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Monthly Report

FUELS PREPARATION DEPARTMENT

JUNE
JULY 1957

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MONTHLY REPORT

FUELS PREPARATION DEPARTMENT

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FOR

JUNE -- 1957

Compiled by

Fuels Preparation Department

July 19, 1957

Richland, Washington

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FUELS PREPARATION DEPARTMENT
MONTHLY REPORT SUMMARY FOR
JUNE - 1957

MANUFACTURING OPERATION

Four hundred ninety-eight tons of acceptable fuel elements were produced which was 91% of the 547 tons forecast in HW-50113-RD.

I & E production was temporarily discontinued on June 5 due to low yields. Higher yields were experienced after production was resumed on June 24.

Reactor operating problems, resulting from the cored fuel element, have caused curtailment of cored production.

At month end there was a 0.6 month's supply of bare uranium cores. A 1.0 month's supply of finished fuel elements was available in the combined 100-300 storage area.

During June the solid yield was 81% which was 6% higher than the May experience.

Equipment modification, required for production of blunt nose tru-line fuel elements was completed.

ENGINEERING OPERATION

Three ruptures occurred during June in normal, solid and cored elements. One rupture occurred in a "doe" uranium-aluminum fuel element. Two of the 4 ruptures reported were in 1/2" cored elements. Seven ruptures have been sustained in cored elements since inception of the program. Because of poor performance of this type of element, procurement was stopped during June.

Irradiation of I & E elements continued without incident. To date 564 tubes have been charged for exposure at a wide range of power levels and specific tube powers. One tube of K size and 1 tube of C size pieces were charged for initial evaluation in K reactor.

Testing and evaluations completed to date indicate no significant difference between M-388 alloy and 1245 in general corrosion resistance. M-388 alloy, however, is expected to exhibit much greater resistance to intergranular attack. Large scale charging (20,000 to 25,000/month) will begin in August or September. Combination of tru-line features with M-388 alloy jackets should result in a significant lessening of corrosion type ruptures.

KER loop operating problems continue to delay the program for evaluating IPR size fuel elements. M-388 clad self-supported cored elements, IPR massive I & E or washer type, and IPR clusters are scheduled for charging in the KE-KER facility. Loop #1 is scheduled to operate with organic coolant about September 1.

An evaluation is underway to determine dissolving rates and metallurgical properties for dingot uranium to which an "additive impurity" of carbon has been made. Results of this study may indicate the need to specify a carbon range to provide additional improvements in dingot material.

Evaluations continued for centrifugally cast uranium pieces. Addition of a number of alloying elements is being investigated as a means of providing superior grain structures. A preliminary reactor test will be made utilizing about 100 solid and 100 I & E cast elements. These elements are unalloyed, beta heat treated pieces and will be utilized to determine whether gross performance problems exist. Attractive economic incentives exist for development of the centrifuge casting process.

Alpha and gamma phase extrusion uranium studies continued. An eight tube reactor test for alpha material is scheduled in July. Two different gamma phase alloys were extruded and are scheduled for metallurgical evaluation to determine reactor suitability.

Exploratory tests in extrusion cable cladding of HAPO elements was carried out at the General Cable Company in New Jersey. One hundred nickel plated elements were clad at 37 feet-min. These elements have been shipped to HAPO for evaluation. Exploratory HAPO fuel element extrusion cladding tests were carried out at the Battelle Memorial Institute. Several of the elements clad at BMI will be shipped to HAPO for future evaluation.

A preliminary analysis of uranium monocarbide as a ceramic fuel core material was made. This was based on data reported in the literature. Preliminary evaluation indicates potential advantage and the study is continuing.

A formal proposition for cable cladding uranium from BMI and a formal proposition from the American Bearing Corporation for pressure casting uranium cores were received. Form and content appear acceptable and these are being processed through the Contract Specialist, Purchasing and Stores.

All Design and Project work is proceeding on schedule and within costs. A revised project proposal and revised scope for CG-713, "Conversion to I & E Lead-Dip Fuel Elements", is under preparation. Changes are in accordance with needs of IPD as indicated in the official production forecast.

FINANCIAL OPERATION

Reconciliation of uninstalled capital equipment with Property Accounting records was completed. After necessary cross checking with other Department, entries were made to write off unlocated items and to add items not on record. Net amount of this entry, involving the addition of 59 items and the write off of 57 items, was \$15,050 credit.

An underrun of between 2 and 3 % in the FY 1957 Operating Budget is estimated. This underrun, which cannot be definitely determined until the books are closed on July 15, results from a curtailment of operating costs during the last quarter of the year.

MAINTENANCE AND POWER OPERATION

The Cost Reduction Program realized a net annual saving of \$10,402. The total saving for the first quarter of the program is \$36,211. This represents 93% of the quarterly savings budgeted in March.

EMPLOYEE & PUBLIC RELATIONS OPERATION

A summer session of PBM I was initiated during the month with 16 voluntary participants. This second presentation will be completed in October and the third course is planned to get underway in August.

The last two in a series of four all-day Communication Workshops were conducted this month. A total of 59 exempt employees participated. This represents 32% of our exempt force. Additional workshops are planned for this fall.

A 300 Area "Family Open House" was held on Saturday, June 1. A total of 1899 people attended. This, of course, was the first such event in the history of Hanford. The host of favorable reactions expressed on the day of the Open House and received since then, are indicative that the function was eminently successful.

Seven grievances were processed during the month; however, two of these grievances were submitted by a Relations and Utilities employee against FPD. Of the seven grievances submitted, five involved jurisdiction and two involved overtime.

On June 12 the Company received notice from the NLRB advising that the HAMTC had brought an unfair labor practice charge against the Company for alleged unilateral reduction of personnel in the canning line. On June 20 the HAMTC also signified their intent to arbitrate the canning line grievance, which was submitted in April.

The Department continued to operate without a disabling injury. There were no serious accidents or fires during the month. The medical treatment frequency rate increased from 3.26 in May to 3.64 in June.

PERSONNEL STATISTICS:

Number of employees May 31, 1957	772
Number of employees June 30, 1957	784

<u>OPERATION</u>	<u>EXEMPT</u>	<u>NON-EXEMPT</u>	<u>TOTAL</u>
GENERAL	1	1	1
MANUFACTURING	69	297	366
ENGINEERING	42	29	71
FINANCIAL	16	24	40
MAINTENANCE & POWER	40	234	274
EMPLOYEE RELATIONS	16	15	31
TOTAL	184	600	784

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FUELS PREPARATION DEPARTMENT

MANUFACTURING OPERATION

June, 1957

I. CURRENT OPERATIONS

A. Production and Productivity

1. Statistics

	8" Solid	8" De-pleted	8" Cored	En-riched	I & E	Total
<u>Current Month's Production</u>						
Acceptable Fuel Elements Produced(Tons)	455	4	23	10	6	498
As % of Forecast Production	112	13	38	100	15	91
As % of Past 3 Months' Production	104	133	38	200	60	97
Average						
As % of Past 12 Months' Production	106	400	70	1000	100	106
Average						
As % of June, 1957 Goal	108		28	167	3	84
As % of June, 1958 Goal (500 MWD/Ton)	165		14	25	3	74
As % of June, 1958 Goal (750 MWD/Ton)	455		92	40	2	111
% of Forecast Achieved - Last Fiscal Quarter	112	150	89	56	38	107
% of Forecast Achieved - Last 4 Fiscal Quarters	105	150	96	56	45	103
Production Adjusted for In-Process Inventory	457	4	23	10	18	512
<u>Productivity (Adjusted for In-Process Inventory)</u>						
Pieces - Man-hour Direct Labor	7.6		5.9	8.1	2.1	
Forecast	-	-	-	-	-	-
Previous Month	6.6		5.9	7.2	1.9	
<u>Operating Efficiency</u>						
Current Month (%)	-	-	-	-	-	87
Forecast (%)	-	-	-	-	-	90
Previous Month (%)	-	-	-	-	-	91
<u>Manufacturing Yield</u>						
Current Month (%)	81	85	77	85	22	
Forecast (%)	82	83	79	84	55	
Previous Month (%)	75		74	82	28	
Bare Uranium in Storage (Tons)						321
Canned Uranium in Storage (Tons)	439	10	87	10	19	565
Uranium Utilization (%)						95.7

2. Activities

a. Production

The Manufacturing Operation operated throughout June on a two- (2) shift basis with five canning lines on "A" shift and four canning lines on "B" shift. Four hundred ninety-eight (498) tons of acceptable uranium fuel elements were produced which was 91 percent of the five hundred forty-five (545) tons forecast in HW-50113-RD. Variance from forecast resulted from lower operating efficiency and a below forecast yield for I & E fuel elements.

I & E production was temporarily discontinued due to low yields. Extensive short-range tests were run to evaluate process improvements. On the basis of knowledge gained through these tests, production was resumed on June 24 with significant improvements in yield.

Reactor operating problems caused by cored fuel elements have resulted in below forecast charging rates for the past two (2) months. As a result, cored production has been curtailed.

Approximately five hundred (500) pieces of blunt-nose tru-line fuel elements were manufactured. Increased production of this product is scheduled to begin in July.

Production of depleted uranium was rescheduled due to difficulties in testing the material grain structure.

Production of fuel elements using M-388 (1% Ni) alloy caps and cans was postponed due to reactor scheduling changes.

An autoclave failure occurred on June 25, apparently caused by mechanical gouging of the inner can wall. Since the last failure on January 31, 688,000 canned elements have been processed through the autoclaves.

b. Productivity

Productivity was higher in June than in May. A solid yield increase of 6 percent more than offset a 4 percent drop in operating efficiency.

c. Manufacturing Yield - Solid Production

The manufacturing yield for solid fuel element production was 81.4 percent compared to 75.1 percent for May. A decreased canning reject rate and a record low bond test reject rate were major factors contributing to yield improvement. All reject categories were improved except bad weld, marred surface, and miscellaneous.

The canning reject rate dropped from 4.0 percent in May to 2.3 percent in June. This reduction is attributed to development of more proficiency in the use of the four-man canning line.

In June the poor bond reject rate was 3.9 as compared to 6.1 percent in May. A decrease in brittle bonding resulting in more even dissipation of weld heat was responsible for the improvement in this category.

c. Manufacturing Yield - Solid Production - continued

The bond test reject rate dropped from 3.1 percent for May to 0.4 percent for June. This was the lowest bond test reject rate since introduction of the ultrasonic bond test in March 1956. The following factors have attributed to this improvement:

- (1) Reduced porosity due to installation of vibrators in the canning jacks late in 1956.
- (2) Better control of brittle bonding.
- (3) More accurate calibration of the bond tester through the use of more precise standards.

The bad weld reject rate was 1.8 percent in June which was the same as experienced in May. The continued high reject rate was attributed to weld bead oxide, dimples, and moisture problems. Moisture problems have been accentuated by high humidity periods. The reject rate in this category has recently decreased due to several equipment improvements.

