpha particle emitters in Redox swamp and Redox retention basin water were 1.4×10^{-5} μc/cc, and 5.8×10^{-5} μc/cc, respectively, on October 16. Later samples indicated values less than 5×10^{-9} μc/cc.

A maximum activity density of gross beta particle emitters in 107-D basin effluent water was noted on October 16 to be 6.4×10^{-3} μc/cc. This maximum followed a trend from July when the monthly average was 3.4×10^{-3} μc/cc.

Radiological Sciences Department

Analytical Control Laboratory

Routine analyses were carried out as follows:

Laboratory	Analyses Completed October	Analyses Completed 1953 To Date
Type Sample		
Vegetation	1422	13051
Water	1725	18701
Solids	353	3346
Air samples	395	3892
Uranium (fluorophotometer)	495	5384
Oil fog (fluorophotometer)	232	1122
Special survey samples (RMSS)	13	284
Special survey samples (RMU and RS)	55	679
Phillips Petroleum -Tritium in water	7	31
Total	4697	46495
Counting Room		
Beta measurements (recounts included)	7065	64643
Alpha measurements (recounts included)	2207	24267
Control points (alpha and beta)	2503	25993
Decay curve points	5183	48789
Absorption curve points	439	3649
Total	17397	167341

Control Services

Evaluation of isotope variations in reactor effluent was continued in order to evaluate the effects of changes in water treatment and changes in Columbia River water quality.

Synoptic Meteorology

Forecasts	Number made	October Percent reliability
Production	93	83.2
24-hour	62	84.1
Special	53	83.0

Temperature averaged 55.4°F, or 2.4°F above normal. Precipitation totaled 0.20 inch, or only about one third of the normal amount of 0.59 inch.

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Radiological Sciences Department

RESEARCH AND DEVELOPMENT ACTIVITIES

Experimental Meteorology

Tests were started to determine whether fluorescent pigments could be dispensed, mixed with fog-oil from conventional equipment, without interference with fluorescent sampling at the receptor.

Sutton's diffusion hypothesis was transformed from rectangular coordinates to cylindrical coordinates and tables were prepared to facilitate evaluation of field test data. Preliminary analysis of the average hourly field test results indicated that values of the diffusion parameter and the stability parameter were far different from those given by Sutton for three-minute averages.

Computations of theoretical concentrations and plume widths expected downwind of a 75 m. stack as a function of stability and distance were completed using a revised diffusion coefficient of 0.12 for neutral stability and a wind speed of 5 mps. Theoretical computations were made for the rise of a plume as a function of time, heat generation rate, and stack exit velocity.

An analysis of the airflow in the 100 Areas indicated that the wind was either up-river or down-river about 27% of the year at 100-H, and 42% of the year at Station 9 (about 1.5 miles south of Hanford).

Earth Sciences

The scintillation counter well probe was used extensively in the 241-T-31 reverse well area and in the 361-T crib area. The results from the latter correlated exceedingly well with those obtained by G.M. probe in 1951, following cessation of use of the cribs. No appreciable gross movement of the radioisotopes is indicated during the past two years. Surveys of contamination below the water table in the reverse well area determined the vertical distribution of the radioisotopes in the ground water sands.

The thermally hot artesian ground water encountered in well 107-B-2 at a depth of 773 feet continued to indicate the presence of a source of heat. The water temperature at the water surface in the well was 80°F at close of drilling, rose to 99°, and then to 105° within a month.

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Radiological Sciences Department

Earth Sciences (Continued)

Soil column experiments were performed with actual first cycle waste solutions and simulated waste solutions spiked with 0.2 mg Cs per liter to further evaluate the disposal problem. The effluent from both experiments indicated breakthrough of Cs amounting to 2-4% of the original amount present after only one column volumn of liquid had passed through each column. Equilibrium experiments indicated essentially no difference in the total adsorption of radioisotopes between diluted and undiluted wastes.

The adsorption of Sr by soil increased slowly with time for solutions up to 0.01 S * in concentration. Sodium nitrate strongly inhibited the adsorption of Sr; with 400 gm/liter, adsorption was 1/40 that obtained with no sodium nitrate. Yttrium had little effect on Sr adsorption when the concentration of the latter was less than 0.01 S but had appreciable effect at higher concentrations.

Industrial Hygiene

The studies on the 291-U sand filter performance were completed for the purpose of determining the feasibility of by-passing it. Radiochemical analyses indicated that the MPC for Sr^{90} could be exceeded at ground level near the stack during unstable meteorological conditions and at off-site locations during stable conditions. Recommendations were given to maintain the sand filter in operation.

At the request of the Atomic Energy Commission, a study was made of dust conditions at the Kaiser limonite ore crushing operations at 100-K Area. Dust counts correlated with determinations of the free silica content of the airborne dust established that the problem was a nuisance dust condition rather than a silicosis hazard.

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* S = saturation capacity in milliequivalents per 100 g soil.

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Methods

The new steel salmon nest thermistor-equipped probe was fully assembled, tested and installed in the Columbia River near Priest Rapids. First measurements again showed a significantly different temperature six inches below the river bottom.

Tests on the laboratory multiweir sampler and the laboratory circular plane weir sampler neared completion. The precision obtained with the multiweir sampler was within the proposed specifications. The sampler can be recommended for use where accurate proportional sampling of flowing liquids is needed with minimum maintenance and no power requirements.

Preliminary tests showed that AgI^{131} can be extracted from silver nitrate impregnated glass wool filter pads by an acidic solution of mercuric nitrate. The activity is recovered and counted as a precipitate obtained when the solution is adjusted to pH 4.

Further study of the electrodeposition of plutonium from acid solution indicated satisfactory deposition on plates 4.5 and 8.7 mm^2 in contrast to the 40 mm^2 area now used.

A procedure for the determination of Cr^{51} in 107 Basin water was developed using 8-hydroxyquinoline as a chelating agent for precipitating the contaminants.

A study was completed showing that radium and americium are not carried with plutonium in the TTA analysis and, therefore, will not interfere.

An analytical procedure for Mo^{99} in 107 Basin water and fission product mixtures, such as bomb fallout, was developed and appears to be quite specific. Contamination with other fission products was well below 1%. Contamination from 107 water solutions is somewhat greater but has not been accurately determined as yet.

A determination of the ratio of the 0.2 and 0.7 Mev. beta particle emissions in Ru^{103} was made by absorption studies. The results showed 97% and 3%, respectively.

Radiochemical Standards

The parameters of filling gas composition, tube diameter, and anode configuration for the end-window proportional beta particle counter were studied. Propane was found to be the superior filling gas, insuring long flat voltage plateaus. Nearly the theoretical geometry was obtained for tubes of three different diameters, suggesting that virtually no insensitive volume exists within the tubes, a significant improvement over mica window G.M. tubes.

Backscatter measurements were made for Mn^{56}, Mo^{99}, and for Tl^{204}, on end mica window counters. Self absorption-scatter measurements were made of shorter and long-lived beta emitters concentrated by small fish, algae, and plankton.

Tests were made determining the minimum holding agent which must be used to insure against loss of I^{131} during drying of standard samples. Self absorption-self scatter measurements were made for I^{131} in silver iodide precipitates.

Physics

Study of time-of-flight techniques for fast neutron energy analysis for the Positive Ion Accelerator Laboratory indicated that, in general, they possess advantages in speed and accuracy over other methods which have been proposed. Detectors with very rapid response are required for time-of-flight measurements. A tube containing a cathode of fissionable material (in this case uranium) and an electron multiplier structure was designed and built to determine if a very rapid response detector of fast neutron fissions can be made in this way.

The electron monitoring chamber which was built for the electron Van de Graaff operated satisfactorily. It measured a dose rate of 10^5 rep/sec for 0.7 microampere beam current; dose rates much lower than this are required for instrument research and calibration but the method of intensity reduction employed must not produce large quantities of X-rays. A modification of the Van de Graaff control system to obtain much smaller beam currents is being considered.

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Physics (Continued)

The method of comparing characteristics of various scintillating materials was applied to several new materials -- sodium iodide, stilbene, and plastic phosphors to select the most suitable phosphors for problems in neutron and beta ray counting.

The K source was used to measure the energy sensitivity of Juno, Totem Pole, and C.P. instruments.

The surface dose rate of a Sr^{90} beta ray applicator was measured with an extrapolation chamber for the Biology Section. The active material was deposited in a thin layer; for such cases, the beta ray age-diffusion theory predicts a dose rate of approximately 1.5 rep/sec per mc/cm^2. This measurement provided the first good experimental check of this prediction for Sr^{90}; the result was 1.25 rep/sec per mc/cm^2 which is in satisfactory agreement with the predicted value.

IBM computation of certain integrals basic to the beta ray age-diffusion theory was completed.

A gamma-ray monitor for the Van de Graaff which uses a single ionization chamber rather than a sequence of chambers was designed and built to measure all normally used dose rates.

Instrument Development

Design of the detecting system for telemetering wind speed and the two-dimensional velocity vector approached completion. Speed will be monitored with a cup anemometer interrupting a light beam; the velocity vector will be measured by determining direction with a vane coupled to a resolver into the output of which the speed is factored instrumentally.

A data reduction system for the wind component meter was designed.

Design of a filter type sampler for non-volatile particulate matter in stack gases was completed and fabrication was started. The filter is a tape which is moved stepwise from the sampling point to a heater and then to a takeup roll. Sampling period is selected by the operator at setup time.

Instrument Development (Continued)

Tests of a cathode ray beam deflection system for pulse height analysis were completed successfully.

In collaboration with Methods, a scheme was devised for the continuous monitoring of Ru^{103}, Ru^{106}, and I^{131}, in stack gases, and the recording of each concentration separately. Ru^{106} will be monitored by beta counting; Ru^{103} by monitoring the 0.5 Mev. photoelectric line and subtracting instrumentally the fraction contributed by Ru^{106}; and I^{131} by monitoring the 0.364 Mev. line and subtracting instrumentally the amount contributed by the 0.5 Mev. Compton spectrum. Logarithmic counting rate meters and means for determining total emission are being studied for use in this system.

BIOLOGY SECTION

AQUATIC BIOLOGY

Biological Chains

Concentration factors for P^{32} were computed for planktonic and attached algae grown in different levels of stable phosphate nutrient. Isotopic dilution was apparent, but not direct and linear. Rapid depletion of phosphate from the water phase to very low levels caused concentration factors to be similar in all the low-phosphate aquaria and sharply separated from the 6 higher-phosphate aquaria. Failure of the expected ratio of concentration to isotopic dilution to hold for high-phosphate aquaria may suggest that the P^{32}, introduced later, was more easily available to the algae than some of the inactive phosphate. Concentration factors were relatively stable with time in the high-phosphate aquaria, but increased with time at low-phosphate levels.

Ecology

Survey of the Columbia River

Routine collection of organisms was continued under favorable conditions. Average activity densities at Hanford remained at about the same level for plankton and algae, 3×10^{-2} and 6×10^{-3} $\mu c/g$,

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Radiological Sciences Department

Ecology (Continued)

respectively, but declined in invertebrates to 8×10^{-3} μc/g of caddis fly larvae and in small fish to 4×10^{-3} μc/g. Maximum activities for large fish, 10^{-2} μc/g of chiselmouth scales, 10^{-3} μc/g of bass bone, and 10^{-4} μc/g of bass flesh, were substantially lower than last month. Two sturgeon captured between 100-H and 100-F had very low activity densities. Radioactivity of small fish collected below 100-H dropped to less than half that observed at Hanford. Whitefish with significant amounts of activity were no longer found in the Priest Rapids area.

An aerial survey of salmon spawning grounds revealed very few nests with the majority located outside the Hanford reservation, upriver from Midday.

Effluent Monitoring

During the last week of the month, eggs were obtained from chinook salmon spawning in the Columbia River near the Hanford reservation. These eggs were used to start a new study designed to determine the influence of temperature on survival. Puget Sound strain eggs will be included in the test, as soon as obtainable, for comparison with previous studies.

BIOLOGY CONTROL UNIT

Biological Monitoring

Rodent thyroid activity densities again increased, with the maximum of 1.1×10^{-3} μc/g occurring one mile SE of Redox.

Fission product contamination was observed in all rodent feces samples during the second half of the month.

Clinical Laboratory

There were 58 miscellaneous and 900 blood analyses performed, including 122 creatinine studies by two methods. Comparative studies indicated the greater accuracy in the Miller method for creatinine determination.

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Radiological Sciences Department

Microscopy

Routine services were performed in histology and electron microscopy for Toxicology, and in exploratory autoradiography of the rat skin for Metabolism.

Radiochemistry

Routine services included 950 analyses for I^{131} or P^{32}, 278 tritium analyses, and 106 Pu analyses.

METABOLISM

Plutonium Absorption and Metabolism

In tests on percutaneous transmission of plutonium nitrate solution in the rat, absorption was constant at about 2%, except at low concentration where it appeared to increase to about 3%.

Fission Product Absorption and Metabolism

No result.

Tritium Absorption and Metabolism

Additional analyses on tissues from rats exposed to tritium gas indicate no apparent significant variation in tritium content of body water from various tissues. The high value for bound tritium in muscle, previously reported, was not confirmed by analyses on a different group of exposed animals.

Rats, sacrificed at the age of six months after being on a constant tritium oxide regimen since conception, showed an average concentration of tritium in hydrogen from organic compounds which was approximately 20% of the tritium concentration in the hydrogen of their body water. This was approximately the same level of tritium incorporation observed for mature animals kept on the same tritium oxide regimen for four months. The highest concentration of tritium in organic hydrogen (37% of that in body water hydrogen) was found in the brain.

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Mechanism of Radiation Damage to Plants

Photosynthesizing algae and algae utilizing glucose as a source of energy were grown in the presence of C^{14} labeled acetate, and various compound fractions from the algae isolated and C^{14} uptake determined. The comparison between glucose-utilizing cells and photosynthesizing cells was similar to that previously observed between irradiated and unirradiated cells, the incorporation of C^{14} in triglycerides being much greater in the glucose-utilizing cells than in the photosynthesizing cells.

PLANT NUTRITION AND MICROBIOLOGY

Absorption and Translocation of Radioelements in Plants

An experiment was conducted in the greenhouse to determine the uptake of Ru^{106} by four species of plants. It was found that the species of plant may have a significant effect on the uptake of this ion. The approximate values for the leaf-root ratios were as follows: beans - 0.0002; oats, tomato, and Russian thistle - 0.002. These observations are considered interesting since the bean usually demonstrates a high level of uptake efficiency. The values are an order of magnitude greater than those for cerium and at least 3 orders of magnitude less than for strontium.

RBE by Microbiological Methods

The automatic turbidimeter was received and is undergoing tests to determine operating characteristics.

In an attempt to find a chemical dosimeter less energy dependent than iron, the G-yield in a phenol dosimeter was compared to that in iron. The following values were obtained:

	H^3	P^{32}
G - iron	14.0	12.0
G - phenol	0.73	0.56

From this, it is apparent that the phenol dosimeter is fully as dependent on the energy of the beta particle as is iron.

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RBE by Microbiological Methods (Continued)

Dilute solutions of irradiated biotin and folic acid have been examined to determine whether these vitamins are converted by irradiation into closely related compounds possessing either stimulatory or inhibitory properties. No activity has been found.

Genetic Effects of Internally Deposited Radioelements

Growth was obtained from cultures of Neurospora grown on all levels of phosphorus, very slight growth occurring even in the one to which no phosphorus was added. Although the numbers of colonies obtainable from these cultures was small, it is hoped that they will be adequate to roughly evaluate the effect of P^{32} transmutation. Isolations are still in progress and tests for mutations have not yet been made.

No explanation has been found for the apparent inability of E. coli to utilize minute traces of phosphorus. Contaminating phosphorus is being dialyzed out of casein so this material as well as vitamins can be used as a growth supplement. Previous tests have indicated that amino acid supplementation increases the efficiency of phosphorus utilization.

Preliminary experiments have been made to determine whether colloidal particles can be more readily coated with plastic by a solvent evaporation technique or by catalytic hardening of the plastic from an emulsion. Neither method has yielded satisfactory results to date.

TOXICOLOGY UNIT

Experimental Animal Farm (Toxicology of I^{131})

The ratios of I^{131} in the thyroid gland to the I^{131} fed daily (Q/q)

Experimental Animal Farm (Continued)

in October were as follows:

	5 μc/day	1.5 μc/day	0.5 μc/day	0.15 μc/day
Original ewes	2.4			2.9
1950 Offspring	1.4			3.5
1951 Offspring (from off-project)	2.6	2.9	3.0	3.5 2.6
1953 Offspring	1.9			2.8

Skin Beta Burns

Beta irradiation of the skin of sheep was initiated using a Sr^{90} plaque with a measured surface dose of 3,650 rep/hour.

Thyroid Inhibiting Drugs

Due to reports from the Experimental Station, University of Tennessee at Oak Ridge, a special study designed to evaluate the thyroid-inhibiting effects of a commonly used anthelminthic (phenothiazine) and two drugs of similar chemical structure, methylene blue and acriflavine, was initiated. Its purpose was to evaluate the extent of thyroid depression as revealed by external thyroid monitoring when fed to animals maintained on 5 μc I^{131}/day. The prophylactic dose (small daily dose) of phenothiazine resulted in a measurable decrease in the concentration of I^{131} in the thyroid gland. Only a slight decrease was noted in the sheep fed a single therapeutic dose of phenothiazine and in the sheep fed one dose of methylene blue.

Radioactive Particles, Metabolism and Toxicology

Work was continued on the tumorigenicity of plutonium oxide particles administered via the tracheobronchial route to a pulmonary tumor-sensitive strain of mice.

Radiological Sciences Department

Alpha Particle Induced Gas Reactions

A G-yield in the order of 10 molecules of NO_2 per 100 ev was again obtained in exposures of N_2O and 80% N_2O + 20% O_2.

The search will continue for a more reactive gas mixture which will include N_2O as one of the components.

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FINANCIAL DEPARTMENT MONTHLY REPORT
OCTOBER, 1953

On the basis of a report prepared by a representative of the Internal Audit Unit following an audit made at the vendor's plants, the Engineering Department negotiated a new price on the graphite supplied during July, August and September by the National Carbon Company under Special Agreement No. G-5 at a cost of approximately $73,000 less than that proposed by the vendor for these shipments.

Arrangements for the annual meeting of the Washington State Municipal Finance Officers Association, held in Richland on October 23, were made by the financial adviser for the Community Real Estate and Operations Department. The 69 members of the Association who attended included seven representatives of the General Electric Company.

The results of a survey of hospitals in the State of Washington, conducted jointly by Medical Department and Financial Department personnel, were released this month. The survey report compares the costs of various hospitals on an "employee per patient-day" basis, and analyzes the costs of various hospital services.

The semi-annual report on personnel requirements was transmitted to the Atomic Energy Commission on October 30.

Work on the mid-year budget review got under way and is to be completed in December.

Under the Washington Unemployment Compensation Act, an experience rating credit was issued to the General Electric Company, of which $332,102.87 was allocated to the Hanford Atomic Products Operation. This credit amounts to 1.2 per cent of 1952 wages subject to contributions and will be used to offset payments which would otherwise be made for the third and fourth quarters of 1953, and a portion for the first quarter of 1954.

The physical inventory of "uninstalled" capital assets which began in September, was completed in the 100, 200, 300, 700, and 1100 Areas in October, except for equipment in the laboratories in the 300 Area. Reconciliation of the accounts and the preparation of permanent records will require considerable additional time.

[redacted]

Statistics

A summary of cash disbursements and receipts (excluding reimbursements by the Atomic Energy Commission) for the months of October and September, 1953, is shown below:

Disbursements	October	September
Payrolls (Net)	$3 074 226	$2 843 506
Materials and Freight	1 012 027	1 741 163
Payroll Taxes	560 668	629 137
Payments to Subcontractors	997 559	547 048
United States Savings Bonds	229 466	235 150
Group Insurance Premium	131 228	147 642
Pension Plan - Employees' Portion	110 330	97 142
Income from Special Funds	187 618	-0-
Other	156 683	150 608
Total	$6 459 805	$6 391 396
Receipts		
Rent	$ 172 401	$ 119 702
Hospital	63 397	62 499
Telephone	48 875	48 267
Electricity	47 797	45 274
Sundry Accounts Receivable	28 134	14 413
Bus Fares	7 993	7 639
Refunds from Vendors	3 062	1 312
Sales to AEC Cost-type Contractors	10 747	35 360
Income from Special Funds	187 618	-0-
Other	4 969	8 879
Total	$ 574 993	$ 343 345
Net Disbursements	$5 884 812	$6 048 051

Advances as of October 31 and September 30, 1953, may be summarized as follows:

	October	September
Cash in Bank - Contract Accounts	$3 212 735	$3 097 548
Cash in Bank - Salary Accounts	50 000	50 000
Travel Advance Funds	125 000	125 000
Total	$3 387 735	$3 272 548

Personnel and Organization

	Current Month	Prior Month
Personnel Changes During Month		
Employees at beginning	336	332
Additions and transfers in	7	13
Removals and transfers out	(7)	(9)
Employees at end of month	336	336
Personnel by Unit at Month-End		
General	9	9
Reimbursement Unit	4	4
General Accounting Unit		
General Accounts	19	19
Inventory Accounting	7	8
Plant Accounts	32	32
Accounts Payable	37	36
Accounts Receivable	22	21
General	3	3
	120	119
General Cost Unit		
Consolidated Costs and Budgets	5	6
Plant Auxiliary Operations	17	17
Community Operations and Real Estate	7	7
Radiological Sciences and Other	7	7
Medical	3	3
General	4	3
	43	43
Manufacturing Cost Unit		
Costs and Budgets	33	34
General	8	8
	41	42
Engineering Cost Unit		
Project Section Costs	16	15
Design Section Costs	7	8
Technical Section Costs	11	9
General	6	6
	40	38
Payroll Unit		
Preparation and Employee Records	33	35
Confidential Payroll Records	7	6
Employee Benefit Plans & Payroll Reports	21	22
IBM Procedures	1	1
General	2	2
	64	66
Internal Audit Unit	12	12
Rotational Trainees	3	3
Total	336	336

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-2
Appropriations Section	Ie-1 through Ie-2
Payroll and Auditing Section	
Payroll Unit	If-1 through If-5
Internal Audit Unit	Ig-1

GENERAL ACCOUNTING UNIT
MONTHLY REPORT - OCTOBER 1953

ACCOUNTS PAYABLE

Volume of work processed in Accounts Payable during October increased substantially as compared to previous months. Vouchers booked numbered 3 515, amounting to $3 163 377, and freight bills paid numbered 1 689, amounting to $464 351. New purchase orders received numbered 1 919, and totaled $2 017 029. This indicates that the work load will not fall below the current level for the next few months.

Discount earned during the month amounted to $3 070. Fiscal year to date total discount earned amounts to $12 314.

Since the start of the fiscal year, there has been a significant decrease in the outstanding deposits on returnable containers. This reduction has been effected through emphasis on the return of empty containers. The balance in this account as of October 31 was $25 115 as compared with the June 30 balance of $30 416.

Invoices have been received from National Carbon Company covering shipments of graphite under Special Agreements No. G-5 and G-23, in the amounts of $3 473 060 and $684 138, respectively, as of October 31, 1953.

With respect to Special Agreement No. G-23, the delivery of the first 1 000 tons of unpurified graphite was made on September 1, 1953, after which prices to be redetermined by negotiations shall be deemed to be effective with respect to all deliveries subsequent to the first 1 000 tons. As of October 31, 1953, the deliveries under this contract were approximately 70.84 percent complete.

It is estimated at this time that final deliveries under both G-5 and G-23 as presently modified will be made during the first half of January, 1954.

Deliveries of graphite under Special Agreement No. G-12 are scheduled to commence November 13, 1953.

ACCOUNTS RECEIVABLE

The gross accounts receivable balance at October 31, 1953 amounted to $297 562, a decrease of $82 311 from the balance at September 30, 1953. This decrease is primarily due to a decrease of $76 640 in the rent account from $113 328 at September 30, 1953 to $36 688 at October 31, 1953. The unusually high balance at September 30, 1953 resulted when no payroll deductions were made from September salaries due to cancellation of leases and revision of rental rates.

General Accounting Unit

ACCOUNTS RECEIVABLE (CONTINUED)

Out-patient invoices issued in October at Kadlec Hospital numbered 1 592 and totaled $6 200 as compared with 1 781 in September, totaling $7 979. In-patient revenue totaled $67 188 as compared with $64 795 in September. This increase in revenue resulted from increase in hospital census from 78.8 in September to 81.2 in October, 1953.

Approximately 200 revised wage deduction authorizations were forwarded in October to General Electric employees housed in North Richland covering barracks and trailer space rentals. All authorizations were signed and returned as of October 31, 1953.

Audit of Accounts Receivable - Telephone was accomplished by the Internal Audit group in October. All pertinent records were made available, and considerable time was consumed in discussions with Audit personnel relative to records and procedures. Audit of Accounts Receivable - Rents and Electricity is scheduled for the month of November.

During the month, uncollectible accounts in the amount of $6 024 were written off and assigned to the Atomic Energy Commission. Of the total assigned, $5 106 represented uncollectible Kadlec Hospital accounts, and $968 represented uncollectible tenant service and utilities accounts.

Procedure development continued on the transition of electricity billing from IBM to Burroughs procedures. Due to delays in delivery of the required billing machine, it is now anticipated that such billing operation can not be inaugurated before March 1, 1954.

GENERAL ACCOUNTS

Unexpended advances from the Commission amounted to $3 387 735 at October 31, 1953 as compared with $3 272 548 at the end of last month. An advance of $6 000 000 was requested this month from the Commission to provide for November disbursements.

Financial statements for Hanford Atomic Products Operation and Atomic Products Division were issued for the month of September, 1953 on October 12, and October 15, 1953, respectively; other major financial reports were issued on the scheduled dates.

Particular attention was given this month to the report of Commitments, Expenditures, and Reimbursements. A revised report for the HAPO General Financial Statements was prepared for inclusion in October statements. In comparing the prime contract amount, as amended June 30, 1953, with expenditures and commitments for the first quarter of FY-1954, there remained an excess over expenditures and commitments in the amount of $81 019 000. This amount is allocated as follows: Hanford Atomic Products Operation,

GENERAL ACCOUNTS (CONTINUED)

$66 922 000; Knolls Atomic Power Laboratory, $13 224 000; and General, $873 000. Expenditures for the first quarter totaled $24 219 000, detailed as follows: Hanford Atomic Products Operation, $17 582 000; Knolls Atomic Power Laboratory, $6 346 000; and General, $291 000.

As part of our continuing program to economize through elimination of unnecessary reports and duplication of work wherever possible, several functions performed by General Accounting and Engineering Cost Units were consolidated. The monthly Consolidated Construction Work in Progress Report is now prepared by Engineering Cost since that Unit records and reports approximately 90% of all construction cost incurred. Because General Accounting controls and distributes cost transfers between General Electric and the Atomic Energy Commission, the control and distribution of cost transfers between CPFF subcontractors and General Electric was transferred to General Accounts from Engineering Cost. Further duplication of work was eliminated by establishing four sub-accounts in general ledger account Construction Work in Progress - Engineering. Charges to Engineering Cost will flow directly to personnel responsible for the work rather than to a control desk in Engineering Cost Unit for further distribution.

Work in general ledger increased considerably in October as compared with prior months. Document control procedures were established to account for stores tickets from the time they leave Stores until final distribution to Cost. In addition, quantity controls were established to provide a control over extensions of stores tickets by IBM. During the month, 28 000 stores tickets were processed by general ledger.

Fifty-eight shipping documents were processed during the month relieving Excess Inventories in the amount of $198 000. Much time was spent in October reviewing open shipping documents to determine that invoices had been issued or costs had been transferred to the consignee. As a result of this review and intensive effort to clear open documents, 75 documents were closed and an additional 35 to 50 will be cleared in the near future.

During October, 290 travel and living expense reports totaling $56 776 were booked as compared with 205 reports totaling $33 855 in September. Charges against the Overhead Allowance for Travel and Living Expenses and Conference Expenses totaled $1 780 and $1 414, respectively, as compared with $946 and $663 in September. The sizable increase in travel and living expense is partially due to the increase in number of material inspectors travelling for the Engineering Department.

A comparison of actual travel and living expense variation recorded in October with budgeted amounts shows a net amount over budget of $447. This is the first month of the current fiscal year in which the budget has been exceeded.

General Accounting Unit

INVENTORY ACCOUNTING

Considerable time was devoted with Stores personnel in discussing and reviewing present document control procedures to determine if improvements could be made so as to speed the flow of inventory documents to Inventory Accounting or to improve related document control work. As a result of these discussions, a time schedule was established, effective October 21, 1953, governing flow of inventory documents through Stores to Inventory Accounting. With the use of this time schedule, all documents covering a day's business reach Inventory Accounting within 10 working hours after material is disbursed or transferred as compared with 18 working hours in the past. In addition, the method of handling and controlling material transfer documents was revised to eliminate duplication of effort on the part of Stores. Among other things, the revision in procedure eliminated the preparation of journal entry requests and the extension of total value of material transfers by Stores Unit.

Several discussions were held during the month with Technical Section and Office Unit personnel to resolve questions which have been raised concerning inventories of unrecorded materials.

An agreement was reached with the Transportation Section whereby inventory of anti-freeze will be reclassified, effective November 1, 1953, as a general supplies item, and the value of the material currently booked in the fuel and lubricants inventory account will be transferred to a newly established caption in the general supplies inventory account. Responsibility for the inventory will, however, remain with the Transportation Section.

In line with the standardization program currently in effect to properly classify and describe materials in Stores stock, the inventory of stainless steel (caption 32) will be discontinued, effective November 1, 1953, and replaced by caption 46 (angles, bars, plates, etc.) and caption 48 (fittings, valves, etc.). In connection with this reclassification, time was spent with Stores personnel in reviewing and formulating routines to be followed by all concerned in order to effectively transfer the book value of the stainless steel from the present account.

Time was spent in reviewing the draft of the proposed organization and policy guide covering Control of Reactor and Other Special Materials.

Effective October 1, 1953, Inventory Accounting assumed responsibility for maintaining subsidiary ledgers on all inventory accounts except essential materials inventory. These ledgers will be the official subsidiary ledgers and will replace the subsidiary ledgers maintained by General Accounts. The establishment of these ledgers in Inventory Accounting eliminates duplication of effort on the part of General Accounts and provides Inventory Accounting with detailed ledgers for reporting purposes.

General Accounting Unit

PLANT ACCOUNTS

Inventories of uninstalled cataloged plant were completed as scheduled in the 100, 200, 300, 700, and 1100 Areas. Inventories of the 300 Area, however, did not include the Hanford Works Laboratory Area due to contemplated relocation of equipment in that area. Assistance received from other departments made the completion of these inventories possible.

A preliminary control card was adopted and is being currently forwarded to custodians of equipment inventoried. This will provide a means of control of items inventoried pending reconciliation with plant records and the preparation of permanent record cards.

The Atomic Energy Commission approved our recommendation providing for the depreciation of uninstalled cataloged equipment according to year of acquisition. Each year's acquisitions are to be treated as one plant record unit and depreciated until fully amortized. No depreciation is to be booked after 100 percent amortization, and the items are to remain on the books until actually removed from service.

Necessary office work in connection with Plant Accounting has fallen behind as a result of our using six office clerks for full-time inventory work. Overtime was scheduled throughout the month of October for the purpose of handling current work and reconciling inventories.

An analysis of the account, Plant and Equipment Not Used or Not Currently Useful was made to determine what steps could be taken to relieve our records of items included in this account. The balance in this account of $8 263 000 has been reduced during the month in the following amounts:

Transferred to In Service accounts:	
Power Wiring Systems -- 189-D and F Buildings	$ 253 708
291-C Stack (Hot Semi Works)	76 275
Items written off against applicable reserves:	
Slab Yard, 200-W Area	142 236
Piping Systems, 189-D and F Buildings	119 806
Total	$ 592 025

Of the remaining balance, equipment in the 186-D Building valued at $4 861 000 has been entered on invitations to bid by the Atomic Energy Commission. Bids are to be opened on December 1, 1953 and disposition may be made after that date. Other items will remain in the account pending results of our current investigation.

General Accounting Unit

	October	September
Accounts Payable		
Balance at Beginning of Month	$ 413 142	$ 403 762
Vouchers Entered	3 163 377	3 320 808
Cash Disbursements	3 156 114 DR	3 312 740 DR
Cash Receipts	3 062	1 312
Other	-0-	-0-
Balance at End of Month	$ 423 467	$ 413 142
Number of Vouchers Entered	3 515	3 243
Number of Checks Issued	2 177	2 123
Number of Freight Bills Paid	1 689	1 475
Amount of Freight Bills Paid	$ 464 352	$ 433 117
Number of Purchase Orders Received	1 919	1 548
Value of Purchase Orders Received	$ 2 017 029	$ 1 608 974
Cash Disbursements		
Payrolls (Net)	$ 3 074 226	$ 2 843 506
Material and Freight	1 012 027	1 741 163
Lump Sum and Unit Price Subcontracts	997 559	547 048
Payroll Taxes	560 668	629 137
United States Savings Bonds	229 466	235 150
Income From Special Funds	187 618	-0-
Group Insurance Premium	131 228	147 642
Pension Plan - Employees' Portion	110 330	97 142
All Other	156 683	150 608
Total	$ 6 459 805	$ 6 391 396

General Accounting Unit

	October	September
Cash Receipts		
Advances from Atomic Energy Commission	$ 6 000 000	$ 5 000 000
Income From Special Funds	187 618	-0-
Rent	172 401	119 702
Hospital	63 397	62 499
Telephones	48 875	48 267
Electricity	47 797	45 274
Sundry Accounts Receivable	28 134	14 413
Sales to Cost-type Contractors	10 747	35 360
Bus Fares	7 993	7 639
Refunds from Vendors	3 062	1 312
Other	4 969	8 879
Total	$ 6 574 993	$ 5 343 345

Bank Balances at End of Month		
Chemical Bank and Trust Company - New York		
Contract Account	$ 1 277 712	$ 640 884
Seattle-First National Bank - Richland		
Contract Account	1 190 840	1 568 132
United States Savings Bonds Account	277 489	232 740
Salary Account No. 1	20 000	20 000
Salary Account No. 2	30 000	30 000
Travel Advance Account	43 311	50 007
National Bank of Commerce - Richland		
Contract Account	744 183	888 531
Total	$ 3 583 535	$ 3 430 295

General Accounting Unit

	October	September
Accounts Receivable		
Hospital	$ 127 497	$ 125 713
Cost-type Contractors	37 212	28 174
Rent	36 688	113 328
Equipment Sales to Facilities	28 269	28 618
Sundry	27 734	46 413
Telephones	22 353	22 463
Electricity	16 644	14 610
Safety Shoes	1 000	377
Loans to Employees	165	177
Subtotal	297 562	379 873
Reserve for Bad Debts	23 842 CR	29 991 CR
General Ledger Balance	$ 273 720	$ 349 882
Hospital		
Number Out-patient Invoices Issued	1 592	1 781
Charges During the Month	$ 73 389	$ 73 353
Collections - Cash	63 397	62 499
- Payroll Deductions	4 325	5 851
Cost-type Contractors		
Number Invoices Issued	41	28
Amount of Invoices Issued	$ 19 785	$ 18 015
Cash Received	10 747	35 360
Rent		
Houses		
Number Houses Occupied	6 046	6 043
New Leases and Lease Modifications	137	158
Lease Cancellations	118	133
Charges During the Month	$ 307 100	$ 266 297
Collections - Cash	102 414	59 053
- Payroll Deductions	291 979	115 406
Dormitories		
Number Rooms Occupied	849	918
New Assignments	107	172
Removals	176	203
Charges During the Month	$ 18 944	$ 14 905
Collections - Cash	5 545	3 956
- Payroll Deductions	13 623	10 795
Facilities		
Number Facility Leases	155	152
Revenue	$ 64 442	$ 56 693

General Accounting Unit

	October	September
Accounts Receivable		
Sundry		
Number Invoices Issued	352	302
Amount of Invoices Issued	$ 10 407	$ 24 667
Cash Received	28 134	14 413
Telephones		
Working Telephones (excludes official telephones)	6 119	6 061
Telephone Work Orders Processed	346	348
Charges During the Month	$ 49 657	$ 49 595
Cash Received	48 875	48 267
Electricity		
Number of Bills Issued	6 802	6 627
Amount of Bills Issued	$ 49 574	$ 45 557
Cash Received	47 797	45 274

	Number	Amount
Uncollectible Accounts (Total to Date)		
Accounts Forwarded to Collection Agencies	550	$ 45 954
Accounts Returned as Uncollectible	268	29 077
Collections	197-1)	7 599-2)
Balance at Collection Agencies October 31, 1953	118	$ 9 278

(1- Includes 164 accounts collected in full and 33 accounts partially collected.

(2- Represents total collections, half of which is remitted to General Electric.

General Accounting Unit

	October	September
Travel Advances and Expense Accounts		
Cash Advances - Beginning of Month	$ 70 202	$ 47 889
Advances During the Month	71 912	66 274
Expense Accounts Submitted	56 176 CR	37 630 CR
Cash Refunded	11 899 CR	6 331 CR
Cash Advances - End of Month	$ 74 039	$ 70 202
Outstanding Cash Advances		
Current	$ 68 123	$ 64 333
Over 30 Days	5 916	5 869
Total	$ 74 039	$ 70 202
Travel and Living Expenses		
Actual Expenses	$ 56 776	$ 33 855
Billed to Government	53 917	31 908
Balance in Variation Account at End of Month	7 650 DR	4 791 DR

Inventories		
Current Inventories		
General Supplies	$ 959 043	$ 1 052 484
Fuel and Lubricants	98 861	102 504
Essential Materials	3 396 701	3 279 757
Total Current Inventories	4 454 605	4 434 745
Stand-by	2 597 686	2 638 656
Bulk Steel	71 515	80 273
Special Materials	297 953	286 458
Excess Materials	2 681 820	2 709 988
Total Inventories - Gross	10 103 579	10 150 120
Less: Excess Inventory Reserve	(2 735 446)	(2 759 350)
Stand-by Inventory Reserve	(687 077)	(741 692)
Total Inventory Reserve	(3 422 523)	(3 500 042)
Total Inventories - Net	$ 6 681 056	$ 6 650 078
Spare and Excess Equipment		
Recorded in Plant Accounts		
Spare Equipment Held in Storage	$ 1 516 736	$ 1 499 146
Excess Equipment	1 615 198	1 646 030
Excess Equipment Reserve	(1 611 565)	(1 654 911)

GENERAL COST UNIT
MONTHLY REPORT
OCTOBER, 1953

General

The Washington State Municipal Finance Officers Association held their annual meeting in Richland on October 23, 1953. Arrangements for the meeting were made by the financial advisor for Community Operations and Real Estate Department. Sixty-nine members of the Association attended the all-day meeting.

