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HW--51782

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Monthly Report

FUELS PREPARATION DEPARTMENT

JULY 1957

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RM IEN 10-7-92

MONTHLY REPORT

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FUELS PREPARATION DEPARTMENT

FOR

JULY, 1957

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Compiled by

Fuels Preparation Department

August 9, 1957

Richland, Washington

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FUELS PREPARATION DEPARTMENT
MONTHLY REPORT SUMMARY FOR
JULY, 1957

MANUFACTURING OPERATION

Five hundred seventy-nine (579) tons of acceptable uranium fuel elements were produced which was eighty-nine percent (89%) of the 648 tons forecast in HW-50113RD.

The tenth canning line was added on July 31, 1957.

A new high in total production was established.

The manufacturing yield for I & E fuel elements was 40.5 percent in July compared to 22.0 percent in June.

At month-end there was a 0.7-month supply of bare uranium cores in storage. A 0.8-month supply of finished fuel elements was available in the combined 100-300 storage area.

During July the operating efficiency was 88 percent which was 2 percent better than the June experience.

ENGINEERING OPERATION

Eight ruptures occurred in July. All were in normal uranium solid elements. Five of these were classified as side hot-spot failures, bringing total failures of this type to 13 for a 3-month period. Preponderance of these failures indicate that substantial improvement can be expected by utilizing elements of greater corrosion resistance. Large scale charging of M-388 clad, blunt-nose, Tru-line elements will start in August or September. It is expected that this program will alleviate the side hot-spot failure problem.

Irradiation of I & E fuel elements continued without incident. A significant increase in the charging rate at C reactor will start in September. Complete I & E loading in C reactor is expected before year's end. Ten M-388 clad, self supporting, massive I & E elements were charged at KER during July. IPR size massive I & E elements and stainless steel jacketed clusters are scheduled for KER charging in mid-August. Charging of I & E washer elements have been delayed pending more complete evaluations.

Several new techniques were adopted in 306 Pilot Plant which improved I & E yields materially. Translation of certain of these methods to 313 Building production resulted in 10% to 20% improved I & E yields through autoclaving. Part of the betterment of Pilot Plant yields was due to improvements in testing equipment reliability. All types of testing equipment are now operating satisfactorily with the exception of the internal Al-Si penetration tester. A two frequency system and a multiphase differential probe have been devised to reduce "false" rejects because of extraneous signals. A combination of these techniques is being evaluated with the objective of improved penetration testing.

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ENGINEERING OPERATION - continued

A two layer thickness gauge has been developed and a prototype is being built. This unit utilized the position of spots on a cathode ray screen to simultaneously indicate the thickness of nickel and aluminum on uranium. Fabrication of a new prototype ultrasonic attenuation and surface tester for uranium is underway. This should be ready for testing in August. Demonstration of ultrasonic cleaning equipment in vendor laboratories has indicated it may provide improved and cheaper cleaning of fuel element components. Evaluation is continuing.

One hundred solid and 100 I & E centrifugally cast fuel cores have been metallurgically evaluated. These will be canned in August for reactor charging. One hundred fuel cores, cable clad by the General Cable Company were received, tested and evaluated. The cable cladding process continues to show promise warranting additional development. It is planned to clad additional cores using preheated uranium if arrangements can be completed with the General Cable Company. Close contact is being maintained with Argonne National Laboratory and Battelle Memorial Institute regarding the status of their uranium mono-carbide programs. Work at these sites is of considerable interest to Hanford since many of the questions regarding the use of uranium mono-carbide as fuel elements may be answered. While no immediate work is planned at HAP0, results of their studies will be considered in the planning and specific direction of fuel element development programs at Hanford.

A revised proposal and revised scope for the conversion of 313 Building to I & E production have been forwarded to the AEC. Changes are in accordance with requirements of official production forecasts.

MAINTENANCE AND POWER

The Cost Reduction Program realized a net annual saving of \$16,863. This represents 76% of the quarterly budget for this Program. This saving was the result of the reclassification of 219 people in the Operation from "Q" to "L" clearances.

Building 3701 was transferred from Hanford Laboratories Operation to the Department during the month.

The first HAP0-wide Maintenance Management meeting was held on July 17. The subject of the meeting was "Union Relations" and R.E. Donnell of Relations and Utilities Operation addressed the group.

EMPLOYEE RELATIONS

The second series of the course "Understanding People" was completed during the month. Total participation in this course during 1957 has been 153, approximately 83% of the exempt employees of the Department.

A reading improvement course was organized through the Richland Public Schools' Adult Education night school with classes beginning July 29.

Nine grievances were processed during the month. Five involved jurisdiction, two concerned overtime and two involved the transfer procedure.

EMPLOYEE RELATIONS - continued

An answer to the Unfair Labor Practice Charge before the NLRB which arose out of the canning line crew reduction was submitted to the NLRB July 11, 1957. The approach in answering the charge was to develop a detailed and factual story of significant changes in the canning line process achieved since 1953. The notice received from the Council of intent to arbitrate this matter failed to cite the article of the contract alleged to have been violated. The Company has since requested the Council to advise the Company of the specific provision of the contract through which it is seeking relief through the grievance and/or arbitration procedure.

On July 26 discussions were held with the HAMTC regarding the establishment of a Craft Training Program for both journeymen and trainees. The Council indicated concurrence with the proposed arrangement.

The Department continued to operate without a disabling injury. There were no serious accidents or fires during the month. The medical treatment frequency rate decreased from 3.64 in June to 3.44 in July.

There was one security violation during the month.

FINANCIAL OPERATION

Audit was completed and formal report issued on Management of Capital Assets. This completed the audit program for FY 1957 as agreed upon with AEC.

Measurement Report covering FY 1957 was completed and issued on July 25.

As of July 31, 1957, reconciliation of uninstalled plant and equipment with property records is complete and records are being processed through the IBM 702 machine. IBM listing have been furnished each property custodian covering property for which he is accountable.

PERSONNEL STATISTICS:

Number of employees June 30, 1957	784
Number of employees July 31, 1957	795

<u>OPERATION</u>	<u>EXEMPT</u>	<u>NON-EXEMPT</u>	<u>TOTAL</u>
General	1	1	2
Manufacturing	71	306	377
Maintenance and Power	40	235	275
Engineering	43	28	71
Financial	16	24	40
Employee Relations	16	14	30
TOTAL	187	608	795

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FUELS PREPARATION DEPARTMENT
MANUFACTURING OPERATION

July, 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	525	7	-	12	35	579
Produced (Tons)						
As % of Forecast Production	98	-	-	92	87	89
As % of Past 3 Months'						
Production Average	123	700	-	171	318	117
As % of Past 12 Months'						
Production Average	122	350	-	200	500	121
As % of June, 1957 Goal						98
As % of June, 1958 Goal (500						
MWD/Ton)	190	-	-	30	17	86
As % of June, 1958 Goal (750						
MWD/Ton)	525	-	-	48	12	129
% of Forecast Achieved - Last						
Fiscal Quarter	100	13	81	75	39	93
% of Forecast Achieved - Last 4						
Fiscal Quarters	105	36	85	66	42	100
Production Adjusted for In-Process						
Inventory						587
<u>Operating Efficiency</u>						
Current Month (%)						89
Forecast (%)						90
Previous Month (%)						87
<u>Manufacturing Yield</u>						
Current Month (%)	82	80	-	82	41	
Forecast (%)	81	83	-	84	58	
Previous Month (%)	81	85	77	85	22	
Bare Uranium in Storage (Tons)	175	6	122	10	130	443
Canned Uranium in Storage (Tons)	365	11	74	15	45	510
Uranium Utilization (%)						95
Special Products Canned						None
Special Products Finished						None

2. Activities

a. Production

During the period of July 1 to July 30, inclusive, the Manufacturing Operation worked on a two-shift basis with five canning lines for "A" shift and four canning lines for "B" shift. On July 31 the Manufacturing Operation worked on a two-shift basis with 5 canning lines on each shift and will continue this operating schedule during August. Five hundred seventy-nine (579) tons of acceptable uranium fuel elements were produced which was eighty-nine (89) percent of the six hundred forty-eight (648) tons forecast in HW-50113-RD. Variance from forecast resulted from:

- (1) Operating efficiency which was one (1) percent less than forecast.
- (2) In the forecast, the Manufacturing Operation had scheduled start-up of the 10th canning line for July 15. However, in June the reactors did not charge the amounts anticipated and this caused a build-up in the finished fuel element inventory by July 1. For this reason, the start-up of the 10th canning line was postponed until July 31 and is the primary reason for the variance between the quantity forecast and produced.

While the total production was below forecast, it did establish a new record which topped the previous high of January, 1957.

b. Manufacturing Yield - Solid Production

The manufacturing yield for solid fuel element production was 82.2 percent as compared to 81.4 percent for June.

The thin wall reject rate decreased from 0.9 percent in June to 0.5 percent in July. This improvement is attributed to a new lot of sleeves which were placed in service.

Elimination of caustic pitting and AlSi chip carryover reduced the miscellaneous reject rate from 4.1 percent in June to 2.6 percent in July. These improvements are the result of recent modifications to the sleeve cleaning machine number one.

In July the canning reject rate was 1.4 percent as compared to 2.3 percent in June. The July canning reject rate is comparable to that obtained in the first quarter of calendar year 1957. This improvement indicates that the difficulties resulting from the reduction in solid fuel element canning crew size have been overcome.

An increase in the inclusion reject rate from 2.4 percent in June to 4.3 percent in July was attributed to the use of sleeve cleaning machine number two. Brass inclusions from the sleeve machine rails were the main source of trouble. Plans call for replacing these brass rails with stainless steel rails and modifying the machine to the water-hot soap rinse process of sleeve cleaning machine number one.

b. Manufacturing Yield - Solid Production - continued

The bad weld reject rate was 1.5 percent as compared to 1.8 percent in June. Currently a full-scale comparison test is being made of the double pass and the preheat-single weld pass techniques. If the reject rate for the former is equal to or less than that of the latter, then the double weld technique will be incorporated into the standards. Such a change will increase both production capacity and versatility of the welding equipment.

In July the poor bond reject rate was 3.4 percent as compared to 3.9 percent for June. A more uniform inspection level resulted from review of written and visual standards with the inspectors.

Void and marred surface reject rates varied little from the June experience.

c. Manufacturing Yield - Cored Production

No cored fuel elements were manufactured during July.

d. Manufacturing Yield - I & E Production

During June and July, extensive I & E process tests were made in both the 313 and 306 Buildings. By applying the new knowledge and techniques gained from these tests and by better control of canning and finishing variables, there has been marked I & E yield improvement, with more improvement expected shortly.

The yield for I & E fuel elements was 40.5 percent in July compared to 22.0 in June and 27.7 percent in May. Improvements were noted in all reject categories except external bond test, voids, and inclusions.

The increase in the inclusion rate from 1.3 percent in June to 5.0 percent in July was due to brass particles. (See discussion under solid fuel elements above.)