Thin wall rejects were down slightly from 1.3 percent in May to 0.9 percent in June. Improved sleeve control and homogeneity of sleeve lots decreased this category.

The inclusion reject rate descended from 3.2 percent in May to a "normal" 2.4 percent in June. Unusual inclusion problems of April and May were eliminated.

Miscellaneous rejects increased from 2.7 percent to 4.1 percent in June. This was attributed to AlSi carryover in new sleeves.

Other reject rates varied little from the May experience.

d. Manufacturing Yield - Cored Production

The manufacturing yield for cored fuel element production was 77.3 percent compared to 73.9 percent for May. Improvement in the bond test yield (See Manufacturing Yield - Solid Fuel Elements) was largely responsible for this increase. This category decreased from 5.2 percent in May to 0.9 percent in June. Other yield trends were similar to solid fuel elements.

e. Manufacturing Yield - I & E Production

The yield for I & E fuel elements was 22.0 percent in June compared to 27.7 percent for May and 36.4 percent for April. Production of this fuel element was temporarily discontinued on June 5, 1957 due to progressively lower yields. Reject rates exceeded fifty (50) percent at the bond and penetration test station equipped with electronic testing machines. Extensive process tests were made in both the 313 and 306 Buildings and production was resumed on June 24. By applying the new knowledge gained through these tests and with better control of the canning and finishing variables, toward month end yields in the 50 percent region for some I & E lots were being achieved. Although all process difficulties with the I & E element have not yet been eliminated, continued improvement is expected.

f. Manufacturing Yield - Enriched Fuel Elements

The manufacturing yield for enriched fuel elements was 84.7 percent in June compared to 82.3 percent for May. Reject experience did not differ significantly from the reject rates for solid fuel elements.

g. Manufacturing Yield - Depleted Fuel Elements

The depleted material canned in June was the first depleted material canned since March, 1957. A yield of 84.8 percent was achieved compared to 84.3 percent for March. The most significant change was in the bond test reject rate which decreased from 4.4 percent in March to 0.3 percent in June. However this decrease was offset by an increase in the miscellaneous reject category from 0.6 percent in March to 4.2 percent in June. Other reject rate fluctuations were comparable to solid fuel element experience since March, 1957.

h. Other Activities

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

<u>PWR No.</u>	<u>Description</u>
274	To determine: if proposed sleeve machine modifications will adversely affect inclusion reject rate; effect of varying temperatures in Dip-Rinse and Spray-Rinse; effect of additional soap rinse on caustic pitting and sleeve cleaning efficiency.
283	To evaluate quality of Hunter-Douglas can shipment prior to processing (Test Batch).
284	To determine effect of new sleeve material (1030 steel) on average residual can wall thickness.
294	To evaluate Hunter-Douglas aluminum components (Test production run).
PT-80-A-91-FP	To evaluate M-388 (1% Ni) alloy jackets in semi-production quantities.
PT-IP-81-A-92-FP	To eliminate fuel element misalignment in the reactor.

The uranium in bare storage increased to 0.5 month's supply at the end of June. This increase was due to:

- (1) Delay in increasing the production level from 8 to 9 canning lines because of the equipment outage of Fernald in May.
- (2) Postponement of I & E production due to low yield. About half of this current inventory is bare I & E cores.

A 1.0 month supply of finished fuel elements was available in the combined 100 - 300 storage area at month's end which was the same as experienced in May.

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h. Other Activities - continued

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

<u>Fuel Element</u>	<u>No. of Pieces</u>
8" Solid	27,227
6" Solid	194
4" Solid	272
8" Cored	2,725
I & E	<u>6,338</u>
TOTAL	36,756

On June 4, 1957, 1350.3 pounds of 0.94 enriched scrap and 581.37 pounds of "defective" enriched material were transferred to the Hanford Laboratories Operation at their request. This material will be returned to the Fuels Preparation Department in solution form upon completion of the tests.

3. Conversion Costs

Estimated conversion costs per solid fuel element for June are about two (2) percent lower than May actual conversion costs and about seven (7) percent higher than April actual costs. Decreased conversion cost compared to May is primarily due to increased yield which more than offset lower operating efficiency. Increased conversion cost compared to April is primarily due to lower production resulting in higher overhead unit cost.

B. Plant Problems and Incidents

1. General

During June the operating efficiency was 87 percent which was 4 percent under the May experience. Equipment outages caused 49 percent of the lost time. Operational and process outages accounted for 51 percent of the lost time.

2. Cap and Can Machines

The major cause for equipment downtime this month was the malfunction of cap and can machine baskets. Redesign of the basket support and tilt mechanism to compensate for buoyancy eliminated this problem.

3. Welders

New welding torches which use electric heaters in the torch cooling system to prevent condensation at the electrode have reduced oxides in the weld bead. Also, the feasibility of using a nine-second welding cycle (versus the present twenty-two second cycle) has been demonstrated. One machine will be converted to the new cycle for continued tests by late August.

C. Operating Plans

1. Bare Uranium Metal Quality

A downward trend was noted in the porosity type of rejects (voids plus box test) during the month. This was due principally to a reduction in brittle

1. Bare Uranium Metal Quality - continued

bonding. The true porosity rejects can be expected to increase slightly during the next month because the hydroxyl content of the beta treating salt bath at Fernald has shown a continuing increase. However, this increase in hydroxyl content has not been as severe as last summer due to the use of more efficient carbon dioxide sparging and the conversion to a different type of salt.

2. Aluminum Component Cost Savings

Substantial savings have recently been attained through development of alternate sources of supply for aluminum components. Greater savings are expected as the field becomes more competitive. The most recently approved vendor submitted a bid 7.1 percent under the present vendor on aluminum caps. Comparable savings can be expected on cans and I & E components as the new vendors are approved later in the year.

3. Manufactured Bond Test Standards

More accurate calibration of the bond tester has been accomplished through development of a manufactured standard piece. This standard replaced the "natural" fuel element which often resulted in over critical calibration. Extensive non-destructive and destructive tests have proven the standard to be satisfactory.

4. Blunt Nose Tru-Line Fuel Elements

Equipment modification required to manufacture this product was completed. Modifications included:

- a. Development of new welding technique to allow complete machining of the piece before welding.
- b. Development of tooling system to form the cap end contour in one facing operation on the Acme Gridley lathe.
- c. Design and fabrication of required contour measuring devices.
- d. Design and fabrication of a stamper to identify the piece.

D. Financial Matters

1. Inventories

The monthly inventory value of essential materials was increased from an average of \$350,000 to approximately \$425,000 during the month of June. The increase is due to new type components; (1) M-388 caps and cans, (2) 7 $\frac{1}{4}$ inch cans for enriched pieces, (3) M-388 blunt nose tru-line. It was necessary to purchase those items in quantities exceeding a three (3) months' supply to achieve minimum unit cost and optimum total cost.

E. Employee Relations

1. Safety

Members of the Operation were treated for 24 minor injuries for a frequency rate of 4.60.

2. Radiation Experience

The radiation exposure experience is summarized in the following table:

	Frequency of Exposures per Two-Week Period, in Mrads			
	<u>400</u>	<u>300</u>	<u>200</u>	<u>100</u>
June	0	0	0.5	11.0
May	0	0	2.0	13.0
Year-to-date	0	0	0.4	10.0

The improvement noted over last month's performance resulted primarily from a significant reduction in cored fuel element production and smaller throughput in the fuel element recovery process.

3. Security

No security incidents or violations were reported in June.

II. PERSONNEL MATTERS

A. Visits and Visitors

F.L. Van Wyck attended the General Electric Company Quality Control Inspection Training School at Bronxville, New York June 3 through June 6, 1957.

R.E. Olson and R.D. Ellingson presented papers at the AEC Nuclear Materials Management Conference in Washington, D.C. R.D. Ellingson presented a paper entitled "Simplification of In-Process Accountability in Uranium Fuel Element" on June 17; R.E. Olson presented a paper entitled "Special Problems in Accountability of Enriched Uranium" on June 18.

P. Onderchain of Manufacturing Services in Schenectady, N.Y. visited with D.W. Haught to review manufacturing processes. He was accompanied by A.E. Wiles.

B. Reports of Inventions

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 June, 1957.

C. Meetings

Members of the Operation attended 17 staff meetings, 8 information meetings and 28 safety and security meetings.

D. Significant Reports Issued

1. Routine

<u>Number</u>	<u>Title</u>	<u>Author</u>	<u>Date</u>
HW-50706	Monthly Report, Quality Control Operation, Fuels Preparation Department, May 1957	KV Stave	6-1-57

1. Routine - continued

<u>Number</u>	<u>Title</u>	<u>Author</u>	<u>Date</u>
HW-41288	Production and Inventory Report Manufacturing Operation - FPD May 1957	HE Berg	6-10-57
HW-50693	Production Report - FPD - Manufacturing Operation Month Ending May 31, 1957	HE Berg	6-10-57

2. Non-Routine

HW-50708	Uranium Washer Dimension Change	HE Berg RE Olson	6-11-57
HW-51044	Lot Types	RE Olson	6-21-57
HW-51050	Uranium With Controlled Additives	HE Berg RE Olson	6-21-57
HW-51051	Solid, Normal, Uranium Cores for Recrystallization Production Test	HE Berg RE Olson	6-21-57

K. V. Stave
Acting Manager - Manufacturing

KV Stave:WLH:rhs

8" CANNING REJECTS BREAKDOWN BY MAJOR CLASSIFICATIONS

NOTE :- 1956 FIGURES
INCLUDE BOTH SOLID
AND CORED.

