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HW--50572-Del.

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FUELS PREPARATION DEPARTMENT

Monthly Report

MAY
~~JUNE~~ 1957

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**HANFORD ATOMIC PRODUCTS OPERATION
RICHLAND, WASHINGTON**

PRELIMINARY REPORT

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MONTHLY REPORT

FUELS PREPARATION DEPARTMENT

FOR

MAY, 1957

HAN - 66124 - DEL

Compiled by

Fuels Preparation Department

June 27, 1957

Richland, Washington

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FUELS PREPARATION DEPARTMENT
MONTHLY REPORT SUMMARY FOR
MAY, 1957

MANUFACTURING OPERATION

Five hundred three tons of acceptable uranium fuel elements were produced which was 95% of the five hundred thirty-two tons forecast in HW-50113-RD.

The ninth canning line was added on May 24, 1957.

New daily production records were established in May.

At month's end there was a 0.4 month supply of bare uranium cores. A 1.1 month supply of finished fuel elements was available in the combined 100-300 storage area.

During May the operating efficiency was 91% which was 4% higher than the April experience.

ENGINEERING OPERATION

Twelve ruptures occurred during May in solid and cored production material.

Approximately 242 tons of 1/2" cored elements have been charged to date. Four ruptures have occurred in cored elements since inception of the cored element program.

Irradiation of I & E elements continued without incident. To date, 465 tubes have been charged. Post irradiation measurements are underway for I & E elements discharged at 1900 MWD/T. Initial analysis shows no unusual dimensional instability, no evidence of core cracking or braze deterioration. Yields continued low (35%); however, a number of process changes are being initiated to improve yields.

Fifteen hundred "C" size hot-press elements are being procured from Sylvania for testing at HAP0. Sylvania reports the application of a thin nickel plating to cap spires before canning provides a consistently good bond at closure surfaces. This has resulted in a 20% yield improvement for Sylvania elements used at Savannah River. It appears that this improvement could make the element competitive with the dip-canned I & E element.

Approximately 27,000 M-388 clad elements were canned during May. A comparative evaluation of standard alloy pieces and M-388 clad pieces recently discharged is underway. No final conclusions have been reached regarding longitudinal pitting in M-388 pieces in the extreme position of the tubes. Preliminary evaluation indicates cavitation. Weight losses in standard pieces was somewhat larger than M-388.

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Performance of low hydrogen dingot material continued good. Satisfactory experience leads MCW to consider the hydrogen problem for ingots solved; this situation will be kept under surveillance.

Development programs relative to centrifugally cast elements continue. One hundred solid and 100 I & E cast elements have been ordered from Fernald for preliminary reactor testing.

Agreement has been reached with General Cable Corporation to cable clad 100 HAPO elements in their Schloemann press by mid-June. An interim contract with Battelle for preliminary cable cladding development was issued to cover the balance of FY-1957. Battelle is preparing a formal proposition for FY-1958 for work in the cable cladding field.

Contract negotiations are proceeding with the American Bearing Company for utilization of die pressure casting technique for fuel element core fabrication. Successful pursuit of this approach would provide a significant breakthrough in the economics of segmented fuel elements.

A fuel and reactor survey draft was issued reviewing competition existing in the fuel development field and trends the industry may take. A review was made of feed material plant capacity and yields as part of the over-all uranium cycle study. A comparison of fuel costs for the HAPO Power Demonstration Reactor and the Savannah River Power Reactor was completed. Preliminary study of organic coolants was issued.

CG-646 - Modification of Pickle Machines - 313 Building was completed May 14. A financial underrun of 14.5% was sustained. All other Design and Project work is proceeding on schedule and within costs.

The Fuel Element Pilot Plant is essentially "debugged" and ready for operational use. Five development tests were completed in addition to test runs during May.

FINANCIAL OPERATION

A report from the Company's Auditing Department was received this month covering an audit recently completed by the traveling auditors. This report indicated that the accounts were being maintained in a satisfactory manner and that routines reviewed were appropriate and adequate for protecting and safeguarding the assets of the Department.

As a result of a reallocation of funds initially authorized in FY-1957 for Equipment Not Included in Construction Projects, notification was received from Contract Administration that authorized funds had been reduced by \$64,000. At the time this notice of reduction was received, expenditures to date plus firm commitments exceeded the revised amount by approximately \$17,000. In view of this, authorization was requested and received from the HAPO General Manager to overrun the revised budget by this amount.

Part I of a Measurements Manual was completed and distributed to all level 3 and 4 managers. The remaining parts of this Manual are scheduled for completion by September 15.

Conversion of weekly payroll records from punched cards to magnetic tape was completed during May. This further automation of Personnel Accounting functions will result in reduced costs through the elimination of certain clerical functions and will also permit more flexibility in report preparation.

MAINTENANCE AND POWER OPERATION

The Cost Reduction Program realized a net annual saving of \$1,561 during the month. This brings the total annual savings to \$25,800, which represents 66% of the Quarterly Budget.

A complete electrical outage occurred on Friday, May 17. The emergency generator was started approximately 30 seconds after the outage occurred. No significant losses were experienced as a result of the outage. Approximately four line hours were lost due to reduced power to the furnaces in the 313-B Building.

EMPLOYEE RELATIONS OPERATION

Two of the four planned Communication Workshops were held for exempt employees during the month. An average of approximately 16 participants are scheduled to attend each of the workshops.

The Department's first Professional Business Management-I Course was completed on May 28 with 16 employees participating. The second course is scheduled to start in June.

Approval was received on May 10 to conduct a 300 Area Open House for families of employees. The tour will include 10 non-classified buildings and will be held June 1.

Individual charts showing the pay-performance relationships for the 32 first line supervisors and foremen have been completed and charts for the balance of the exempt force are in process of preparation.

Thirteen grievances were processed during the month. Of the thirteen grievances submitted four involved the grievance procedure; three on jurisdiction; two on responsibility regarding work performance; and one each on transfer, wage rates, seniority and overtime.

The Department continued to operate without a disabling injury. There were no serious accidents during the month. The medical treatment frequency rate decreased from 3.88 in April to 3.26 in May.

The first fire loss within FPD property since September 1, 1956 occurred May 13 in the 313 Building. The fire resulted when oil saturated aluminum lathe turnings were dumped into a recovery furnace. Flames and heat generated by the flaming oil apparently ignited the soot accumulation in the 12" aluminum exhaust duct causing a 6' section of the duct to rupture and fall apart. Estimated damage was \$210.

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There were no security violations experienced during May.

The 300 Area Master Evacuation Plan has been developed in final form and an information program concerning the Plan commenced.

PERSONNEL STATISTICS:

Number of employees April 30, 1957 763
Number of employees May 31, 1957 772

<u>OPERATION</u>	<u>EXEMPT</u>	<u>NON-EXEMPT</u>	<u>TOTAL</u>
General	1	1	2
Manufacturing	68	292	360
Engineering	42	30	72
Financial	16	23	39
Maintenance & Power	40	228	268
Employee Relations	16	15	31
TOTAL	183	589	772

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FUELS PREPARATION DEPARTMENT

MANUFACTURING OPERATION

May, 1957

I. CURRENT OPERATIONS

A. Production and Productivity

1. Statistics

	8" Solid	8" De-pleted	8" Cored	En-riched	I & E	Total
<u>Current Month's Production</u>						
Acceptable Fuel Elements Produced(Tons)	436	0	52	9	6	503
As % of Forecast Production	99	-	87	90	27	95
As % of Past 3 Months' Production	102	-	87	225	67	100
Average						
As % of Past 12 Months' Production	103	-	168	900	100	109
Average						
As % of June, 1957 Goal	104	-	63	150	8	85
As % of June, 1958 Goal (500 MWD/Ton)	159	-	33	22	3	75
As % of June, 1958 Goal (750 MWD/Ton)	436	-	208	36	2	112
% of Forecast Achieved - Last Fiscal Quarter	112	150	89	56	38	107
% of Forecast Achieved - Last 4 Fiscal Quarters	105	150	96	56	45	103
Production Adjusted for In-Process Inventory	454	-	51	9	1	515
<u>Productivity (Adjusted for In-Process Inventory)</u>						
Places - Man-hour Direct Labor	6.9	-	5.4	7.6	0.8	
Forecast	-	-	-	-	-	
Previous Month	6.6	-	5.9	7.2	1.9	
<u>Operating Efficiency</u>						
Current Month (%)	-	-	-	-	-	91
Forecast (%)	-	-	-	-	-	90
Previous Month (%)	-	-	-	-	-	87
<u>Manufacturing Yield</u>						
Current Month (%)	75	-	74	82	28	
Forecast (%)	83	-	80	84	52	
Previous Month (%)	81	-	79	83	36	
Bare Uranium in Storage (Tons)						245
Canned Uranium in Storage (Tons)						615
Uranium Utilization (%)						95.0

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2. Activities

a. Production

During the period of May 1 to May 23, inclusive, the Manufacturing Operation worked on a two-shift basis with four canning lines for each shift. Starting on May 24 and continuing through the balance of May, the Manufacturing Operation worked on a two-shift basis with five canning lines on "A" shift and four canning lines on "B" shift. Five hundred three (503) tons of acceptable uranium fuel elements were produced which was 95 percent of the five hundred thirty-two (532) tons forecast in HW-50113-RD. Variance from forecast resulted from the manufacturing yields which were below forecast and changes in product mix and in-process inventory.

Part of the scheduled I & E production was delayed until June in order to make several I & E process improvements. These improvements included refacing and rewelding of welding rejects, changing the inner can wall penetration standard, and establishing different vibration techniques during the canning operation. Current plans call for making up the delayed May I & E production in June.

b. Manufacturing Yield - Solid Production

The manufacturing yield for solid fuel element production was 75.1 percent compared to 80.9 percent for April.

The thin wall reject rate increased from 0.3 percent to 1.3 percent in May. The increase was attributed to the thermal characteristics of the sleeves used during most of the month. When these sleeves were replaced by sleeves with 0.2 percent carbon content, the residual can wall thickness increased.

The canning reject rate increased from 1.7 percent in April to 4.0 percent in May. Contributing to this increase was the training problem associated with the reduction in solid and cored fuel element canning crew size.

In May the poor bond reject rate was 6.1 percent as compared to 3.7 percent for April. Most of the additional rejects were caused by braze layer impurities and brittle bonds.

The bad weld reject rate increased from 1.1 percent in April to 1.8 percent in May. The principle cause for the increase was the no preheat-double welding procedure which resulted in increased weld bead oxides. Because Tru-line and I & E fuel elements require the use of the double weld pass, the welding machines on one finishing line were so converted. Consequently, the bad weld reject rate has increased for all fuel elements fabricated on this finishing line.

In May the inclusion reject rate decreased to 3.2 percent from 4.2 percent in April. Void, marred surface, and miscellaneous reject rates varied little from the April experience.

c. Manufacturing Yield - Cored Production

The manufacturing yield for cored fuel element production was 73.9 percent as compared to 79.2 percent for April. The reject rates for thin walls in-

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c. Manufacturing Yield - Cored Production - continued

creased from 1.0 percent to 2.5 percent, for canning from 3.3 percent to 3.7 percent, and for poor bonds from 3.3 percent to 4.7 percent. These increases resulted from the same causes described above for solid fuel element production.

During the period when one cored fuel element lot was being manufactured, brass inclusions from the sleeve cleaning machine rails caused an increase in the inclusion reject rate. This resulted in an inclusion reject rate of 3.4 percent as compared to 2.2 percent in April.

d. Manufacturing Yield - Enriched Production

The manufacturing yield for enriched fuel elements was 82.3 percent as compared to 83.4 percent in April. Brittle bonds caused the only significant change from the previous month in the manufacturing yield.

e. Manufacturing Yield - I & E Production

The manufacturing yield decreased from 36.4 percent in April to 27.7 percent in May. Mechanical difficulties with the welding machines accounted for most of the increase in the bad weld reject rates from 3.2 percent to 4.4 percent for the outer weld and from 3.3 percent to 7.6 percent for the inner weld.