In order to meet I & E production commitments, a change was made from 1245 to M-388 (1% Ni) components on July 19. Use of the M-388 components resulted in processing difficulties during the canning operation that had not been experienced with 1245 components. AlSi penetration of the cap spire, wide male braze lines, and thin inner tube walls reduced manufacturing yields to autoclaves. Extensive process tests resulted in new knowledge and techniques which were applied to the process. As a result, by month end yield of fuel elements canned in M-388 components was comparable to those canned in 1245 components.

e. Manufacturing Yield - Enriched Production

The manufacturing yield for enriched fuel elements was 82.4 percent as compared to 84.7 percent in June. Both six inch solid and cored enriched fuel elements were processed. Individual reject categories showed fluctuations similar to those of the solid fuel element production.

f. Manufacturing Yield - Depleted Production

During July the manufacturing yield for depleted uranium elements decreased to 79.5 percent from 84.8 percent in June. Length control problems during the facing operation caused an increase of 2.4 percent in the miscellaneous reject rate. Most of these fuel elements were sent to Reprocess Storage for refacing. Bond test rejects increased by 2.2 percent. Other reject categories were similar to the solid fuel element experienced for July.

g. Direct Labor Productivity

In the past, the Manufacturing Operation has been reporting direct labor productivity statistics in pieces per man-hour of direct labor. Due to the fact that these statistics are not available prior to the monthly report deadline, they are no longer included herein. However, direct labor productivity statistics will continue to be reported in the Manufacturing Operation Measurements Report.

h. Other Activities

At month's end there was a 0.7-month supply of bare uranium cores in storage which is above optimum level. The extra metal was provided as a contingency during labor contract negotiations at National Lead Company this fall. A 0.8-month supply of finished fuel elements was available in the combined 100 - 300 storage areas as compared to 1.0-month supply for June.

The supplies of Tru-line and cored fuel elements, which have been idle in the inventory for the past several months, began to move again during the latter part of the month. To date, none of the material canned in M-388 components during May has been charged into reactors. Considerable effort is being made to get these special products moving in order to allow a more efficient use of finished inventory and to prevent shortages of regular finished fuel elements.

No Process Work Requests were completed during July.

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

	Pieces
8" Solid	30,156
8" Cored	744
6" Solid (enriched)	495
6" Cored (enriched)	907
I & E	14,696
TOTAL	46,998

Three scrap shipments were made to the National Lead Company containing 127,885 pounds of solid uranium scrap, 8789 pounds of uranium in C-6 scrap, and empty uranium core containers. (Some turnings and oxide were also shipped for Hanford Laboratories Operation).

3. Conversion Costs

Conversion costs for solid and enriched fuel elements are estimated to be comparable with June actual costs.

In past months, a portion of Product Engineering Costs and Expenses (P.E.C.E.) was distributed to products on the basis of direct labor and the remainder of P.E.C.E. were charged directly to products. Starting in July all P.E.C.E. will be distributed on the basis of direct labor. This change is expected to reduce I & E conversion costs by seventy (70) percent.

B. Plant Problems and Incidents

1. General

During July the operating efficiency was eighty-nine (89) percent which was two (2) percent better than the June experience. Equipment outages caused fifty-five (55) percent of the lost time. Operational and process outages accounted for the balance.

2. Canning Furnace Failure

On July 16, the induction coil blower for Ajax furnace 1-D failed. This caused overheating of the induction coil and the furnace was shut down. When start-up of the furnace was attempted on the following day, there was an AlSi penetration through the lower channel to the copper bushing around the induction coil. The furnace was removed from the line for repairs and replaced by a furnace from the recovery area. Extensive investigations are being made to:

- a. Determine the exact cause of the Ajax furnace 1-D failure.
- b. Revise operating procedure for furnace care when various types of failures occur.
- c. Provide a different start-up procedure which will prevent liner failures during start-up.
- d. Develop a method of testing the liner condition while a furnace is in operation.
- e. Evaluate materials which may be better than those used currently for furnace repairs.

3. Cap and Can Cleaning Machines

The #2 Cap and Can Machine degreasers have been modified to improve flexibility and effectiveness. Initial tests of the modified installation have shown that the cleaning is superior to any system used previously.

During a one-month test period optimum degreaser operating conditions will be established. After the completion of the test period, action will be initiated to modify the degreaser system on the #1 Cap and Can Machine. Because of the time required for the procurement of equipment and material the modification of the degreaser on the #1 Cap and Can Machine will be completed about December 1, 1957.

B. Plant Problems and Incidents - Continued

4. Zig-Zag Conveyor Shielding - Distribution Table Area

The shielding under the fuel element conveyor at the distribution table consisted of 16 gauge flattened expanded metal, reinforced with 1 x 1/8 inch angles with a few cross members of the 1 x 1/4 inch bar. Both the expanded metal and the light bar angles were too small for this application. Carriers of fuel elements which accidentally spilled on the shielding bent the cross members. Occasionally the fuel elements penetrated through the expanded metal. Because of the safety hazard the shielding was replaced during June with stronger materials. The 16 gauge flattened expanded metal on the bottom of the shielding was replaced with 3/4-#9 Standard expanded metal, the 1/8 inch thick bars were replaced with 1/4 inch bars and 1 x 1 x 1/4 inch angles were added to the outside edge, the bottom and sides. These revisions should provide sufficient strength in the shielding so that fuel elements which fall off the conveyor will not penetrate through the mesh.

5. Cast Canning Baskets

New cast canning baskets have been received from Electrical Steel Foundry Company. One assembly has been placed on a furnace along with a standard canning basket. Tests indicate that performance of the new cast basket is equal to standard equipment.

Design of the new cast basket provided a quick-change feature which is expected to reduce change-over time. Further testing will be done before the final decision will be made as to the use of this type of basket.

6. Horizontal Duplex Basket

A duplex basket which holds the fuel elements horizontally during agitation was designed by the Manufacturing Operation and tested in the 306 Building. Horizontal agitation provided by this basket was expected to increase the flow of metal through the center of the I and E fuel element, thereby improving the heat transfer and the bonding. A short run of forty recovered fuel elements was canned. Bonding between the can and core was superior to any which had been canned previously. Normally, recovered pieces will have better bonding properties than virgin material, so this test in itself was not as significant as desired. Therefore, two hundred pieces of virgin metal were canned using the horizontal agitation. Results indicated that significant improvement might be achieved through the use of horizontal agitation. Because of these findings, the design for an improved model of the horizontal agitator was released to the Minor Construction Shops for fabrication. The agitator will be completed during the third week in August and subsequently installed in the 306 Building semi-works for further testing.

B. Plant Problems and Incidents - Continued

7. Thulium Source Radiograph Machine

The I and E fuel element requires welding on its outer periphery on one end and on the bore periphery on the other end. The weld on the outer periphery can be radiographed for inspection by established X-ray methods. The location of the bore periphery weld makes it difficult to radiograph by conventional methods. To solve this problem, use of a radioactive source mounted on a probe and inserted into the bore was investigated. Prototype equipment was designed. Fabrication was completed during July. Approximately 500 interior I and E welds have been radiographed with this machine and only small voids have been discovered. Currently the machine is being used by the Engineering Operation for further testing.

C. Operating Plans

1. Bare Uranium Metal Quality

Metal quality reject rates for seams, striations, and grain size remained at approximately the same level as the past four months. An upward trend in the hydroxyl content of the Fernald beta treating salt bath resulted in slight increases in porosity rejects.

2. Cans Extruded from Cast Blanks

As a possible means of reducing aluminum can costs, Alcoa requested that cans extruded from cast blanks be evaluated for use in fuel element manufacture. Use of cast blanks would permit complete fabrication at Alcoa's Edgewater plant and eliminate the higher costs of rolling aluminum rods at Alcoa's Messina plant. Examination disclosed that the as-cast grain structure is not upset sufficiently during extrusion to provide a metallurgically sound structure of the can base. For this reason further evaluation was discontinued.

3. Ten Canning Line Operation

On July 31 the Manufacturing Operation increased the number of canning lines from nine to ten. Increased reactor requirements for fuel elements necessitated this increase in manufacturing activities.

4. Production Forecast

A revised production forecast, HW-51698-RD, dated July 29, 1957, calls for five (5) percent more reactor requirements (160 tons) during the first half FY-1958 than was scheduled in the previous forecast. A portion of this (80 tons) was due to rescheduling material from the second half of FY-1958. Plans call for starting the 11th canning line on November 4 in order to meet reactor requirements. Production activity is expected to continue at this level for about 2 years.

Cored production is scheduled to be discontinued after the 130 tons in bare storage have been processed. During FY-1958, I&E and enriched production will be increased about 10 percent more than previously scheduled.

I. Employee Relations

Members of the Operation were treated for 20 minor injuries for a frequency rate of 3.38.

The frequency of exposures greater than 200 mrad per two-week badge period was 0.0. The frequency of exposures greater than 100 mrad per two-week badge period was 9.0 as compared to 11.0 for June.

One open file violation was reported in July. This is the first security violation in the Manufacturing Operation during calendar year 1957.

II. PERSONNEL MATTERS

A. Visits and Visitors

J. E. Bergman visited the General Machine Company, Spokane, Washington to discuss recent trends in the sleeve development program and to review the quality requirements of steel sleeves.

K. Drumheller attended the General Electric Value Analysis Seminar held at San Jose, California.

J. E. Bergman visited the Aluminum Company of America and Western Gear Corporation in Seattle, Washington also Hooker Electrochemical Company and United Power Control, Incorporated, in Tacoma Washington, July 8 through 11 to discuss aluminum component quality problems.

T. B. Correy visited Linde Air Products Company, Seattle, Washington for a demonstration of Argon Helium Gas mixing equipment.

B. Reports of Invention

Members of the Operation 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 July, 1957.

C. Meetings

Members of the Operation attended 18 staff meetings, 14 information meetings and 23 safety and security meetings.

D. Significant Reports Issued

1. Routine

<u>Number</u>	<u>Title</u>	<u>Author</u>	<u>Date</u>
HW-41214	Monthly Report, Quality Control Operation Fuels Preparation Department, June 1957	TD Naylor	7-1-57

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D. Significant Reports Issued - Continued

2. Non-Routine

<u>Number</u>	<u>Title</u>	<u>Author</u>	<u>Date</u>
HW-51708	Fabrication History of Uranium Fuel Element Cores for December, January, February, March, April, May, and June, 1956 and 1957	RE Olson	7-25-57
HW-50702	Uranium Core Requirements - Fuels Preparation Department - June 1957 through March 1958	HE Berg & HP Kraemer	6-28-57
HW-51209	Request to Procure Four Inch Uranium Cores	HE Berg & OW Rathbun	7-1-57
HW-51210	Request to Procure Gamma Extruded Material	HE Berg & OW Rathbun	7-1-57
HW-51204	Production Assumptions, FY 1958 Budget Review	HE Berg & HP Kraemer	7-1-57
HW-51248	Analysis of Uranium Scrap Returns FY 1958, FPD	HE Berg & HP Kraemer	7-1-57
HW-51698	Official Production Forecast July 1957 through June 1962	HE Berg & HP Kraemer	7-29-57

KVS:RIB:v1

K.V. Stave
Acting Manager-Manufacturing

8" CANNING REJECTS BREAKDOWN BY MAJOR CLASSIFICATIONS

LEGEND

SOLID 35

NOTE : - 1956 FIGURES
INCLUDE BOTH SOLID
AND CORED.

