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MONTHLY REPORT

GENERAL ELECTRIC
COMPANY

Fuels Preparation Department

MARCH 1958

MASTER

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MONTHLY REPORT

FUELS PREPARATION DEPARTMENT

68869

FOR

MARCH, 1958

Compiled by

Fuels Preparation Department

April 15, 1958

Richland, Washington

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FUELS PREPARATION DEPARTMENT
MONTHLY REPORT SUMMARY FOR
MARCH, 1958

MANUFACTURING OPERATION

During the month the Manufacturing Operation worked on a two-shift basis with five canning lines on each shift, except for one week. Only four canning lines per shift were operated during the week beginning Monday, March 10. Five hundred eighty-two tons of acceptable fuel elements were produced which was 102% of the 570 tons forecast in HW-54606-RD. The variance from forecast resulted primarily from operating efficiency approximately 5% above forecast.

The inventory of bare uranium at the end of March totaled 440 tons or a 0.6 month supply. Finished inventory in the 100-300 Area decreased by 178 tons to 518 tons or a 1.0 month supply.

The manufacturing yield for solid fuel element production was 86.1% compared to 79.7% for February. The yield for I & E fuel element production increased to a new high of 80.1%. The yield for February was 74.1% which was the previous high yield.

Operating efficiency reached an all-time high of 94.7% compared to the previous high of 93.2% obtained in both January and February.

An I & E "K" size fuel element failed in the autoclave operation on March 17. The cause of failure is not yet known.

An electrical power failure was experienced on March 16, extending from approximately 12:30 AM until approximately 1:45 AM. Only minor damage to process equipment resulted.

ENGINEERING OPERATION

No failures in I & E normal pieces have occurred to date.

About 600 I & E and solid elements were satisfactorily canned on the 30 second cycle (versus present 45 second cycle) in the 306 semi-works with quality equal to that obtained on the longer cycle. Potential production gains of 50% are indicated possible by this change. Pilot plant developments were continued in rewelding hot bath recovery, M-388 bond improvement, and in studies to provide information regarding autoclave inclusions.

A number of tests were initiated for NPR elements to further detail their performance under aggravated conditions. These included both aluminum clad (special alloys) and zirconium clad elements. Concurrent non-destructive testing equipment developments were completed.

All project work is on schedule and within costs.

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FINANCIAL OPERATION

Final schedules for the FY-1960 budget and revision of FY-1959 budget were delivered to Contract Accounting on March 28. These incorporated recently revised rates for HAPO service assessments based on numbers of employees assigned and functions.

Formal report covering physical inventory of uninstalled capital equipment was issued March 15. Four items valued in total at \$870 were not located and 24 items not previously on record were found. Annual physical inventory of the 300 Area coal pile and the semi-annual inventory of precious metals was taken on March 31. Results are currently being tabulated.

An FPD Plant Record Unit Catalog was issued on March 28 to selected individuals having use for such a document. This is a revision of the HAPO catalog issued in 1950.

MAINTENANCE & POWER OPERATION

There were two cost reductions submitted, representing a savings of \$5,892. Total realization for the quarter is \$21,181. This is 89% of the first quarter's Cost Reduction budget.

General Accounting, Personnel Accounting, and Salary & Wage Administration Operations moved to the 300 Area on 3/15/58. This completes the movement of FPD personnel from 700 Area. All personnel of this Department are now located in the 300 Area.

Improvements in the method of fabricating the penetration tester probe in use in the 313 Building were completed. Improvements include a jig for rapidly winding coils on a lathe and simplification of assembly and component parts recovery. It is estimated these modifications will reduce the cost of these probes by 50%.

On March 16 at 12:30 AM there was a total electrical power outage in the Area. The emergency turbo-generator in the 384 Building came on line automatically and carried the emergency load without incident. Normal power was restored at 1:45 AM. However, switching difficulties interrupted electrical power to boilers and auxiliaries in the 384 Building from 1:45 AM to 3:32 AM.

Preliminary Architect-Engineer drawings for the sanitary water supply expansion were received and reviewed. It was requested that two items be re-evaluated to improve the water supply system. These were: Revision of piping at the proposed reservoir to allow a separate inlet-outlet pipe to permit the use of the reservoir as a sand trap; and the elimination of four 90° turns in the 16" line between the 300 Area Parking Lot and the 382 Building.

EMPLOYEE RELATIONS OPERATION

The second presentation of the General Manager's annual meeting with employees and their spouses was held with 149 persons in attendance.

Three speeches were presented before community groups.

Revisions to the Secretarial Plan were made and distributed to FPD management. The information issued included promotional and transfer guides and the Secretarial Evaluation Plan.

Twenty-two grievances were processed at Step I during March. Of this number, 15 were jurisdictional, three involved absence payments, three overtime and one on unsafe equipment. The James grievance is scheduled to be heard at the arbitration level in Portland on April 19, with Professor Kleinsorge -- University of Oregon, serving as the third party member of the arbitration panel.

At month end the Department had operated 577 consecutive days without a disabling injury. The medical frequency rate for March was 4.25 as compared to 3.88 in February (a corrected figure). There were no serious accidents, or fires during the month.

