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**MONTHLY
REPORT**

MMK-6447

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MAY 1958

GENERAL ELECTRIC
FUELS PREPARATION DEPARTMENT

MAY 1958

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MONTHLY REPORT

FUELS PREPARATION DEPARTMENT

FOR

MAY, 1958

Compiled by

Fuels Preparation Department

June 17, 1958

Richland, Washington

Classification reviewed for de-
classification but not changed

by J. F. Brown
(by m. Walker)
5/15/73

Work performed under contract No. W-31-109-Eng-52 between the Atomic Energy
Commission and General Electric Company.

Route to:	P.R.No.	Location	Files Route Date	Signature and Date
<u>J. E. Travis</u>		<u>acc - 2nd</u>		

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FUELS PREPARATION DEPARTMENT
MONTHLY REPORT SUMMARY FOR
MAY, 1958

MANUFACTURING OPERATION

During the month the manufacturing plant was operated on a two-shift basis with four canning lines on each shift. Five hundred ninety-six (596) tons of acceptable uranium fuel elements were produced which was 112% of forecasted production.

The manufacturing yield for eight inch solid production was 90.1%; for eight inch I & E production the manufacturing yield was 86.3%. Both of these yields are all-time record highs and were achieved despite a tightening of the bond test standards.

At month end there was a 1.4 month supply of bare uranium in storage. All types of cores were in adequate supply throughout the month. A 1.5 month supply of finished material was on hand in the combined 100-300 storage areas. At month end adequate supplies of all product models were available for reactor use.

Operating efficiency was 94%. Equipment downtime caused one-third of the lost time with operational outages responsible for the remaining two-thirds.

The only significant quality problem has been an increased autoclave failure rate. Four fuel elements failed during the autoclave test during the calendar 1958 total to eight. A large majority of recent failures resulted from minute pinholes in the external weld bead of the I & E fuel elements. As an immediate approach to the problem, an additional weld inspection station was placed between the etch and autoclave operations. A program is underway to correct the condition at its source.

Magnetic filter traps have been installed on recirculating lines of both sleeve cleaning, and cap and can cleaning machines. Removal of iron particles from process solutions is expected to reduce the incidence of iron inclusions on the aluminum jackets of fuel elements.

The program for improving bonds has begun to take effect. By reducing the silicon content of the duplex AlSi, by raising the duplex lead temperature, and by increasing the depth of the duplex lead cover, any tendency toward brittle bonding near the top of the fuel element has decreased significantly. The reduction in brittle bonding, coupled with a tightened bond test rate count standard, has raised the bond quality level of the outgoing products.

Through the efforts of Manufacturing personnel an agreement was reached with Alcoa to reduce the cost of I & E spires from four to six per cent. Dollar savings are expected to be equal to more than two per cent of the FY-1959 aluminum components budget.

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ENGINEERING OPERATION

The increasing incidence of corrosion ruptures has led to a concentrated IPD-FPD program to reduce the problem. Some of the steps being taken by FPD include: redimensioning of I & E elements and tru-line contours; use of water mix pieces in I & E columns; accelerated charging of corrosion resistant alloys; improvement of the process to eliminate brittle bonding; use of total count criteria for bond testing; accelerated development of processes to reduce warp and minimize surface hydrogen; accelerated development and testing of self-supported elements.

The American Bearing Corporation finished its casting of 1000 I & E washers thereby completing this phase of the development contract. Casting of 1000 I & E cores is now underway with delivery scheduled in early July. Twenty-eight hollow uranium bars of C size I & E cores, 18" long were "cold" extruded at Hunter Douglas this month. This material is now undergoing examination and preliminary results appear favorable. Caps and cans impact extruded from cast blanks are now being received at HAP0 and testing is underway. Considerable economic potential exists in this process due to the elimination of machining steps in component preparation.

Most the extrusion cladding equipment for use with the 306 Building 400 ton press has arrived on site. Installation and shakedown will start in early June. Receipt of ultrasonic cleaning equipment for the 306 Building Pilot Plant is expected in June.

The first major equipment installation for project CG-713 (Conversion to I & E) was made May 16 and 17 without interruption to production. Performance has been excellent. All other projects are on schedule and within costs.

FINANCIAL OPERATION

Preliminary work has been started on year end closing activities. A schedule of specific requirements, indicating the financial component responsible for necessary action, will be issued early in June.

The analysis of portable instrument repair productivity was continued during May. Tentative labor standards were developed for repair of each type of instrument. The value of the current productivity measure of combined unit costs, compared to measuring productivity by labor standards, indicates that the labor standard provides a more effective measure.

MAINTENANCE & POWER OPERATION

There were four cost reduction, representing \$15,304 annual savings, completed during the month. Annual budget realization is now 47%.

Equipment installation for the Darex Project continues ahead of schedule.

The tie-ins for utilities for PRTR are complete.

In order to reduce the amount of fly ash emitted to the area, all flue gas was routed through the fly ash separator.

EMPLOYEE RELATIONS OPERATION

During the month, sixteen exempt employees completed the PBM-I course, sixteen participants completed the Work Simplification course and eight Employee Relations people participated in a short supervisory course based on a Harvard Business School film.

Two speeches were presented by FPD employees before community groups. Reprint of an article written by an FPD employee was featured as the lead article in the May, 1958 issue of the AMA "Management" magazine.

Seven grievances were processed at Step I during May. Of the seven grievances two each involved jurisdiction, overtime, and responsibility -- the other concerned hours of work.

The briefs in the James arbitration case were submitted to the arbitration panel on May 26. The case now rests with the panel for a decision.

We have been advised by the Federal Mediation and Conciliation Service of the appointment of Kenneth McCaffree, professor of economics, University of Washington, as the third member for the arbitration panel in the D. J. Franklin case.

The Department achieved the HAPO General Manager's Award on May 2 upon completion of 609 consecutive days without a disabling injury. The medical frequency rate decreased sharply from 6.14 (corrected figure) in April to 4.23 in May. There were no serious accidents or fires during the month.

PERSONNEL STATISTICS:

Number of employees April 30, 1958	762
Number of employees May 31, 1958	762

<u>OPERATION</u>	<u>EXEMPT</u>	<u>NON-EXEMPT</u>	<u>TOTAL</u>
General	1	1	2
Manufacturing	55	299	354
Engineering	49	26	75
Financial	16	21	37
Maintenance & Power	39	232	271
Employee Relations	14	9	23
TOTAL	174	588	762

GENERAL MANAGER
FUELS PREPARATION DEPARTMENT

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MANUFACTURING OPERATION

May, 1958

I. CURRENT OPERATIONSA. Production and Productivity1. Statistics

	NORMAL				ENRICHED			Total
	8" Solid	8" I & E C	8" I & E K	8" I & E O	6" Solid	6" I & E C	6" I & E O	
<u>Current Month's Production</u>								
Acceptable Fuel Elements Produced (Tons)	338	92	93	0	11	62	0	596
As % of Forecast Production	113		103		110		155	112
As % of Past 3 Month's Production	100		86		137		230	101
Average								
As % of Past 12 Month's Production	76		201		110		564	103
Average								
As % of June 1958 Goal (500 MWD/Ton)	123		93		28			88
As % of June 1958 Goal (750 MWD/Ton)	338		62		44			132
% of Forecast Achieved - Last Fiscal Quarter	112		88		130		80	103
% of Forecast Achieved - Last 4 Fiscal Quarters	102		87		94		61	96
<u>Operating Efficiency</u>								
Current Month (%)								94
Forecast (%)								91
Previous Month (%)								93
<u>Manufacturing Yield</u>								
Current Month (%)	90		86		88		82	
Forecast (%)	78		70		78		70	
Previous Month	89		85		84		90	
Bare Uranium in Storage (Tons)								759
Finished Product in Storage (Tons)								680
Special Products Finished (Pieces)								5,794
Uranium Utilization (%)								95.5

2. Activitiesa. Production

During the month the manufacturing plant was operated on a two-shift basis with four canning lines on each shift. Five hundred ninety-six (596) tons of acceptable uranium fuel elements were produced which was 112 percent of

Production - continued

the five hundred thirty (530) tons forecast in HW-55761-RD. Variance from forecast resulted primarily from reduction of the work-in-process inventory and from above forecast yields for all products.

b. Manufacturing Yield - 8-inch Solid Production

The manufacturing yield for 8-inch solid production was 90.1 percent compared to 89.1 percent for April. This yield - an all-time record high - was achieved despite a tightening of the bond test standards. About half of the yield improvement resulted from reprocessing fuel elements which exhibited minor surface imperfections. The balance of the yield improvement came from improved effort and control in all fabrication steps. Thorough destructive analyses have been and are being made to assure that quality of reprocessed material is at least as good as first-run material.

c. Manufacturing Yield - 8-inch I & E Production

The manufacturing yield for 8-inch I & E production was 86.3 percent compared to 85.1 percent for the previous month. As with 8-inch solid production, the I & E yield - an all-time record high - was achieved despite a tightening of the bond test standards. Decreases in the thin wall and surface reject rates more than offset slight increases in the assembly, braze layer integrity, and braze layer contamination reject rates.

d. Manufacturing Yield - 6-inch Enriched Solid Production

The manufacturing yield for 6-inch enriched solid production was 87.6 percent compared to 83.8 percent in April. In all fabrication steps good control was experienced.

e. Manufacturing Yield - 6-inch Enriched I & E Production

For 6-inch enriched I & E production the manufacturing yield was 81.6 percent compared to 89.9 percent for the previous month. Increases were noted in all reject rates; however, the most significant increase occurred in the braze layer integrity reject rate which reflected the tightening of bond test standards.

f. Other Activities

During May the last of the blunt nose, tru-line components, both 1245 and X-8001 alloys, were processed. These were the remainder of about 100,000 sets of the tru-line components of each alloy purchased for production testing.