Personnel Requirements by Facility, GM-PER-40 was transmitted to the Atomic Energy Commission on October 30, 1953.

The Midyear Budget Review is progressing satisfactorily. A minimum of detail is being prepared for this submission.

Consolidated Costs and Budgets

Requirements for Midyear Budget Review, with regard to Inventories and Equipment Not Budgeted in Construction Projects, were transmitted to accountants and financial advisors on October 21, 1953.

The semi-annual report, "Personnel Requirements by Facility", GM-PER-40, was completed on October 30, 1953. The submission to the Atomic Energy Commission consisted of three parts, as follows:

(1) Summary of Manpower requirements by operating facility, for example, 100-B Area, Redox, etc. through June 30, 1957.

(2) Detailed Manpower requirements for the 7000 Program (Community).

(3) Housing requirements for permanent work force and employee turnover statistics, also through period ending June 30, 1957.

A complete reconciliation of Revised Financial Plan for 7000 Program (Community) was completed and forwarded to the three department managers involved on October 5, 1953.

A comprehensive review of Statistical and Computing Services costs was undertaken with the following points being covered:

(1) Review of previous fiscal year machine rental costs.

(2) Forecast of rental costs which may be incurred in FY 1954.

(3) Review of method of determining machine rental rates to be charged to customers.

(4) Presentation of new rental rate schedule.

(5) Review and recommendations for changes in time keeping procedure in machine room.

(6) Presentation of a proposed work order procedure for all of the Statistics and Computing Section.

Plant Auxiliary Operations

Work in connection with the FY 1954 Midyear Budget Review is progressing satisfactorily. Work on the operating budget is being held to a minimum with adjustments being made in only those units which appear out of line and without changing department totals or direct allocations to production costs.

Answers to a series of questions submitted informally by the Atomic Energy Commission are being prepared and will be submitted for their use. These questions cover procedures used in accumulating and liquidating costs of the Transportation Section and were also concerned with costs trends.

In order to facilitate ledger posting as well as obtain better analysis of vouchers at the time they are received in cost, a revised procedure was placed in effect October 1, 1953. In brief, this procedure calls for a main control ledger and a sub-ledger for each section in the Plant Auxiliary Operations Department.

It is now apparent that several improvements planned for the 700 Area buildings will not be accomplished; therefore, the total costs of operating the area for FY 1954 will be much less than was originally budgeted. For this reason, on October 1, 1953, we were able to reduce office rental rates from $ .25 a square foot to $ .20 a square foot.

Community

On October 23 the Washington State Municipal Finance Officers Association held an all-day meeting at the Desert Inn. Sixty-nine members from various Washington cities attended. Topics discussed included items such as "Investment of Public Funds", "Municipal Bonds", and a round-table discussion of Municipal Accounting. The State Examiner from Olympia and a staff of five auditors were on hand to answer all questions. The main speaker at the evening banquet was Mr. Joseph Clark, Chicago, Illinois, International Secretary of the Municipal Finance Officers Association.

During the month we accepted the responsibility for keeping the Kardex file on inventory formerly performed by the Community Electrical Unit. This was done as an economy measure since it would have been necessary for the Electrical Unit to hire an additional person to do this work. It is felt that the Cost Unit can do this work without hiring any additional help.

Medical

In accordance with instructions received October 2, 1953, schedules were prepared to supply manpower requirements for incorporation into A.E.C. Bulletin GM-PER-40. Information received from the field was combined by sections for review with each respective manager. Submission of the final report to the consolidations group was made October 16, 1953.

During the month, a revised schedule of costs and revenue was received for Kadlec Hospital and Public Health - Richland which adjusted the initial A.E.C. Financial Plan. The additional salary adjustment as well as an increase in revenue were incorporated into the initial Financial Plan and will be included on cost reports for the month of October. This constituted the Midyear Review insofar as operating costs were concerned. No changes were made on Industrial Medical-Operations or Public Health - North Richland.

Medical (Continued)

The survey of Washington hospitals comparing Kadlec Hospital with other hospitals of similar size throughout the state was completed and released.

Staff

A meeting was held with employees of the unit at which time various items of general interest were discussed. This was much in the same form of the Management Information Meeting held for exempt personnel. It is planned to hold these meetings once a month provided there is adequate material for discussion.

The PER-40 Personnel Estimates were completed and forwarded for consolidation, and preliminary work was completed on the remainder of the Midyear Budget Review.

MANUFACTURING COST UNIT
OCTOBER, 1953

GENERAL

As October was designated Fire Prevention Month, the Fire Extinguisher Demonstration was attended and substituted for our regular safety and Security Meeting.

PRODUCT COST ACCOUNTING

The method of computing cost per unit of Plutonium, represented by a ratio on the monthly Summary of Manufacturing Costs, was changed from an "18-8" month rolling average to a current cost basis. July and August unit costs were revised to reflect this change.

A Top Secret document (15-1752) titled "Product Unit Cost (Current Basis)" covering the first quarter of Fiscal Year 1954, was issued. This report shows the unit cost of feed material, conversion and depreciation.

Effective with the October Product Cost Report issued to Atomic Energy Commission, the amounts shown will be rounded off to the nearest dollar. This change will reduce clerical effort and make the report more legible.

BUDGETS

Detail work on the mid-year budget review has been held to a minimum pending receipt of bogey forecasts from field personnel.

A manpower forecast for the period 12-31-53 through 6-30-57 for the Manufacturing Department was prepared and submitted as per AEC Bulletin GM-Per-40.

MAINTENANCE AND PLANT IMPROVEMENT

A supplemental work order (form 702-F) was distributed to Area Personnel during the month. By use of this form instead of the regular work order (form W-983-F), an addition to a previously authorized job or a change of scope is clearly indicated, eliminating previous confusion on such jobs.

REPORTS AND RECORDS

The responsibility for reporting costs of the Mechanical Development Shops was transferred from Manufacturing Cost to Technical Cost. A standard charge per month was established for costs incurred by the Metal Preparation Section, to be billed to Technical each month.

As UO_3 is being shipped to a new location, a study was made and new freight rate was obtained from the AEC to be used as a basis for our UO_3 freight accrual in October.

A report entitled "Power Costs - Reactor Section" was prepared. This report listed total and unit costs for each area and process, showing electricity, maintenance and other costs.

Process material consumption data for the Separations Section was prepared in the field by Manufacturing Cost personnel at the same time the monthly inventory was taken. This was completed on the second day of the month, allowing entries to Separations cost to be completed one day earlier than in prior months.

REACTOR SECTION COSTS

The Reactor Section Standard Cost Manual was issued October 19, 1953.

Standard Cost Reports are now issued monthly for all Sub-Sections and Units of the Reactor Section.

As a part of the Cost Information Program, a meeting was held with the Electrical Unit supervision in October.

The monthly inventory check of Power sub-section essential material was observed at 100-H Area. The type of records maintained and methods of checking were found to be adequate for accuracy in reporting consumption of materials and for control of inventories.

SEPARATIONS SECTION COSTS

Unit cost explanations for September and the forecast covering the period October through March for $BiPO_4$, Redox, 234-5, TBP, UO_3, and P-10 were prepared and submitted at the monthly Cost meeting held October 21, 200-W Area.

The Standard Cost Report for September was prepared in conjunction with Reports and Records personnel and presented at the Area Cost meeting.

The Separations Section portion of the Quarterly Savings and Improvement report, Document HW-29510, was prepared for the Section Manager.

A review of the distribution of janitor charges in the Separations Section was made and a revised distribution list submitted to Reports and Records.

METAL PREPARATIONS SECTION COSTS

The Cost and Manpower Bogey Forecast for FY 1954 was revised during the month.

The Standard Manual for the Preparation of Slugs has been completed and will be distributed the first week in November, 1953.

Rental rates for Space Occupancy, 300 Area were revised due to the new study for electrical energy.

Since the Radiation Monitoring Unit of the Metal Preparation Section was combined with the Process Control Sub-Section in October, 1953, cost reports for those groups were also consolidated.

The cost of services of the Process Control Sub-Section is now being distributed on a Work Order basis. (Previously distributed on Study.) This method provides more accurate distribution to the operations receiving the services.

ENGINEERING COST UNIT
MONTHLY REPORT - OCTOBER, 1953

DESIGN COST

Cost reports for September were issued October 8, 1953. A review of report publication costs is being made at the present time to determine less expensive methods. It is expected that savings will be reflected in November costs.

Budget preparation forms have been submitted to the Design Section in addition to a request for full FY 1954 bogey estimate. The bogey information will have precedence over the budget and work is in progress to assure its completion on schedule. The Design Section will use new budget figures which are based on current developments and the experience of the 1st quarter FY 1954 on the December statements. It appears the major change will be increased Research and Development activity.

The month of October will be the last in which the Engineering Department is responsible for cost transfers to and from collateral contractors. This function will be assumed by General Accounting effective November 1, 1953. The responsibility for general ledger account 0813 Deposits Received has been transferred to General Accounting effective October 1, 1953.

The Design Section operating expenses reflect an underliquidation of cost at $47.00 per engineering man-day for the month of October in the amount of $8,624.53 and for the fiscal year to date at October 25, 1953 in the amount of $27,402.05. The total to date underliquidation of $6,156.59 includes prior fiscal year's overliquidation in the amount of $21,245.46.

TECHNICAL COST

September Research and Development detailed reports were issued October 12, 1953. Operating cost reports were issued to Technical Section and Engineering Administration Sub-Section on October 15, 1953. The analysis letters to the Manager - Technology and the Manager - Engineering Administration were issued on October 19, 1953. Rescheduling of work in the Technical Cost Sub-Unit permitted additional emphasis on issuing the Research and Development detail reports at an earlier date which resulted in greater benefits to those in charge of Research and Development Studies.

Work continued during October in arranging for the Computing Unit to perform cost summarizations of Work Orders which are now being posted by hand. It was agreed with the Computing Unit that this work should be accepted concurrently with summarization of Technical Section Time Distribution Reports. IBM procedures covering these operations are now being written by the Computing Unit.

During October a budget transfer of $261,379 was made from Manufacturing Department to the Engineering Department - Technical Section for Mechanical Development Shops. The budget is being recasted and will appear on the November reports.

On October 22 and 23 a physical inventory was taken of platinum, gold, and silver that was in the custody of Engineering Department personnel. The inventory was successfully completed by personnel of the Technical Cost Sub-Unit together with the cooperation and help of material custodians. Reconciliation of the physical count with custodial records and control records is almost complete. All necessary adjustments will be made in November.

Engineering Cost Unit (Continued)

TECHNICAL COST (Continued)

During the month, employees of the Technical Cost Sub-Unit made a tour of outer areas conducted by K. F. Priest. The tour included the slug canning facilities in the 300 Area, water facilities and C-Pile in the 100-B Area, and the Redox plant in the 200-W Area. Those employees who participated indicated the tour was very educational and beneficial in that they were able to acquire an overall picture of the operations at Hanford Atomic Products Operation.

PROJECT COST

Analysis of Operating Costs for the month of September was submitted to the Project Section manager on October 20, 1953. Quarterly report of Project Section Operating Costs compared to budget for First Quarter FY 1954 was issued on October 14, 1953.

Construction Work in Progress - Engineering report for the month of September was furnished the Atomic Energy Commission on October 10, 1953.

Financial Closing Statement was issued during the month on Project CG-349, Hot Semi-Works.

During the month plans were completed to publish project costs incurred by the Minor Projects Sub-Section and the Minor Construction Management Unit in greater detail. The first report of this type will be issued for the week ending November 1, 1953, and will permit comparison with the project estimate more readily.

Manpower forecast by quarter ending through Fiscal Year 1957 was completed and forwarded for consolidation early in the month.

APPROPRIATIONS SECTION
MONTHLY REPORT - OCTOBER , 1953

It is estimated that $234,000 of the indicated total cost of $533,000 of CG-550 - Reactivation of P-10 is cost of equipment. The directive, therefore, states that funds for this equipment will be provided from the budget for Equipment Not Included in Construction Projects.

Directive authorizing CG-563 - Modification of 314 Building for Fuel Development stated that source of funds was 300 Area Expansion Program rather than Miscellaneous Projects as indicated in the project proposal. This change was accepted by General Electric.

The following project proposals or revisions were approved by the Appropriations and Budget Committee in October:

CG-482, Rev. 3	Pile & Pile Water Plant Improvements	Change of scope and reduction of funds from $2,250,000 to $380,000
CA-514, Rev. 1	Expansion of 300 Area Production Facilities	Increase of GE funds from $1,200,000 to $1,975,000
CA-535, Rev. 2	Redox Capacity Increase, Phase II	Change of project schedule, method of performing work & allocation of funds
CA-539, Rev. 2	Additional Waste Storage Facilities for Redox	Reduction in funds from $4,000,000 to $3,285,000
CG-550, Rev. 2	Reactivation of P-10 Facilities	Increase in funds from $440,000 to $533,000

Also authorized were appropriation requests amounting to $289,235, the major items of which were:

Sixteen Station Wagons	$40,000
Sixty Sedans	$90,000
Fire Trucks	$80,000

The Appropriations Sub-Committee approved appropriation requests amounting to $68,200.

The following directives and work authorities were issued to GE during October:

CG-562	Waste Metal Recovery Plant Modifications	Directive authorized GE $128,000
CA-441	Solvent Building	Directive authorized detail design to GE

CA-529	Personnel Meter Gatehouse Facility Improvements	Directive increased project funds from $30,000 to $33,000; work authority decreased GE funds from $5,500 to $4,500
CA-257	Biophysics Laboratory	Work authority decreased GE funds from $961,000 to $954,000
CG-564	Installation of Additional Ball 3-X Equipment, 105-C Building	Directive authorized GE $62,500
CG-559	Process Tube Flow Facility 189-D	Directive increased authorized funds from $11,000 to $90,000
CA-381	Radiochemistry Building, Hanford Works Laboratory Area	Directive authorized additional work but no increase in funds
CA-414	Pile Technology Building, Hanford Works Laboratory Area	Directive authorized additional work but no increase in funds
CA-514	1952 Hanford Expansion - 300 Area Production Facility	Work authority increased GE funds from $1,200,000 to $1,975,000
CA-504	Improved Lighting 760, 761 & 762 Buildings	Directive changed scope of work; work authority decreased GE funds from $9,000 to $8,000
CG-563	Modification of 314 Building for Fuel Development	Directive authorized GE $75,000

PAYROLL UNIT
MONTHLY REPORT
OCTOBER 1953

Replies were prepared in draft form to 97 audit questions directed to Payroll employees by the Finance Division of HOO, AEC. The questions were in connection with an audit of Hanford personnel administration and payroll policies and practices, referred to in the September, 1953 monthly report of the Financial Department. The replies will be submitted to HOO, AEC after review and approval.

Under the Washington Unemployment Compensation Act, an experience rating credit of $332 102.87 was allocated to Hanford Atomic Products Operation. This credit amounts to 1.2 per cent of 1952 wages subject to contribution and will be used to offset payments which would otherwise be made for the third and fourth quarters of 1953, and a portion of the first quarter payment for 1954.

Section Managers were notified in October of the names of employees in their respective sections who, at the end of September, had not taken all of their vacations for the year 1953. Lists were furnished indicating the names of the employees and the number of vacation days not taken.

During October, Payroll discontinued the use of employment record cards for non-exempt employees. Information formerly recorded on the cards is maintained in the Payroll folders of the employees.

Payroll Unit (continued)

STATISTICS

NUMBER OF EMPLOYEES	Total	Monthly Payroll	Weekly Payroll
Changes During Month			
Employees on Payroll at beginning of month	8 549	2 283	6 266
Additions and transfers in	74	4	70
Removals and transfers out	(85)	(12)	(73)
Transfers from weekly to monthly payroll		10	(10)
Transfers from monthly to weekly payroll		(2)	2
Employees on payroll at end of month	8 538	2 283	6 255

Number at month-end - by Payroll classifications	Oct.	Sept.
Bargaining group - HAMTC	3 410	3 415
- Building Services	68	68
- Two Platoon Firemen	44	45
- Hanford Guards	456	461
Other weekly - non-bargaining	2 321	2 322
Executive, administrative and operating	1 790	1 777
Professional	449	461
Total	8 538	8 549

Number at month-end - by departments		
Engineering	1 525	1 533
Manufacturing	3 312	3 314
Plant Auxiliary Operations	2 080	2 079
Community Operations and Real Estate	429	436
Financial	336	336
Employee & Public Relations		
Technical Personnel	80	85
Other	117	117
Radiological Sciences	362	357
Medical	252	249
General	13	14
Law	5	5
Accountability	24	21
Property Management and Control	3	3
Total	8 538	8 549

OVERTIME PAYMENTS DURING MONTH		
Weekly Paid Employees	$61 463-a)	$55 294-b)
Monthly Paid Employees	17 078-c)	19 313-c)
Total	$78 541	$74 607

NUMBER OF CHANGES IN SALARY RATES AND JOB CLASSIFICATIONS		
	1 102	1 454

(a- Includes 5 weeks ended 10-25-53
(b- Includes 4 weeks ended 9-20-53
(c- Represents overtime worked during previous month

Payroll Unit (continued)

GROSS PAYROLL PAID DURING MONTH	October	September
Engineering	$ 833 629	$ 778 864
Manufacturing	1 815 998	1 555 623
Plant Auxiliary Operations	979 748	829 090
Community Operations & Real Estate	205 062	185 260
Other	561 881	491 377
Total	$4 396 318 -a)	$3 840 214 -b)

ANNUAL GOING RATE OF PAYROLL		
Base Plus Overriding Adjustment	$45 040 607	$45 081 690
Overtime	760 507	886 844
Isolation Pay and Area Differential	1 893 695	1 926 758
Shift Differential	542 328	535 057
Total	$48 237 137	$48 430 349

AVERAGE HOURLY BASE RATES (Includes overriding adjustment)		
Bargaining group - HAMTC	$2.388	$2.384
- Building Services	1.764	1.761
- Two Platoon Firemen	2.240	2.250
- Hanford Guards	2.040	2.040
Other Weekly - non-bargaining	2.002	2.003
Executive, administrative and operating	3.357	3.361
Professional	3.650	3.643
Total	$2.528	$2.527

AVERAGE EARNINGS RATE PER HOUR	October -c)			September -c)		
	Weekly	Monthly	Total	Weekly	Monthly	Total
Engineering	$2.153	$3.501	$2.912	$2.152	$3.508	$2.912
Manufacturing	2.624	3.543	2.805	2.623	3.546	2.804
Plant Auxiliary Operations	2.245	3.267	2.388	2.245	3.263	2.389
Community Operations & Real Estate	2.274	2.944	2.496	2.271	2.943	2.492
Other	2.031	3.695	2.461	2.043	3.703	2.473
Total	$2.367	$3.475	$2.659	$2.369	$3.478	$2.661

(a- Includes payments for five-week period ended October 25, 1953, in the case of weekly paid employees.

(b- Includes payments for four-week period ended September 20, 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.

Payroll Unit (continued)

EMPLOYEE BENEFIT PLANS

Participation in Benefit Plans at Month End	Number Eligible Oct.	Number Participation Oct.	Percent Participation Oct.	Percent Participation Sept.
Pension Plan	8 027	7 774	96.8%	96.7%
Insurance Plan				
Personal Coverage	8 530	8 442	99.0	99.0
Dependent Coverage	-	5 802	-	-
U. S. Savings Bonds				
Stock Bonus Plan	8 534	3 936	46.1	45.7
Savings Plan	8 534	1 037	12.2	11.8
Both Plans	8 534	4 513	52.9	52.3

Pension Plan	October	Total to Date
Number Retired	5	286-a)
Aggregate Annual Pensions Including Supplemental Payments	$1 401	$66 301-b)
Amount contributed by employees retired	3 502	89 010

(a- Includes 15 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.

	October	September
Number who became eligible for participation	67	87
Number who applied for participation	63	85
Number who elected not to participate	4	1
Replies not received	-	1

	October	Year to Date
Normal Retirement Pension Applications	5	19
Optional Retirement Pension Applications	-	10

Insurance Plan Claims - Death Benefits -c)	October	Total to Date
Number	-	132
Amount	-	$823 013

Claim Payments - Accident & Health Insurance	October	September
Number of Checks	1 306	1 565
Number of Claims	712	991
Amount of Benefits	$ 63 590	$ 80 119
Total benefits paid since December 1, 1950 to date	$2 273 892	$2 210 302

(c- Total to date includes all claims under the old and new Insurance Plans and 10 deaths on which accidental death benefits were paid.

U. S. Savings Bonds Annual Going Rate of Deductions	October	September
G. E. Employees Savings and Stock Bonus Plan	$1 735 891	$1 722 971
G. E. Savings Plan	528 232	507 958
Total	$2 264 123	$2 230 929

Payroll Unit (continued)

Employees Who Have Entered Military Service

	Total to Date				
	Called to Duty	Volunteered for Duty	Number Reactivated	Number Resigned-a)	Net
Reserve Officers	42	6	(8)	(1)	39
Enlisted Reserve	56	6	(24)	(3)	35
National Guard	7	-	(4)	-	3
Selective Service	87	-	(30)	(1)	56
Voluntary Enlistments	-	123	(4)	(5)	114
Total	192	135	(70)	(10)	247

(a- Employees who were removed from the roll to enter Military Service and subsequently had their continuous service broken.

Annuity Certificates (for duPont Service)	October	Total to Date
Number Issued	1	97

Suggestion Awards		
Number of awards	84	2 368
Total amount of awards	$1 455	$47 750

Patent Award Payments	October	Year to Date
Number of award	-	3
Amount	-	$75.00

PREFERENTIAL RATES	October	September
Number- Eliminated (Net)	2	3
Number Currently in Effect	664	666

MILITARY ALLOWANCE PAYMENTS	October	Total to Date
Number	3	69
Amount	$1 356	$25 319

INTERNAL AUDIT UNIT
MONTHLY REPORT
OCTOBER, 1953

A report on the examination of National Carbon Company's records of production costs of graphite supplied under Special Agreement No. G-5 (see monthly report for September) was issued in October. The data reported was used by a representative of the Engineering Department in negotiating a price for graphite shipped during July, August and September, 1953 which was substantially less than the price proposed by National Carbon Company; the reduction in the cost of graphite for the three months resulting from the negotiation was approximately $73,000.

A report on the audit of Surplus, Salvage and Scrap Sales, made to determine adequacy of and compliance with established procedures with respect to accountability, internal controls, and safeguards, was issued in October.

Work continued on the following audits:

Accounts Payable
Overtime Lunches
Accounts Receivable - Telephone

An audit of Source and Fissionable Material Accountability records was started in October.

PLANT PROTECTION SECTION

MONTHLY REPORT - OCTOBER 1953

ORGANIZATION AND PERSONNEL

Number of employees on payroll:

	Beginning of Month	End of Month	Increase	Decrease
Staff	2	2		
Administration Area Maintenance	61	65	4 (a)	
Security and Patrol	512	511		1 (b)
Safety and Fire Protection	154	154 (c)		
Office Unit (Laundry and Building Services, Clerical, and Records Control)	307	310	3 (d)	
TOTALS	1,036	1,042	7	1

NET INCREASE: 6

(a) - Administration Area Maintenance

4 - Transferred in

(b) - Security and Patrol

4 - Reactivated
1 - Transferred out
3 - Deactivated
1 - Termination

(c) - Safety and Fire Protection

1 - Transferred in
1 - Deactivated

(d) - Laundry and Building Services

2 - Reactivated
1 - Termination

Clerical Services

7 - New Hires
3 - Transferred out
2 - Terminations

SAFETY AND FIRE PROTECTION UNIT

Injury Statistics

	SEPTEMBER	OCTOBER	YEAR TO DATE	COMPARATIVE PERIOD, 1952
Major Injuries	0	2	12	15
Sub-Major Injuries	1	4	16	19
Minor Injuries	326	357	3,471	3,855
Exposure Hours	1,394,406	1,447,747	14,456,207	14,690,491
Major Injury F/R	0.00	1.38	0.83	1.02
Major Injury S/R	0.00	0.05	0.034	0.061
Penalty Days	0	75	150	375
Actual Days Lost	0	4	424	524
Minor Injury F/R	2.33	2.47	2.40	2.62
Estimated Medical Treatment Time Required	1,304 hours	1,460 hours	14,020 hours	15,572

Industrial Fires

Department	Area	No. of Fires	Cause	Loss
Manufacturing	200-W	1	Spontaneous ignition	$ 5.00
Manufacturing	300	1	Combustibles too near heat or flame	250.00
TOTALS		2		$255.00

Safety Activities

There were two major injuries during the month -- one in the 200-West Area, second and third degree burns from scalding hot water; and the other in the 100-F Area, partial amputation of distal phalanx of right index finger.

There were four sub-major injuries and one near-serious injury. The minor injuries increased from 326 in September to 357 in October.

The injury trend in two of the 100 Areas and the 200-West Area shows a definite increase.

The Safety Engineers in all of the industrial areas assisted the Fire Protection Engineers with their various demonstrations during Nation Fire Prevention Week. These demonstrations were both interesting and beneficial for Fire Prevention-- both in the home and the plant.

The study of adequate portable breathing air and suitable gas mask equipment continues.

Special efforts by all Safety Engineers are being put forth to investigate those minor injuries that show evidence of outstanding unsafe acts.

The safety coverage of the outer area industrial roads has helped considerably in bringing about a very satisfactory and well-maintained condition of these roads. The spilled gravel at intersections has been cleared away and the road shoulders and sections adjacent to the shoulders have been bladed which improves the general appearance and is good firebreak.

Our Safety Engineers are again required to give safety coverage to subcontractors and the Minor Construction group to eliminate hazardous conditions affecting operational people.

The new safety training course for supervision in the Metal Preparation Section in the 300 Area has been started and meetings are now being conducted.

Additional information on injury experience and statistics is being furnished the Medical Department which is compiling statistical information on major and minor injuries.

Fire Prevention Activities

Two fires occurred during the month causing a loss of $255.00.

Demonstration type meetings were held in the 100 and 200 Areas and in the 300 Area. Fifty-one meetings were held in the 100 Areas with 1,500 attending; 26 meetings in the 200 Areas with 550 attending and 20 meetings in the 300 Area with 700 attending.

Fire prevention posters were posted throughout the areas and on and in all of the area buses.

The safety topic of the month, "Fire Prevention" was distributed to all employees.

Fire prevention comic books and educational literat re were placed in all lunch rooms and reading racks.

Fire drills were held in all buildings having evacuation signaling devices.

The GE NEWS was supplied with articles and pictures for five publications.

Seven fire extinguisher demonstrations were given in the 700 Area.

A public address system was used the week of October 5 at the bus terminal from 6:00 to 7:30 AM and from 2:00 to 3:30 PM. Music with spot announcements was used.

A simulated burning building was displayed at the 300 Area barricade.

A fire extinguisher demonstration was given at the WhiteBluffs Fire Station for Construction and Minor Construction forces.

Special inspection committees were organized and inspected all areas for fire hazards.

The heat actuated device in the 276-S Building was tested. Operation was satisfactory.

New fire procedures have been put into operation for the 329 and 321 Buildings.

Fire Alarm Box No. 31 in the 300 Area was changed to a master box and covers alarm equipment in the new change house.

Fire Department officers held safety meetings for the 100-B Area Power Department and for Technical groups in 222-S Building in 200-West.

Buildings in all areas were inspected by the Fire Department using fire apparatus and a full company of men. They were in touch with headquarters at all times by radio.

The Fire Department participated in all building evacuations with apparatus.

The Fire Chief's car, 750 GPM pump, and a 1000 gallon brush truck were entered in the Richland parade on October 2.

OFFICE UNIT

Laundry and Building Services

200-West Laundry	September	October
Pounds Delivered	196,785	175,705
Pounds Rewashed	11,365	6,603
Total Dry Weight	208,150	182,308
Monitoring Section		
Poppy Check - Pieces	173,947	162,205
Scaler Check - Pieces	244,936	216,025
Total Pieces	418,883	378,230
Rewash Pieces	14,284	6,423
700 Area Laundry		
Flatwork - Pounds	40,731	31,635
Rough Dry - Pounds	38,183	43,410
Finished - Pounds	2,258	2,254
Total Weight	81,172	77,299
Estimated Pieces	106,335	101,261

Clerical Services

Central Mail and Addressograph

Inter-office mail continues to increase both in volume and bulk. Outgoing and incoming postal mails decreased slightly. Special delivery and registered postal remained normal. Special assignments included only the routine mailings, i.e. Health Bulletins, Safety Booklets, etc.

The registered delivery service is working out as planned with no major changes. A telephone was installed in the room provided for handling registered mail which completed the equipment necessary to do the job.

A Postal Inspector visited the mail room, checking our procedures with the U.S. Post Office, comparing records, etc. of outgoing postal mail. No suggestions were made for changes of procedure or preparation and only agreeable or complimentary remarks were made.

Types and Pieces of Mail Handled	October	September
Internal	2,042,778	1,807,976
Postal	87,885	92,733
Special	2,136	2,052
Total Mail Handled	2,132,799	1,902,761
Total Postage Used	$3,662.18	$3,569.56
Total teletypes handled	3,473	3,820
Total Store Orders handled	947	817

Addressograph	October		September	
Type of List	Number of Runs	Total Copies	Number of Runs	Total Copies
Plant name list	106	170,089	108	253,818
Housing List	12	31,350	10	37,726
Payroll List	9	22,532	9	29,481
Total new plates	3,167		966	
Total corrected plates	1,390		3,861	
	4,557		4,827	

Office Equipment - Furniture

The total value of office furniture held for projects in Account 93 on the last day of the month was $27,050.31. The total value of account 93 on the last day of September was $38,635.00. The September balance, minus material held for projects in the amount of $21,905.00 would equal $16,730.00 of material available for active inventory stock. A total of $6,103.00 was disbursed during the month of September which represents a material movement of once every two and three quarters months.

Office Machines

One Multilith 1250 machine was received for Kaiser Engineers and set up in 100-K Area.

There has been an increase in number of electric typewriter requests received during the month. The reasons in general are to replace manual machines because of work loads, additional copy requirements, and duplimat typing.

A representative from the Financial Department reviewed present method of requisitioning, warehousing, and issuing of parts for office machines. A report of his findings and recommendations will be forwarded for discussion at a later date.

The General Services Administration requested a report in quintuplicate of each electric typewriter in use by General Electric Company, as well as a consolidated report of all other electrically powered office machines in use by the Company. This voluminous report was completed and forwarded to the Property Management Branch of AEC.

Instrument Repair

Instrument repair work consisted of regular routine maintenance in the 700, 1100, and 3000 Areas. Yearly overhaul of irrigation well house water flow recorders was started.

Central Printing

The Central Print Shop furnished printed material on short notice for the Board of Directors visit to Hanford on October 14 and 15. All work was completed and delivered ahead of schedule.

October was the highest producing month of this year thus far. Three unusually large orders were printed - 74,800 sheets for Plant Organization Directory, 600,000 sheets of form G-88-DS and 150,000 sheets of form G-281-DS. A total of 2,200,625 sheets printed and 436 orders handled. Gross billing for the month was $25,034.65.

In view of a near serious accident which occurred in Central Printing last month this shop was furnished sterile bandages and tourniquets. A representative of Public Health gave a talk on First Aid in general and also demonstrated the application of a tourniquet.

Work Completed	October	September
Orders received	418	414
Orders completed	436	357
Back log	79.3	73
Copies printed	2,210,625	1,351,701
Negatives masked	805	692
Negatives processed	949	661
Photo copy prepared	299	231
Litho plates processed	994	696

Stenographic Services

As was anticipated, loan requests dropped to a minimum due to the end of heavy vacation season. Fifteen such requests were filled.

Productive work was completed for fifty-three different cost code groups throughout the month.

Breakdown of Hours	October	September
Dictation and transcription	22	55
Machine transcription	1	19
Letters	17.5	12
Rough Drafts	62	44.5
Dittos, duplimats, xerography	379	298
Miscellaneous	412.5	230
Training Time	490	432.5
Meeting Time	--	4
Unassigned Time	48	69
Vacation Time	--	88
Absentee Time	4	--
	1,436	1,252
Employees loaned to other departments	852	1,651
	2,288	2,903

Area Mail and Duplicating

Work loads in Area Mail increased this month due to the fact that packaged registered delivery mail is now being delivered within 300 Area by personnel assigned to the 3760 Building Mail and Duplicating office. A total of 1,604 registered delivery packages were handled at this location in October.

The new Brackett backstripping machine was installed in the 300 Area duplicating office on October 1. An accessory necessary for use with Mystic binding tape was ordered and has been received and installed. The machine is being adjusted and an operator trained. It is expected that the use of this equipment will greatly accelerate binding of formal reports and make it possible to reduce by one, the number of employees assigned to the subject office.

One additional model 1250 duplicator and an operator recently assigned to the 300 Area duplicating office is making it possible to keep work loads reduced to a minimum, and provide much faster service on all 300 Area work.

Priority jobs handled this month include two orders handled by the 703 office for the AEC Budget Division. Both jobs were completed on the same afternoon they were received, and in time for dispatch to Washington, D.C. by special courier. A letter of commendation was received for this work.

Duplicating and Mail Statistics	October	September
Orders received	3,232	2,908
Orders completed	3,272	2,797
Orders on hand	56	128
Offset plates	16,400	16,230
Offset copies	894,548	972,895
Stencils	1,109	334
Stencil Copies	18,025	7,266
Ditto Masters	515	370
Ditto Copies	15,438	9,506
Zerox plates	1,028	963
Verifax masters	1,409	1,042
Verifax copies	3,350	2,537
Total Internal Mail	587,274	533,868

Records Control

Quantity of records received, processed and stored:

Community Operations and Real Estate Department	3	Standard	Storage	Cartons
Employee and Public Relations Department	5	"	"	"
Engineering Department	154	"	"	"
Financial Department	54	"	"	"
Manufacturing Department	4	"	"	"
Plant Auxiliary Operations Department	21	"	"	"
Radiological Sciences Department	5	"	"	"
Sub-Contractors				
Atkinson and Jones	7	"	"	"
Vitro Corporation	5	"	"	"
TOTAL	258	Standard	Storage	Cartons

Persons provided records service: 850

Cartons of records destroyed: 540

Records Cartons issued: 305

Percentage of Records Service Center vault occupied by records is 80.7%.

Twenty-six requests for file cabinets were received. Twenty requests were filled, four requests were cancelled, six requests for file cabinets are pending. Two fire proof combination locked cabinets were picked up in exchange for key locked cabinets resulting in a savings of $300.00 ($225.00 cost of combination cabinet minus $75.00 cost of key locked cabinet equals $150.00 savings per cabinet exchanged. Five key locked cabinets picked up with no exchange.

Uniform filing was established in five offices during the month. A total of 456 offices have installed the uniform filing system to date. Seventeen rechecks were made on established files.

Nine Requests for Authorization for records disposal were submitted to the Atomic Energy Commission. Two Requests for Authorization for records disposal were approved by the Atomic Energy Commission. Twenty Evaluations of Records for disposal were developed and submitted for internal departmental approval.

The Atomic Energy Commission transmitted to General Electric a copy of the Comptroller General's ruling pertaining to records disposal contained in the First War Powers Act and the Independent Offices Appropriation Act. This ruling releases records created prior to June 30, 1952, for disposal in accordance with approved disposal schedules.

ADMINISTRATION AREA MAINTENANCE UNIT

CA-504 Improved Lighting 760, 761, 762 Buildings: Indications are that contractor's work will be completed in November.

-- New Administration Building: Latest informal information is to effect that local AEC office is considering new appeal to Washington office for reinstatement of $631,000 to construct new building. Indicatinns are that AEC is giving consideration to site now occupied by 705 Building, in case funds are provided for new building.

CA-525 Conversion of Basement, 5th Wing, 703 Building to Civil Defense Auxiliary Center: Visual inspection indicates this facility to be approximately 95% complete.

AEC-114 New Transportation Facilities: Progress on Phase I delayed because of lack of information on hoists and pits and late awarding of second phase. Contract on Phase II was awarded to Sound Construction Company on September 17, and Notice to Proceed was issued October 1.

IR-147 Partitioning, 761 and 762 Buildings: Rearrangement of radiators (following partition installation) is complete in 761 Building and 50% complete in 762 Building.

CA-434 Bio-Assay Laboratory: Contract awarded on Phase II, October 19.

Project Proposal CA-561, 713 Building Alterations, was rescoped to include sprinkler system and resubmitted, at request of AEC.

Striping of parking lots along east side of 700 Area was completed.

Shakes were installed on exterior of 704 Building.

Interior cycle painting program is in progress.

Approximately fifteen office moves were made during the month.

Three partition installations were made.

General Maintenance

Conversion of the old shoe sales bus into a Mobile Civil Defense Center is approximately 60% complete.

Rest room exhaust fans which were installed by contractor early this year are giving poor service. Most failures require replacement.

Ground grids for lightning protection system for 784 Building stack are complete.

Automatic "Fyr-Eye" control was placed in operation on Central Stores boiler and time clock was set to control periodic firing.

Battery charger in Central Stores covered storage was rewired so that the electric sweeper may also be charged at that location.

Installation and replacement of steam radiators are complete in 761 Building and 50% complete in 762 Building.

Fire and domestic water lines in 722 Building were replaced from feed valves to building.

Air conditioners have been winterized.

Steel tread plate and guard rails have been installed on runway portion of docks at Excess Yard Warehouses 12, 13 and 41.

Metal siding on the compressed gas cylinder storage building at Central Stores was spread at the bottom to provide increased ventilation.

Eighteen miles of highway striped for Transportation Section.

Steam Operation

No. 4 boiler was in service at the beginning of the month. With the increasing load, No. 1 boiler was also placed in operation on September 29. On October 8, No. 3 boiler was put in service and No. 4 boiler removed from the line for minor repairs. Numbers 1 and 3 boilers remained in service for the balance of the month.