PERSONNEL STATISTICS:

Number of employees February 28, 1958
Number of employees March 31, 1958

758
763

<u>OPERATION</u>	<u>EXEMPT</u>	<u>NON-EXEMPT</u>	<u>TOTAL</u>
General	1	1	2
Manufacturing	58	298	356
Engineering	47	26	73
Financial	16	22	38
Maintenance & Power	38	232	270
Employee Relations	<u>14</u>	<u>10</u>	<u>24</u>
TOTAL	174	589	763

L L German
General Manager
Fuels Preparation Department

LLGerman/jak

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MANUFACTURING OPERATION
March, 1958

I. CURRENT OPERATIONSA. Production and Productivity1. Statistics

	8" Solid	8" Cored	Enriched			
	Solid		Solid	I & E	I & E	Total
<u>Current Month's Production</u>						
Acceptable Fuel Elements Produced (Tons)	259	0	15	22	286*	582
As % of Forecast Production	81		150	63	140	102
As % of Past 3 Months' Production Average	60		167	157	244	101
As % of Past 12 Months' Production Average	56		150	314	540	103
As % of June 1958 Goal (500 MWD/Ton)	94		38		143	86
As % of June 1958 Goal (750 MWD/Ton)	259		60		95	129
% of Forecast Achieved - Last Fiscal Quarter	97	143	97	48	96	97
% of Forecast Achieved - Last 4 Fiscal Quarters	102	74	80	41	81	97
<u>Operating Efficiency</u>						
Current Month (%)						95
Forecast (%)						90
Previous Month (%)						93
<u>Manufacturing Yield</u>						
Current Month (%)	86		79	77	80	
Forecast (%)	81		81	66	66	
Previous Month (%)	80		71	69	74	
Bare Uranium in Storage (Tons)	268		6	10	156	440
Finished Product in Storage (Tons)	290		8	28	192	518
Uranium Utilization (%)						95

* I & E production includes 6 tons of 7" I & E depleted uranium.

2. Activities

a. Production

During the month the Manufacturing Operation worked on a two-shift basis with five canning lines on each shift except for one week. Only four canning lines per shift were operated during the week beginning Monday March 10, 1958. Released manpower was used in the heat treating and fuel recovery operation to reduce work-in-process. Five hundred eighty-two (582) tons of acceptable fuel elements were produced which was 102 percent of the five hundred seventy (570) tons forecast in HW-54606-RD. The variance from forecast resulted primarily from operating efficiency approximately 5 percent above forecast.

b. Manufacturing Yield - Solid Production

The manufacturing yield for solid fuel element production was 86.1 percent compared to 79.7 percent for February. This substantial gain in yield was caused primarily from a decrease in braze layer integrity rejects, component preparation rejects and surface rejects.

Component preparation rejects decreased from 1.7 percent in February to 0.8 percent in March. This was due primarily to a reduction in caustic pitting.

Assembly rejects decreased from 1.8 percent in February to 1.5 percent.

Braze layer integrity rejects decreased from 4.9 percent in February to 3.2 percent. This decrease was attributed to the fact that 1245 cap and can components were used exclusively which to date have been less susceptible to brittle bonding.

Braze layer contamination rejects decreased from 3.7 percent in February to 1.7 percent in March which was due in most part to the re-weld procedure in the Special Canning Operation.

Thin wall rejects declined slightly from 0.7 percent in February to 0.6 percent in March.

Marred surface rejects remained steady at 3.1 percent for March having been 3.0 percent in February.

Facing rejects remained at 0.0 percent for March which was also the percentage for February.

Welding rejects remained steady at 0.6 percent for March compared to 0.8 percent in February.

Surface rejects decreased from 3.7 percent in February to 2.4 percent in March. This was because of less inclusions.

c. Manufacturing Yield - I & E Production

Yield for I & E production increased to a new high of 80.1 percent. The yield for February was 74.1 percent which was the previous high yield. Improved yield was primarily the result of decreased reject rates in braze layer contamination, welding and surface categories.

Component preparation rejects remained steady at 0.4 percent for both March and February.

Assembly rejects remained steady at 3.6 percent for both March and February.

Braze layer integrity rejects increased from 2.2 percent in February to 3.2 percent in March. This was attributed to eroding of the can wall in the large core "K" size fuel elements of the initial production run.

Braze layer contamination rejects decreased from 3.5 percent in February to 0.5 percent in March due primarily to the re-weld procedure in the Special Canning Operation.

Thin wall rejects increased from 1.9 percent in February to 5.3 percent in March and was due in most part to rejection of "K" size fuel elements.

Marred surface rejects decreased from 3.9 percent in February to 3.2 percent in March.

Facing rejects remained steady at 1.1 percent in March compared to 1.3 percent in February.

Welding rejects decreased from 2.6 percent in February to 1.1 percent in March because of the re-weld procedure.

Surface rejects decreased from 6.5 percent in February to 1.5 percent in March primarily because of the absence of serious inclusion incidents.

d. Manufacturing Yield - Enriched Production - I & E

Enriched I & E yield increased from 68.7 percent in February to 76.6 percent in March. The increase was due to less braze layer integrity rejects and braze layer contamination rejects.

e. Manufacturing Yield - Enriched Production - Solid

Enriched solid yield increased from 70.6 percent in February to 78.6 percent in March. This increase was primarily the result of less component preparation rejects and surface rejects.

f. Other Activities

The inventory of bare uranium at the end of March totaled 440 tons or a 0.6 month supply. The combination of high operating efficiency and high yields has caused a temporary tight supply of bare I & E fuel. I & E

f. Other Activities - continued

receipts scheduled for the next three months should alleviate this condition. The supply of bare solid fuel is now adequate as the result of increased receipts from National Lead Company of Ohio during the month.

Finished inventory in the 100-300 Area decreased by 178 tons to 518 tons or approximately a 1.0 month supply.

Inventory of essential materials was at an estimated 3.3 month supply for March compared to a 3.3 month supply for February.