LEGEND

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ENGINEERING OPERATION

June, 1957

VISITORS: None

TRIPS

<u>Name</u>	<u>Company Visited</u>	<u>Contact</u>	<u>Date</u>	<u>Reason</u>
O.W. Rathbun	MCW, St. Louis, Mo.	J.A. Fellows	5-25 to 6-1	Discuss uranium fabrication problems.
	NLO, Cincinnati, Ohio	W.T. Warner	"	" "
G.F. Jacky	BMI, Columbus, Ohio	F Shober CJ Slunder RJ Fiorentino	6-14	Discuss fuel cladding experi- ments.
	General Cable Co., Perth Amboy, N.J.	R Yeakle	6-22 to 6-29	Observe experi- mental fuel cladding.
J.C. Williamson	G.E., Schenectady	J Horn	6-19	Attend Graphic Reproduction Seminar.
	Eng'g. Admin. Consulting Service, Schenectady	C.H. Bayer	6-20	Confer on drafting problems.
J.W. Talbott	General Cable Co., Perth Amboy, N.J.	I Boehmer R. Yeakle	6-24 to 6-25	Plan cable cladding tests.
	G.E. Research Lab., Schenectady	D Libby	6-25	Consult on cable cladding.
	Lake Erie Machinery Co. Buffalo, N.Y.	Coleman Swanson	6-26	Discuss extrusion press designs and inspect plant.
A.J. Karnie	General Cable Co., Perth Amboy, N.J.	I Boehmer R Yeakle	6-24	Plan cable cladding tests.
	G.E. Research Lab., Schenectady	DJ Whittingham	6-24 to 6-26	Discuss technical aspects of "lost punch" impact ex- trusion technique.
P.H. Reinker	Washington, D.C.		6-19 to 6-21	Attend FEDC meeting

PERSONNEL

<u>Name</u>	<u>Title</u>	<u>Nature of Change</u>	<u>Date</u>
<u>Process Engineering</u>			
G.B. Hanson	Engineer	Hired in	6-28
R.J. True	Summer employee	Hired in	6-10
A. Russell	Rot. Tech. Grad.	Rotated out	6-7
<u>Materials Engineering</u>			
R.M. Peekema	Engineer	Transferred out	6-1
<u>Drafting & Files</u>			
R.W. Hutton	Draftsman	Reactivated	6-12
B.L. Garbe	Clerk	Terminated	6-28
<u>Testing Methods</u>			
A.N. Iverson	Rot. Tech. Grad.	Rotated in	6-13
H.E. Fisk	Summer employee	Hired in	6-3
M.M. Klenck	Summer employee	Hired in	6-3
<u>Design & Projects</u>			
G.L. Cooper	Summer employee	Hired in	6-12
F.J. Mollerus	Rot. Tech. Grad.	Rotated out	6-10

PROCESS ENGINEERING

Regular Production Rupture Experience

Three ruptures occurred during the month in normal uranium solid and cored production and one rupture occurred in a "doe" metal, uranium-aluminum fuel element. In the normal uranium ruptures, two were classified as side hot spot and one was unclassified. Two of the ruptures occurred in KE reactor, one in KW, and one in C reactor. Two of the three normal uranium ruptures were in 1/2" cored material making a total of 7 cored fuel element failures in about 275 tons of material charged to date. On the basis of the high rupture frequency and poor performance of the 1/2" cored material, the procurement of 1/2" cores from Fernald has been stopped until an understanding of the failure mechanism of the 1/2" cored material is obtained through examination of ruptured pieces. The goal exposure for the cored material presently in KE reactor has been reduced from 600 to 500 MWD/T.

I & E Program

The irradiation of I & E fuel elements in C reactor continued without incident. During the month 136 tubes were charged and 56 discharged at a variable goal exposure of 800 MWD/T. To date about 564 tubes of I & E fuel elements have been

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charged in C reactor and 169 tubes discharged without a failure. Average and maximum specific powers for the I & E charges are 41 and 57 KW/ft., respectively.

Three tubes of I & E and two tubes of solid controls assembled with enriched uranium (1.44% U-235) are undergoing irradiation at C reactor at average specific powers of 70-75 KW/ft. (maximum 90-95 KW/ft.) The three tubes of I & E have reached exposures of about 1250 MWD/T; however, the two tubes of solid controls have reached exposures of 1150 and 930 respectively without rupture.

One tube of K size and one tube of C size I & E fuel elements have been charged in KW reactor for initial evaluation of in-reactor behavior of I & E pieces in K reactor. During the month, I & E canning was carried out in the pilot plant to develop and improve the canning process to obtain higher yields, and in the 313 Bldg. production facility to produce sufficient fuel elements for reactor charging. Toward the end of the month, improved process techniques developed in the pilot line were incorporated in the production line with a resulting increase in yield from 15-20 per cent to the range of 45 per cent. Part of the increased yield was obtained by substitution of statistical sampling and destructive examination of fuel elements for internal penetration in place of the internal penetration tester which has not been developed to the point where it can be used reliably. In the pilot plant, some of the major process changes made to improve the yields are: (1) caustic etch of components replaced with a Duponal wash, (2) canning cycle increased from 45 to 50 seconds with a 70 second can-sleeve preheat, (3) canning tongs modified and improved, (4) cap-spires are pre-heated in a vibrating well under AlSi, (5) cap-spires are inserted into the cores before the cores are fully seated, (6) quench technique modified to insure a dry tube before machining and welding, and (7) in one run the cores were agitated horizontally in the duplex bath. Using one or more of the above process improvements, yields up to 60-65 per cent were obtained in 10 canning runs in which the number of pieces canned varied from 40 to 480. It is expected that as additional canning experience is gained and additional improvements incorporated in the process, yields of 70-75 per cent can be obtained regularly. Based on the improvements made to date, the provisional specifications for I & E canning have been revised to include the 50 second canning cycle with 70 second preheat, cap wetting by vibration, cap-spire insertion before core seating, modified quench technique, and internal bond standard of 0.75 cm. in place of 0.5 cm.

Because the I & E fuel element has a larger diameter than the solid piece, the I & E rests eccentrically in the process tube and causes elevated water temperatures at the top of the annulus. A mixing piece has been designed and tested to equalize the temperatures in the annulus but certain operational problems are associated with its use. An alternative to the mixing piece is being investigated, and consists of decreasing the jacket thickness by 10 mils to permit a decrease in overall fuel element diameter of 20 mils. The effect of this reduced can wall on penetration reject rates is being investigated.

M-388 Alloy Program

The reactor charging of about 25,000 solid and cored fuel elements clad in M-388 alloy and canned during May was delayed pending agreement on the future of cored pieces and while awaiting results on initial reactor tests on M-388 alloy. At

the present time, it appears that large scale charging (20,000-25,000 per month) of solid fuel elements clad in M-388 jackets will start during July.

Two tubes containing solid fuel elements jacketed in M-388 and 1245 alloy and alternated in the downstream half of tubes at C reactor orificed to obtain outlet water temperatures of 120 C were discharged at 600 MWD/T. Weight loss data for the two alloys were not significantly different, nor was the visual appearance of the two types of jackets. On the basis of the results obtained to date to compare the general corrosion resistance of M-388 alloy with 1245 alloy in a reactor environment, there appears to be no difference between the two alloys. However, the M-388 is expected to exhibit much greater resistance to the intergranular attack associated with side hot spot ruptures.

Blunt Nose Tru-Line Program

The initial shipments of blunt nose tru-line components are expected to arrive during July and large scale reactor charging (30,000-35,000 per month) is expected to begin in late August or early September. The use of the blunt nose tru-line feature combined with the use of M-388 alloy jackets is expected to decrease the number of corrosion type ruptures significantly.

Process Technology

A rapid, single pass welding cycle was demonstrated during the month, which reduces the welding time from about 20 seconds to 9 seconds per weld. Examination of welded pieces indicated that the quality was equivalent to that produced by the standard weld cycle.

IPR Program

Loop operating problems continue to delay the program for evaluating IPR size fuel elements. Loop No. 1 is charged with dummy pieces and is operating on single pass coolant while pumps are overhauled; Loop No. 3 is scheduled to be charged with M-388 clad self-supported cored elements at the next reactor outage followed by IPR massive I & E or washer type; Loop No. 2 is charged with standard size cored pieces and is scheduled for IPR clusters; Loop No. 1 is scheduled to operate with organic coolant about September 1.

Fifty-two standard size cored fuel elements with collapsible ribs, 13 massive IPR size I & E, 17 IPR size I & E wafer type, and 122 IPR size cored fuel elements were provided during the month.

The three 1.8" diameter cored (3/4" hole) IPR size fuel elements being irradiated in the KE through holes were discharged at an exposure of 630 MWD/T without incident. Examination is scheduled for mid-July.

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MATERIALS ENGINEERING

Low Hydrogen Dingot Uranium

There were no uranium fuel cores from low hydrogen dingots canned during June; however, six lots containing approximately 4175 pieces (total) are at HAP0 and will be canned early in July.

One special dingot, containing 500 ± 200 ppm carbon, has been made by MCW and is now at Fernald being fabricated to finished solid cores. This material will be used on the "additive-impurity" evaluation recently started. Samples will also be used for "cold" laboratory studies of nitric acid dissolving rates of dingot uranium with higher than normal carbon. It appears, from CPD experience to date, that regular low carbon dingot uranium dissolves much slower than ingot uranium. This would reduce capacity if any significant production quantities of dingot metal were to be processed. The higher carbon dingot uranium is being studied since carbon content is the most significant chemical difference between ingot and dingot uranium.

A metallographic study will also be made on samples from this dingot to determine if the increased carbon will produce a smaller and more desirable grain size than is present in regular dingot metal.

The combined results of these laboratory studies may indicate the need to specify a carbon content range for all dingot material.

Centrifugally Cast Uranium

Metallurgical examination of samples of centrifugally cast uranium, as-cast (i.e., not heat treated), containing various amounts of silicon and carbon, indicates that 1000 ppm and 2000 ppm silicon produces an equiaxed grain structure with a smaller average grain diameter than that of current beta heat treated production metal. There seems to be but little difference in grain size between the two alloy concentrations. The densities of the approximately 1500 ppm and 2000 ppm silicon bearing uranium are 18.85 and 18.74 respectively which compares favorably with the 18.90 average of current production metal. 305 Reactor reactivity tests on bare pieces, although incomplete, show k_{eff} values in the range of -0.3 to -0.45 as compared to 0.0 ± 0.25 specified for typical HAP0 production solid fuel cores. Metallurgical examination of as-cast pieces of varying carbon content shows that carbon in amounts up to 1000 ppm does not refine the as-cast grain size. The result is a coarse-grained dendritic structure typical of cast unalloyed uranium.

From these preliminary results it has been decided to investigate silicon in amounts ranging from 500 to 1000 ppm as a grain refining element. In addition, several other alloying elements (iron, aluminum, chromium, molybdenum, manganese, and others) are being investigated.

In the meantime, a preliminary reactor test using unalloyed, centrifugally cast, beta heat treated uranium, is planned to determine if any gross performance problems exist. The cores for this test (100 solid and 100 I & E) have been cast and will be shipped from FMFC as soon as inspections have been completed.

Alpha Phase Extrusion of Uranium

The Bridgeport Brass Company has postponed extruding hollow rods for economic evaluation until development work on the process is completed. The main problems are mandrel material, mandrel design, and optimizing dimensions. Solid cores from the third and fourth solid extrusion were canned for an eight-tube production test. The bare piece reject rate was two per cent. The canning yield was 87 per cent. These fuel elements, which will be exposed to 300-700 MWD/T, will be charged in "F" reactor during July.

Gamma Phase Extrusion of Uranium

Uranium which is fabricated in the gamma phase may have a randomly oriented structure which may not require heat treatment. In order to inhibit grain growth, uranium alloys are being investigated for this program. Three rods of a 0.4 atomic per cent chromium alloy and two rods of 1.5 atomic per cent silicon alloy were extruded during June. The rods were 1.45" diameter by 20 feet long.

These rods will be machined into cores for inspection and canning evaluation, and the alloys will be metallurgically evaluated to determine the suitability of the material as a reactor fuel. A high carbon (3000 ppm) alloy and a 3.8 atomic per cent zirconium alloy are scheduled for extrusion during July.