The quantity of steam generated was 5% less than in October 1952.

The first full month's experience with the newly installed meter measuring the steam flow to auxiliaries at 784 plant revealed that 13% of the generated steam was used within the plant. Previously an estimated figure of 15% had been used for this item. Indications are that several economies can be effected from the results shown by this instrument.

Condensate meters were installed at Mickey's shoe Renewing Shop and the Shoe Salon on October 22, to measure the steam used at each of these establishments.

On October 23, both of the city water supply lines to 784 plant were out of service from approximately 8:15 A.M. to 4:30 P.M. while contractor was tying in the new 10" cast iron water main west of the building. During this period, all water requirements were obtained by using city water from the hospital through the soft water line. Despite the low terminal pressure of 15 pounds while the softeners were in operation, sufficient water was obtained to permit substantially normal operation.

Part time firing at the 1131 Area Boiler plant was started on October 1 with operators on loan from Community Public Works Unit. Transfer of these operators and full time firing was effected October 12.

Operators from the 784 plant are being used as necessary to perform periodic incidental manual operations at Central Stores automatic oil fired boiler.

Coal consumed	1,044.15 net tons
Steam generated:	15,662.1 M. lbs
Steam leaving plant:	13,634.0 M. lbs
Steam delivered:	11,476.4 M. lbs
Total water softened:	2,492,400 gallons
Total soft water sent to Kadlec Hospital:	108,540 gallons
Total soft water sent to 784 heating plant:	2,092,460 gallons

SECURITY AND PATROL UNIT

Document Report

Number of classified documents unaccounted for as of October 1: 401
(153 of the above 401 documents are chargeable to
E. I. du Pont de Nemours & Co.)

Number of classified documents reported as unaccounted for during October: 6

Number of classified documents recovered during the month of October: 19

Number of classified documents remaining unaccounted for as of November 1: 388
(153 of the above 388 documents are chargeable to
E. I. du Pont de Nemours & Co.)

An extensive survey is being conducted in an effort to improve our document and print control procedures.

The Non-Technical Document Review Board held two meetings during October and reviewed a total of 39 classified documents. Of this number -

11 were downgraded to "Restricted",
22 had their classification retained,
5 were not within the scope of the Board, and
1 was referred to the Atomic Energy Commission.

Security Education

Six security items appeared in the Works NEWS during the month.

There were 356 security meetings held and attended by 5,182 employees of the General Electric Company. A representative of Security and Patrol Unit showed security films at some of these meetings as indicated below:

"Signal 99" was shown at three meetings, each with an average attendance of fifteen employees.

"The Defense Rests" was shown at three meetings, each with an average attendance of 20 people.

"The Man on the Left" was shown at two meetings, each with an average attendance of 13 employees.

"Only The River" was shown at one meeting with eight people present.

"On Guard" was shown also at one security meeting with 36 employees present.

"The Tallest Shadow" which is our most recent security film, was shown at 13 meetings, each with an average attendance of 24 people.

GE Security Bulletin No. 80 entitled "We Wrote the Law and It Reads" was distributed on October 23, 1953.

The following security posters were posted during the month:

450 copies of the large size poster bearing the slogan "Censor Conversation" were posted in all the plant areas.

200 copies of the bus size poster with the same slogan were posted in the plant busses during October.

Five employees of the General Electric Company received a "Q" security orientation talk from either a representative of the Security Unit or a Security Patrol supervisor during the month of October.

Statistical Report of Security Patrol Activities

	100-B	100-D	100-F	100-H	100-K	200-E,W	300
Pat Searches	90	90	64	81	0	360	1
Escorts	13	4	5	19	20	25	67
Ambulance Runs	6	3	4	2	0	4	5
Passes issued:							
One day temporary	72	8	7	16	0	45	34
Travel	1	0	0	0	0	0	52
Red Tag	215	114	19	48	0	461	76
Telephonic	20	1	0	1	6	0	17
Supervisors' post contacts	305	339	310	276	0	857	518

Other Security Patrol Activities (Computed by hours):							300 & 700
Security File Check	162	143		328	479	482	1,380
Building Check	295	33	231.1		522	430	720

Arrest Report Violations	Number of Violations	Cont. Cases from Sept.	Cases Cleared	Fined	Dismissed
Speeding	9	0	8	8	1
Vagrancy	1	0	1	1	0
Failure to observe stop sign	1	0	1	1	0
Driving while under influence of intoxicating liquors	1	0	1	1	0
	12	0	11	11	1

Citation Tickets Issued:	12
Warning Tickets issued:	3

Security Patrol Training Activities

215 Security Patrolmen received classroom instruction during the month.

197 Security Patrolmen attended firearms training during the month.

Training courses were as follows:

Safety Class	1/4 hour
Security Class	1/4 hour
Operations Class	1 1/2 hours

Security Patrol Post Changes

On October 1, the 105-KE crate storage area was classified as a security "exclusion" area. One man will be needed at this post around the clock.

Field Inspection Activities

Contacts made to locate unaccounted for documents:	23
Searches conducted to locate unaccounted for documents:	9
Overdue file combinations changed:	13

General

On October 5, the Security Patrol Unit began the rephotographing program in the 100 Areas of employees who were hired during 1947 and 1948.

The Board of Directors of the General Electric Company visited Hanford on October 14 and 15, 1953. Visits to the plant areas were made and members of the Board attended a series of meetings. The Security and Patrol Unit assisted in the plant tour and in securing the meetings.

Security Administration

Daily Badge Log Entries:	2,156
Q clearances	51
Formal "P" clearances issued:	27
"P" approval clearances issued:	34
Category access granted:	39
Category access withdrawn:	13

In the rephotographing program the following photographs have been processed by the Security Office:

"A" type badges	349
"B" type badges	1,628
Photos for Passes	269
TOTAL	2,246

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HANFORD ATOMIC PRODUCTS OPERATION
General Electric Company
Richland, Washington

REPORT OF VISITORS FOR PERIOD ENDING OCTOBER 31, 1953

Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
ENGINEERING DEPARTMENT - ADMINISTRATION SECTION							
I. Visits to other Installations							
C. G. Stevenson to: U. S. Atomic Energy Comm. Washington, D. C.	Attend meeting of Library & Document Control Committee of Tech. Information Panel	A. F. Thompson	10-12-53	10-13-53	X		
C. G. Stevenson to: Westinghouse Elec. Corp. Pittsburgh, Pennsylvania	Attend meeting of Tech. Information Panel	W. D. Shepherd	10-14-53	10-16-53	X		
C. G. Stevenson to: Argonne National Lab. Chicago, Illinois	Study application of IBM techniques to classified documents, circulation and inventory	H. D. Young	10-19-53	10-20-53	X		
ENGINEERING DEPARTMENT - TECHNOLOGY SECTION							
I. Visitors to this Works							
J. C. Barton Oak Ridge National Laboratory Oak Ridge, Tennessee	Discuss specification analysis	V. R. Cooper R. E. Smith	10-5-53	10-7-53	X		200-W Redox, 221-U 300 XXX 300-L XXX
J. S. Breitenstein National Lead Company Fernald, Ohio	Process consultation	F. W. Woodfield	10-5-53	10-6-53	X		200-E 201-C 200-W Redox, 221-U 300 XXX 300-L XXX
F. N. Browder Oak Ridge National Laboratory Oak Ridge, Tennessee	Discuss recovery process, shipment of classified material to ORNL and Purex process [redacted]	V. R. Cooper O. F. Hill	10-20-53	10-23-53	X		200-E 201-C 200-W Redox, 221-U, 231, 234 300-L XXX

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Restricted Data Areas
T. F. Fisher Knolls Atomic Power Laboratory Schenectady, New York	Shutdown of KAPL-108 irradiations	J. A. Berberet C. W. Gillard	9-28-53	10-9-53	X	100-D 100-H 300	105 XXX 303; 700
J. M. Frame Aircraft Nuclear Propulsion Project Arco, Idaho	Discuss radiation effects on materials and equipment	R. B. Richards	10-5-53	10-7-53	X	100-B 100-D 300	105-B 105 303; 700
T. E. Hicks California Research & Development Co. Livermore, California	Consultation on separations technology	V. R. Cooper	10-26-53	10-26-53	X	300	XXX
E. K. Hulet Radiation Laboratory Berkeley, California	Experiments in chemical separations	E. M. Kinderman	9-30-53	10-22-53	X	200-W 300	222-S XXX
H. E. Jackson Oak Ridge National Laboratory Oak Ridge, Tennessee	Discuss waste recovery process of classified material to ORNL and Purex process	F. W. Woodfield V. R. Cooper	10-20-53	10-23-53	X	200-E 200-W 300-L	201-C Redox, 221-U, 231, 234 XXX
R. B. Lemon Phillips Petroleum Company Arco, Idaho	Discuss separations processes	O. F. Hill F. W. Woodfield	10-8-53	10-9-53	X	200-W 300-L	Redox XXX
W. H. Lewis Oak Ridge National Laboratory Oak Ridge, Tennessee	Discuss waste recovery process of classified material to ORNL and Purex process	V. R. Cooper F. W. Woodfield	10-20-53	10-23-53	X	200-E 200-W 300-L	201-C Redox, 221-U, 231, 234 XXX
R. H. Rainey Oak Ridge National Laboratory Oak Ridge, Tennessee	Discuss waste recovery process of classified material to ORNL and Purex	V. R. Cooper F. W. Woodfield	10-20-53	10-23-53	X	200-E 200-W 300-L	201-C Redox, 221-U, 231, 234 XXX
F. Reines Los Alamos Scientific Lab. Los Alamos, New Mexico	Arrange for facilities for the Neutrino Program	J. A. Berberet	10-27-53	10-29-53	X	100-B 100-H 300-	105-C XXX XXX; 700

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Restricted Data Areas
T. C. Runion National Lead Company Fernald, Ohio	Process consultation	F. W. Woodfield	10-5-53	10-6-53	X		200-E 201-C 200-W Redox, 221-U 300 XXX 300-L XXX
W. J. Scheiber Knolls Atomic Power Laboratory Schenectady, New York	Training on nuclear steam power plant operation	S. L. Nelson	10-12-53	10-16-53	X		100-B 105-B, 105-C 100-D 105 100-F 105 100-H 105 200-W 221-T, 221-U
B. E. Thompson Oak Ridge National Laboratory Oak Ridge, Tennessee	Discuss specification	V. R. Cooper R. E. Smith	10-6-53	10-7-53	X		200-W Redox, 221-U 300 XXX 300-L XXX
II. Visits to other Installations							
M. Altman to: Argonne National Laboratory Chicago, Illinois	Reactor information meeting	H. D. Young	10-7-53	10-9-53	X		
M. Altman to: Columbia University New York, New York	Discussion on heat transfer problems	A. J. Bendler	10-12-53	10-14-53	X		
M. Altman to: Knolls Atomic Power Lab. Schenectady, New York	Discussion on heat transfer problems	H. W. Huntley	10-12-53	10-16-53	X		
M. Altman to: Sylvania Electric Products Bayside, New York	Discuss fuel element development	H. H. Hausner	10-15-53	10-17-53	X		
R. J. Anicetti to: Oak Ridge National Lab. Oak Ridge, Tennessee	Attend a ceramic information in the Atomic Energy Program	D. D. Cowen	10-28-53	10-29-53	X		
J. C. Ballinger to: Brookhaven National Lab. Upton, Long Island, New York	Brrokhaven reactor experiment	D. H. Gurinsky	10-18-53	10-24-53	X		

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass	Areas
J. A. Barberet to: Phillips Petroleum Company Idaho Falls, Idaho	Consultation regarding Material Test Reactor slug exposure facility	W. B. Lewis	9-30-53	10-1-53	X		
S. H. Bush to: Argonne National Lab. Chicago, Illinois	Discuss reactor metallurgy	F. G. Foote	10-13-53	10-14-53	X		
S. H. Bush to: Knolls Atomic Power Lab. Schenectady, New York	Discuss reactor metallurgy	J. R. Low, Jr.	10-15-53	10-16-53	X		
J. J. Cadwell to: Phillips Petroleum Company Idaho Falls, Idaho	Consultation regarding Material Test Reactor slug exposure facility	W. B. Lewis	9-30-53	10-1-53	X		
J. J. Cadwell to: U. S. Bureau of Mines Albany, Oregon	Consultation regarding zirconium	E. Hayes	10-16-53	10-16-53	X		
P. A. Carlson to: Ames Laboratory Ames, Iowa	Consultation on fuel element development program and ceramic information meeting	F. H. Spedding	10-26-53	10-26-53	X		
P. A. Carlson to: Oak Ridge National Lab. Oak Ridge, Tennessee	Consultation on fuel element development program and ceramic information meeting and metallurgy and fuel element discussion	J. Warde E. J. Boyle Dr. Frye	10-27-53 10-30-53	10-29-53 10-30-53	X X		
A. B. Carson to: Argonne National Lab. Chicago, Illinois	Attend reactor information meeting	H. D. Young	10-7-53	10-9-53	X		
E. D. Clayton to: Argonne National Lab. Chicago, Illinois	Attend reactor information meeting	H. D. Young	10-7-53	10-9-53	X		
D. E. Davenport to: Argonne National Lab. Chicago, Illinois	Attend reactor information meeting	H. D. Young	10-7-53	10-9-53	X		

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
D. G. Donahue to: Argonne National Lab. Chicago, Illinois	Attend reactor information meeting	H. D. Young	10-7-53	10-9-53	X		
O. H. Greager to: Phillips Petroleum Co. Idaho Falls, Idaho	Discuss cooperative program on Material Test Reactor irradiations	R. L. Doan	10-5-53	10-5-53	X		
W. A. Horning to: Argonne National Lab. Chicago, Illinois	Attend reactor information meeting	H. D. Young	10-7-53	10-9-53	X		
W. A. Horning to: Knolls Atomic Power Lab. Schenectady, New York	Discuss reactor physics	T. Snyder B. R. Prentice	10-12-53	10-13-53	X		
W. T. Kattner to: U. S. Atomic Energy Comm. New York, New York	Discuss uranium quality problems and fabrication of uranium	R. L. Kirk	10-9-53	10-9-53	X		
W. T. Kattner to: Bridgeport Brass Bridgeport, Connecticut	Discuss uranium quality problems and fabrication of uranium	R. M. Treco	10-12-53	10-12-53	X		
W. T. Kattner to: Battelle Memorial Inst. Columbus, Ohio	Discuss uranium quality problems and fabrication of uranium	H. A. Saller	10-13-53	10-14-53	X		
W. T. Kattner to: National Lead Company Feed Materials Production Center Fernald, Ohio	Discuss uranium quality problems and fabrication of uranium	J. M. Ciborski	10-15-53	10-16-53	X		
D. C. Kaulitz to: Phillips Petroleum Company Idaho Falls, Idaho	Consultation regarding Material Test Reactor slug exposure facility	W. B. Lewis	9-30-53	10-1-53	X		
F. J. Leitz to: U. S. Bureau of Mines Albany, Oregon	Consultation on zirconium	E. Hayes	10-16-53	10-16-53	X		

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
M. Lewis to: Cal.Research & Dev. Co. Livermore, California	Discuss chemical problems	H..G. Hicks	10-5-53	10-9-53	X		
W. R. Lewis to: Atomic Energy of Canada, Ltd. Chalk River, Ontario	Tripartite reactor safety conference	Members of the conference	10-12-53	10-14-53	X		
L. H. McEwen to: Oak Ridge National Lab. Oak Ridge, Tennessee	Discuss utilization of sweetened uranium at Hanford	S. Cromer	10-5-53	10-6-53	X		
L. H. McEwen to: Argonne National Lab. Chicago, Illinois	Attend reactor information meeting	H. D. Young	10-7-53	10-9-53	X		
G. M. Muller to: Cal.Research & Dev. Co. Livermore, California	Consultation on reactor physics	J. W. Flora	10-19-53	10-30-53	X		
J. F. Music to: National Carbon Company Clarksburg, West Virginia	Technical discussion on G-5 and G-12 production	V. C. Hamister R. L. Mansfield	10-5-53	10-7-53	X		
H. Neumann to: Argonne National Lab. Chicago, Illinois	Attend reactor information meeting	H. D. Young	10-7-53	10-9-53	X		
W. J. Ozeroff to: Atomic Energy of Canada, Ltd. Chalk River, Ontario	Attend tripartite reactor safety conference	Members of the conference	10-12-53	10-15-53	X		
P. J. Pankaskie to: Revere Copper & Brass, Inc. Detroit, Michigan	Observe alpha extrusion of uranium	P. Lowenstein	10-19-53	10-23-53	X		
R. S. Paul to: Argonne National Lab. Chicago, Illinois	Attend reactor information meeting	H..D. Young	10-7-53	10-9-53	X		

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass	Areas
O. W. Rathbun to: National Lead Company Fernald, Ohio	Discuss uranium quality problems and fabrication of uranium	J. M. Ciborski	10-15-53	10-16-53	X		
O. W. Rathbun to: U. S. Atomic Energy Comm. New York, New York	Discuss uranium quality problems and fabrication of uranium	R. L. Kirk	10-9-53	10-9-53	X		
O. W. Rathbun to: Bridgeport Brass Co. Bridgeport, Connecticut	Discuss uranium quality problems and fabrication of uranium	R. M. Treco	10-12-53	10-12-53	X		
O. W. Rathbun to: Battelle Memorial Inst. Columbus, Ohio	Discuss uranium quality problems and fabrication of uranium	H. A. Saller	10-13-53	10-14-53	X		
R. B. Richards to: National Carbon Company Clarksburg, West Virginia	Technical discussion of G-5 and G-12 production	V. C. Hamister R. L. Mansfield	10-5-53	10-6-53	X		
R. B. Richards to: Argonne National Lab. Chicago, Illinois	Attend reactor information meeting	H. D. Young	10-7-53	10-8-53	X		
W. C. Riley to: National Carbon Company Clarksburg, West Virginia	Technical discussion of G-5 and G-12 production	V. C. Hamister	10-5-53	10-7-53	X		
M. J. Sanderson to: Battelle Memorial Inst. Columbus, Ohio	Attend metallography steering committee meeting	H. A. Saller	10-14-53	10-14-53	X		
M. J. Sanderson to: Knolls Atomic Power Lab. Schenectady, New York	Discuss metallurgy research problems	J. E. Burke	10-15-53	10-16-53	X		
J. R. Triplett to: Argonne National Lab. Chicago, Illinois	Attend reactor information meeting	H. D. Young	10-7-53	10-9-53	X		

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass	Areas
G. E. Wade to: Phillips Petroleum Co. Idaho Falls, Idaho	Consultation regaring Material Test Reactor slug exposure facilities	W. B. Lewis	9-30-53	10-1-53	X		
M. T. Walling to: Argonne National Lab. Chicago, Illinois	Attend reactor information meeting	H. D. Young	10-7-53	10-9-53	X		
D. C. Worlton to: Knolls Atomic Power Lab. Schenectady, New York	Visit ultrasonic facilities at Schenectary	C. Mannel	10-19-53	10-23-53	X		
ENGINEERING DEPARTMENT - DESIGN SECTION							
I. Visitors to this Works							
R. L. Olson North American Aviation Downey, California	Discuss design, construction and cost of reactor items and welding techniques	V. D. Nixon W. M. Harty R. T. Jaske	10-5-53	10-8-53	X		105-KW; 100-B 105-C 200-W Redox 300 303; 700
G. H. Syrovy North American Aviation Downey, California	Discuss design, construction and cost of reactor items and welding techniques	V. D. Nixon W. M. Harty R. T. Jaske	10-5-53	10-8-53	X		105-KW; 100-B 105-C 200-W Redox 300 303; 700
F. W. Davis U. S. Atomic Energy Comm. Washington, D. C.	Discuss welding problems at Hanford	E. B. LaVelle	9-28-53	10-5-53	X		700
II. Visits to other Installations							
E. L. Armstrong to: Oak Ridge National Lab. Oak Ridge, Tennessee	Design information on new reactor	S. Cromer	10-5-53	10-6-53	X		
E. L. Armstrong to: Argonne National Lab. Chicago, Illinois	Attend reactor information meeting	H. D. Young	10-7-53	10-9-53	X		
W. J. Dowis to: Argonne National Lab. Chicago Illinois	Attend reactor information meeting	H. D. Young	10-7-53	10-9-53	X		

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
G. L. Locke to: Oak Ridge National Lab. Oak Ridge, Tennessee	Design information on new reactor	S. Cromer	10-5-53	10-6-53	X		
G. L. Locke to: Argonne National Lab. Chicago, Illinois	Attend reactor information meeting	H. D. Young	10-7-53	10-9-53	X		
G. M. Roy to: Oak Ridge National Lab. Oak Ridge, Tennessee	Design information on new reactor	S. Cromer	10-5-53	10-6-53	X		
G. M. Roy to: Argonne National Lab. Chicago, Illinois	Attend reactor information meeting	H. D. Young	10-7-53	10-9-53	X		
ENGINEERING DEPARTMENT - PROJECT SECTION							
I. Visitors to this Works							
C. H. Bayer General Electric Company Schenectady, New York	Drafting occupations and drafting work being done at Hanford	G. H. Hill	10-26-53	10-28-53		X	700
E. R. Ur Aircraft Nuclear Propulsion Project Cincinnati, Ohio	Drafting occupations and drafting work being done at Hanford	G. H. Hill	10-26-53	10-28-53	X		700
II. Visits to other Installations							
R. C. Hollingshead to: Vitro Corporation New York, New York	Consultation on centrifuge design-Project CA-513	J. C. Tourek	10-5-53	10-8-53	X		
EMPLOYEE AND PUBLIC RELATIONS DEPARTMENT -							
I. Visits to other Installations							
W. A. Watts to: Westinghouse Atomic Power Pittsburgh, Pennsylvania	Attend AEC technological information committee meeting	N. H. Jacobson	10-12-53	10-14-53	X		

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
LEGAL DEPARTMENT							
I. Visits to other Installations							
D. S. Cameron to: Knolls Atomic Power Lab. Schenectady, New York	Conference on legal problems mutual to KAPL and Hanford	S. MacMackin	10-1-53	10-1-53	X		
L. Lomen to: Knolls Atomic Power Lab. Schenectady, New York	Conference on legal problems mutual to KAPL and Hanford	S. MacMackin	10-1-53	10-1-53	X		
MANUFACTURING DEPARTMENT							
I. Visits to other Installations							
J. H. Black to: Knolls Atomic Power Lab. Schenectady, New York	Discussion on submarine power plant	K. R. Van Tassel	10-5-53	10-9-53	X		
R. E. Dunn to: Argonne National Lab. Chicago, Illinois	Attend reactor information meeting	H. D. Young	10-7-53	10-9-53	X		
S. M. Gill to: National Lead Company Fernald, Ohio	Discuss uranium slug manufacturing problems	C. H. Walden	10-13-53	10-16-53	X		
W. P. McCue to: E. I. du Pont de Nemours & Co. Wilmington, Delaware	Conference on organization	B. H. Mackey	10-27-53	10-27-53		X	
II. Visitors to this Works							
J. C. Barton Oak Ridge National Lab. Oak Ridge, Tennessee	Discuss analytical procedures	L. M. Knights D. F. Shepard	10-6-53	10-6-53	X		200-W 222-S
W. A. Scheiber Knolls Atomic Power Lab. Schene ly, New York	Observe reactor operation and decontamination work	S. L. Nelson	10-13-53	10-16-53	X		100-H 105 100-D 105-DR

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Name - Organization	Purpose of Visit	Person Contacted	Arrival	Departure	Restricted Data Class.	Restricted Data Unclass.	Areas
ADMINISTRATIVE PRACTICES							
I. Visitors to this Works							
F. N. Browder Oak Ridge National Laboratory Oak Ridge, Tennessee	Conference on inactive status metal fabrication material	V. D. Donihee	10-22-53	10-22-53	X	700	
D. E. George U. S. Atomic Energy Commission Washington, D. C.	Re-evaluation of SF material requirements	V. D. Donihee	10-1-53	10-16-53	X	All Areas-All Bldgs.	
J. T. Jackson Oak Ridge National Laboratory Oak Ridge, Tennessee	Conference on inactive status metal fabrication material	V. D. Donihee	10-22-53	10-22-53	X	700	
W. H. Lewis Oak Ridge National Laboratory Oak Ridge, Tennessee	Conference on inactive status metal fabrication material	V. D. Donihee	10-22-53	10-22-53	X	700	
D. F. Musser U. S. Atomic Energy Commission Washington, D. C.	Re-evaluation of SF material requirements	V. D. Donihee	10-1-53	10-16-53	X	All Areas-All Bldgs.	
F. Pittman U. S. Atomic Energy Commission Washington, D. C.	Evaluation of inventory precision	W. K. MacCready V. D. Donihee	10-16-53	10-16-53	X	700	
R. H. Rainey Oak Ridge National Laboratory Oak Ridge, Tennessee	Conference on inactive status metal fabrication material	V. D. Donihee	10-22-53	10-22-53	X	700	
C. W. Thornton U. S. Atomic Energy Commission Washington, D. C.	Evaluation of inventory precision	W. K. MacCready V. D. Donihee	10-16-53	10-16-53	X	700	
RADIOLOGICAL SCIENCES DEPARTMENT							

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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							
J. H. Rust University of Tennessee Knoxville, Tennessee	Whole Body Radiation Seminar	L. K. Bustad C. M. Barnes	10-20-53	10-21-53	X	300 XXX 100-F 108	
II. Visits to other Installations							
J. W. Healy to: Atomic Energy of Canada, Ltd. Chalk River, Ontario	Attend meeting on reactor safety	D. B. Langmuir	10-12-53	10-14-53	X		
PLANT AUXILIARY OPERATIONS DEPARTMENT - STATISTICS AND COMPUTATIONS							
I. Visitors to this Works							
R. C. Gerber, Jr. Cal. Research & Dev. Co. Livermore, California	View 105-K Reactor Model	B..E. Leslie	10-19 -53	10-19-53	X		
N. B..Shumate Cal. Research & Dev. Co. Livermore, California	View 105-KW Reactor Model	B. E. Leslie	10-19-53	10-19-53	X		
W..F. Gray U. S. Atomic Energy Commission Aiken, South Carolina	View 105-KW Reactor Model	R..B. Wilson	10-28-53	10-28-53	X		
Mr. Davidson U. S. Atomic Energy Commission Aiken, South Carolina	View 105-KW Reactor Model	R. B. Wilson	10-28-53	10-28-53	X		
H. B. Rahner U. S. Atomic Energy Commission Aiken, South Carolina	View 105-KW Reactor Model	R. B. Wilson	10-28-53	10-28-53	X		

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PURCHASING AND STORES SECTION
PLANT AUXILIARY OPERATIONS DEPARTMENT
SUMMARY - OCTOBER 1953

The Business and Defense Services Administration has revoked, effective November 1, 1953, Order M-80 and Schedules 1, 5, A and C. Removal of these controls permits the unrestricted use of Nickel and Columbium-Tantalum by civilian industries and may make our procurement more difficult.

HWC 1108 covers twelve 1500 HP vertical motor driven pumps being furnished by the Byron Jackson Company of Los Angeles for the K Area River Pump House. The first two motors were scheduled for assembly the week of November 12 for test. One motor will be shipped to Los Angeles where a complete test will be made on the pump, the second motor being shipped direct to the Hanford Project.

Because of the increased number of requisitions placed in the Construction Procurement Unit during the month of October, one expediter, one buyer and two stenographers were borrowed from other Units.

An alternate proposal has been received from General Chemical Division, Allied Chemical and Dye, on the modification of the Aluminum Nitrate Nonahydrate Contract. This is presently being evaluated and will be the subject of discussions with Manufacturing and Finance.

Difficulty has been experienced with aluminum caps furnished by the Aluminum Company of America. The caps were made to our specifications, but apparently the iron-silicon ratio had been set too high and a large percentage of the caps have been cracking after welding. A change has been made in the metal specification which should solve the problem.

Forty-four formal excess lists containing 5452 items valued at $ 792,830 were transmitted to the Commission for action.

Since certain export restrictions have been relaxed both ferrous and non-ferrous scrap is expected to tighten up, as this relaxation is expected to bolster buying by the mills, as they would rather stockpile scrap than to have it shipped overseas.

A program was instituted during the month for requisitioning, warehousing and issue of argon gas for Blaw-Knox and Kaiser Engineers in addition to General Electric. This will simplify the purchasing as well as the control and return of cylinders. With only a moderate investment in additional storage facilities, Stores will increase disbursements by $50,000 annually for about 1½ years.

The coupon-cutting phase of our stainless steel testing program has been completed. The Seattle laboratory is reported to be buried in work, so that our test results and subsequent marking of stock will be delayed.

During October materials and equipment valued at $72,445 were withdrawn from Excess accounts for use on the project.

PURCHASING AND STORES SECTION
SUMMARY

Successful negotiations were completed with the rail carriers for a reduction in the freight rate on the movement of Caustic Potash from Pittsburg, California to the Project. The savings in freight charges will amount to approximately $212.00 per car.

The problem of acquiring suitable railroad equipment for loading outbound shipments from the 2714 Warehouse was solved when the rail carriers provided special designed cars which eliminates the necessity of us having to provide blocking and bracing material and the labor to install it. The savings in labor and material is conservatively estimated at $100.00 per car. Six of these special cars are now assigned to this service.

Organization and Personnel	9-30-53	10-31-53	Change
Employees on Roll	278	273	-5

PURCHASING AND STORES SECTION
ADMINISTRATION UNIT
OCTOBER 1953

Administration of the Priorities System and the Defense Materials System was delegated on October 1, 1953 from the expired National Production Authority to the Business and Defense Services Administration (BDSA). Existing NPA Delegations, Regulations and Orders were ratified and continued under BDSA.

The Business and Defense Services Administration has revoked, effective November 1, 1953, Order M-80 and Schedules 1, 5, A and C. Removal of these controls permits the unrestricted use of Nickel and Columbium-Tantalum by civilian industries and may make our Procurement more difficult.

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.:

October 1953	VENDOR TYPE			
Cost Category	Government Agency	Small Business	Big Business	Educational and other
$0 - $ 24.99	$ 53.55	$ 4,198.69	$ 1,552.47	$ 135.81
$25 - $ 499.99	673.91	85,201.82	48,997.24	96.00
$500 - $ 24,999.99	2,957.57	283,447.79	300,105.61	
$25,000 - $ Up		64,732.00	1,151,931.57	
	$3,685.03	$437,580.30	$1,502,586.89	$ 231.81
Number of Actions	18	1160	662	16

Vendors Contacts	183
Claims Processed	0
Damage Reports Processed	11
Over & Short Reports Processed	1
Accounts Payable Request Handled	241
Difference Slips Processed	59
Clearance Slips & Purchase Order Change Approvals	220
Material Exception Reports	222
Return Orders Issued	147

Shown below is a summary of the net value of procurement actions placed with vendors for manufactured or shelf items in the states of Washington, Oregon, Idaho and Other Areas.

State	Manufactured	Shelf	Total
Washington	$ 911,354.11	$ 155,245.74	$ 1,066,599.85
Oregon	68,492.44	63,543.66	132,036.10
Idaho		4.75	4.75
Other	643,731.07	101,712.26	745,443.33
Total	$1,623,577.62	$ 320,506.41	$ 1,944,084.03

PURCHASING AND STORES SECTION
ADMINISTRATION UNIT
OCTOBER 1953

	G	D	Total
Requisitions on hand 10-1-53			
Operations Procurement	660	0	660
Construction Procurement	0	118	118
A.E.C. Procurement	233	30	263
Total	893	148	1041
Requisitions Assigned during October			
Operations Procurement	1704	0	1704
Construction Procurement	0	315	315
A.E.C. Procurement	264	28	292
Total	1968	343	2311
Requisitions Placed during October			
Operations Procurement	1766	0	1766
Construction Procurement	0	260	260
A.E.C. Procurement	343	32	375
Total	2109	292	2401
Requisitions on hand 10-31-53			
Operations Procurement	598	0	598
Construction Procurement	0	173	173
A.E.C. Procurement	154	26	180
Total	752	199	951

Purchase Orders Placed	HW	HWC
Operations Procurement	1468	
Essential Material	53	
Construction Procurement		236
Local Purchase	15	4
Total	1536	240

Value of Orders Placed		
Operations Procurement	$ 434,265.46	
Essential Material	1,287,424.98	
Construction Procurement		$ 220,827.97
Local Purchase	97.80	31.89
Total	$1,721,788.24	$ 220,859.86

Alterations Issued	Increase	Decrease	No Change	Total
HW Operations	27	33	1	61
Essential Material	4	5	1	10
HWC Construction	12	10	6	28
Total	43	48	8	99

Value of Alterations Issued	Increase	Decrease	Total
HW Operations	$ 10,084.48	$ 8,861.49	$ 18,945.97
Essential Material	2,534.63	26,294.51	28,829.14
HWC Construction	26,116.88	2,014.37	28,131.25
Total	$ 38,735.99	$37,170.37	$ 75,906.36

Government Transfers	OR	ORC
	1	0

Organization and Personnel	9-31-53	10-31-53	Change
Employees on Roll	27	27	0

PURCHASING AND STORES SECTION
CONSTRUCTION PROCUREMENT UNIT
OCTOBER, 1953

HWO 1108 covers twelve 1500 HP vertical motor driven pumps being furnished by the Byron Jackson Company of Los Angeles for the K Area River Pump House. The first two motors were scheduled for assembly the week of November 12 for test. One motor will be shipped to Los Angeles where a complete test will be made on the pump, the second motor being shipped direct to the Hanford Project.

Mr. W. E. Johnson's letter of September 14 on the subject of "Prerequisite foundation for claims against vendors" has been discussed with all buyers in the Construction Procurement Unit, and the points brought out in this letter are being watched very closely and are being incorporated in our purchase orders.

Because of the increased number of requisitions placed in the Construction Procurement Unit during the month of October, one expediter, one buyer and two stenographers were borrowed from other Units.

During the month of October requisitions assigned to the Construction Procurement Unit increased 17% over September. Requisitions placed during the month of October decreased 9% from September. Requisitions on hand at the end of October were 46% in excess of those on hand at the end of September.

Organization and Personnel

	9-30-53	10-31-53	Change
Employees on Roll	12	12	0

PURCHASING AND STORES SECTION
OPERATIONS PROCUREMENT UNIT
OCTOBER -- 1953

Statistical and General

The rate of increase in incoming requisitions, as mentioned last month, has dropped off, indicating that inventory materials are still being utilized in place of newly-purchased materials. Our total residual workload has increased approximately 7% over last month but is still at a "sub-normal" level.

An alternate proposal has been received from General Chemical Division, Allied Chemical and Dye, on the modification of the Aluminum Nitrate Nonahydrate Contract. This is presently being evaluated and will be the subject of discussions with Manufacturing and Finance.

Considerable difficulty has been experienced with aluminum caps furnished by the Aluminum Company of America. These caps were made to our specifications both as to dimensions and metal specifications. The iron-silicon ratio, apparently, had been set too high and a very heavy percentage of the caps have been cracking after welding. Discussions with the Aluminum Company on the problem have lead to a change in the metal specification, which should solve the problem. It will, however, take from 30 to 60 days to secure caps made from the new alloy.

Essential Material Contracts

The following contracts have been approved by the Commission and are in force:

1. Methyl Isobutyl Ketone
2. Supplemental contracts on Sodium Bismuthate, Chlorine, and Sodium Dichromate

The following contracts have been negotiated and are ready for General Electric approvals:

1. Supplemental contracts on Lime and Sulfamic Acid
2. Ferrous Ammonium Sulfate
3. Liquid Chlorine--12-month requirement.

Lime--award made and contract being negotiated--12-month requirement.

Steam Coal--contracts have been written by the Essential Materials buyer and our legal counsel and are being sent to the vendors for signature.

Organization and Personnel

	9/30/53	10/31/53	Change
Employees on roll	32	33	+ 1

PURCHASING AND STORES SECTION
STORES UNIT
OCTOBER 31, 1953

Statistical and General

Process tubes, approved for disposal by the Commission, were moved to the Surplus Yard thus making the old construction warehouse in 100-D Area available for disposal.

Forty-four formal excess lists containing 5452 items valued at $792,830 were transmitted to the Commission for action.

Activity in Scrap and Salvage Sales increased during October with the number of excess lists released for public sale more than twice the previous month's total. The number of Property Disposal Reports handled and the amount of scrap being received have also increased.

Since certain export restrictions have been relaxed both ferrous and non-ferrous scrap is expected to tighten up, as this relaxation is expected to bolster buying by the mills, as they would rather stockpile scrap than to have it shipped overseas.

A program was instituted during the month for requisitioning, warehousing and issue of argon gas for Blaw-Knox and Kaiser Engineers in addition to General Electric. This will simplify the purchasing as well as the control and return of cylinders. With only a moderate investment in additional storage facilities, Stores will increase disbursements by $50,000 annually for about 1½ years.

Stainless steel is in process of transfer from Central Stores to 200-W Area, where most of the material is used. Concurrently, the book value of these items are being transferred from Caption 32 to Classes 47 and 48. This is our first complete move under the Uniform Catalog plan, and bin numbers in 200-W are being assigned accordingly.

The coupon-cutting phase of our stainless steel testing program has been completed. The Seattle laboratory is reported to be buried in work, so that our test results and subsequent marking of stock will be delayed.

As a direct result of the SAR program, there are 568 items yet to be excessed valued at some $40,000.

In the Excess Material and Equipment account the following items are reported:

Disbursements by store order	$ 62,993
Disburesments by transfer	9,452
Offsite shipments	192,708
Receipts	210,828

Organization and Personnel	9-30-53	10-31-53	Change
Employees on Roll	194	189	-5

PURCHASING & STORES SECTION

TRAFFIC UNIT

October, 1953

STATISTICAL AND GENERAL

Successful negotiations were completed with the rail carriers for a reduction in the freight rate on the movement of Caustic Potash from Pittsburg, California to the Project. The savings in freight charges will amount to approximately $212.00 per car.

The problem of acquiring suitable railroad equipment for loading outbound shipments from the 2714 Warehouse was solved when the rail carriers provided special designed cars which eliminates the necessity of us having to provide blocking and bracing material and the labor to install it. The savings in labor and material is conservatively estimated at $100.00 per car. Six of these special cars are now assigned to this service.