The following pieces were processed through the Fuel Recovery Operation during the month:

	<u>Pieces</u>
Solid 8"	12,717
Cored 8"	267
I & E "C" - 8"	30,674
I & E "K" - 8"	<u>8,345</u>
	52,003

One shipment of 65,411 pounds of uranium scrap plus some empty fuel core boxes was made to National Lead Company of Ohio during the month.

B. Plant Problems and Incidents

1. General

During March, the operating efficiency reached an all-time high of 94.7 percent even with the operation of three canning lines per shift of I & E production for a sustained period of time. The previous high operating efficiency was 93.2 percent obtained in both January and February.

2. Autoclave Failure

There was one autoclave failure during the month which occurred on March 17, 1958. The element was an 8-inch "K" size I & E (X-8001). A metallographic examination is being made as a possible means of determining the cause of the failure.

3. Trichlorethylene Fumes at Cap and Can Machine

With the introduction of a hot trichlorethylene spray bank on the number two cap and can machine, excessive concentrations of trichlorethylene fumes were measured in the work area. The concentration existed only at start-up of the machine. As soon as loaded baskets entered the degreaser tank the fumes no longer overflowed the tank.

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3. Trichlorethylene Fumes at Cap and Can Machine - continued

To remedy the condition, the hot spray bank is turned off during each start-up period until a loaded basket enters the degreaser. This procedure has been effective in reducing trichlorethylene fumes in the work area below limits specified by the Industrial Hygiene Operation, Relations and Utilities Operation.

4. General Power Failure

An electrical power failure was experienced on March 16, 1958 extending from approximately 12:30 a.m. until approximately 1:45 a.m. The canning furnaces were unharmed; however, a thin crust had formed on the molten metal. Some electron tubes in the penetration and bond test equipment were damaged when power was restored due to a sudden high voltage input without a low voltage warm-up period.

5. Third I & E Fuel Penetration and Bond Tester

The third I & E fuel penetration and bond tester was installed on March 24, 1958. The number one finishing drag chain conveyor was shortened so that the two solid fuel penetration and bond testers could be moved over to provide space for the third I & E fuel penetration and bond tester. All testers are located for "in-line" throughput from weld inspection.

C. Operating Plans

1. Excess Production

It is planned to schedule I & E production in excess of reactor demands in order to build up finished inventories. This is to provide an adequate supply of finished fuel during the final stages of CG-713 - Conversion to I & E Lead Dip Fuel Elements - when production capacity may be limited.

2. Fuel Element Stamping

The stamping operation for I & E fuel elements has now been transferred from the Canning Operation to the Finishing Operation allowing the lathe operator to perform the stamping. Better utilization of personnel in this manner is another step toward increasing the production pieces per operator man-hour.

3. Automatic Length Inspection

Work is continuing in conjunction with Process Engineering to plan, design, and procure a system to gage automatically fuel element length. It is planned to incorporate the system into the automatic unload equipment for the facing lathes. A three-signal system is being considered. Any fuel element within the control limit range would be automatically passed with no signal. A fuel element outside this range but within the tolerance limit range would be passed and a warning signal would be given. Any piece falling outside the tolerance limit range would be automatically rejected and the lathe operator warned. I & E fuel elements would be automatically gaged after each facing.

3. Automatic Length Inspection - continued

Braze line and contour inspection could then be placed on an audit basis or a statistical inspection. Cost of the system is expected to be offset by elimination of possible defects and possible reduction of manpower at the braze and length inspection stations.

D. Employee Relations

Members of the Operation were treated for 31 medical treatment injuries for a frequency rate of 5.20.

Frequency of exposures greater than 200 mrad per two-week badge period was 1.5. The frequency of exposures greater than 100 mrad per two-week badge period was 11.5.

II. PERSONNEL MATTERSA. Visits and Visitors

R.E. Olson visited J.C. Mead at Fernald on March 18, 19 and 20 to discuss uranium quality control. On March 20 he gave a talk at the University of Kansas entitled "Uranium from Ore to Fuel Elements".

J.E. Bergman visited Mr. W. Hinsely, Metallic Coatings Company, Long Beach, California to determine the applicability of metal spray coating for the fabrication of poison pieces. He also visited Mr. J. Carney, Haveg Corporation in Norwalk, California to discuss the use of plastics for canning sleeve fabrication.

On March 6 Mr. Bergman visited J.L. Frankel, Harvey Machine Company, Torrance, California and R.A. Quadt, Hunter Douglas Company, Riverside, California to discuss aluminum component quality.

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 March, 1958.

C. Meetings

Members of the Operation attended 25 staff meetings, 23 safety and security meetings and 10 information meetings.

D. Significant Reports Issued1. Routine

<u>Number</u>	<u>Title</u>	<u>Author</u>	<u>Date</u>
HW-55206	Monthly Report, Quality Control Operation, Fuels Preparation Department, February 1958	KV Stave	3-3-58

1. Routine Reports Issued - continued

<u>Number</u>	<u>Title</u>	<u>Author</u>	<u>Date</u>
HW-55280	Uranium Quality Control Analytical Results	GB Hansen	3-10-58
HW-55304	Production Report, FPD, Manufacturing Operation, Month Ending 2-28-58	HE Berg	3-11-58
HW-55347	Uranium Quality Control Analytical Results	GB Hansen	3-10-58
HW-55504	Fabrication History of the Uranium Fuel Cores for February 1958	RE Olson	3-27-58
HW-54984	Fabrication History of Uranium Cores for December 1957 through January 1958	RE Olson	2-14-58