Canning line number 1 is controlled with a Flex-O-Timer system which has more flexibility and signaling devices than the control systems for the other canning lines. In the past, I & E fuel elements were assembled on canning line number 1. In order to release canning line number 1 for development work, I & E fuel elements were assembled on canning line number 6. Consequently the canning reject rate increased from 5.7 percent in April to 6.9 in May.

Small wrinkles in the internal can wall caused an increase from 0.2 percent for April to 1.1 percent for May in the mandrel reject rate.

Modifications were made to the internal bond and penetration tester which reduced the sensitivity to small wrinkles. As a result the internal thin wall reject rate dropped to 15.7 percent from 17.5 percent for April. Although the internal bond test reject rate increased from 7.8 percent in April to 9.8 percent, destructive testing failed to disclose abnormal amounts of porosity.

f. Manufacturing Yield - M-388 Production

During May, the first extensive - 25,600 pieces - production experience using aluminum alloy components containing 0.7 percent nickel (M-388 alloy) was obtained. A manufacturing yield of 73.8 percent was achieved for solid and cored uranium cores canned in M-388 components. During the preceding three day period, the manufacturing yield was 78.3 percent for solid fuel elements canned in standard aluminum components (1245 alloy).

The significant changes in the manufacturing yield were increased poor bond and bond test reject rates. These increases were associated with brittle bonding which was more severe when using the M-388 alloy components.

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g. Direct Labor Productivity

On May 24 Canning Crew "A" established a new production record by canning 5,307 pieces on 5 canning lines. This record is most commendable considering that the crew worked without any relief operators. Both crews combined their efforts on May 28 to set a daily record of 9,482 pieces canned. The canning crews worked at 98 percent efficiency to achieve these two production records. It is important to note that the establishment of these records required the teamwork of all persons working in the manufacturing plant. Not only must the canning crews assemble on every cycle, but also the component parts preparation crews must supply sufficient materials, the finishing and inspection crews must perform their functions so as to keep the production rolling, and the maintenance personnel must keep the equipment operating continuously.

h. Other Activities

During the month, the following Special Tests and Process Work Requests were completed in the canning facilities:

<u>PWR No.</u>	<u>Description</u>
231	To determine the lowest average canning bath temperature at which it is practical to operate utilizing the additional time for insertion allowed by this cycle (short pre-heat, long submerge).
276	To determine if the present lower weight limit for the core recovery process can be lowered to 7.80 pounds.
283	To evaluate can shipment prior to processing the remainder of the shipment.
PT-56A-86MT	Evaluation of low Hydrogen Dingot Uranium.
PT-80-A-91-FP	Evaluation of M-388 alloy jackets in semi-production quantities.
282	To determine the effect of core surface defects upon the bonding layer.
284	To determine effect of new sleeve material (1030 steel) on average residual can wall thickness.

At month's end there was a 0.4 month supply of bare uranium cores. A 1.1 month supply of finished fuel elements was available in the combined 100 - 300 storage area as compared to 1.0 month supply for April. This increase in canned inventory results from actual reactor charges being lower than forecast.

The following pieces were processed through the fuel element recovery process:

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h. Other Activities - continued

	<u>Pieces</u>
8" solid	37,848
8" cored	5,940
enriched	576
I & E	<u>5,613</u>
TOTAL	49,977

One shipment of 87,494 pounds of solid uranium scrap was sent to the National Lead Company during May.

3. Conversion Costs

May estimated conversion costs are about 15 percent higher than April actual costs because of lower manufacturing yields.

B. Plant Problems and Incidents

1. General

During May the operating efficiency was 91 percent which was 4 percent higher than the April experience. Equipment outages caused 41 percent of the lost time. Operational and process outages accounted for 59 percent of the lost time.

2. Bare Uranium Core Pickle Machines

The project for modification of the pickle machines from a spray to a dip degreasing process was completed in May.

3. Overhead Conveyor System

Components are delivered from the Component Parts Preparation area to the Canning area by means of the overhead conveyor system. As provided by Project CA-514 these nine conveyors were powered by three drive units. One drive unit supplied the power for three conveyors which delivered components to two canning lines. This arrangement was satisfactory for a four canning line operation, in that the standby set of two canning lines could be used in the event of failure of a part of a conveyor system. Also, the standby equipment allowed preventive maintenance work without causing production downtime.

The above described system was not dependable enough to supply the more efficient five or six canning line operations. In order to assure less conveyor downtime, less resulting production time loss and the use of a five or six canning line operation, six additional drive units were installed in May. Now each conveyor is individually powered.

4. Semi-Automatic Quench Machine

In January 1957 a study was made to determine if the 313 Building water flow was adequate for the simultaneous operation of five semi-automatic quench machines. Investigation disclosed that the water flow would supply only four quench machines. Modifications have been made to the water supply system

4. Sem-Automatic Quench Machine - continued

which increased water pressure in the quench machines supply line by about twenty (20) percent and provided adequate water flow for the simultaneous operation of five quench machines.

5. Electrical Power Outage

During the early morning hours of May 17 there was an electrical power outage which lasted for about $3\frac{1}{2}$ hours. No attempt was made to bail any furnaces. Instead, special channel rods were inserted in all Ajax furnaces. Metal temperatures dropped to about 500 degrees centigrade and the metal in the furnaces solidified. After power service was restored, the metal was brought slowly up to operating temperatures with no damage to equipment. One canning line was in operation at 8:30 a.m. and the remainder at 8:40 a.m.

Quick work on the part of Manufacturing personnel prevented a prolonged work stoppage. Had rods not been inserted in furnace channels before the metal solidified, it would have been necessary to suspend Manufacturing production activities, for possibly three to four weeks, while the furnaces were repaired and returned to service.

C. Operating Plans

1. Bare Uranium Metal Quality

Seams, striations, and grain size reject rates remained at less than one percent which is comparable with the past three months' experience. The bond test reject rate for first run fuel elements increased from about two percent to about four percent.

2. Asymmetrical Grain Size in Dingt Material

As a part of the uranium quality control program one fuel element core is taken from each lot for metallurgical and chemical analyses. One purpose of this testing is to determine if the grain size is typical of beta heat treated uranium and if the grain structure has uniform size around the longitudinal axis of the core. For one dingt lot, the tested sample showed a marked difference from one side of the core to the other. Three additional samples were tested and one exhibited the same structure. The entire lot has been withheld from the production stream.

3. Equipment Failure at Fernald

During the first two weeks in May, the Fernald rolling mill was shut down because of equipment failure. The mill was returned to service by May 13, after temporary repairs were made. Since the National Lead Company had on hand a large supply of rolled uranium rods, this shut down is not expected to affect seriously shipments to HAPO.

4. Residual Can Wall Thickness

A recently completed test indicates that the residual can wall thickness is affected by the rate at which the fuel element core is inserted in the can-sleeve assembly. By using a slower insertion rate, the average residual

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4. Residual Can Wall Thickness - continued

can wall thickness of test material increased about 20 percent. As compared to regular production, the thin wall reject rate for the test material was about 75 percent lower. Additional testing is planned in order to determine the effect of the slower insertion rate on oxidation of the braze layer.

5. Nine Canning Line Operation

On May 24 the Manufacturing Operation increased the number of canning lines from eight to nine. Increased reactor requirements for fuel elements necessitated this increase in manufacturing activities.

D. Employee Relations

Members of the operation were treated for 27 minor injuries for a frequency rate of 4.44.

The frequency of exposures greater than 300 mrad per two-week badge period was 0.0. The frequency of exposures greater than 200 mrad per two-week badge period was 2.0. The frequency of exposures greater than 100 mrad per two-week period was 13.0 compared to 8.0 for April. Increased handling of cored uranium fuel elements which have more nearly reached radioactive equilibrium and increased fuels recovery operation thruput are responsible for the change in exposure rates.

No security incidents or violations were reported in May.

II. PERSONNEL MATTERS

A. Visits and Visitors

K.E. Carpenter attended the National Convention of the American Society for Quality Control in Detroit, Michigan.

N. Olsen, A. VanVorst, A. Miller and J. Finley of the Aluminum Company of America visited the Fuels Preparation Department to discuss current and future requirements for aluminum components.

J.W. Nickolaus attended a Machinability Seminar in Schenectady, and visited the National Acme Company in Cleveland, Ohio to discuss equipment application with the Acme Machine Company.

R.E. Olson visited Mallinckrodt Chemical Works, St. Louis, Mo. and FMPC, Cincinnati, Ohio to discuss uranium quality.

B. Reports of Invention

T.B. Correy submitted a report of invention HWIR-816, for a machine welding torch for use in the inert gas shielded tungsten electrode arc welding process. (2-11-57)

C. Meetings

Members of the operation attended 15 information meetings, 24 staff meetings and 25 safety and security meetings.

D. Significant Reports Issued

1. Routine

<u>Number</u>	<u>Title</u>	<u>Author</u>	<u>Date</u>
HW-41288-RD	Monthly Production and Inventory Report Manufacturing Operation - FPD	HE Berg	5-6-57
HW-50070	Monthly Report, Quality Control Operation, Fuels Preparation Department, April 1957	KV Stave	5-1-57
HW-50113	Official Production Forecast, FPD May 1957 thru September 1958	HE Berg	5-6-57
HW-50136	Production Report - FPD - Manufacturing Month Ending April 30, 1957	HE Berg	5-8-57

2. Non-Routine

HW-50043	Uranium Quality Control Analytical Results	GB Hansen	5-1-57
HW-50098	Surface Dose Rate of Production Canned Uranium Fuel Elements	RO Budd	5-3-57
HW-50207	Uranium Cover for Cable Cladding	HE Berg & RE Olson	5-14-57
HW-50235	Five Year Operating Plan - FPD, 5-16-57	HE Berg	5-8-57
HW-50258	Request for Uranium Billets	HE Berg & RE Olson	5-20-57
HW-50260	Electrical Resistivity as a Function of Hydrogen Content of Uranium Metal	RI Miller	5-17-57
HW-50270	Tentative Specifications for Uranium Fuel Element Cores	RE Olson	5-20-57
HW-50346	Special Problems in Accountability for Enriched Uranium	RE Olson	5-22-57

III. ORGANIZATION

Effective May 1 the Inspection Operation was integrated with the Quality Control Operation and the Test Reactor Operation was transferred to the Finishing and Special Products Operation.

The former Quality Audit, In-Process Inspection and Final Inspection groups have been realigned into new groups called Quality Control Engineering, Quality Assurance, and Quality Appraisal.

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III. ORGANIZATION - continued

The primary purpose in realigning the work functions was to consolidate long-range quality control improvement and standards establishment in the Quality Control Engineering group and to place all responsibility for the short-range work of assuring and appraising the quality of the product in the other groups.

Manager-Manufacturing

WMM:RIB:rhs

8" CANNING REJECTS BREAKDOWN BY MAJOR CLASSIFICATIONS

LEGEND

SOLID 35

NOTE : - 1956 FIGURES
INCLUDE BOTH SOLID
AND CORED.