Cable Cladding

Exploratory tests in extrusion cladding of Hanford-goemetry fuel elements were carried out at the General Cable Company, Perth Amboy, New Jersey, plant, using their Schloemann opposed-ram extrusion press. This equipment is designed for continuous sheathing of electrical cable with aluminum. Objectives of these tests were to gain knowledge of design and operation of cable cladding extrusion presses, and to test equipment and a range of process variables for cladding Hanford fuel elements.

A total of 100 nickel plated fuel elements were clad at extrusion speeds ranging from eight to 37 feet-min. Uranium cores were not preheated. The press containers (and aluminum billets) were maintained at a temperature of 500 C. The cladding operation proceeded very smoothly, and the sheath appeared to be of good quality except for a few inclusions, probably due to foreign material in the containers of the press. Nominal cladding thicknesses of 45 to 80 mils were generally controlled within ± 3 mils.

A report describing the cladding operation in detail is being prepared. The clad fuel elements are being shipped to HAP0 for evaluation.

Exploratory HAP0 fuel element extrusion cladding tests were carried out at the Battelle Memorial Institute, using co-axial extrusion equipment and a porthole-type die and mandrel, similar to those used for cladding flat plates for SRL. Objectives of these tests were to obtain preliminary information on performance of extrusion tools, bond and weld integrity, and uniformity of cladding thickness.

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A total of five fuel elements were clad at an extrusion speed of ten inches-min., with the aluminum billet at 565 C. The fuel element cores were preheated during a residence time of about 10 minutes in the hollow mandrel (also heated to about 565 C) prior to cladding. This preheat chamber was purged continually with argon gas. Preliminary examination of the clad fuel elements indicates:

1. Variation in the nominal 50 mil jacket thickness is ± 5 mils or less.
2. The longitudinal diffusion welds in the jacket (produced by the porthole die and mandrel) are not detectable under microscopic examination.
3. A satisfactory metallurgical bond between the cladding and the uranium core was obtained, but the cladding could be readily peeled from the SAP (sintered aluminum product) material which was used as end plugs.

Several of the fuel elements clad at BMI will be shipped to HAP0 for further evaluation.

Aluminum Components

The fifty regular cans and caps of M-388 alloy received from Harvey Machine Co. in May have been approved and an order for 4000 pieces of each type has been placed.

The first 50 I & E cans and caps fabricated from M-388 alloy by Hunter-Douglas are expected to arrive at HAP0 within the next three weeks. A rod section of the Kaiser M-388 alloy material was submitted by Hunter-Douglas for analysis at HAP0. Although all tests are not complete, the preliminary results indicate that the material is satisfactory.

A pilot lot of 35 I & E caps, submitted by Harvey has been inspected. Several dimensions were not within specified tolerances and the pilot lot was rejected. The most serious defects were tube wall thicknesses and tube closure soundness. It has been suggested that Harvey attempt to correct these defects and submit another pilot lot for inspection.

Alcoa is still experiencing difficulties in fabricating AlSi clad I & E caps. Consequently, the delivery date has been extended to August 15, 1957.

Eight Alcoa cans fabricated from ultrasonic reject bloom stock and four regular cans have been non-destructively tested by the Testing Methods personnel. Several suspected defects were located by eddy current and ultrasonic examination with no apparent difference between the regular cans and those fabricated from the reject bloom stock. The instrument signals were not strong enough to cause rejection by the penetration tester at its present sensitivity. To determine the type and extent of the defects, destructive examination of suspect areas is planned. As reported last month, radiographs of these twelve cans showed no defects.

Pilot Plant - I & E Development

Eight process work requests were processed during June. These involved the canning of about 2,000 "C" size I & E, 150 KER size I & E, and about 900 each of "O" and "K" size I & E fuel elements. This represents a total of about 16 tons. Although final yields have not been determined for this production it is anticipated that 6 or 8 tons of fuel elements acceptable for reactor charging will be obtained.

These fuel elements were canned under process conditions varied to improve yields at all process stations.

Notable departures from previous process conditions were:

1. Installation of cap vibration.
2. Extending canning cycle from 45 to 50 seconds.
3. Modification of cap insertion techniques to a simultaneous core-cap spire assembly.

Definite improvements in yields at various stations have been achieved with the modified process. Additional factors significant in these yield improvements must also be considered. These are:

1. Relaxation of internal bonding requirements and elimination of internal penetration as a reject category as determined by test instruments.
2. Improvement in operator skill and more reliable performance of pilot plant equipment.

Pilot Plant-Equipment Development

The use of a duplex bath as a means of improving the recovery of I & E rejects is being developed as a cooperative effort with the Manufacturing Engineering Operation. A standard process duplex bath has been used to dissolve the can base, cap tube chimney, and the AlSi column plugging the internal bore of I & E leaker rejects. Two fuel elements may be processed simultaneously in the standard duplex baskets with a time cycle of 45 seconds and a lead temperature of 630 C. At the present the regular process for preparing these fuel elements for re-use is to face both ends and drill the AlSi plug with a production rate of approximately one each six minutes. The use of the duplex bath will accomplish this with a production rate of approximately ten pieces each six minutes.

The possibility of entrained moisture resulting from the quenching process requires the use of a cover on the duplex furnace and a separate start-stop control for the duplex agitator timer to eliminate any possible hazard to personnel or property. The design of suitable equipment is in progress.

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The application of ultrasonic cleaning equipment to the component cleaning processes is being investigated in cooperation with the Testing Methods and Process Engineering Operations. Several vendors are being contacted and visited to obtain a unit which is capable of processing I & E components at the production rate required by the 306 Fuel Element Pilot Plant.

Equipment is being designed to test the use of carbon dioxide as an agent for internal quenching of I & E fuel elements. Commercial kits are available for the application of carbon dioxide as a machining coolant. Two of these kits will be modified for internal quenching.

TESTING METHODS

I & E Fuel Element Testing

Several improvements and changes were made in the 313 and 306 Building prototype bond and penetration testers which should result in higher yields. High reject rates at the internal bond test were found to be due to the detection of "brittle bonds". These are currently considered acceptable by Process Engineering. Methods of aligning the bondtester were devised to allow the brittle bonds to be passed while still insuring detection of true unbonds and voids.

The internal bond test standards was also reviewed and revised. The maximum unbond length in the circumferential direction was increased from 0.5 cm. to 0.7 cm. Attempts are also being made to use the Lamb Wave technique of crystal separation to set the instrument to reject only when the unbond length in the longitudinal direction is also greater than 0.5 cm. Several hundred elements tested with these new settings gave very few rejects. The external bondtester (306 Building) is now being revised to reject on voids greater than 1.0 cm in the circumferential direction, as at present, plus the added restriction of requiring the void to extend more than 0.7 cm in the longitudinal direction. These changes give a more realistic two-dimensional reject criterion.

Undesirably high reject rates continue to be obtained from the internal penetration test because of its sensitivity to braze layer voids and surface irregularities. The developmental differential probe has been established as the best scheme yet found to discriminate against voids in the braze region.

This new probe can be made to function when held away from the surface, although the depth at which discrimination against defects takes place varies with the probe to surface spacing. Additional circuitry required for this system has been assembled for laboratory evaluation. Differential probes have also been fabricated for use with the lab and pilot plant automatic conveyors. In its present state of development, the new probe will not discriminate against surface irregularities. It will, however, make it possible to determine the relative number of void signals compared to surface irregularity signals. The improvement in yield will depend upon the number of "internal penetration" rejects caused by deep lying voids unaccompanied by surface "bumping" or "blistering".

Mechanical operation of the prototype automatic testers has generally been satisfactory. Several internal probe failures resulted from metal chips penetrating the wax in the probe body. The wax is being replaced by epoxy resin in future probes to reduce this difficulty. A "bounce-preventer" is being added to the 306 Transformation tester to eliminate bouncing of rough surfaced reprocessed cores. Changes have also been made in the index wheel to prevent its malfunction.

Eighty KKR elements were tested in the laboratory. Renovation of the laboratory prototype conveyor was completed and this will expedite future testing of small experimental lots.

Negative results were obtained from the metallographic examination of four spires selected as possible defective components by eddy current testing of one hundred I & E spires. One of these four had shown a visible depression on the outside accompanied by a projection on the inside. The source of the eddy current signal obtained from the other three is undetermined.

Methods Development

Eddy current and ultrasonic tests were made on a dozen Alcoa cans which were fabricated from metal known to have flaws as previously detected by ultrasonic means. Some gave eddy current indications which were not associated with apparent surface scratches. These signals were smaller than those obtainable from a penetration of AlSi to within 20 mils of the surface. The ultrasonic tests showed some correlations with the eddy current results and also gave signals with no apparent surface defects. These cans are being metallographically examined to evaluate the potential need and feasibility for non-destructive testing of cans.

A portable device was devised and provided on short notice for locating the ends of individual uranium cores in a long cable clad assembly. A HAP0 GM survey meter with a special guide is used to measure the natural beta activity of the uranium along the length of the assembly. The depression of activity at the junction between cores defines the midpoint of the junction to within 1/8".

Various possible applications for ultrasonic agitation in fuel element preparation have been scoped and are being summarized in a report. Vendors of generating equipment and transducers are to be visited to determine the equipment best suited for our development needs.

Additional study of the ultrasonic bare uranium surface inspection technique was completed using artificial fabricated defects. Calibration of the method is nearly complete and fabrication of a prototype tester is well underway.

A bondtester was installed in the 105-C basin. This and the grain size measuring equipment were aligned and readied for use with unirradiated fuel elements.

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Hanford Test Reactor

Metal testing continued routinely. Technical assistance was provided for several special tests including the measurement of relative power generation of four different KER loop mock-up assemblies. Results of the latter are being reported in HW-51238.

DESIGN & PROJECTS

Status of Projects

CG-713 - Conversion to I & F Lead-Dip Fuel Elements: The preliminary scope for this project (HW-50208) was reviewed with Manufacturing representatives and the General Manager during the month. At these meetings it was decided (1) that the production capacity of the 313 Building should be planned to meet the needs of IPD as predicted by the official production forecast. The forecast predicted from technical studies indicates a higher throughput. (2) The scope of the project would incorporate predicted welding developments and would therefore incorporate fewer welding machines. Manufacturing Engineering assumed the responsibility of demonstrating by December, 1957, the successful operation of a low-cost automatic welder with approximately double the capacity of present welding equipment. Welder procurement will be the determining factor in project completion.

A revised project proposal and a revised scope are under preparation and will be ready for approvals by July 15, 1957.

CG-737 - Electric-Pneumatic Control System: Design drawings have been forwarded to interested personnel for comment. Procurement of principle equipment has been initiated.

CG-759 - Additional Steam Generation Capacity - 300 Area: The AEC has requested that a study be performed to determine the advisability of installing several small package plants for building heating rather than an addition to the main generating plant. A preliminary review of this alternative was made at the time of preparing the project proposal and the indications were that such an addition would be unattractive. A more detailed study is being made and will be forwarded to the AEC.

IR-210 - Oil, Paint and Solvent Storage Facility: The general contractor, Frank H. Lohse, started construction June 18, 1957. The bid price was \$10,308 and scheduled completion is August 3, 1957.