W Mathis
Manager - Manufacturing

WM MATHIS:RRC:rhs

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8" CANNING REJECTS
BREAKDOWN BY MAJOR CLASSIFICATIONS

LEGEND

SOLID
1957

1958

8" CANNING REJECTS BREAKDOWN BY MAJOR CLASSIFICATIONS

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LEGEND

1 & E
1957

1958

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PREPARED BY G.X. BEARD

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ENGINEERING OPERATIONVISITORS

<u>Name</u>	<u>Company</u>	<u>Contact</u>	<u>Date</u>	<u>Reason</u>
KA Jones	Traveler's Ins. Co., Seattle, Wn.	TW Gore	3/18	Relating to third party boiler inspection.
J Roth HR Pittman	Continental Can, Seattle, Wn.	DC Lehfeldt	3/14	To view the pro- totype automatic welder.
WJ McGonnagle	ANL, Lemont, Ill.	RS Paul	3/18	To review paper for Geneva mtg.
MB LeBeouf	KAPL	RS Paul	3/25	To discuss radi- ation measurement techniques.

TRIPS

<u>Name</u>	<u>Company Visited</u>	<u>Contact</u>	<u>Date</u>	<u>Reason</u>
K Drumheller	G.E., San Jose, Calif.	B Huggins	3/4-5- 6	Discuss oxide fuel elements.
HL Libby	Los Alamos Scientific Lab., Los Alamos, New Mexico	GH Tenney	3/3-4	Discuss non- destructive testing methods.
	Metrol, Inc., Pasadena, Calif.	R Hochschild	3/5-6- 7	Inspect equipment being procured from Metrol, Inc.
TB Correy	G.E. X-Ray, Milwaukee, Wis.	M Zunik	3/20-21	Consultation on contract.
	Hevi-Duty Electric Co., Watertown, Wis.	D Krazek	3/24-25 26	Witness acceptance tests.
	W.F. & John Barnes Co., Rockford, Ill.	R Vandewalker	3/27	Discuss proposed equipment.
EA Weakley	G.E. X-Ray, Milwaukee, Wis.	MA Edwards	3/20-21	Consult on feasi- bility contract.

TRIPS (cont'd.)

<u>Name</u>	<u>Company Visited</u>	<u>Contact</u>	<u>Date</u>	<u>Reason</u>
GF Jacky JH Johnson	Savannah River, duPont Augusta, Georgia	CC McBride	3/10- thru 3/13	Discuss equip- ment and processes for the extrusion cladding of fuel elements.
	BMI, Columbus, Ohio	CJ Slunder	3-14	" " " "
	Moczik Tool & Die Works, Detroit, Michigan	C DeBuigne	3-3	" " " "
	AECL, Chalk River Ottawa, Canada	EE Sinclair	3/4 thru 3/7	" " " "
GW Riedeman	Hunter Douglas Aluminum Corp., Riverside, Calif.	NH Gammell	3/6 thru 3/8	Discuss and ob- serve component fabrication.
SM Gill	4th Nuclear Eng'g. and Science Conference, Chicago, Ill.		3/17 thru 3/21	Attend conference.
SM Gill PH Reinker	American Bearing Co., Indianapolis, Indiana	H Lambertus	3-20	Determine progress on DDR contract.
PH Reinker	Atomic Industrial Forum Conference, Chicago, Ill.		3/17- 18-19	Attend conference.

PERSONNEL

<u>Name</u>	<u>Title</u>	<u>Nature of Change</u>	<u>Date</u>
<u>Testing Methods</u>			
GWR Endres	Rot. Tech. Grad.	Transferred out	3/21
<u>Materials Engineering</u>			
OW Rathbun	Engineer	Terminated	3/31

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PROCESS ENGINEERING

Regular Production Rupture Experience

Seventeen fuel elements, 12 normal uranium and 5 enriched, ruptured in the reactors during the month. Of the normal uranium fuel elements, 2 were cored and 10 were solid. Two were classified as core splits, 6 as side spots, 1 as side other, and 3 unclassified. Of the enriched uranium failures, 3 were solid and 2 were 6-inch I & E. One of each type was unclassified and the remainder were side hot spots. The distribution of ruptures by reactor was, 4 in B, 2 in DR, 4 in H, 3 in KE, and 4 in KW. Four of the normal uranium ruptures were in M-388 jacketed, blunt nose tru-line cans. All were side hot spot failures.

I & E Program

Charging of I & E in the C and K reactors continued on schedule. One thousand five hundred ninety tubes of 2500 tube central zone (65%) are charged in KE; 1636 tubes of 2500 central zone (67%) are charged in KW. C reactor has been operating with a fully loaded I & E central zone since January. Old reactor "to rupture" test has reached an exposure of 10⁴⁰ MWD/T for the I & E, 960 MWD/T for the solid controls. No failures have occurred to date in any normal uranium, 8-inch I & E fuel elements.

Forty tubes of depleted I & E and 136 tubes of enriched I & E were charged in C reactor for the Pu-240 program.

The I & E yield in the 313 Bldg. production facility was 79.3% for the month. For the same period, the solid yield was 85.6%.

Dingot Program

To date, approximately 610 tubes of solid low hydrogen dingot material have been charged in DR reactor and 427 tubes discharged at normal goal without incident. Twenty charges each of dingot and ingot material in a "to rupture" test at DR reactor have reached exposures of 475 MWD/T without incident. Lot charging of dingot material at the rate of 200 tons per month, about half solid and half I & E, will start in July.