Five hundred fifty-seven (557) acceptable pieces of 7-inch I & E depleted material were produced which was adequate to meet reactor charging requirements.

Fifteen (15) tons of 4-inch solid material were completed during the month. Sufficient finished material was obtained to supply reactor needs for this product for the remainder of the calendar year.

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f. Other Activities - continued

At month end there was a 1.4 month supply totaling seven hundred fifty-nine (759) tons of bare uranium cores in storage. All types of cores were in adequate supply throughout the month.

Finished product inventories decreased slightly when reactor charges for the month exceeded finished production. A 1.5 month supply - 680 tons - of finished material was on hand in the combined 100-300 storage areas. At month's end adequate supplies of all product models were available for reactor use.

In May the projected annual turnover rate of essential materials was 2.09.

The following pieces were processed through the fuel recovery operation:

	<u>Pieces</u>
Solid 8"	5,600
I & E "C" 8"	7,051
I & E "K" 8"	3,273
I & E "O" 8"	66
Solid 6"	794
I & E 6"	6,583
Solid 4"	799
Cored	<u>5</u>
Total	24,171

One shipment totaling 54,174 pounds of normal and 1,430 pounds of enriched solid uranium scrap was sent to the National Lead Company.

B. Plant Problems and Incidents

1. General

During May the operating efficiency was 94 percent. Equipment downtime caused one third of the lost time with operational outages responsible for the remaining two thirds.

2. Autoclave Failures

The only significant quality problem experienced during May has been an increased autoclave failure rate. Four fuel elements failed during the autoclave test bringing the 1958 to-date total to eight compared to a 1957 total of seven. A larger majority of recent failures resulted from minute pinholes in the external weld bead of the I & E fuel element. As an immediate approach to the problem, an additional weld inspection station was placed between the etch and autoclave operations. Recognizing that any visual inspection cannot be depended upon completely to screen out each defective element at the level of one out of 20,000 or better, Manufacturing and Engineering personnel are working together to correct the condition at its source. Although the increased autoclave failure rate is disturbing, the autoclaves were designed for screening out just such defective elements as these:

2. Autoclave Failures - continued

<u>Date</u>	<u>Type of Element</u>	<u>Reason for Failure</u>
5/2/58	I & E "K" 8" (X8001 Component)	Cap weld pinhole
5/8/58	I & E "C" 8" (1245 Component)	Cap weld pinhole
5/15/58	I & E "K" 8" (X8001 Component)	Cap weld pinhole
5/16/58	I & E "K" 8" (X8001 Component)	Cap weld pinhole

3. Autoclave Liners

To date 18,000 new autoclave liners have been received and placed in use. The marred surface reject rate has decreased significantly since the installation of these new liners.

4. Magnetic Traps

For testing purposes, a magnetic filter trap was installed in the caustic recirculation line of the number 2 sleeve cleaning machine. The trap was effective in removing iron particles from the caustic solution. Consequently magnetic traps have been installed on all recirculation lines (except the diversey lines) of both sleeve cleaning and cap and can cleaning machines. Removal of iron particles from process solutions is expected to reduce the incidence of iron inclusions on aluminum jackets of fuel elements.

C. Operating Plans

1. Bare Uranium Quality

Bare metal quality remained at the same level as during the previous four-month period. Less than two (2) percent of the cores were rejected for seams and striations while the porosity reject rate of canned pieces at the radiograph was less than three (3) percent.

2. Bond Improvement Activities

The program for improving bonds, which is being carried out jointly by Manufacturing and Engineering, has begun to take effect. By reducing the silicon content of the duplex alsi, by raising the duplex lead temperature, and by increasing the depth of the duplex lead cover, any tendency toward brittle bonding near the top of the fuel element has been reduced significantly. Other process refinements are being evaluated in the 306 facilities. These also will be introduced into the 313 Building process when their value has been demonstrated. To date the improvements realized have enabled the Manufacturing Operation to tighten the bond test count rate standard without significant yield loss. On the other hand, the total count bond test standard, being used on the I & E enriched element to screen out clusters of small voids, has lowered the May yield by a few percent. In both cases, the effect has been to raise the bond quality level of the outgoing products.

3. Xero-radiography

An extensive test was made of the mechanical and quality aspects of the prototypic 25 degree angle radiograph tray and the xero-radiographic process.

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3. Xero-radiography - continued

Rather than x-ray film, this new process utilizes a sensitized plate which appears to give better definition of voids in or near the weld bead. The lower angle tray permits better location of the defects. Quality, operating, and economic evaluations of both process and prototype are continuing.

4. Horizontal Welding Machine

The prototypic horizontal welder was placed on an extended production test to give production and quality experience in preparation for production horizontal welders which will arrive this summer as a part of the I & E conversion project. No significant difficulties with this machine have been encountered so far.

5. SS Accountability

On April 1 the Manufacturing SS accountability system was simplified greatly with the elimination of the autoclave station as a balance area. This change, coupled with a thorough review of accountability procedures and responsibilities, has resulted in a significant improvement in the accuracy and timing of accountability inventories and reports.

6. Reduction in Aluminum Components Prices

Through the efforts of the Manufacturing personnel an agreement was reached with Alcoa to reduce the cost of I & E spires from four to six percent effective May 1. In addition, a nation-wide reduction of two cents per pound was made on all aluminum. Dollar savings are expected to be equal to more than 2 percent of the FY 1959 aluminum components budget.

7. Hanford Test Reactor

Reactivity values obtained on fuel element cores were normal and showed no significant trends regarding the isotopic ratio. The Test Reactor was operated at a 30 watt power level during May except for 150 minutes of operation at 600 watts to irradiate an assembly and calibrate foils for IPD. All activities met nuclear safety specifications. Irradiated materials were handled under SWP conditions.

D. Employee Relations

Members of the Operation were treated for 28 medical treatment injuries for a frequency of 4.95.

The frequency of exposures greater than 200 mrad per two-week badge period was 0.0. The frequency of exposures from 100 - 200 mrad per two-week badge period was 8.0 for May as compared to 14.5 for April. The exposure level dropped coincident with reduction from ten to eight canning lines a day.

One security violation - an open file - was reported in May.

II. PERSONNEL MATTERS

A. Visits and Visitors

W.M. Mathis attended a Feed Material Meeting in Washington, D.C. on May 22, 1958.

D.L. Cornell attended the Annual Convention of the American Society for Quality Control, Boston, Massachusetts on May 26, 27 and 28. He visited Mr. D.D. Ward and Mr. W.P. Sime of Manufacturing Services, Quality Control Service, New York Office on May 29 to discuss non-destructive testing equipment, quality control feedback systems, and new developments in welding and testing techniques.

J.E. Bergman visited the Central Chain and Transmission Company, Inc., Yakima, Washington May 21, 1958 to discuss steel sleeve fabrication with Mr. C.E. Mason.

H.C. Money visited the National Lead Company, Fernald, Ohio and Mallinckrodt Chemical Works, St. Louis, Missouri during the week of May 26 through May 30 to discuss production methods.

B. Reports of Invention

Members of the Operation engaged in work that might reasonably be expected to result in inventions or discoveries advise that, to the best of their knowledge and belief, no inventions or discoveries were made in the course of their work during May, 1958.

C. Meetings

Members of the Operation attended 23 staff meetings, 18 safety and security meetings and 8 information meetings.