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ENGINEERING OPERATION

May, 1957

VISITORS

<u>Name</u>	<u>Company Represented</u>	<u>Contact</u>	<u>Date</u>	<u>Reason</u>
JL Michaelson	G.E. Gen. Eng'g. Lab.	HF Zuhr	5-31	Consultations
JF MacNeil	Nat'l. Lead Co. of Ohio	OW Rathbun	5-7/9-57	Discuss uranium fabrication
EB Basch				
E Noe	Nat'l. Lead Co. of Ohio	OW Rathbun	5-27/28	" "

TRIPS

	<u>Company Visited</u>			
SM Gill	FMPC, BMI	GW Wunder F Shober	5-21/24	Attend MDAC meeting
OW Rathbun	MCW, FMPC	JA Fellows WT Warner	5-27/31	Discuss uranium fabrication
JH Johnson	Stearns Mfg. Co.		5-2/3	Obtain info. on machining processes & techniques.
JT Stringer	Sylvania, Hicksville, N.Y. G.E., Schenectady, N.Y.	S. Roboff Mfg. Services	5-18/23	Fuel element technology
PH Reinker	Nat'l. Lead Co. of Ohio	GW Wunder	5-22/23	Attend MDAC meeting
	Sylvania, Hicksville, N.Y.	S. Roboff	5-20/21	Discuss fuel element technology.

PERSONNELTesting Methods

<u>Name</u>	<u>Title</u>	<u>Nature of Change</u>	<u>Date</u>
TW Cannon	Rot. Tech. Grad.	Transferred out	5-20

Drafting & Files

KC Kenoyer	Draftsman Trainee	Hired in	5-6
CJ Young	Gen. Clerk	Transferred in	5-20

Design & Projects

SG Forbes, Jr.	Sr. Engineer	Hired in	5-9
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PROCESS ENGINEERING

Regular Production Rupture Experience

Twelve ruptures occurred during the month in regular solid and cored production material. The classification of the ruptures was as follows: two split, five side hot spot, two cap failures, and three unclassified. The ruptures were distributed as follows: one in B reactor, one in D, two in DR, two in H, two in KE, and three in KW. One of the cap failures was similar to the type of cap failure experienced a year ago and is attributed to longitudinal growth in the uranium core. Two of the failures (in KE reactor) were in 1/2" cored material. The rupture frequency for the month was slightly lower than the previous month.

Cored Fuel Element Program

Approximately 242 tons (72,000 elements) of 1/2" cored material has been reactor charged to date on a variable goal discharge schedule of 600 MWD/T. Four ruptures have occurred in the 1/2" cored material. Preliminary results of an examination of three tubes of material sent to the 105-B examination facility indicates some evidence of radial cracking and elliptic shape similar to that observed in the 3/8" cored fuel elements. So far, there have been no stuck charges in 1/2" cored material but this may be due to the fact that most of the 1/2" cored material has been used in the larger annulus K reactors.

I & E Program

Irradiation of I & E fuel elements in C reactor continued without incident at specific powers of about 65 KW/ft. and a goal exposure of 800 MWD/T. An additional 65 tubes were charged during the month and 33 tubes discharged at goal exposure. About 465 tubes of I & E (11,500 pieces) have been charged to date.

Three tubes of enriched I & E and two tubes of solid enriched control pieces operating at average specific powers of 70-75 KW/ft. have reached exposures of about 870 MWD/T for the I & E and 800 and 570 MWD/T for the solid controls.

An initial test on a spool piece designed to mix the water flow in the hole and the annulus of the I & E fuel element has been carried out in one tube in C reactor. Temperature measurements made in a new tube and containing a column of I & E fuel elements with one mixer piece in the downstream portion of the charge indicates that the ratio of the top annulus temperature to the bulk tube outlet coolant temperature is about 1.2 as compared to 1.7 without the mixing piece.

Incomplete results on the analysis of post-irradiation measurement data on I & E elements exposed to goal and to 1900 MWD/T show no unusual or excessive dimensional instability. One I & E piece exposed to 1900 MWD/T has been sectioned in Radiometallurgy with results which show no evidence of internal core cracking or braze layer deterioration.

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Two thousand four hundred seventy-six C size I & E fuel elements were canned during the month in 313 Building with a yield of 35 per cent. Major causes of reject were internal penetration test (inadequate instrument), external and internal bond, poor bond in the welds, bad welds, and canning assembly rejects. Beginning on June 3, 313 Building will operate for two weeks on I & E production. The following changes will be incorporated into the process in an attempt to improve the yields: (1) vibration of cap-spire in the canning bath, (2) improved design of canning tongs, (3) rewelding bad welds, and (4) re-running penetration rejects using a 10 mil standard instead of a 20 mil standard.

Initial operation of the semi-works on C size I & E pieces revealed many minor process items which required correction before the semi-works could be used for process improvement.

Provisional Process Specifications for I & E Fuel Elements (HW-47289, Rev. 1) was issued.

Sylvania-Corning Hot Pressed I & E Fuel Elements

Arrangements were completed to procure from Sylvania-Corning Nuclear Corporation an initial lot of 1500 hot pressed "C" size I & E fuel elements. These fuel elements will be faced, welded, tested, and autoclaved at Hanford and used for out-of-reactor and possible initial in-reactor evaluation. Sylvania reports that by applying a very thin nickel plate to the cap-spire before canning, a consistently good bond is achieved at the closure surfaces. It is reported that this technique has improved the Savannah River yield of Sylvania elements through welding from about 75 to 95 per cent.

M-388 Alloy Program

Approximately 19,450 solid and 7,425 one-half inch cored fuel elements were canned during the month as part of the program to charge 25,000 M-388 clad fuel elements per month for eight months for evaluation.

The 5,000 M-388 clad elements previously charged in KE, C, D, and B reactor to compare the general corrosion of M-388 alloy with standard 1245 alloy have reached maximum exposures of 325 MWD/T in a run to goal exposure of 600 MWD/T. Two tubes alternately charged with 1245 and M-388 alloy in C reactor and operating at effluent water temperatures of 120 C have reached 460 MWD/T in a run to a goal of 600 MWD/T.

Examination of the solid fuel elements canned in M-388 and 1245 alloy and exposed in H reactor to 900 MWD/T, and which exhibited pitting and erosion on discharge, continued. Weight losses were slightly greater for the 1245 alloy pieces than for the M-388. No explanation has been found for the groove pitting in the M-388 piece in the furthest downstream position.

E-N Loads

Two failures, one solid and one cored, occurred in 6" long E metal (0.94% U-235) during the month at exposures of 781 MWD/T in the solid (split failure) and 841 MWD/T in the cored (unclassified failure). Examination of the discharged cored E pieces reveal gross amounts of ellipticity which is usually associated with internal radial cracking. These results coupled with the rather mediocre performance of the normal 1/2" cored uranium fuel elements is expected to lead to the specification of I & E geometry for E metal fuel elements.

MATERIALS ENGINEERING

Low Hydrogen Dingot Uranium

Two more lots of uranium fuel elements from low hydrogen dingots were canned during May. The AlSi bond layer porosity (bond test plus void reject rates) for this material, and for all low hydrogen dingot uranium canned to date, has been approximately equal to production ingot uranium canned during the same period (~2 per cent).

MCW has reduced the hydrogen in dingots by the use of combinations of the following:

1. Helium purging of the reduction bomb
2. Roasting of the MgF_2 bomb liner
3. Filming the Mg reductant with HF

Process (3) seems to show the greatest individual benefit. As a result of these developments and the satisfactory canning experience, the hydrogen problem with dingots is considered solved.

Centrifugally Cast Uranium

Four different groups, eleven pieces per group, of centrifugally cast uranium containing varying amounts of silicon and carbon (up to 2000 ppm of each) have been tested in the 305 test reactor. These tests were made to establish the maximum loss of reactivity that would be expected if relatively large and controlled amounts of silicon and/or carbon were used to control the as-cast grain size of uranium fuel cores. Results of the tests show k_{inf} values of -0.530 for the high silicon low carbon, -0.313 for the high carbon low silicon, -0.318 for intermediate amounts of both. Present production uranium averages about -.100 k_{inf} . This loss in reactivity would be tolerable in view of the probable reductions in current production costs that could be achieved by centrifugally casting I & E uranium fuel cores. This is because such pieces would require only a light grinding and/or reaming operation to finish to conformance with current HAP0 fuel core specifications.

Samples of these 48 test pieces are now being tested for physical and mechanical metallurgical properties.

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One hundred solid and 100 C reactor size I & E elements, centrifugally cast from typical production uranium (unalloyed) have been requested from FMPC. These pieces will be used in a preliminary reactor test to determine any gross difference between cast and wrought uranium during irradiation.

Other elements are also being considered as possible additions for improving the grain size, physical, and/or mechanical properties of centrifugally cast uranium.

Alpha Extrusion of Uranium

The Bridgeport Brass Company extruded no HAPO size uranium rods this month; a 100-billet hollow-rod extrusion is planned in June if development work with new mandrels is promising. The alpha extrusion program for FY 1958 is indefinite. The best yields thus far were obtained of the fourth solid extrusion. The inspection yield at FMPC was 94.5 per cent and the rods to good element yield was 75 per cent. This is comparable to the best yields obtained from rolled rods.

Solid cores from the third and fourth solid extrusions will be canned in June for an eight-tube production test. The tubes will be exposed to 300-700 MWD/T to evaluate the dimensional stability of the extruded cores.

Gamma Extrusion of Uranium

The fabrication of uranium in the gamma phase may have a randomly-oriented structure which will not require heat-treatment. Uranium alloys of chromium and silicon which inhibit grain growth have been cast at MCW. The alloys are scheduled to be extruded during the week of June 17. Alloys of zirconium and carbon which are also being investigated have not yet been cast.

Aluminum Components

Fifty cans and caps were received from Harvey, representing their first attempt to fabricate M-388. Although the testing of these components is not complete, the preliminary results have all been favorable.

Two thousand KER size end plugs were received as replacement for an earlier shipment that did not meet the material composition specified. This latest shipment did meet specifications, and brings to a close the last outstanding order that was a bottleneck to planned canning schedules. There are still some outstanding orders and some incomplete orders, but none of these are holding up any scheduled programs.

The Hunter-Douglas order for I & E components of M-388 alloy has been delayed until the end of June. This is the second delay caused by a lack of material, which is to come from Kaiser.

Alcoa has submitted eight can samples on the aluminum quality investigation. Each of these cans presumably contain a "prior defect", i.e., an ultrasonic indication of unsoundness in the 6" x 6" bloom stage. X-ray tests at HAPO

showed no residual defects. It is planned to test these cans ultrasonically and later to examine by incremental caustic dissolving.

Fuels Engineering Pilot Plant

Status of De-Bugging and Readiness for Operational Use

All critical items of equipment modification and general project de-bugging necessary to maintain a safe and dependable operation have been completed. A number of less critical items of this nature are not completed but will not seriously affect pilot plant operation. These are being accomplished as rapidly as possible with the limited availability of maintenance personnel. Approximately 50 man hours of overtime were scheduled during May for completion of critical work items.

Production Activities

Production activities during the month were directed mainly to shake-down of equipment, training of operating personnel and making necessary adjustments to conform to process standards in component preparation, canning, machining and welding process areas. Approximately 750 fuel elements were canned for this purpose. At the conclusion of these tests, Quality Control Engineering monitors approved all equipment and processing as being within manufacturing standards. On May 24 the first "E" size I & E fuel element (200) were canned for production purpose. These elements have not been completely processed as yet to establish an overall yield.

Development Activities

Eight process work requests involving 400 I & E fuel elements and 130 cored fuel elements were completed during the month.

1. Preparation (6) fuel elements for penetration standards.
2. Preparation of 120 fuel elements for one pass welding tests.
3. Preparation of 3 dummy fuel elements for display.
4. Preparation of 50 fuel elements to evaluate testing equipment.
5. Preparation of 40 fuel elements to evaluate cap vibration.
6. Preparation of 100 fuel elements to evaluate double cycle preheating of cores.
7. Preparation of 80 KER size I & E fuel elements.
8. Preparation of 130 KER size cored fuel elements.

Operation Planning

A pilot plant work request form similar to the Process Work Request form has been drafted and is being duplicated for trial use.

During periods that development activities are not in progress, fuel elements will be processed for production.