M-388 Alloy and Blunt Nose Tru-Line Program

Continued abnormally high rupture experience of fuel elements canned in M-388 alloy blunt nose tru-line jackets has lead to the initiation of an intensive program to improve the process for canning these fuel elements in an attempt to produce a better, stronger bond. Nearly all of the failures to date have been side hot spot and there is evidence that this may be related to the higher incidence of weaker, brittle bonds found in fuel elements canned in M-388 alloy. Preliminary development work indicates that the depth of submergence of the core in the duplex bath during canning may be significant in the production of brittle bonds.

Process Technology

Reduced Canning Cycle

Four hundred fifty I & E and 180 solid fuel elements were canned in the Pilot Plant on a 30 second cycle (vs. present 45 sec.). Initial and incomplete investigation indicates no difference in fuel element quality.

Reclamation of Weld Rejects by Rewelding

Over 5,000 weld rejects have been refaced and rewelded in the 313 Bldg. with yields of 70%.

Fuel Element Recovery by Can Melting

Three hundred reject fuel elements were recovered in the pilot plant by recycling the canned piece directly through the duplex bath to remove the old can, and then recanning directly in the canning bath. Preliminary results indicate that this recovery process is feasible, however, examination of the recanned pieces for bond layer integrity is still in process.

Treater Tank Coil

A Ni replacement coil for black iron has been in operation for seven weeks without evidence of corrosion. Seven weeks service is more than the average life of the previous black iron coils.

Transformers for Automatic Welders

The decision was made to use 300 ampere, sine wave saturable reactor transformers for the five automatic welders to be installed in 313 Bldg. for I & E production welding.

Automatic Welders

Design is complete and out for bid. Bid opening is scheduled for April 9.

Face-weld Sequence

Based on a series of favorable tests run in 313 Bldg., the decision was made to permit face-face-weld-weld for the two ends of I & E fuel elements. Previous information had indicated that facing both ends of I & E before welding resulted in excessive contamination and high reject rates on one end.

MATERIALS ENGINEERING

Dingot Uranium

A test canning of about 4,000 dingot fuel element cores in January showed that the salt used in beta heat treating was the most important variable in controlling the effect of the hydrogen content of the uranium fuel core. This fact

agreed with previously obtained information. However, variation of hydrogen content of the dingot did not seem to be related to later evolution of hydrogen during lead dip canning, which does not substantiate previously obtained information. It is planned, therefore, to repeat this production test in the immediate future, using about 60 tons of uranium cores.

Further studies of the dissolving of dingot uranium continue to indicate its slow solution rate. DuPont (SRP) reported about a 35% increase in dissolving time for 11,000 irradiated fuel elements. Analysis of present production plans indicate that the HAPO separations facilities could experience a production bottleneck in 1959 unless an answer to the dissolving problem is found.

The first shipment of I & E fuel cores fabricated from low hydrogen dingot uranium was received during the month.

Cast Uranium Fuel Cores

Two massive I & E fuel cores and 48 washers cast by American Bearing Corp. have been examined to determine their metallurgical characteristics before and after beta heat treating. These examinations show the as-cast structure to be large grained, typical of cast uranium prior to heat treating. A single beta heat treatment modified the grain size of the I & E core such that it was approximately the same as production rolled and heat treated ingot uranium.

Washers which were heat treated exhibited a grain size somewhat finer than production metal. This fine grained material is a potentially desirable structure. The only defects found in washers and cores were micro-cracks which had been observed previously in centrifugally cast cores from the National Lead Company of Ohio. There were significantly fewer micro-cracks in the American Bearing Corp. product and their seriousness is as yet unknown.

In addition to the above, 25 completed I & E fuel cores were received from ABC late in the month, and about 75 more will be received shortly. While these show certain casting defects on the surfaces, it is known how to eliminate these. In general, the physical appearance of the pieces is good. Metallurgical examination has not been completed.

It is planned to have ABC cast about 1,000 fuel cores in the next two or three months, and an irradiation test is now under serious consideration.

X-8001 Aluminum Fabrication

Vendors supplying HAPO components from X-8001 alloy are having difficulty casting homogeneous ingots. Harvey Aluminum reports having to scalp about 50% of ingot weight to get to uniform metal. This situation, unless corrected, will eventually result in an increase in X-8001 component costs. It appears that casting methods will have to be modified to permit casting uniform ingots of this alloy. FPD is working with the vendors to improve ingot quality.

Cans and Spires from Cast Blanks

Preliminary tests show components forged from cast 1245 blanks are generally comparable to standard components. Caustic dissolution tests of completed components have shown material to be clean and free from porosity. The as-fabricated structure is acceptable with a somewhat large grain size; the material recrystallizes uniformly and smoothly when annealed at 575 C for one-half hour.

A further development effort is in progress to optimize casting techniques and to fabricate components in X-8001 alloy. So far, nickel alloy components from other projects, fabricated from small (about 20 pounds) cast billets, have shown no alloy segregation.

Extrusion Cladding

A detailed survey of the state of the art of extrusion cladding was carried out during the month by visiting AECL, Savannah River, and BMI. In summary, AECL is producing extrusion clad flat plates as the standard NRU fuel element. The uranium is not nickel plated, and only weak jacket-core bonding is achieved. Trial production cladding and irradiation testing of nickel-plated uranium flats with a high jacket-core bond strength ($< 5,000$ psi) is to be carried out in the near future. Cladding is done at 10'/min. extrusion speed. Feasibility of applying a 25-mil bonded cladding at 10'/min. speeds has been demonstrated; however, for cladding flat plates on a production scale, a 92-mil thick cladding is applied, which is subsequently machined to 25-mils. With the thicker cladding, the extrusion is self-propelled, and superior end-closures are achieved.