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ENGINEERING OPERATION

July, 1957

VISITORS

<u>Name</u>	<u>Company</u>	<u>Contact</u>	<u>Date</u>	<u>Reason</u>
WE Ellerman	Mallinckrodt Chemical Works	SM Gill	7-9/10/11	Discuss uranium machining and fabri- cation.

TRIPS

<u>Name</u>	<u>Company Visited</u>	<u>Contact</u>	<u>Date</u>	<u>Reason</u>
PH Reinker HF Zuhr	San Jose & Vallecitos	G. Roy MJ Sanderson	7-10/11	Discuss fuel element fabrication techniques.
JE Ruffin	Linde Air Products Seattle, Wn.	JW Nickinson	7-19	Welding equipment demonstration.
JH Johnson CL Frederick	Branson Ultrasonic Corp., Stamford, Conn.	PK Bloch	7-22	Discuss equipment for ultrasonically cleaning aluminum components.
	Circo Equipment Co. Rahway, N.J.	JJ Maestrian	7-23	
	Acoustica Ass. Inc. Long Island, NY	FM Platzman	7-24	
	Vibro Ceramics Div. Gulton Industries Methucen, N.J.	LC Oakley	7-25	
	Ultrasonic App. Lab. Davenport, Iowa	Hancock	7-26	
OW Rathbun	Ohio Crankshaft Co. Cleveland, Ohio	EL Myers	7-29	Discuss induction heat treatment of uranium.
	Magnethermic Corp. Youngstown, Ohio	J. Anning	7-30	
	Lepel High Frequency Labs., NYC, NY	CL Jennings	7-31	
	High Vacuum Equip. Corp., Hingham, Mass.	TH Crane	8-1	

<u>Name</u>	<u>Company Visited</u>	<u>Contact</u>	<u>Date</u>	<u>Reason</u>
RG Post	ANL, Chicago	K. Smith	7-8/9	Discuss fuel element development.
	BMI, Columbus	FR Shober	7-11	
	Aircraft Nuclear Propulsion, Cincinnati	C Brassfield	7-10	
	Carbaloy, Detroit	D Swartz	7-12	
HF Zuhr	American Bearing Corp., Indianapolis	H Lambertus	7-29	Discuss fuel element development.
	GE-ANP, Cincinnati	M Leverett	7-30/31	Discuss fuel element and moderator development.
	National Lead of Ohio, Fernald	FL Cuthbert	8-1	Discuss fuel element development.

PERSONNEL

<u>Name</u>	<u>Title</u>	<u>Nature of Change</u>	<u>Date</u>
<u>Materials Engineering</u>			
S. B. Crisp	Secretary	Terminated	7-12
J. P. Pilger	Tech. Grad.	Rotated in	7-24

PROCESS ENGINEERING

Regular Production Rupture Experience

Eight ruptures occurred during the month in normal uranium solid and cored production. Five of the ruptures were classified as side-hot spot, two were classified as charging damage, and one was unclassified. All of the ruptures occurred in solid uranium pieces. The distribution of the failures in the reactors was: four in DR, two in C, and one each in B and KE. The four DR ruptures all occurred in material charged on the same day and in a lot of material canned in Hunter-Douglas components. Preliminary examination does not indicate, however, that faulty components were responsible for the ruptures. No 1/2-inch cored material was canned during the month. 11.7 tons of already canned material was charged into F and H reactor and 37.2 tons was discharged from C and KE reactor at normal goal exposure. Four of the seven previously incurred 1/2-inch core failures are now in Radio-metallurgy undergoing examination.

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It is significant to note that no core split type failures have occurred in the past two months and only two have occurred in the past three months even though reactor power has been increased slightly over the same period. On the other hand, 13 side hot spot failures have occurred over the past three months indicating that substantial performance improvement can be obtained by utilizing fuel elements more resistant to corrosion attack. Large scale utilization of fuel elements clad in M-388 jackets and having contoured ends (blunt nose tru-line) is expected to start during August and September, and this should alleviate the side hot spot failure problem.

I & E Program

Irradiation of I & E fuel elements in C reactor continued during the month without incident. Forty-three tubes of I & E were charged and 35 discharged at a goal exposure of 800 MWD/T. To date about 600 tubes of I & E have been charged into C reactor and 200 discharged without a rupture. A significant increase in the charging rate of I & E in C reactor is expected to start in September with the goal of achieving complete I & E loading in C reactor before the end of the calendar year.

Two ruptures occurred in the solid enriched (1.44% U-235) control tube material being irradiated with three tubes of I & E enriched fuel elements at maximum specific powers of 90-95 KW/ft. The two solid ruptures occurred at exposures of 1053 and 1226 MWD/T. The average exposure of the three tubes of I & E was 1550 MWD/T at months end.

Irradiation of a tube of C size I & E in K reactor indicates that the abnormal temperatures at the top of the annulus found when using K size pieces can be reduced to reasonable levels by using the C size I & E in K reactor. The uranium lost by using the smaller diameter C size piece can possibly be recovered by using a K size core, thinner can wall cans, and a reduced AlSi gap. Canning studies are being carried out using 40 mil wall thickness cans (instead of 45 mils) and reducing the AlSi gap 2 to 5 mils to determine the effect on canning and on reject rate. Preliminary results indicate that canning can be accomplished readily and that the 20 mil residual can wall thickness specifications can be met without excessive rejects. As C reactor power ascension continues, it is expected that the dimensions of the C size I & E will not be optimum as far as temperature distribution in the annulus is concerned. In this case, it is expected that the O.D. of the fuel element can be decreased without sacrificing any on core diameter, by again decreasing the can wall thickness and AlSi gap.

Four tubes of old reactor size I & E were charged into D reactor during the month for initial investigation of hydraulic and heat transfer characteristics.

Process development work continued in the 306 Pilot Plant to develop techniques for producing I & E fuel elements at higher yields and lower costs. Major development tests during the month were:

1. Use of tapered can recesses instead of stepped can recesses.

Use of tapered can recesses has given a low internal penetration reject rate which may be due to less wrinkling of the spire. All subsequent components coming to the plant will have tapered recesses.

2. M-388 components

Canning techniques were developed which gave canning yields for M-388 components equivalent to the yields obtained with alloy 1245 components. Yields to autoclave of between 60 and 70 per cent have been obtained on several runs.

3. Horizontal Agitators in the duplex bath

The use of horizontal agitation instead of vertical appears to give a more uniform bonding strength over the core surface.

4. Relaxed core specifications

Six hundred sixty cores were canned with I.D. specifications relaxed from ± 3 mils to ± 10 mils. Yields were good and there was no apparent difference in canning. Relaxing the core I.D. specification is expected to result in savings of 3 cents per pound in Fernald fabrication costs.

5. Double duplex cycle

The core preheat time was doubled to determine if any improvements in the bond strength could be obtained. Results of this test are not available as yet.

The 313 building production line operated during the month to produce I & E and utilized several canning techniques developed the previous month. These improvements were a long preheat canning cycle, cap wetting by vibration, spire-core insertion canning, and modified internal bond standards. Yields ranging between 47 and 57 per cent were obtained up to autoclaving as compared to yields of about 36 per cent obtained before the new techniques were incorporated in the process. Final yields through autoclaving were disappointing because of a large number (up to 15%) of rejects for inclusions and stained surfaces on the cans.

M-388 Program

Irradiation of approximately 5000 fuel elements clad in M-388 jackets continued at C, D, and B reactors. One rupture of an M-388 jacketed fuel element occurred in D reactor at an exposure of 295 MWD/T and was classified as a side hot spot. Examination of the ruptured piece in Radiometallurgy revealed that U-Al diffusion had occurred. There was no evidence of intergranular attack. For standard solid material clad in M-388 jackets, charging will be initiated in September at the rate of 65 tons/mo. for regular contoured material and 105 tons/mo. for blunt nose tru-line contoured material.

IPR Program

An initial charge of 10 M-388 clad self-supporting, massive, 1.8 inch O.D., I & E fuel elements were charged into the #2 KER loop on July 25 and will be irradiated at an average specific power of 60 KW/ft., and maximum tube outlet water temperature of 180 C.

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Loops Nos. 3 and 4 are scheduled to be charged with IPR size, massive I & E and 4-element stainless steel jacketed clusters in mid-August. Charging of I & E washer type elements has been deferred until a better guarantee of residual can wall thickness can be made. Modification of loop No. 1 for organic coolant has been delayed and fuel elements for this loop are not expected to be required before December.

MATERIALS ENGINEERING

Centrifugally Cast Uranium

Longitudinal mechanical properties, determined at 100 C on as-centrifugally cast, centrifugally-cast-double-beta-heat-treated, and typical HAPO production metal, show the as-cast uranium to have approximately 75,000 psi ultimate strength with 24 per cent elongation and the cast, heat treated uranium 90,000 psi ultimate strength with 26 per cent elongation as compared to 90,000 psi 28 per cent elongation of the production metal. This is a smaller sacrifice in mechanical properties than was anticipated in the cast unalloyed metal.

Similar mechanical properties tests will be made on the centrifugally cast high silicon (1000-2000 ppm) uranium currently on site. Preliminary metallographic studies indicate the presence of varying amounts of microcracks in as-cast material.

The 100 solid and 100 I & E fuel cores centrifugally cast and beta heat treated, using unalloyed uranium, should be canned during August. It is planned to irradiate two tubes of each of these.

Low Hydrogen Dingots (PT-IP-56-A-86-MT)

Approximately 4000 solid cores of low-hydrogen dingot uranium were canned during July 1957. Bond test plus void reject rates was 2.9 per cent as compared to an average of 2.4 per cent for regular production canned during the past three month period. As specified in the production test, three monitor tubes of these elements, randomly selected, will be autoradiographed prior to reactor charging. The remainder of the pieces will be reactor charged according to the original lot numbers.

Alpha Phase Extrusion of Uranium

The production test IP-58-A-87-FP of solid fuel cores from the third and fourth extrusions was charged into F reactor in July. Exposures of 300-700 MWD/T are planned.

Gamma Phase Extrusion of Uranium

MCW has cast three 3.8 atomic per cent (nominal) Zr alloy billets and three carbon alloy billets. Since the carbon analysis of the billets was low at 1800 ppm, they will be recast in an attempt to increase the carbon content above 2000 ppm. These six billets are scheduled for extrusion in September.