As a result of rate reductions obtained from the carriers, there was a total savings in freight charges for the month of October amounting to $1,351.28. This makes a total savings from September 1, 1946 to date of $1,752,914.89.

Savings Report

1. Rate reductions obtained from carriers:

Commodity	Origin	Savings for October, 1953	Savings from 9-1-46 thru September, 1953	Savings from 9-1-46 to date
Empty Cylinders	Richland, Wash.	$ 2.00		
Extrusions, Aluminum	Phoenix, Ariz.	56.44		
Gases, Compressed	Yakima, Wash.	22.94		
Limestone	Delle, Utah	320.00		
Sulfamic Acid	Grasselli, N.J.	949.90		
		$1,351.28	$1,751,563.61	$1,752,914.89
2. Freight Bill Audit		898.46	114,373.76	115,272.22
3. Loss and Damage Overcharge Claims		2,124.36	131,168.62	133,352.98
4. Ticket Refund Claims		980.95	32,896.45	33,877.40
5. Household Goods Claims		00.00	17,276.59	17,276.59
		$5,415.05	$2,047,279.03	$2,052,694.08

Work Volume Report

Completed Travel Requests 134

PURCHASING & STORES SECTION
TRAFFIC UNIT
OCTOBER, 1953

Work Volume Report (cont.)

Reservations resulting from above:	Rail	70
	Air	158
	Hotel	166
Expense Accounts Checked		322
Household Goods & Automobiles	Movements Arranged Inbound	1
	Shipments Traced	2
	Insurance Riders Issued	2
	Insurance Bills Approved	8
	Furniture Repair Orders	1
Ticket Refund Claims	Filed	14
	Collected - Number	19
	Collected - Amount	$980.95
Freight Claims	Filed	8
	Collected - Number	11
	Collected - Amount	$2,184.36
	Over and Shorts Processed	7
	Damage Reports Processed	8
Freight Bill Audit Savings		$898.46
Freight Shipments Traced		39
Quotations	Freight Rates	181
	Routes	155
Bills Approved	Air Express	24
	Boat	3
	Carloading	89
	Express	153
	Rail	1,010
	Truck	248
Carload Shipments	Inbound	1,077
	Outbound	18

Report of Carloads Received

Commodity	CMSTP&P	NP	UP	Total
Aluminum Ingots	1		2	3
Aluminum Sulphate	2	2		4
Bichromate of Soda	2	1		3
Caustic Soda	12	10	16	38
Chlorine	2	1	1	4
Coal	106		861	967

PURCHASING & STORES SECTION
TRAFFIC UNIT
October, 1953

Report of Carloads Received (cont.)

Commodity	CMSTP&P	NP	UP	Total
Electric Transformers		1		1
Ferrous Ammonium Sulphate		1		1
Furnace Liners	7	6		13
Hydroflouric Acid		1		1
Lacquer Solvents	1			1
Lime			2	2
Lime Rock	1			1
Methyl Isobutyl Ketone		1	1	2
Nitric Acid		16	9	25
Oxalic Acid	1			1
Petroleum Naphtha	1			1
Phosphoric Acid	1			1
Soda Ash	1	1		2
Steel Containers		2		2
Sulfamic Acid		1		1
Sulphuric Acid	1			1
Merchandise Cars	2			2
Total	141	44	892	1,077

Organization & Personnel	9-30-53	10-31-53	Change
Employees on Roll	11	10	-1

55-410

U. S. ATOMIC ENERGY COMMISSION
HANFORD OPERATIONS OFFICE
RICHLAND, WASHINGTON

DATE: June 22, 1955

TO: BUDGET

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 March 10, 1955.

Hanford Document No. 52778 G. E. Document No. HW-29794-L

Doc. Date 11-25-53 Original Classification [redacted]

Title or Subject: Transportation Section Monthly Report-October 1953

Author(s) or Originator [illegible]

Pages To-1 thru To-9 (..) Downgraded to [redacted]

( ) Classification Cancelled

According to our records you have copy(ies) [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: [redacted]

This document was transmitted to you [illegible]
from Hanford on
Registry No.

Lee E. Speer

LEE E. SPEER, Chief
Classified Document Control

DECLASSIFIED

Classification Cancelled or Changed to HW-28787

By authority of THE GE[illegible] ELECTRIC COMPANY, NON-TECHNICAL DOCUMENT REVIEW BOARD. ROY E. JAYNES, Secretary.

Date.....

TRANSPORTATION SECTION
MONTHLY REPORT
October 1953

GENERAL

Transportation Section personnel forces remained at 495 with 1 new hire, 3 reactivations - personal illness, 1 termination, 2 transfers out, and 1 deactivation - personal illness.

Thirty-six additional employees enrolled in the Good Neighbor Fund during the recent re-canvass program. This raised the percentage of participation to 85.4% within the Transportation Section.

A Bus Driver sustained a sub-major injury on October 20 in the 200-West Area when he stepped into a small hole and twisted his ankle causing a fracture to his left foot. This was the first sub-major injury incurred by the Bus Operations Unit.

Completed manpower estimates by Transportation Budget Units through FY 1957 and prepared a narrative explanation of anticipated changes over 9-30-53. Forecasted personnel were further segregated into functional categories as required by A.E.C. Bulletin GM-PER-40.

Prepared exempt and non-exempt overtime estimates by Transportation Budget Units for the last three quarters of FY 1954. These estimates with the revised manpower requirements will be used in the FY 1954 Midyear Budget Review.

Preparation of information for the Atomic Energy Commission to be used in connection with the GM S&S 45 Audit Annual Report has been in progress throughout the month and should be completed early in November. This report is intended to examine various aspects of the equipment program as to maintenance facilities, tools and repair parts, maintenance practices, assignment and utilization data, motor pool operations, cost control and reports, etc.

Satisfactory progress continued on the New Consolidated Transportation Facilities. A proceed notice was issued to the Sound Engineering and Construction Company on October 1 with Phase II work scheduled to start by October 15. Awards to vendors for new equipment were completed on October 5. Necessary revisions to final plans have been completed and a new issue of approved plans and specifications were reviewed on October 16.

RAILROAD ACTIVITIES

Commercial cars handled during October decreased 11% over September. The following recapitulation indicates the distribution of commercial cars handled:

Carload Movements -	Loads In	Empties In	Loads Out	Empties Out
General Electric Company	940	33	29	901
Blaw-Knox	45	-	-	41
Coleman Floor Covering	1	-	-	1
Fox-Smith	1	-	-	1
Grove, Wilson, Shepard, Kruge	12	-	-	10
L. F. Hauserman	1	-	-	1
L. A. Hopkins Co.	3	-	-	3
Kaiser Engineers	156	1	1	153
D. V. Libby Co.	3	-	-	2
Soule Steel Co.	1	-	-	1
Steel Construction Co.	1	-	-	1
A. E. C.	81	-	-	70
U.S. Army	19	-	-	22
AEC - Kaiser Engineers	72	-	-	76
	1,336	34	30	1,283

Process Service continued on an upward trend as actual cars handled increased 28% over September. The 181 process cars handled in October virtually equalled the previous recorded high of 182 in July 1953.

Approximately 600 man-hours of overtime were required primarily for process service outside of normal shift hours and on week ends. In addition, a large portion of the commercial night crew's time had to be diverted to process schedules.

Coal shipments from the Montana fields began arriving via the Milwaukee railroad. The shipments from the Utah and Wyoming fields will be reduced by a corresponding number thus making no change in total daily receipts.

Special service included the handling of 14 cars of ballast for construction forces and railroad track maintenance crews.

Total car movements including process service totaled 3,175 in October compared to 3,389 in September, 1,414 in August; 1,726 in July; 3,275 in June; 2,617 in May; 2,278 in April; 2,314 in March; 2,691 in February; and 2,730 in January.

Locomotive 39-3731 was struck by Patrol car 1A-5207 at the 19th Street railroad crossing in 200-West Area on September 30 at 6:40 P.M. There were no injuries and damages totaled approximately $400 to the government sedan.

Completed major engine repairs on locomotive 39-3730. This unit was released for service on October 22 and has since operated satisfactorily with no further difficulty being anticipated. This unit required extensive repairs after failing in the field on two separate occasions. Considerable effort was expended by the factory representative and equipment maintenance personnel in endeavoring to ascertain the reason for the failures but no conclusive determination was possible.

Completed extensive repairs to the braking system on cask car 10B-3640.

Routine inspection and minor repair services were performed on October 7 and 22 for the U.S. Army car operated off-plant for the Atomic Energy Commission.

Transportation Section

Heaters within the Riverland Roundhouse have been serviced in readiness for winter operation including overnight storage for 120-ton locomotives. Electrical connections for immersion heaters on 80-ton locomotives have been checked and repaired as these units must remain outside due to the lack of storage space. Locomotives left overnight in the 700 Area will be connected with the steam line.

Standpipe repairs have been completed at Riverland permitting restoration of water service to steam locomotives for the Milwaukee Railroad.

Stock record cards on SubAccount 932 - Railway Equipment Parts have been moved from Riverland to the 100-H Area Garage where inventory control will be maintained on repair parts for all of the outlying area garages.

Railroad track maintenance activities included lining, surfacing, and dressing of trackage requiring 4,031 man-hours; installation of ties, rail, and other track materials requiring 861 man-hours; distribution and handling of track materials requiring 393 man-hours; weed control requiring 590 man-hours; sand removal and oiling switches requiring 128 man-hours; road crossing repairs requiring 155 man-hours; and special work orders requiring 640 man-hours which included the removal of a 700 Area turnout for retirement and the installation of a permanent turnout for the 100-K Area.

AUTOMOTIVE ACTIVITIES

The Plant Bus System transported 3.8% fewer passengers in October than in September. The following statistics indicate the magnitude of service rendered:

Passenger volume	136,652
Revenue - bus fares	$ 6,782.62
Earnings - transit advertising (September)	$ 204.28
Bus trips	6,592
Bus miles - passenger carrying	195,503
Passenger miles	4,796,562

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	6
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

Transportation Section

The Cottonwood Shuttle Route for the Plant Bus System was extended by one city block on October 5 to accommodate personnel now residing in the new Bauer-Day Housing in the southeast corner of Richland.

The Richland Bus System transported 11.2% more passengers in October than in September. The following statistics indicate the volume of service rendered:

Total passengers including transfers	11,308
Revenue - bus fares	$ 754.91
Earnings - transit advertising (September)	$ 10.12
Bus trips	1,155
Bus miles - passenger carrying	6,122
Passenger miles	26,018

Six fare boxes were designated for the exclusive use of the Richland Bus System on October 19 to preclude any possibility of this revenue becoming mixed with fares from the Plant Bus System at the time the fare boxes are empties.

Special transportation was provided during the month as follows:

Bus tour of the Plant and Richland on October 15 for approximately thirty-five representatives of West Coast newspapers.

Bus tour of Richland and North Richland on October 23 for approximately sixty Washington State Municipal Finance Officers.

Eighteen of the new 53-passenger General Motors coaches have been received and the remaining four are scheduled for delivery by November 4. Four of these units were placed in Plant bus service on October 26.

Off-Plant chauffeured automobile trips (Company business and/or official visitors) totaled 109 which were rendered to the following locations as indicated:

Benton City, Washington	2
Hinkle, Oregon	9
Kennewick, Washington	4
Pasco, Washington	65
Pendleton, Oregon	17
Sunnyside Washington	4
Yakima, Washington	6
AEC Airport	2

The following tabulation indicates the volume of Drivers Test Service rendered:

Applicants:	Male	17	Number tests given	21
	Female	4	Number rejected	0

Permits issued:	Limited to driving with glasses	4
	Unlimited	17

Permits reissued:	Rehires	17
	Expirations	305

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Transportation Section

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	53,230	19,625	5,700	1,665	279
Received during month	99,763	19,700	30,500	3,241	0
Dispensed during month	106,168	17,895	27,200	2,381	279
Stock at end of month	46,825	21,430	9,000	2,525	0

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	28
Class A Inspections and Repairs	92
Class B Inspections and Lubrications	989
Bi-weekly Inspections - buses	177
Other routine maintenance repairs and service calls	2347
Accident repairs and paint jobs	49
Tire repairs	557
Wash jobs	519
	4,758

The following tabulation indicates the Plantwide usage of automotive equipment:

Code	Type	No. of Units	Total Mileage
1A	Sedans	338	608,670
1B	Buses	91	251,486
1C	Pickup Trucks	460	283,047
1D	Panel,Carryall,Sta.Wagon	153	168,106
1E	Armored Cars	1	134
1G	Jeeps	2	1,520
68 Series	Trucks	206	83,596
		1,251	1,396,559

Electrical connections for immersion heaters on Plant buses have been checked and placed in service to facilitate starting during cold weather.

Winterizing of HO equipment was begun on October 12 and is approximately 85% complete.

Discontinued the practice of returning rebuilt engines to the Stores Unit for storing since it is not practical to stock a complete line of new or rebuilt replacement motors. An engine requiring a major overhaul will now be removed and sent to the motor room for rebuilding and then returned for installation in the same vehicle. This procedure reduces handling to a minimum and eliminates the subsequent 40% charge from the Stores Unit; enables all repair work to be performed on one repair order thus providing better record control;

precludes the possibility of a double charge from the cost of a new or rebuilt motor plus the expense of rebuilding the old engine.

Established a revised procedure for checking and certifying the accuracy of speedometers on Patrol vehicles. Each unit must now traverse the measured mile course north of the 300 Area with a stop watch check being made. Necessary corrections are recorded on the certification sticker on the cowl of each vehicle.

Completed preliminary arrangements for a General Motors Diesel Engine Training School at the Richland Community House on November 2.

Completed the final two phases of the study on 41-passenger buses vs. 41-passenger buses augmented by twenty-two 53-passenger buses. This study indicated fairly conclusively that the larger capacity buses will permit a daily savings of from six to nine round trips, Monday through Friday. This factor, coupled with reduced requirements of approximately 700 employees over previous personnel estimates by the Manufacturing Department, indicates that no additional buses will be needed for the current expansion program.

The standard I.M.E. rate for the Equipment Maintenance Unit was changed from 80% to 85% effective October 1. This increase was largely caused by the 100% loss incurred in excessing obsolescent and overstocked repair parts.

Considerable attention has been devoted toward reducing the automotive parts inventory. The turnover ratio of 8.1 months supply on hand at 7-31-53 has been progressively reduced to 6.2 months supply on hand at 9-30-53 through the excessing of obsolescent and overstocked items. In order that we may further assist in a systematic reduction, the Stores Unit has been requested to furnish an itemized listing of individual parts or sets and the turnover rates. From a review of this information we hope to ascertain what items can be released for excessing or transferred to stand-by without impairing equipment maintenance efficiency. In some cases, where the maximum and minimum quantities have been higher than necessary, it may prove desirable to use such items without replacement until a proper stock level can be attained.

Buses 1B-5159 and 1B-5160, which were involved in an accident at the 101 Building railroad crossing on September 11, were sent to Wentworth and Irwin, Inc. at Portland, Oregon on October 12 for major repairs at a contract cost of $7,110.

Completed the modification of heating systems on 1952 Ford Sedans that was begun in September.

LABOR ACTIVITIES

The weed control program for 1954 was begun on October 26 with the spray application of a soil sterilizing chemical to prevent seed germination. Spraying operations will cover electrical sub-stations, 700,1100 and 3000 Areas, and certain sections of the Plant Road and Railroad Systems.

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Transportation Section

Applied Equipment Rental Rates are being raised 12% effective November 1 to more adequately liquidate the heavy equipment expense of the Track and Road Maintenance Unit. This increase is consistent with the general increase of July 1 and is necessary to re-establish an equitable differential.

Repairs to a timber bridge located on Route 11-A three miles beyond the Yakima Barricade have been completed. This 85 foot long and 24 foot wide structure was badly deteriorated by decay. Minor Construction forces installed new decking and abutments.

Furnished two compressors and assisted in the winterizing of the Richland Irrigation System requiring 91 man-hours.

Removed 70 tree stumps for the community of Richland which were endangering sewer lines by root growth. These stumps were winch extracted and then moved to the burning grounds for disposal requiring 49 man-hours.

Unloaded and stockpiled eleven carloads of lump coal in the 3000 Area requiring 39 man-hours. This coal will be delivered to the 1131 Boilerhouse, Prosser Barricade, and Yakima Barricade for heating purposes as needed.

Miscellaneous excavations in the 700 and 1100 Areas and the completion of cleaning the drainage canal from Van Giesen to McMurray Road required 61 man-hours.

Handling of materials and equipment for the Stores Unit included 15 carloads and 118 truckloads and required 2,675 man-hours.

Miscellaneous labor and equipment services for the 300 Area required 743 man-hours.

Movement of equipment and material and other miscellaneous labor services for the 100 and 200 Areas required 225 man-hours.

The daily trucking service between Richland and the Manufacturing Areas handled 333 cases of acid, 1,933 cylinders of compressed gas, and 750 tons of operational supplies requiring 1,597 man-hours.

Administration Area maintenance services required 652 man-hours.

Maintenance of primary roads required 1,118 man-hours; secondary roads 40 man-hours; Manufacturing Area walkways, parking areas and related ground maintenance required 368 man-hours.

Seal treatment of the 100-C cutoff road required 184 cubic yards of 5/8" chips, 3,736 gallons of MC 5 oil, and 204 man-hours before failure of oiling equipment caused a shutdown until next season.

Transportation Section

The following tabulation indicates in tons the volume of road asphalt material handled by Road Maintenance personnel:

	MC 1	MC 3	MC 4	Mc 5
Stock at start of month	0	43.61	0	50.63
Received during month	0	0	0	77.49
Used during month	0	26.54	0	15.5
Stock at end of month	0	17.07	0	112.62

The following tabulation indicates the volume of road aggregate materials handled by Road Maintenance personnel:

	3/4" to 0 Pre-mix Tons	½" to 0 Pre-mix Tons	5/8" Chips Cu.Yd.	1/4" Chips Cu.Yd.	3/4" Crushed Rock Cu.Yd.
Stock at start of month	76	27	1,267	6,060	1,004
Made during month	107	403	150	0	0
Used during month	90	245	184	311	73
Stock at end of month	93	185	1,233	5,749	931

The handling of office furniture, equipment, and records involved 132 moving jobs requiring 1,090 man-hours.

Weed cleanup at electrical sub-stations required 77 man-hours.

Furnished one Serviceman to the Public Relations Section in connection with special photographic activities requiring 152 man-hours.

Hauling material from Central Stores to the Minor Construction Warehouse in White Bluffs required 88 man-hours.

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HW-29794-[redacted]

Copies #1 - 12-Plant Monthly
13-HD Middel
14-RB Britton
15-FJ Mollerus
16-AEC
JI Thomas
17-700 File
18-300 File
19-HA Carlberg
20-O Mageehon
21-ES Staples

November 6, 1953

ELECTRICAL DISTRIBUTION AND TELEPHONE SECTION

MONTHLY REPORT

October 1953

GENERAL

The Section total work force was one hundred and sixty-eight (168) as of October 31, a reduction of one from the previous month.

A new process load power peak was established during the month, exceeding the previous billing demand by 1,015 KW.

Date	Demand KW	September Comparative KW Demand
10-26-53 (10:00 AM-10:30 AM)	113,515	112,500

The Stromberg-Carlson Company was awarded a contract on October 6, 1953, to fabricate equipment for the new official telephone exchange. The exchange equipment will be housed in a concrete block structure to be adjoined to the present 706 Building, which will be remodeled and converted for office and operating space.

ELECTRICAL DISTRIBUTION UNIT

Maintenance and Operation

Two power interruptions occurred within the 100-B Area during the morning of October 5 when a faulty cable splice caused an oil circuit breaker to open twice. There was no loss of production.

On October 9, oil circuit breaker 174 in the Hanford Substation failed to remain closed when being put back into service. An investigation located the origin of the unbalanced currents in faulty action of the tap changer in the second 115 KV/66 KV transformer bank. The tap positions on this bank were only recently changed to these positions to meet future power requirements at 100-K Area. It will be necessary to transport the transformer to the 200-W Area in order to lift the core to make repairs.

[redacted]

ELECTRICAL DISTRIBUTION UNIT

Maintenance and Operation (Continued)

A disturbance occurred on the B.P.A. system at 5:21 p.m., October 26, due to loading conditions. During a controlled operation, frequency dropped to 59.6 cycles and voltage to 220 KV. This is not critical to operations, but heralds the approach of the greater winter loads when manipulation will be necessary to meet system peaks.

Equipment tests with the Doble instruments detected a faulty 12 KV section in a 230 KV lightning arrester stack. This is the third such condition disclosed in this maintenance program.

System Expansion and Planning

A new 3750 KVA transformer was received on October 28 and will be placed in service at the 300 Area by the end of November to back up the present 3750 KVA transformer at the primary substation.

The "as-built" Electrical Distribution system maps and pole data maps for all areas were completed and the anchor data maps are now ninety percent complete.

TELEPHONE UNIT

Maintenance and Operation

Ninety percent of the repair work on the 100-B to Riverland 26-pair cable was accomplished preparatory to the planned cable lashing job.

A summary of telephone service is as follows:

	Subscriber Stations In Service		Lines Available For Service	Sides Available For Service	Exchange Lines In Service
	Res. and Misc.	Official			
Richland	5909	987	52	283	3955
N.Richland	357	252	147	27	453
Process Areas	29	1709	359	--	1573
Total	6295	2948	558	310	5981

Richland Exchange four-party service:

	October 23, 1953	September 23, 1953
Number of Subscribers	1067	1041
Number of vacant sides	157	163

One hundred and thirty-five (135) new requests for residential telephone service were received, making the backlog two hundred and ninety-six (296).

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TELEPHONE UNIT

Maintenance and Operation (Continued)

Service orders during the month were as follows:

Residential and commercial	388
Official (permanent)	291
Official (temporary)	135
Total	814

System Expansion and Planning

The new four-position manual switchboard at 100-K Construction Area was tested and cut into service the night of October 22.

Specifications on type of equipment for the new 100 K-BC telephone exchange were rewritten in order that all vendors can bid on this complete 300-line system.

A study of methods of tree trimming along the Richland distribution system and costs of these various plans was prepared during the month.

The relocation of the 100-line private exchange in the 202-S Building was planned and a layout for the intra-building cable prepared.

RB Britton

ELECTRICAL DISTRIBUTION
AND TELEPHONE SECTION

RB Britton:MAW:clh

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HW-29794-B DEL

POWER STATISTICS
ELECTRICAL DISTRIBUTION AND TELEPHONE SECTION
FOR MONTH ENDING OCTOBER 31, 1953

744 hours

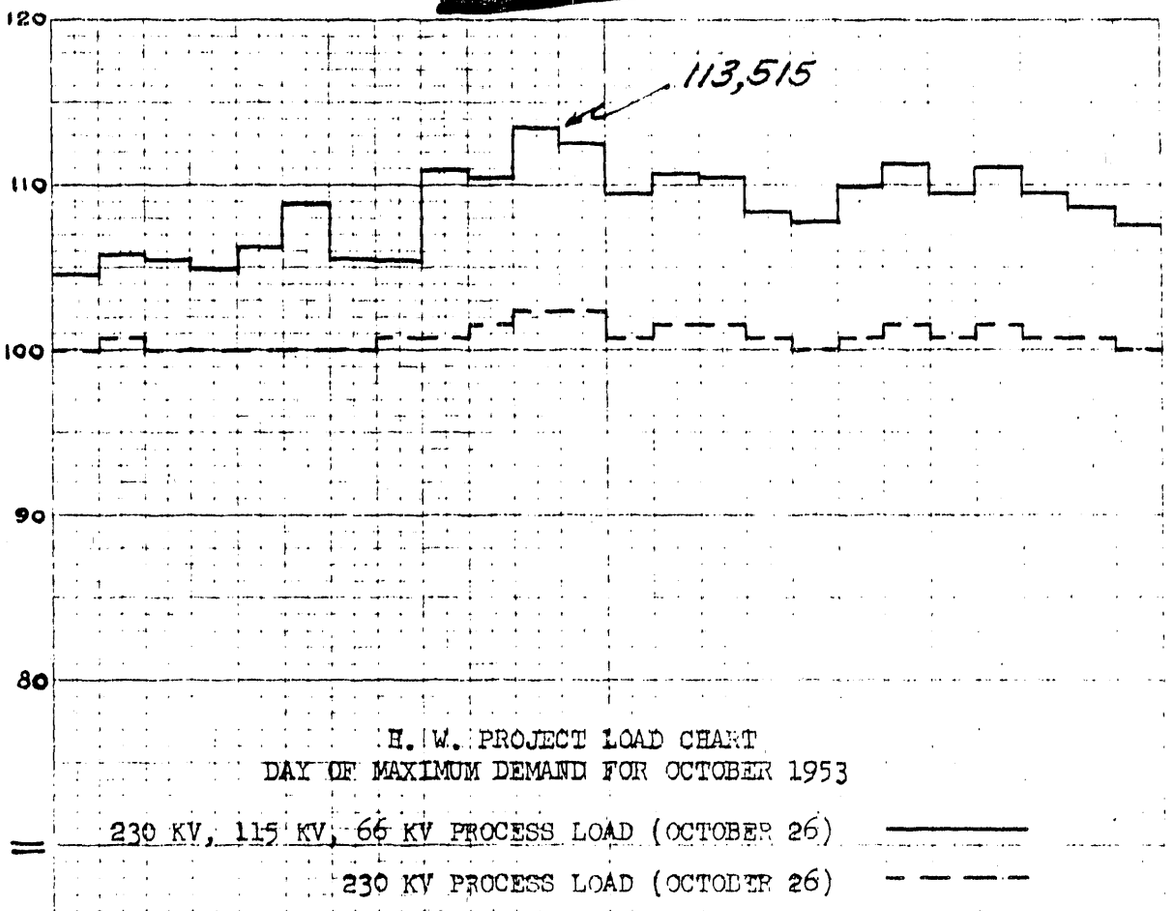
	ENERGY - MW HRS.		MAXIMUM DEMAND-KW		LOAD FACTOR - %	
	Last Month	This Month	Last Month	This Month	Last Month	This Month
230 KV System						
A-2 Out (100-B)	26965	25355	44800	43800	83.6	77.8
A-4 Out (100-D)	16115	16380	23700	23800	94.4	92.5
A-5 Out (100-H)	7704	10080	14550	16350	73.5	82.9
A-6 Out (100-F)	7450	8250	11700	11900	88.4	93.2
A-8 Out (200 Area)	5436	6016	9720	10080	77.7	80.2
TOTAL OUT	63670	66081	104470 **	105930**	84.6	83.8
MIDWAY IN	64531	67086	102400 *	103200 *	87.5	87.4
115 KV System						
B1-S4 Out (N. Rich.)	1493	1742	3341	4204	62.0	55.7
B1-S5	94	86	432	432	30.3	26.8
Richland	7552	8718	17280 *	19200*	60.7	61.0
BB3-S4 Out (300 Area)	1320	1288	3120	3040	58.8	56.9
TOTAL OUT	10459	11834	24173 **	26876**	60.1	59.2
Benton In	10800	13000	35600 *	33600*	42.1	52.0
So. Richland In	-	-	- *	- *	-	-
TOTAL IN	10800	13000	35600 **	33600**	42.1	52.0
66 KV System						
B9-S11 Out (100-K)	792	906	1840	2000	59.8	60.9
B7-S10 Out (W.Bluffs)	327	411	1125	1125	40.4	49.1
Hanford Out	39	50	300 **	300**	18.1	22.4
TOTAL OUT	1158	1367	3265 **	3425**	49.2	53.6
HANFORD IN	1149	1456	3100 *	3800*	51.5	51.5
Project Total						
230 KV Out	63670	66081	104470 **	105930**	84.6	83.8
115 KV Out	10459	11834	24173 **	26876**	60.1	59.2
66 KV Out	1158	1367	3265 **	3425**	49.2	53.6
TOTAL OUT	75287	49282	131908 **	136231**	79.3	78.2
230 KV In	64531	67086	102400 *	103200*	87.5	87.4
115 KV In	10800	13000	35600 **	33600**	42.1	52.0
66 KV In	1149	1456	3100 **	3800**	51.5	51.5
TOTAL IN	76480	81542	141100	140600	75.3	77.9

*Denotes Coincidental Demand
**Denotes Non-Coincidental Demand

Average Power Factor-230 KV System 90.9
Average Power Factor-115 KV System 91.4
Average Power Factor- 66 KV System 89.1

[redacted]

[redacted]



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PLANT AUXILIARY OPERATIONS DEPARTMENT
STATISTICAL AND COMPUTING SECTION

MONTHLY REPORT - OCTOBER, 1953

Personnel Statistics

Following is the month end summary of personnel:

Statistical and Computing Section

Unit	As of 9-30-53			As of 10-31-53			Net Change		
	Ex	Non-Ex	Total	Ex	Non-Ex	Total	Ex	Non-Ex	Total
General	1	1	2	1	1	2	0	0	0
Statistics	20	8	28	20	8	28	0	0	0
Computing	9	32	41	8	36	44	-1	+4	+3
Graphics	1	11	12	1	11	12	0	0	0
Procedures	10	3	13	11	3	14	+1	0	+1
TOTAL	41	55	96	41	59	100	0	+4	+4

Statistics Unit

	As of 9-30-53			As of 10-31-53			Net Change		
	Ex	Non-Ex	Total	Ex	Non-Ex	Total	Ex	Non-Ex	Total
Staff	1	3	4	1	3	4	0	0	0
Administrative Statistics	4	0	4	4	0	4	0	0	0
Precision & Quality Control	1	1	2	1	1	2	0	0	0
Technical Statistics	3	1	4	3	1	4	0	0	0
Mathematical Analysis	3	0	3	3	0	3	0	0	0
Numerical Analysis	8	3	11	8	3	11	0	0	0
TOTAL	20	8*	28	20	8*	28	0	0	0

* Includes one rotational trainee.

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Computing Unit

	As of 9-30-53			As of 10-31-53			Net Change		
	Ex	Non-Ex	Total	Ex	Non-Ex	Total	Ex	Non-Ex	Total
Staff	2	1	3	1	0	1	-1	1	-2
Audit and Control	1	3	4	1	4	5	0	+1	+1
Operation	6	28	34	6	32	38	0	+4	+4
TOTAL	9	32	41	8	36	44	-1	+4	+3

One circuit engineer was transferred to the Procedures Unit effective 10-1-53. One secretary terminated effective 10-9-53. Four tabulating machine operators and one keypunch operator were hired during the month of October.

Graphics Unit

	As of 9-30-53			As of 10-31-53			Net Change		
	Ex	Non-Ex	Total	Ex	Non-Ex	Total	Ex	Non-Ex	Total
Staff	1	1	2	1	1	2	0	0	0
Illustrators	0	9	9	0	9	9	0	0	0
Graphic Designer	0	1	1	0	1	1	0	0	0
TOTAL	1	11	12	1	11	12	0	0	0

Procedures Unit

	As of 9-30-53			As of 10-31-53			Net Change		
	Ex	Non-Ex	Total	Ex	Non-Ex	Total	Ex	Non-Ex	Total
Staff	1	1	2	1	1	2	0	0	0
Clerical	0	2	2	0	2	2	0	0	0
Procedure Analysts	9	0	9	10	0	10	+1	0	+1
TOTAL	10	3	13	11	3	14	+1	0	+1

A circuit engineer was transferred from the Computing Unit to the Procedures Unit effective 10-1-53 as a procedures analyst.

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FOR THE MANUFACTURING DEPARTMENT

A routine monthly report on 300 Area production for the month of September was issued. (Document HW-29631, "Statistical Quality Report - 300 Area", to W. W. Windsheimer from the Statistics Unit.) This concludes the issuance of these reports by the Statistics Unit. Subsequent data may be obtained from the Process Unit of the Manufacturing Department.

A routine quarterly report was issued on the variation of test pile results. (Restricted letter,"Variation of Test Pile Results - Third Quarter 1953", to W. W. Windsheimer from D. O. Richards.) These results were based upon the variation of the dih values of the secondary standards. In addition, some work was done to determine the amount of variation between test pile stringers of canned uranium slugs, and the amount of variation due to the total effect of the test pile, operators, and miscellaneous other factors.

Present plans call for one reactor per month to be completely re-orificed, beginning in November and ending in April. Venturis are to be installed in the majority of the tubes, permitting operation on a trip-before-boiling basis with a high degree of sensitivity. To accomplish re-orificing in the past, area engineers laid out tentative orifice patterns, using temperature maps and panellit pressure maps as a guide. During an outage, the new orifices were installed, the water pressure raised to normal operating levels, and the panellit gauges reset. The water pressure was then reduced, and the necessary corrections made. This procedure was repeated until satisfactory (Not necessarily optimum) orifices had been installed and all panellit gauges set. This trial-and-error method was time consuming. To speed up the process, the present re-orificing program will be carried out on a tube-by-tube basis through the utilization of electronic calculating machines. Individual tube characteristics will be calculated which will enable the area engineers to determine accurately venturi and orifice patterns resulting in optimum tube flows, temperature, and trip sensitivities. Among other things, post-re-orificing panellit pressure will be calculated, making it possible to set panellit gauges while the venturis and orifices are being installed. The feasibility of the computational procedure is being thoroughly investigated by analyzing data from D reactor, dating back to June, 1953. By testing the various assumptions inherent in any re-orificing program analytically rather than experimentally, a considerable saving is expected. This saving could conceivably amount to fifteen production days in each area involved.

Experiments are being designed to determine the optimum methods of firing coal under varying conditions and to compare the efficiencies of several coals at optimum operating procedures. (Unclassified letters, "Experimental Designs for Determining the Most Economical of Three Types of Coal", to J. C. Baudendistel from D. W. Gaylor, dated October 16, 1953 and October 20, 1953.) To aid in establishing these designs, analyses were performed on the efficiencies of three types of coal burned under similar conditions. (Unclassified letter to J. C. Baudendistel from D. W. Gaylor, "Analyses of Coal Efficiencies and Related Variables from Data Obtained by Burning Coals Under Similar Conditions", dated November 2, 1953.

A new method of sampling waste stream content was proposed and compared to the method previously in use. (Letter, "Composite Sampling Versus Peanut Sampling of Waste Stream Content", to D. Bixby from J. L. Jaech, dated October 6, 1953.)

A study of PR measurements was made for the Analytical Control Unit. Possible biases and sources of variation in specific gravity measurements and AT counting-rate measurements were investigated, and the total effect of errors known to date was evaluated. It was recommended that a subsequent study be made of the X-ray method of analysis if this method replaces radioassay. ("Statistical Evaluation of E-17 Errors in Product Removal Measurements", to P. B. Fisk from N. D. Peterson, October 9, 1953, HW-29582.)

A Poisson distribution was fitted to the number of system faults in the electrical distribution system in the sub-stations for the last eight years. From this a prediction of the number of the faults to be expected in future years was made.

The final report was issued on the study of seasonal patterns in lime sulphate, alum, lime, and sodium silicate consumption. (Letter, "Power Materials Consumption Patterns", to F. F. Vlacil from L. W. Smith.) Work was begun on a study of certain manufacturing costs.

Fifteen reports on H reactor operating limits were completed. In a meeting with the area engineers, standard report formats for reactor data from all areas were drawn up. Following this, two general purpose tabulator control panels were wired. The resulting system is quite flexible and will prepare any one of forty-four different reports, depending on the code punched in a lead card.

Graphic's work for the Manufacturing Department included layout and rendering of thirty large illustrated visual aids in color to be used in lectures on Personnel Protection Methods; preparation of nine cartoon sketches for an Engineering Methods Improvement program; and making revisions and plotting current data to fifty-five Manufacturing Department Control Charts.

Layout and design of the 1953 Manufacturing Department Yearbook dummy has been started. Format, color, cover design, illustration techniques, etc., will be submitted for approval in November.

34 hours were spent on forms design for the Manufacturing Department.

For the Manufacturing Department, three routine IBM reports and twenty-two non-routine jobs were completed for a total of 25 IBM service requests.

FOR THE ENGINEERING DEPARTMENT

A formal report covering the trends and amount of variation associated with chemical impurities present in metal produced by Mallinckrodt Chemical Works

was issued (Document HW-29544, "Summary of Mallinckrodt Chemical Works Metal Quality", by D. O. Richards). Machine procedures for the routine processing of Mallinckrodt metal quality data have been completed. Data from Fernald are being accumulated, and procedures for processing them will be written soon.

The residual can wall thickness, braze line width, number of radiographic voids and inclusions, porosity, strength required to hand strip, and average quality factor ratings of manually and mechanically canned slugs were compared statistically to determine which process produced better slugs. It was found that the mechanically canned slugs had significantly less variation and more satisfactory mean values for braze line width and minimum residual can wall thickness. On the other tests the mechanically canned slugs rated either poorer in quality or the same as manually canned slugs.

In connection with the proposed reduced sampling plan for reactivity testing of K pile graphite, the question arose as to possible loss of discrimination in the graphite zoning due to the reduced sample size. A study based on the variability both within and between the lots so far tested indicated that the loss will not be great. In connection with this particular problem, the general classification problem involved was solved, and tables are being prepared which will apply to many similar problems.

There are many factors which affect slug corrosion rate, but the exact contribution of each factor is not known, nor is it known whether or not all causal factors have been considered. In observing the behavior of curves of corrosion rate versus slug surface temperature for six tubes, all exposed for fifty days, a rather large difference between the curves was noted. It is thought that this can be explained either by the fact that slug surface temperatures are calculated by a formula known to be in error, or by the differences in power among the six tubes. These possible explanations were investigated on the basis of extensive empirical data. (Letter, "Problems in Corrosion Rate, Slug Power, and Slug Surface Temperature", to S. Goldsmith from J. L. Jaech, dated October 19, 1953.)

On the basis of past work, it is known that ruptures are influenced by various factors. One of these factors is the nearness of a slug to a control rod. The distributions of observed slug ruptures with respect to distances from rods, and with respect to distances from rod planes, were tested to see whether or not these factors influenced slug ruptures. (Verbal report to L. W. Lang from J. L. Jaech on October 29, 1953.)

Coolant water entering a pile is retained in a reservoir prior to being piped to the piles. An estimate of the change in temperature of the water as a result of storage is desired, the problem being complicated by the fact that the length of time the water remains in the reservoir is unknown. The solution of the problem is being held up pending receipt of pertinent data.