Savannah River and BMI have clad-bonded flat plates satisfactorily at speeds ranging up to 33 in./min., limited by adequate preheat equipment.

Present HAPO plans are to install an appropriate die block, container and tooling on a press now in 306 Bldg. and continue development there.

Development Activities - Pilot Plant

Approximately 1500 solid fuel elements have been canned in the pilot plant during the past two month period to develop information on autoclave inclusions. Various contaminants were introduced between the sleeve and can wall to produce typical specimens. All fuel elements were for visual examination and destructive testing.

Further development work on hot bath recovery, i.e., melting the aluminum jacket off in an AlSi bath and immediately recanning, was continued during the month. Except for lower canning yields due to experimental temperature adjustments, the process appears to produce fuel elements comparable to first run fabrication in cladding integrity.

Reduced cycle canning was evaluated. Changes in equipment arrangement, operator assignment, and time cycles were established to allow canning on a 30 second

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cycle. Both solid and I & E fuel elements were canned with normal yield rates. Conditions were established and canning was demonstrated for a 40 second cycle with favorable results.

TESTING METHODS

Fuel Element Testing

Several improvements in the operation of the I & E Transformation Testers were developed and demonstrated. Optimization of the crystal angles and sizes and a new crystal holder should significantly reduce the alignment time and inaccuracies in testing. Addition of a transistorized preamplifier is expected to reduce the number of false rejects caused by electrical transients tripping the alarm circuit.

Efforts to improve the equipment availability time of the 313 I & E Bond-Penetration Testers are continuing jointly with Manufacturing-Engineering. Craft training sessions are underway, a more rugged internal penetration test probe has been evaluated, and a detailed analysis is being made of the causes for downtime.

Favorable test results are being obtained with the final design of the Bump Discriminator for the internal AlSi Penetration Tester. Laboratory and pilot plant tests with subsequent destructive examinations show that the process testers are detecting and rejecting thin wall spires, and also that the Bump Discriminator will salvage an appreciable fraction of those elements falsely rejected because of surface irregularities. Operating and maintenance problems with the Bump Discriminator under production line conditions are now being evaluated in the pilot plant.

Project CG-713 - 313 Building I & E Conversion

Fabrication of the new testers is on schedule. Circuit improvements were incorporated in the new Bondtesters. Preparation of the instruction manuals and operating procedures is underway. Plans have been made for completing the debugging and acceptance testing of all the new equipment in the Testing Methods laboratory prior to delivery to Manufacturing.

NPR and Category II Development

Cladding thickness measurements continued with samples of NMI coextruded Zircaloy clad rods and an order was placed for fabrication of a variable rate feeder for eddy current testing. Previous successful unbond detection results with the 20 mc pulse echo system have been corroborated with a one mc through transmission technique and one and 10 mc Lamb Wave tests. A large crack in a uranium core has also been detected by the through transmission method. The bondtesting results were in agreement with NMI data.

New Methods Development

A test method was developed and equipment was loaned to the Plutonium Metallurgy Operation of HLO for detecting thin claddings (core dog boning) in the Pu-Al

alloy MTR fuel plates. This is done by counting low energy gamma activity from the core with a collimated scintillation spectrometer. An alternate method based on through transmission measurements of low energy Americium-241 gamma rays was also found feasible. The first method has been put to fruitful use and there is considerable interest in attempting to further improve the accuracy.

Some X-ray diffraction tests to compare Sonic Orientation Resonance Test results with calculated growth indices were completed. Very low growth indices were obtained for even the extreme cores as selected by SORT. These included an as-rolled core. The X-ray readings showed a large variation from end to end of a given core making correlations difficult. Further X-ray correlations are planned using more samples from each piece. This work is also being coordinated with related studies at Fernald.

Development and evaluation studies on the inductive thermometry bondtest method, the prototype ultrasonic surface test, and the prototype ultrasonic attenuation test are proceeding satisfactorily.

Hanford Test Reactor

Metal testing continued routinely and one special test was completed. Development of the sub-critical neutron flux monitor was delayed some by faulty functioning of the period meter circuit.

RESEARCH & PROJECTS

Status of Projects

CG-713 - Conversion to I & E Lead-Dip Fuel Elements - Detail design is essentially complete. All major components and all major equipment excepting the welders are on order. Bids for welders are due to open April 9, 1958.

Equipment layout has been revised to allow Face-Face, Weld-Weld flow of material.

Drawing of cam jigs and revisions to the prototype welder will be started in drafting on April 14.

CG-759 - Additional Steam Generating Facility - Directive HW-448, Modification #1, was issued March 19, 1958. It authorizes project costs of \$633,536 including \$58,536 in transferred capital property.

Scope plans and specifications for a fixed price design and construction contract were completed and transmitted to the AEC for approval, March 31.

CA-774 - 300 Area Water System Modifications - Architect-Engineer preliminary drawings being reviewed by GE and the AEC. Title II services scheduled to start April 10 and be completed by May 10, 1958.

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CG-787 - Sprinkler System - 313 Building Addition - Preparation of criteria for a design and construct contract is in progress. It is anticipated that they will be completed and submitted to the AEC during the week ending April 19.

Directive authorizes \$49,000 for the project which is to be completed by January 31, 1959.

CGF-792 - Warehouse Space - FPD - Project proposal requesting \$61,000 for 6,400 square feet of storage space transmitted to Contract Administration March 28, 1958. AEC consideration anticipated by April 10, 1958.