Extrusion Cladding Evaluation

The 100 solid cylindrical uranium fuel elements which were extrusion clad during July by the General Cable Company have been received and preliminary evaluation work carried out. Efforts included visual examination of the jacket surface, testing the jacket-core bond, measurement of the outside diameter and jacket wall thickness, non-destructive testing of the jacket for defects, and preliminary corrosion testing. Results are:

1. The jacket contains a large number of inclusions of foreign material generally preferentially located in stringers along the longitudinal diffusion welds. It appears that there are few, if any, of the 100 pieces which are entirely free of these defects. The included foreign material has not been positively identified; however, it is believed to be iron oxide and carbon. Iron oxide may have flaked off of the rusty surfaces of billet handling equipment and another source is slag residue from a ram nosepiece which had lodged in a billet container and was cut out with a torch just prior to the cladding experiments. Carbon may originate from the animal-fat lubricant used on the ram nosepiece. Considering these sources, it is believed that the foreign material included in the jacket could be largely eliminated by better housekeeping and equipment maintenance.
2. Jacket-peeling tests on four fuel elements indicated no evidence of a metallurgical bond between the jacket and the nickel plated uranium or the aluminum end plugs. This result was not unexpected since the uranium was not heated prior to cladding.
3. Dimensional control of the cladding thickness was very satisfactory. Initial measurements indicate an 8-mil range from minimum to maximum thickness for the nominal 44 and 55-mil thick wall and a 10-mil range for the 80-mil wall.
4. Thirty pieces having the best surface quality and covering a range of extrusion conditions and wall thicknesses have been tested for jacket inhomogeneity using an eddy-current testing device. In addition, these have been autoradiographed. The eddy-current test showed evidence of one or sometimes two longitudinal stringers 1/3 to full length of the piece in 18 of the pieces tested, while 7 showed no inhomogeneity. In subsequent tests efforts will be made to determine the nature of the inhomogeneity, and its effect on corrosion resistance of the jacket.
5. Three pieces of extrusion clad aluminum bar exposed for one week in 95-100 C 300 Area process water showed no evidence of preferential corrosion except at the site of inclusions.

A report describing the cladding operation has been issued (HW-51328 - Unclassified).

Aluminum Components

As reported last month, cans fabricated by Alcoa from ultrasonic-reject bloom stock were eddy-current and ultrasonically tested and several suspected defect areas found in these as well as regular cans used as controls. The suspected

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defect areas of three regular and three reject stock cans are being radiographed in an effort to confirm results of the eddy-current and ultrasonic tests. Two of the reject-stock cans were progressively caustic-etched, removing about 5 to 8 mils per immersion. Visual examination did not reveal any can wall defects in the defect-areas indicated by ultrasonic and eddy-current testing.

Chemical analysis of Kaiser M-388 rod, which is to be used by Hunter-Douglas in fabrication of caps and cans, is complete, and the material meets specifications. Photomicrographs indicated some agglomeration of second phase; however, whether or not this will affect the structure of the impact extruded cans is not known. Caps and cans fabricated from this material are expected on site shortly.

In an effort to detect significant variance in nickel content of M-388 components, wet-chemical nickel analyses have been made on wall material of 15 cans, including five from an early shipment of 10,000, five from a recent shipment of 200,000 and five miscellaneous pieces. All results were within the specified 0.9 to 1.3 wt. % nickel, with no significant variance between samples taken from near the base and near the open end of each can. The nickel content of the 10,000 shipment was consistently high with values ranging from 1.18 to 1.25 per cent, compared to 1.04 to 1.10 per cent on the remaining pieces.

Pilot Plant

General Activities: Pilot plant equipment lists have been prepared and submitted to the Production Maintenance Operation for the purpose of providing periodic inspection and routine servicing. Routine maintenance costs for the pilot plant at the present time are being charged 100 per cent to the Materials Engineering Operation. The Financial Operation is presently considering the establishment of a charge ratio between Engineering and Manufacturing based on acceptable production accomplished in the pilot plant.

Development Activities: The most significant development work performed in the pilot plant during July involved the determination of the canning properties of M-388 alloy components for I & E "C" size fuel elements. In initial canning attempts using M-388 with "K" size I & E fuel elements a high rate of spire leakers and AlSi penetration occurred. This condition was also characteristic of M-388 components for "C" size fuel elements. Various methods and techniques were used to reduce these reject categories. Most successful were refinements in spire insertion techniques and optimizing the cap and can vibration in the canning bath. Recent yield data is comparable to that previously attained for 1245 alloy components (60-70%).

Other development activities conducted have improved yield rates and appear promising in improving quality. Cans with tapered recesses have improved cap seating and reduced attendant high cap and internal penetration rejects. Horizontal agitation of the element in the duplex bath increased the penetration reject problem but significantly improved both internal and external bonding.

At the beginning of the month the supply of 1245 components was exhausted and practically all canning has been with M-388 alloy. As a result the problem of establishing process conditions for this alloy delayed the yield improvement

program for I & E's canned with regular components. It may be predicted that improvements such as using cans with tapered recesses, horizontal duplex agitation, refinements in spire-core insertion techniques, and more reliable testing instrument performance when applied to 1245 components may provide higher yields than has been previously demonstrated.

Planning Activities: It appears desirable from the standpoint of improved operating efficiency to have a continuous throughput of production at all processing stations in the pilot plant, using conveyors from canning to machining, machining to welding, and through the welders to the Bond Penetration tester. Certain operator jobs would be combined and hand truck loading and unloading eliminated. Fuel elements canned could be tested within two to three hours after canning to provide yield data and quality information to guide the selection and timely introduction of desirable process variations. Provisions for continuous-throughput operation are being made and test runs will be carried out in approximately two weeks. In conjunction, a test will be made to double-face fuel elements prior to welding.

Equipment Development: Demonstration of ultrasonic cleaning equipment in vendor laboratories has indicated that its use may provide improved and cheaper cleaning of fuel element components. Satisfactory cleaning of both M-388 and 1245 I & E cap tubes and can was observed with a 30-second dip in an ultrasonically vibrated alkaline cleaning bath followed by a water rinse. This process offers the desirable possibility of eliminating the present tri-chlor and TSPP cleaning baths. The application of ultrasonic vibration to the Diversy 514 cap and can surface preparation bath as well as uranium core cleaning and pickling appears desirable; however, benefits will have to be determined by test. A detailed evaluation of ultrasonic cleaning equipment will be published in a trip report being prepared.

Conversion of the I & E base-end radiograph tray from film to the xerox process was completed in June. The tray has now been remounted on the 306 Fuel Element Pilot Plant X-ray machine and is being used by Process Engineering Operation personnel in the development of the xeroradiographic weld inspection process.

Design was completed for a device to permit welding either the base or cap end of I & E fuel elements on the same welding machine.

TESTING METHODS

Process Fuel Element Testing

Very little assistance was required from Testing Methods in operation of the 313 building testers. Quality Audit is completing the selection of new 20 mil standards for the external penetration test.

I & E Fuel Element Testing

The automatic I & E test conveyors operated satisfactorily during the month. A new external probe mounting for the 306 bond-penetration tester eliminated the trouble previously caused by fuel elements bouncing into the penetration test probe. It also improves the bond test crystal adjustment, and permits simultaneous

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internal-external bondtesting by reducing the amount of energy received by the internal receive crystal from the external transmit crystal. Two probe failures resulted from striking extraneous AlSi on the inside of fuel elements.

Increased reliability of the test equipment and better calibration standards have contributed to the increased production yields in the pilot plant. The pilot plant bond test standards are now as follows:

External -- 0.9 cm in the circumferential direction by
0.6 cm in the longitudinal direction

Internal -- 0.6 cm in the circumferential direction by
0.5 cm in the longitudinal direction

The external penetration test has been set at about 20 mils and the internal test at 13 mils. The internal penetration test rejects are not considered as rejects at present for yield calculations. Penetration reject rates continue to be high.

Four hundred I & E fuel elements were tested with both the 313 and the 306 building equipment. The 313 penetration reject points were found to be about 16 mils-external and 10 mils-internal. The 313 internal bond test was slightly more restrictive than that in 313. Although the external bond and penetration testers in the pilot plant are of different electronic designs than those in 313, reproducible results were demonstrated when both were calibrated with the same standards.

Efforts to develop a satisfactory internal penetration tester have continued. The new multiphase differential probe was mounted on the laboratory automatic test conveyor and used to test fuel elements which had been previously rejected due to surface bumps and/or braze layer voids. Under these conditions, signals from probe vibrations masked the penetration signals and prevented a determination of the effectiveness of discrimination against voids. Some modifications are being made to the probe design in an attempt to correct this difficulty. Although the multiphase probe does give promise of better discrimination against voids, it will not, even in principle, give reduced signals from the surface bumps which often accompany the voids. In order to reduce the effect of these surface irregularities, a new version of a two frequency system has been devised and is now being evaluated. In its present form, the signals from surface bumps are about halved. Further adjustments are being made and it is intended to combine the multiphase and the dual channel systems as soon as both function satisfactorily individually.

An interim possibility for salvaging some of the false internal penetration test rejects is being studied with Process Engineering. A mandrel was passed through the bore of eight "rejects" to depress the surface bumps. When retested, none gave signals larger than that from a true 20 mil penetration and all passed the test. Three other elements having bumps were tested and the signal heights obtained. After mandrelizing, the signals were again measured. One didn't change, one was greatly reduced, and the third became largely negative but was

little reduced as far as the "trapping level" of the penetration tester was concerned. This method seems to show promise of reducing some of the bump signals, but additional tests are required to determine its overall effectiveness.

Methods Development

Twenty-seven developmental cable clad fuel elements were examined by an eddy current method. Signals were obtained quite generally in the region of the diffusion welds. Whether these are due to variations in metal conductivity or the presence of inclusions is not yet known.

A two layer metal thickness gage has been developed. A prototype unit calibrated for nickel and aluminum on uranium is being fabricated for the Hanford Laboratory Operation. This unit utilizes the position of a spot on a cathode ray screen to simultaneously indicate the thicknesses of both the nickel and the aluminum.

Fabrication of an experimental film meter was completed. This instrument which is to be used for corrosion studies will measure the thicknesses of oxide films over a metal over the ranges 0-1 and 0-4 mils. Some troubles were had with the original probe and a new one was designed and is now being machined.

Fabrication of the electronic portions of the new prototype ultrasonic attenuation and uranium surface testers is about 75 per cent complete. These should be ready for debugging in August.

Some experiments were performed on transformation testing large grain dingot material. It was suspected that the large grains may mask out by high attenuation any small grain effects. Several samples were heat treated to produce untransformed areas. Two of these would be rejected under present standards, and one having a small surface untransformed area would have been accepted. It may be possible to select dingot standards so as to reject most of this type. However, tests are required to determine whether a high reject rate would result from small grain transformed dingot pieces which are quite common.

Hanford Test Reactor

Metal testing continued routinely. Relative power generation of a seven rod cluster was measured in a KER loop mockup and will be reported when the calibration of foils is complete.

DESIGN & PROJECTS

Status of Projects

CG-713 - Conversion to I & E Lead-Dip Fuel Elements: The revised project proposal (HW-51271) was forwarded to the AEC on July 23. The proposed scope of work consists of additional lathe, welding, test, radiograph and miscellaneous equipment necessary to operate six canning lines on I & E or solid production

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giving a production capacity of approximately 700 tons/month. Cost is estimated at \$368,000 with beneficial use 11 months after authorization. HW-51713 describes in more detail the scope of work covered by the revised project proposal.

CG-737 - Electric Pneumatic Control System for Canning Area - 313 Building: Design drawings were reviewed by interested personnel and their comments were incorporated. Delivery of critical equipment is scheduled for October 20, 1957.