D. Significant Reports Issued

1. Routine

<u>Number</u>	<u>Title</u>	<u>Author</u>	<u>Date</u>
HW-54445-RD	Production & Inventory Report, FPD, Manufacturing Operation, April, 1958	HP Kraemer	5-5-58
HW-55924	Monthly Report, Quality Control Operation, FPD, April 1958	KV Stave	5-1-58
HW-55982	Production Report, FPD, Manufacturing Operation, Month Ending April 30, 1958	HE Berg	5-9-58
HW-56127	Uranium Quality Control Analytical Results	GB Hansen	5-21-58

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2. Non-Routine

<u>Number</u>	<u>Title</u>	<u>Author</u>	<u>Date</u>
HW-56120	Predicted Direct Material and Scrap Loss CY 1958, Manufacturing Operation, Fuels Preparation Department	RR Cahall	3-31-58

J. M. Mathis
Manager - Manufacturing

WM Mathis:RIB:rhs

8" CANNING REJECTS BREAKDOWN BY MAJOR CLASSIFICATIONS

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LEGEND

SOLID
1957

1958

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8" CANNING REJECTS
BREAKDOWN BY MAJOR CLASSIFICATIONS

LEGEND

1 & E
1957

1958

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ENGINEERING OPERATION
May, 1958

VISITORS

<u>Name</u>	<u>Company</u>	<u>Contact</u>	<u>Date</u>	<u>Reason</u>
RJ Gandy	GE, San Jose, Calif.	PH Reinker	5-20	Discuss hafnium fabrication
BD Bohna JJ Brezina	B.D. Bohna & Co., San Francisco, Calif.	TW Gore	5-8/12	Site inspection for project CG-759.
M Lysne P McGinnis EC Webber	Bunstead & Woolford, Seattle, Wash.	TW Gore	5-8/9	" "
SM Gilbert CP Byrnes WO Stevens	S.M. Gilbert Co., Seattle, Wash.	TW Gore	5-9	" "
GG Hill	Bigge Drayage Co., Oakland, Calif.	TW Gore	5-9	" "
RT Early ED Varey	R. T. Early Const. Co., Tacoma, Wash.	TW Gore	5-9/12	" "
G Kipper	Wyatt & Kipper Co., Seattle, Wash.	TW Gore	5-7/12	" "
WT Batcheller	W. T. Batcheller Co., Seattle, Wash.	TW Gore	5-12	" "
KE Robinson	Seattle Boiler Works, Seattle, Wash.	TW Gore	5-12	" "
RH Simmons WH Geharht	Ind. Service & Eng'g. Co., Denver, Colo.	TW Gore	5-12	" "
JW Krofts R Whinnfrey	Bay & Tide Co., Tacoma, Wash.	TW Gore	5-8	" "
WS Pauley	H. O. Bovay Co., Spokane, Wash.	TW Gore	5-16	" "
DD Diedrickson	Stock & Equipment Co., Seattle, Wash.	TW Gore	5-14	" "

TRIPS

<u>Name</u>	<u>Company Visited</u>	<u>Contact</u>	<u>Date</u>	<u>Reason</u>
AJ Karnie	Watson-Stillman Rochester, NY	AJ deMateo	5-24/28	Consultation on extrusion presses.
	Nuclear Metals, Inc. Cambridge, Mass.	P Loewenstein		" "
JW Nickolaus	Nuclear Metals, Inc. Cambridge, Mass.	P Loewenstein	5-5/16	Studying co-extrusion processes.
GW Riedeman	Hunter Douglas Aluminum Corp., Riverside, Calif.	RA Quadt	5-6/10	Oversee uranium extrusion and investigate special sources for aluminum fabrication.
RE Olson	National Lead Co. of Ohio, Cincinnati, Ohio	JC Mead	5-28/29	Discuss uranium processing and quality control.
	Mallinckrodt Chemical Works, St. Louis, Mo.	JA Fellows	5-26/27	Discuss uranium processing and quality control.
HL Libby	Institute of Radio Engineers, Seattle, Wn.		5-2	Present talk at professional society meeting.
CL Frederick	KAPL, Schenectady, NY	WR Plant	5-19	Discuss nondestructive testing.
	GEL, Schenectady, NY	JG Hutton	5-19	" "
	GOSAM Transistor Symposium, Schenectady		5-20/21	Attend symposium.
	National Lead Co. of Ohio	PR Morris	5-22	Discuss nondestructive testing.
JT Stringer	GE X-Ray, Milwaukee, Wis.	MA Edwards	5-12	Discuss electron beam welding.
	Gatlinberg, Wis.	JE Cunningham	5-14/16	Fuel Element Conference
TB Correy	Naval Air Base, Whidby, Island, Wash.	T Kayler	5-28	Inspect surplus spot welder.
CA Strand	Pioneer-Central Div. Bendix Aviation Corp. Davenport, Iowa	EN Fitch	5-26/28	Working Ultrasonic Cleaning Symposium
PH Reinker	MCW, St. Louis, Mo.			Attend FEDC meeting.

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PROCESS ENGINEERINGRegular Production Rupture Experience

Twelve normal uranium ruptures (5 solid, 4 I & E) and three enriched (1 I & E, 2 solid) occurred in the reactors during the month. All of the ruptures were either hot spot failures or were unclassified. Distribution of ruptures by reactor was 2 in B, 1 in C, 1 in D, 4 in DR and 4 in KE.

I & E Program

Four normal uranium I & E fuel elements ruptured during the month in KE reactor. All were side hot spots, showed evidence of possible misalignment in the process tube, and may have been subjected to some charging damage. A program to reduce the corrosion type failures is outlined below.

Jacket Rupture Program

The increasing incidence of corrosion type failures in the reactors has led to a joint IPD-FPD concentrated program to reduce the problem. In FPD the following steps are being taken:

1. Revise K reactor I & E dimensions to obtain optimum heat and flow balance to reduce top of annulus temperatures.
2. Redesign the tru-line contour for the K reactor I & E to insure mating of the contours under the worst conditions of misalignment.
3. Prepare 2,500 water mixing pieces for charging in the I & E columns.
4. Accelerate the charging of M-388 jacketed components as well as the A-2 alloy.
5. Push the conversion of the remaining three production lines presently not converted, to the improved process conditions for reducing brittle bonds.
6. Apply total count criteria to all production for bond testing.
7. Reconsider delay quench at Fernald to reduce warp.
8. Push evaluation of chloride salt bath heat treatment for uranium to minimize surface hydrogen.
9. Push the development and testing of self-supported fuel elements for the present reactors.

Process Technology

Brittle bonding: Laboratory studies indicate that brittle bonding is reduced and tougher bonds are formed when the compound layer is of the U-Al₃ type structure.

This type of layer is produced by a combination of higher duplex temperature and lower silicon in duplex AlSi.

Cap Wetting: An increased number of non-wet caps in the I & E production has recently been observed. Process modifications to alleviate this problem center around a modified vibrator cycle.

Electron Beam Welding

Design of equipment to handle the fuel elements in the pilot plant for the electron beam welder is 50% complete. GE X-Ray will make the initial tests on the electron beam welder at Milwaukee during the week of June 2. One hundred stainless cores, AlSi canned, are available at GE X-Ray for the initial studies.

MATERIALS ENGINEERING

Casting - Uranium Washers and I & E Fuel Cores

American Bearing Corporation has completed the casting of 1000 uranium washers and will ship these to HAPO within the next week. Previous examination of a small development quantity of cast washers showed these to be generally satisfactory with respect to properties except for some micro-porosity or micro-cracking which may result in a high rejection upon nickel plating. It is believed these washers would be satisfactory for any AlSi process. Receipt of these washers and applicable technology will complete this phase of the American Bearing casting development contract.

American Bearing is proceeding with the casting of 1000 I & E fuel cores. A pilot quantity of these is to be shipped to HAPO this week and it is anticipated that the entire 1000 pieces will be received at HAPO early in July.

Uranium Cold Extrusion

Twenty-eight hollow uranium bars of "C" size I & E diametral dimensions by 18 inches long were "cold" extruded at Hunter Douglas this month. Extrusion ratio was about four to one, extrusion speed was about 20 feet per minute, and billet preheat temperatures ranged between 580 and 780°F. In general, these extrusions looked good with respect to surfaces and dimensions. The material has been returned to HAPO and is now being examined for structure and orientation.

Cast Aluminum Extrusion Blanks

A representative sample of the first shipment of 1245 hot press I & E caps and cans impact extruded from cast blanks has been selected for canning. Arrangements have been completed with HLO to can these components the first of next month. Metallurgical examination showed these components were subject to severe grain growth. However, an annealing cycle had been used on these components that produced similar results in normally produced components. A parallel development effort with C-64 aluminum fabricated into standard eight inch solid components and varying blank preparation and annealing methods will be started soon.

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The first lot of X-8001 solid eight inch cans fabricated at Hunter Douglas under this program are complete and enroute to HAPO.

X-8001 (M-388) Alloy Segregation

Alcoa and Hunter Douglas have arranged for more careful preparation of the original cast ingots from which extrusion blanks are rolled and cut and it is believed this will eliminate nickel segregation from these vendors. To improve ingot structure, Harvey Aluminum added 0.1% titanium to one alloy ingot but the experiment was not successful and the test ingot was scrapped. The titanium did refine the cast structure but objectional segregation was still present.