A study pertaining to the effect of increased water pressure on tubes in the pile is being conducted. Certain statistical problems have arisen such as the sample size required to obtain the desired results, and the effect of certain specified blemishes in the tube on its ability to withstand increased pressure.

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Further consultation was held relative to the slug examination facility to be located at the 105-C test basin. Preliminary computing runs were made on existing slug data analagous to that which will be recorded when the facility is in operation. A statistical analysis was made of these data for the purpose of indicating what variables are pertinent and should be recorded when the operation is put on a routine basis.

Consultations were held concerning statistical and computing considerations on the proposed nearly-continuous monitoring of flow and Δt for a given tube in the reactor.

Many incidental results will no doubt be possible from this study. Comparisons between MWD as computed by existing methods and that which is actually computed from the nearly-continuous monitored data should provide some evidence as to the accuracy of currently reported MWD data.

When tubes are pushed into the pile, a certain amount of friction must be overcome. An attempt was made to determine whether or not the content and thickness of an anodizing film has any appreciable effect on this friction coefficient. (Verbal report to R. Dillon from J. L. Jaech on October 26, 1953.)

An analysis of data appearing in a document on in-pile behavior of anodized slugs was performed in order to check the validity of the conclusions determined without any statistical analyses by those responsible for the document. The statistical analysis resulted in essentially the same conclusions as the author had hoped to find but was unable to detect without the refinements of a statistical analysis. The experiment involved determining the corrosive effects and interactions of exposure level, position of slug in pile tube, method of anodizing the slugs, amount of anodic film, and temperatures.

In checking through panellit deviation readings for 122 consecutive days, it was noted that a certain shift frequently reported all eight observations during the shift to be the same, whereas this had never occurred in the other shifts. A statistical analysis revealed an extremely small probability associated with this observed frequency, thus indicating that this particular shift was biased in recording the data.

Two additional calculations pertaining to the spike enrichment problem have been completed, and a third is ready for processing. The main objective of the problem is to determine the economic feasibility of spike enrichment, i.e., enrichment affected by loading enriched metal in circular pattern about the center of the reactor. The computation requires that the effective radius of the enriched annulus be determined for a large number of parameter combinations. This radius results from the solution of a transcendental equation which is solved by trial-and-error methods on the card-programmed-calculator.

Calculations relating to the fast fission effect of internally cooled slugs are continuing. Because of two errors in the original formulation of the problem, all previous results have been invalidated. The errors have been corrected, and

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the new programs are now being tested. The determination of the fast effect consists essentially of a numerical integration over the dimensions of the hollow slug. The integrands involve a complicated function which previously was tabulated only, and therefore had to be fit by an analytic curve. The accuracy of this curve fit will be the limiting factor in the accuracy of the results.

Three integrals were evaluated numerically for the Experimental Physics group. The integrals involved the exponential integral function commonly encountered in shielding and radiation absorption problems. Two additional sets of numerical integrations are also being done for the Theoretical Physics group. The first set arises in the attempt to find an analytic solution for the neutron flux in a cubical pile embedded in an infinite reflector. These are moderately difficult to compute because of poor behavior near the origin. The second set of numerical integrations is part of a study to determine the wave function of the tritium nucleus, or the triton. This work is of considerable importance to theoretical physics, and is believed to be the first of its type in an increasingly important field.

A problem concerning surface resonance absorption in a triangular lattice is being done for the Advance Technology Sub-Section. It entails the determination of the number of neutrons of resonance energy which are absorbed per second by a slug in a comparatively closely-packed triangular lattice. The neutrons arriving from the first and second neighboring slugs are to be counted separately, but any more distant neighbors can be ignored. The computational work will include the numerical evaluation of a large number of double integrals with very complicated boundaries. The analytic work consists primarily of finding these boundaries.

Considerable progress was accomplished during the month on the Runaway and Melt problem. As described previously, it concerns the change in flux distribution in the neighborhood of a hollow slug when that slug has melted down into a semi-cylindrical shape. Preliminary results are quite favorable to the successful completion of the problem. Moreover, the methods which were investigated in connection with the problem can be utilized to considerable benefit in future studies.

A shorter problem entirely completed during the month involved the mathematical analysis of the electrical circuit of the feedback system of a Beckman automatic control device. In an ordinary Beckman a large resistor is used, leading mathematically to a linear differential equation. The customer replaced this resistor by an electronic tube, the voltage across which is proportional to the logarithm of the current, thus leading to a non-linear differential equation for which the solution was obtained.

A large scale project, the Boltzmann equation, received considerable study during the month. This integral equation, which describes more accurately than does diffusion theory the flux distribution in a pile, was studied for the cases of infinite piles with point, line, and cylindrical shell sources of neutrons. Although extreme mathematical difficulties still confront any investigator, the customer feels that progress is being made. Liaison with a

research group at Oregon State College has been established to the end that some of their work may be directed so as to facilitate solution of this problem. In particular, they may be able to provide us with numerical or iterative techniques.

The long range problem concerning the variation in pressure and steam quality through the pile is nearing completion. At that time it will be possible to determine accurately, in advance of construction, the pressure required at the pumping plant to maintain adequate flow through the active zone. This should save considerable money and construction time, since the knowledge of necessary capacity of the pumping plant enables one to build a safe and, at the same time, economical facility.

A sequential sampling plan for determining the operational characteristics of certain gauges proposed for reactor installation was devised for the Reactor Design and Development Unit. Due to the cost of each gauge (approximately $65.00) a plan based on fixed sample size seemed inadvisable inasmuch as certain decisions as to acceptable or unacceptable performance might possibly be made on the basis of just a few samples if extreme conditions were observed.

It is known that the distribution coefficients of Pu and H^+ are some functions of the A_{NN}, $(NH_4)_2SO_4$, HNO_3(Aq.) concentrations and the Pu valence, but the exact functional relationships are not known. A tentative plan proposed to determine these functions involved preparing 162 solutions and making 4 determinations on each solution. A savings of approximately $4,000.00 in laboratory work alone will be effected by the use of a proposed experimental design which will enable the experimenter to obtain the necessary information without making all the determinations originally planned. (Letter, "Experimental Design to Determine the Distribution Coefficients of Pu and H^+ as Functions of A_{NN}, $(NH_4)_2SO_4$, HNO_3(Aq.), Pu(Aq.), and Pu Valence", to E. Voiland from J. L. Jaech, dated October 28, 1953.)

A half-life study of U^{237} has been started. Ten differenct samples were taken, and these samples were read using two counters, one an argon counter and the other a helium one. Tests will be made to see if significant differences exist between samples and between counters. The half-life of U^{237} with accompanying limits will be computed. This work is the beginning of a program which will eventually lend to more accurate estimates of cross sections in the pile.

One contributing factor toward a major disaster in reactor operations is earthquake damage. An investigation was made on earthquake statistics and reactor design in an effort to determine the likelihood of a disaster resulting from this cause.

Absenteeism control charts were prepared for the Engineering Administration Sub-Section and the Technical Section. These charts show the expected value and limits of the monthly absenteeism rate for each of the two groups of employees. By plotting the actual monthly absenteeism rate on the charts, one can compare actual performance with that which would be expected if the group's underlying rate were not significantly different from the plantwide rate.

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Consultations were held with members of the Advance Technology Sub-Section on problems connected with certain economic studies.

Routine computational work for the Engineering Department consisted of exponential pile curve fitting, the processing of 98 maps of C reactor hot spot data for July, August and September, DR reactor lattice conductance calculations for October, tube power distribution for H reactor, and tube factor calculations for D reactor.

A rough draft of the formal report on Classified Files has been prepared. This report includes the general recommendations for a revision of the present procedure. Study is continuing on the detailed application of these recommendations. It is estimated that the annual savings to be realized is approximately $100,000.

13 3/4 hours were spent on forms design for the Engineering Department.

Routine Graphic's work for Applied Research included layout and rendering of three illustrations for document HW-29128 titled "Abrasive Cutting of Irradiated Uranium"; photo mounting and touch-up for document HW-29599; and preparation of material for two slides to be used in an off- site lecture.

Routine work for Pile Technology included photo touch-up for document HW-29333 titled "100 Area Out of Pile Corrosion Inspections"; completion of graphs and charts for document HW-29087 titled "Status Report, Beta Phase Thermal Cycling of 4" Hanford Slug"; layout and rendering of illustrations and photo mounting for document HW-29488 titled "Continuous Charging Studies"; photo retouching and plate mounting for document HW-29139 titled "Effects of Various Small Dichromatic Concentrations on Front Process Tube Corrosion"; preparation of ten graphs and schematic diagrams for a report titled "Calibration Curves for Infra Red Co. Analyzer - Upper and Lower Ranges"; completion of an illustration in color showing various parts of a Vacuum Chamber; preparation of six plates on Pile Reactivity to be made into slides for lecture purposes; and preparation of six graphs and two illustrations for document HW-29125 titled "Production Test 105-440P."

Routine graphics work for Fuel Technology included touch-up, mounting and lettering for nine photos to be used in document HW-29667 titled "Proposed Operation of Flow Cup Laboratory"; and preparing general revisions to data sheets for document HW-28019 titled "Uniform Enrichment Study".

Graphics work for the Design Section included preparation of four large charts in color to be used in the Design Manager's section meeting.

Nine non-routine IBM jobs were completed for the Engineering Department.

FOR THE PLANT AUXILIARY OPERATIONS DEPARTMENT

Final approval has been received on a revised method of purchase order distribution. This method will result in an annual reduction of one million sheets of paper.

A study of methods of controlling the protective clothing in use inventories is being made. As part of the continuing laundry survey, this study is being made to ascertain the feasibility of having the laundry control these inventories.

A method was developed whereby duplicating orders may be priced using IBM equipment. The Duplicating unit has accepted the proposal to use this method and are making the necessary arrangements to put the new procedure into use in the near future.

Certain changes were made in the procedures for accounting for office machines to provide Office Equipment with additional information. A procedure was developed to provide a routine method of making corrections and additions to the machine master file.

Twenty-one new or revised IBM internal operating procedures were prepared by the Procedures Unit for the Computing Unit.

A study was made of absenteeism rates in the Statistical and Computing Section for 1953 to date. The units and the section as a whole did not differ significantly from what would be expected from the plantwide history of absenteeism, consideration of seasonal and sex differences included. Control charts for each of the four units accompanied the report. (Letter, "Investigation of Absenteeism in the Statistical and Computing Section", to B. F. Butler from N. D. Peterson.)

Work continued on a variety of problems arising in the operations of the Computing Unit. These included machine and control panel utilization studies. As a result of these studies over $1,000.00 in equipment purchase requisitions have been cancelled.

29 1/4 hours were spent on forms design for the Plant Auxiliary Operations Department.

For the Plant Auxiliary Operations Department, fourteen routine IBM machine reports and 5 non-routine jobs were completed for a total of 19 IBM service requests.

FOR THE COMMUNITY OPERATIONS & REAL ESTATE DEPARTMENT

Revision of computing procedures were made to permit estimation of electric billing from bi monthly meter reading instituted by the Richland Electric System.

2 1/2 hours were spent on forms design for the Community Operations and Real Estate Department.

Thirty-two routine IBM machine reports and one non-routine IBM job requests were completed for the Community Operations and Real Estate Department.

FOR THE RADIOLOGICAL SCIENCES DEPARTMENT

Since radioactive phosphorus is a major waste product deposited in the Columbia River at Hanford, statistical analysis was made of the movement, and the rate of movement, of phosphorus between water, plankton, algae, and deficit material. (Unclassified letter, "Aquarium Microcosm Experiment No. 3", to R. H. Whittaker from D. W. Gaylor, dated October 5, 1953.)

Plutonium deposition in body tissues, blood stream, urine, and feces of dogs injected with plutonium and treated with varying dosages of therapeutic agents, is being studied. This is preliminary work to the establishment of therapeutic treatments for plutonium absorption by humans. A systematic tabulation of these data, conversions from aliquots to deposition on an organ basis, computations of average depositions, and calculations of the per cent of total plutonium injected found in the various body tissues, blood stream, urine, and feces for several time intervals after plutonium injections were made. Computations performed by the Toxicology Unit were checked. A statistical comparison of two methods for obtaining alpha counts was also performed. (Oral report plus tables to R. W. Wager and L. A. Temple on October 8, 1953.)

Estimates and confidence limits for body tissues deposition of plutonium for several groups of high level plutonium chronically fed rats are being computed. The results of this experiment along with the first experiment dealing with lower dosages may aid in the establishment of the maximum permissible concentration in drinking water.

Work on the beta dosage integrals has been completed. A total of 600 numerical integrations were involved. Preliminary results indicated a marked discrepancy between the calculated results and those expected from a reduced form of the integrals. Closer inspection of the integrals revealed the presence of a singularity. The programming was modified to accommodate this singularity, and the final results are now consistent with the reduced integrals.

A parameter study problem involving 800 combinations of four variables has been partially completed. The formulas evaluated involved trigonometric and logarithmic functions. By computing small parts of the formula separately and combining, a considerable saving was effected over computing the formula 800 times.

Routine computational work for the Radiological Sciences Department consisted of sheep thyroid and radioanalysis calculations, and aquatic biology calculations.

14 1/4 hours were spent on forms design for the Radiological Sciences Department.

A number of displays were prepared for the Radiological Sciences Department to be used in a meeting on October 14. A display titled "Radioactivity of Columbia River Organisms" was included in this work. This display unit is built around a large contour clay model of the area with a backboard display unit illustrating aquatic life, seasonal variations, laboratory tests, etc. The overall display is to be developed further in the near future and will be used in an off-site review.

Other Graphic work for Radiological Sciences included preliminary design and layout of a Radiation Hazards booklet; preparation of four charts for document HW-29571; and rendering of a Redox Plant perspective cut-a-way illustration.

Five routine IBM reports were completed for the Radiological Sciences Department.

FOR THE MEDICAL DEPARTMENT

A procedure for transferring the data on 5,000 accident reports to IBM cards has been proposed to the Medical Department. An additional procedure is currently being prepared for the preparation of routine reports which will provide accident frequencies by man, location, type, etc.

Five routine IBM reports were completed for the Medical Department.

FOR THE EMPLOYEE AND PUBLIC RELATIONS DEPARTMENT

As a result of the 1952 Separations Study, two additional tabulations concerning the length of service of employees were requested by the New York office. The first tabulation shows the number of employees leaving the Company with one, two, etc. up to twelve months of service, with each group broken down by sex and reason for leaving. The second tabulation gives a distribution by length of service of all employees on the roll on December 31, 1952.

Tabulations of employee responses to the 1953 Attitude Survey questionnaires will be completed shortly, enabling a detailed statistical analysis and interpretation of results. Frequency distributions of responses have been completed for the majority of the black questionnaires, a process involving extensive use of the electronic statistical sorter. All of the written comments are presentlybeing paraphrased and classified according to the subject matter of the comment, and the department, section, unit, and job type of the employee. Preliminary survey results for a particular section were presented to management as requested.

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A new procedure was developed to produce the quarterly appraisal tabulation for Salary Distribution. This procedure materially simplified the preparation of this report. In accord with recommendations, a key punch operator was cleared to make corrections to the exempt salary file with a resulting savings in time and costs. The preparation of routine procedures and panel wiring is continuing.

Liaison work was performed in connection with the preparation of the semi-annual report of G. E. Employees. The report was revised to correctly report persons subject to the draft. Work is continuing on the possibility of placing the payroll number in the personnel file. A procedure was prepared for the reporting of separations by length of service, sex, and reasons for leaving.

Three employee suggestions were answered during October. Information is being gathered for two other suggestions which appear to be valuable.

Routine Graphics work for the Employee and Public Relations Department included layout and inking of a chart titled "Salary Ranges and Payment Rates"; photo-retouch work for the Photo Unit including touch-up of plates to be used in making slides; plotting and inking three charts on employment status; and plotting current data to the Employee Separations Rate Chart.

13 1/4 hours were spent on forms design for the Employee and Public Relations Department.

For the Employee and Public Relations Department, eight routine IBM reports and seven non-routine jobs were completed for a total of fifteen IBM service requests.

FOR THE FINANCIAL DEPARTMENT

A cost estimate was prepared indicating that it would be profitable to prepare a single payroll check for each bank for the amount to be deposited in employees' accounts. An estimate was also prepared on the reporting of absentee statistics by unit with a suggestion that the entire problem of absentee data recording be re-opened for study. Other estimates prepared were for the preparation of exempt payroll checks and for the reporting of work order cost-to-date in order by customer unit.

The work on established procedures included assistance in balancing the 941-A Quarterly Report of Taxable Earnings; the listing of rents not deductable due to employee failure to return a signed lease; a revision in the exempt salary distribution reports; establishing a new control of employees eligible for optional retirement under the pension plan; a revision in vehicle reporting to show D & C Equipment separately; a revision in the reporting of store order distributions; a revision in the reporting of Accounts Payable Vouchers distribution; follow-up work on the quarterly report of earnings; and the inserting of controls to provide for checking the accuracy of the allocation of vacation payments to the proper cost week.

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Procedures were prepared for the preparation and reporting of college graduates and for determining those employees who will have 25 years of service by 1954.

39 hours were spent on forms design for the Financial Department.

Routine Graphic work for the Financial Department included plotting current data and publishing the Employee Payroll Statistics Report; making revisions to twenty-six plates, plotting current data and publishing the HAPO Cost Charts Report; and plotting current data to miscellaneous absenteeism and cost charts.

For the Financial Department, five hundred twenty-nine (529) routine IBM machine reports and thirteen non-routine jobs were completed for a total of five hundred forty-four (544) IBM job requests. In addition 25,016 paychecks, and 25,016 earning statements were prepared and 25,171 cancelled paychecks were reconciled.

FOR THE ADMINISTRATIVE STAFF

The preliminary survey of paperwork brought about in the recording and reporting of cost and production data was completed. The second phase of this investigation is underway.

FOR THE ATOMIC ENERGY COMMISSION

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Considerable statistical effort was expended in obtaining estimates of the precision of certain inventory and production figures.

Routine graphics work for the Atomic Energy Commission included plotting of current data to a number of construction cost charts; completion of seven charts for the Manager's Data Book; plotting of current figures to Total Force charts; preparation of Material Flow Charts; making revisions to Status of Internal Audit Program Data sheets; layout and inking of seven illustrations and three graphs for slides to be used in lecture on "Metallic Coating Thickness Meter"; design and preparation of master plates for a poster on "Property Conservation"; and preparation of miscellaneous charts and graphs.

Purchase Order Analysis reports were changed and procedures were revised to comprehend this change.

SUMMARY

During the month of October 134 statistical, mathematical, procedural, and graphical problems were completed. and as of October 31, a backlog of 270 problems were on hand. In addition 599 routine IBM reports and 60 non-routine IBM jobs were completed for a total of 659 IBM service requests; 25,016 paychecks, 25,016 earning statements, and 6,990 electric bills were prepared; and 25,171 cancelled paychecks were reconciled.

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Department Serviced	Percent of Services Rendered				
	Units				Statistical & Computing Section
	Statistics	Procedures	Computing	Graphics	
Manufacturing	20	4	2	10	8
Engineering	48	15	9	37	23
Plant Auxiliary Operations	7	33	1	10	8
Community Operations & Real Estate	0	1	6	0	3
TOTAL OPERATING DEPARTMENTS	75	53	18	57	42
Radiological Sciences	5	1	2	10	4
Medical	0	1	0	0	0
Employee and Public Relations	7	11	6	2	6
Financial	0	23	73	16	41
Administrative Staff	7	9	0	4	3
TOTAL STAFF DEPARTMENTS	19	45	81	32	54
Atomic Energy Commission	6	2	1	11	4
TOTAL	100	100	100	100	100

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EMPLOYEE AND PUBLIC RELATIONS DEPARTMENT

SUMMARY -- OCTOBER, 1953

The number of applicants interviewed in October was 1,071, as compared with 1,387 for September. In addition, 83 new applicants applied by mail. Open, nonexempt, nontechnical requisitions decreased from 109 at the beginning of the month to 100 at month end. Seventy-three employees were added to the roll and 86 removed during the month. Separations rate decreased from 2.62% for fiscal month of September to .96% for fiscal month of October. These rates when converted to annual rates are 27.33% and 12.52% respectively. During October, 30 new requests for transfer to other type work were received by Employment and 38 transfers were effected. Attendance recognition awards were distributed to 135 employees in October, including 29 employees who qualified for three-year awards.

Four employees retired during the month. One hundred and forty-seven visits were made to employees confined to Kadlec Hospital and 60 checks were delivered to employees confined at the hospital or at home. At month end, participation in the Pension Plan was 96.8%, in the Insurance Plan 99%, and the Employees Savings and Stock Bonus Plan 46.1%. At month end there were 720 registered under Selective Service and 751 military reservists were on the roll. Since August 1, 1950, 303 employees have terminated to enter military service, of which 75 have returned, 12 have not claimed reemployment rights, leaving 216 still in military-leave status.

A total of 51 new employees attended orientation meetings. Of this number, 88.2% have signed up to participate in the Pension Plan, 100% in the Insurance Plan, and 92.1% in the Good Neighbor Fund.

Forty-five adopted suggestions were approved for awards in October, resulting in cash awards totaling $710, with a total net savings of $4,016.90.

The required machine and tabulating work concerning the Attitude Survey was nearing completion at month end, and the tabulated data was scheduled for referral to the statistical people during the first week of November.

Sixty-two pensioners and guests seemingly had a very enjoyable time at the Third Annual Pensioners' Luncheon held October 20, in the Officers' Club.

By month end, 388 employees had become members of the Good Neighbor Fund as the result of the recanvass program currently in process.

Employee and Public Relations
Summary

Training and Development programs and activities for October, 1953, were as follows: Management Orientation was presented on Monday, October 4, with seven new exempt employees attending. Supervisor's 40-Hour was held during the week of October 26 through 30, with 15 new supervisors in attendance. Policy Panel Seminar, a 20-hour program, was held October 12-16, with 9 members of supervisory-management present at each meeting. Principles and Methods of Supervision was presented to two groups during the two weeks of October 12-23, with a total of 38 supervisors completing the course. Conference Leading was conducted Monday, October 19, with 12 exempt employees in attendance. Principles and Methods of Supervision Refresher was held Tuesday, October 6, with 7 supervisors attending. Management Conferences on Human Relations eight groups met for their second meeting on October 7, 8, 11, 12, 21, 22, 28, and 29. Total attendance was 108 supervisors. Professional Management Development program "Wage Rates" was held Tuesday evening, October 20, with 23 in attendance, and "Salary Administration" program was held on Tuesday evening, October 6, with an attendance of 21. Management Panel Forum meeting "Is Promotion Your Business?" was held on Tuesday evening, October 13, with an attendance of 12. The meeting "Is 'Two-way Flow' a One-Way Street?" was held Thursday evening, October 29, with 10 in attendance. How Our Business System Operates (HOBSO) II was presented to three pilot groups on Friday, October 2, and Friday, October 9, with a total attendance of 55 supervisors. At the request of the Supervisor of Community Maintenance, Customer Relations program was presented Tuesday and Wednesday, October 6 and 7, and Tuesday and Wednesday, October 20 and 21, to 49 non-exempt community maintenance employees. Two members of the Training staff attended the American Society of Training Directors Western Regional Conference on October 9, 10, and 11 in Seattle. A member of the Training staff attended the Pacific Northwest Personnel Management Association's Annual Conference October 29-31 in Seattle. The Manager of Economic Training of General Electric Company met Tuesday, October 13, with the Training staff for a discussion on the presentation of HOBSO II. At the request of the Supervisor of Process Unit, a member of the Training staff attended two regular Information Meetings for exempt personnel Friday, October 16, and Friday, October 23. Distribution was made of 45 revised pages of the Supervisor's Handbook.

The GE Board of Directors' visit to Hanford was given full coverage in the GE NEWS, both prior to and following the visit. Publicity included a complete itinerary of their plant tour, photos of all Board members and visiting officers of the Company, and follow-up photo coverage of their plant tour.

The power producing reactor news release was published in condensed form in the GE NEWS.

The GE Baby Derby results at Hanford--8 babies born to employee families on October 15--were given news stories and photo treatment in the GE NEWS.

Achievement of the 75th Anniversary plutonium production increase and unit cost reduction goals was announced in a GE lead story.

Employee and Public Relations
Summary

The first share of GE common stock awarded to Hanford inventors under the new patent policy was given prominent GE NEWS coverage.

Total GE NEWS circulation was cut back from 10,200 to 9800 copies per week, following the latest periodic check on distribution.

Technical Personnel recruiting was aided through revision and production of a recruitment poster for placing in college placement offices, and through the revising and production of the recruitment pamphlet, "Atomic 'Test'". These items were produced at the request of Technical Personnel.

A total of 816 posters, concerning nine different subjects ranging from security and fire prevention to employee relations and suggestion system, were posted throughout the plant during the month. Nineteen projection engagements were filled, combined audience totaled 525 employees, and 14 films were ordered from off-site for showings here.

Three Management News Bulletins were distributed during the month to all exempt employees. In addition a letter to members of management from the Good Neighbor Fund Board of Trustees was written and distributed on an emergency basis.

The GE NEWS Anniversary issue included two double-page spreads on Company history, research program, GE presidents, etc.

Recruiting

Recruiting visits to Universities are now underway jointly with other General Electric Company representatives to see candidates at both Ph.D. and at B.S. levels. With less extensive total coverage, members of this office are conducting a greater percentage of the total recruiting visits.

Technical Personnel Transfers and Losses

During this month, we have assisted in arranging six transfers within the plant. In several other cases we have assisted employees in reaching the decision to remain in their present positions, where resignations had been contemplated. We are maintaining close contact with various supervisors so as to have the longest possible advance notice of any changes in plans which might affect technical personnel.

Education

The School of Nuclear Engineering now has 238 students who have paid the full tuition, representing a higher-than-normal percentage of the original 294 applicants. Discussions are being held with the Manufacturing Department towa

assuming in the School certain formal technical training courses which have heretofore been conducted on the job.

Rotational Training Program

Present trainees total 66. We are meeting with Section Managers and other supervisors to maintain a suitable variety of temporary assignments and to foresee suitable placements for these men. It now appears that the majority of these trainees can be placed by next spring.

The News Bureau produced 28 releases during the month. Of these, 17 were sent to the local list, including radio stations. Three were distributed to Northwest daily newspapers, and 11 received special distribution.

In addition to making arrangements for service of food and use of the new Richland American Legion Club for President Cordiner's Press Conference on October 15, preparations for accommodating the approximately 30 newspapermen were made. This included reservation of their hotel rooms, a large room in the Desert Inn Hotel for use as a press room, and arrangements with the local Western Union telegraph office to prepare for the transmission out of Richland of a large amount of press copy. The telegraph office also agreed to send a man periodically to the hotel to pick up copy.

Press packets were prepared by Public Relations to supply, in handy, indexed form information and stories on GE, Richland, the Hanford plant and the Board of Directors. One of these packets was distributed the morning of October 15 at the breakfast press conference. The other press packet was handed out at the outset of a bus tour of Richland.

Two bus tours were arranged for the newspapermen. One was the highway tour of the operating areas, and the other was of the town of Richland. The AEC furnished the guide for the area tour, and Public Relations did the same for the Richland tour.

A group of German Journalism students from the University of Oregon visited Richland this month. They interviewed the HAPO General Manager, as well as the local AEC manager, and toured the town.

Eight requests for information about Hanford were answered by sending fact sheets on Hanford operations and on the community of Richland, plus additional informative material.

Robert S. Wood, Assistant Editor of the WESTERN INDUSTRY, visited Richland October 5 and 6. Public Relations escorted him on several talks with GE people which resulted in requests from him for six specific articles for his magazine.

Employee and Public Relations
Summary

A GE public relations representative attended a 3-day meeting of the AEC's Industrial Information Committee held at Pittsburgh this month. Many helpful suggestions for successful operation of an industrial information group were received. Hanford's industrial information program appears to be the most advanced in accomplishment and range of program of any of the AEC sites.

A 9-page article with 10 illustrations describing scientific and engineering accomplishments at Hanford during 1953 were submitted to the GENERAL ELECTRIC REVIEW for use in the January 1954 issue.

HEATING, PIPING AND AIR CONDITIONING, and POWER ENGINEER have requested information on the Hanford atomic heating system announced jointly by the Company at Hanford and the AEC. Each has been sent a sketch of the system and the news story recently released. Each was promised a copy of a paper on this development when the paper is revised in accordance with AEC's request, and fully cleared.

Seven papers were submitted by Hanford Atomic Products Operations authors for clearance during the month.

The COMMUNITY NEWSLETTER and NEWS DIGEST for October were distributed to community leaders in Pasco, Kennewick, and Richland.

Anticipating the need for motion picture footage covering the visit of the Company's Directors, the motion picture camera crew scheduled and exposed film on the arrival, area visitation and departure of the group. Some of the footage will be used in the Orientation film, "Here's Hanford," currently being produced.

A total of 230 photography assignments were filled during the month of October, producing a total of 19,108 prints. Of the total, 11,417 were "A" and "B" employee identification badge prints.

The month of October had the largest production of the Technical Lab., Photography Unit, since its opening in April, 1952. Approximately 98% of the prints produced were for use in Technical reports. Other prints were used for general record and publicity.

Three full working days were devoted by Photography Unit personnel to the taking and production of photographs concerned with the visit of the Board of Directors. A total of 52 exposures were made and approximately 250 prints, size 8"x10" were produced.

Photographic equipment valued at approximately $2,000 has been transferred between departments, through the Photography Unit control system, and from the Photography Unit to requesting Departments during the month, avoiding purchase of new equipment by receiving departments.

Employee and Public Relations
Summary

Cyrus Ching, Chairman of the new AEC Labor Panel, was in Richland on October 30 to get acquainted with the physical setup of the project. Guard force representatives of most AEC plants met in Washington, D. C., on October 19 to protest the relaxation of security regulations which resulted in a significant reduction of Guard forces over the country. In an NLRB-conducted election on October 20 and 21 radiation monitoring Inspectors voted 58 to 44 in favor of representation by the HAMTC. On October 12, representatives of the Metal Trades and Building Trades Departments, AFL, met with Company representatives for the purpose of discussing the method by which work is allocated on the project. We were officially notified that effective October 1, 1953, A. J. Mayhew, a patrolman, replaced V. R. Miller as business representative for the Guards Union. At the request of area management, a series of four weekly meetings with supervision of the Reactor Section was arranged for the discussion of mutual problems. It seems probable that the future Davis-Bacon predeterminations will include a rate for Sign Painters which will necessitate our taking a second look at some of the work presently being performed by our maintenance forces. The BSEIU served notice upon the Richland Maintenance Company (Vance Properties) of a desire to open their present agreement to negotiate revised wages, hours, and conditions of employment. Two nonunit grievances from female laboratory assistants in the 222-S Building were processed at the Step I level.

The Asbestos Workers Local failed to ratify the project agreement reached between Kaiser and the International President in Washington, D. C., on October 19. Understandings originating in Washington, D. C., have resulted in the setting aside of the arbitration award in the Technical Engineers' wage dispute, and the selection of a tripartite committee to resurvey the area to determine the proper rate for Technical Engineers. In a pre-hearing conference between AFL Machinists and Millwrights, the NLRB Hearing Officer obtained a memorandum of understanding from the two crafts which pledged no further work stoppages. The Painters have requested a Schedule A opening to negotiate a 10-cent-per-hour package increase. The Boilermakers have reached an agreement applicable to the Seven Western States Agreement. The construction contractors received notice from the Building Trades Council of a desire to open the Master Agreement for negotiation.

EMPLOYEE AND PUBLIC RELATIONS DEPARTMENT

OCTOBER, 1953

ORGANIZATION AND PERSONNEL

General

There were no organizational changes during October.

Employee Relations

Effective October 5, 1953, Joanne McKinney, Messenger, transferred to Radiological Sciences Department.

Effective October 16, 1953, Ruth M. Henry, General Clerk B, terminated for personal illness.

Technical Personnel

Trainees - Beginning of Month 69 - End of Month 66

Net Change:	Placement in departments	3
	Resignations (military)	0
	(other)	0
	New Hires	0

Public Relations

There were no organizational changes during October.

Union Relations

There were no organizational changes during October.

Salary Administration

There were no organizational changes during October.

Number of Employees on Roll	October-1953
Beginning of Month	200
End of Month	195
Net Change	5

Employee and Public Relations

EMPLOYEE RELATIONS

ACTIVITIES

General

The required machine and tabulating work concerning the Attitude Survey was nearing completion at month end, and the tabulated data was scheduled for referral to the statistical people during the first week of November.

Eight employees, who were not taken on a tour of the areas previously, were taken on an area tour during the month.

Personnel Practices

Employment

	September, 1953	October, 1953
Applicants interviewed	1,387	1,071

385 of the applicants interviewed during October were individuals who applied for employment with the Company for the first time. In addition, 83 applications were received through the mail.

Open requisitions	September, 1953	October, 1953
Exempt	1	1
Nonexempt	109	100

Of the 109 open, nonexempt, nontechnical requisitions at the beginning of the month, 61 were covered by interim commitments. Of the 100 open, nonexempt, nontechnical requisitions at month end, 50 were covered by interim commitments. During October, 54 new requisitions were received requesting the employment of 66 nonexempt, nontechnical employees.

	September, 1953	October, 1953
Employees added to the rolls	88	73
Employees removed from the rolls	181	86
NET GAIN OR LOSS	-93	-13

Separation:

	Fiscal Month September, 1953		Fiscal Month October, 1953	
	Male	Female	Male	Female
Including employees who were laid off for lack of work	1.97%	5.44%	.71%	2.05%
Excluding employees who were laid off for lack of work	1.93%	5.44%	.59%	1.99%

Employee and Public Relations

EMPLOYEE RELATIONS

Over-all Separation:

	Fiscal Month September, 1953	Fiscal Month October, 1953
Including employees who were laid off for lack of work	2.62%	.96%
Excluding employees who were laid off for lack of work	2.56%	.85%

During October, 10 employees left voluntarily to accept other employment, 5 left to enter military service, and 2 left to enter business for self.

Transfer Data

Accumulative total of requests for transfer received since 1-1-53	462
Number of requests for transfer received during October	30
Number interviewed in October, including promotional transfers	52
Transfers effected in October, including promotional transfers	41
Transfers effected since 1-1-53 including promotional transfers	451
Transfers effected in October for employees being laid off	1
Number of stenographers transferred out of steno pool in October	6
Transfer requests active at month end	342

ADDITIONS TO THE ROLLS

	Exempt	Nonexempt	Community Firemen	Total
New Hires	—	49	2	51
Re-engaged	—	—	—	—
Reactivations	—	21	1	22
Transfers	—	—	—	—
TOTAL ADDITIONS		70	3	73

TERMINATIONS FROM THE ROLLS

	Exempt	Nonexempt	Community Firemen	Total
Actual Terminations	8	46	1	55
Removals from rolls(deactivations)	2	28	1	31
Transfers	—	—	—	—
TOTAL TERMINATIONS	10	74	2	86

Employee and Public Relations

EMPLOYEE RELATIONS

GENERAL

	9-1953	10-1953
Photographs taken	362	136
Fingerprint impressions	150	132

PERSONNEL SECURITY QUESTIONNAIRES PROCESSED

	9-1953	10-1953
General Electric cases	91	59
Facility cases	34	35
TOTAL	125	94

INVESTIGATION STATISTICS

	9-1953	10-1953
Cases received during the month	75	55
Cases closed	171	97
Cases found satisfactory for employment	109	43
Cases found unsatisfactory for employment	9	1
Cases closed before investigation completed	27	1
Special investigations conducted	10	9

PERFECT ATTENDANCE RECOGNITION AWARDS

Total one-year awards to date since January 1, 1950	6182
One-year awards made in October for those qualifying in September	59
Total two-year awards to date since January 1, 1950	1783
Two-year awards made in October for those qualifying in September	47
Total three-year awards to date	577
Three-year awards made in October for those qualifying in September	29

During October, 18 people whose continuity of service was broken while in an inactive status were so informed by letter.

Advertisements for a Nurse Anesthetist were placed for the next issue of the following medical journals: "Nursing Outlook", "Journal of the American Medical Association","Journal of the American Association of Nurse Anesthetists", and "Hospitals".

In July, advertisements were placed in the "Journal of the American Association", and "Journal of the American Association of Nurse Anesthetists". Very favorable results were received from this media.

Employee and Public Relations

EMPLOYEE RELATIONS

A return recruiting trip was made to Yakima to interview interested personnel being laid off at the John Deere Plant. Thirty-one people were interviewed, four of which were placed in process. Tentative offers were made for the following classifications: Machinist, Millwright, and Tabulating Machine Operator.

Supervisor Selection Program — Twenty-seven candidates were tested including six subjects from the Radiological Sciences Department, a new group to use the procedure. One trip was made to 100-B area to test a group of candidates for the Reactor Section and others were tested in the 705 Building, for Metal Preparation, Separations Section, and the Radiological Sciences Department.

Clerical — The Minnesota Clerical Test was administered to twenty-six clerical applicants during the month.

Interviewer Training — A satisfactory recording of an intensive interview was made for use with the interviewer training meetings and another group of three evaluators is scheduled for a meeting on November 5, 1953.

Employee Benefits

The following visits were made with employees during the month:

Employees contacts made at Kadlec Hospital	147
Salary checks delivered to employees at Kadlec Hospital	51
Salary checks delivered to employees at home	9

At month end participation in Benefit Plans was as follows:

	September	October
Pension Plan	96.7%	96.8%
Insurance Plan	99%	99%
Employees Savings and Stock Bonus Plan	45.7%	46.1%

Fourteen letters were written to deceased employees' families during October concerning payment of monies due them from the Company, and also to answer their questions.

Since September 1, 1946, 132 life insurance claims have been paid totaling $823,013.

Employee and Public Relations

EMPLOYEE RELATIONS

Four employees retired during October, namely:

Peter O. Hansen	W-3597-637	Normal Retirement
Charles W. Mason	W-6516-347	Normal Retirement
George W. Powell	M-692-944	Normal Retirement
John V. Theis	W-6343-637	Normal Retirement

During October, 20 letters were written to retired employees providing them with information of general interest. To date 268 employees have retired at Hanford, of which 137 are continuing their residence in the vicinity.