CG-759 - Additional Steam Generating Capacity - 300 Area: By letter dated June 26, 1957, the AEC requested that a study be made on the installation of low pressure package boilers for 300 Area building heating. This study was forwarded to the AEC on July 31 (HW-51742). Capital cost of such an installation was estimated to be nearly 50 per cent higher and annual operating costs about \$230,000 higher than the proposed addition to the central steam plant. Engineering features of the low pressure units make them additionally undesirable.

IR-210 - Oil, Paint and Solvent Storage Facility - 300 Area: Contractor progress has been generally good. It is not expected that the completion date of August 11, 1957 will not be met, however, because of late arrival of the fire alarm system. This is an AEC managed project.

IR-228 - Evacuation Warning System: Design was 10 per cent complete by the end of the month. It is anticipated that design will be completed on schedule by August 15.

Increased Water Supply - 300 Area: Preparation of the project proposal is awaiting decision on the location of proposed plutonium facilities which will have a significant bearing on the size of the additional import line from North Richland.

Research and Development

Lost Punch Cladding of I & E: Inquiries were made to Verson Allsteel and Impact Extrusions for the purpose of determining their interest in tool development to test the feasibility of impacting cans around I & E fuel elements.

Cable Cladding: Design studies were begun on a simple furnace to be used for pre-heating uranium cores for a second test in General Cable Company's Schloemann cable-cladding press.

Documents Issued

HW-51361, "Semi-Monthly Status Report, Design & Projects Operation," J.W. Talbott, 7-12-57.

HW-51711, "Semi-Monthly Status Report, Design & Projects Operation," J.W. Talbott, 7-25-57.

HW-51742, "Evaluation of Low Pressure (15 P.S.I.) Boilers Within 300 Area," Design & Projects Operation, 7-30-57.

HW-51760, "Relation of Fuel Element Recovery Capabilities to Future Requirements," A.C. Callen, 7-30-57.

DRAFTING & FILES

Principal Jobs in Drafting

306 Building: I & E Automatic Conveyor drawings - 8 As-Builts (of 19)

313 Building: I & E Tooling - 7 drawings
 Fuel Element Drop Point Conveyor - 6 drawings
 Fully Automatic Welding Machine Prototype - 5 drawings
 Service Stair to Roof
 Fuel Element Tray
 Electric Pneumatic Timing System - 9 As-Builts
 Resistance Furnace
 Transformation Tester

382 Building: 4 As-Builts

384 Building: 24 As-Builts

Miscellaneous: 6 Building Electrical Load Center drawings, showing
 normal settings
 8 Floor Plans (existing Buildings)

Drawings Produced: New 46
 Revised 67
 Small Charts 31
 Large Charts 3
 Miscellaneous 8

ADVANCED ENGINEERING

Uranium Mono-carbide

Argonne National Laboratory and Battelle Memorial Institute were visited to discuss the status of their programs which include uranium mono-carbide. Both sites have initiated programs to obtain the physical and chemical properties of the mono-carbide and other refractory compounds of uranium.

These programs may answer many of the questions pertinent to the use of the mono-carbide as a fuel element core material. Additional work at HAPO is not anticipated in the immediate future but close contact with the progress at ANL and BMI will be maintained. If the direction of their effort proves different than presently indicated or if other HAPO programs indicate a more intense and specifically directed effort is required for HAPO interests, then the situation will be reviewed and additional programs instituted at HAPO or off-site.

Uranium Utilization

A preliminary study was made to determine whether savings could be made in uranium scrap losses which average about 5 per cent of the canned uranium. The cost to Hanford of recycling this scrap amounts to \$1-1.5 million per year. The

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majority of the losses ($>3\%$) occur because of surface imperfections which are revealed by a pickle inspection following the recovery operation. Although there is no evidence that these surface imperfections would result in fuel element failure in service, there is likewise no evidence to justify relaxing specifications. The solution appears to lie with the improvements in uranium quality which are being brought about by the dingot program.

Less than one per cent of the losses occur due to underweight fuel elements. Although these elements could conceivably be recanned and irradiated with normal risk, it can be shown that the small gain in fabrication costs is offset by reactivity losses at the reactors.

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 July, 1957, except as listed below. Such persons further advise that, for the period therein covered between reports, notebook records, if any, in the course of their work have been examined for possible inventions or discoveries.

HW-51764, "Multiphase Differential Eddy Current Test Coil Assembly," H. L. Libby.

"Lost Punch Cladding of Fuel Elements," A. J. Karnie

Manager - Engineering

PH Reinker:mbs

FINANCIAL OPERATION

JULY, 1957

AUDITS AND PROCEDURES

Auditing - This month the audit program for the year was completed, and field work continued on the audit of Inventories. This audit covers financial controls applicable to Essential Materials, Special Materials, Spare Parts, and shop supplies. Simplifications have been effected in essential material inventory accounting and considerable improvement has been realized from recommendations concerning the control of shop supplies and tools.

Office Procedures - Continued progress has been made on the daily time distribution procedure for maintenance work. Necessary form revisions have been completed and a written procedure has been prepared.

Work was started on a complete compilation and review of all reports issued by the Financial Operation to determine their necessity, comparative usefulness and cost, and potential simplification or improvement.

Following is a summary of other procedures accomplishments:

1. Completed final modifications and procurement arrangements for printing the Salary Administration Personnel Record key-sort card.
2. Completed an evaluation and prepared a reply concerning possible application in FPD of the work request system being developed in IPD.
3. Initiated a survey of significant areas in FPD for potential paper-work improvement and simplification of clerical and administrative work.

Forms Control - In connection with a request for evaluation of a proposed Company absence record form, copies of both an improved absence record form recently developed by FPD Personnel Accounting and a suggested alternative form for Company-wide usage were forwarded, together with appropriate explanation, to Schenectady.

The monthly report of absenteeism form was revised in order to simplify the information presented and to emphasize the significant comparative data.

Notable new forms include a Sanitation Service Request developed by Area Maintenance; and the Capital Closing Report and Tagging Request, designed by Plant and Property Accounting, which combines two previously frequently used forms.

GENERAL ACCOUNTING OPERATION

Authorization to incur costs of \$35,000 in FY 1958 for metallurgy consultation with the Research Laboratory was received from AEC. This authorization is a continuation of similar arrangements in effect during FY 1957.

Appropriation Requests processed during July totaled \$41,227 and are summarized below:

<u>Number</u>	<u>Title</u>	<u>Amount</u>
AR-58-FP-1	Heat Recovery Equipment consisting of a flash tank and heat exchanger	\$ 7 500
AR-58-FP-2	Automatic Etch Machine Loaders Modified Dual Preset Counter	12 500
AR-58-FP-3	Digital Recorder and Timer	2 500
AR-58-FP-4	Oscillograph Record Camera	1 465
AR-58-FP-5	Additional Bond and Penetration Test Equipment	7 000
AR-57-FP-24	Procure Two Potentiometers	262
Suppl. 1		
AR-57-M-10R	Replace Cap and Can Baskets on Cap and Can Machine	10 000
		<hr/>
		<u>\$41 227</u>

In connection with the equipment budget, all operations of the Department were requested to review their equipment requirements for FY 1958. This information will be forwarded to Contract Administration in August, and at that time an allocation to Departments of available equipment funds is expected to be made.

Allocation of funds to cover general plant projects in FY 1958 will be made essentially on a first come, first served basis. Since our requirements from this budget item are not great, adequate funds are expected to be allocated.

In accordance with a request received from Contract Administration, that organization was advised that reconciliation of movable property records had been completed and are now being processed on the 702 machine.

The allocation of cost, designation of property units, account classification, and issuance of project unitization reports were completed on the following projects this month:

CA-601	General Grounds Improvement - 300 Area	\$ 59 605
CG-646	Modifications to Pickling Machines, 313 Bldg.	47 338
		<hr/>
		<u>\$106 943</u>

The annual savings and improvement report covering savings realized during FY 1957 was completed on July 31. A total of 15 items were included in this report, which resulted in savings of \$140,832.

GENERAL ACCOUNTING OPERATION (Continued)

The FY 1958 budget allocation for Attendance at Meetings of Professional and Trade Societies and Attendance at Off-Site Courses and Seminars was approved during July. A comparison of budget for FY 1958 with FY 1957 actual expenditures by level 3 operation follows:

Attendance at Meetings of Professional and Trade Societies:

	<u>FY 1958 Budget</u>	<u>FY 1957 Actual</u>
Employee Relations	\$ 500	\$ 533
Engineering	2 000	2 226
Financial	-0-	-0-
Maintenance and Power	400	342
Manufacturing	1 500	1 932
General	600	-0-
	<u>\$5 000</u>	<u>\$5 033</u>

No costs were incurred against this budget during July.

Attendance at Off-Site Courses and Seminars:

Employee Relations	\$ 400	\$ 723
Engineering	-0-	-0-
Financial	250	439
Maintenance and Power	450	49
Manufacturing	450	620
General	250	-0-
	<u>\$1 800</u>	<u>\$1 831</u>

One trip was made during July by an employee of Manufacturing Operation to attend a General Electric Company "Value Analysis Seminar" in San Francisco, California at a cost of \$377.

July travel expenditures were lower than normal due mainly to the fact that ledgers were held open longer at fiscal year end to book as much travel expense as possible. Current statistics are summarized below:

	<u>July</u>	<u>June</u>	<u>Increase or (Decrease) Over June</u>
Travel Advanced to Employees:			
Balance at beginning of month	\$1 981	\$ 4 301	\$(2 320)
July charges	3 688	8 432	(4 744)
	<u>5 669</u>	<u>12 733</u>	<u>(7 064)</u>
Less:			
Expenses accounted for	1 222	9 605	(8 383)
Advances refunded	1 125	1 086	39
Billings to other HAPO components	-0-	61	(61)
	<u>2 347</u>	<u>10 752</u>	<u>(8 405)</u>

GENERAL ACCOUNTING OPERATION (Continued)

	<u>July</u>	<u>June</u>	<u>Increase or (Decrease) Over June</u>
Balance at end of month	<u>\$3 322</u>	<u>\$ 1 981</u>	<u>\$ 1 341</u>
Outstanding Travel Advances:			
Current	\$3 254	\$ 1 949	\$ 1 305
Outstanding over 15 days	<u>68</u>	<u>32</u>	<u>36</u>
Balance at end of month	<u>\$3 322</u>	<u>\$ 1 981</u>	<u>\$ 1 341</u>
Number of Expense Reports submitted	17	37	(20)
Number of Cash Advances	16	24	(8)

A special study on recruitment expenses, requested by F. E. Jochen, was completed and the results forwarded early in August. The study pertained to costs incurred on employee interviews for exempt positions and average cost per exempt person hired on FPD payroll.

MEASUREMENT PROJECT

The Department Measurement Report for FY 1957 (HW-51322) was completed on July 25, 1957 and distributed to the General Manager - HAPO, General Manager - FPD, and level 3 managers within the Department. An unclassified printing of the report will be made after deleting the classified information with distribution to level 4 managers and other interested personnel. The report, segregated by Key Result Areas, covers Department performance for FY 1957.

A twenty-minute presentation of Department and Manufacturing Operation performance was given July 25 to exempt employees of the Manufacturing Operation, using the Department charts as the presentation media.