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New Equipment Development

Prototype ultrasonic cleaning equipment for caps and cans is being selected in cooperation with the Process Engineering and Testing Methods Operation. This equipment will have a production capacity suitable for the 306 Fuel Element Pilot Plant.

The film trays of the 306 fuel element pilot plant radiograph have been modified to accommodate xerox plates and the xerograph process is being developed by Process Engineering Operation.

TESTING METHODS

Process Fuel Element Testing

Very little assistance was required from Testing Methods this month in operation of the process nondestructive tests. Good progress has been made by Quality Audit in preparing synthetic penetration and unbond standards for calibration purposes. The Bondtesters can be set to distinguish consistently between 0.9 cm and 1.0 cm wide synthetic unbonds.

The 313 Building prototype I & E tester was not used this month. Several mechanical improvements have been made in preparation for the next production run.

I & E Fuel Element Testing

Both the Transformation Test and Bond-Penetration Test automatic conveyors in the pilot plant have now been operated under production conditions. The major mechanical problems have been the photocell positioning, excessive wear of the nylon gears, and erratic functioning of the indexing mechanism. Changes have been designed and are being effected to remedy these faults and improve the operation. The Transformation Test electronics have worked satisfactorily in testing about 1600 C size and 300 KER size elements. Several O size lots have been tested and retested on the Bond-Penetration Tester. There are some indications that the Bondtesters occasionally may reject an "undersize" void. Further circuit development is continuing to reduce this possibility and to make these circuits less critical to adjust.

The study of new probe designs to improve the internal penetration tester is continuing. A shielded probe showed little, if any, advantage over the present system and has been abandoned. A probe using the differential principle does give some promise for discriminating between Al-Si penetrations and deeper lying voids.

One hundred I & E "C" type spires were inspected inside and outside by an eddy current method. Radiographic inspection of these had not shown any significant irregularities. The eddy current test revealed one possible bubble. A definite depression was found on the outside, with an accompanying "bump" on the inside. This bump gave a signal nearly as large as that from a fabricated Al-Si penetration at 20 mils from the surface. This spire and three others giving smaller signals are being sectioned for metallographic examination.

A number of KER cored and I & E elements have been tested in the laboratory for bonding and penetration defects. Equipment is being assembled in the lab to facilitate further testing of small lots of odd-sized hollow elements. It is very inconvenient to test these with the 306 or 313 building equipment as it requires shutting down the testers to change probes and recalibrate.

Methods Development

Changes have been made in the design of the new prototype ultrasonic attenuation tester and the ultrasonic surface tester which are being fabricated so that certain components are directly interchangeable. This will simplify further development work with these tests and maintenance in the future.

A rough draft report of a preliminary study on individual fuel element identification, quality grading, and data processing has been completed and is being circulated for comments.

The copper and nickel plating thickness meter for the Plutonium Metallurgy group has been fabricated. Final calibration is underway and it should be ready for use in the next several weeks.

Hanford Test Reactor

Metal testing continued routinely and technical assistance was provided for several special tests. A compilation of all routine and special testing techniques is being prepared jointly with the operating personnel.

A prototype sub-critical neutron flux monitor is being fabricated. This is a slightly modified version of a design which has been developed by D.C. Pound. It will be used to assist certain special experiments and for added nuclear safety.

DESIGN & PROJECTS

Status of Projects

CG-646 - Modification to Pickle Machines: Work was completed and the equipment tested on May 15. The indicated financial under-run was \$7,900.

CG-713 - Conversion to I & E Lead-Dip Fuel Elements: The preliminary scope of modifications for this project has been developed and is being issued as HW-50208. Significant equipment alterations and additions will be confined to the finishing and recovery areas. It appears reasonably certain that the fundamental ground rules of production capacity, flexibility and non-interference of construction with production commitments will be met.

Discussion of the preliminary scope with Manufacturing is scheduled for June 10.

IR-210 - Oil, Paint and Solvent Storage Facility: Bid opening for a lump-sum construction contract is scheduled for June 4.

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CG-737 - Electric-Pneumatic Control System: AEC Directive HW-431 was received May 24. Detail design commenced May 27. This project will replace the present canning furnace timing system with one of improved flexibility and reliability.

Additional Steam Generating Capacity - 300 Area: The project proposal was forwarded to Contract Administration on May 29.

Evacuation Warning System - 300 Area: Study of the system was completed and informal request prepared during the month. The system will incorporate a centrally controlled building alarm system and two sirens, also centrally controlled. Estimated cost is \$11,000.

Additional Water Supply - 300 Area: Scoping studies were completed and the project is being estimated. The proposed project will consist of a 16" water line from the North Richland grid to the 300 Area, modification to the area grid system to supply water to PRPR and additional area storage capacity. The added storage capacity is required to meet AEC fire protection criteria.

Research & Development - Cable Cladding

Considerable discussion was held with O. G. Garner of General Cable Corporation during the month. Tentative agreement has been made for General Cable to clad 100 Hanford fuel elements in their Schloemann cable cladding press by mid-June. In arranging some of the details excellent cooperation was given by several HAPO operations, HOO, Sylvania Electric Products and SRL. A firm price quotation from General Cable is expected on June 30.

Documents Issued

HW-50154, "Fuels Preparation Department Semi-Monthly Status Report," J.W. Talbott, May 10, 1957.

HW-50208, "Conversion of Fabrication Facility to I-E Fuel Element Production - Preliminary Scope," A.J. Karnie, May 22, 1957.

HW-50304, "Fuels Preparation Department Semi-Monthly Status Report," J.W. Talbott, May 24, 1957.

HW-49754, "Project Proposal - Additional Steam Generating Facility - 300 Area," T.W. Gore, (dated April 15, 1957).

DRAFTING & FILES

306 Building: Prototype Ultrasonic Test Head - Miscellaneous As-Builts

313 Building: Cobalt Tester - 5 drawings
 Ultrasonic Test - As-Built - 9 drawings
 Revisions to conveyors, tools, welding machine, welding torch

384 Building: Numerous As-Builts
Proposed 6" water line
Proposed Condensate return

3717-B Building: Ventilation changes

Miscellaneous: 300 Area Steam Lines - Map
Water mixing Perfs
As-Builts
Proposed Fire Station
For Open House - 10 large charts, 58 signs

Drawings Produced

New	59
Revised	186
Small Charts	21
Large Charts	14
Miscellaneous	42

ADVANCED ENGINEERING

Economic Studies

Fuel and Reactor Survey

A rough draft of the Fuel and Reactor Survey was issued for comments. This document represents a broad review of the fuel element field, the competition presently existing in the fuel development field, and some of the possible trends the industry may take in the future. Some of the conclusions are:

1. Government will continue to control the direction of the industry through the expenditure of money, issue of licenses and control of essential materials and processes.
2. Future fuel element designs will evolve into three major types:
(1) production elements - solid or thick walled tubes of uranium in aluminum jackets, (2) power reactor elements - natural or slightly enriched uranium, uranium oxide, or uranium alloy in small diameter rods or pins jacketed in aluminum, zirconium, or stainless steel, and (3) mobile power reactors - flat plates of highly enriched fuel clad in zirconium, stainless steel, or aluminum.
3. At the present time there are at least 22 companies interested in one or more of the important phases of fuel element fabrication. With the market unable to support this number of fabricators, some adjustment appears reasonable. The more heavily invested companys include: Babcock & Wilcox, Sylvania, and Metals and Controls Corporation.

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4. In order to be competitive a fuel fabricator must be in a position to:
 - a. manufacture, test and develop a full range of products and services.
 - b. develop a process capable of producing high quality parts in several sizes and shapes to meet customer demands by a simple tooling change.
 - c. control of the basic raw materials.
 - d. competitive and efficient operation from a cost standpoint.

Analysis of Costs for Sylvania Canned Elements

Cost data provided by the Sylvania Electric Products Corporation and the AEC were analyzed to determine the cost to Hanford of SEP canned fuel elements. On a unit cost basis to HAPO, the SEP production is estimated to be 120-140 per cent of the cost of lead dip fuel elements assuming an 80 per cent yield depending on the uranium core costs. Assuming a complete conversion to Sylvania fuel elements at an annual production of 8000 tons, the added cost is estimated at \$3-4 million per year. Improved reactor performance in reactivity and conversion ratio would be required to offset this cost.

Analysis of Costs for Hanford Hot Press Process

A study of the capital and operating costs involved in conversion of HAPO canning facilities to the hot press process is being made. Costs are similar to those for lead dip canning with the exception of uranium costs. Higher scrap losses are expected for hot press cores due to increased tolerances. This increases the core cost an estimated \$0.15/lb or about \$1.20/piece. This added manufacturing cost may be offset by improved reactivity and conversion efficiency resulting from the increased amount of uranium possible through better control of can wall thickness.

Fuel Cycle Yields

A review was made of feed material plant capacity and yields, as part of the overall uranium cycle study. The yield from concentrated U_3O_8 to acceptable core ranges from 42 to 51 per cent and ingot to acceptable varies from 55 to 69 per cent.

Comparison of Fuel Costs - SRO & HAPO Power Reactor

Fuel costs for the HAPO Power Demonstration Reactor were compared to the Savannah River Power Reactor. The SRO reactor fuel element is a 14 foot tube of natural uranium clad with a 10 mil zirconium jacket and will be exposed to 5000 MWD/T. The net fuel cost is 2.5 mils per KW hr., with no credit taken for plutonium or depleted uranium since the elements will be "buried" after being irradiated.

Net fuel costs for the HAPO Power Demonstration Reactor were 1.10 mils per KW Hr. for the oxide element at 14,000 MWD/T and 1.38 mils per KW Hr. for the metallic element at 2,000 MWD/T.

Research and Development

Off-site Contracts

An interim contract with Battelle Memorial Institute for preliminary development of cable cladding for HAPO was issued. It covers the remainder of the fiscal year. BMI is preparing a formal proposition for work in this field during FY 1958. Negotiation of this proposal continues.

American Bearing Corporation submitted a development proposal for uranium washer fabrication using a casting technique claimed to have a uranium utilization of derby to acceptable washer of 85 per cent. Successful pursuit of this approach will constitute a significant breakthrough in the process economics of segmented fuel elements.

Investigation of other potential off-site development contractors continued.

HLO Program - FY 58

Preliminary discussions with HLO on the FY 58 Research and Development Program continued. A preliminary issue of programs and goals has been prepared.

Lithium-Magnesium Alloys for Tritium Production

At the request of J.C. Woodhouse of the duPont Company, a survey was made of post Hanford programs concerned with Li-Mg alloys. A literature search revealed Li-Mg alloys have not been irradiated at HAPO. Early in 1951, lithium-magnesium target elements were prepared for Hanford by KAPL but the program was terminated before an irradiation was accomplished. Mr. Woodhouse was placed in contact with D.W. Lillie of the General Electric Research Laboratory. Mr. Lillie is currently irradiating magnesium-lithium wires in the CP-5 reactor to study the effects of fission gases on metal properties.

Organic Task Force

The following is an interim report of the FPD representative on the subject task force:

A task force representing IPD, HLO, and FPD has been analysing the available technology relative to the use of organic coolants for a HAPO improved production reactor. The major areas requiring research and development effort include:

1. Reactor engineering and operations
2. Physics
3. Fuel elements

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The greatest uncertainties appear to be in reactor engineering and operations. Leak control, charge-discharge operations, and handling the flammable coolant at high temperatures appear to be the most serious. Organic coolants have several problems in common with high temperature water, for example the front and rear faces will be extremely hot, thermally, and insulation to reduce to temperatures suitable for direct maintenance and charge-discharge appear impractical.

Fuel elements do not appear to offer serious problems. The greatest uncertainties involve selection of jacket material and uranium swelling. Zirconium cannot be used with organics because zirconium hydride is formed at a rapid rate.