Orientation of new employees was presented daily throughout the month. A total of 51 employees attended this program. Of this number, 88.2% signed up to participate in the Pension Plan, 100% in the Insurance Plan, and 92.1% in the Good Neighbor Fund.

The Third Annual Retired Employees Get-Together Dinner was held at the Camp Hanford Officers' Club on Tuesday, October 20 and was attended by 62 pensioners.

One Board of Trustees' meeting for the Good Neighbor Fund was attended by a member of this group during October. A drive for new members was held during the month. To date, 388 new members have been added to the Fund, and many cards are still outstanding.

One member of this group attended a Joint Manpower Mobilization Committee meeting during the month to discuss problems pertinent to employee Reservists and Selective Service registrants. At that meeting, the committee decided to disperse with further regular meetings which dealt primarily with categorizing Reservist employees. As the service recall activity related to Reservists has diminished to an extremely low level, it was decided to discontinue the use of the Request for Determination of Employee's Availability for Active Military Service forms which previously were forwarded to the Departments to be completed on each Reservist employee receiving a change in job classification.

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		751
Number of reservists classified in Category A	113	
Number of reservists classified in Category B	77	
Number of reservists classified in Category C	55	
Number of reservists classified in Category D	506	
Number who returned to active duty to date		219
Number who returned to active duty in October		1

Employee and Public Relations

EMPLOYEE RELATIONS

Number of reservists for which delays have been requested		45
Number of reservists classified in Category B	3	
Number of reservists classified in Category C	2	
Number of reservists classified in Category D	40	
Delays requested (including renewals)		114
Delays granted		106
Delays pending		—
Delays denied		5
Delay requests recalled		3

The statistics with respect to employees registered under Selective Service are as follows:

Employees registered		720
Employees registered who are veterans		208
Employees registered who are non-veterans		512
Deferments requested to date (including renewals)		1118
Deferments granted		862
Number of employees for which deferments have been requested		197
Number of employees classified in Category B	1	
Number of employees classified in Category C	2	
Number of employees classified in Category D	194	
Deferments denied and appealed at state levels		5
Deferments denied and appealed at local levels		—
Deferments denied and held pending appeal at national level		1
Deferments denied by local board and not appealed		5
Deferments denied by state board and not appealed		30
Deferments denied at national level (by Gen. Hershey's office)		2
Deferments denied at national level (by President)		5
Deferments requested, employees later reclassified		92
Deferments requested, later withdrawn		81
Deferments pending		33

Military terminations since 8-1-1950 are as follows:

Reservists recalled	131
Selective Service	167*
Women employees enlisted	5
Total	303

Employees returned from military service:

Reservists	58
Selective Service	17
Total	75

* One employee who terminated for military leave in September did not enter military service, therefore, he has been removed from the Selective Service Military Leave list.

Employee and Public Relations

EMPLOYEE RELATIONS

Known number not claiming reemployment rights	12
Number of employees still in military-leave status	216

Suggestion System, Workmen's Compensation and Liability Insurance

	September	October	Total Since 7-15-47
Suggestions Received	257	230	12625
Acknowledgements to Suggesters	223	238	
Suggestions Pending Acknowledgement	76	68	
Suggestions Referred to Departments for Investigation	223	238	
Suggestions Pending Referral to Departments	76	68	
Investigations Completed & Suggestions closed	112	154	
Suggestions Adopted - No award	2	3	
Adopted Suggestions Approved by Committee for Award	44	45	
Total Net Cash Savings	$7,793.67	$4,016.90	
Total Cash Awards	$ 765	$ 710	
Total Suggestions Out to Investigators	643	690	

An award of $70 was made to an employee in the Radiological Sciences Department for her suggestion regarding an improvement in film filing envelopes. She suggested using an addressographed insert resulting in a savings in labor and material.

The second highest award was made to an employee in the Technical Section for his suggestion to install a counter balance weight system to control pressure on the carborundum wheels used in cutting samples of uranium. This award was in the amount of $50. The adoption of this suggestion resulted in labor and material savings.

Workmen's Compensation

Ray Paulus, 9007764 -- Date of Illness: October 11, 1952; Employer: Atkinson and Jones Construction Company; Nature of Case: Heart Attack.

About 10 a.m. on October 11, 1952, Mr. Paulus complained of feeling ill and was taken to an area first aid station. From there he was transferred by ambulance to the Kadlec Hospital and then to Prosser Memorial Hospital where he died about 8 o'clock that evening of a heart condition. The Department rejected the widow's claim for a pension as the evidence showed that Mr. Paulus' death was the result of natural causes and was unrelated to his employment. The widow then filed an appeal to the Board of Industrial Insurance Appeals and the Board sustained the Department's rejection of the claim. She then appealed to the Superior Court for Benton County and the case was tried before a jury on October 30 and 31, 1953. The Court issued a verdict for the employer and the Department of Labor and Industries. Estimated savings $20,000. Case closed.

Employee and Public Relations

EMPLOYEE RELATIONS

Liability Insurance

A. E. Smith, B-6835739 -- On July 8, 1953, Mr. A. E. Smith reported that his car had been damaged by rocks thrown up by a street sweeper operated by a Community employee. The matter was reported to the Travelers as a routine claim and after investigation the claim was denied. On October 8, 1953, a Summons and Complaint was served on the General Electric Company alleging negligence on the part of a General Electric employee who was operating a street sweeper which threw rocks against Mr. Smith's car. The total amount claimed was $87.55 together with costs. The matter has been set for trial before Chas. T. Morbeck, Justice of the Peace for Benton County, on November 4, 1953. We will be represented by Dean Loney of Kennewick.

Life Insurance

Code information which is known only to Home Office Life Underwriters Association has been furnished 63 insurance companies and investigation agencies during the month of October, 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.

Insurance Statistics

	September, 1953	
	Long Forms	Short Forms
Claims reported to Department of Labor and Industries	45	352

	October, 1953	
	Long Forms	Short Forms
	36	369

Total Since September, 1946 - 17,882

	September, 1953	October, 1953
Claims reported to Travelers Insurance Co.	9	*10

Total Since September, 1946 - 780

* Of the claims reported to Travelers Insurance Company during the month of October all were property damage claims.

Employee and Public Relations
Employee Relations

TRAINING AND DEVELOPMENT

Training and Development programs and activities for October 1953 were as follows:

MANAGEMENT AIDS:

MANAGEMENT ORIENTATION was presented on Monday, October 4, with 7 new exempt employees attending. This program highlights reviews of official sources of information and current management responsibilities. An informal luncheon at the Desert Inn is a feature of this program.

SUPERVISOR'S 40-HOUR was held during the week of October 26 through 30, with 15 new supervisors in attendance. This 40-hour schedule covers Company organization, effective management, the new employee, wage rates, labor relations, Company medical policies, and personal considerations. The importance of understanding people is stressed throughout the program by discussions of case studies of the day-to-day problems of supervisory-management. There are eight films shown during the five days of this program.

POLICY PANEL SEMINAR, a 20-hour program, was held October 12 - 16, with 9 members of supervisory-management present at each meeting. This seminar is a review of all OPG's distributed to Hanford Atomic Products Operation supervisors. It is intended to provide a clearer understanding and more uniform administration of these policies, practices, and procedures.

MANAGEMENT SKILLS:

PRINCIPLES AND METHODS OF SUPERVISION was presented to two groups during the two weeks of October 12-23, with a total of 38 supervisors completing the course.

CONFERENCE LEADING was conducted Monday, October 19, with 12 exempt employees in attendance. This conference stimulates group thinking by actual participation of all personnel enrolled.

PRINCIPLES AND METHODS OF SUPERVISION REFRESHER was held Tuesday, October 6, with 7 supervisors attending. These supervisors were among the first groups to complete the PMS course here on the project. The objective of the refresher program is to review the principles and methods in the art of persuasion.

MANAGEMENT DEVELOPMENT:

MANAGEMENT CONFERENCES ON HUMAN RELATIONS eight groups met for their second

meeting on October 7, 8, 11, 12, 21, 22, 28, and 29. Total attendance was 108 supervisors. The intent of this 12-hour course is to offer supervision a practical study of human relation experiences on the job, and to learn by the experience of others.

PROFESSIONAL MANAGEMENT DEVELOPMENT program "Wage Rates" was held Tuesday evening, October 20, with 23 in attendance, and "Salary Administration" program was held on Tuesday evening, October 6, with an attendance of 21. The Head of Wage Rates Unit of Union Relations Section led the discussion on October 20, and the Manager of Salary Administration Section lead the discussion on October 6. The series of this program of various refresher subjects consist of 15 evening meetings, allowing all exempt personnel to select those subjects of most interest and significant to their work.

MANAGEMENT PANEL FORUM meeting "Is Promotion Your Business?" was held on Tuesday evening, October 13, with an attendance of 12. The meeting "Is 'Two-way Flow' a One-way Street?" was held Thursday evening, October 29, with 10 in attendance. Guest panelists on October 13 were the Manager of Separations Section, Manufacturing Department, and the Manager of Transportation Section, Plant Auxiliary Operations. Panelists for the October 29 meeting were the Manager of Administration Sub-Section, Radiological Sciences Department, and the Supervisor of Public Information Unit, Employee and Public Relations Department. These forums are a series of meetings which give all exempt personnel an opportunity to participate in open discussions conducted by recognized specialists on timely subjects of general interest.

HOW OUR BUSINESS SYSTEM OPERATES (HOBSO) II was presented to three pilot groups on Friday, October 2, and Friday, October 9, with a total attendance of 55 supervisors. This program covers the effects of wartime economy, government controls, and post-war economy.

OTHER ACTIVITIES:

At the request of the Supervisor of Community Maintenance, Community Operations and Real Estate Department, Customer Relations program was presented Tuesday and Wednesday, October 6 and 7, and Tuesday and Wednesday, October 20 and 21, to 49 non-exempt community maintenance employees.

Two members of the Training staff attended the American Society of Training Directors Western Regional Conference on October 9, 10, and 11 in Seattle.

A member of the Training staff attended the Pacific Northwest Personnel Management Association's Annual Conference October 29-31 in Seattle.

The Manager of Economic Training of General Electric Company met Tuesday, October 13, with the Training staff for a discussion on the presentation of HOBSO II.

Employee and Public Relations
Employee Relations

At the request of the Supervisor of Rotational Training Unit, Technical Section, Employee and Public Relations Department, Richard Jaqua, Tech Grad, observed Training and Development activities from October 12 through 30. The purpose was to bring out what industry expects from the individual.

At the request of the Supervisor of Process Unit, Separations Section, Manufacturing Department, a member of the Training staff attended two regular Information Meetings for exempt personnel Friday, October 16, and Friday, October 23. The Training representative was called upon to answer questions concerning Company policies.

A member of Training staff escorted a group of Employee and Public Relations personnel Thursday morning, October 29, and another group on Friday morning, October 30, through the outer areas.

Members of Training and Development have been working throughout the month toward completion of Training and Development 1954 Prospectus.

Supervisor's Handbook:

Number issued during October	2
Number returned during October	4
On Hand	175

Of the 175 on hand, 47 are not usable because of missing pages and 23 have to be checked for completeness. The remaining 105 are ready for issuance.

Distribution was made of 45 revised pages of the Supervisor's Handbook to all handbook holders.

Material and Transcript Distribution: During the month there were 118 program attendance transcripts requested from different departments on the project. Reactor and Separations Sections of Manufacturing Department requested 200 PMS Situation Analysis sheets (large size) and 200 (small size). Design Section of Engineering Department requested 28 "Let's Talk It Over" interview sheets. Finance requested ten 1953 Objectives booklets. There were five requests from Engineering, and Employee and Public Relations Departments for Secretarial Book reference lists.

Employee and Public Relations

EMPLOYEE RELATIONS

EMPLOYEE COMMUNICATIONS

The GE Anniversary issue of the Tri-City HERALD, October 11, contained two full-page advertisements and a full-page cover drawing developed by Employee Communications at the request of Public Relations.

Three Management NEWS Bulletins were distributed during the month to all exempt employees. In addition, a letter to members of management from the Good Neighbor Fund Board of Trustees was written and distributed on an emergency basis. Union relations letter to Radiation Monitoring Inspectors A and B concerning a representation election was edited at the request of Union Relations.

A proposed Company-wide employee Christmas sale of radio and TV sets, which involves an insert in the GE NEWS and a payroll envelope stuffer, will not be utilized as such at Hanford, because major emphasis is pointed at TV, and TV is not available as yet in this area. Mats of all available GE radio sets, however, were requested from the General Manager of the Radio and TV Division. It is planned that these will be published in the GE NEWS during November.

Announcement that all "Let's Talk It Over" interviews between employees and their supervisors were scheduled to be held during working hours was made in a Management NEWS Bulletin and through the GE NEWS. This information was disseminated at the request of the General Manager.

"Your Richland Police," a booklet which is sent to all new residents, and the "Security Handbook" were revised. The latter has been placed in production, and the former will be placed in production as soon as revised page layouts have been developed.

The GE Insurance Plan identification card was revised and purchase requisition issued for its production.

The safety topic for November, "High Stakes," and the health bulletin for November, "Say A--h-h-h-h-h," were written, approved and printed.

2000 copies of "Atomic 'Test'" were reprinted at the request of Technical Personnel. An additional color and 14 new photographs were added to make this technical recruiting publication more attractive and to bring it up to date.

A two-color recruiting poster was produced for the Technical Personnel Section. Three sets of this poster were imprinted in preparation for recruiting visits by Technical Personnel to three educational institutions where the posters may be displayed.

Programs for the third annual get-to-gether dinner for retired GE employees were printed.

"Where's hanford," a 32-page plus cover, two-color loose-leaf brochure, was prepared for distribution to the GE Board of Directors.

Employee and Public Relations

EMPLOYEE RELATIONS

One insertion of a recruitment advertisement for Nurse Anesthetists was placed during the month in "The Journal of the American Association of Nurse Anesthetists," "Hospitals," and "Nursing Outlook," and two insertions in "The Journal of the American Medical Association."

The following posters were installed throughout the plant: 90 copies of one AEC-GE security poster; 8 copies of one, 75 copies of a second, and 100 copies of a third fire prevention poster; 35 copies of a health poster on posture; 90 copies each of two GE Photo News Service posters; 100 copies each of four Elliot Service Company employee relations posters; and 30 copies each of four Sheldon-Claire employee relations posters. In addition, all Suggestion System boxes were serviced regularly with Suggestion blanks, and two sets of posters placed in them during the month.

Nineteen projection engagements were filled with showings to approximately 525 people. Fourteen films were ordered from off-site for showings here. They are: "Productivity: Key to Plenty," "Supervision: Developing Cooperation," "Confession of a Cold," "Emotional Health," "Counselling: Its Tool and Techniques," "Discipline: Giving Orders," "Discipline: Reprimanding," "Confession of a Cold," "Freedom and Power," "New Supervisor Takes a Look at His Job," "Supervisor as a Leader, Part I," "Supervisor as a Leader, Part II," and "Developing Cooperation."

Publicity during the month for the Nucleonics Employees Good Neighbor Fund fall membership drive included four stories in the GE NEWS, an editorial cartoon, an inquiring reporter-type article which featured the photographs and comments of six Hanford people, and a full-page message. As of the end of the month, some 365 new members had joined the Fund.

The GE Board of Directors' visit to Hanford was given full coverage in the GE NEWS, both prior to and following the visit. Publicity included a complete itinerary of their plant tour, photos of all Board members and visiting officers of the Company and follow-up photo coverage of their plant tour. The latter photos were planned in advance during a "dry run" of the plant tour attended by the GE NEWS editor.

The GE NEWS Anniversary issue included two double-page spreads on Company history, research program, GE presidents, etc. A special front page photo montage which depicted GE's development over the past 75 years was designed for this issue.

The GE Baby Derby results at Hanford--eight babies born to employee families on October 15--were given news story coverage and photo treatment in the GE NEWS. Pictures of all local babies with their families were published. An accompanying story included background material on all Anniversary babies throughout the country.

Total GE NEWS circulation was cut back from 10,200 to 9,800 copies per week, following periodic checks on distribution during the month.

Suggestion System was promoted through a feature article with pictures of award winners. This was supplemented by editorial cartoons promoting the Suggestion System.

Employee & Public Relations

EMPLOYEE RELATIONS

Fire Prevention Month was given continual publicity in the GE NEWS during October, including articles and pictures on plant fire prevention training. Material published was coordinated through the Safety & Fire Protection Unit.

Credit Union activities at Hanford publicized during the month in the GE NEWS included organizational meetings and the granting of a charter to the nonexempt employees' Credit Union. Another news story pointed out that all GE people at Hanford may now join a Credit Union, and the business hours of each one at Hanfordalso were published.

Power producing reactor story was published in a condensed version from the official release and from notes obtained by the GE NEWS editor at the announcement press conference.

Civil Defense registration of GE people in certain job classifications was publicized through a GE NEWS story and picture. It was pointed out in the story that by taking the CD oath, employees would be free of liability involving their CD activities.

Art services provided during the month to the GE NEWS by the Employee Communications artist included: an editorial cartoon, two double-page photo feature layouts, layout and art work for a full-page Good Neighbor Fund message, and photo layout for a double-page spread on subject of printed employee communications. The last item will appear in the GE NEWS early in November.

Art work completed during the month at the request of Public Relations included layout and illustration of two messages for insertion in the Tri-City HERALD's GE Anniversary edition, and a type layout for a Community Relations advertisement. Layout and final art work for a new Richland Telephone Directory front cover were completed.

The final art work of a technical personnel recruiting poster, and revised page layout for the recruiting brochure, "Atomic 'Test'," were developed.

Layout and art work for the November safety topic of the month and health bulletin was accomplished.

Additional miscellaneous art work produced during the month included: a diagram of how a reactor building will be heated by effluent water from the reactor, requested by the News Bureau; 14 rough sketches for the forthcoming employee orientation film "Here's Hanford;" mounting and retouching on unclassified photo for the 1953 annual report; a type layout for a revised GE Insurance Plan identification card; a sign requested by the News Bureau; and comprehensive layouts of five GE NEWS messages being developed by Special Programs.

Employee and Public Relations
Technical Personnel Section

TECHNICAL RECRUITING

During this month 24 applications for employment have been considered, the majority involving personal interviews. Our effort has been to preserve goodwill for the Company and A.E.C. since we have not been able to give these people encouragement.

Plans are now complete for the annual recruiting of doctoral candidates where we participate with Company-wide teams of interviewers; also for maintaining our contacts at a number of universities via the Company-wide recruiting visits for M.S. and B.S. candidates. Members of this office will perform a larger percentage of the recruiting than formerly. By this means we will have more uniform standards, take less time of people from other departments and establish better arrangements with the college placement offices so that we obtain referrals of the best of the returning veterans.

At very low cost our recruiting booklet -- Atomic "Test" has been substantially improved in the course of reprinting with the help of the Employee Communications Unit.

TECHNICAL PERSONNEL TRANSFERS AND LOSSES

	October	Year to date
Resignations	7	105
Transfers to Other Divisions	0	35
Transfers within HAPO	6	37
Employees counseled and deciding to remain in present positions.	10	39

Since some personnel reductions are in prospect, members of the recruiting and training staff within this office are now devoting substantial time and attention to discussions with technical employees who want or may need transfers. In addition to up-to-date data on openings within the Hanford Operation, extensive data is being obtained regarding technical positions available elsewhere in General Electric. Similar data is being sought from other A.E.C. operating sites, for use as needed.

We are maintaining close contact with various major supervisors so as to have the longest possible advance notice of any changes in plans in which technical personnel might be affected.

EDUCATION

The School of Nuclear Engineering now has 238 fully paid tuitions -- a higher-than-normal percentage of the original 294 applicants. Among the graduate students, even the engineering graduates are studying primarily the science courses; we are trying to stimulate a corresponding interest in fundamental engineering subjects without attracting men away from the more basic study of science.

We are cooperating with the Manufacturing Department toward assuming in our school (out-of-hours) the formal courses for instrument trainees which have heretofore been conducted during working hours.

Employee and Public Relations
Technical Personnel Section

ROTATIONAL TRAINING PROGRAM

With 3 departmental placements during October, the Rotational Training Program is now down to 66 members. We are meeting in turn with Section Managers and other supervisors to urge the acceptance of these trainees on a variety of assignments looking toward placement. Although we are not through with these conversations it appears we should be able to place most of the trainees next spring, leaving about 25 to carry over into the following fiscal year, and thereby provide spaces for hiring a reasonable additional number from the class of 1954.

Arrangements were made with the Housing Office to establish Dorm M-5 as a residence quarter primarily for technically trained men. Previously Dorms W-21 and W-17 have been used to house these men, but due to the large number of vacancies in all of the dormitories some consolidation has been necessary, and these two dorms have been closed. Experience has shown that housing of men with similar background and training has been beneficial to their morale.

A memorandum explaining the tightening Selective Service requirements being experienced by companies nationally has been prepared for issuance to Technical Graduates on the Rotational Training Program. The object is to acquaint the trainees with various factors concerning universal military training and service, so that they can make their individual decisions wisely.

PUBLIC RELATIONS

During the month of October, the News Bureau issued 28 releases. The breakdown by category, distribution, and content was as follows:

Subject		Distribution	
Pay and Benefits	4	Local newspapers	17
Employment Services	1	Daily newspapers & magazines	2
Good will	5	Weekly newspapers	1
Technology & Research	7	Tri-City HERALD	1
Util. & Public Works	1	Special	7
Real Estate	3		
Administration & Legal	2	Content	
Civil Defense	1		
Richland	1	Information only	2
Development Atomic Energy	3	Picture only	1
Total	28	Short news story	16
		Long news story	8
		Feature story	1

In addition to making arrangements for service of food and use of the new Richland American Legion Club for President Cordiner's Press Conference on October 15, preparations for accommodating the approximately 30 newspapermen were made. This included reservation of their hotel rooms, a large room in the Desert Inn Hotel for use as a press room, and arrangements with the local Western Union telegraph office to prepare for the transmission out of Richland of a large amount of press copy. The telegraph office also agreed to send a man periodically to the hotel to pick up copy.

Press packets were prepared by Public Relations to supply, in handy, indexed form information and stories on GE, Richland, the Hanford plant and the Board of Directors. One of these packets was distributed the morning of October 15 at the breakfast press conference. The other press packet was handed out at the outset of a bus tour of Richland.

Two bus tours were arranged for the newspapermen. One was the highway tour of the operating areas, and the other was of the town of Richland. The AEC furnished the guide for the area tour, and Public Relations did the same for the Richland tour.

The Tri-City HERALD's special edition, dedicated to GE's 75th Anniversary, came out October 11. About half of the pictures and copy contained in its 48 pages were supplied by the News Bureau.

Pictures, with cutlines, of the GE Board of Directors were sent to all publications on our daily list not represented at the Board of Directors' press conference, to the International News Photo service, and to GE's New York office, San Francisco office, CANDID CAMERA, and MONOGRAM.

A group of German Journalism students from the University of Oregon visited Richland this month. Their schedule, arranged by representatives of the News Bureau, included an interview with the General Manager.

Employee and Public Relations

Eight requests for information about Hanford received during the month were answered by sending fact sheets on Hanford Operations and on the community of Richland, plus additional informative material.

Five copies of a more popularized diagram of the reactor heating system were sent to Washington, D.C., through the local AEC Public Information office, for approval to release.

A program intended to bring the News Bureau biography files up-to-date was started this month. Questionnaires were sent to some of the top GE officials at Hanford. As time permits, these questionnaires will be sent to all top officials so that our biography files soon will be complete. To date, six questionnaires have been completed and returned, and new files are being set up on these individuals.

Robert S. Wood, Assistant Editor of WESTERN INDUSTRY, visited Hanford October 5 and 6. Arrangements were made by Public Relations for him to talk with several GE people. As a result of the talks, he requested six specific articles for his magazine. He also expressed interest in three articles being planned by Manufacturing Department. Information will be submitted to WESTERN INDUSTRY for its January issue, which will review accomplishments during 1953 in some 70 industries in the West, including atomic energy.

The supervisor, Public Information, represented the Public Relations Manager at a 3-day meeting of the AEC's Industrial Information Committee at Pittsburgh. Many helpful suggestions for successful operation of an industrial information group were received. GE's industrial information program at Hanford appears to be the most advanced in accomplishment and range of program of any of the AEC sites.

A report of the working party for the AEC's Advisory Committee on Industrial Information that visited Hanford has been received along with comments on the report by AEC Office of Declassification at Oak Ridge. The working party complimented Hanford on the reception it received here. It suggested many subjects that will be investigated by Public Relations as possible industrial information articles.

An article by D. D. McCracken, of Computing, describing solutions to Hanford engineering problems through use of computing equipment, is ready to be submitted to the GENERAL ELECTRIC REVIEW.

An article describing certain features of the new radio-metallurgy laboratory by T. W. Gore, has been edited and will be sent to METAL PROGRESS at that publication's request.

A 9-page article with 10 illustrations describing scientific and engineering accomplishments at Hanford during 1953 was submitted to the GENERAL ELECTRIC REVIEW for use in the January 1954 issue.

An article submitted to PUBLIC HEALTH REPORTS has been returned for revision and illustrations. Caesar Branchini, Public Health, is the author and is doing the revising. Photos for illustrations have been obtained by Public Information.

HEATING, PIPING AND AIR CONDITIONING and POWER ENGINEER have requested information on the Hanford atomic heating system. Each has been sent a sketch of the system and the news story recently released and each was promised a copy of a paper on this development when the paper is fully cleared. In addition, arrangements were made for the author of the paper to prepare a magazine article on the subject for HEATING, PIPING AND AIR CONDITIONING. Public Information will work with the News Bureau to make

material on this subject available to a large group of trade and technical magazines.

CHEMICAL ENGINEERING requested permission to combine information from two papers for an article. Permission from the two authors, O. C. Schroeder and K. K. Campbell, was obtained and forwarded to the magazine and illustrations have been obtained, cleared and will be sent.

A check for $50.00 has been received from MATERIALS AND METHODS. This will be passed on to the author, H. G. Henry, whose article on Teflon Welding appeared in the magazines's October issue.

The text of a credit line developed by the AEC's Industrial Information Committee for use on all unclassified documents was passed on to Technical Information for such use at Hanford.

Six papers were submitted by Hanford Atomic Products Operations authors for clearances. They are as follows:

"Geiger-Mueller Counter Tube Age Characteristics," by J. S. Reddie and W. C. Roesch for a talk before the national convention of the Institute of Radio Engineers, New York, March 22, 1954.

"The Metallurgy of Uranium--A Review of the Open Literature" by O. J. Wick, for presentation October 15 at the meeting of the North Pacific Section of the American Institute of Mining and Metallurgical Engineers, Seattle, Washington.

"Mechanical Construction at Hanford", by W. W. McIntosh, with slides, to be presented at the meeting of the Inland Empire Chapter of the American Society of Heating and Ventilation Engineers, October 9, 1953.

"Hanford Atomic Products Operation Equipment Maintenance" by M. D. McGruder, for presentation at the Western Parts & Service Managers' Conference, Yakima, Washington, October 24, 1953.

"The Application of the Polya-Eggenberger Distribution to Personnel Problems" by F. H. Tingey and L. G. Waters, for presentation at the General Electric Company Third Annual Symposium on Statistical Methods at New York, Nov. 17, 1953.

One abstract was also received for clearance. It was: "Instrument Improvements for Hanford Type Reactors", by J. E. Kaveckis for the 1954 Conference on Nuclear Engineering, University of Michigan, June, 1954.

The Atomic Energy Commission has recommended that the Engineering Department combine their motion picture program with that of the Commission. Studies have been made, with representatives of this Section serving as consultants, on the feasibility of this change. Following this, arrangements were completed for revising the AEC Directive #HW-306 to combine costs of producing both films and this is now being processed by the AEC. We anticipate complications in production under this arrangement, especially in the area of administration and compartmentation of the two films.

Employee and Public Relations

Changes in the Minor Construction film, "Getting the Job Done," as suggested by the General Manager, were made this week and forwarded to the studio for an estimate. The revised version is expected to be completed by November 1 and it will be put to immediate training use.

Approval has been given by the Chief, Engineering and Construction Division, Atomic Energy Commission at Hanford, for the purchase of a new 16mm camera out of operating budget funds. Delivery of the camera has been promised by November 9. The same type camera will be in use during the week of November 2 in connection with Joe Dieve's visit to Richland in the capacity of a consultant. While here he will give our cameraman expert instruction in operation of the new, professional-type camera.

Anticipating the need for motion picture footage covering the visit of the Company's Directors, the motion picture camera crew scheduled and exposed film on the arrival, area visitation and departure of the group. Some of the footage will be used in the Orientation film, "Here's Hanford," now being produced.

A preview was held for John McCarty of Plant Community Relations Department of New York of three community-type slidefilms produced by this Section. He felt that their content was of such interest that he requested copies of each be shipped for review by them.

Management members of Engineering Department held a meeting with the producer and writer of the 100-K Area Design Section motion picture on forthcoming filming requirements and tentative schedules. Arrangements were planned for critical filming operations during the graphite lay-up in December or January. The Section Head requested the preparation of at least an 800-foot finished film of architectural and exterior filming already completed. When present contract obstacles are overcome, this work will be initiated at once to produce the film requested.

Our motion picture people are currently at work on three major motion picture assignments. They report that they are receiving excellent cooperation from personnel in departments responsible for arrangements for filming various phases of plant operation. This cooperation has served a two-fold purpose in that it has been of great benefit to us in reducing time and costs of producing film, as well as promoting good employee relations by the participation of plant people in our motion picture activities. Manufacturing, Radiological Sciences, and Plant Auxiliary Operations, including Transportation and Security Patrol have been exceptionally helpful to our efforts.

A total of 230 photography assignments were covered during the month of October, 1953, and a total of 19,108 prints were produced, of which 11,417 were "A" and "B" badge prints. A total of 7,691 prints were area and news work.

Motion picture film was exposed during the month, on three individual motion pictures, as follows: 1,200 feet, 16mm (B&W) for 100-K Construction project; 2,200 feet, 16mm (color) for Orientation and 200 feet, 16mm (B&W) for A.E.C.

Projection equipment loans during the month, in addition to the 16mm projector and screen used each day by Special Programs Unit, were: $3\frac{1}{4}$" x 4" Lantern Slide Projector and screen, five times; one screen, five times; 35mm sound slide projector and screen, four times; 35mm Goldie projector and screen, two times and 16mm motion picture projector and screen, two times.

Employee and Public Relations

Eleven rolls of contraband films were processed for G. E. Security.

The month of October saw the largest production record to date set by the Technical Lab., Photography Unit, since its opening in April, 1952. Approximately 98% of the prints produced were for use in Technical reports. Other prints were used for general record and publicity. A total of 42 assignments were covered, producing 124 negatives and 1,953 prints. In addition to this, 35, 3¼" x 4" (B&W) glass slides were produced and 7 color transparencies, size 4" x 5", were exposed.

Three full working days were devoted by Photography Unit personnel to the taking and production of photographs concerned with the visit of the Board of Directors. A total of 52 exposures were made and approximately 250 prints, size 8" x 10" were produced.

Photographic equipment valued at approximately $2,000 has been transferred between departments, through the Photography Unit control system, and from the Photography Unit to requesting departments during the month, avoiding purchase of new equipment by receiving departments.

See attached Statistical Report for Photography Unit

PHOTOGRAPHY UNIT MONTH OF OCTOBER, 1953	2" X 2"	2" X 4"	4" X 5"	5" X 7"	8" X 10"	8½" X 11"	11" X 14"	N E G.	16mm M.P.	35mm Color Slides	3¼"X4" (B&W) Slides	3¼"X4" (COLOR) Slides	4" X 5" Ekta-chrome
COMMUNITY OPERATIONS & REAL ESTATE DEPT.													
Fire			41		7		2	48					
Engineering					171			23					
Police		33	92	4	4			86					
Public Library				2				2					
EMPLOYMENT & PUBLIC RELATIONS													
Employment	510							102					
News Bureau		3	1	184	403			80					
Special Programs		16	2		64		2	53					
Works News		71	8	57	79			119					
Employee Benefits			2	18	2			21					
ENGINEERING DEPT.													
Fuel Tech.			354		4						20		
Design											6		
Project						1,953		124			35		7
Technical (300 Area)			90		2				100'				7
Technical (700 Area)			4	480									
Metallurgy			62		47	48		16			7		
Pile Tech.								40					
Engineers	80					8		32			27		
Tech. Information								7			4		
PUBLIC HEALTH													
MANUFACTURING			16			3				47			
Plant Engineers											2		
Operations					37	16		8					
Separations Section		9			56			39					
Power & Maintenance													
RADIOLOGICAL SCIENCES DEPT.													
Management			780									4	
Records & Standards	1,200		500										
Biophysics						44		1			2		
Biology					2							7	40
PLANT AUXILIARY OPERATIONS													
Graphics						33					2	4	
Transportation					15			7					
Security	5,399	5,488	12		60			335					
Fire & Safety				88	67			50					
Reproduction					6			2					
Office Services			9										
A.E.C.													
A.E.C. Safety	-		200	4	46			60		4			
A.E.C. Security	20					40		5					
A.E.C. Operations						48					22		
TOTAL:	7,209	5,620	2,173	835	1,07[illegible]	2,193	4	1,260	100'	51	127	15	54

(More)

(Continued) PHOTOGRAPHY UNIT, MONTH OF OCTOBER, 1953

	August	September	October
Total Assignments	140	254	230
Total Negatives	1,498	1,566	1,260
Total Prints	22,332	21,282	19,108

Union Relations

UNION RELATIONS - OPERATIONS PERSONNEL

Cyrus Ching, Chairman of the new Labor-Management Relations Panel, was in Richland on October 30 for the stated purpose of getting acquainted and becoming more familiar with the physical setup of the project. Arthur Ross, Panel member, who was scheduled to arrive with Ching, was not present and his absence was unexplained.

Ching, accompanied by an AEC representative, visited for about an hour with the General Manager and the Manager, Union Relations, which discussion consisted primarily of political reminiscing and Ching's philosophy with regard to the operation of the Panel. In substance, he agreed that the idea of a panel was not a good one, but necessary. He felt that the utilization of Taft-Hartley to handle atomic energy disputes could, and probably would, result in something worse, i.e., compulsory arbitration, loss of basic freedoms, etc. We question whether anyone's convictions were altered as a result of the discussion.

At a meeting called by the International Guards Union in Washington, D. C., on October 19, Guard force representatives of most AEC plants protested relaxation of security regulations which resulted in a significant reduction of Guard forces over the country. Recent layoffs at Oak Ridge and Los Alamos are believed to have precipitated the action. The group met with the AEC and the Federal Mediation and Conciliation Service (jointly) and were allowed their day in court, but at the conclusion of the meeting the Union commented to the effect that they still hadn't gotten their message "to the people." The Commission is concerned over the possibility of a demonstration of some type to enlist the support of the press in their campaign for tighter security rules.

According to our information, the Union Business Representative from HAPO had little to say and there is no indication that our Guard force is actively participating in the campaign or considering any precipitous action.

The representation election involving radiation monitoring Inspectors, conducted by the National Labor Relations Board on October 20 and 21, resulted in the following vote:

Eligible to vote	109
Actually voted	102
For Union	58
Against Union	44

Six of the seven eligible employees who did not vote were either on vacation or off work because of illness. It appears at this time that the inclusion of the Inspectors A and B into the bargaining unit will be accomplished within the framework of the existing Agreement and at the current wage rates. The Council has requested a meeting with the Company early in November to discuss certain job conditions which are not expected to be particularly controversial.

Employee and Public Relations

At the request of area management, representatives of this office met with exempt personnel of the Manufacturing and Radiological Sciences Departments, on October 27, to pass on to them the Company's philosophy and policies with regard to our union relations. The meeting was attended by approximately 46 exempt personnel of the above departments.

The HAMTC is still applying pressure in the interest of getting Technical personnel to refrain from performing alleged maintenance work. A number of meetings have been held in the field on this subject, as well as sessions with managers of the Technical groups. Considerable improvement in the situation has been accomplished. A rather explosive situation in the 100-F Area was cleared up to the complete satisfaction of this office and personal contacts are being made at other scattered locations in an effort to get this issue "off the front page."

On October 12, representatives of the Metal Trades and Building Trades Departments, AFL, met with Company representatives for the purpose of discussing the method by which work is allocated on the project. Building Trades were particularly concerned about the job in the newly-completed 328 Building, 300 Area, which involved the moving and hooking up of a considerable number of lathes and other machinery. It was pointed out, apparently to their satisfaction, that the handling of this machinery was separate and distinct from the construction of the building proper. This type of work is routinely done by operations forces.

The tone of the meeting was quite friendly and the discussion was concluded with the understanding that if another question of work assignment comes up, officials of the Metal Trades and Building Trades will discuss the issue and, if necessary, will contact Union Relations for a "meeting of the minds."

The Central Stores Warehouse is heated by a completely automatic steam boiler which requires only a snapping of a switch to turn it on or off. At present, it is being operated without a Power Operator in attendance. The HAMTC contends that Power Operators should be present at least part-time while the boiler is running, claiming that the Company is in violation of the State law by not assigning an Operator to this detail. Supervision has advised the union, with the concurrence of the Legal Department, that the State law is not applicable on a federal project. However, further consideration is being given to this problem since there appears to be several manual functions associated with the operation of the boiler which are normally performed by Operating Engineers.

We were officially notified that effective October 1, 1953, A. J. Mayhew, a patrolman, replaced V. R. Miller as business representative for the Guards Union. Mayhew will be a working representative and apparently will not request a leave of absence from his patrol duties.

At the request of area management, a series of four weekly meetings with supervision of the Reactor Section was arranged beginning October 21. The meetings will consist of informal discussions of mutual problems, and we have found

from past experience that these meetings are very beneficial in providing a medium through which we can get our message to the field and, at the same time, gain a better appreciation of field problems. To date, two of these meetings have been held.

Sign Painters were recently granted a Local charter separate and apart from the Painters Local which has heretofore represented them. The Department of Labor in the past has predetermined rates for only brush, spray, and structural steel painters. It seems probable that the future Davis-Bacon predeterminations will include a rate for Sign Painters which will necessitate our taking a second look at some of the work presently being performed by our maintenance forces. The Work Review Committee is fully informed in this regard.