IR-228 - Evacuation Warning System: AEC Authorization was issued July 1, 1957. Completion is scheduled for February 1, 1958, and the estimated cost is \$11,000.

Sanitary Water System Modification: The first draft of the project proposal is being circulated for comment. Principal items of work are the addition of a new 16" water line from North Richland and additional storage capacity of 225,000 gallons.

Research and Development - Cable Cladding: General Cable Corporation clad 100 fuel elements with their Schloemann cable cladding press on June 27. These fuel elements are being returned to Hanford for evaluation by Materials Engineering.

DRAFTING & FILES

Principal Jobs in Drafting

306 Building: Adjustable Mounting Bracket for I & E Test Heads
Spring Hold Down for I & E Fuel Elements
Light Source Mounting Bracket

313 Building: Flex-O-Timer Pneumatic Timer - 12 drawings
Bluntnose Tru-line Tooling
Fuel Element Drop Point Conveyor
Cobalt Tester - 4 drawings
Transformation Tester
Cap alterations; Cap Tray; Thin Wall Can; Can with Groove

384 Building: Misceallenous As-Builts

Drawings Produced:

New	42
Revised	41
Small Charts	33
Large Charts	4
Miscellaneous	9

ADVANCED ENGINEERING

Fuel Element Length

A decrease in the cost of producing plutonium may be realized by increasing the reactivity of Hanford fuel elements. In the overmoderated Hanford reactors this may be done by increasing the amount of uranium which may be placed in the cooling channel by increasing the length and/or diameter of the fuel elements. These effects become increasingly important when we decrease the uranium to moderator ratio to gain fuel element stability as in the I & E case. About 5 per cent more uranium may be placed in a tube by increasing the fuel element length to three feet. Work by Thiele indicates this would result in about 125 added inhours of reactivity. Core costs would be reduced by about \$0.04/lb. due to a reduction in the amount of scrap produced in core fabrication. The elements could be clad by the cable cladding process. A major uncertainty in the reactor behavior of three foot fuel elements is warp. Since the mechanisms of warping are not completely understood, this uncertainty can only be resolved by irradiation testing.

Increasing both the length and diameter of I & E fuel elements could provide as much reactivity as an 8" solid fuel element plus added conversion efficiency. The cladding of I & E fuel elements by the cable cladding method may be done

at a very little increased cost over solid fuel elements if it were possible to use I & E fuel elements with unbonded center tubes. A small scale irradiation test has been proposed to aid in determining the applicability of such a design.

Wrap-around Fuel Element for MINT Program

A contribution was made to a study of the cost of a moderate tritium development program at HAPO. The cost of fabricating fuel and target elements for a small scale reactor were estimated at \$100,000 for FY 58.

Vacuum Canning-Evaluation for Production Use

The vacuum canning process as presently developed is a laboratory technique for producing AlSi bonded fuel elements with a uniform can wall, and a thin ductile compound layer. Experience to date has included the canning of 400 elements, however, the limited data obtained are insufficient for yield prediction.

The process does not appear to be a potential production canning process since the advantages gained by this process can probably be obtained through modification of the present process. Additional process steps are required in core and component preparation for vacuum canning with subsequent cost increases.

However, fuel elements vacuum canned represent what is believed to be the ideal AlSi brazed fuel element. Testing and evaluation of fuel elements canned by this process will indicate the benefits that can be gained through lead dip process modification as well as aiding in establishing the upper performance limit of AlSi bonded fuel elements.

Uranium Carbide -- a Potential High Temperature Fuel Core Material

Uranium monocarbide offers some interesting possibilities as a ceramic fuel core material. A preliminary analysis, based on data reported in the literature, indicates sufficient potential advantages to justify additional effort to resolve some of the indicated problems and provide missing information.

The monocarbide is about 24 per cent more dense than UO_2 and has a higher ratio of uranium so that approximately 35 per cent more uranium per unit volume can be obtained by substituting UC for UO_2 of the same compactness. The UC appears superior to UO_2 for heat transfer by a factor of 2-1/2 to 3. On the same basis, UO_2 is almost equivalent to U metal. This comparison considers both the thermal conductivity and the maximum temperature difference permitted by a surface temperature of 400 C and the maximum core temperature.

Uranium carbide is known to be more reactive with water than is uranium dioxide, but the degree is not known nor have any attempts been made to inhibit the reaction. The R & D effort would be directed initially to study this problem and to determine physical properties.

Considerable interest is developing in uranium carbide, particularly by those developing graphite moderated, gas cooled, pebble bed reactors.

Projected Oxide Fuel Fabrication Costs

In conjunction with IPD's programmed studies on advanced reactors, an estimate was made as to the fabrication cost of a plutonium-uranium oxide fuel element. The elements are 5-feet in length, jacketed in 20 mil zirconium and bundled 7 per cluster. The cost was estimated at \$147 per element and includes all the operations from UF₆ and plutonium nitrate to a finished fuel element. Uranium oxide elements of the same dimensions are estimated to cost \$75 per element or \$11.00 per pound of uranium.

These estimates are projections on present technology, and are based on 1957 dollars and government financing. They do not include the costs of UF₆ and plutonium nitrate. Variation in fabrication technology provides a ±15 per cent uncertainty.

Off-Site Contracts

Battelle Memorial Institute - Cable Cladding: A formal proposition for work during FY 58 has been received from BMI and is being processed through Purchasing and Stores Contract Specialists.

American Bearing Corporation - Pressure Casting Uranium: A formal proposition based on the American Bearing Corporation letter of intent was prepared by Purchasing and Stores Contract Specialists and forwarded to A.B.C. We have been advised informally by A.B.C. that this proposal is acceptable in form and content and expect formalization shortly.

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

NONE

Manager - Engineering

PH Reinker:mbs

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FINANCIAL OPERATION

JUNE, 1957

AUDITS AND PROCEDURES

Auditing - Report on the audit of Management of Capital Assets was issued during the month and work was started on the audit of Inventories. This latter audit, which does not cover SS Materials, will include Essential Materials and the Reserve Account, Special Materials, Spare Equipment, and recorded shop supplies.

An investigation was completed concerning compliance within the Department with audit suggestions and recommendations made by the GE Traveling Auditors. Of the 13 relatively minor items contained in the three audit memorandums, five of which were included in the formal audit report, all but one have been appropriately complied with. This single exception pertains to a plant-wide personnel accounting recommendation which is currently being studied.

Office Procedures - The recently developed procedure for daily IBM recording of applied maintenance hours, initially adopted for one maintenance organization, is operating successfully as planned. Representatives of Data Processing, Product Cost and other interested components have participated in meetings to resolve minor distribution of hours, salary cost discrepancies and to schedule broader application of the procedure.

Representatives of FPD components, Data Processing and Hanford Laboratories Operation attended a meeting to consider improvement of the Overtime Hours Paid report, which is used for equalization of maintenance overtime within the area. Plans were developed for a series of actions to increase uniformity, accuracy, and useability of the report.

A comparative study was made of the work authorization and accounting changes being made in other departments.

Miscellaneous office procedures accomplishments included a preliminary review of present and future requirements for protection of vital records; determination of the most efficient method of accumulating a wide range of data by Level 5 work group, a sub-division not covered by present salary and other cost distribution procedures; evaluation of formal suggestions pertaining primarily to forms; discontinuance of the unnecessary administrative requirements relative to processing employee sales certificates; and appropriate distribution of approximately 30 AEC Manual chapter revisions.

Forms Control - Three plant-wide forms were revised as suggested by FPD, Union Relations, Wage Administration, and Plant Accounting and appropriate approval from other components was obtained.

An SS Material Receiving Report form, developed primarily by SS Accountability and combining two previous forms was designed for integrating more closely and rapidly the information supplied or required by SS Accountability, Material Movement, and Quality Appraisal.

GENERAL ACCOUNTING OPERATION

Work to date in connection with year-end closing of the books is progressing on schedule. All concerned have been formally notified of their respective responsibilities in this area. These include review of balances of all general ledger accounts, establishment of required reserves and accruals and the preparation of miscellaneous adjusting entries. Trial balance is scheduled for issuance July 15.

The level of activity in connection with attending meetings of professional and trade societies and attending off-site training courses during FY 1958 was reviewed. Approval of an allocation of \$7,500 and \$2,500, respectively was requested from the HAPO General Manager, the same as the amount requested for FY 1957.

Updating of OPGs and Advices continued during the month. Revisions to nine of these documents were issued in June.

Travel and Living statistics are summarized as follows:

	<u>June</u>	<u>May</u>	<u>Increase or (Decrease) over May</u>
Travel Advanced to Employees:			
Balance at beginning of month	\$ 4 301	\$2 387	\$ 1 914
Advances to employees	5 160	3 404	1 756
Billings from other HAPO components	<u>3 272</u>	<u>2 727</u>	<u>545</u>
	<u>12 733</u>	<u>8 518</u>	<u>4 215</u>
Less:			
Travel, living and conference expenses reported by employees	9 605	2 958	6 647
Cash refunded by employees	1 086	931	155
Billings to other HAPO components	<u>61</u>	<u>328</u>	<u>(267)</u>
	<u>10 752</u>	<u>4 217</u>	<u>6 535</u>
Balance at end of month	<u>\$ 1 981</u>	<u>\$4 301</u>	<u>\$(2 320)</u>
Outstanding Travel Advances:			
Current	\$ 1 949	\$4 251	\$(2 302)
Outstanding over 15 days	<u>32</u>	<u>50</u>	<u>(18)</u>
Balance at end of month	<u>\$ 1 981</u>	<u>\$4 301</u>	<u>\$(2 320)</u>
Number of expense reports submitted	37	23	14
Number of Cash Advances	24	26	2

GENERAL ACCOUNTING OPERATION (Continued)

The reconciliation of custodians' inventory of uninstalled equipment was concluded during the month and the final correcting voucher written. Analysis of the results of the reconciliation is as follows:

	<u>Number</u>	<u>Value</u>
Items added to record	59	\$ 16 164
Items dropped from record	<u>57</u>	<u>(31 214)</u>
Net Items added and value dropped from record	<u>2</u>	<u>\$(15 050)</u>

The allocation of cost, designation of property units, completion of account classification, and issuance of project unitization reports were completed on Projects CA-590, Fly Ash Collection Equipment--384 Building, and CG-640, Noise Reduction Program--300 Area. Property valuation of each project was:

CA-590	\$42 480
CG-640	<u>46 958</u>
	<u>\$89 438</u>

MEASUREMENT PROJECT

Work was started on the Department Measurement Report which will cover progress during FY 1957. Measurement of goal progress and primary activities not covered by specific goals will be reported by Key Result Area and the area of Management. It is anticipated that the report will be ready for distribution by the end of July 1957.

Rough draft of the second section of the Measurement Manual has been completed. This section of the Manual covers the Key Result Areas, their definitions, and specific measurement indices for the Department and Level 3 Operations. The initial section was distributed to all Level 3 and 4 managers and specialists during June.