Both magnesium and aluminum appear satisfactory although each has potential limitations which must be evaluated before a final selection can be made. These are hydrogen permeability and jacket strength for magnesium and the uranium-aluminum interaction for aluminum. These limitations appear, at present, to be tolerable or to be amenable to circumvention.

Magnesium is the most attractive jacket material from considerations of both neutron economy and fabrication costs. The use of magnesium requires careful control of water and free hydrogen in the organic - both of which must be controlled for other reasons so the additional core required for using magnesium is probably minor.

The use of steel jackets does not appear necessary and would be less economical since the neutron absorption of iron is much higher than that of aluminum.

The extent of uranium swelling must be evaluated. Swelling may prove amenable to control; if not, proper fuel element design can probably compensate.

INVENTIONS

All Engineering Operation 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 May, 1957, except as listed below. Such persons further advise that, for the period therein covered by this report, notebook records, if any, in the course of their work have been examined for possible inventions or discoveries.

NONE

PH Reinker:mbs

P. H. Reinker
Manager - Engineering

FINANCIAL OPERATION

MAY, 1957

AUDITS AND PROCEDURES

Auditing - The General Electric Traveling Auditors' formal report covering their recent audit of the Department was received during the month. The report indicated a satisfactory condition without exceptions and was accompanied by three audit memorandums containing more detailed minor comments and suggestions.

A complete review of the Traveling Auditors' working papers was completed. Plans are to utilize this material as the primary basis for completing audits scheduled during the next two months.

Work was completed on the Audit of Management of Capital Assets and the report will be issued early in June.

A special survey was made of the usage and control of grain alcohol within the Department. Several suggestions for strengthening the procurement and storage controls were adopted.

Office Procedures - Representatives of the Financial Operation attended a demonstration by Data Processing on the use of their newly developed report generator system. This new development provides a method of rapidly extracting selected information from currently maintained stored data. Advantage of this new technique will be elimination of the previously required extensive programing to provide information for a single requester on short notice. Several profitable applications are foreseen within the Department as other information in addition to the presently available personnel data is accumulated.

Final arrangements were completed for processing daily time distribution cards starting with one maintenance organization. Cards will be summarized daily on an 884 IBM typewriter to prepare both a punched tape and a typewritten listing.

Additional work was performed in analyzing the manufacturing cost coding structure and improving the production time distribution forms prepared by individual employees.

Forms Control - The volume of forms orders continued at a substantial level and included nine new designs. Of particular significance was an ozalid master SS Materials Inventory form developed by the Supervisor - Materials Movement to replace two previously required forms.

Following is a summary of forms orders received:

AUDITS AND PROCEDURES (Continued)

<u>Classification</u>	<u>Orders</u>	<u>Quantity</u>
New designs	9	9 200
Revisions	1	100
Reviewed for first time	2	1 700
Reorders	<u>9</u>	<u>9 200</u>
Total	<u>21</u>	<u>20 200</u>

GENERAL ACCOUNTING OPERATION

Purchase Order Distribution - Beginning July 15, 1957, a new procedure for distributing purchase orders will be effected which will provide a better method of getting copies to interested personnel. The General Accounting Operation will receive an ozalid reproducible of all purchase orders of interest to the Fuels Preparation Department. A copy will be made and forwarded to each author and/or co-author. Each Operation requiring copies has been requested to notify General Accounting of their needs.

Payroll Cost Transfers - Under current procedures, Treasury Operation of RUO is assuming responsibility for balancing salary cost distribution with the weekly and monthly payroll disbursement letters for each department. Considerable difficulty is experienced in attempting to balance these accounts for the following reasons:

1. In instances where an employee is loaned to one department by another department, his salary is paid according to the organization code shown on his time card, but his salary is distributed on the IBM cost run to the borrowing department, based on the cost code shown on the back of the time card.
2. In instances where an employee is involved in an inter-department transfer, a delay in processing of records to change the IBM payroll master card often results in a two-week lag during which the salary is paid by one department and cost distributed to another.

Effective June 1, 1957, salaries paid by one department will be booked by the same department. The cost groups will then prepare a second class invoice and transfer costs to the appropriate department. This will enable Treasury Operations to disburse cash to all departments on the basis of each disbursement letter.

Assistance to Hanford - The approval letter for the FY 1958 Assistance to Hanford Program was submitted to Contract Administration for forwarding to the AEC.

This letter requests authorization of \$35,000 for FY 1958 for technical or consulting work and/or other special services to be performed by other General Electric Company components. Individual authorizations will be limited to \$5,000. Authorizations for work or services estimated to exceed \$5,000 will be individually submitted to the Commission and will not apply against the \$35,000 request.

GENERAL ACCOUNTING OPERATION (Continued)

Year End Closing - FY 1957 - A meeting was attended May 29, 1957 to review the proposed closing schedule. It is expected that the closing will follow generally the same pattern as that of previous years.

Travel and Living - Year-to-date expenditures and commitments for attendance at meetings of professional and trade societies amount to \$5,027 compared to a budget of \$5,200. No additional trips are planned for this fiscal year and an underrun of approximately \$175 will be experienced.

Expenditures and commitments for attending off-site training courses and seminars total \$1,853 through May. Inasmuch as no trips other than those currently in a commitment stage are anticipated this fiscal year, the \$2,100 budget is adequate. During May an additional \$300 was transferred to FPD from CPD, thereby making a total increase of \$800 to the original \$1,300 allocation.

Call letters requesting budget information for FY 1958 on attendance at meetings of professional and trade societies and off-site courses were prepared during May. Information from the field is being consolidated for review by Department management later this week.

Travel and living statistics are summarized as follows:

	<u>May</u>	<u>April</u>	Increase or (Decrease) over <u>April</u>
Travel Advanced to Employees:			
Balance at beginning of month	\$2 387	\$4 088	\$(1 701)
Advances to employees	3 404	3 052	352
Billing from other HAPO components	<u>2 727</u>	<u>2 642</u>	<u>85</u>
	<u>8 518</u>	<u>9 782</u>	<u>(1 264)</u>
Less:			
Travel, living and conference expenses reported by employees	2 958	5 525	(2 567)
Cash refunded by employees	931	1 740	(809)
Billings to other HAPO components	<u>328</u>	<u>130</u>	<u>198</u>
	<u>4 217</u>	<u>7 395</u>	<u>(3 178)</u>
Balance at end of month	<u>\$4 301</u>	<u>\$2 387</u>	<u>\$ 1 914</u>
Outstanding Travel Advances:			
Current	\$4 251	\$2 073	\$ 2 178
Outstanding over 15 days	<u>50</u>	<u>314</u>	<u>(264)</u>
Balance at end of month	<u>\$4 301</u>	<u>\$2 387</u>	<u>\$ 1 914</u>
Number of expense reports submitted	23	30	(7)
Number of Cash Advances	26	20	6

GENERAL ACCOUNTING OPERATION (Continued)

Reimbursements - The proposed summer session of the PBM-I Course was reviewed from a reimbursement standpoint and determined to be within the authorized limits of approval letter No. 70.

Documents reviewed from a reimbursement standpoint included 181 purchase requisitions and 167 work orders.

Organization and Policy Guides and Advices - Fifteen Advices were distributed to issuers and users during May for a scheduled six months' review. May activity for OPGs and Advices follows:

OPGs issued	6
Advices issued	1
Revisions issued	<u>19</u>
	<u>26</u>

OPG and Advice distribution lists were reviewed by each Operation and revisions incorporated to make the lists current.

Plant and Property Accounting - Property Accounting Documents Processed - Property Accounting Documents processed during May were as follows:

Excess Declarations	27
Property Disposal Requests	9
Plant & Equipment Transfers	6
Purchase Requisitions Reviewed	181
Commodity Codes Assigned	42
Tagging Requests Issued	12
Capital Work Order Closing	
Reports Issued	17

Appropriation Requests - The following Appropriation Requests were processed during May, 1957:

57-FP-31	Additional Metallographic Polishing Machine	\$ 2 735
	Assembly and Model L Camera	
57-FP-32	Boiler Feed Pump w/Electric Motor Driver	5 300
	for 384 Power House	
57-FP-33	Drill Press, Floor Mounted	1 600
57-FP-34	Collets and Collet Holders	1 800
57-FP-35	High Speed 16" Do All Metal Cutting	
	Band Saw	7 500
57-FP-36	Abrasive Belt Grinder Polisher	1 002
57-FP-37	Automatic Etch Machine Loaders	12 500
57-FP-38	Heat Recovery Equipment - Flash Tank and	7 500
	Heat Exchanger	
57-FP-39	Reader Process Enlarger Model REP-2 and Film	5 100
	Sort Card File Cabinet, Remington Rand	

GENERAL ACCOUNTING OPERATION (Continued)

Status of Equipment Funds - On May 24, 1957 the Financial Plan for Equipment Not Included in Construction Projects was reduced from \$392,000 to \$328,000, a decrease of \$64,000. Inasmuch as estimated expenditures and firm commitments at the end of June were \$17,000 in excess of this revised allocation, we requested and received approval to overrun by that amount.

Reconciliation of Uninstalled Equipment - A listing of items on record but not on hand, and on hand but not on record was forwarded to other HAPO components during the month. Replies are currently coming in which are aiding materially in the reconciliation.

Review of Depreciation Reserves - The review of Depreciation Reserves for Plant Accounts, started in April, has been completed. A final report noting changes will be issued in June.

Financial Closing - Project CG-703, Engineering FY 1959 Budget Preparation - The completion and cost closing statement was prepared and transmitted to Contract Administration during May.

Project 737, Electric Pneumatic Control System for Canning Area--313 Building - Directive No. HW-431 dated May 21, 1957 authorized FPD to manage this project and to incur costs in the amount of \$44,000. The work consists of replacing the present centralized air-switch control system used in the canning area of the 313 Building with a flexible electric pneumatic control system.

Excess Office Furniture and Equipment - A summary of items considered to be in excess by individual components was routed to all other components in the Department on May 8. The purpose was to insure fulfillment of all Department needs before turning these items into Office Facilities Operation, Relations and Utilities.

MEASUREMENT PROJECT

Distribution of the first portion of the Measurement Manual will be made to all level 3 and 4 managers and specialists on June 17, 1957. This distribution will include the binder, the Table of Contents, the Foreword and the section entitled Program Development. The section on Program Development describes the method of developing Objectives, Goals, Programs and Measurements. Subsequent sections will be distributed as they are completed.

Two meetings of the FPD task force on Productivity were held during the month. The task force will meet weekly until an acceptable productivity measure has been established for the Department. The task force is currently studying several examples of methods recommended by Measurement Services.

A Management Program Seminar for all exempt employees of Personnel Practices Operation was initiated the first of June. This seminar, which consists of six, two-hour sessions, is directed toward developing a better understanding of the use of Objectives, Goals, Programs and Measurements by the individual contributor as well as a manager.

MEASUREMENT PROJECT (Continued)

The first meeting of the Maintenance Measurement Task Force is scheduled for June 13. The purpose of this group is to study and develop better methods of measuring maintenance efficiency and productivity.

PERSONNEL ACCOUNTING OPERATION

Conversion of weekly payroll records from a punched card system to a magnetic tape system was completed during May. Adoption of magnetic tape procedures represents a further automation of payroll clerical functions. The manual clerical labor required to maintain punched card files has been entirely eliminated and control procedures have been simplified. In addition to these cost savings, the magnetic tape system has incorporated into it a feature which provides a method of economically and quickly extracting any specific set of statistical data without resort to extensive programing studies.

Data Processing Operation of Relations and Utilities advises that the magnetic tape system will also permit flexibility in report preparation. This means that our Operation can determine its own computing and report requirements without the necessity of integrating such requirements with the needs of other HAPO Personnel Accounting operations. Our Operation will therefore be charged for computing services requested by us and will not be required, as is presently the case, to assume a portion of the cost burden for services we do not specifically need. It is our understanding that this system of charging for computing services may be initiated in the near future and that charges will then be billed on a "per printed line" basis.