Spire Cans

At the request of Process Engineering, an order was placed for purchase of 5,000 component sets of integral spire-can design. Hunter Douglas was low bidder and received the order.

Extrusion Cladding

Acquisition of extrusion cladding equipment for use in the 306 Building 400-ton press is proceeding on schedule and most of the equipment has been received on site. Installation and shakedown tests will be carried out in early June.

Design and drafting of the extrusion cladding preheating and pushing equipment is 50% complete. The fuel element preheating has been converted to muffled type and is ready for testing.

Pilot Plant - Process Development

Development work to reduce brittle bonding extended well into May and is continuing with other development activities being performed concurrently. Results of work accomplished in the pilot plant have been utilized in the 313 Building to significantly reduce the brittle bond reject rates on production material for 1245 components. Since nickel alloy components, X-8001, gave the greatest brittle bonding problem, resumption of canning with these components will await results of present pilot plant refinement of conditions to significantly reduce or eliminate brittle bonding with this component alloy.

Pilot Plant - Equipment Development

A 10 KW ultrasonic cleaning generator and 5 stainless steel encased barium titanate transducers to provide 360 square inches of cleaning area have been ordered for the Fuel Element Pilot Plant. The plant-site delivery date is June 30, 1958.

Additional modifications made to the pilot plant lead duplex agitator now permits a depth of stroke of 9-16 inches in either lead or AlSi.

TESTING METHODS

Fuel Element Testing

All enriched I & E elements are being tested with a total count Bondtester to reject pieces with excessive porosity. Random samples of elements which passed this test were retested after autoclaving and up to 50 percent of these then failed to pass the total count test. Since no known changes were made to the testers, it is again suspected that something may be happening in autoclaving to make porosity or non-wetting more susceptible to detection with the pulse-echo Bondtester. Results to the contrary reported last month appear invalid after more complete review of the data. Controlled studies are being established to investigate this.

Good results have been obtained with an alternate method for rejecting braze porosity based on adding a long memory circuit to the present count-rate reject system Bondtest. Decisions have been reached to install this on the new Project CG-713 testers and to recommend its use after the new equipment is installed. This method has the following advantages: (1) it detects clusters of small unbonds as effectively as the total count method, (2) it discriminates against single voids more on an area basis rather than by the circumferential length only, (3) it can pass widely scattered small unbonds which may be rejected by total count, and (4) it does not require the additional total count instrumentation.

Prior to Project CG-713 completion, all I & E production (enriched and natural) will be tested with the total count system now temporarily installed. Solid enriched elements will be tested with a long-memory count-rate system.

Project CG-713 - 313 Building I & E Conversion

Two complete Bond-Penetration electronic consoles have been completed and delivered to the 326 laboratory for debugging and acceptance tests. Fabrication of the remainder of the electronics is on schedule, and fabrication of the mechanical systems is about 10 days behind schedule. Pilot plant testing of the new Model 1B Bondtesters has been trouble free. Some difficulties have been encountered in installation of an External Penetration Test Probe Servo system in the 313 Building. These problems are being resolved and it is expected to be in use shortly. Manual writing and craft training sessions are proceeding satisfactorily.

NPR and Category II Development

Evaluation of the various nondestructive tests for NPR fuel elements is continuing. Designs have been completed and orders placed for mechanical equipment for ultrasonic immersion testing elements of varying diameters and lengths. Frost tests have been completed on 22 NMI zircaloy clad rods and they have been returned to Testing Methods for further examinations.

4000 Program Research

A requested report was submitted to the AEC Division of Reactor Development listing problems in nondestructive testing which need investigation and also a proposal

for basic research studies which Testing Methods would be interested in undertaking. The latter are studies in multichannel or broadband eddy current testing, ultrasonic Lamb Waves, and advanced data handling technique for nondestructive testers. Informal word has been received from J. Simmons, Chief-Metallurgy Section, Division of Reactor Development, that \$75,000 has been approved for HAP0 for this program during FY 59 and funds will be authorized upon receipt of the formal proposal through HOO-AEC.

New Methods Development

Two hundred random cores were tested on the prototype Sonic Orientation Resonance TEST (SORT). Thirteen exceeded the tentative reject limits for longitudinal resonance and two for torsional resonance. Twelve cores were taken to Fernald for correlation with P. R. Morris' ultrasonic velocity test for grain orientation. Sensitivity of his test is 0.1 microsecond for 10 cycles measured on SORT. Since his overall resolution is about 0.15 microsecond, only the extreme cores selected by SORT gave detectable differences at FMPC. These were in agreement.

X-ray diffraction Growth Index correlations with the ultrasonic velocity test are giving good results. These also indicate that the previously reported poor correlation with SORT at HAP0 are probably due to the small differences detectable by SORT being beyond the accuracy of the present Growth Index calculations.

Transformation testing cores could be accomplished with either SORT or the Fernald ultrasonic velocity test. SORT is most sensitive to partially untransformed pieces but neither can detect untransformed areas which are very small.

Good results have been obtained from bondtesting irradiated elements at the 105-C basin. The original equipment required a manual readout which was slow and cumbersome to use. This has been replaced with an automatic reject system which has increased the throughput 4-5 times. Modifications have also been made to permit internal bondtests on I & E elements.

A test for seams in aluminum cans is being devised in an attempt to salvage 100,000 cans which are being withheld from process because of suspected defects. It is planned to use the Radac eddy current equipment with a small scanning type probe.

A Hughes Memoscope image storage oscilloscope has been received. It is being applied first to development of a bondtest mapping system.

Hanford Test Reactor

Metal testing continued routinely. Reactivity measurements were completed on poison splines for IPD.

RESEARCH & PROJECTS

Status of Projects

CG-713 - Conversion to I & E Lead-Dip Fuel Element Production. The first major equipment installation was made during the weekend of May 17-18 without any interruptions to production. Performance has been very satisfactory.

Procurement of electrical components for Automatic Welders and Power Supplies is on schedule. Welder fabrication at the vendor's plant started May 26 and units are scheduled to be ready for inspection June 12 and 13. Power supply units are scheduled to be shipped late in July.

Prototype buffer fabrication has been slow due to problems associated with matching parts. Extra attention is being given to this item to avoid delays.

CG-759 - Additional Steam Generating Facility - 300 Area: Bids for a design-construct fixed price contract were opened May 20. Six bidders submitted prices ranging from \$409,977 to \$539,900. G. E. fair cost estimate was \$448,600. The low bid was not accepted and the contract was awarded to Bunstead and Woolford for \$429,225 on 6-3-58.

CA-774 - 300 Area Water System Modification: Architect-Engineer design was completed May 16. Bid assemblies for a fixed price construction contract have been issued. Bid opening is scheduled for June 19.

CG-787 - Sprinkler System - 313 Building Addition: G.E. prepared specifications were completed May 8. Bid assemblies for a fixed price construction contract have been issued and bid opening is scheduled for June 18.

CAF-792 - Warehouse Space - FPD: G.E. prepared specifications completed May 26. Bid assemblies for a fixed price construction contract are due to be issued June 6. Bid opening scheduled June 25.

Budget Study - Hot Press Facilities: Evaluation of methods of providing facilities for producing hot-pressed diffusion-bonded fuel elements is continuing. Consideration is being given to conversion of existing facilities and open alternate, providing a new, separate facility capable of meeting production requirements.

306 Building Pilot Plant Modification: Project proposal is being routed for approvals.

Research & Development

I. Irradiation Testing

A. Status of Test Facilities

Loop 1 - The 7-rod cluster elements have not been charged due to questionable loop operation. Debris in the lines has caused partial plugging of the dump valve. Until the condition is corrected the loop cannot be charged.

Loop 2 - The charge of 1.6% enriched washer fuel elements clad in A-2 alloy was discharged 5-15-58 at an exposure of about 400 MWD/T. The loop has not been recharged.

Loop 3 - The loop continued to operate with s/s clad 4-rod clusters. The current exposure is about 2000 MWD/T. It is scheduled for discharge in mid-June.

Loop 4 - This loop continued to operate with 1.6% enriched washer fuel elements clad in A-2 alloy. Current exposure is about 700 MWD/T.

II. Fuel Element Development

A. Aluminum Clad

Fuel elements clad in A-1, A-2, C-2 and M-388 were removed from EIMO-7 after 1250 hours of operation at 304 C water, pH 4.5 with H_3PO_4 . No gross corrosion was observed.

B. Zirconium Clad

The HLO-NMI contract has been modified to produce about 30' of rod for tube and rod fuel elements.