The first meeting of the Maintenance measurement task force was held on June 13. It was decided that the initial study to develop better methods of measuring maintenance efficiency and productivity should be confined to a small area of activity rather than the broad area of maintenance activity in FPD. As a result, the Instrument and Electrical Maintenance Operation will be studied first.

PERSONNEL ACCOUNTING OPERATION

The May report mentioned that initial steps had been taken to redesign the payroll register to incorporate statistical information which is now furnished by Data Processing in the form of separate reports. Preliminary design has been completed and Data Processing advises that programming should be completed by the middle of July.

Pension Statements were distributed to all employees participating in the Pension Plan at December 31, 1956. These statements not only informed the employee of his 1956 contributions and the amount of pension credited to his account but provided a formula for calculating the approximate amount of pension he would receive at normal retirement age.

Relations and Utilities requested assistance in balancing and reconciling Savings and Stock Bonus Plan accounts which were incorrectly transferred at the time of reorganization in September 1956. Detailed reconciliations of our general ledger accounts for September, October, and November 1956 were furnished. Additional assistance will be furnished as required.

A request from Good Neighbor Fund Board for participation statistics was answered. Statistics included total annual contributions, average contribution, amounts designated for specific charitable organizations, and number of participants segregated by city of home address.

Job classification codes for all nonexempt employees were changed to conform with a revised code listing prepared by Relations and Utilities - Salary and Wage Administration. The revised codes will assist R & U - Salary and Wage in the performance of wage rate studies, area surveys, etc.

The job of transcribing the necessary information to a new absence record form, designed by this Operation, has been completed for all nonexempt employees. This new form provides for easier determination of eligibility for absence payments and attendance recognition awards.

Data Processing is currently working on a program to eliminate the manual posting of monthly U. S. Savings Bonds purchase lists. Program completion is expected during July.

During the nine months ended June 30, 1957, 109 employees were transferred between FPD and the other five HAPO components. Seventy-five employees were transferred into FPD and 34 were transferred out of FPD. During this same period, five employees were transferred between FPD and other components of the Company. Four were transferred out, three to APED (San Jose) and one to ANP (Evendale). One was transferred into FPD from Central District (Houston, Texas).

PRODUCT COST OPERATION

Cost Accumulation - The Manufacturing Cost Report was issued on a new reproduction process (ozalid), utilizing re-useable report mats. This process eliminates the typing time and results in 50% reduction in printing expense. As many other reports as practicable will be issued by this process.

PRODUCT COST OPERATION (Continued)

Meetings were held with members of Data Processing to discuss the results of the first week's daily time distribution. The errors detected were manually corrected and reviewed with the machine operator. It is planned to implement the system of daily time distribution in the Area Maintenance Operation July 22, 1957.

A meeting was held with Maintenance and Power management to discuss the measurement report on Steam and Steam Forecast. Few minor changes were made on the presentation and will be incorporated in the June reports.

Memorandum Inventory balances are being maintained and reported to each foreman in the Maintenance components on indirect materials. This material is segregated under two categories:

Shop Tools
Miscellaneous Applied Materials

A program of contacting individual foremen was started to explain and interpret coding procedures and cost reports.

Budgets - A revision to the FY 1958 budget is now under way. The latest production forecast and new personnel estimates will be incorporated along with the recent budget reduction. There remain some differences of opinion in the level of charges to and charges from other departments, which we must resolve in order to effect the required adjustments to end function costs. Efforts are being made to resolve these differences.

The new Financial Plan (document HAN-65810, dated May 28, 1957) indicates a reduction in FY 1957 operating funds of about \$112,000. Considering estimated June costs, including year-end adjustments, it appears that we will underrun the Financial Plan about 3%. This underrun results primarily from the curtailment of the I & E program and the deferment of adding personnel as budgeted.

Cost Analysis - Schedules were prepared which compared the average monthly cost for the fourth quarter FY 1957 (April, May actual and June estimated) to the June 1957 Goals. Attached to the schedule was a detailed analysis of the variances.

Work is currently under way to establish calendar year as well as fiscal year goals for 1958 and 1959. This work will be completed by the end of the current month.

A considerable amount of time was spent in working up cost data for FPD Engineering to be used in document HW-51205 - Status of I & E Fuel Element Program. This document is scheduled for release in July 1957.

Four productivity schedules were prepared and submitted to the Productivity Task Force for review.

PRODUCT COST OPERATION (Continued)

Inventories - In compliance with a request by the Atomic Energy Commission that we submit revised data in regard to zirconium program for FY 1957 through 1959, requisite schedules have been distributed to the respective components.

In anticipation of the six-inch I & E fuel element production, two inventory captions have been added:

Aluminum Cans 6" - I & E

Aluminum Caps 6" - I & E

The quarterly physical inventory of special materials was completed during the month with no discrepancies detected.

Net charges in FY 1957 against the essential material inventory reserve were \$19,897. Total inventory write-offs to the reserve were \$43,902.

Twelve thousand one hundred and twenty aluminum cans valued at \$5,293 were returned to the vendor for credit. Reason for this large claim was that one shipment was packed without fillers, resulting in much jostling and causing considerable amount of oxidation.

The coal inventory was increased 1,500 tons during the month in anticipation of the miners' holiday in July.

Physical inventories of shop stock in Instrument and Electrical Maintenance Operation are still in progress.

Manager - Finance

WS Roe:whm

MAINTENANCE AND POWER OPERATION

JUNE 1957

GENERAL

Material and Property

Declarations of Excess Issued 5

Productive Maintenance Program

Outstanding orders as of 5/22	107
Orders issued in June	79
Orders completed in June	41
Outstanding orders as of 6/25	145

The Cost Reduction Program realized a net annual saving of \$10,402. The total saving for the first quarter of the program is \$36,211. This represents 93 per cent of the quarterly savings budgeted in March.

The revised method of time distribution for nonexempt personnel was initiated in the Instrument and Electrical Maintenance Operation. This method provides for the individual entering hours worked on a time distribution card, which shows the distribution of the entire 8 hour day plus overtime. The cards are checked to ensure accuracy and completeness. The information is then typed on an IBM 884 machine, which produces a narrative sheet that may be distributed as required for the Foreman's use. The machine at the same time produces a punched tape from which IBM punched cards can be produced. This method completely eliminates the use of the back of the time card for the distribution of the man's charges.

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	745	356 371
Verifax	89	2 044
Ozalid	46	4 142
		<u>362 557</u>

Fifteen formal reports were completed. These reports consisted of 4,713 volumes with a total of 175,676 pages.

The backlog of the Duplicating Operation has increased. Much of this backlog is the result of collating jobs for other Departments. This work is being done on the new automatic collator, with prompt and accurate results.

The janitorial services in the Area have been faced with the problem of locked office doors in the Hanford Laboratories area. Arrangements were made with the Security and Patrol Operation to assign keys to the individual janitors. It was agreed that present security regulations make it unnecessary for offices to be locked or for patrol to be present while the janitors clean offices in this location.

The No. 2 high tank valve pit has been cleaned, all valves checked, and a new clean-out valve installed in the bottom of the standpipe. The pipes and the pit were then painted.

The project perimeter fence was repaired. Approximately 200 fence posts were replaced. All loose wire was renailed and other repairs made as necessary.

The horizontal boring mill was removed from the 3717 Building machine shop. This machine will be released for utilization at another location. The removal of this equipment permits better utilization of space in this building.

INSTRUMENT AND ELECTRICAL MAINTENANCE

The Portable Shop repaired 922 portable radiation survey instruments. The average repair time per instrument was 1.13 man-hours.

The fabrication of 12 extended CPs is 96 per cent complete. Tests on three of these instruments indicate that waxing of the probes will not be necessary. This results in a cost saving to the customer.

Instrumentation work on the liquid moderated reactor, being installed in the 321 Building, was completed. Included in this instrument work was the installation of five pre-amplifier devices which are designed to operate in the corrosive atmosphere in the building. The pre-amplifiers are enclosed in tubes which are purged with air for cooling purposes and to prevent the introduction of nitric acid fumes into the components.

The positive ion accelerator was in operating condition 17.5 days during the month. The electron accelerator was down for approximately ten days for its annual overhaul.

The RCL 100 channel analyzer in the 329 Building was modified. These modifications included the provision for the utilization of regulated voltage in all circuits in the unit. In addition, a measuring device which accumulates the instrument dead time, i.e., the time the instrument is unable to count because of a previous pulse, was installed. This device permits the determination of the reliability and accuracy of the counts obtained on this equipment.

A credit of \$10,803 was given to the Hanford Laboratories Operation due to overliquidations during the first 10 months of operation in FY 1957.

The inventory of the Instrument and Electrical Maintenance Shop Stocks was completed. The inventory amount to \$17,000. The supplies are in seven locations.

POWER

Power Statistics

	<u>JUNE</u>	<u>MAY</u>
Average Steam Generated (M lbs/hr)	32.8	32.4
Maximum Steam Generated (M lbs/hr)	49.0	56.0
Total Steam Generated (M lbs)	23 651	24 111
Coal Consumed (tons)	1 531	1 455
Evaporation rate (steam/#coal)	7.72	8.28
No. boilers on 3 2		
Date of change 6 8		
Sanitary Water from 3000 Area (Million Gals.)	65.4	63.3
Total Water from 3000 Area (Average rate GPM)	1514	1417
Soft Water from #3 and #4 Wells (M gals)	11.3	12.0
Water from #2 Well (M gals)	.25	.25
Peak water consumption for 24 hours (Million Gals.)	2.5	2.3

The decreased evaporation rate of 7.72 as compared to 8.28 for May is due to the return to Kemmerer coal (Utah coal was used during May). In addition, the steam load is such that one boiler is insufficient but two boilers are not operated at full efficiency.

The results of the corrosion tests on the condensate return lines from the 325 Building were received from the Betz Water Conditioning Company. These results indicate that the corrosion in these lines exceeds 5 mils per year. The addition of a filming amine into the steam mains to reduce corrosion in the condensate lines is being investigated. The effect of this amine on fuel elements in the autoclaves is a primary consideration of the study.

The annual overhaul to No. 3 Boiler was completed. Following the overhaul, the boiler inspector from the Travelers Insurance Company inspected it and reported the boiler to be in excellent operating condition.

A leak in the 6" water line from North Richland to the 300 Area was repaired. The leak was the result of an air relief valve failing. After the repair was made, the lines were tested. The test revealed there was no appreciable leakage in this line.

PLANT ENGINEERING

There were 18 training lectures presented to electrical, instrument, pipe-fitter, painter and millwright craft personnel. This represents 209 class man-hours of formal training. Subjects covered in these lectures were: Electrical theory, operation and maintenance of Leeds & Northrup recorders, operation and maintenance of Bristol recorders, calibrating testing, valve types, painting techniques and belting.

T. D. Gibbs, Engineer, Facilities Analysis, spent the week of June 10 at a light conference held by the General Electric Company at Nela Park.