The BSEIU served notice upon the Richland Maintenance Company (Vance Properties) of a desire to open their present agreement to negotiate revised wages, hours, and conditions of employment. This contract covers maid service in the Richland dormitories. To date, we have no information on the progress of these negotiations.

Female laboratory assistants in 222-S Building are required to lift sample containers weighing from 25 to 32 pounds. The containers must be held away from the body when carried and frequently lifted at arm's length when placing them under hoods, in decontamination sinks, etc. The lifting requirements have recently been made a specific condition of employment, causing the employees to feel that any inability to do this lifting would cause them to lose their jobs. Two grievances have been submitted, apparently reflecting the opinions of a group of employees. The Step I answer explained why the job required women who could lift these weights and mentioned that lifting was being studied from an engineering standpoint. The answer failed to resolve the grievance.

It is our understanding that the group of aggrieved employees then contacted the HAMTC for counsel, even though they are not in the unit. It is known that the group has visited the Pasco office of the State Department of Labor and Industries to report the condition and to seek advice. A sad commentary on the effectiveness of our nonunit grievance procedure. You can be assured that this office contacted the women immediately, heard their story, and convinced them of their rights under the grievance procedure. A subsequent discussion with the supervision involved, disclosed that an experimental lifting device was being fabricated and nearing completion. We are assured this device will be installed within the next few days and if successful, others will be provided where necessary to relieve the lifting problem. This specific information is being given to the employees in a further attempt to resolve the grievance at Step I.

The AEC has advised us of rumors from "reliable sources" that the Washington State Board Against Discrimination in Employment has some reason (political or otherwise) for looking for a test case in the Tri-City Area. This information has been passed on to our Employment Office.

Employee and Public Relations

Grievance Statistics:

Five 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	28	1
Grievances Received this year	256	28
Settled At Step I this Month	9	0
Settled at Step I this Year	112	21
Pending Settlement at Step I at End of Month	0	2
Settled at Step II this Month	16	2
Settled at Step II this Year	107	7
Pending Settlement at Step II at End of Month	212*	1
Brought to arbitration during the Month	0	0
Pending Settlement by Arbitration	9**	0
Total Number Pending Settlement	221	3

*Includes 145 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 7 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	7	0
Separations Section	6	1
Metal Preparations Section	1	0
Total for Department	14	1
Plant Auxiliary Operations Department		
Plant Protection Section	9	0
Transportation Section	3	0
Electrical Distribution & Telephone Section	1	0
Total for Department	13	0
Community Operations & Real Estate Department		
Real Estate Maintenance Section	1	0
Total for Department	1	0
Engineering Department	0	0
Radiological Sciences Department	0	0

Employee and Public Relations

Department (Cont.)	Unit	Nonunit
Employee and Public Relations Department	0	0
Financial Department	0	0
Medical Department	0	0
Legal Department	0	0
GRAND TOTAL	28	1

Subjects Covered by Grievances

Unit		Nonunit	
Jurisdiction	13	Health-Safety-Sanitation	1
Health-Safety-Sanitation	1		
Overtime Rates	3		
Seniority	4		
Wage Rates	3		
Miscellaneous	4		
Total	28		1

CONSTRUCTION LIAISON

At a meeting in Washington, D. C., on October 19, an understanding was reached between Kaiser and the International President of the Asbestos Workers which would permit the Local union to enter into a project agreement calling for a wage rate of $3.30 an hour, plus $4 isolation pay, which constitutes an approximate equivalent of the Spokane rate plus subsistence. The agreement was subject to Local ratification, which was denied at a meeting on October 22. A meeting with Conciliation Service was held in Richland on October 26 and agreement was again reached on the terms outlined above. The Local membership refused to ratify at a meeting on the following night. Local Building Trades Council has agreed to furnish men to perform the work and have expressed a willingness to intercede on behalf of the employers. Meanwhile, laborers are being used to put temporary covering on some of the more critical steam lines. AEC has indicated that they are going to make one more effort to resolve this matter and failing, will request the Panel to assume jurisdiction.

Understandings originating in Washington, D. C., have resulted in the setting aside of the arbitration award in the Technical Engineers' wage dispute, and the selection of a tripartite committee comprised of one union representative (Nelson, Business Agent), one Kaiser representative (Ryan, out of the Oakland office), and one neutral party (Arthur Ross, AEC Labor Panel member), to resurvey the area to determine the proper rate for Technical Engineers. The AEC agreed to reimburse according to the recommendations of this committee.

Employee and Public Relations

On October 12, a meeting was conducted by the NLRB as a pre-hearing conference between AFL Machinists and Millwrights. Neither the NLRB nor Kaiser was anxious to press the charge, but the Commission was adamant that the matter be pursued unless positive assurance could be given that no future work stoppages would occur over work assignments in the 2101 Building. The NLRB Hearing Officer successfully maneuvered the business representatives of the two crafts (Machinists and Millwrights) into a memorandum of understanding that in essence pledged no further work stoppages and provided that future disagreements would be referred to their respective International presidents for settlement.

The Painters have requested a Schedule A opening to negotiate a 10-cent-per-hour package increase which they claim was granted the general area. The 10 cents is broken down into 7½ cents for a health and welfare plan, and a 2½-cent general wage increase.

The Boilermakers have reached an agreement applicable to the Seven Western States Agreement that provides for: (1) a wage increase of 15 cents an hour (to $3.05); (2) a 50-cent increase subsistence allowance; (3) a classification, Boilermaker-Blacksmith, at a rate of $3.05 an hour which represents a 55-cent increase from the Journeyman Blacksmith rate that was in effect prior to the amalgamation of the two crafts. The request is for identical terms to be applicable to this project effective October 1, 1953. There is little question but what the terms will be accepted, but a definite problem exists with regard to recognizing anything above $4 a day for isolation pay. To recognize the 50-cent-per-day increase in subsistence allowance as an increase in isolation pay would upset the entire pattern of isolation payment for other crafts. Adding this amount to the wage scale is unacceptable to the union. Serious consideration is being given to inaugurating a vacation plan (entirely new to this craft) as a means of recognizing the 50-cent emolument.

The construction contractors have received notice from the Building Trades Council of a desire to open the Master Agreement for negotiation. The anniversary date of the Agreement is January 1, but negotiations are scheduled to start next Monday. Demands are not know at this time.

WAGE RATES

A new procedure was instituted by which the Payroll Unit is notified of rate changes and given signed approval papers on each specific rate change. This change will result in eventually reducing our clerical force by 25% due to the elimination of duplicated records and work.

The investigation of unpleasant and uncomfortable working conditions was completed and a report submitted covering the available information on two phases which warrant consideration; namely, the wearing of face masks, and noise levels. The final evaluation of the study on noise levels and frequencies will be forthcoming from the Industrial Hygiene, Biophysics Section, Radiological Sciences Department.

Employee and Public Relations

A reimbursement authorization request was submitted to the Atomic Energy Commission to revise Reimbursement Authorizations Nos. 203 and 215 to correct inequalities arising as a result of the company-wide rate change of June 10, 1953. The proposed revision will enable the General Electric Company to pay equal pay to individuals upgraded in the Metal Preparation Section before and after the general rate revision.

The general review of all semi-technical jobs was continued, with the committee holding seven meetings in various areas during the month. A pattern for the classification of laboratory and engineering assistant jobs is being established.

A series of day and evening meetings on the subject of wage administration was addressed by members of the Wage Rates Unit.

At the request of the Aircraft Nuclear Propulsion Department, the Wage Rates Unit compiled statistics on absenteeism and the cost of absenteeism at HAPO. This information was forwarded to ANP and will be used in the study being made to determine whether the nonexempt wage structure for the ANP Department at Arco, Idaho, will be established on an hourly rated basis or on a salary basis similar to the Hanford plan.

Three hundred seven (307) automatic increases and seventeen (17) merit increases were processed during October. Requisitions for seventy-three (73) prospective employees and additions to the payroll for forty-five (45) new employees were approved. Review for proper classification, rate, etc., was made for twenty-three (23) reactivations, one hundred sixteen (116) reclassifications, one hundred sixty-four (164) temporary reclassifications, sixty-five (65) transfers, and two (2) transfers from the exempt roll.

SALARY ADMINISTRATION

1. The regular quarterly report for the quarter ending September 30, 1953, was issued on October 28. The analysis of the distribution of salaries within grades shows a more satisfactory situation than has existed heretofore; 46.4 of the salaries were at the midpoint of the ranges or above. The over-maximum and under-minimum salaries continued to show improvement. This normal pattern of distribution was brought about largely by the adjustment of base rates in accordance with the 1953 survey.

2. The Manager, Salary Administration, spent a week in New York consulting with members of the Salary Administration Services Section in preparation for the forthcoming modification of our salary plans to conform with the Company plans.

3. Annual appraisals of employees on the E.A.O. Plan were beginning to be received and tabulated.

4. Indications were received that the line managers were accelerating their efforts to prepare position descriptions in the E.A.O. Plan for a substantial number of employees now paid according to the Professional Plan.

5. Audits in the field involving conformance with position descriptions and organization structure, the review and evaluation of position descriptions, the detailed study of organization structure, and other administrative work proceeded according to schedule.

COMMUNITY OPERATIONS AND
REAL ESTATE DEPARTMENT
MONTHLY REPORT SUMMARY
OCTOBER, 1953

ORGANIZATION AND PERSONNEL

Number of employees on rolls:	SUFFIX	BEG. OF MONTH	END OF MONTH
General Administration	310	4	4
Community Operations Section			
Administration	340	2	2
Engineering	341	9	9
Public Works General & Utilities	342	30	27
Public Works Labor Crews	343	41	40
Recreation & Civic Affairs	344	5.5	5.5
Library	345	9.5	11
Fire	346	66	66
Police	347	51	49
Electrical System	348	20	21
Sub-Totals		234	230.5
Community Real Estate Section			
Administration	350	3	3
Housing Rental	351	23	23
Maintenance	353	153	151
Commercial Property	357	12	12
Sub-Totals		191	189
Civil Defense Program	360	1	1
GRAND TOTALS		430	424.5

There was a decrease of 5.5 employees in the Department during the month of October, 1953.

GENERAL

Richland suffered its second traffic fatality of the year when a woman was killed in a one car accident on October 4 at the intersection of Stevens and the By-Pass.

Washington State Patrol Sergeant Lourch presented the Annual Inventory of Traffic Safety Activities for 1952 with comments and recommendations to members of the Community Operations Section on October 8. Richland was rated among the top ten of 415 cities in the 10,000 to 25,000 population group.

The Fire Department cooperated in the Chamber of Commerce sponsored observance of Fire Prevention Week, October 4 to 10.

Four lease awards were made covering the construction and operation of a community television system, construction and maintenance business, an automotive service station and a church.

Three new sublessee enterprises opened for business.

A public restaurant opened for business in the Richland Labor Temple Association Building.

COMMUNITY OPERATIONS SECTION
MONTHLY REPORT
SUMMARY
OCTOBER 1953

ORGANIZATION & PERSONNEL:

	BEGINNING OF MONTH		END OF MONTH	
	Exempt	Non-Exempt	Exempt	Non-Exempt
ADMINISTRATION	1	1	1	1
ELECTRICAL	5	15	5	16
PUBLIC WORKS	12	59	12	55
RECREATION & CIVIC AFFAIRS	3	2 1/2	3	2 1/2
LIBRARY	3	6 1/2	3	8
POLICE	18	33	18	31
FIRE	66	0	66	0
ENGINEERING	6	3	6	3
	114	120	114	116 1/2

Richland suffered its second traffic fatality of the year when a woman was killed in a one car accident on October 4 at the intersection of Stevens and the By-Pass.

The intersection of Thayer Drive and the By-Pass highway was illuminated with three mercury vapor lights and a mercury vapor light was placed at the intersection of Stevens and the By-Pass highway during the past month. A traffic signal light was also installed at Symons and George Washington Way.

Washington State Patrol Sergeant Lourch presented the Annual Inventory of Traffic Safety Activities for 1952 with comments and recommendations to members of the Community Operations Section on October 8. Richland was rated among the top ten of 415 cities in the 10,000 to 25,000 population group.

The American Institute of Chemical Engineers, Columbia Valley Section, held an exhibit at Community House October 6 and 7. There were 31 vendors in attendance. The show was witnessed by approximately 950 people.

Irrigation water was shut off in the Richland canal on October 1. Planning is progressing on further improvements in the domestic water system with Atomic Energy Commission representatives.

COMMUNITY OPERATIONS SECTION
RICHLAND ELECTRICAL UNIT
MONTHLY REPORT
OCTOBER 1953

ORGANIZATION AND PERSONNEL	Exempt	Non-Exempt
Employees beginning of month	5	15
Transfers in	0	2
Transfers out	0	1
Terminations	0	0
Total end of month	5	16

SYSTEM MAINTENANCE AND OPERATION

Outside Lines

Poles set and transferred	15
Anchors set and guys installed	3
Street lights repaired and steel mast arms installed	10
Street lights relamped - Mercury Vapor	8
Street lights relamped - 6000L and 4000L, 1100 Area	119
Street lights relamped - 6000L and 4000L, 700 Area	3
Flood lights relamped, 1100 Area	17
Flood lights relamped, 700 Area	1
Stack lights relamped, 700 Area	1
Primary line footage added	0
Primary line footage removed	0
Transformer KVA added	25
Transformer KVA removed	0
Net transformer KVA installed	25
New services installed - residential	0
Temporary services installed and removed	3
New services installed - commercial	4
Scheduled outages - primary	0
Scheduled outages - secondary	1
Unscheduled outages - primary	3
Unscheduled outages - secondary	1
Standby and escort	4
High voltage tree trimming	67
Low voltage tree trimming	90

TRAFFIC SIGNALS

Relamping	122
Operational failures	2
Installations	1
Removals	0
Routine maintenance checks	27
Routine check RR signal at Van Giesen	4

RICHLAND ELECTRICAL UNIT

(Traffic Signals cont'd.)

Total signals in operation - automatic	17
Total signals in operation - manual	3

PUBLIC WORKS ELECTRICAL MAINTENANCE

Electrical motors checked and serviced - irrigation (out of service)	0
Electrical motors checked and serviced - water	68
Electrical motors checked and serviced - sewage	57

FIRE DEPARTMENT TEST AND MAINTENANCE

Inside circuit and equipment checks	4
Outside circuit checks	4
Inside faults repaired	1
Outside faults repaired	2
New circuits placed in operation	0
New boxes placed in operation	0

SUBSTATIONS

Main feeder and tie breaker checks - BB1S1	5
" " " " " " - BB1S2	5
Secondary and pad located stations - Checked jumpers, cutouts, grounds and general condition	8

METERING - OPERATION, MAINTENANCE, CONSUMPTION AND REVENUE

Voltage and load checks	1
Meters tested - customers' requests	4
New meters shop tested	5
Faulty meters replaced	0
Damaged meters and covers	2
Residential read-ins	210
Residential disconnects	0
Residential reconnects	1
Residential read-outs	119

Note: Consumption and revenue reports, under IBM operation, are not available until the 18th of following month.

Consumption and revenue:

	No. of Meters	KWH	Revenue
Schedule 1 - Residential	6601	3,770,764	$42,863.96
Schedule 2 - Commercial			
Class 1 - (In Lease)	65	695,770	6,427.76
Class 2 - (Metered Basis)	201	570,288	6,666.74
Class 3 - (Plant Adm.) Comm. Rate			
700 Area		365,400	2,305.20
Kadlec Hospital		61,020	511.10

RICHLAND ELECTRICAL UNIT

	No. of Meters	KWH	Revenue
Public Health		2,588	29.91
1131 Bus Terminal		70,200	531.60
Central Stores		72,000	669.00
Stores Excess & Salv.		32,400	332.00
.005 Rate			
1125 Whse. Area		10,000	50.00
AEC Airport		15,000	75.00
Army Dike #1 & #2		6,720	33.60
Medical-Dental Bldg.		10,800	54.00
Library		6,640	33.20
Central Fire Station		4,740	23.70
Community Adm.		607,841	3,039.21
Total		6,302,171	$63,645.98

UNUSUAL INCIDENTS

On October 4, 1953, a car lost control and crashed through street barriers and signal guy wire at Stevens Drive and By-Pass Highway. Call out time from 8:50 to 10:15 a.m.

Cisco Construction Company bulldozer bumped into pole carrying 7200 volt circuit to N. Richland Well Field, short-circuiting line, blowing main fuses and damaging two switches, causing their replacement. Repairs were completed after a forty-five minute outage (3:30 p.m. - 10-15-53). Repairs amounted to $75, and were backcharged to Cisco Company.

CALL-OUT TIME

1.8 hrs. - 6:30 to 8:15 p.m. - 10-17-53 - 2 men. To re-fuse transformer on Berkshire Street in Sixth Housing Addition.

.8 hrs. - 6:30 to 7:15 p.m. - 10-18-53 - 1 man. To re-fuse panel at Central Fire Station.

1 hr. - 6:00 to 7:00 p.m. - 10-23-53 - 2 men. To re-fuse transformer on Lassen Street in Sixth Housing Addition.

HOLD-OVER TIME

1.5 hrs. - 4:18 to 5:45 p.m. - 10-16-53 - 2 men. To disconnect service to 762 Building for contractor to install service entrance.

PLANNED OVERTIME

1.4 hrs. - 6:30 to 7:48 a.m. - 10-19-53 - 2 men. To reconnect service to 762 Building.

RICHLAND ELECTRICAL UNIT

COMMENTS

Secondary extension of 300' was made to provide 3 Ø power and light for public display purposes at Community House.

Circuit breaker repairs were made to upper and lower units to 300 Kva stations A and B in Uptown Shopping Area where plug-in contacts between unit breakers and station Buss were burned off. Area load was assumed by two platform stations. Plug-in contacts were eliminated entirely, and direct contacts were installed, reducing any chance for further trouble of this nature.

Well "L" in N. Richland Well Field was disconnected for contractor to complete transformer platform. Requested by Mr. Hooton of AEC. Removed old superseded station "E" after contractor completed new station. Work was done under AEC Work Order, providing for our forces to do this work.

Irrigation telephone line was repaired west of 3000 Area where wire was cut and insulators broken. Requested by Mr. Petty of Water Dept.

Increased secondary capacity was provided to Richland Bank to care for additional load to feed building extension.

Increased secondary capacity was provided to John Dam Park in the form of five additional 120/240 outlets, installed on as many poles, along south side of Lee Blvd. to serve public functions more conveniently and in a less hazardous manner than heretofore. They were connected to existing metered circuit.

Additional signal installation was completed at Symons and George Washington Way, with the exception of sun glare hoods, which will be installed as soon as received.

Street lighting on south Thayer was extended from end of Sanford to Bypass Highway, three mercury vapor lights at Bypass intersections, and five 6000 lumen lights between intersections.

Additional lighting was provided to light area near restrooms and fireplaces at John Dam Park - one mercury vapor light was used and another to be installed as soon as received.

Additional lighting was provided at dangerous intersection at Stevens Drive and Bypass by installation of 2100 lumen mercury vapor light.

25 Kva transformer and associated service was added on Kadlec Road to furnish light and heat to school hutment for handicapped children.

Secondary rearrangement was made to clear construction of Weber Warehouse along Wellsian Way.

Permanent service was connected to Newberry Store site in Uptown Shopping Area Permanent service was also connected to buss heater outlets at school maintenance shop.

RICHLAND ELECTRICAL UNIT

(Comments cont'd.)

Trees were trimmed from 90 locations to clear fire alarm circuits in 1100 Area.

Trees were trimmed from 67 locations to clear high voltage circuits in 1100 Area.

Ninety-eight meters were set in Sixth Housing Addition. This leaves a total of 61 meters to be set to complete the residential metering in this Addition. These meters will be set as soon as the contractor is ready for them.

Completed overhaul of 7 1/2 H.P. pump motor at N. Richland Well Field.

COMMUNITY OPERATIONS SECTION
PUBLIC WORKS UNIT
MONTHLY REPORT
OCTOBER 1953

ORGANIZATION AND PERSONNEL

	Exempt	Non-Exempt
Employees Beginning of Month	12	59
Transfers Out	--	4
Transfers In	--	1
New Employees	--	--
Terminations (Leave of Absence)	--	1
Total End of Month	12	55

SANITATION

Total weight of trash and garbage collected from residential, commercial, and industrial areas of Richland during October was 1266 tons.

The number of trash trailers emptied per month has increased by about 40% during the past year due to expansion of the commercial areas, and although this material does not contribute much weight to the total tonnage figure, the increase in frequency has added considerably to the work load.

ROADS AND STREETS

A drainage problem on Haupt, in the vicinity of Sibert, was corrected by raising the grade on Haupt from a point 200' north of Sibert to a point 100' south of Sibert, and by lowering an existing catch basin at the northeast corner of Haupt and Sibert, and installing a new catch basin on the west side of Haupt, south of Sibert.

The program of repairing the downtown gutters which have deteriorated at the flow line, adjacent to vertical type straight curb, has been continued this month and is approximately complete.

The annual cleaning of storm water catch basins has been completed, and approximately 40% of the storm sewer lines have been flushed.

Community Operations Section
Public Works Unit

All gravel roads were bladed and shaped during the past month.

Laying of asphaltic surface on the west side of Gribble, from the termination of the original pavement to the concrete curb and gutter installed by Guthrie Construction Company, was completed this month by a Guthrie Company sub-contractor.

Routine seasonal maintenance of streets, street signs, drainage systems, municipal parking lots and sidewalks was continued.

PARKS AND PUBLIC GROUNDS

All irrigation hoses and sprinklers have been collected from lawn areas in the care of this group, and have been placed in storage.

All portable furniture has been removed from park areas and placed in winter storage.

Winterizing of parks irrigation systems, restroom facilities and drinking fountains is in process.

Annual clean-up of weed growth in shelterbelt areas and open areas throughout Richland has been started and will continue until completion.

Routine seasonal maintenance of parks buildings, equipment and grounds; shelterbelt plantings; and public areas has been continued.

DOMESTIC WATER

Average daily consumption for October was 9.093 million gallons. Peak consumption during the month occurred on the seventh day when 13.244 million gallons were used.

A fire hydrant inspection, lubrication and repair program has been started and is about 25% completed. All hydrants are opened and flushed, port cap threads are lubricated, and repair work as necessary is performed.

The pumps in wells 4, 13, and 18 have been pulled and are now being overhauled.

Replacement of the 10" water main within the 700 area from Knight Street to building 713 A, was started under Project S-808, and all pipe has been laid and tested. The line will be placed in service when a satisfactory report on bacteriological analysis has been received.

Community Operations Section
Public Works Unit

Progress on the contract for equipping of wells and installation of well header has been rather slow during the past month. At this time all work on the wells is complete with exception of electrical work which is about 90% completed. The major part of the well header has been laid, but no connections have been made from the wells, or to the existing header.

DOMESTIC WATER

	Well Production Million Gallons	Average Daily Production	Total Consumption Million Gallons	Av. Da. Consump.
Richland	97.3300	3.1397	195.2371	6.2980
North Richland	113.9700	3.6764	38.8152	1.2521
Columbia Field	68.3352	2.2044		
300 Area			47.8316	1.5430
TOTAL	279.6352	9.0205	281.8839	9.0931

SEWERAGE SYSTEM

Normal operations and maintenance were continued. Approximately 45,000 gallons of sludge were pumped to the drying beds.

The primary digestor at #2 Treatment Plant was opened for inspection of the sludge blanket and mixing equipment. The sludge blanket was in very satisfactory condition. A break was discovered in the lubrication line to the lower bearing on #3 mixer, and this mixer has been removed for repairs to the lubrication line and bearing.

A 2" water line was installed to the McMurray Sewage Lift Station to provide for flushing of the wet well, which is essential to the maintenance of sanitary conditions at this location.

Flow meter readings at the Treatment Plant for the month of October are as follow:

SEWAGE

	Total Flow Million Gallons	Average Daily Flow Million Gallons
Plant No. 1	32.700	1.055
Plant No. 2	66.630	2.149
TOTAL	99.330	3.204

Community Operations Section
Public Works Unit

IRRIGATION SYSTEM

- Annual repair of canal valves, checks, and lines is continuing according to schedule.

Since present plans call for abandonment of the irrigation pump houses and distribution systems, only those parts of the system which will, or may be, used next year are being winterized. All winterizing as planned is now complete and the following is a resume of work done.

Station #1 - located at Lee Boulevard and Cullum Avenue

This station serves the plaza, men's and women's dormitories, the Gillespie Parkway and several small grassed areas in downtown area, and residences in the south end of town between Lee and Davenport.

This system has been completely winterized.

Station #2 - located on south side of Abbott Street

This station serves all areas south of Davenport.

This system has been completely winterized.

Station #3 - located east of Hains Avenue and Van Giesen Street

This station serves the area east of Hunt Avenue from Hunt Point to Green Triangle.

This system has not been winterized, with exception of the line in the Green Triangle which will be tied to domestic water.

Station #4 - located on the canal just north of Swift Boulevard

This station serves an area north and east of the canal, bounded generally on the east by Long Avenue and Thayer Drive, and including Sacajawea School, Central United Protestant Church, the Catholic Church, and the cemetery.

Only the following segments of this system have been winterized: Sacajawea School, Central U.P. and Catholic Churches, the cemetery, and the line between Perkins and Thayer.

Station #5 - located on canal between Thayer and Columbia High School

This station serves the area south and west of the canal, as far south as Lee, and the Bomber Bowl and Columbia High slope.

This system has not been winterized, with exception of the lines in the Bomber Bowl and Columbia High slope, which may be tied to domestic water.

Station #6 - located on the canal south of Carmichael School

This station serves the area south of Lee Boulevard and west of Thayer Drive.

This system has not been winterized.

COMMUNITY OPERATIONS SECTION
RECREATION AND CIVIC AFFAIRS UNIT
MONTHLY REPORT
OCTOBER 1953

ORGANIZATION AND PERSONNEL

	Exempt	Non-Exempt
Beginning of Month	3	2-1/2
New Hires	0	0
Terminations	0	0
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 October 31, 1953:-

Administration	7
Principals & Supervisors	14
Clerical	24
Teachers	299
Health Audiometer	0
Cooks	43
Bus Drivers	1
Maintenance	18
Operations	44
	450

CLUBS AND ORGANIZATIONS

As of October 31, 1953, the employees of the listed organizations, exclusive of those included in the Real Estate, Commercial and Other Properties Unit Report, include:-

Youth Council	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 October 7, 1953. The Board was informed of the installation of two street lights in the picnic and playground apparatus area at Riverside Park; also, the installation of two 500 watt floodlights on the Shelter House at Columbia Playfield to illuminate the general play equipment area. The next meeting of the Board is scheduled for Tuesday, November 10, 1953.

The October through December Recreation Program began on Friday, October 2, 1953. The program is to include such activities as the Elementary and Junior Square Dancing, the Elementary Program on Fridays, Photography and Dramatics on Saturdays, Tumbling and Crafts on Mondays, Junior Stamp Club and Ballroom Dancing on Tuesdays, Crafts and Hi Spot on Wednesdays, and Archery on Thursdays at Columbia High School.

The Co-Recreation Program sponsored by the Unit and conducted at the Spalding Grade School began on Monday, October 5 and is to continue each Monday throughout the Fall and Winter.

On October 6 and 7, the American Society for Chemical Engineers, Columbia Valley Section, sponsored a show in the Games Room at the Community House with 31 vendors participating and 950 spectators attending the two-day show.

(Recreation and Civic Affairs Unit Monthly Report Continued)

Attendance for the Month of October, 1953 was as follows:-

		No. of Sessions	Youth	Adults	Sub-Total
COMMUNITY HOUSE					
I.	Sponsored Programs				
	Games Room Activities	21	1868	349	2217
	Ballroom Dancing	4	215	17	232
	Crafts	7	41	12	53
	Dramatics	2	10	2	12
	Elementary Program	5	1190	96	1286
	Fly Tying	2	4	3	7
	Photography	4	29	4	33
	Elementary Square Dancing	5	916	144	1060
	Junior Square Dancing	5	964	94	1058
	Junior Stamp Club	2	19	8	27
	Tumbling	3	34	14	48
II.	Special Events				
	American Institute Chemical Engineers Industrial Show	2	200	750	950
III.	Permit Groups				
	Hi Spot	9	2514	54	2568
	Rec-A-Teers	5		1271	1271
	Y Supper Club	4		157	157
	International Folk Dancers	8	6	191	197
	Richland Rod and Gun Club	1	35	143	178
	Gentrics (G.E. Women)	1		22	22
	Sword & Mask Club	5	12	62	74
IV.	Other	30	127	863	990
	Sub-Totals	125	8184	4256	12440
PARKS AND PLAYGROUNDS					
RIVERSIDE PARK					
I.	Sponsored Programs				
	None	-	-	-	-
II.	Special Events				
	None	-	-	-	-
III.	Permit Groups				
	Picnic Groups	2	26	252	278

(Recreation and Civic Affairs Unit Monthly Report Continued)

(Riverside Park Continued)	No. of Sessions	Youth	Adults	Sub-Total
IV. General Recreation Activities	-	-	-	-
Sub-Totals	2	26	252	278
COLUMBIA PLAYFIELD				
I. Sponsored Programs				
None	-	-	-	-
II. Special Events				
None	-	-	-	-
III. Permit Groups				
None	-	-	-	-
IV. *General Recreation Activities	39	19110	156	19266
Sub-Totals	39	19110	156	19266
OTHER				
Wellsian Lake	-	-	-	-
Neighborhood Playgrounds	-	-	-	-
Burlin Camp	8	134	453	587
Softball-Baseball Bookings	-	-	-	-
Sub-Totals	8	134	453	587
SPALDING PROGRAM				
Adult Co-Recreation	4		156	156

SUMMARY OF STATISTICS

Community House	125	8184	4256	12440
Parks and Playgrounds	49	19270	861	20131
Spalding Program	4		156	156
Total Attendance - October	178	27454	5273	32727

Grand Total for October 32,727

FY Grand Total-To-Date 204,913

* - (This figure includes school attendance at Columbia Playfield for both September and October; figure was omitted on September's Report.)

COMMUNITY OPERATIONS SECTION
RICHLAND PUBLIC LIBRARY
MONTHLY REPORT
OCTOBER 1953

ORGANIZATION AND PERSONNEL	Exempt	Non-Exempt
Employees - Beginning of Month	3	6½
Transfers In	0	0
Transfers Out	0	0
New Hires	0	2
Terminations	0	1
Part Time Employees to Full Time	0	½
End of Month	3	8

GENERAL

Circulation

Books	17,833 (Adult - 10,588; Juvenile - 7,245)
Magazines	546
Pamphlets	52
Records	1,240
Interlibrary Loan	46
Grand Total	19,717

Current Book Stock

Books added this month	344
Books withdrawn this month	17
Grand Total	27,220

Registration

Adult	244
Juvenile	72
Total	316
Total Registered Borrowers	14,342

Children's Story Hour Attendance 258 (234 - Pre-School; 24 - Special Hallowe'en)

Thirty meetings, including the meeting of the General Electric Board of Directors, were held in North Hall this month.

The second series of discussion groups on World Politics, sponsored by the Richland Public Library and the American Foundation for Political Education, started October 4, 1953, with twenty participants. The leaders of the group this year are Miss Frances Ritz and Mr. Gordan Cochrane.

Twenty four school-age children attended the special Hallowe'en story hour on October 24, 1953. The special pre-school Hallowe'en story hours were held at the regular pre-school story hour period on Tuesday and Wednesday mornings, October 27th and 28th. They were attended by sixty-three children.

COMMUNITY OPERATIONS SECTION
RICHLAND POLICE DEPARTMENT
MONTHLY REPORT
OCTOBER 1953

ORGANIZATION	Exempt	Non-Exempt
Employees - Beginning of month	18	33
Transfers In	0	0
Transfers Out	0	0
New Hires	0	0
Terminations	0	2
Total - End of Month	18	31

GENERAL

On October 2, 1953, Mr. Raymond R. King was appointed by the Board of County Commissioners to the office of Justice of the Peace for Richland, to fill the vacancy created by the death of Judge Earle W. Brown.

Capt. W. A. Ziegler and Lt. E. E. Miller attended the Governor's Safety Conference held in Olympia, on October 8 and 9. They served on the Law Enforcement Section of the Traffic Safety Committee.

Capt. C. F. Klepper and Sgt. J. A. Schmitz attended the meeting of the Washington Police Officers Association held in Ellensburg on October 3.

The Police Department handled the traffic control functions during the Fire Prevention Parade held in Richland on October 3.

The annual Police Athletic League Banquet honoring the PAL's Little League baseball team and the PAL's basketball team was held at the Desert Inn on October 12. Guest speakers included Mr. R. H. Hopkins, Community Manager, Capt. J. S. Johnson, President of the Police Athletic League, Sgt. A. L. Reil, Secretary for the PAL, Chief H. W. Strock, PAL Trustee, and Lt. A. F. Novotny, Athletic Manager for the Police Athletic League.

Six thousand illustrated pamphlets entitled "A Message to School Children and Their Parents" were distributed to school children during the month of October. These pamphlets contained certain precautions for school age children with regard to being approached by strangers, etc.

A new traffic light has been installed at the intersection of Symons and George Washington Way. New mercury vapor lights have been installed at Stevens and the By-Pass and the By-Pass and Thayer intersections.

Richland suffered its second traffic fatality for the year when a woman was killed in a one car accident on October 4 at the intersection of Stevens and the By-Pass. There were also four other persons injured, who were passengers in the car.

Sgt. Lourch of the Washington State Patrol spent October 7 and 8 in Richland discussing the analysis of our report submitted to the National Safety Council for the year 1952. A considerable amount of time was spent by Sgt. Lourch analyzing our past accomplishments and recommending means by which we might improve our score for the coming year.

TRAFFIC

	1953 Sept.	1953 Oct.	1952 Sept.	1952 Oct.	1953 Total to Date	1952 Total Same Period
Reportable accidents	13	19	23	19	194	221
Property damage accidents	10	15	20	18	162	191
Injury accidents	3	4	3	1	31	29
Total persons injured	3	8	3	1	42	36
Fatal accidents	0	1	0	0	2	1
Accidents-Daylight hours	10	12	16	13	135	143
Darkness	3	7	7	6	59	77
Accidents-Business district	1	5	6	6	68	71
Residential "	10	10	12	11	98	121
Other "	2	4	5	2	28	29
Accidents investigated	12	15	18	10	132	155
Criminal complaints filed	10	10	15	6	103	116
Violations contributing to accidents:						
Negligent driving	0	1	6	4	20	38
Fail. to yield r.o.w.	8	6	7	2	73	62
Following too closely	0	1	3	5	28	29
Drunk driving	0	3	0	1	8	3
Pedestrian violation	0	0	0	1	3	1
Inattention to driving	2	0	1	1	4	10
Reckless driving	0	0	0	0	4	7
Speeding	0	1	1	0	4	2
Unsafe speed	0	0	0	0	8	33
Improper backing	0	1	2	4	11	16
Disregard. stop sign	0	1	2	0	6	9
Hit and run	0	0	0	0	1	1
Improper passing	0	0	0	1	3	5
Improper turn	0	0	0	0	3	5
Failure to signal	0	0	1	0	0	2
Wide right turn	0	1	0	0	1	1
Wrong side of road	0	0	0	0	1	1
Asleep at wheel	0	0	0	0	1	0
Bicycle violation	0	2	0	0	3	0
Turning from wrong lane	0	0	0	0	0	2
Defective equipment	2	0	0	0	2	0
Animal in roadway	1	2	0	0	3	0
Traffic safety meetings	18	10	6	5	103	107
Attendance, traffic films	500	215	200	230	6185	6280
North Richland:						
Reportable accidents	7	5			78	
Property damage accidents	7	5			66	
Injury accidents	0	0			12	

Richland	1953 Sept.	1953 Oct.	1953 Ave. Per Accident Sept.	1953 Ave. Per Accident Oct.	1952 Ave. Per Accident Sept.	1952 Ave. Per Accident Oct.
Accident property damage	$3,511.64	$7,155.00	$270.12	$376.58	$201.31	$198.10

TRAINING

Advance training for Richland Police members at the Small Arms Range for the period in Field Instruction is as follows:

.38 Caliber Revolver 1/2 Hour
Total number of men reporting at the Range 22
Number of men fired over the Army-L Course 21

Qualifications on the Army-L Course as follows:

Expert	5	23.8%	Marksman	7	33.3%
Sharpshooter	6	28.6%	Unqualified	3	14.3%

ACTIVITIES AND SERVICES	September 1953 Richland	September 1953 North Richland	October 1953 Richland	October 1953 North Richland
Bank escorts and details	7	4	6	4
Bicycles impounded	22	5	9	4
Bicycle violations, other	3	2	0	0
Bicycles registered	63	0	33	0
Children lost or found	17	5	21	0
Complaints investigated (no enforcement action)	22	7	32	13
Deaths reported	2	0	0	0
Dog, cat, loose stock complaints	6	2	6	2
Dogs, cats, reported lost or found	18	0	9	1
Doors, windows found open in facilities	19	31	18	28
Emergency messages delivered	10	84	7	80
Fires investigated	6	1	10	5
Guns registered	21	0	20	0
Law enforcement agencies assisted	10	2	6	0
Letters of inquiry	69	0	79	0
Miscellaneous escorts	2	0	14	2
Persons injured by dogs	0	0	0	1
Plant departments assisted	19	1	22	1
Prisoners processed through Jail	14*	10	25*	13
Private individuals assisted	13	0	16	0
Property lost or found	15	1	12	3
Records inquiries	88	0	90	0
Reports processed through Records	280	132	253	109
Street lights out reported to Electrical	155	25	116	20
Total	881	312	804	286

*Two prisoners handled for Security Patrol for September, and two for October.