C. NMI Visit - J. W. Nickolaus

A trip report concerning details of a two-week stay at NMI (5-5-58 through 5-16-58) will be issued 6-6-58. The purpose of the trip was to get acquainted with some of the techniques used in billet assembly and coextrusion. In addition, several interesting new processes were observed which will probably merit attention in the near future. These were:

1. Aluminum Cladding Coextrusion
2. Diffusion Barrier Cladding of Nickel and Zirconium by Coextrusion
3. Aluminum Cladding by Hot Drawing

NMI has an enviable record in the development of fuel element fabrication techniques. They have recently reorganized their management set-up and are currently increasing their staff personnel to meet the increasing demand for their development services.

Although coextrusion is their primary interest at this time, they have equipment available for casting, drawing and other fabrication techniques.

D. Restraint of Uranium

The zirconium clad restraint specimen charged in the MTR in March is still being irradiated.

E. Uranium Alloys

Two new alloys, U-0.1 w/o Ti and U-0.1 w/o V, are being investigated by HLO for the purpose of developing improved resistance to corrosion.

DRAFTING & FILES

Major Jobs in Drafting

306 Building	Automatic I & E Tester Extrusion Cladding Layouts Extrusion Press Revisions Electron Beam Welder Layouts
313 Building	Bump Discriminator Dip Quench Machine Pickle Area Conveyor Radiographic Tray Facing Lathe - loader revisions Bond and Penetration Tester Drawings Hot Press - Furnace Layout
Miscellaneous	Automatic Badge Feed Mechanism

Drawings Produced:	New	53
	Revised	50
	Large Charts	3
	Small Charts	5
	Miscellaneous	6

INVENTIONS

All Engineering Operation personnel engaged in work that might reasonably be expected to result in inventions or discoveries advise that to the best of their knowledge and belief no inventions or discoveries were made in the course of their work during May, 1958, except as listed below. Such persons further advise that for the period therein covered by this report, notebook records, if any, in the course of their work have been examined for possible inventions or discoveries.

NONE

PH Reinker:mbs

P. H. Reinker
Manager - Engineering

FINANCIAL OPERATION
MAY, 1958

GENERAL ACCOUNTING OPERATION

A meeting of HAPO General Ledger Specialists was held on May 13, 1958. Topics discussed included fiscal year closings, classification of travel, and continuity of service adjustments.

Information required for preparation of the FY-1959 Budget for Attendance at Meetings of Professional and Trade Societies and Offsite Courses and Seminars was requested from Level 3 Operations. Budget estimates are to be submitted to Contract Accounting by June 16, 1958.

Preliminary work has been started on year-end closing activities. A schedule of specific requirements, indicating the financial component responsible for necessary action, will be issued early in June. In order to document all FY-1958 closing activity, it has been resolved to use the General Ledger Fiscal Year-end clearing account to accumulate over and under accruals or liquidations of costs. Allocations will be made from this account to establish additional reserves where necessary and the remaining balance will be transferred to Product Cost prior to closing the books for the year.

Advice E. 2.1.1-Travel, Living and Moving Expenses, is under revision. Significant items to be covered are:

1. Re-instatement of reservation service by RUO Traffic Operation.
2. Special approvals revised to include AEC approval and advance notice for travel to Canada and Mexico when travel is for the purpose of conducting company business at AEC expense.
3. Reference to "U Drive" automobiles revised to include reference to the fact that cash discounts are granted to GE employees by both Avis Rent-a-car System and Hertz Systems, Inc.
4. Identify items covered by per diem allowances.
5. Identify items charged directly against the Contract Fee Budget such as laundry, valet service, and certain personal telephone calls.

Reporting requirements of the Commission in regard to travel and living expenses will be revised effective with July, 1958 reports. The new report will reduce both clerical and typing efforts.

Travel and living expenses reimbursed by the AEC totaled \$3 014, covering settlement of 13 trips on which 73 days were spent in travel status. A comparison with April activity is summarized below:

	<u>May</u>	<u>April</u>	<u>Increase or (Decrease) Over April</u>
Travel advances to employees:			
Balance at beginning of month	\$ 4 500	\$4 063	\$ 437
Current month charges	<u>10 656</u>	<u>5 778</u>	<u>4 878</u>
	<u>15 156</u>	<u>9 841</u>	<u>5 315</u>

GENERAL ACCOUNTING OPERATION (continued)

	<u>May</u>	<u>April</u>	<u>Increase or (Decrease) Over April</u>
Less:			
Expenses accounted for	\$ 3 940	\$4 473	\$ 533
Advances refunded	<u>340</u>	<u>868</u>	<u>528</u>
	<u>4 280</u>	<u>5 341</u>	<u>1 061</u>
Balance at end of month .	<u>\$10 876</u>	<u>\$4 500</u>	<u>\$6 376</u>
Outstanding travel advances:			
Current	\$10 434	\$4 500	\$5 934
Outstanding over 15 days	<u>442</u>	<u>-0-</u>	<u>442</u>
	<u>\$10 876</u>	<u>\$4 500</u>	<u>\$6 376</u>
Number of expense reports submitted	20	25	(5)
Number of cash advances	32	29	3

A meeting of HAPO Plant and Property Accounting Specialists and a representative of the Data Processing Operation was held May 8. Purpose of the meeting was to discuss plans and methods of providing an IBM program for handling uninstalled equipment. Results will not be known until Data Processing problems have been analyzed.

Two Appropriation Requests totaling \$2 730 were processed and approved during May. One 1956 request for \$24 540 was revised and re-issued.

The financial closing statement for Project CG-737 Electric Pneumatic Control System-313 Building, was issued May 31, 1958. This project was closed to plant for \$37 010, or \$6 990 less than the \$44 000 authorized. Also, a transfer of \$14 418 for Project IR-210 Oil, Paint and Solvent Storage Facilities-300 Area was received from the Commission and booked to Plant Accounts. Unitization of IR-210 will be issued next month.

A new Organization Guide B 2.5 "Manufacturing Operation", was issued during May, thus completing Organization Guides for all Level 3 Operations.

OPG G 3.2 "Review of Work to be Performed by Plant Maintenance Forces", was completely rewritten to reflect the latest thinking of the Counsel on this subject. The revision indicates what types of work may be performed by plant forces; responsibility for work review determination; types of work requiring work review determination; and provides a uniform course of action to be followed prior to authorizing performance of work by plant maintenance forces.

The Department Safety Award eligibility requirements have been revised in accordance with a recent change in the HAPO-wide Guide. New eligibility requirements exclude employees on military leaves, those transferred within HAPO, or removed from the active payroll because of lack of work anytime prior to the date the award is achieved.

GENERAL ACCOUNTING OPERATION (continued)

The authority to approve Deferment of Vacation has been raised from Level 3 to Level 2. This change results from the recent delegation of authority providing for the Department General Manager to approve payment in lieu of vacation, and for deferment of all or part of a vacation from one year to the next.

MEASUREMENTS

The analysis of portable instrument repair productivity was continued during May. Tentative labor standards were developed for repair of each type of instrument. The value of the current productivity measure of combined unit costs, compared to measuring productivity by labor standards, indicates that the labor standard provides a more effective measure.

A study of other Maintenance and Power components was started with emphasis on developing productivity measures for all Maintenance and Power activities.

PERSONNEL ACCOUNTING OPERATION

The Managers of Personnel Practices, Union Relations, and Personnel Accounting held the first of a planned series of informal luncheon meetings with Level 4 Managers and the supervisors reporting to them. The object of the meetings is to create a more relaxed atmosphere and afford supervisors a better opportunity to ask questions or express opinions. It is hoped that working relations and cooperation will improve through mutual understanding of problem areas.

Personnel Accounting participated in a discussion of a new IBM Time Recorder and related procedures with representatives of International Business Machines Corporation. The new recorder is designed to eliminate manual clerical effort required to prepare time cards for use in Data Processing Equipment. IBM representatives will submit a formal proposal of the procedure for use of the new recorder at HAPO.

The Consumer's Price Index rose to 123.5 during April, a .2 of a point increase. Another increase of only .1 of a point during May and June will result in another .59% increase in nonexempt salaries under the Five Year "Better Living" Program.

Approximately 33 man hours were devoted to preparation of absenteeism statistics requested by Employee Relations Operation.

PRODUCT COST OPERATION

A review of the SS Material scrap account was made in May. Classification of sludge previously included sludge C-6, filter press canvas, and salt bath. Beginning with the current month's product cost report, individual types of scrap material will be itemized and valued by type. Any difference between the newly assigned value and previous value will be charged back to the product responsible for the scrap material.

A review of the value of SS Materials assigned to the Engineering Operation was effected during the month. Enriched material quantities valued at current market

PRODUCT COST OPERATION (continued)

and normal material valued at the fiscal year average unit price, result in an over-valuation of approximately \$671 000. Current plans include the adjustment of this account in June by charging the account SS Material Consumed in Research - Non-fund.

Reserve requirements for essential materials are under study. Inventory Materials subject to obsolescence have been identified and contingent losses for fiscal year 1959 are being determined through segregation of material values by individual captions.