Initial steps have been taken to redesign the present payroll register. Our goal is to eliminate the twelve statistical reports presently required for recording and disbursing payrolls and to consolidate the same information into the formal payroll register. Elimination of these statistical reports will reduce our charges for computing services, reduce space requirements for record storage, and reduce clerical effort by concentrating several reference sources into a single document. Computing Operations personnel have advised that they will begin programing analysis on this revised payroll register immediately but have not stated an expected completion date.

New Salary Record Cards are being prepared for all exempt salaried employees. Present records reflect paid rates during certain periods and base rates during others. The new records, which should be completed by the middle or latter part of August, will reflect paid rates in all cases. Salary and Service Records (Form E-1102-D) for employees on position level 13 and above have been completed and forwarded to Messrs. F. K. McCune, W. E. Johnson, and L. L. German. Mr. German will be furnished this record for all exempt employees as they are completed.

Several previous reports have made mention of pending settlement of insurance claims covering fees charged by a certain chiropractor for "bloodless surgery." Full settlement of these claims was made by Metropolitan Life Insurance Company during May on the basis of the charges submitted. However, policy with respect to future claims of this nature has not been established.

PERSONNEL ACCOUNTING OPERATION (Continued)

Eighty-nine insurance claims for medical expense and weekly sickness and accident benefits were received and processed during May. No claims were on hand at the close of business May 31, 1957. Benefit checks totaling \$11,268 covering 93 insurance claims were received from Metropolitan and distributed to employees, hospitals, doctors, etc., during the month.

PRODUCT COST OPERATION

Cost Accumulations - April direct labor costs were allocated to products on the basis of canning line input, with added factors of cost for steps peculiar to I & E and Cored. Some revisions to the original instructions for coding direct labor have been issued, and the system in use now appears to be satisfactory.

Time distribution shown on weekly time cards for operating personnel was checked throughout the month. Any questionable codes or combination of codes were called to the attention of the operating supervision and corrections made as necessary.

A suggested coding system for FY 1958 that would accumulate costs by station or process was formulated and was submitted to the Specialist - Manufacturing Administration for consideration. A meeting is scheduled with him early in June to discuss this matter.

Meetings were held with personnel of Quality Control Operation to discuss a new report for their Operation. Details were worked out, and May costs will be reported on the new cost areas of Quality Prevention, Appraisal, and Failure.

A meeting was held with personnel of Data Processing Operation to discuss the feasibility of changing presentation of information on certain IBM runs. Basically the idea is to issue detailed runs weekly and consolidated runs monthly, which allows time to issue reports one to two days sooner.

All work routines in Cost Accumulations were reviewed to reduce repetitive routine calculations that are time-consuming and could be done in a simpler manner.

Inventories - Approval was requested and received from the Atomic Energy Commission to increase the inventory reserve for the forthcoming fiscal year. A percentage of 10% will be established instead of the 5% used last fiscal year.

The following aluminum components were considered obsolete and charged to reserve in the current month:

16106	Aluminum Cans	7-1/4"	\$ 6 304
40891	Aluminum Wafers	3/10"	4 421
800	Aluminum Wafers	1/10"	87
720	Aluminum Wafers	1/4"	87
			<u>\$10 899</u>

Salvage value of the above amounted to \$ 895

PRODUCT COST OPERATION (Continued)

In charging the reserve for the first cost less salvage value of the above items, the reserve account balance has increased to a debit balance of \$19,897. No additional charges are anticipated during the current fiscal year.

A physical inventory of Manufacturing Maintenance Shop stock was completed as of May 1, 1957. Material inventories were valued at \$12,887 and included items that will be applied to work orders in the future. The value of this type of material will be carried on the monthly operating report as a memorandum, showing beginning balance, receipts, issues, and ending balance. This procedure has been adopted for control purposes only and is not to be construed as a valuation account. A physical inventory of shop stock is currently in progress, covering Maintenance and Power Operation - Instrument and Electrical Maintenance. A physical inventory of shop stock is planned for Area Maintenance the latter part of June.

Recent revisions of the AEC Manual require a physical inventory of Special Materials twice a year, instead of once a year, as in the past.

Revised Product Cost Report forms have been submitted to Consolidations for approval and issue.

Budgets - A revised personnel estimate for FY 1958 and FY 1959, together with justification for increases, has been prepared. The revision incorporates the new production forecast and the decrease in dollar amounts from the budget as submitted to the AEC on May 1, 1957.

Cost Analysis - Direct material and direct labor standards have been revised and brought up to date. In addition, material standards have been developed for those products for which Tru-Line and M-388 and Tru-Line M-388 type components will be used. These material standards are based on current price quotations rather than prices being used to liquidate current essential material inventories.

Manager - Finance

WS Roe:whm

MAINTENANCE AND POWER OPERATION

MAY 1957

GENERAL

Material and Property

Declaration of Excess issued	5
Property Disposal Report issued	6

Productive Maintenance Program

Outstanding orders as of 4/22	111
Orders issued in May	56
Orders completed in May	60
Outstanding orders as of 5/22	107

The Cost Reduction Program realized a net annual saving of \$1,561 during the month. This brings the total annual savings to \$25,800, which represents 66% of the Quarterly Budget.

The Modifications to the heating and ventilating equipment in the 3717-B Building were completed. The changes eliminated the dirt problems associated with the previous installation.

There were 96 personnel reclassified from "Q" to "I" clearance status.

The Customer Relations Survey for the Instrument and Electrical Maintenance and Area Maintenance Operation was completed. Very good response was received from the individuals contacted as 46% of the questionnaires were returned entirely or partially completed.

The recommendations made by the committee from FPD, HLO and R&U Operations to modify the private vehicle parking lot to improve traffic flow and increase pedestrian safety have been adopted. Steps have been taken to obtain authorization to proceed with this work.

AREA MAINTENANCE

The responsibility for the 300 Duplicating and Mail Operation was assumed during the month. Duplicating statistics for the period covered are:

<u>PROCESS</u>	<u>NO. OF ORDERS PROCESSED</u>	<u>NO. OF COPIES MADE</u>
Multilith	763	331 222
Verifax	75	1 310
Ozalid	15	2 913
		<u>335 445</u>

Fifteen formal reports were prepared. These reports consisted of 2,436 volumes with 76,375 pages.

There were 18,724 pieces of mail processed by the Mail Operation during a five day period.

A section of the road leading to the burning ground was relocated to reduce the travel time associated with trash disposal.

A plumber has been assigned to routine rest room repair. This has resulted in increased utilization of manpower and improved servicing of these facilities.

The backlog of sheetmetal work has continued to increase. The new sheetmetal shear now in operation permits increased production which will reduce this backlog.

The installation of one 12,000 and two 6,000 cubic feet per minute air conditioning units to the 3703 Building was completed.

INSTRUMENT AND ELECTRICAL MAINTENANCE

The portable shop repaired 1110 portable radiation service instruments. These instruments were repaired at a new low average cost per instrument of 1.06 man hours per instrument.

The third set of temperature sensing elements for Project Whitney has been fabricated, calibrated and installed.

Revisions to the 12-fold counter in the 325 Building were completed. These revisions resulted in improvement in the instrument performance and reliability. In addition, two scintillation probes for monitoring clothing were added.

A complete electrical outage occurred on Friday, May 17, 1957. The outage extended from 12:49 a.m. to 4:35 a.m. The BPA 115 KV loop had been temporarily opened in Richland to permit a construction crew to install a new line. The inadvertent failure of one phase of the 115 KV line south of Benton Sub-Station disrupted the only remaining feed to the 300 Area.

The emergency generator was started manually approximately 30 seconds after the outage occurred. Automatic switchgear properly transferred the load to the emergency circuits in the 313, 325, 326, 327, and 329 Buildings. No significant losses were experienced as a result of the outage. Approximately four line hours were lost due to reduced power to the furnaces in the 313-B Building. This loss was anticipated in the original design of the equipment and emergency circuits.

Steel storage bins have been installed in the 3708 Building stock room. The inventory and reorganization of this stock room is complete. Inventories of all shop stocks in the laboratory area are complete. As a result of this inventory some obsolete equipment was excessed and arrangements were improved which result in improved stock control.

POWER

Power Statistics

	<u>MAY</u>	<u>APRIL</u>
Average Steam Generated (M lbs/hr)	32.4	43.5
Maximum Steam Generated (M lbs/hr)	56.0	62.0
Total Steam Generated (M lbs)	24 111	31 301
Coal Consumed (tons)	1 455	2 065
Evaporation rate (steam/#coal)	8.28	7.58
No. boilers on	2 3 2	
Date of change	1 30 31	
Sanitary Water from 3000 Area (Million gals.)	63.3	60.8
Total Water from 3000 Area (Average rate GPM)	1 417	1 408
Soft Water from #3 and #4 wells (M gals)	12.0	12.6
Water from #2 well (M gals)	.25	.30
Peak Water Consumption for 24 Hours (Million Gals.)	2.3	2.3

The increased evaporation rate of 8.28, as compared to 7.86 for May, 1956, is due to the use of Utah coal from the coal pile during the month. This coal was used for 18 days while the replacement coal crusher was being installed. The coal pile contained Utah coal with a BTU content of 13,000 BTU/lb.; the normally used Kemmerer coal contains 10,200 BTU/lb. The installation of the 3/4" coal crusher was completed on May 23, 1957, and also contributed to the improved evaporation rate.

The annual overhaul of instrumentation on No. 3 boiler was completed.

The mechanical overhaul to No. 5 boiler was completed. The grate dumping cylinders on this boiler were moved from inside the ash pits to the outside. This was done so that repairs to the cylinders can be made without taking the boiler out of service. This boiler was inspected by the third party inspector on May 14, 1957. His report indicated this equipment to be in good condition.

Screens have been installed in the over-flow lines between the settling basins in the north process pond. These screens will prevent plugging of these lines.

PLANT ENGINEERING

There were thirteen training lectures presented to the craft personnel of the Department. This represents 192 class manhours of formal training. Subjects covered in these lectures were: Electrical Theory; Operation and Maintenance of the Penetration Tester; Operation and Maintenance of the Sonotest Equipment; Recorder Calibration; DU Spectrophotometer; and Miller Welders.

A study of the utility requirements of the PRP Reactor has been completed. The requirements of this facility are 1500 gpm of sanitary water. In addition, the steam requirements for the PRP Reactor are 10,000 pounds per hour peak load for winter heating and 50,000 pounds per hour to operate their generator for emergency power. It was also agreed that Maintenance and Power Operation will supply 240KW of emergency electricity to this installation.

FIRE PROTECTION

Statistics

Fire Responses

HAPO	5	Loss	\$358
Construction	0	Loss	None
Private	0	Loss	None
Outer Area	0	Loss	None

Description of Fires

Fuels Preparation Department, 3703 Building, May 9, 2:52 P.M. Accidental alarm. Maintenance crew installing air conditioner system in attic evidently jarred the alarm system while hammering, causing accidental alarm. Loss - None.

Fuels Preparation Department, 313 Building, May 15, 5:37 P.M. A crucible filled with hot metal was placed in a waste lugger filled with oil soaked aluminum turnings. The heat from the hot metal ignited the oil and turnings. The fire was extinguished with a booster line. Loss - None.

Hanford Laboratories Operation, 327 Building, May 22, 10:38 A.M. An employee let an element slip from a pair of tongs into a Hypersonic Transducer containing a pint of alcohol. The element broke the crystal in the bottom of the unit and the alcohol ignited when it came in contact with the electrical wiring in the base of the unit. Fire scorched the front of the cabinet on which the unit was setting. Extinguished by a building employee with a 5# CO₂ extinguisher. Loss - \$10.