MONTHLY REPORT
RICHLAND POLICE DEPARTMENT
(RICHLAND - NO. RICHLAND)
OCTOBER 1953

OFFENSES	KNOWN		UNFOUNDED		CLEARED OTHER*		CLEARED ARREST	
	Rich.	No. Rich.	Rich.	No. Rich.	Rich.	No. Rich.	Rich.	No. Rich.
PART I								
1. Murder								
2. Rape								
3. Robbery								
4. Aggravated Assault	-	1	-	-	-	-	-	-
5. Burg.-Break. & Entry	3	-	-	-	-	-	1	-
6. Larceny Over $50.00	3	3	-	1	-	-	3**	-
Under $50.00	7	8	-	-	-	3	2	1
7. Auto Theft	2	1	1	-	-	-	2**	1
TOTAL PART I CASES	15	13	1	1	-	3	8	2
PART II								
8. Other Assaults	1	1	-	-	-	-	1	1
9. Forgery & Counterfeit	-	-	-	-	-	-	-	-
10. Embezzlement & Fraud	4	2	-	-	-	-	-	-
11. Stolen Prop:Buy:Rec.	-	-	-	-	-	-	-	-
12. Weapons: Carry: Poss.	-	-	-	-	-	-	-	-
13. Prostitution	-	-	-	-	-	-	-	-
14. Sex Offenses	2	-	-	-	-	-	2	-
15. Offenses Ag. Fam. & Child	1	-	-	-	1	-	-	-
16. Narcotics	-	-	-	-	-	-	-	-
17. Liquor Laws	-	-	-	-	-	-	-	-
18. Drunkenness	13	4	-	-	-	-	13	4
19. Disorderly Conduct	4	-	-	-	-	-	4	-
20. Vagrancy	1	4	-	-	-	-	1	4
21. Gambling	-	-	-	-	-	-	-	-
22. Driving While Intoxicated	3	2	-	-	-	-	3	2
23. Viol. Rd. & Dr. Laws								
Fail. to Stop & Identify	1	-	-	-	-	-	-	-
Speeding	34	13	-	-	-	-	34	13
Stop Sign	21	15	-	-	-	-	21	15
Reckless Driving	4	1	-	-	-	-	4	1
Right of Way	4	1	-	-	-	-	4	1

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 II								
Negligent Driving	14	4	–	–	–	–	4	4
Defective Equipment	6	10	–	–	–	6	6	4
Illegal Passing	3	2	–	–	–	–	3	2
24. Parking	12	20	–	–	1	1	11	19
25. All Other Traffic Viol.	19	7	–	–	1	–	18	7
26. All Other Offenses:								
Malicious Mischief	2	–	–	–	2	–	–	–
Vandalism	4	3	–	–	2	–	–	–
Disturbance	–	–	–	–	–	–	–	–
Bike Violations	14	5	–	–	14	5	–	–
Family Disturbance	4	–	–	–	4	–	–	–
Public Nuisance	1	–	–	–	–	–	1	–
Investigation	2	3	–	–	2	3	–	–
Prowler	2	–	–	–	–	–	–	–
Juvenile Delinquency	1	–	–	–	–	–	1	–
Pickup for Outside Agency	–	1	–	–	–	–	–	1
Obscene Telephone Call	1	–	–	–	–	–	7**	–
Damage to Property	1	–	–	–	1	–	–	–
Viol. of Dog Ordinance	1	–	–	–	–	–	1	–
Molesting	2	–	–	–	–	–	–	–
27. Suspicion	1	–	–	–	–	–	–	–
TOTAL PART II	183	98	–	–	28	15	149	78
PART III								
28. Missing Persons	5	–	–	–	4	–	–	–
Lost Persons	21	–	–	–	21	–	–	–
Lost Animals	9	1	–	–	7	–	–	–
Lost Property	31	4	–	–	30	1	–	–
29. Found Persons	–	–	–	–	–	–	–	–
Found Animals	3	–	–	–	1	–	–	–
Found Property	26	–	–	–	22	–	–	–
TOTAL PART III	95	5	–	–	85	1	–	–

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 IV								
30. Fat.M.V.Tr. Acc.	1							
31. Pers.Inj.M.V.Tra.Acc.	4	-						
32. Prop.Dam.M.V.Acc.	14	5						
33. Other Traffic Acc.								
34. Public Accident)	No Accurate Statistics Kept							
35. Home Accidents)								
36. Occupational Acc.)								
37. Firearms Accidents								
38. Dog Bites		1						
39. Suicides								
40. Suicide Attempts								
41. Sud.Death.& Bod. Found								
42. Sick Cared For								
43. Mental Cases	1							
TOTAL PART IV	20	6						
COMPOSITE TOTALS PART I,II,III,IV CASES	313	122	1	1	113	19	157	80

*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. ** Two larcenies cleared by arrest for previous month, 7 obscene telephone calls cleared by arrest for previous months, and 1 auto theft cleared by arrest for previous month.

Property reported stolen	Richland	$2,149.21
Property reported stolen	No. Rich.	$2,268.00
Property recovered	Richland	$4,060.21
Property recovered	No. Rich.	$2,006.00

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 (July-Dec. 1952)		One Month Average	1952 July - Dec.	1953 September	1953 October
Murder	.440	.073	-	1	-
Robbery	11.850	1.995	2	-	-
Agg. Assault	10.5	1.75	-	-	-
Burglary	69.95	11.658	8	-	3
Larceny	206.7	34.45	111	16	10
Auto Theft	38.65	6.44	9	2	2

Number of offenses known to police per 25,000 inhabitants regardless of whether offenses occurred in cities or rural dist.

State of Washington Six Months (July-Dec. 1952)		One Month Average	1952 July - Dec.	1953 September	1953 October
Murder	.228	.038	-	1	-
Robbery	8.28	1.38	2	-	-
Agg. Assault	2.68	.447	-	-	-
Burglary	61.4	10.23	8	-	3
Larceny	199.25	33.208	111	16	10
Auto Theft	35.6	5.933	9	2	2

The percentage of offenses committed by persons under the age of 25 years is shown:

National Average Percentage of Cases Year of 1952		Richland 1952 July - Dec.	Richland 1953 September	Richland 1953 October
Robbery	59.0	-	-	-
Burglary	74.1	8%	-	33%
Larceny	57.4	24%	13%	30%
Auto Theft	80.4	8%	-	-

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 (July-Dec. 1952)		One Month Average	1952 July - Dec.	1953 September	1953 October
Murder	.176	.029	-	-	-
Robbery	4.74	.790	-	-	-
Agg. Assault	4.20	.700	-	-	-
Burglary	27.98	4.663	2	1	-
Larceny	82.69	13.782	24	9	11
Auto Theft	15.46	2.577	2	2	1

Number of offenses known to police per 10,000 inhabitants regardless of whether offenses occurred in cities or rural dist.

State of Washington Six Months (July-Dec. 1952		One Month Average	1952 July - Dec.	1953 September	1953 October
Murder	.091	.015	-	-	-
Robbery	3.31	.552	-	-	-
Agg. Assault	1.07	.178	-	-	-
Burglary	24.56	4.093	2	1	-
Larceny	79.70	13.283	24	9	11
Auto Theft	14.24	2.373	2	2	1

The percentage of offenses committed by persons under the age of 25 years is shown:

National Average Percentage of Cases Year of 1952		N. Richland 1952 Oct. - Dec.	No. Richland 1953 September	No. Richland 1953 October
Robbery	59.0	-	-	-
Burglary	74.1	-	-	-
Larceny	57.4	8%	-	18%
Auto Theft	80.4	33%	-	100%

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 age group because of the practice of some jurisdictions not to fingerprint youthful offenders.

MONTHLY REPORT RICHLAND POLICE DEPARTMENT JUVENILES INVOLVED SEPTEMBER 1953

OFFENSE	NO. CASES	JUVENILES	SEX	4	5	7	8	9	10	11	12	13	14	15	16	17
RICHLAND																
Juvenile Delinquency	1	5	4-M 1-F									1 1	1	1	1	
Malicious Mischief	2	6	M			1		2			1	1			1	
Larceny	3	3	2-M 1-F								1		1		1	
Vandalism	1	2	M													2
TOTALS	7	16				1		2			2	3	2	1	3	2
NORTH RICHLAND																
Larceny	1	1	M	1												
TOTALS	1	1		1												

RICHLAND POLICE DEPARTMENT
RICHLAND JUSTICE COURT CASES
OCTOBER 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	15	6	8	1						2	3	$ 41.00	$ 19.50	$ 12.50
DRIVERS LICENSE	23	13	6	3	1					3	10	15.00	30.00	12.00
DRUNK DRIVING	4	3		1					2	1			157.50	
DR. IN VIOL. OF RESTRICTED LICENSE	2		1		1					1	2			
DR. WHILE LIC. REV.	1			1										
F.T. DIM LIGHTS	1		1									7.50		
F.T. SIGNAL	1				1					1				
F.T.Y.R.O.W.	9	5	3	1						6	1	45.00	38.50	
FOLLOWING TOO CLOSE	1		1									15.00		
EXCESSIVE NOISE	1	1											3.50	
ILLEGAL PARKING	24	1	20	3								71.50	3.50	3.50
ILLEGAL PASSING	5		3	2						2		22.50		
ILLEGAL "U" TURN	1		1									7.50		
ILL. USE OF 1 WAY ST.	1		1								1			
IMPROPER PLATES	7	2	1	4							1	7.50	3.50	3.50
NEGLIGENT DRIVING	25	14	10	1						8		247.50	285.00	35.00
NO REGISTRATION	6	5		1						1	6			
PERMIT UNLIC. OPERATOR TO DRIVE	1	1											7.50	7.50
RECKLESS DRIVING	3	3							2				137.50	25.00
SPEEDING	49	19	27	2	1					8	4	274.50	131.00	7.50
STOP SIGN	25	5	18	1	1					4		165.00	32.50	
CONT. TO DEL. OF A MINOR	1	1					1							
DISORDERLY CONDUCT	4	4									4			
DOG ORDINANCE	1				1								52.50	
PROVOKING ASSAULT	1	1										90.00	62.50	40.00
PUBLIC INTOXICATION	11	5	6										17.50	17.50
VAGRANCY	1	1												
TOTAL	224	90	107	21	6		1		4	37	32	$1009.50	$982.00	$164.00

ONE NEGLIGENT DRIVING CASE AMENDED TO FTYROW.
ONE RECKLESS DRIVING CASE AMENDED TO NEGLIGENT DRIVING.

RICHLAND POLICE DEPARTMENT
NORTH RICHLAND JUSTICE COURT CASES
OCTOBER 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	9	2	6	1						1	1	$ 45.00	$ 15.00	$ 7.50
DRIVERS LICENSE	10	5	4	1							9		3.50	3.50
DRUNK DRIVING	2	1		1					1	1			52.50	
F.T.Y.R.O.W.	1	1								1			7.50	
FOLLOWING TOO CLOSE	1	1								1			7.50	
ILLEGAL PARKING	18	3	5	7	3							17.50	10.50	
ILLEGAL PASSING	3	1	2								1	7.50	3.50	
ILL. USE OF 1 WAY ST.	1		1									7.50		
IMPROPER PLATES	4	2	1	1								7.50	10.00	
NEGLIGENT DRIVING	9	3	3	2	1					4		75.00	77.50	
RECKLESS DRIVING	2	2							2				80.00	
SPEEDING	11	4	5	1	1					1		65.00	27.50	
STOP SIGN	16	4	10	2								72.50	19.50	3.50
DISORDERLY CONDUCT	2				2					2		27.50		
DRUNK & DISORDERLY	1		1										27.50	
PETIT LARCENY	1	1										25.00		
PUBLIC INTOXICATION	2		2							1			77.50	77.50
THIRD DEG. ASSAULT	2	2												
TOTAL	95	32	40	16	7				3	12	11	$350.00	$419.50	$92.00

ONE DRUNKEN DRIVING CASE AMENDED TO NEGLIGENT DRIVING.

POLICE DEPARTMENT - TRAFFIC CONTROL STATISTICS
OCTOBER - 1953

MOTOR VEHICLE ACCIDENTS REPORTABLE:

	Total Number		Fatalities		Major Injuries		Minor Injuries	
	Sept.	Oct.	Sept.	Oct.	Sept.	Oct.	Sept.	Oct.
Richland	13	19	0	1	0	1	3	3
North Richland	7	5	0	0	0	0	0	0

ACCIDENT CAUSES:

	Negligent Driving		Failure to Yield Right of Way		Reckless & Drunken Driving		Other Causes	
	Sept.	Oct.	Sept.	Oct.	Sept.	Oct.	Sept.	Oct.
Richland	0	1	8	7	0	3	5	8
North Richland	2	1	1	0	1	0	3	4

PLANT WARNING TRAFFIC TICKETS ISSUED:

	Speeding		Stop Sign		Parking		Imp. License		Def. Equipment		Other V.		Totals	
	Sept.	Oct.	Sept.	Oct.	Sept.	Oct.	Sept.	Oct.	Sept.	Oct.	Sept.	Oct.	Sept.	Oct.
Richland	0	0	0	0	1	1	0	0	1	0	0	1	2	2
No. Richland	0	0	0	0	0	1	0	0	3	6	1	0	4	7

TRAFFIC CHARGES AND COURT CITATION TRAFFIC TICKETS ISSUED:

	Speeding		Stop Sign		Drunken Dr.		Reckless Dr.		Right of Way		Neg. Drv.		Parking V.		Other V.		Totals	
	Sept.	Oct.	Sept.	Oct.	Sept.	Oct.	Sept.	Oct.	Sept.	Oct.	Sept.	Oct.	Sept.	Oct.	Sept.	Oct.	Sept.	Oct.
Richland	42	41	34	21	5	3	1	4	5	2	20	16	43	24	41	56	148	167
No. Richland	31	10	20	16	7	2	1	2	5	0	9	4	18	18	35	26	126	78

THERE WAS NO TRAFFIC COUNT TAKEN DURING THE MONTH OF OCTOBER

NOTE: TRAFFIC CONTROL STATISTICS SHOW ORIGINAL CHARGES ONLY

COMMUNITY OPERATIONS SECTION
RICHLAND FIRE DEPARTMENT
MONTHLY REPORT
OCTOBER 1953

Organization and Personnel	Exempt	Non-Exempt
Employees - Beginning of Month	66	0
Transfers In	0	0
Transfers Out	2	0
Terminations	1	0
New Hires (and Reactivation)	3	0
End of Month	66	0

Fire Protection		Richland	North Richland
Fire Loss (Estimated):	Government	$ 25.00	$ 0.00
	Personal	668.00	152.87
	October Total	$693.00	$152.87
	1953 Total	$215,164.85	$3,642.61
Response To Fire Alarms		30	24
Investigation of Minor Fires & Incidents		3	1
Ambulance Responses		33	
Inside Schools or Drills		33	15
Outdoor Drills		13	13
Safety Meetings		8	3
Security Meetings		4	2
Fire Alarm Boxes Tested		187	100
AEC Airport Standbys		3	

One fire company responded October 24th to assist the Enterprise Volunteer Fire Department on a residential fire.

Fire Prevention

The Fire Department cooperated in the Chamber of Commerce sponsored observance of Fire Prevention Week, October 4th to 10th, by giving 7 fire truck demonstrations at Richland and North Richland schools, 3 fire trucks in the Fire Prevention parade and a public fire demonstration following the parade, preparation of fire hazards in the "House of Hazards", conducted tours through the fire stations and fire prevention movies for eighteen organized groups composed of 849 students and 44 adults in addition to numerous casual visitors. Fire Department representatives gave talks to the Rotary Club and American Legion. Assistance was given the public schools, clubs and special groups for their participation in the campaign.

On October 12th the Fire Marshal assisted A.E.C.Engineering on an acceptance test and inspection of the converted sprinkler system in the Chief Joseph Junior High School.

The Assistant Fire Marshal gave fire prevention talks to all Transportation supervisors and several Engineering groups. With the assistance of the Area Safety Engineer, fire extinguisher demonstrations were given for a total of 940 employees in the 700 Area.

Surprise fire drills were conducted during the month at Kadlec Hospital, 703, 705, 760, 761, 762 and 770 Buildings.

The Assistant Fire Marshal attended the monthly meeting of the Richland Traffic Control Committee.

COMMUNITY OPERATIONS SECTION
ENGINEERING UNIT
MONTHLY REPORT
OCTOBER 1953

PERSONNEL	Exempt	Non-Exempt	Total
Employees - Beginning of Month	6	3	9
Employees - End of Month	6	3	9

ENGINEERING UNIT JOBS COMPLETED DURING MONTH OF OCTOBER

Project K-756	Installation Traffic Light, Symons and George Washington Way. Light installed and in operation.
ESR 805-RC	Plans, Specifications, & Inspections, Cannon-Joseph Building, West of Kennell Ellis. Final inspection held 10-29-53.
ESR 856-RC	Revised Legal Description, Frank Berry's Sporting Goods Store.
ESR 857-RC	Legal Description, Church of Nazarene
ESR 858-RC	Revised Legal Description, Davis Furniture Store
ESR 861-RC	"As Built" Plans, All Saints Episcopal Church. See ESR 765.
ESR 862-RC	"As Built" Plans, Redeemer Lutheran Church. Plans transmitted to Reproduction Section File.
ESR 863-RC	"As Built" Plans, Latter Day Saints Church. See ESR 581.

STATUS OF ENGINEERING UNIT JOBS TO BE COMPLETED

PROJECTS

25.7 Kadlec Hospital Grounds Improvement - Project submitted to AEC.

C-488 Additional Erosion Control and Development, Public Areas, FY-1952 - All work complete except tree planting at Jason Lee Playground and installation of playground equipment.

K-753 Flow Control Valve, Sewage Treatment Wet Well - Awaiting delivery of equipment.

K-837 Replace Water Tank, Recreation Building - Awaiting Manager approval.

L-728 Installation of Insulated Fire Alarm Wire - To be completed as locations furnished by Fire Unit.

S-808 Replacement 10" Water Main, 700 Area - Work progressing. 85% complete.

Engineering Unit (Cont.)

ENGINEERING SERVICE REQUESTS

571-M Free Methodist Church, Plan Checking - 99% complete. No progress this month.

572-M First Baptist Church, Plan Checking - 83% complete. Progressing slowly.

574-M Assembly of God Church, Plan Checking - 73% complete. Progressing slowly.

588-M Alteration Permits - An open active file.

634-M Engineer Liaison, Richland Water - Following construction closely by periodic inspection. Providing liaison on new work phases.

715-M Television Antennae - An open active file.

722-M Erosion Control and Development, Public Areas, FY 1953 - Project submitted to A & B Committee.

726-M Plans, Specs., Inspections, CD Joseph Bldg. #4 - Final inspection to be made. Building not occupied.

729-M Plans, Specs., Inspections, Grace Bacon Building - 40% complete. Work progressing slowly.

730-M Plans, Specs., Inspections, Richland Realty Company (Newberry Store) - 50% complete. Work progressing.

768-M Plans, Specs., Inspections, Carl Peterson Building, Lee & Gillespie - 99% complete. Exceptions to be cleared held up by disagreement between owner and contractor.

770-M Latter Day Saints Storehouse, West Jadwin - 80% complete. Work progressing.

779-M Plans, Specs., Inspections, Richland Labor Temple - 99% complete. Building occupied. Final inspection to be made.

783-M Plans, Specs., Inspections, American Legion Building - 99% complete. Exceptions not completely cleared up by contractor.

790-M "As Builts" General - Work progressing steadily within the limits of the assigned money.

804-RC Study, Roof Richland Lutheran Church - Report completed this month by Engineering Department.

806-M Plans, Specs., Inspections, Richland Development Co., Block 2, Uptown - 99% complete. Exceptions to be cleaned up by owner.

Engineering Unit (Cont.)

809-M Plans, Specs., Inspections, Parcell Bldg. (Duportail & Hartford) - Awaiting word as to whether plans submitted are to be used by lessee.

811-RC Extend water & sewer - Parcell Bldg Site at Duportail & Hartford - Design held up pending use of site by lessee.

815-M Plans, Specs., Inspections, Veterinary Hospital - Plans approved. Building permit issued.

816-M Plans, Specs., Inspections, Richland Transfer & Storage - 99% complete. Cleanup items being done by contractor.

817-M Plans, Specs., Inspections, Diana Langevin Building - 85% complete. progressing slowly. One part of building now occupied.

818-M Plans, Specs., Inspections, McVicker Bldg. (East of Liquor Store) - ESR cancelled. Lessee withdrew.

819-M Plans, Specs., Inspections, Safeway Store - Clearing and grading work started October 26, 1953.

820-M Landscape Design for 300 Area - Report being reviewed by AEC.

822-M Plans, Specs., Inspections, EH Kidwell Service Station - Plans not received. Fuel tanks on site.

829-M Design plans and Specifications, Storm Drain, George Washington Way - Redesign necessary because of changed conditions of Spokane Housing Inc. curbs.

832-M Inspection and Liaison, Spokane Housing - Inspections continuing daily. Reports being made to AEC.

833-M Inspection and Liaison, Bauer-Day Housing - Final exceptions still to be cleared.

836-M Plans, Specs., Inspections, Church of Nazarene Addition - 45% complete. Work progressing slowly.

841-RC Legal Description & Utility Study, Seattle First National Bank Addition - 90% complete.

842-M Plans, Specs., Inspections, Kaiser-Johnson Store Addition - 90% complete. Work progressing rapidly.

845-M Plans, Specs., Inspections, Seattle First National Bank Addition - 30% complete. Work progressing.

846-M 24" Replacement Sewer - Swift Boulevard and Gribble Street Improvement - 95% complete on design work.

Engineering Unit (Cont.)

852-RC Legal Description, Area Between Wordrop, Hoxie, George Washington Way and McMurray, Richland Baptist Church - 90% complete.

853-M Plans, Specs., Inspections, Richland Heights Baptist Church, Thayer and Duportail - Plans not received to date.

854-M Field Engineering and Inspection, AEC Airport - 99% complete.

855-M Title III Inspection, McMurray Road - 50% complete. Work progressing behind schedule.

859-M Removal of Irrigation System - Report submitted to AEC.

860-M Replace water line #5 Well to Lee Boulevard Reservoirs - Scoping delayed pending AEC decision on two additional wells.

864-M Project Proposal, Street Construction, FY 1954 - Forwarded by Engineering Unit to project coordinator.

865-RC Legal Description Revised, All Saints Episcopal Church - 75% complete.

866-M Design, Engineering, Inspection, Walks, Drives Columbia Playfield - Project approved. Design to be started at early date.

867-M Plans, Specifications, and Inspections, Richland Baptist Church on George Washington Way - Partial permit issued for excavation and footing, pending completion of plan review.

REAL ESTATE SECTION

SUMMARY

October 1953

ORGANIZATION AND PERSONNEL:

	BEGINNING OF MONTH		END OF MONTH	
	Exempt	Nonexempt	Exempt	Nonexempt
Real Estate Section 350	2	1	2	1
Housing & Maintenance Unit 351	5	18	5	18
353	12	141	12	139
Commercial Property Unit 357	6	6	6	6
	25	166	25	164

Decrease in number of employees 2

GENERAL

Four lease awards were made covering the construction and operation of a community television system, construction and maintenance business, an automotive service station, and a church.

Three new sublessee enterprises opened for business.

The Veterans Administration vacated the Government-owned building located at 329 Cullum Avenue.

A public restaurant opened for business in the Richland Labor Temple Association building.

HOUSING AND MAINTENANCE UNIT

October, 1953

ORGANIZATION AND PERSONNEL

Number of employees on the payroll:

Beginning of month:	17 exempt	
	159 nonexempt	
	176	176
End of month	17 exempt	
	157 nonexempt	
	174	174

RICHLAND HOUSING

HOUSING UTILIZATION AS OF MONTH ENDING OCTOBER 31, 1953

	Conven.	A&J	T	Pre Cut	Ranch	Pre Fab	Dorm Apt.	A&J Apt.	2BR Apt	4th Hsg.	Tract	Total
GE Employees	2223	252	10	379	814	1176	10	52	63	194	36	5209
Comm.Fac.	91	16		32	71	48		5	1	9	2	275
AEC	82	28		25	61	18		6	5	16	3	244
Other govn.	6	2			4	1					1	14
Schools	54			6	10	55		1	1	2		129
Post Office	5				2	10				1	3	21
Comm. Act.	9			1	7	4					1	22
Med. Fac.	3	20			3	1				3		30
C.T.Main	2			2	5	9				2		20
Kaiser Eng.	6	8			6							20
J.A.Jones	2	2			2	1						7
Vitro Corp.	1	2			1							4
Blaw-Knox		2		2								4
P.S.Lord	1				2					1		4
Minor Contr.					1	1						2
Vernita O.											5	5
Commonwealth						1						1
Not Certified	2			1	5	3				1		12
Total	2487	332	10	448	994	1328	10	64	70	229	51	6023
Houses assgn. leases written	2				1	2						5
Houses assgn. leases unwritten	11	1		2	5	11				1		31
Houses available for assgn.												
Total	2500	333	10	450	1000	1341	10	64	70	230	51	6059

	Begin Month	Moved In	Moved Out	End of Month	Diff.
Conventional Type	2493	37	43	2487	-6
A&J Type	333	1	2	332	-1
"T" Type	10			10	
Precut Type	448	10	10	448	
Ranch Type	999	14	19	994	-5
Prefab Type	1331	39	42	1328	-3
Dorm Apts	10			10	
A&J Apts	64	2	2	64	
2BR Apts	68	3	1	70	+2
Fourth Housing	229	7	7	229	
Tract Houses	51			51	
Total	6036	113	126	6023	-13

OCTOBER 1953

DORMITORY REPORT

Dormitories

	Beds Available	Vacant Beds	Occupied Beds
Men	566	94	472
Women	431	72	359*
Total	997	166	831*

* This includes 2 beds used for Dorm Office
** Includes 27 beds in Dorm M 13 (Teachers)

Waiting Lists

	Single Rooms	Double Rooms
Men	0	0
Women	14	0

HOUSING
CANCELLATION AND ALLOCATIONS

STRAIGHT CANCELLATIONS

Voluntary terminations	33
R. O. F.	0
Discharge	0
Transfers	1
Retirement-divorce-misc.	7
Move off project	17
Deaths	5
Wherry housing	1
Total	64

ALLOCATIONS

Houses allocated to new tenants	51
Exchanged houses	29
Moves	30
Turnovers	4
Total leases signed	114
Total cancellations	126
Houses assigned "As Is"	61
Houses sent to renovation	32
Applications pending	332

TENANT RELATIONS PROGRESS REPORT

	Orders Incomplete as of September 30	Orders Issued 9-30 to 10-30	Total Orders Incomplete as of October 30, 1953
Service orders	443	2421	917
Work orders	852	562	841
Service charges		257	

Principal work order loads

	Incomplete as of September 30, 1953	Incomplete as of October 30, 1953
Laundry tub replacement	15	17
Bathroom renovations (tub, tile, lino.)	104	86
Tileboard bathroom	9	8
Kitchen floor linoleum	60	45
Kitchen cabinet linoleum	4	21
Shower stall	21	4

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188 alteration permits were issued, as compared to 132 issued during September.

Install driveway	3	Install auto. washer	25
Install auto. dryer	35	Install fence	12
Convert to oil	39	Install 110 V circuit	8
Install porch	1	Extend chimney	1
Remove shelves in utility room	1	Install water softener	2
Remove broom closet	1	Install porch light	2
Install back door	1	Install coal stoker	3
Basement excavation	11	Install 220 V circuit	4
Install TV antenna	4	Install auto. dishwasher	3
Install humidifier	1	Install patio	2
Install concrete sidewalks	3	Build tool shed	1
Remove kitchen sink	1	Reverse range and refer	5
Raise door threshold	1	Remove partition, coalbin and furn.	3
Install partition in basement	3	Install vent in utility room	1
Remove laundry trays	2	Glaze porch	1
Install vinyl plastic on floors	1	Sand floors	1
Change position of water heater	1	Install exhaust fan	1
Install glass in door	1	Install air conditioner	1
Install book shelves	1	Remove kitchen cupboard	1

1369 inspections were made, as compared to 1247 made in September.

Alteration permits	4	Bathtubs	1
Cupboards	1	Drainage	1
Floor boards	8	House siding	2
Jack and shim	8	Leaking basements	8
Linoleum	193	Paint	283
Porch and steps	39	Screen doors	6
Shower stalls	16	Sidewalks	28
Sinks	22	Tileboard	2
Toilet seats	53	Topsoil	9
Storms	123	Walls	2
Windows	1	Miscellaneous	275
Renovations	94	Cancellations	35
Shows (new tenants)	105		

MONTHLY PROGRESS REPORT
INTERIOR REDECORATING REPORT
FISCAL YEAR - 1954

TYPE UNIT	NO. UNITS SCHEDULED	COMPLETED THIS MONTH	COMPLETED TO DATE	BALANCE TO BE PAINTED
A	154	20	47	107
B	364	95	118	246
C	0	0	0	0
D	3	0	0	3
E	40	7	9	31
F	108	25	35	73
G	3	0	1	2
H	79	11	16	63
K	0	0	0	0
L	3	0	0	3
M	1	0	0	1
Q	5	1	1	4
R	1	0	0	1
S	2	0	0	2
T	6	2	5	1
U	5	1	1	4
V	26	1	2	24
Y	192	62	78	114
Z	5	3	3	2
1 BR.	43	1	5	38
2 BR.	146	2	3	143
3 BR.	136	0	2	134
Tract	9	1	2	7
1 BR. Apt	9	0	0	9
2 BR. Apt	3	0	0	3
TOTAL:	1343	232	328	1015

35 Houses processed thru Renovations
44 Trees trimmed and stumps pulled
12 Sidewalks Repaired
7 Street steps repaired
9 Loads top soil delivered
4 Loads top soil delivered and area seeded
2 Driveways repaired
31 Trash Pickups completed
40 Dorm Rooms cleaned and sealed
26 Dorm Rooms redecorated

Bumper logs and black top repairs made to Campbell's #2 Parking Lot.
Cut and removed trash and weeds from Commercial Area
Completed work on 2-fire damaged houses
Redecorated 2 groups of offices in Medical-Dental Building

PLUMBING SHOP

JOB DESCRIPTION	NUMBER COMPLETED
Replacements - Major Fixtures:	
Bathtubs	0
Electric Water Heaters	18
Laundry Tubs	24
Plumbing W. O. Repairs	30
Plumbing for floor tile replacement	7
Cleared major sewer stoppages caused by tree roots	38
Plumbing for sink top replacements	12
Steam work orders	26

Steam inspection once a week on Dormitories, Apartments and Government-owned Commercial Buildings

Turned off all domestic irrigation water throughout the city.

Winterized air conditioners in dormitories and Commercial buildings

SERVICE ORDER CREW

The following is a status report on Service Orders:

A.	On hand at the beginning of the Month	126
B.	Received during the Month	2373
C.	Completed during the Month	2199
D.	On hand at the end of the Month	300
E.	A total of 158 hours were spent on Work Orders	

Incompleted Service Orders by Crafts:

Plumbing	141
Electrical	111
Carpentry	48

CARPENTRY

JOB DESCRIPTION	NUMBER COMPLETED
Replace bath wall tile	1
Repair bath wall tile	6
Replace bath floor linoleum	10
Repair bath floor linoleum	1
Replace kitchen floor linoleum	58
Repair kitchen floor linoleum	6
Replace steps and landings linoleum	13
Replace hall floor linoleum	1
Repair utility room linoleum	1
Replace linoleum - Medical-Dental Building (1 Order)	48.0 M.H.
Replace kitchen sink top linoleum	21
Repair kitchen sink top linoleum	10
Replace work bench linoleum	3
Replace kitchen sinks	2
Repair windows - Shop	11
Make new windows - Shop	4
Weatherstrip windows	1
Repair window screens - Shop	597
Make new window screens - Shop	2
Apply roof coating	9
Repair roof	45
Shingle House - 2003 Davison	72.0 M.H.
Shingle House - Tract #898	27.0 M.H.
Repair porches	55
Repair siding	4
Repair Thresholds	0
Repair exterior doors - Shop	16
Repair wall	2
Repair coal bin	1
Repair stairway	1
Repair for painters	3.5 M.H.
Repair for electricians	5.5 M.H.
Repair for plumbers	14.5 M.H.
Time spent on Mock-up Work - C-58274 (Complete)	73.0 M.H.
" " " " - C-58259 (Complete)	3.5 M.H.
" " " " - Dorm Apts. (Complete)	4.5 M.H.
Time spent on Shop Equipment	27.0 M.H.
Miscellaneous Orders	5
Cut counter down - 1116 Building	1
Upholster Chair	2
Cabinet Doors repaired - Shop	44
Cabinet Doors replaced - Shop (Made New)	21
Cabinet Drawers repaired - Shop	138
Cabinet Drawers replaced - Shop (Made New)	5
Repaired shelves	2

Carpentry - continued

JOB DESCRIPTION	NUMBER COMPLETED
Chempoint - Routine	105
Chempoint - Work Orders	37
Paint Touch-ups Completed	134
Paint Touch-ups Completed in Shop	10
Interior Carpentry Repair to all Type Houses (4 yr. cycle)	269
Exterior Carpentry Repair (Commercial Facilities - Desert Inn)	48.0 M.H.
Screen Doors Repaired	8

MECHANICAL SHOP

JOB DESCRIPTION	NUMBER COMPLETED
A. Millwright Crew:	
Furnace Service Orders	309
Routine furnace inspection and lubrication	509
The blower motors and fans in the precut Houses have been inspected and lubricated. The filter pads and belts have been replaced, as necessary. We have started routine inspection of the A & J Housing Unit.	
B. Sheetmetal Crew:	
Replacement of Shower Stalls	16
Replacement of gutters	21
Flashing around Ranch House coal hatches	14
Fabricate Ranch House closet tracks	48
Replacement of smoke pipe in Conventional Houses	11
Making metal thresholds	24

COMMERCIAL PROPERTY UNIT - REAL ESTATE SECTION
October, 1953

PERSONNEL - COMMERCIAL PROPERTY UNIT:	October
Beginning of Month	12
End of Month	12
Net Change	0

PERSONNEL - COMMERCIAL AND NONCOMMERCIAL FACILITIES:

	Commercial		Noncommercial		Total	
	Richland	North Richland	Richland	North Richland	Richland	North Richland
September	1,536	183	121	1	1,657	184
October	1,554	185	121	1	1,675	186
Net Change	+18	+2	0	0	+18	+2

SUMMARY OF ROUTINE ITEMS PROCESSED:

	Commercial		Noncommercial		Total		
	Richland	North Richland	Richland	North Richland	Richland	North Richland	Total
Work Orders	51	17	3	0	54	17	71
Back Charges	3	0	0	0	3	0	3
FY Work Orders	214	89	3	0	217	89	306
FY Back Charges	11	0	0	0	11	0	11

CONTRACTS AND NEGOTIATIONS:

A. Commercial:

1. Supplemental Agreements:

a. Richland Fuel and Lumber Co. - to provide for adjustment of the rental payments and the operation of a soft-drink bottling plant on the premises.

b. Uptown Theater - to provide for the payment of electricity on a meter basis and to establish an allowance to Lessee on account of such payment.

c. Village Theater - to provide for the payment of electricity on a meter basis and to establish an allowance to Lessee on account of such payment.

d. Richland Dental Center - to provide for lease of additional space in the Medical Dental Building and adjust the rental payments.

e. Kaiser's Market - to provide for adjustment of rental payments to include a minimum monthly guarantee.

2. Lease Awards:

a. J. H. Whitney and Co. - was awarded a license to construct and operate a community television system.

b. Lloyd G. Cook - was awarded a lease to construct a building in the Light Industrial Area in which he proposes to operate a construction and maintenance business.

c. James R. Parcell - was awarded a lease to construct a building in the Light Industrial Area for the operation of a service station.

B. Noncommercial:

1. Lease:

a. Richland Heights Baptist Church - a ground lease covering the construction and maintenance of a church on Thayer Drive.

2. Supplemental Agreements:

a. Richland Masonic Lodge #283 - to redefine the leased premises.

b. Church of Jesus Christ of Latter Day Saints - to provide for the construction of an additional building to be used as a welfare storehouse.

GENERAL:

A. Commercial:

1. Thorn's Draperies, opened for business in the Davis Furniture Company Building in the Uptown Business District.

2. Jack Charlesworth, Painting Contractor, formerly located in the Automatic Laundry Co. Building, opened for business in the Richland Development Co. Building, Block 2, Uptown Business District.

3. William M. Compton, Insurance Agency, opened for business in the Cannon and Joseph Building No. II, Block 4, Uptown Business District.

4. Dunning and Ray, Insurance Agency, opened for business in the Cannon and Joseph Building No. II, Block 4, Uptown Business District.

5. Initial construction work commenced on the Safeway, Inc. building on Lee Boulevard.

6. Duncan M. Chalmers, M.D., terminated his lease in the Government-owned Medical-Dental Building.

7. Final inspection reports were received on the Medical-Dental Properties, Inc. and Cannon & Joseph No. II buildings.

8. E. W. Moore commenced construction on his building located on West Van Giesen to be utilized for the practice of veterinary medicine.

B. Noncommercial:

1. General Services Administration (V.A.) vacated the Government-owned building located at 329 Cullum.

2. A public restaurant opened for business in the Richland Labor Temple Association Building on Knight Street.

COMMERCIAL PROSPECTS:

Inquiries were received during the month concerning the establishment of the following types of enterprises:

Drive-In Restaurant
Marine Parts & Service
Heating & Maintenance Shop

SUMMARY OF OCCUPANCY AND EXPANSION STATUS

A. COMMERCIAL:	SEPTEMBER			OCTOBER		
	Richland	North Richland	Total	Richland	North Richland	Total
1. Number of Government-owned Buildings	38	8	46	38	8	46
a. Number of Prime Lessee Businesses	39	9	48	37*	9	46
b. Number of Sublessee Businesses	18	0	18	18	0	18
c. Total Businesses in Government-owned Buildings	57	9	66	55	9	64
2. Doctors and Dentists in Private Practice	27	0	27	26	0	26
3. Number of Privately-owned Buildings	52	7	59	52	7	59
a. Number of Prime Lessee Businesses	39	6	45	39	6	45
b. Number of Businesses operated by Sublessees	98	2	100	101	2	103
c. Total Businesses in Privately-owned Buildings	137	8	145	140	8	148
4. Privately-owned Buildings under Construction	8	0	8	8	0	8
5. Total number of Businesses in Operation	194	17	211	195	17	212

SUMMARY OF OCCUPANCY AND EXPANSION STATUS

B. NONCOMMERCIAL:	SEPTEMBER			OCTOBER		
	Richland	North Richland	Total	Richland	North Richland	Total
1. Government-owned Buildings						
a. Churches	4			4		
b. Clubs and Organizations	7			7		
c. Government Agencies	2			2		
Total	13			13		
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	102		102	102		102

*Corrected 11-1-53

END

DATE
FILMED
6/29/92