Changes expected in control of Research and Development funds present certain problems in the fiscal year 1959 budget. In the event that FPD has no purse-string control of Research funds, assessments coming from the assessment pool would be reduced; the assessment going to the pool would be increased for Development work we anticipated for IPD. FPD overheads would then be allocated only to Production and the pool. If changes are made in personnel as a result of more or less Research work, the Engineering Operation budget would have to be reworked. The possibilities of a shift in effort between Development and Process Technology also exists which would result in a new Production budget. When a decision is reached regarding funds assigned from IPD, changes will be incorporated into the budget and Level 4 component budgets issued.

Cost Accumulations - The possibility of billing landlord costs on the basis of four differentiated rates rather than one all-inclusive rate per building is under study. Present rates are established by building, with no allowance for the time or cost factor of office-space cleaning time versus shop-area cleaning time, etc. The four categories proposed are: (1) Office Space; (2) Shop Space; (3) Manufacturing Space; and (4) all other. The four rates would apply to all buildings. A report will be made at a later date on results of the study.

Data Processing was contacted on the possibility of programming continuity of service into salary runs and rounding dollars on cost runs automatically. Both were already scheduled to be programmed at some future date.

The Product Cost Operation completed their portion of "An Introduction to Finance" as scheduled. Subjects discussed were:

Financial Statement Analysis
Introduction to Manufacturing Cost Accounting
Elements of Cost
Job Order and Process Cost Systems
Standard Costs
Budgets

Preliminary work is under way on developing new labor and material standards for the Manufacturing Operation. Old labor standards were based on a fixed crew operating ten canning line shifts per week. The most recent production forecast indicates a decrease in canning line shifts. As a result of the waste control program under way for the past four months in Components Parts Preparation, actual consumption of components is slightly less than standard allowance and may result in revising material standards

PRODUCT COST OPERATION (continued)

In the future, all special requests from IPD dealing with experimental-type fuel elements or components will be accompanied with a purchase requisition or written authorization permitting FPD to charge IPD for all costs incurred, even though an experiment or test proves unsatisfactory.

Several meetings were held with representatives of Manufacturing and Power and Maintenance Operations in an attempt to resolve problems related to proposed changes in work order procedure. All differences have not been resolved; however, some progress has been made. Allocation of Maintenance costs based on assigned personnel and use of work orders to cover craft personnel which cannot be assigned may be the key to resolving this problem.

The Reclamation of Fuel Element Rejects program continues to contribute to higher yields and lower cost. During May, 9 903 pieces were reclaimed with 7 595 pieces returned to the production stream. This represents a yield of approximately 77% and results in labor and material savings of \$8 263.

Acting Manager - Finance

JN Byland:mh

MAINTENANCE AND POWER OPERATION

MAY, 1958

GENERAL

Productive Maintenance Program

Outstanding orders as of 4/30	57
Orders issued in May	64
Orders completed in May	57
Outstanding orders as of 5/31	64

There were 4 cost reductions completed, representing total annual savings of \$15,304. This brings the total savings for the quarter to \$20,269, which represents 88 per cent of the quarterly cost reduction budget. Annual budget realization is 47 per cent.

Arrangements have been made to have minor construction personnel use part of the 301 Bldg. for a lunch room. This releases the 3722-B hutment for use by the contractor who will work on Project CG 759, Additional Steam Generating Facility.

Blacktop was laid at the 3706 and 3760 Buildings to provide additional parking space for mail trucks.

The women's restroom in 3707-A Bldg. was enlarged to conform to standards.

AREA MAINTENANCE

Duplicating

<u>Process</u>	<u>No. of Orders Processed</u>	<u>No. of Copies Made</u>
Multilith	827	466,322
Verifax	80	1,786
Ozalid	73	4,834

There were 9 Formal Reports completed, consisting of 2,440 copies - 105,705 pages.

A new stitcher was received and placed in service. The additional capacity of the new stitcher will permit binding larger volumes.

General Maintenance

The installation of equipment in the 321 Bldg. for the Darex Project continues ahead of schedule. A Titanium condensor has been assembled in the 321 Shop in preparation for installation.

Tests of welds in Titanium indicated an improved argon gas purge was required. A fine screen was installed in the gas purge outlet, reducing the velocity of the gas flow. This modification has improved the quality of the field welds.

Two draft stop walls were constructed in the attic of the 3703 Bldg. These walls were required to divide the attic of the building as required by fire protection standards. Each wall was provided with a door held open with a fusible link.

Thirteen new book stacks were installed in the 3760 Building library. Prior to installation the old stacks were re-arranged.

New slip rolls for a sheetmetal forming machine were received and installed. The new rolls permit the use of a machine with 14-gauge capacity and will permit the ultimate release of a forming machine with 20-gauge capacity.

The tie-ins of steam, air, propane and condensate for the PRTR were completed. To avoid interruption of HLO facilities, this work was completed on an overtime basis.

INSTRUMENT AND ELECTRICAL MAINTENANCE

The Portable Shop repaired 1,021 portable radiation detection instruments. Average time per instrument was 1.02 man hours.

Repairs were made to the 300 Area water meter located in North Richland. The meter was completely overhauled. Three new impellers were installed before repairs were completed. The impeller blades were being damaged by small rocks in the water main, necessitating repeated replacement.

Electrical service to the 321 Bldg. tank farm was disconnected to permit the installation of the warehouse by C.E.O.

A new 100 amp breaker and service were installed in the 321 Bldg. to provide adequate power to the welding shop.

Alarms were installed on the Hydrogen furnaces in room 6-4-G, 325 Bldg. Failure of these furnaces will activate a signal to alert operators in the 325 Building to the off-standard condition.

A faulty cathode tube in the electron accelerator in the 3745-A Bldg. was replaced. In addition, the voltage regulator was repaired.

POWER

<u>Statistics</u>	<u>May</u>	<u>April</u>
Average Steam Generated (M lbs/hr)	29.1	43.6
Maximum Steam Generated (M lbs/hr)	47.0	63.0
Total Steam Generated (M lbs.)	21,642	32,136
Coal Consumed (tons)	1,427	2,118
Evaporation Rate (steam/#coal)	7.58	7.59
Efficiency - Actual	60.0	58.7
Efficiency - Theoretical	66.7	66.8
No. Boilers on 2 1 2		
Date of Change 1 20 29		
Sanitary Water from 3000 Area (Million gals.)	63.5	64.5
Total Water from 3000 Area, Average rate GPM	1,423	1,494
Total Water from #3 and #4 Wells (Million gals.)	12.9	10.8
Total Water from #2 Well (M Gals.)	.30	.30
Peak Water Consumption for 24 Hours (Million gals.)	2.4	2.4

All flue gas was routed through the fly ash separator by means of the induced draft fan. This action minimizes the fly ash emission to the area.

On May 9th, while the ground storage tank was supplying sanitary water to the area through pumps 1 through 4, No. 3 pump lost suction. Fortunately, the condition was discovered in time to limit the extent of pump damage. The head furnished by the ground storage tank through the 36-inch riser was insufficient to supply water when all pumps are in service. To prevent damage to the pumps the import line to the suction header was opened. Operation will continue in this manner until the new ground storage tank is installed. No effort will be made to control sand by using the existing ground storage tank until the new reservoir is constructed and in operation.

Additional laboratory equipment installed in the basement of the 325 Bldg. has reduced the normal static exhaust pressure from 6 inches to $5\frac{1}{2}$ inches. This decrease reduces the efficiency of the entire exhaust system.

PLANT ENGINEERING

There were 26 training classes held for craftsmen of HLO and FPD. This represents 313 man hours of craft training. In addition, 5 training sessions, representing 84 man-hours, were held for 100-H Area janitorial personnel. The training program for this janitorial group was completed by Foy Leach, Specialist, Craft Training and Manual Writing, and certificates of achievement presented to the employees by R. T. Jessen, Manager, H Reactor Operation.

The installation of the flash tank and heat exchanger in the 384 Bldg. was contracted to the Construction Engineering Operation for a sum of \$9500.

The final report was received from the Breslove Separator Co. of Pittsburgh, Penn., which was retained as consultant to study 300 Area fly ash problem. The report was satisfactory and the contract closed.

FIRE PROTECTION

<u>Fire Responses</u>		<u>Loss</u>
HAP0	7	\$10.00
Construction	0	0
Private	0	0
Outer Area	2	0

Significant Fires:

On May 24, material in the 300 Area contaminated burial ground ignited spontaneously. The burning material was covered by use of a bulldozer by personnel from Transportation Operation, R.U.O.

On May 28, a sludge barrel placed just outside the machine shop door at the 306 Bldg. caught fire. The fire was extinguished and the barrel moved from the building. Loss, \$10.00.