Hanford Laboratories Operation, 321 Building, May 31, 9:35 A.M. A pot, in Cell A, exploded and ignited the wooden scaffolding above the pot. The fire was extinguished with a 2½" line from Engine #3, using a fog nozzle. Uranium that had blown out of the pot was burning on the floor. This was extinguished by removing the fire from the material. After all the fire was extinguished, the building walls were washed down. Loss due to fire - \$348. In addition, there was a loss of \$9,598, which was due to explosion.

Hanford Laboratories Operation, 321 Building, May 31, 2:36 P.M. Accidental alarm when maintenance crews were re-setting the alarm system. Loss - None.

PERSONNEL MATTERS

Organization Changes

F. A. Leach assumed the responsibilities of Supervisor, Craft Training and Manual Writing, Plant Engineering Operation.

D. A. Hunsaker was promoted to the exempt roll as Foreman, Instrument Maintenance.

Safety, Security and Radiation Experience

Medical Treatment Injuries	-	14
Frequency Rate	-	2.99
Disabling Injuries	-	0
Near Serious Accidents	-	0

There were no cases of radiation over-exposure reported.

There were no security violations reported.

Meetings

Round Table - Staff	-	21
Safety and Security	-	33
Information	-	7

Reports of Invention

A report of invention was filed for A. F. Zettel, W-19455-4550. This report covered High Impedance Switch, Compression Type.

All other personnel engaged in work which might lead to new developments were contacted; no other inventions were reported.

Manager
Maintenance and Power

E. Hilgeman:JPF:pas

EMPLOYEE RELATIONS OPERATION

May, 1957

PERSONNEL DEVELOPMENT

The Department's first Professional Business Management-I course was completed by 16 participants at a dinner meeting on Tuesday, May 28 at the Desert Inn. The General Manager, principle speaker, presented the certificates. A second PBM-I course presentation is scheduled to start in June and a third in the latter part of August.

Two Communication Workshops were held for exempt employees during the month, and two additional workshops are scheduled for the fall. An average of approximately 16 participants are scheduled to attend each of the workshops in the current series. Comments indicate participants feel the program will be of definite assistance to them in their work.

Nine Manufacturing Operation employees and four Maintenance and Power employees were placed in the Manufacturing Personnel Inventory during the month, bringing the total to 28 Fuels Preparation Department employees in the Inventory.

Arrangements were made for the Manager-Area Maintenance to discuss a special "exchange" training and development program for craft supervisors with the Personnel Manager of the Boeing Airplane Company in Seattle.

The Manager-Drafting and Files was assisted in investigating the possibility of providing a Draftsman Training course through the Columbia Basin College.

Eight new exempt employees attended the Management Orientation in W-10 on Friday, May 17. Subsequently they completed their orientation through individual discussions with Department personnel.

One tech. grad. assignment was vacated during the month, leaving a total of seven assigned to the Department at month's end. A total of 8 tech. grads. have accepted permanent positions in the Department since September 1, 1956, seven since January 1.

To assist technical graduate's integration into community, copies of the "Richland Organization Directory" have been obtained for distribution to new tech. grads. and new direct placements.

Arrangements were made to issue an Advice covering the tech. grad. program patterned after an OPG on this subject issued by Relations and Utilities.

The Specialist-Personnel Development is arranging for a conducted tour of approximately 80 tech. grads. and college juniors through 300 Area facilities on or about July 22 as part of their HAPO orientation.

COMMUNICATION

Approval to conduct a 300 Area Open House was received from the AEC on Friday, May 10. The task force was immediately alerted and a meeting held that afternoon. In spite of the short time available for final implementation of tour plans, it was decided to hold the open house as planned on Saturday, June 1. The tour, which may be taken by employees and adult members of their families, will include 10 nonclassified buildings, as well as displays by both HLO and FPD.

Two Department publications were reviewed on request and suggestions offered for improvement. They were: a booklet on the 300 Duplicating Service, and a brochure on the Secretarial Compensation Plan.

Installation of the automatic collater in the Duplicating Shop was completed and Wage Administration established a classification of Reproduction B for this work. Union Relations was advised of this evaluation.

The job audits for all weekly jobs within the Engineering Operation and the Administration Operation of Maintenance and Power was completed. Recommendations were made to alter the duties of one job which carried a grade in excess of the evaluated worth of the work. The audit of the Administration Operation of Maintenance and Power was completed prior to reorganization of the group.

Job audits within the Financial Operation are well under way and as presently progressing, will be completed ahead of the audit schedule.

Wage Administration was requested to prepare a series of generalized job descriptions for use by Relations and Utilities in making a survey of jobs peculiar to the Atomic Energy Industry. The job descriptions were written covering the Metal Handler, Fabricator and Operator classifications, and the Engineering and Laboratory Assistant work within the Fuels Preparation Department.

All necessary action was taken to implement the April 29, 1957 cost of living adjustment.

Wage Administration job descriptions and related data were provided to the Atomic Power Equipment Department, San Jose, for their use in establishing job classifications. This information included detailed job descriptions of certain assignments, progression schedules and generalized descriptions of the Fuels Preparation Department production assignments.

Approval was received from the Atomic Energy Commission for use of the revised Drafting and Design rate structures. The approval which was effective April 15, 1957 was implemented in Fuels Preparation Department, and all employees affected have received job title changes and the benefit of the new rates.

Work has begun in preparation of a "Guide to the Secretarial Compensation Plan" which will be provided to all management in Fuels Preparation Department having secretarial employees reporting to them. Personnel Development and Communications have been asked for assistance.

Recommendations for the improvement of certain forms used by Wage Administration are being proposed by Fuels Preparation Department. The proposals are primarily directed toward improving the format and content of the "Recommendation for Payroll Status Change," "Notice of Automatic Increase," and "Records Transfer Forms."

Graphs were plotted on all FPD technically trained employees showing year of First Degree and Salary. This was prepared for comparison of General Electric with Engineers Joint Council.

A list has been made of those FPD exempt employees receiving increases to date. This list is segregated by operation, showing month and effective date of increase and percentage of increase. It will be kept up to date for ready reference and statistical reports for those authorized to receive this information.

One report form "Monthly Changes in Exempt Payroll" issued from Salary & Wage Records has been revised, and revision of "Salary Distribution Data" and "Distribution of Salaries by Levels" is in process.

GE News publicity devoted to Fuels Department activities and employees during the month totaled $156\frac{1}{2}$ column inches, an average of nearly one-half page per issue. This publicity included items on the handling of the 300 Area Open House, safety, suggestion award winners, employee promotions, and achievement of welding award by Maintenance and Power.

During the month five Management News Bulletin issues and two issues of the FPD Newsletter were distributed. A priority message on an explosion in an HIO facility was disseminated.

Two General Manager's meetings were arranged, one with the Management Information group and one with employees from the exempt group. Suggested material for discussion was developed for the General Manager for both meetings.

One paper was approved for presentation by a Fuels employee before the Richland branch of AIEE; one other paper was submitted to Public Communication for approval.

Assistance was provided the Manufacturing Operation in development of a fuel element display for the Press Tour held May 9, 10 and 13. Some rearrangement of the May 13 tour was necessary due to an emergency run in the 305 Building on May 13. The tour went smoothly in this building in spite of the rearrangement.

SALARY AND WAGE ADMINISTRATION

There were 7 positions audited during May. Excluding Level 2 and 3 Managers, fixed rate and vacant positions, 36 of the 106 positions have been audited or 101.8% on a monthly basis. A total of 38 audits have been completed of the 167 incumbents.

Individual charts showing the pay-performance relationships for the 32 first line foremen and supervisors were completed. These charts were an adaptation of ones now in use by other General Electric Departments, although our charts cover the history of the pay-performance relationship from the time of the current salary plan - January 1, 1955. Preparation of charts for all other exempt personnel is in progress.

An audit of the extent of knowledge held by exempt persons of the appraisal page 2 covering the current appraisal period was completed. This audit covered 110 exempt personnel.

Two organization changes were effective May 1, 1957. These were in the Maintenance and Power, and Manufacturing Operations. In conjunction with these organization changes, two new positions were established and three positions either retitled or evaluated to different levels. Two 4th Level Manager positions were eliminated.

Information obtained on the reconciliation trip concerning financial positions was summarized and transmitted to the Manager, Finance.

Samples of organization charts prepared by using a micro-elite typewriter and multilith reproduction were prepared and transmitted to the Managers, Employee Relations of Fuels Preparation Department and Relations and Utilities Operation for consideration. The method was rejected for the July 1, 1957 issue but will be considered for later editions.

HEALTH AND SAFETY

	<u>May</u>	<u>April</u>
Disabling Injuries	0	0
Serious Accidents	0	0
Medical Treatment Cases	43	50
Medical Treatment Frequency	3.26	3.88
Employee Hours of Exposure	131,935	128,920
Orientation		
Presentations	3	3
Attendance	7	18
Rotational Trainee Orientation		
One Hour Each	1	2
Inspections	14	8
Suggestions Evaluated	4	8
Medical Examinations Scheduled	91	80
Supervisors Training	6	4

Program Development

Pedestrian traffic and swing shift parking lot usage studies have been completed. Pedestrian traffic hazard exists primarily at shift change, and recommended action for control will include only constant emphasis to Department personnel of the need for care while walking in areas other than on regular walkways. Swing parking changes will not be recommended.

Accident Prevention Standards and Bulletins are in preparation for Fuels Preparation Department in a complete revision of the present Accident Prevention Bulletins.

HAPD Accident Prevention Standards have been distributed to all exempt personnel and a survey completed to determine management members who require this service.

Basic instruction in accident prevention was given to six members of supervision during May, and one rotational trainee was given an orientation covering the Health and Safety business.

The regular monthly inspection conducted by the Central Safety Council was completed on May 18.

All FPD employees have been presented with a copy of a safe vacation pamphlet entitled, "Your Policy To A Safer Vacation."

The subjects of safe vacations and safe driving are being emphasized by the Program Council through presentation of a topic of the month and a Department wide safety meeting scheduled for the first week in June. The Area Accident Prevention Committee has recommended that all management members make every effort possible to encourage personnel to strive for a safe vacation.

Activities

May activity included contacts on the following items: Eye protection, solvents ventilation, pedestrian traffic, exits, lighting, color coding, stair hazards, traffic control, air power tools, atmospheric contamination, work limitations, respiratory protection, walkways, publicity. guards, steam connectors, housekeeping, caustics, flammable liquids, disposal, crane hooks, clearance requirements,

sand blasting hazards, attic work, ladders, acid handling equipment, materials handling, barricades, power equipment, hoisting apparatus. production equipment safeguards, plumbing code, compressed gas equipment, tank car unloading, storage, railroad right of way, welding, safety showers, water line requirements, floor surfacing, lounge and rest room facilities, gasoline powered equipment, fork lifts, and foot protection.

FIRE PREVENTION AND CIVIL DEFENSE

	<u>April</u>	<u>May</u>
Fires and Investigations	0	2*
Building Inspections	43	32
Fire Protection Surveys	0	1
Hazard Reports Submitted	11	5
Orientation Program		
Nonexempt Employees	18	5
Rotational Trainees	1	1
Supervisor Training	3	6
Total Number of Presentations	6	4
Suggestions Evaluated	2	0

*The first fire loss in FPD property occurred May 13 when the contents of an exhaust duct in 313 Building ignited, causing a damage of \$210. The fire resulted when oil saturated aluminum lathe turnings were dumped into a recovery furnace. Flames entered duct causing the thin layer of soot to ignite. Following laboratory analysis of the residue in the exhaust system and an engineering study of the operation, a formal investigation was conducted to determine the corrective action necessary to prevent a recurrence.

Investigated a small fire in a trash lugger near 3722 Building which was extinguished with water from a building fire hose. The fire resulted when a piece of hot steel was dumped into the trash container. No damage resulted.