FIRE PROTECTION

Fire Responses

HAPD	3	Loss	None
Construction	0	Loss	None
Private	0	Loss	None
Outer Area	2	Loss	None

Description of Fires

Hanford Laboratories Operation, 321 Building, June 13. An electric motor shorted out and over-heated. CO₂ was used to cool the motor. The electricians were called to disconnect the motor. Loss - none.

Fuels Preparation Department, 3706 Building, June 28. Accidental alarm. Loss - none.

Hanford Laboratories Operation, 329 Building, June 28. Ballast burned out on electric light fixture. Loss - none.

PERSONNEL MATTERS

Organization Changes

None.

Safety, Security and Radiation Experience

Medical Treatment Injuries	16
Frequency Rate	3.97
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	25
Safety and Security	30
Information	11

Reports of Invention

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

Manager
Maintenance and Power

E.Hilgeman:JPF:mkm

EMPLOYEE RELATIONS OPERATION
JUNE, 1957

PERSONNEL DEVELOPMENT

A summer session of PBM-I was initiated during the month with 16 employees participating. This second presentation this year will be completed in October, and a third series will start in August and be completed in December.

A plan for orienting approximately 80 tech. grads., junior and post-graduate students and professors to the Department was developed. Tentative date for the discussion and tour is July 17. The seven students and professors assigned for the summer to FPD were given the same internal orientation program as that for tech. grads. assigned to Fuels.

The initial draft of the "Your Share of American Enterprise" program was completed during the month and will replace the out dated program, "Your Stake In American Industry".

A new American Management Association booklet on cost control was forwarded to the Manager-Finance, who in turn gave general distribution within Financial Operation. Theme of a lead article was the psychological attitudes of employees toward cost control.

Copies of "The First Five Years of Professional Development," a brochure developed by the Engineers Council for Professional Development, are being distributed to tech. grads., summer students, professors and department managers. The folder sets forth a program of development for young engineers during the crucial first five years in industry.

Twenty-eight supervisors attended the first in a series of training sessions to review the Nonexempt Personnel Development Program. Reaction of supervisors indicates strong acceptance of the program as currently constituted.

Since April 1, Personnel Development forms have been distributed and returned, as follows:

	<u>April</u>	<u>May</u>	<u>June</u>
Distributed	28	34	49
Returned	28	25	18
Outstanding	0	9	31

The Manager-Engineering has reviewed a proposed Creative Thinking program developed by the Specialist-Personnel Development and will hold a planning session during July to tailor the course to the Department's needs. The Engineering Operation will be primarily responsible for presenting this program for technically trained people of the Department.

In-plant training activities during June occupied approximately 1.9% of total work time, as against a goal of 2% average for the year.

Two tech. grad. assignments were vacated during the month and two were filled by tech. grads. The availability of assignments was reduced significantly by the seven summer placement employees who absorbed the openings normally available for tech. grads.

COMMUNICATION

A total of 59 level 4, 5 & 6 exempt employees attended the four Communication Workshops presented during May and June. This represents 32% of the FPD exempt roll. Additional workshops are planned for this fall. The great majority of those who attended indicated on anonymous questionnaires that the program would be of definite assistance in the conduct of their work.

A 300 Area "Family Open House" was held on Saturday, June 1 by the Fuels Preparation Department and Hanford Laboratories Operation. A total of 1,899 employees and adult family members visited the area during the open house, the first of its kind at Hanford. The great many favorable comments from visitors, received both orally and in writing, indicate that the open house was highly successful.

A study has been undertaken of the quality and quantity of GE News coverage given FPD people and activities. Initial findings indicate that, on a pro rata employee basis, Fuels could expect to receive an average of 8.6% of GE News column inches available after deducting the average of 2½ pages per eight page issue devoted to material applicable to all departments. The study indicates Fuels has received approximately 8.6% of available GE News space since the first of the year.

Pension Plan Status reports were mailed to the homes of all nonexempt employee participants along with a letter from the General Manager. Exempt employees received their status reports and advance copies of the letter at their plant addresses.

The Good Neighbor Fund Drive conducted during the month utilized material developed by the Specialist-Communication which subsequently was utilized by several other HAPC components. Preliminary results include \$300.00 increase in annual contributions to the Fund. A total of 28 people increased their contributions, three cancelled their membership and two new participants enrolled.

Four regular and three special editions of the Management News Bulletin were prepared and distributed. One of the special bulletins announced the appointment of the Manager-Manufacturing to serve as Acting General Manager for the period July 1 through September 30. Another carried a statement from the HAPC General Manager concerning rumored layoffs. The third announced the filing with the NLRB of an unfair labor practice against the Company and naming the Department.

Two issues of the FPD Newsletter were prepared and distributed to all employees. Two General Manager's meetings, one with the Management Information group and the other with exempt employees, were arranged. One technical paper was cleared for presentation, leaving no papers pending approval.

GE News publicity devoted to Department activities and employees during the month totaled 84 column inches, an average of nearly 1/3 of a page per issue. This publicity included items on the 300 Area Open House, employee off the job activities, retirement, PBM-I group graduating, flag day, and suggestion and attendance awards.

A salary administration booklet was read, edited and placed in the hands of Central Printing.

Additional materials developed for distribution included: revised telephone list, organization and functions of Employee Relations and Financial Operations, and the safety topic of the month, "Walk With Safety".

SALARY AND WAGE ADMINISTRATION

There were 9 positions audited during June. Excluding Level 2 and 3 Managers, fixed rate and vacant positions, 45 of the 87 exempt positions as of December 31, 1956 have been audited or 136.3% of the two year goal on a monthly basis. A total of 50 audits have been completed of the 169 incumbents.

The Salary Plan Talk was given twice during May with 15 persons in attendance. Questions and discussion after the talk were essentially the same as those from the fall series which were previously recorded.

Investigation of the practice with respect to promotion of nonexempt craftsmen to the exempt role for foreman vacation and illness relief with and without an increase in salary is in progress. Preliminarily it is believed that there are no problems in the Fuels Preparation Department at present.

The structural and functional organization charts and the organization directory were issued reflecting personnel numbers as of June 12, 1957. Exempt changes through July 1, 1957 are recorded.

A reminder to all supervisors of exempt employees to the effect that mid-year is a good time to review the performance appraisal and reporting individuals insofar as the listing of programs, assignments and measurement factors are concerned.

Two new positions are to be established on July 1, 1957. These are Analyst, Manufacturing Equipment - Manufacturing Engineering Operation and Analyst, Maintenance Scheduling - Area Maintenance Operation.

Audit of the Financial Operation nonexempt jobs was completed. The audit of the Employee Relations Operation has been started and will be completed during the first week of July. To date 45% of all nonexempt job descriptions in Fuels Preparation Department have been audited which represents the assignments of 274 employees.

Hourly Compensation information for manual job classification was submitted to the New York Office at the request of H. H. Hutchinson, Employee Compensation Service. The information included pay rates and progression schedules for several of the bargaining unit jobs.

Advices 3.4.1 and 3.4.2, Bargaining Unit and Non-Bargaining Unit Wage Rate Rules, were revised and submitted for approval. The sections of these advices which were revised were those relating to the amounts paid for shift differential and isolation pay.

HAPU Union Relations and legal staff representatives were provided information concerning the method of assigning Engineering Assistant work in Fuels Preparation Department. This information was collected in connection with the National Labor Relations Board hearing during the month concerning a jurisdictional dispute in the 1706-KE Building, Irradiation Processing Department.

A total of 22 documents were processed in recording salary actions for exempt employees and 78 documents for nonexempt actions.

HEALTH AND SAFETY

	<u>June</u>	<u>May</u>
Disabling Injuries	0	0
Serious Accidents	0	0
Medical Treatment Cases	41	43
Medical Treatment Frequency	3.64	3.26
Employee Hours of Exposure	112,654	131,935
Orientation		
Presentations	1	3
Attendance	19	7
Rotational Trainee Orientation		
One Hour Each	7	1
Inspections	10	14
Suggestions Evaluated	10	4
Medical Examinations Scheduled	97	91

Program Development

The safety film, "No License To Kill," was presented by the Health and Safety Program Council during the first week in June. Scheduling was arranged for all FPD personnel. Attendance was good.

The Central Safety Council made their regular monthly inspection of FPD facilities. The inspection schedule started into the second period of coverage for each facility in June.

Health inspections were initiated for FPD lunch rooms during June. Items being evaluated include sink top condition, refrigerator cleanliness, heating equipment, and general housekeeping.

Basic instruction and a briefing on the Health and Safety function was presented to seven college students assigned for summer employment.

Activities

June activity included contacts on the following items: Hazardous chemicals, publicity, noise and atmosphere studies, eye protection, drinking fountain plumbing codes, safety showers, traffic, safety meetings, walks, public health; materials handling, storage, guarding, lighting, power equipment, control equipment, roads, safety shoes, process equipment hazards, steam, disposal, stairways, compressed gases, ladders, piping installations, training, painting, ventilation, suggestions, solvents, housekeeping, safety rules, and job hazard analysis.

FIRE PREVENTION AND CIVIL DEFENSE

	<u>May</u>	<u>June</u>
Fires and Investigations	2	0
Total Fire Loss	\$218	0
Inspections	32	15
Fire Protection Surveys Completed	1	0
Hazard Reports Submitted	5	6
Fire Prevention and Civil Defense Talks	0	2
Employees in Attendance	0	48
Orientation Program		
Number of Presentations	6	2
Attendance - Non-exempt Employees	5	19
Attendance - College Summer Placements	0	7

Program Development

Developed a new training course in Plant and Civil Defense for Fire Protection personnel. The first of four scheduled classes was conducted on June 28, 1957.

A project for installing a fire protection sprinkler system and explosion proof wiring in 3734-A Building was approved and contractor started construction during the month.

A project proposal for an area defense warning system was completed and submitted to AEC for approval.

A work request for 72 signs to identify all water control valves in the area is approximately 20 percent complete. The painting program for fire hydrants, sectional control valves and associated barricades is complete except for scotch-lighting barricades.

Approximately 50 fire extinguishers, of unsafe or undependable condition, are being replaced by new extinguishers. Extinguishers are being lowered to eliminate the lifting hazard.

Advices on "Plant Evacuation" and "Reporting Fires" were issued.

The 300 Area Master Evacuation Plan was distributed on FPD Lists 1, 2, 3 and 4, and to other HAPO Departments.

Attended a meeting of Civil Defense representatives to plan a HAPO Civil Defense Practice scheduled for 8:30 a.m., July 12, 1957.

Completed Communications Workshop Course.

General Activities

Approved Engineering Plans for installing an overhead spent acid line between 306 and 313 Buildings.

Arranged for the removal of ten old gas cylinders, containing unidentified gases, from the 3732 Building to an isolated location outside the Area where firemen discharged their contents.

Approved four welding permits in 313 Building and arranged for firemen to stand by during welding operations.

Approved spray painting of coal hoppers on idle boilers in the 384 Power House.

Arranged quarterly tests of automatic carbon dioxide fire extinguishing systems in 313 Building.