On May 22, a call was received from the 306 Bldg. that a barrel containing Uranium turnings was heating. Two firemen wearing necessary protective clothing, emptied the barrel into a hole in the ground. The turnings were reclaimed after they cooled.

Eight members of the FPD Fire Protection Operation attended a three-day course on "Fire Hazards in the Atomic Industry", presented by Mr. F. L. Brannigan, Washington office of U. S. A.E.C.

INVENTIONS

The Swaged Thermocouples sent to the Measurements Lab., Instrument Department, West Bend, Mass. have been returned. This was necessary to insure control of government property.

All other personnel of the Operation engaged in work which might lead to inventions and discoveries advised that, to the best of their knowledge, none were made in the course of work during May, 1958.

SAFETY, SECURITY AND RADIATION EXPERIENCE

Medical Treatment Injuries	20
Frequency Rate	4.56
Disabling Injuries	0
Near Serious Accidents	0

There were no radiation overexposure cases reported.

There were no security violations reported.

MEETINGS

Round Table - Staff	23
Safety and Security	32
Information	6

Acting Manager
Maintenance and Power Operation

G.A. Huff:JPF:dg

EMPLOYEE RELATIONS OPERATION
May, 1958

SALARY AND WAGE ADMINISTRATION

Eight positions were audited in May. Excluding Levels 2 and 3 Managers, fixed rate, and vacant positions, 14 of the 112 positions as of January 1, 1958, have been audited, or 60% of the two-year goal on a monthly basis.

Audits were completed and results reported to the General Manager of appraisal discussions and currency of new assignments reflected by page 2 of the appraisal. The responses, when compared to the September, 1957 Attitude Survey and to audits conducted in April, 1957, show improvement in administration of the appraisal plan by supervisors of exempt employees.

Effective June 1, 1958, the practice of adjusting the fixed rate salaries of Fire Protection captains and lieutenants in accordance with the nonexempt adjustment pattern will be discontinued. Thereafter, the salaries will be adjusted as all other exempt employees. For the transition period, Salary Administration representatives of FPD, IPD and CPD agreed that compensation action should be similar for the three departments. Accordingly a specific compensation plan acceptable to concerned Level 3 management was developed.

By request of General Accounting Operation for data needed for budgeting purposes, the number of FPD exempt employees with technical degrees was developed by use of keysort cards. Other data, such as employees with and without technical degrees working on technical positions and those with technical degrees not working on technical positions, was developed for future use.

The Manufacturing Operation Production Job Study proceeded on schedule. The evaluation results of 37 identifiable jobs have been submitted to Manufacturing Level 4 Managers, who have expressed overall acceptance and endorsement. The data is now being analysed to prepare proposals for improving the classification and job assignment criteria for these Chemical Worker jobs.

FPD participated in discussions with HAPO Wage and Employment representatives to prepare groupings of related nonexempt work classifications. These groupings were requested as a basis for implementing the HAPO-wide reduction of force procedure for nonunit employees.

A 1.77% cost-of-living adjustment of base rates was provided to most nonexempt employees effective April 29, 1958. All interested FPD management were notified promptly in writing following confirmation of the increase from Employee Compensation Service.

Fuels Preparation Department prepared much of the ground-work for a joint Salary and Wage meeting, held to discuss development of improved nonexempt compensation plans. A statement of proposed action recommending the establishment of task forces to develop new or improved wage plans was adopted and submitted by the HAPO Salary and Wage Managers to the Managers of Employee Relations.

PERSONNEL DEVELOPMENT

Six personnel development programs were concluded, initiated or in progress during the month.

1. Sixteen exempt employees completed the Professional Business Management-I course on May 20.
2. Sixteen participants completed the Work Simplification course. Using actual Department problems in their studies, these participants realized a minimum annual savings of \$23,000, greater than 5 fold return on total cost. Total improvements ultimately may range between \$80,000 and \$244,000.
3. The course in "Accounting Fundamentals" for other than Financial employees continued with 10 participants.
4. One employee continued participation in the Creative Approach seminar being presented in IPD.
5. One employee continued participation in the Reactor Process Fundamentals course being presented in IPD.
6. Eight Employee Relations people participated in a short supervisory course based on a Harvard Business School film, "The Merrill Case".

Total Company-sponsored training, appropriate portions of which were conducted on employees' own time, totaled 1.4% of exempt employees' normal working hours. Accumulative training in FPD to date is 1.44% of exempt work time. In-Plant time of courses has been 0.95% of exempt working hours during May.

Plans for presenting the 8-hour Communication Workshop on June 11 were completed.

The Personnel Development course-needs of approximately 70% of FPD exempt employees had been received by month's end.

A system for providing nonexempt employees an opportunity to appraise supervisors was investigated as part of a program to strengthen man-manager relations.

The GE Advanced Management Course reading references were made available to all level 3 and 4 management and to FBM-I participants.

The FPD Exempt Inventory system underwent further study and refinement.

Two Technical Graduates completed their rotational assignments within Fuels. One summer student, a college Junior, joined the Department in a Tech Grad assignment. Plans were made to participate in the HAPO orientation program for summer employees and new Technical Graduates.

COMMUNICATION

Assistance was provided in developing HAPO-wide Operation Upturn plans. Major emphasis will be placed on serving the AEC better, thereby strengthening HAPO jobs, and this program was communicated to management and non-exempt employees through Department channels as well as the GE News.

A survey of improved working conditions in the Department was completed. It will supply a source of additional publicity on improvements not previously publicized.

Five Management News Bulletins were issued during the month, plus two FPD Newsletters.

GE News column inches covering Fuels' activities and employees totalled 149.5 during May. Of this number, 12 column inches were devoted to routine items and 137.5 column inches to plant communication in support of Department programs. The total represents an average of slightly less than $\frac{1}{2}$ GE News page per issue.

Two General Manager's meetings - one with exempt employees and one with non-exempt - were arranged.

Other Communication programs and activities conducted during the month covered: the Canning Operation program to minimize component losses, the Department's winning of the General Manager's Safety Award on May 2, the May 6 Civil Defense practice evacuation, planning for distribution of benefit plan participation report to all employees and planning a program to assist Personnel Practices' efforts to validate craft testing.

One group of college students and two groups of school principals visited the 305 Test Reactor during Hanford tours.

Two speeches were presented by Fuels' employees before professional groups.

Reprint of an article by the FPD Personnel Development Specialist, "Clocking the Supervisor's Day", was featured as the lead article in the May, 1958, issue of the AMA "Management" Magazine.

UNION RELATIONS

On May 2, 1958 the Company and the HAMTC submitted 12 cases to the Federal Mediation and Conciliation Service requesting that agency to designate the third member for an arbitration panel in each case. The D. J. Franklin grievance (FPD) was one of the 12 submitted to the FMCS. We have since been advised by the FMCS of the appointment of Kenneth McCaffree an Economics Professor from the University of Washington. Mr. McCaffree served as Labor Relations Consultant to the Atomic Energy Commission at Hanford from 1953 to 1956. It is expected the case will not be heard until September at the earliest.

Previously the Council had requested that the P. A. Lynch case be submitted to the FMCS, however, this was withdrawn when the Company directed a letter to the Council advising that the Company's position was that the case was not arbitrable.

The briefs in the James arbitration case were submitted to the arbitration panel on May 26. The case now rests with the panel for a decision.

It has been decided to take no further positive action in the Jensen and Claypool arbitration cases until and unless the Council replies to the Company's letter of January 9 which was written with the intent of clarifying the Step II answer in the interest of settling the case.

Inasmuch as the latest correspondence in the Feigum-Neal arbitration case was directed to the Council by the Company it has been decided to do nothing further until a reply is received from the Council.