The Personnel Practices Management Program Seminar was completed during July with the final session conducted July 17. The results of this Seminar will be studied for application in other level 4 operations.

A study of the monthly Measurement reports issued by Manufacturing Operation and Maintenance and Power Operation together with supporting records was initiated during the latter part of the month. The purpose of this study is to determine the value and usefulness of the current reports as well as areas of duplication.

PERSONNEL ACCOUNTING OPERATION

In accordance with the cost-of-living escalator provision of General Electric's Five-Year "Better Living" program, an increase of 1.77% of base salaries was granted most nonexempt employees effective July 29, 1957. This most recent adjustment brings the total cost-of-living adjustments to salaries since September, 1955 to 5.31%.

If personnel remains near the present level, the 1.77% cost-of-living wage adjustment will result in an increase of \$45,000 to \$50,000 a year in the Department annual payroll.

The single, fixed rate salary schedules for Captain and Lieutenant, Fire Protection, were also adjusted effective August 1, 1957 to reflect the higher cost-of-living index.

A letter was forwarded to level 3 managers calling attention to clerical work being performed that may represent a duplication of work routinely performed by Personnel Accounting. It was suggested that other operations investigate the possibility of effecting cost reductions through the use of services performed and records maintained by Personnel Accounting.

PRODUCT COST OPERATION

Closing activities for FY 1957 were well coordinated and integrated with other Departments, and all dates were met, generally ahead of scheduled dates. Appropriate reserves were established for possible obsolescence of process materials, spare parts, general supplies, and excess inventories. After reserves were established, a year-end adjustment of \$16,000 was made to production costs.

Efforts are currently directed toward cost reductions within the Department. Specifically, these include reviewing work of a clerical nature now carried on in other operations of the Department which may be duplicated in the Financial Operation, or work which can and should be absorbed by Financial at no extra cost. Work is continuing on proposed personnel ceilings which will be necessary in order to effect desired overhead reductions. All financial activity, including the cost and usefulness of financial reports, is also being carefully scrutinized.

In regard to Key Result Area No. 3 - Productivity, an approach to the measurement to be employed has been formulated, and method of reporting the Department's productivity has been developed.

With the agreement of those concerned, the following reports were eliminated, combined, or the reproduction method changed in order to reduce operating costs and reporting time:

PRODUCT COST OPERATION (Continued)

Eliminated: No. 210 - Productivity and Profitability of Steam
No. 211 - Productivity and Profitability of Duplicating

Combined: No. 206 - Power Cost and Production Forecast with
No. 208 - Power Operation Cost Report

As mentioned last month, a 50% reduction in cost of duplicating reports was obtained by changing from a multilith to an ozalid process. Effective with July, the level 4 operating cost reports will be reproduced directly from ledger sheets, eliminating the ozalid process and saving all transcribing time, mat-cleaning and handling time, and one to two days reporting time. Ozalid reproduction for the Manufacturing Cost Report No. 202 will be retained until the quality of reproduction paper is improved. It is now possible to have operating reports delivered to responsible managers within two hours after final costs have been accumulated. Contacts with management to determine if additional monthly reports can be put on a quarterly basis are under way.

Meetings with Data Processing employees were held to firm up the reporting format of IBM runs. Target date for the new runs is October 7, at which time Data Processing charges will be made on a cost-per-line basis.

IME and man-day billing rates were reviewed. No changes were made or are anticipated until after the first quarter, FY 1958.

Work is proceeding on the revision of FY 1958 budget. Changes in organization, revised personnel estimates, and revised production forecasts are being incorporated in this revision.

Information available on Research and Development allocations indicates that the Department has a total of \$870,000 available for research work as compared with \$744,000 in FY 1957. In FY 1957, direct costs allocation totaled \$684,000, with an additional \$60,000 for general plant overheads. In FY 1958, Research and Development will bear full share of plant overheads. This should be approximately \$150,000, with \$720,000 available for Engineering direct cost.

Essential material unit price-list for the first quarter, FY 1958, was calculated and distributed.

Two new captions were added during the period to aid in future cost allocations to the end product. These captions are:

Aluminum Wafers, Index 1/10 NC
Steel Sleeves, 6" I & E

A small quantity of radium has been added to the list of materials included in the Department's special materials account.

PRODUCT COST OPERATION (Continued)

The following two classes of spare parts were added to those captions which have been converted to AEC classifications:

4166 - Machinery and Equipment Parts

4176 - Special Industrial Equipment Parts - 300 Area

With the addition of the above two classes, a total of ten have been converted.

Manager - Finance

WS Roe:whm

MAINTENANCE AND POWER OPERATION

JULY 1957

GENERAL

Material and Property:

Productive Maintenance Program

Outstanding orders as of 6/25	145
Orders issued in July	64
Orders completed in July	60
Outstanding orders as of 7/31	149

The Cost Reduction Program realized a net annual saving of \$16,863. This represents 76 per cent of the quarterly budget for this program. This saving was the result of the reclassification of 219 people in the Operation from "Q" to "L" clearances.

There were nine unfired pressure vessels inspected by a representative of the Travelers' Insurance Company. All vessels were found to be in acceptable condition.

Building 3701 was transferred from HLO to FPD during the month.

A meeting concerning the Overtime Hours Paid list was held with representatives of the Financial, Manufacturing and Maintenance and Power Operations. It was established that Personnel Accounting would assume responsibility for the issuance and accuracy of the Overtime Hours Paid list for both Manufacturing and Maintenance personnel.

The first HAPO-wide Maintenance Management Meeting was held on July 17. The subject of the meeting was Union Relations. R. E. Donnell, R&UO, addressed the group.

AREA MAINTENANCE

Duplicating statistics for the period covered are:

<u>PROCESS</u>	<u>NO. OF ORDERS PROCESSED</u>	<u>NO. OF COPIES MADE</u>
Multilith	858	459 306
Verifax	86	1 839
Ozalid	26	2 814

There were eight formal reports completed. These reports consisted of 4330 volumes with a total of 191,194 pages.

The increased number of impressions made by the Duplicating Facility is the result of fiscal year end reports for HLO, the preparation of 11 Brussels Conferences' Technical Papers and additional work load from FPD-HLO personnel in the 700 Area due to the discontinuance of the 760 Building Duplicating Facility.

The exhaust system in the welding shop of the 3722 Building has been completed and installed.

INSTRUMENT AND ELECTRICAL MAINTENANCE

The Portable Shop repaired a total of 1,065 radiation survey instruments. The average repair time per instrument was 1.14 man-hours.

There were 13 new Samson Alpha Meters received. These instruments have been given acceptance checks and placed in the portable radiation instrument pool. In addition, 97 HAPO GM Meters, 30 Scintillation Poppies and 22 CP-TP radiation instruments were received.

All servicing of V.G.M. and E.G.M. Meters has been discontinued. These meters are being replaced by the new HAPO G.M. Meter. As a result of this replacement, future purchases of the costly (\$6.46) 300 volt batteries, which were used in the old instruments, will no longer be required.

An unusual amount of leak checking activity was performed during the month. The following items were checked:

- 9 special fuel elements
- Manifold assembly
- 3 stainless steel bellows for the mass spectrometer in the 200 Areas
- Bellows assembly and water jacket
- Heat exchanger unit
- Cathodic etcher
- Thermocouple and heater assembly

The quarterly inspection of the 300 Area fire alarm system was completed.

The air purge of the pre-amplifiers on the liquid moderated reactor in the 321 Building has proved very successful. Maintenance due to corrosion in this system has been virtually eliminated.

Work on the "ramp generator" for use with the HAPO 100 channel analyzer has been completed. This generator produces pulses of increasing amplitude and is useful in setting up and calibrating the analyzer.

The first of nine RCL 256 Channel Analyzers was installed for the Experimental Physics Group.

All electrical work on the Operational Pressurized Charging Machine has been completed.

Fabrication of thermistor type temperature measuring equipment for Project Whitney has been completed.

POWER

Power Statistics

	<u>July</u>	<u>June</u>
Average Steam Generated (M lbs/hr)	28.2	32.8
Maximum Steam Generated (M lbs/hr)	43.0	49.0
Total Steam Generated (M lbs)	20 949	23 651
Coal Consumed (tons)	1 383	1 531
Evaporation Rate (steam/#coal)	7.56	7.72
No. Boilers on	2 3 2 3 2	
Date of Change	1 4 8 13 14	
Sanitary Water from 3000 Area (Million Gals.)	68.8	65.4
Total Water from 3000 Area (Average rate GPM)	1542	1514
Soft Water from #3 and #4 Wells (M gals)	13.4	11.3
Water from #2 Well (M gals)	.25	.25
Peak Water Consumption for 24 Hours (Million Gals.)	2.5	2.5

The annual overhaul of No. 4 Boiler was completed. Following the overhaul, the inspector from the Travelers' Insurance Company inspected the boiler and reported it to be in very good condition.

Open overflow lines have been installed between the settling basins and from the #3 Basin to the main pond in the north process disposal pond. These open overflow lines will permit uninterrupted service, which was not the case with the former pipe lines between the basins and the main pond as they kept plugging up.

Oil was placed on the leaching trenches from the septic tanks as part of the mosquito control program.

On Friday, July 19, water was discovered coming through the floor in the emergency generator room in the 384 Building. The powerhouse was operated on a temporary water connection and the 10" incoming water main closed. The floor in the compressor room was dug up and a leak in a 90° ell in the water main and a leak in the drain line from the compressor room were found.

The installation of a new 6" water line from the main to the powerhouse, which was in progress and had been interrupted by the strike of the pipefitters, was completed on an emergency basis so that a reliable supply of water could be maintained while repairs to the 10" connection were made.

The 10" main was relocated to enter the powerhouse 10' above grade and returned to service on July 31. The two water lines now feeding the powerhouse will permit uninterrupted operation in the future. The drain from the compressors was rerouted to the ash sluice trench.

A leak was detected in the return condensate line from the 325 Building. It was determined that the leak was caused by external electrolysis due to the proximity of one rod of the 325 Building ground system. The condensate return line was repaired, the ground rod relocated and the system returned to service.

PLANT ENGINEERING

There were 17 training lectures presented to electrical, instrument, pipefitter, machinist and janitorial personnel. This represents 373 man-hours of training.

Permission has been received from Union Relations to proceed with the Craft Training Program for electrical and mechanical craft trainees.

FIRE PROTECTION

Fire Responses

HAPO	4	Loss	None
Construction	0	Loss	None
Private	0	Loss	None
Outer Area	1	Loss	None

Description of Significant Fires

None

SIGNIFICANT REPORTS

Machine Tool Utilization by W. L. Hampson and J. P. Fichten.

A verbal report on the Results Obtained from Work Simplification in FPD was presented at an IPD Appreciation Clinic by J. P. Fichten.

Semi-annual Machine Tool Utilization Report by A. B. Jackson.

Quarterly Revision of the Requirements for Steel, Copper and Aluminum per AEC Bulletin #17 was issued by A. B. Jackson for FPD.

REPORTS OF INVENTION

All personnel of the Operation engaged in work which might lead to inventions and discoveries advised that, to the best of their knowledge, none were made in the course of their work during July 1957.