Investigated a fire in HLO Building 325 caused by spontaneous ignition of a bundle of five new floor mops obtained from GE Stores. Recommended to FPD Janitor Foreman that a survey be made of all mops in FPD buildings and that mops of this brand be discarded. Also arranged with R&U Safety Specialist to reject this brand of mop as a store stock item.

Program Development

Conducted the first training program on the 300 Area Evacuation Plan for 21 employees of Manufacturing Maintenance. The program will be continuous.

Presented fire prevention talk at safety meeting for 18 employees of Maintenance and Power.

General Activities

Supervised an operational test of 313 Building fire doors and submitted recommendations for closing a hole in fire wall in switchgear room and for completing the two new fire doors to conform with Fire Code Standards.

Concluded a study of recent high resistance grounds on the area fire alarm system occurring during the off-shift hours and submitted recommendations for emergency repairs when the ground conditions exceed 50 percent of the line voltage on either fire alarm loop.

Approved an Advice on Plant Evacuation and arranged for printing of the Area Master Evacuation Plan. Both will be distributed simultaneously upon completion of printing.

Issued welding permit for welding racks in a tank on cap and can machine #2.

Arranged for laboratory tests to determine the fire hazard of mixing diversy and methanol. Tests revealed the mixture ignited spontaneously. Recommended operating procedure be established to avoid this hazard.

By mutual agreement, relieved R. H. Scott of HLO during his two day absence from the Plant.

Supervised repairs to a leak in a Methanol tank car prior to unloading operations in the 311 Tank Farm.

Approved an oil storage facility outside of 313 Building.

Provided assistance and advice on the following subjects during the month: Roof design standards, air conditioning systems, fire alarm systems, fire detector coverage in 313 Building, proposed underground alcohol storage facility, grounding flammable liquid tanks, evacuation horns and devices, and laboratory fire hazards.

UNION RELATIONS

The canning line grievance submitted during April was the subject of 2 meetings with the HAMTC during May, both of which were considered to be Step II discussions of the grievance. It was anticipated that the Council would file an Unfair Labor Practice complaint against the Company following a Step II Answer which was forwarded to the Council on 5/31/57.

Four grievances received during May were filed in connection with the grievance procedure. Three of these grievances were submitted as an outgrowth of the reduction in the canning crews and were related to discussions concerning employees' failure to perform following the reduction in the canning crews.

Grievance Statistics:

A total of 13 grievances were received and 5 Step II grievance meetings were held. The following is a breakdown of the status of these grievances:

	UNIT	NONUNIT
Received this month	13	0
Received since 1/1/57 (see below)	34	0

Union Relations (Continued)

Step I			
Answer unsatisfactory	13	0	
Answer satisfactory	0	0	
*Pending time limit	0	0	
Settled this month	0	0	
Step II			
Discussed this month	2	0	
**Pending time limit	3	0	
Settled this month	1	0	

*Step I Grievances which Council indicated desire to discuss at Step II but not scheduled are considered settled at Step I at three months.

**Step II Grievances which Council indicated their intention to arbitrate but no further action taken are shown settled at Step II after three months.

Subject of May Grievances: (13 Total)

	Mfg. Oper.	Eng. Oper.	Majrt & Power	Empl. Rel.	Finan.
Grievance Procedure	3		1		
Responsibility	1		1		
Jurisdiction	2		1		
Transfer	1		0		
Wage Rates	1		0		
Seniority	0		1		
Overtime	0		1		

Subject of Grievances for 1957: (34 Total)

Jurisdiction	7	7
Overtime	3	1
Absence	0	2
Ratios	2	0
Hours of work	1	1
Seniority	1	1
Recognition	1	0
Grievance Procedure	3	1
Responsibility	1	1
Transfer	1	0

TECHNICAL PERSONNEL PLACEMENT

College Recruiting

F. E. Jochen's recruiting activities in the colleges and universities of his district during the past recruiting year have resulted in 70 program offers being extended by HAPO to BS-MS candidates in science and engineering. In addition, 10 were considered for direct placement. As of this date, 20 offers have been accepted, and no offers are open.

For the college recruiting year September 1, 1956 to September, 1957 to date, 28 rotational assignments from the Personnel Development Program have been made in the Fuels Preparation Department, resulting in 7 permanent assignments to the exempt roll, and 1 permanent assignment to the nonexempt roll, for a total of 8 permanent assignments.

Summer Program

The Fuels Preparation Department expects that its one college professor, one high school teacher, two graduate students, and three junior students will join the roll during the first two weeks in June to accept their Summer Program assignments which are now being prepared for them by their future supervisors.

Experienced, BS/MS Recruiting

Four technical or experienced personnel were added to the exempt roll this month making a total of 29 added from October 1, 1956 to date. This represents a 121% achievement on the roll in relation to requirements as forecast for the year October 1, 1956 to October 1, 1957 (including attrition allowance) pro rated for the first eight months covered by this forecast. In line with the adjusted manpower ceilings for the fiscal year 1958, F. E. Jochen is preparing a revised departmental technical and exempt personnel requirements report, covering the period of June 1, 1957 to July 1, 1958.

As a result of our advertising activities, 8 applications have been received, 7 for the engineering economist opening, which are now under consideration, and one for the electrical engineer or experimental physicist opening, who did not meet the requirements, and was "signed-off".

The Fuels Preparation Department has reviewed 6 referrals from APED, none of whom qualified for our openings, and 25 from IPD's Project Engineering exempt personnel available lists, who are still being considered for current FPD openings.

F. E. Jochen prepared and submitted a text on FPD job opportunities to E. E. Costello of Relations and Utilities, who is co-ordinating a project for a HAPO-wide publication on job opportunities for the experienced engineer and scientist.

Experienced, BS-MS Recruiting (9-1-56 through 5-31-57)

	Cases Con- sidered-FPD	Invitations - FPD				Offers - FPD			On The FPD Roll
		Ext.	Visited	To Vis.	Open	Ext.	Acc.	Open	
<u>Engineering</u>									
Chemical	43	10	7	0	0	8	6	1	6
Electrical	29	13	8	0	0	5	3	0	3
Mechanical	44	22	18	0	0	12	6	1	5
Industrial	9	4	3	0	0	2	1	1	0
Metallurgical	20	11	8	0	0	3	3	0	2
Civil	8	0	1	0	0	0	0	0	0
Geological	0	0	0	0	0	0	0	0	0
<u>Science</u>									
Chemistry	17	1	1	0	0	1	1	0	1
Physics	13	4	2	0	0	0	0	0	0
Mathematics- Statistics	5	1	1	0	0	0	0	0	0
<u>Other*</u>	<u>107</u>	<u>15</u>	<u>16</u>	<u>0</u>	<u>0</u>	<u>11</u>	<u>11</u>	<u>0</u>	<u>11</u>
Totals	295	81	65	0	0	42	31	3	28

*Included in the above statistics under "Other" are 7 FPD qualified, experienced non-degree people upgraded from the non-exempt roll, and 2 qualified, experienced persons transferred from other HAPO components to the FPD exempt roll.

PhD Recruiting (9-1-56 through 5-31-57)

	F P D			F P D	
	May	To Date		May	To Date
Cases Considered:	11	84	Offered:	0	1
To be interviewed:	0	--	Accepted Offers:	0	0
Interviewed:	1	20	On the Roll:	0	0

Terminations and Transfers

One exempt employee terminated employment with the Fuels Preparation Department during the month of May to transfer to ANP, Cincinnati.

Terminations and Transfers (Technical and/or Exempt Personnel), 9-1-56 through 5-31-57.

	<u>May</u>	<u>To Date</u>
TERMINATIONS	1	12
TRANSFERS TO OTHER COMPONENTS		
Requests Received	3	22
Completed Transfers	1	6*
Closed Cases	0	9
Active Cases	4	--
Dormant Cases	2	--

* Includes two transfers within HAPO

EMPLOYMENT

Unfilled Requests for Personnel 20

Personnel Requirements Cancelled 3

Employees Added to the Rolls 19

Employees Removed from the Rolls 14

Transfer Data (Concerns Requests for Transfer - FPD)

Total Requests for Transfer Active at Start of Month	51
Number of Requests Received	6
Number Interviewed	4
Requests for Transfer Effectuated in Month	6
Requests for Transfer Cancelled	0
Requests for Transfer Active at Month's End	51

Procurement

Offers	4
Interviews	6
Requests for Personnel	
Received	15
Transfers (All)	7
New Applications Received	7

Upgrades within FPD 9

Personnel Records

Letters to Outside Agencies Regarding Information 6

Perfect Attendance Recognition Awards 6

Service Recognition Pins 10 Year - 7 5 Year - 5

General

Arranged for 3 aptitude tests.

Supervisory selection interviews 8

EMPLOYEE BENEFITS AND SERVICE

Visits to Ill or Hospitalized Employees

Employees visited at Kadlec Methodist Hospital 5.

Pension Plan

During the month two employees retired:

CLYDE O. BECKHAM W-16132-4560 Normal Retirement

ROY WARNER W-9468-4560 Normal Retirement

Employee Benefits Plans

Participation in the Employee Benefit Plans as of the end of April and May is listed as follows by Department or Operation:

	Pension Plan		Insurance Plan		Savings & Stock Bonus	
	April	May	April	May	April	May
Fuels Preparation	99.7	99.7	99.7	*100.0	52.3	53.8
Chemical Processing	98.8	99.0	99.7	99.7	57.5	51.8
Irradiation						
Processing	99.3		99.7		60.4	
Hanford Labs	97.8		99.5		59.6	
Relations and						
Utilities	99.7		99.6		53.5	
Construction						
Engineering	98.9	98.9	99.7	99.7	68.3	71.8

* Insurance Plan May figure

Of two former non-participants who have applied for Insurance Plan coverage; one has been rejected by Metropolitan Life Insurance Company, therefore no longer eligible to participate and the other applicant has been requested to take a physical examination.

313 Building Tours

During the month 15 FPD employees and 5 employees from other HAPO Departments toured the 313 Building.

Selective Service and Reserve Statistics

Total number of non-veteran employees subject to military service training through Selective Service System Total 32

Number classified IA	15	Number classified 4F	<u>5</u>
" " 3A	5	Total	<u>32</u>
" " 2A	7		

Number of Technically Trained and Engineering Personnel for whom deferments are currently being requested 7.

One request for an occupational deferment concerning an engineer was made during the month.

Reservists Data - Total Number of Reservists on Roll 51.

Number of Ready Reservists	<u>35</u>
Number of Standby Reservists	<u>16</u>

Number of employees on military leave 3.

Suggestion Statistics

	Fuels Preparation Department		From Other Departments		Total	
	April	May	April	May	April	May
Received	58	42	19	15	77	57
Completed (all suggestions re- jected or all approvals re- ceived).	56	62	21	14	77	76
Adopted	9	25	0	0	9	25
Percent Adopted	15.5	40.3	0	0	13	33
Net Savings	\$124.10	\$7,501.95	0	0	\$124.10	\$7,501.95
Cash Awards	\$95.00	\$1,156.00	0	0	\$95.00	\$1,156.00
<u>Awards</u>						
Net Savings	77%	15.4%	0	0	77%	15.4%
No. referred to other Depts.	7	5			7	5
Suggestions Awarded	9	20			9	20

Cumulative Statistics
(Since 1-1-57)

Prior Backlog	165	167	10	8	175	175
Present Backlog	167	147	8	9	175	156
Received	220	262	72	87	292	349
Adopted	65	90	5	5	70	95
Net Savings	\$11,217.94	\$18,719.89	\$65.00	\$65.00	\$11,282.94	\$18,784.89
Awards	\$1,435.00	\$2,591.00				
<u>Awards</u>						
Net Savings	12.8%	13.8%				
No. outstanding to other Depts.	14	4				

SECURITY VIOLATIONS

There were no security violations during the month of May.

Manager - Employee Relations

END

DATE
FILMED

2 / 8 / 93