Grievance Statistics:

	<u>Unit</u>	<u>Nonunit</u>
Received this month	7	0
Received since 1/1/58	60	1
Step I		
Answer unsatisfactory	6	0
Answer satisfactory	1	0
Pending time limit to close	6	0
Settled this month	3	0
Step II		
Discussed this month	0	0
Pending time limit to close	4	0
Settled this month	2	0
Pending arbitration	6	0

Subject of May Grievances: (7 Total)

	<u>Mfg. Oper.</u>	<u>Eng. Oper.</u>	<u>Maint. & Power Oper.</u>	<u>Emp. Rel.</u>	<u>Fin. Oper.</u>
Jurisdiction	1		1		
Overtime	1		1		
Responsibility	2				
Hours of Work	1				

Subject of Grievances for 1958: (61 Total)

		<u>Nonunit</u>
Jurisdiction	8	
Seniority		1
Overtime	5	
Absence	6	
Unsafe Equipment	1	
Transfer	1	
Responsibility	2	
Hours of Work	1	

PERSONNEL PRACTICES

Technical Personnel Placement

Experienced and BS/MS Recruiting (1-1-58 through 5-31-58)

	<u>Cases Considered</u>	<u>Invitations</u>				<u>Offers</u>			<u>On FPD Roll</u>
		<u>Ext.</u>	<u>Visited</u>	<u>To Vis.</u>	<u>Open</u>	<u>Ext.</u>	<u>Acc.</u>	<u>Open</u>	
Engineering	19	1	1	0	0	3	2	0	1
Science	9	0	0	0	0	0	0	0	0
Other	100	0	0	0	0	1	1	0	0

PhD Recruiting

	<u>Cases Considered</u>	<u>Interviewed</u>	<u>To be Interviewed</u>	<u>Offers</u>			<u>On FPD Roll</u>
				<u>Ext.</u>	<u>Acc.</u>	<u>Open</u>	
May, 1958	8	1	1	0	0	0	0
CY'58 to date	50	1	0	1*	0	-	0

*Carry over of 1 case from 1957

Terminations and Transfers, Technical and/or Exempt Personnel

	<u>Terminations From FPD Roll</u>	<u>T-r-a-n-s-f-e-r-s</u>					<u>Active Cases</u>	<u>Dormant Cases</u>
		<u>Considered</u>	<u>Completed</u>	<u>Closed</u>	<u>Cases</u>			
May, 1958	1	-	1	0		10	2	
CY'58 to date	9	40	7	21		-	-	

* Carry over of 5 cases from 1957 (3 active and 2 dormant)

A Junior Metallurgical Engineering student from the Colorado School of Mines, the first of four Fuels Preparation Department Technical Summer Program people, was assigned to Quality Control - Manufacturing Operation on May 27, 1958.

There was a noticeable increase in the number of position openings referred to Fuels Preparation Department this month over recent comparable periods. Eighteen were received from other General Electric components and four from HOO-AEC. Resumes of eight candidates were submitted for consideration in filling these openings. One has been accepted and will transfer June 1, 1958, one was not accepted, and six are still under consideration.

Referrals of exempt personnel from other General Electric components for placement consideration in the Fuels Preparation Department continued heavy. A total of 62 referrals were received for the month, fourteen from other HAPG-GE components and 48 from off-site GE components. No openings were available in FPD for which 59 of these people could be considered commensurate with their background and experience. One was accepted and two are still under consideration.

Employment

Personnel: Added: 9 Removed: 8

Reduction of Force: By FPD 0
 By Seniority bumping 2

Transfer requests active at month end: 51

Procurement:

Offers:	5	Requests for personnel:	10
Interviews:	13	Transfers (all):	7

Upgrades within FPD: 3

Perfect attendance recognition awards: 7
Service recognition pins: 4 10 year, 8 5 year

Employee Benefits and Service

Employee Benefit Plans participation is as follows: Pension 99.9% ;
Insurance 100% ; Stock Bonus 62.6% .

Nonveteran employees subject to Selective Service are classified as follows:
1-A 10 ; 2-A 9 ; and all others 10 . In addition there are: 9 technical
occupational deferments active; 15 Standby and 35 Ready Reservists; 3 employees
on military leave.

Security Violations for May - 1

D. K. Moore, a Standards Technician, was awarded one of the 40 GE scholarships
for the coming college year.

HEALTH AND SAFETY

	<u>May</u>	<u>April</u>
Disabling Injuries	0	0
Serious Accidents	0	0
Medical Treatment Cases	52	80
Medical Treatment Frequency	4.23	6.14
Employee Hours of Exposure	122,793	130,189
Orientation Presentations	1	2
Attendance	4	20
Inspections	25	26
Suggestions Evaluated	7	8
Safety Talks	1	1
Attendance	22	67

Medical examinations during April totaled 79 which was 109.72% of quota.

Program

The Medical Treatment Frequency rate dropped from a peak of 6.14 to 4.23 during May. Of a total of 52 injuries reported 34 were sustained to the hands, and eight were caused by windblown particles entering eyes.

Fuels Preparation Department completed 638 days without a Disabling Injury through May 1958 for a total of 2,597,347 hours of exposure.

On May 2, the Department achieved the HAPO General Manager's Safety Award upon completion of 609 days without a Disabling Injury.

The necessary Disabling Injury free exposure for a second Award of Merit from the National Safety Council was attained on April 15.

The Council informed Health and Safety that a second Award of Merit would not be presented but that the Department would become eligible for The Award of Honor upon completion of 3,000,000 hours.

The monthly safety meeting for office personnel was held on May 21. R. D. Gilbert was in charge of the meeting and presented an illustrated talk on "The Right Choice In Safety."

Activities

Work Activity during May included contacts on the following items: New power equipment installation and safeguards, corrosive chemicals, lock and tag procedure, respiratory protection, lubricants, suggestion evaluations, toxic solvents, publicity, ventilation, pressure vessels, compressed gas cylinder manifolds and piping, ladders, eye protection, guards, orientation, safety meeting schedules, hazardous metals, traffic, home safety, railroad right of way, road cuts and barricades, water flow, Accident Prevention Standards, equipment tests, electrical circuits, equipment approval, chemical piping and gaskets, explosive gases, hoisting apparatus, vehicular safety, construction activity, materials handling equipment, mosquito control, mail handling, emergency procedures, hand tools, protective clothing, compressed air usage, staging, welding, safety showers, flooring, storage, and high work.

FIRE PREVENTION AND CIVIL DEFENSE

	<u>April</u>	<u>May</u>
Fires and Investigations	0	0
Fire Loss	0	0
Number of Inspections	36	29
Fire Surveys Completed	0	1
Hazard Reports Submitted	4	7
Orientation Attendance - Nonexempt	17	4
Orientation Attendance - Technical Graduates	3	0
Supervisory Training in Fire Prevention and CD	0	8

Program Development

Nuclear safety standards were changed to permit the use of water for fire fighting operations in all 303 enriched storage buildings, with exception of the special material storage building 303-G. This will greatly improve the fire risk on Fuels Preparation Department property.

Fire watch tours by the Fire Protection Operation were expanded to include 303-J and 3722-A Buildings on a four-hour schedule on night shifts and weekends.

Invitation to bid on construction projects for a sprinkler system in 313 Building, expansion of the area water system and a general warehouse in the 303 Area were sent to prospective bidders during the month, with bid openings scheduled for June 9, 19 and 25 respectively. These projects will correct serious fire code violations.

A project proposal for a sprinkler system, wiring modification and a fire alarm system for 3713 Building to conform with fire code standards is being developed, as a result of a fire survey submitted on May 22.

Arranged for a communication release of an article on "Flammable Mastics Threaten Do-It-Yourselfers" in an employee newsletter.

A 300 Area Civil Defense Practice Evacuation was held on May 6, as a part of the Nation-wide Operation Alert - 1958. A total of 1087 employees evacuated the Area in 8 minutes and returned through badge lanes in 6 minutes. The new area defense warning system performed satisfactorily.

Inspection openings were made in the main exhaust ducts from the canning furnaces in 313 Building and test schedules were developed for determining the oil vapor fire hazard within the ductwork. No means for cleaning the ducts have been established due to continuous operation of the system.

Installation of colored Crash Alarm phones in the 300 Area was completed by the Telephone Operation (R&UO) on May 13. Instruction on use of these phones was prepared and distributed to all holders of Crash Alarm phones and Level 3 Managers.

Completed a 16-week Work Simplification Course and studied a cost saving project evaluated to save the Department a minimum of \$20,000 annually.

Completed a 3-day course in the "Fire Hazards of the Atomic Industry" presented by Washington - AEC instructors in the 325 Building.

General Activities

Assisted HLO in developing fire code standards and safety devices as minimum requirements for the installation of a helium gas pressure ventilating system over a miniature furnace in the 3708 Optical Shop.

Conducted a final acceptance inspection and test of the new fire alarm system in the PRTR warehouses.

Assisted HLO during two separate sludge barrel incidents near the 306 Building at the request of their ERO Manager during the absence of the HLO - Health and Safety Specialist. One full barrel was saved due to early detection of its overheated contents and by the corrective action taken. The other barrel contents were destroyed by a spontaneous fire.

Caused Minor Construction to correct code violating wiring which they had installed in the 301 Building.

Assisted Research and Project Engineering in developing special conditions to be observed by the contractors awarded the 313 Building sprinkler system and the water system expansion project.

Issued welding permit to perform special welding work in a hot laboratory in the 3706 Building.

Detected an overheated electric motor in the attic ventilating system of 3717-B Building and caused replacement of defective motor and installation of overload protection.

Other advice and service performed included the following subjects: Special waste disposal, welding on metal insulated buildings, roof ventilators, ventilating hot water heater rooms, correcting buried water main shutoff valves, relocating civil defense buses during construction work at site, engineering data on central fire alarm station, overcrowded paint shops, non-explosion-proof motors in explosive atmosphere, defective thermostat controls and various fire code interpretations.

Manager - Employee Relations

END

**DATE
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1 / 13 / 93**