PERSONNEL MATTERS

Organization Changes

M. D. Lawell, Area Maintenance Operation, promoted to Foreman, Laboratory Area Mechanical.

C. P. Gibbons, Area Maintenance Operation, promoted to Analyst, Maintenance Scheduling.

H. E. Thilenius, Instrument and Electrical Maintenance Operation, temporarily promoted to Foreman, Instrument Shop, to replace L. M. Palmer who is on sick leave.

SAFETY, SECURITY AND RADIATION EXPERIENCE

Medical Treatment Injuries	24
Frequency Rate	5.41
Disabling Injuries	0
Near Serious Accidents	0

There were no cases of radiation overexposure reported.

There were no security violations reported.

MEETINGS

Round Table-Staff	23
Safety and Security	29
Information	8

Manager
Maintenance and Power

E. Hilgeman:JPF:mkm

EMPLOYEE RELATIONS OPERATION
July, 1957

PERSONNEL DEVELOPMENT

Two sessions of a "pilot run" Creative Thinking seminar were held to develop an appropriate seminar for FPD technically trained personnel. Sessions were lead by the Manager-Engineering and participants included three other members of the Engineering Operation, one Manufacturing employee and the Specialist-Personnel Development.

A tour of approximately 80 "Q-cleared" technical graduates and summer students was completed on the morning of July 17. Approximately 22 FPD people assisted with the tour and approximately 12 additional managers visited with the guests during their lunch period. The Tech. Grad. Program Director, and several of those who attended the tour commended on the smoothness and completeness of the FPD tour.

The Understanding People course was completed by 83 participants during this second series of presentations by the plant psychologist, bringing the total participation during 1957 to 153, approximately 83% coverage of FPD exempt employees.

A reading improvement course was organized through the Richland Public Schools' Adult Education Night School, the first class session beginning July 29. Participants include 13 Fuels employees and five others whose enrollment was arranged through Fuels Personnel Development.

Three tech. grad. assignments were vacated during the month and two were filled, leaving a total of five regular tech. grads placed on assignments within Fuels at month's end. In addition, seven summer placement employees were on the roll at month's end occupying seven of the Department's tech. grad. assignment openings.

COMMUNICATION

A survey of Department needs for approximately 30 periodicals which will no longer be circulated by the Plant Library was initiated.

A report of progress in the Fuels Preparation Department during the first half of 1957 of the Five-Year Relations Program was completed, as was Personnel Development and Communication quarterly report.

A joint meeting with members of the Management Information group was held Thursday, July 18. Purpose of the meeting was to foster Department-wide integration, and to this end level 3 managers made presentations of their respective operation's goals, progress and problems. An informal telephone survey following the meeting indicated high acceptance by those who attended. Similar meetings are planned on a bi-monthly basis.

The communication plan for distribution of the Exempt Salary Plan booklet was developed. Plans call for the booklet to be distributed during August.

During the month one speech was submitted to Public Communication and approval received. This presentation, on the subject of Quality Control, was presented to a local Naval Reserve Co. by the Supervisor-Quality Control Engineering.

Four weekly issues of the Management News Bulletin were distributed, as well as two issues of the FPD Newsletter. Two priority messages were distributed, one to Manufacturing, Maintenance and Power and Engineering, and one to level 3 managers only.

A total of 216.5 column inches of GE News space during the month was devoted to FPD employees and activities. This represents an average of 54 column inches per issue, as compared with a total of 65 column inches in a full page of the GE News. Routine items such as attendance and safety awards accounted for 39½ column inches; planned, non-routine items such as the tech. grad. visit to FPD, the pilot plant news story, etc. consumed a total of 177 column inches.

SALARY AND WAGE ADMINISTRATION

There were 14 positions audited during July. Excluding Level 2 and 3 Managers, fixed rate and vacant positions, 53 of the 84 exempt positions as of October 1, 1956 have been audited, or 151.4% of the two year goal on a monthly basis. A total of 64 audits have been completed of the current 172 incumbents.

In follow-up on the procedure of providing foreman relief in the Department it was determined that apparently no significant problems existed. A policy was prepared providing 2 alternate courses of action when covering foreman absences.

Two new positions were approved effective July 1. These were Analyst, Maintenance Scheduling and Analyst, Manufacturing Equipment. The position of Foreman, Maintenance II (Carpentry and Paint) was re-evaluated and retitled as Foreman, Maintenance I (General Maintenance).

The remaining Organization and Policy Guides for the Level 3 Managers have now been completed and transmitted to the Financial Operation for issuance.

As a result of discussion between the Fuels Engineering and Fuels Manufacturing components a number of revisions to the functional charts have been received from the Specialist, Manufacturing Administration. These revisions, principally affecting Manufacturing Engineering, more accurately describe the actual work being performed and result in closer agreement with the General Electric Organization and Structuring criteria.

A draft entitled, "Supervisor's Guide to Wage Administration," has been completed by the Wage Administration Specialists of the FPD and R & U Operation, and distributed in rough draft to Employee Relations personnel at HAPO. Comments have been received from most of the reviewers. The revised text will be reissued for further review.

Audit of nonexempt jobs in the Employee Relations Operation has been completed. Audits to date include 48.5% of all employees and 48.6% of all job descriptions. These percentages will require adjustment at completion of all department audits to reflect the numbers of persons and job descriptions actually present at that time. The figure of 180 job descriptions for the total department was set conservatively high; it appears at this time there will be approximately 165 job descriptions.

An investigation was made of the work assigned to the Floor Serviceman and Janitor Classifications at the request of the Manager, Union Relations. During recent years the value of work available to be performed by floor servicemen has substantially decreased. As a result, a question has been raised as to the scope of duties which should be performed by the floor servicemen, since they have been performing increased amounts of work also common to the Janitor Classification. Recommendations were made resolving this problem, and the Fuels Preparation Department job descriptions were revised slightly.

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

A revised form for calculating the differential of the first-line foremen and supervisors was devised and will be used to show the history of their pay differential since November 30, 1956. In addition, a graph illustrating the differential was prepared. The work sheet and graphs are being revised when any change affecting the differential occurs.

A total of 30 documents on exempt employees and 87 on nonexempt employees were processed during the month.

Union Relations

The answer to the Unfair Labor Practice Charge, case number 19-CA-1476, involving the reduction of personnel on the canning line was sent to the National Labor Relations Board on July 11, 1957. In substance, the Company's position was that the action taken in reducing canning line personnel was not in violation of any requirements of law for collective bargaining with the Council. In fact, it was the Company's contention that because of past practice which involved a series of reductions in canning line personnel, without resorting to collective bargaining, that this action did not obligate the Company to bargain collectively. In addition, the Company contended that Article II, Section 1, (a) of the 1955 HAMTC-GE Agreement gives management the prerogative to determine the methods and means by which it is to operate and gives the Company the right to establish the canning line crew size. We also contended that the settlement agreement of 1955 which was "intended to be and shall be in full settlement of issues which were, or which the Council or the Company had by law the right to make, the subject of collective bargaining in negotiations between them preceding the execution of this Agreement", precludes the Council from contending that the matter of reducing canning line personnel was subject to collective bargaining. In effect, it is our opinion that this matter could have been set forth in the 1955 Agreement as a subject of collective bargaining and perhaps was even discussed prior to the execution of the Agreement but inasmuch as it was not included in the Agreement it cannot now be said to be a matter subject to collective bargaining. We also pointed out that the technological changes as made over the years permitted the Company to legally institute the change, and finally we contended that since the Council had requested arbitration of its grievance under the appropriate provisions of the HAMTC-GE Agreement, that the Council should exhaust its relief under the arbitration article in the contract. We also requested the Council to advise the Company of the provision of the Agreement upon which it relies in seeking relief through the grievance. This request was made by letter of July 10 from the Manager, Union Relations, Relations and Utilities to the Council. We concluded by advising the NLRB that the Company felt the charge should be dismissed as being wholly without merit.

On July 26, discussions were held with the HAMTC regarding the establishment of a Craft Training Program for both journeymen and trainees. The Council indicated concurrence with the proposed arrangement and the Craft Training Supervisor for FPD has been so advised and it is our understanding that the program will be instituted immediately.

A revision in the administration of the lay-off procedure was established wherein FPD now requires at least one week written notice prior to advising our personnel affected of reduction of force. It is hoped that this period will enable our Employment personnel to locate other types of jobs for those people scheduled for lay-off so that we can, insofar as possible, maintain a stabilized work force.

Grievance Statistics:

A total of 8 grievances were received and 5 were scheduled for Step II discussion. The following is a report of grievance activity:

	<u>UNIT</u>	<u>NONUNIT</u>
Received this month	8	0
Received since 1/1/57	49	0
Step I		
Answer unsatisfactory	7	0
Answer satisfactory	1	0
*Pending time limit	4	0
Settled this month	7	0
Step II		
Discussed this month	5	0
**Pending time limit	1	0
Settled this month	2	0

*Step I grievances which Council indicated desire to discuss at Step II but not scheduled, are considered settled at Step I at two 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 July Grievances: (8 total)

	Mfg. Oper.	Eng. Oper.	Maint. & Power Oper.	Empl. Rel. Oper.	Fin. Oper.
Jurisdiction	1		4		
Overtime	2		0		
Transfer	1		0		

Subject of Grievances for 1957: (49 total)

Jurisdiction	8	16
Overtime	5	3
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	2	0

HEALTH AND SAFETY

	<u>July</u>	<u>June</u>
Disabling Injuries	0	0
Serious Accidents	0	0
Medical Treatment Cases	44	41
Medical Treatment Frequency	3.44	3.64
Employee Hours of Exposure	127,707	112,654
Orientation		
Presentations	2	1
Attendance	18	19
Rotational Trainee Orientation		
One Hour Each	1	7
Inspections	15	10
Suggestions Evaluated	2	10
Medical Examinations Scheduled	67	97

Program Development

The Central Safety Council inspection was completed on July 10. The inspection program has extended into the second period of coverage for two months and improvement has been noted in overall conditions.

Fuels Preparation Department was awarded the National Safety Council's Award of Merit for performance from September 1, 1956 to June 30, 1957 without a Disabling Injury. Total exposure for the period was 1,202,818 man hours.

The monthly safety meeting for FPD women employees was held on July 17. The hazards encountered in walking were covered in a prepared talk and discussion.

Surface control and disinfestation of mosquito breeding areas was undertaken by Maintenance and Power Operation during July, in cooperation with the Public Health program.

Approximately 70% of the Industrial Medical examinations to be completed during 1957 have been scheduled through the end of July. It is anticipated that all personnel will have been examined before the end of November.

Activities

July activity included contacts on the following items: Materials handling, toxic solvents, guarding, degreasing operations, back flow prevention, steam cleaning, guided work cases, welding, respiratory protection, equipment movement and installation, chemical disposal, roads, ventilation, excavations, safety showers, cranes, compressed gases, mercury hazards, face and eye protection, inspections, safety meetings, traffic, acid line installation, elevators, automatic control equipment, mosquito control, noise control, lock and tag procedures, grinding wheels, laboratory classification, scaffolding, ladders, suggestion evaluation, and packaged heating equipment.