306 Building Plating Facility

Existing 306 Building electroplating facilities are being studied to recommend modifications necessary to provide for plating a greater range of sizes and shapes.

Research and Development

Irradiation Testing

A. Status of Test Facilities

Ten hot-press canned 1.6% enriched washer fuel elements clad in A-2 alloy were charged on 3-14-58. Temperature rise and flow data show the power generated is about 356 KW/tube, which is only 65% of the 550 KW/tube anticipated for the loading. 305 Test Reactor tests confirm the anticipated power of 550 KW/tube. The accuracy of the loop thermocouples is limited to about ± 10 C, which will effect the accuracy of the power calculations in the loops.

A charge of fuel elements clad in C-2 alloy is being prepared for charging into this loop when the current test is complete.

Fuel Element Development

A. Aluminum Clad

Fuel elements clad in A1, A2, C1 and C2 aluminum alloys have been exposed to 300 C water (pH 4.5) in Elmo 7 for about 700 hours. The pitting corrosion which occurred after 150 hours has not increased significantly. Since the flow rate of the test varied from 5 to 20 FPS, new fuel elements are being tested at a constant rate of 20 FPS. As before, the new pieces show slight pitting at 150 hours. (The original elements still are being exposed.)

Coupons of alloys A2 and C2 have reached exposures of 1844 hours in 360 C deionized autoclave water. Both alloys are performing better than X-8001 alloys.

The surfaces of some A-1 alloy coupons were treated to produce cast structures. The coupons were tested in 360 C deionized water for 10 days; the treated surfaces showed marked improvement in corrosion resistance over wrought coupons. Tests are being continued.

Alcoa has submitted a bid of \$17,000 for 3000 components each of alloys A1, A2, A3 (1.4% Ni, 1.4% Fe). The components will be standard solid caps and cans. Bids for I & E components have not yet been received.

B. Zirconium Clad

Fuel Element Design Operations, HLO, fabricated two 7-rod clusters and two 4-rod clusters for charging in KER testing loop No. 1. Preliminary calculations of the PT show that surface temperature of the zirconium will be in the 270 C to 300 C range for the 7-rod clusters. Peak power generation should approach 10 to 12 KW per foot per rod. The PT is expected to be completed and the 7-rod fuel elements charged on the next KER charging period.

Fuels Fabrication Development Operation reports that a process for spot welding zirconium supports to a heat generating surface of a Zr clad fuel element has been worked out. The interim supports for the long rod tests will be attached by spot welding; long rods test should be charged in loop 3 during the month of May.

1.6% enriched material was received from NMI but has not been inspected to date. This material will be used by Fuel Element Design Operation to fabricate 4 and 7-rod clusters for testing in KER and ETR test loops.

C. Uranium Alloys

One melt of U-0.5 w/o Mo was cast during the month. Some segregation of the molybdenum was detected. It is felt that this segregation can be prevented by holding the metal in a molten state for a longer time before casting.

D. Restraint of Uranium

The zirconium clad uranium restraint specimen charged in the MTR during March is not operating as predicted. Core and cladding temperatures of 600 and 350 C were anticipated. The thermocouple inside the test piece indicates a 425 C core temperature which will produce a 225 C surface temperature. The low temperature is probably due to an error in flux values for the tube.

Another test will be charged next cycle after the flux value is checked.

Lost Punch Cladding

Verson Allsteel Press Company will begin Phase II of their contract about mid-April, 1958. Purchase Requisition No. G345133 for Phase II was delivered to the AEC Procurement on March 27, 1958. Indecision as to the classification of the project has delayed further action by AEC Procurement.

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306 Building Modification

A preliminary layout of the extrusion press and supporting facilities has been made. Several presses are being investigated for this installation.

Press for NPR

Preliminary specifications and requirements for a press capable of co-extrusion and extrusion cladding have been sent to five press engineering and manufacturing companies.

DRAFTING & FILES

Major Jobs in Drafting

306 Building:	Electron Beam Welder - layouts Tong Holder
313 Building:	Fully Automatic Welder Automatic I & E Tester Conveyor Layout Automatic Buffer Storage Conveyor Automatic Unloader - Acme Gridley Lathe Revisions to Components and Tools
384 Building:	Scope of lighting Miscellaneous As-Builts
Drawings Produced:	New 58 Revised 69 Large Charts 2 Small Charts 46 Miscellaneous 64

ADVANCED ENGINEERING

Production Capacity Study

The study determining the effect on operating costs for increased production quantities of fuel elements was reviewed to include additional changes requested by the AEC.

Economic Potential of Aluminum Jacketed Fuel Elements

Work is well underway on a report which combines all the recent studies on jacketing aluminum clad fuel elements. The scope of the report includes the operations from uranium ore to a jacketed fuel element. Jacketing techniques include lead dip, cable cladding, point closure, and lost punch.

The primary purpose of this report is to combine all the past studies into a single report and standardize the assumptions, thereby providing a reference for comparison purposes for future work.

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 March, 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

for Manager - Engineering

PH Reinker:mbs

FINANCIAL OPERATION

MARCH, 1958

AUDITS AND PROCEDURES

Office Procedures - An investigation was made of possible future data processing applications within the Department. At least fourteen areas, representing activities in each level 3 operation, appear feasible and will warrant study during the next few years.

A preliminary study was made of possible use of the new IBM 8200 Time Punch for recording time distribution data. The punch automatically prepares cards for final processing and is adaptable to present maintenance time distribution systems. The study will be continued to determine the extent of possible advantages and whether or not the equipment would be economically justified.