Investigated accidental fire alarm in 3706 Building caused by an auxiliary fire alarm box being activated by jar from slamming door. Arranged for box to be relocated to a nearby sturdier wall.

Relieved the Health and Safety Specialist during his vacation and assisted HLO during the absence of their Safety Specialist during the month.

UNION RELATIONS

On June 12, the Company received notice from the NLRB advising that the HAMTC had brought an unfair labor practice charge against the Company for alleged unilateral reduction of personnel in the canning line. On June 20, the HAMTC also signified their intent to arbitrate the canning line grievance. The Field Examiner assigned to the case has been in communication with both HAMTC and the Company and has requested an answer to the charge which is to be submitted not later than July 6. It was learned that the Field Examiner inquired of the HAMTC as to whether all remedies under the contract had been exhausted and he had particular reference to the grievance and arbitration procedure. It is concluded that the HAMTC filed their intent to arbitrate because of the question raised by the Examiner. It is the recommendation of FPD that we not agree to arbitrate this grievance. The answer to the unfair labor practice charge will request dismissal of the charge based upon both factual and legal grounds.

A meeting was held with product department craft training supervision and Union Relations Managers, concerning proposed training programs for craft trainees. The recommended program has been forwarded to the Relations and Utilities Union Relations Manager and Legal with FPD recommendation that the proposed program be instituted as early as possible. It is expected that the subject will have to be discussed with the Union prior to instituting the program.

On June 6 the first FPD Industrial Relations Council meeting was held. The purpose of the Council is to discuss proposed Step II answers to grievances, grievances scheduled for Step II and any other matters concerning Union Relations policy in FPD. Meetings were also held on June 13 and June 20.

Grievance Statistics:

A total of 7 grievances were received and 3 were scheduled for Step II discussion. The following is a report of grievance activity:

Grievance Statistics (Continued)

	<u>UNIT</u>	<u>NONUNIT</u>
Received this month	7	0
Received since 1/1/57	41	0
Step I		
Answer unsatisfactory	6	0
Answer satisfactory	1	0
*Pending time limit	8	0
Settled this month	8	0
Step II		
Discussed this month	3	0
Pending time limit	* 1	0
Settled this month	4	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.

***Corrected figure - Last month's report indicated 3 and it should have been 1.

Subject of June Grievances: (7 Total)

	Mfg. Oper.	Eng. Oper.	Maint. & Power Oper.	Empl. Rel. Oper.	Fin. Oper.
Jurisdiction			*5		
Overtime			2		

Subject of Grievances for 1957: (41 Total)

Jurisdiction	7	12
Overtime	3	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	1	0

* This total includes two grievances submitted by an employee in Relations and Utilities, however, both grievances were against Maintenance & Power, Fuels Preparation Department.

TECHNICAL PERSONNEL PLACEMENT

College Recruiting

Offer activities in the field of college recruiting have been drawn to a close for the recruiting year September 1956 to September 1957. F. E. Jochen's recruiting activities in the colleges and universities of his district have resulted in 70 program offers being extended by HAPO to BS-MS candidates in science and engineering, and 10 persons being considered by HAPO for direct placement. This year to date, a 27.5 percentage acceptance rate, which includes 3 direct placement acceptances, was achieved in F. E. Jochen's district.

For the college recruiting year September 1, 1956 to September 1957 to date, 28 rotational assignments from the Personnel Development Program have been made in the Fuels Preparation Department, resulting in 8 permanent assignments to the exempt roll, one of which was upgraded from the permanent non-exempt roll this month.

Summer Program

Seven summer program people - one college professor, one high school teacher, two graduate students, and three summer juniors - have joined the Fuels Preparation Department for their Summer Program assignments. The members of F.P.D. have been made aware of their responsibility in providing stimulating assignments and a friendly work environment for these summer employees, so that these men will return to their respective campuses as HAPO's "ambassadors of good will," a most effective aid in establishing good campus relations.

Experienced, BS-MS Recruiting

Two technical or exempt personnel were added to the exempt roll this month, one of whom was a direct placement candidate, and one of whom was a technical graduate upgraded from a non-exempt permanent assignment with the Fuels Preparation Department to an exempt assignment with F.P.D., making a total of 30 added to the exempt roll from October 1, 1956 to this date. This represents a 110% achievement on the roll in relation to requirements as forecast for the year October 1, 1956 to October 1, 1957 (including attrition allowance) prorated for the first nine months covered by this forecast.

The quarterly report covering the Fuels Preparation Department's technical and exempt personnel requirement for the period June 1, 1957 to July 1, 1958, has been completed and prepared from information submitted by individual departmental components. Conforming with most recent budget indications, and from analysis of this report, it has been determined that a total of 20 technical and exempt personnel (including attrition replacements) will be needed during this period. These requirements for the most part are primarily on the basis of replacements to cover the normal attrition rate.

The Fuels Preparation Department has received eleven applications to date as a result of its advertising activities. Nine 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. F. E. Jochen is taking appropriate action in the referral and responses to these applications.

Experienced, BS-MS Recruiting (9-1-56 through 6-30-57)

	Cases Con- sidered-FPD	<u>Ext.</u>	<u>Invitations - FPD</u> <u>Visited To Vis.</u>	<u>Open</u>	<u>Offers - FPD</u> <u>Ext.</u>	<u>Acc.</u>	<u>Open</u>	<u>On The</u> <u>FPD Roll</u>	
<u>Engineering</u>									
Chemical	47	11	8	0	0	9	7	0	7
Electrical	31	13	8	0	0	5	3	0	3
Mechanical	45	22	18	0	0	12	6	1	5
Industrial	9	4	3	0	0	2	2	0	0
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	19	1	1	0	0	1	1	0	1
Physics	15	4	2	0	0	0	0	0	0
Mathematics- Statistics	5	1	1	0	0	0	0	0	0
<u>Other*</u>	<u>121</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	320	82	66	0	0	43	33	1	30

*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 HAPO components to the F.P.D. exempt roll.

PhD Recruiting (9-1-56 through 6-30-57)

	F P D			F P D	
	<u>June</u>	<u>To Date</u>		<u>June</u>	<u>To Date</u>
Cases Considered:	12	96	Offers Extended:	0	1
To be interviewed:	0	--	Accepted Offers:	0	0
Interviewed:	1	21	On the Roll:	0	0

Terminations and Transfers

One exempt employee terminated employment with the Fuels Preparation Department in June to transfer to Hanford Laboratories Operation.

Terminations and Transfers, Technical and/or exempt Personnel, (9-1-56 through 6-30-57)

	<u>June</u>	<u>To Date</u>
TERMINATIONS	1	13
TRANSFERS TO OTHER COMPONENTS		
Requests Received	2	24
Completed Transfers	1	7*
Closed Cases	3	12
Active Cases	2	--
Dormant Cases	1	--

*Includes three transfers within HAPO

EMPLOYMENT

Unfilled Requests for Personnel 8

Personnel Requirements Cancelled 0

Employees Added to the Rolls 23

Employees Revoved from the Rolls 14

Transfer Data (Concerns Requests for Transfer - FPD)

Total Requests for Transfer Active at Start of Month	51
Number of Requests Received	11
Number Interviewed	6
Requests for Transfer Effectuated During Month	6
Requests for Transfer Cancelled	2
Requests for Transfer Active at Month's End	54

Procurement

Offers	11
Interviews	11
Request for Personnel	
Received	10
Transfers (All)	17
New Applications	
Received	0

Upgrades within FPD 10

Personnel Records

Letters to Outside Agencies Regarding Information 8

Perfect Attendance Recognition Awards 4

Service Recognition Pins 10 Year - 4 5 Year - 10

EMPLOYEE BENEFITS AND SERVICE

Visits to Ill or Hospitalized Employees

Employees visited at Kadlec Methodist Hospital None

Pension Plan

Individual reports entitled "Your Share In the General Electric Pension Plan" were received from Schenectady and were distributed to all employees participating in the Plan as of December 31, 1956.

During the month of June, the Patent Agreement record file was audited. It was found that each employee in the department required to sign this agreement had done so.

Advance information regarding this report was prepared and distributed to all members of management together with an item entitled "The Value of a General Electric Pension" for distribution to all non-exempt employees.

Employee Benefits Plans

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

	Pension Plan		Insurance Plan		Savings & Stock Bonus	
	<u>May</u>	<u>June</u>	<u>May</u>	<u>June</u>	<u>May</u>	<u>June</u>
Fuels Preparation	99.7	99.5	100.0	100.0	53.8	53.1
Chemical Processing	99.0	99.1	99.7	99.7	58.1	58.4
Irradiation						
Processing	99.4		99.7		62.1	
Hanford Labs	97.9		99.5		60.2	
Relations and						
Utilities	98.9		99.7		54.6	
Construction						
Engineering	98.9	99.0	99.7	99.7	71.8	72.8

313 Building Tours

During the month arrangements were made for 4 FPD employees and 24 employees from other HAPO Departments to tour the 313 Building. In addition arrangements were made for 10 FPD employees to tour 100 K area 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>6</u>
" " 2A	<u>7</u>	Total	<u>33</u>
" " 3A	<u>5</u>		

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

Two requests for occupational deferments concerning engineers were made during the month.

Reservists Data - Total Number of Reservists on Roll 55.

Number of Ready Reservists	<u>37</u>
Number of Standby Reservists	<u>18</u>

Number of employees on Military leave 4.

Suggestion Statistics

	Fuels Preparation Department		From Other Departments		Total	
	May	June	May	June	May	June
Received	42	62	15	21	57	83
Completed (all suggestions re- jected or all approvals re- ceived)	62	58	14	11	76	69
Adopted	25	0	0	0	25	0
Percent Adopted	40.3	0	0	0	33	0
Net Savings	\$7,501.95	0	0	0	\$7,501.95	0
Cash Awards	\$1,156.00	0	0	0	\$1,156.00	0
<u>Awards</u>						
Net Savings	15.4%	0	0	0	15.4%	0
No. referred to other Depts.	5	9			5	9
Suggestions Awarded	20	16			20	16

Cumulative Statistics (Since 1-1-57)

Prior Backlog	167	147	8	8	175	156
Present Backlog	147	151	9	18	156	169
Received	262	324	87	108	349	432
Adopted	90	90	5	5	95	95
Net Savings	\$18,719.89	\$18,719.89	\$65.00	\$65.00	\$18,784.89	\$18,784.89
Adoption Ratio	34.4	34.4	5.7%	4.6%	27.2%	27.2%
Awards	\$2,591.00	\$2,591.00				

<u>Awards</u>		
Net Savings	13.8%	13.8%
No. Outstanding to other Depts.	4	11

General

Arrangements have been completed for the collection of data for the Employee Relations Index(ERI) program. The program began July 1 and will run for periods of 13 weeks.

SECURITY VIOLATION

Three security violations occurred during June in Fuels Preparation Department.

Ed Wilson
Acting Manager,
Employee Relations

END

**DATE
FILMED**

1 / 15 / 93