FIRE PREVENTION AND CIVIL DEFENSE

	<u>June</u>	<u>July</u>
Fires and Investigations	0	4*
Fire Loss	0	0
Inspections	15	27
Hazard Reports Submitted	6	5
Fire Prevention and Civil Defense Talks	2	5
Number Employees in Attendance	48	56
Orientation Program		
Number of Presentations	2	3
Attendance - Non-exempt Employees	19	18
Attendance - Summer Placements	7	0
Attendance - Technical Graduates	0	1

*Four accidental fire alarms -- no fires involved.

Fire Investigations

On June 28, 1957 a gust of wind caused a door in 3706 Building to slam shut with sufficient force to trip the fire alarm box on wall adjacent to door. The fire alarm box was replaced with a new model that cannot transmit an alarm from these conditions.

On July 11, 1957 a hi-lift truck hit a fire alarm box in 313 Building causing it to transmit an alarm. This being the second such alarm in recent months, management cautioned all operators about their careless driving and will restrict use of hi-lift trucks to authorized drivers.

On July 16, 1957 a machinist in 3717 Building inadvertently opened a test valve on the building sprinkler system causing it to trip the fire alarm system. The valve was tagged to prevent recurrence.

On July 22, 1957 during the process of carting a large pipe column into 3717 Building welding shop, the door casing was struck with sufficient force to trip the fire alarm box near door. The box was replaced with the new model.

Program Development

Concluded a series of Civil Defense training classes for Fire Protection personnel.

An area-wide Civil Defense Practice was conducted on July 12. A total of 1104 persons evacuated to the parking lot in seven minutes. Participants were very orderly and no infractions of the Area Evacuation Plan were noted.

A project proposal for installing a defense warning system in the 300 Area was officially approved by the AEC. The completion date is February 1958, with design work scheduled to commence during week of July 29, 1957.

Acted in advisory capacity to a committee appointed to study methods for safeguarding the storage of vital FPD records from fire and other disasters.

Plans for our October Fire Prevention Week program were initiated at the July meeting of the Health and Safety Program Council. Each member was requested to submit his ideas for the program at the next meeting. A meeting with other departments was arranged to discuss plans and pool ideas for a HAPO-wide program.

General Activities

Survey of 313 Building fire walls and automatic fire doors revealed sufficient code violations to eliminate the fire rating of the entire wall. Arrangements were made to correct all violations by work order request.

Arranged for the replacement of obsolete fire extinguishers in 305 Building with modern types.

Authorized installation of dikes around above ground oil storage tanks proposed for package boilers in a study being made by Project Engineering.

Caused relocation of oil drum racks, removal of empty waste drums and designated parking areas for trash luggers to eliminate the hazardous congested area on west side of 313 Building.

Advised Project Engineers that contractor had substituted explosion-proof motors in the modification of 3734-A Building.

Approved location of a welding booth for contractor installing a new acid line in the 303 Area.

Initiated an engineering study for installing a single control switch for all intake and exhaust fans in 3706 Building to eliminate starting a dozen motors following a building fire alarm.

Provided advice and assistance on the following subjects: Additions to area water system; approval of engineering drawings; schedule for sprinkler system tests; fire alarm grounds; revision of 306 Building emergency procedures; preparation of mechanical standards; sun protection for flammable liquid storages; hazards of janitorial supplies; appointment of Building Fire Wardens; transporting civil defense medical supplies; classification of laboratories; fire protection for rail shipments of product scrap; and procedures for maintenance work in hazardous areas.

TECHNICAL PERSONNEL PLACEMENT

College Recruiting

Plans are under way to hold the Western Regional Recruiters Meeting to be conducted by J. B. Holmes, Manager, Western Region Engineering Recruiting, Engineering Personnel Services. The meeting is tentatively scheduled to be held in the University Room, Rickey's Studio Inn at Palo Alto on September 23 - 24. The purpose of the meeting is to obtain the latest information on the various programs for recruiting at the colleges and also to exchange ideas on interviewing and recruiting techniques, in order to improve effectiveness and unity in this important activity. F. E. Jochen will attend as one of the HAPO representatives.

Summer Program

No activities.

Experienced, BS-MS Recruiting

Two technical or exempt personnel were added to the exempt roll this month. One, W. D. Faubion, transferred from Apparatus Sales in Oklahoma City, and one, Roy E. Bailey, technical graduate was transferred from R&U to exempt permanent assignment with the Fuels Preparation Department making a total of 33 added to the exempt roll from October 1, 1956 to date. This represents a 110 per cent 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 ten months covered by this forecast.

The Fuels Preparation Department has received thirteen applications to date as a result of its advertising activities. Ten of these applications have been for the position of Engineering Economist, one for the position of Electrical Engineer or Experimental Physicist, and one for a general position as "Chemist" but whose application was directed to HAPO as a result of other advertising. Eleven of these have been signed-off because it was felt that their qualifications, background and experience did not meet those required for the openings. Two are still under consideration.

We received from the Aircraft Nuclear Propulsion Department, the referral of a position opening for a Manager, Facilities Engineering, Aircraft Nuclear Propulsion Department. This was referred to Mr. Mathis for recommendations of any Fuels Preparation Department candidates. However, ANPD notified us at a later date that this position opening has been cancelled.

Several position openings in the Lamp Division, Nela Park have been referred to us for recommendation of any possible candidates from the Fuels Preparation Department. This is being explored through the Operation Managers of F.P.D.

Experienced, BS-MS Recruiting (9-1-56 through 7-31-57)

	Cases Con- sidered-FPD	Invitations - FPD				Offers - FPD			On the FPD Roll
		Ext.	Visited	To Vis.	Open	Ext.	Acc.	Open	
<u>Engineering</u>									
Chemical	50	12	9	0	0	10	8	0	8
Electrical	33	13	8	0	0	5	3	0	3
Mechanical	45	22	18	0	0	12	6	0	6
Industrial	9	4	3	0	0	2	2	0	1**
Metallurgical	20	11	8	0	0	3	3	0	3
Civil	8	0	1	0	0	0	0	0	0
Geological	0	0	0	0	0	0	0	0	0
<u>Science</u>									
Chemistry	20	2	2	0	0	1	1	0	1
Physics	16	4	2	0	0	0	0	0	0
Math-Stat.	5	1	1	0	0	0	0	0	0
<u>Other*</u>	<u>124</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	330	84	68	0	0	44	34	0	33

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

**J. P. CoVan on roll in June but not included in June on roll statistics.

PhD Recruiting (9-1-56 through 7-31-57)

	F P D			F P D	
	July	To Date		July	To Date
Cases Considered:	6	102	Offers Extended:	0	1
To be interviewed:	0	-	Accepted Offers:	0	0
Interviewed:	0	21	On the Roll:	0	0

Terminations and Transfers

No employees terminated employment with the Fuels Preparation Department this month.

Terminations and Transfers, Technical and/or exempt Personnel, (9-1-56 through 7-31-57)

	July	To Date
TERMINATIONS:	0	13
TRANSFERS TO OTHER COMPONENTS:		
Requests Received	0	22
Completed Transfers	0	7*
Closed Cases	0	12
Active Cases	1	--
Dormant Cases	2	--

*Includes three transfers within HAPD

EMPLOYMENT

Unfilled Requests for Personnel 24

Personnel Requirements Cancelled 0

Employees Added to the Rolls 18

Employees Removed from the Rolls 12

Transfer Data (Concerns Requests for Transfer - FPD)

Total Requests for Transfer Active at Start of Month	54
Number of Requests Received	4
Number Interviewed	6
Requests for Transfer Effectuated During Month	0
Requests for Transfer Cancelled	6
Requests for Transfer Active at Month's End	52

Procurement

Offers	8
Interviews	8
Request for Personnel Received	26
Transfers (all)	12
New Applications Received	2

Upgrades within FPD 11

Personnel Records

Letters to Outside Agencies Regarding Information 8

Perfect Attendance Recognition Awards 9

Service Recognition Pins 10 Year - 3 5 Year - 5

General

Supervisory Selection Interviews 4

EMPLOYEE BENEFITS AND SERVICE

General

A quarterly report of employee participation in the Pension, Insurance and Stock Bonus Plans as of June 30, 1957 was distributed to Level #3 and #4 Managers.

Visits to Ill or Hospitalized Employees

Employees visited at Kadlec Methodist Hospital 2

Employee Benefits Plans

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

	<u>Pension Plan</u>		<u>Insurance Plan</u>		<u>Savings & Stock Bonus</u>	
	June	July	June	July	June	July
Fuels Preparation	99.5	99.6	100.0	100.0	53.1	53.7
Chemical Processing	99.1	99.2	99.7	99.7	58.4	57.7
Irradiation						
Processing	99.4		99.7		62.1	
Hanford Labs	97.9		99.5		60.2	
Relations and						
Utilities	99.7	99.7	99.7	99.3	53.4	50.5
Construction						
Engineering	99.0	98.9	99.7	99.7	72.8	73.2

313 Building Tours

During the month arrangements were made for 13 FPD employees to tour the 313 and 305 Buildings. Commencing this month the FPD production facilities tour has been extended to include the 305 Building. In addition arrangements were made for 12 FPD employees to tour 100 K reactor facilities.

Selective Service and Reserve Statistics

Total number of non-veteran employees subject to military service training through Selective Service System Total 33

Number Classified 1A	<u>15</u>	Number Classified 4F	<u>5</u>
" " 2A	<u>8</u>	Total	<u>33</u>
" " 3A	<u>5</u>		

Number of Technically trained and Engineering Personnel for whom deferments are currently being requested 8

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

Reservists Data - Total number of Reservists on Roll 58

Number of Ready Reservists	<u>39</u>
Number of Standby Reservists	<u>19</u>

Number of employees on Military leave 4

Suggestion Statistics

	Fuels Preparation Department		Other Departments		Total	
	June	July	June	July	June	July
Received	62	45	21	11	83	56
Completed(all suggestions rejected or all approvals received)	58	16	11	9	69	25
Adopted	0	16	0	0	0	16
Percent Adopted	0	100.0%	0	0	0	64
Net Savings	0	\$581.43	0	0	0	\$581.43
Cash Awards	0	\$160.00	0	0	0	\$160.00

	Awards					
Net Savings	0	27.5%	0	0	0	27.5%
No. referred to other Depts.	9	8	0	0	9	8
Suggestions Awarded	16	0	0	0	16	0

Cumulative Statistics (Since 1-1-57)

Prior Backlog	147	164	8	18	156	182
Present Backlog *	164	180	18	20	* 182	200
Received	324	369	108	119	432	488
Adopted	90	106	5	5	95	111
Adoption Ratio *	27.8%	28.7%	4.6%	4.2%	*22.0%	22.7%
Net Savings	\$18,719.89	\$19,301.32	0	0	0	0
Awards	\$ 2,591.00	\$ 2,751.00				

	Awards	
Net Savings	13.8%	14.3%
No. Outstanding to other Depts.	11	9

*corrected

GENERAL

The collection of various personnel statistics for the Employee Relations Index was started on July 1.

SECURITY VIOLATIONS

There was one security violation during the month of July.

Manager - Employee Relations

**DATE
FILMED**

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