An examination was made of procedures for accountability of SS materials. Several possibilities are being considered in order to reduce the amount of reporting and computing and decrease time requirements for each phase of reporting.

Other Auditing and Procedures accomplishments included:

1. Review of requirements and appraisal of effectiveness of procedures within the Department for the storing and safeguarding of precious metals. Established controls were found to be satisfactory.
2. Completion of plans for the 10 session FPD Introduction to Finance Course to be started in April.
3. Investigation of employee participation in the automotive surplus sales auction. No irregularities in FPD were noted.

Forms Control - Over 15,000 department forms were duplicated this month, consisting of 9 new designs, 3 form revisions, and 15 reorders. New forms of particular interest are:

1. FPD Statistical Chart - A multi-purpose, semi-completed chart developed by Personnel Practices for graphic presentation of various department statistical data by level 4 operation.
2. Temporary Equipment Custody Record - A three-part form developed by the Manufacturing Operation property custodian and Plant and Property Accounting for establishing a memorandum record of loaned equipment.
3. Shipment Request - A form for standardizing and consolidating information formerly contained in several memorandums in connection with shipments of fuel elements for process testing.
4. Material for Re-Process Storage - A formal record identifying by lot SS materials held for re-process. This form replaces various work sheets used in the past.

AUDITS AND PROCEDURES (Continued)

5. Planned Maintenance Authorization - A comprehensive form providing description, justification, and approvals necessary for "planned maintenance" work.

GENERAL ACCOUNTING OPERATION

Arrangements were completed with Instrument and Electrical Maintenance Operation to accumulate fabrication costs of instrument tubes on an individual expense code for each type of tube. The General Ledger account "Fabrication Work in Progress" has been redesigned to reflect month-end book value of each type of tube on hand. Since costs for completed tubes are liquidated at standard rates, this change will assist in control of standard rates applied.

Procedures have been completed on all details related to establishing an FPD Local Cash Working Fund for cash advances. A letter will be issued to levels 3 and 4 managers early in April informing them of the new service.

Travel and living expenses reimbursed by the AEC totaled \$4 238, covering settlement of 17 trips on which 98 days were spent in travel status. March activity compared with February is summarized below:

	<u>March</u>	<u>February</u>	<u>Increase or (Decrease) Over February</u>
Travel Advances to employees:			
Balance at beginning of month	\$5 451	\$ 4 668	\$ 783
Current month charges	<u>3 961</u>	<u>5 824</u>	<u>(1 863)</u>
	9 412	10 492	(1 080)
Less:			
Expenses accounted for	4 377	3 878	499
Advances refunded	<u>972</u>	<u>1 163</u>	<u>(191)</u>
	<u>5 349</u>	<u>5 041</u>	<u>308</u>
Balance at end of month	<u>\$4 063</u>	<u>\$ 5 451</u>	<u>\$(1 388)</u>
Outstanding travel advances:			
Current	\$4 063	\$ 5 451	\$(1 388)
Outstanding over 15 days	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>
	<u>\$4 063</u>	<u>\$ 5 451</u>	<u>\$(1 388)</u>
Number of expense reports submitted	21	17	4
Number of cash advances	17	12	5

OPG E 3.3 - Authorization and Performance of Work--was issued this month. This Guide sets forth comprehensive requirements for various classifications of work and establishes the course of action regarding authorization and performance.

GENERAL ACCOUNTING OPERATION (Continued)

A new Advice was issued on the General Electric Company Educational Loan Program and the Educational and Charitable Fund Scholarship Award Program. Provisions for administering the programs on a Company-wide basis were incorporated.

A report on the physical inventory of uninstalled equipment was compiled and issued March 15, 1958. Final tabulations resulted in issuance of Missing Property Reports on four items valued at \$870, and the addition of twenty-four items to plant record valued at \$6 382. Significant problem areas encountered during the inventory have been discussed with Property Custodians and solutions resolved.

The FPD Plant Record Unit Catalog was issued March 28, 1958. The catalog is a revision of the HAPO Plant Record Unit Catalog compiled and issued in 1950.

In regard to the Plant Acquisition and Construction Budget \$41 000 is budgeted in FY-1959 for Fume Control in the 313 Building, budgeted as a General Plant Project. In FY-1960, \$2 300 000 is requested for Fuel Element Casting and Extrusion Sheathing Facilities under Budget Item 6024 - Technological Improvements and Emergency Facilities. Estimated cost of all HAPO projects included in this Budget Item total \$14 565 000. Total funds budgeted is only \$5 000 000, or 34% of funds requested, which is considered adequate to provide for all projects of this type actually initiated during FY-1960.

Appropriation Request activity increased considerably during the month. Eight requests totaling \$48 525 were issued, two of which were approved before month-end. Remaining requests are still in process for approval.

The centralized air-switch control system in the canning area of the 313 Building was replaced by an electric-pneumatic control system installed under Project CG-737 for \$37 000. The old system valued at \$44 898, installed in 1955 under Project CA-514-Hanford Expansion Program - 300 Area Production Facilities, was retired from plant records during March.

MEASUREMENTS

Preliminary analysis of the use of contributed value as a functional measure for the Manufacturing Operations indicates little advantage over current measures; however, further study of these measures is required.

A meeting was held with Employee Relations Operations to discuss the methods of presenting the ERI (Employee Relations Index) measurement to level 3 and 4 components of the Department. This method of measuring employee attitudes will be presented jointly by Personnel Practices Operation, and Measurements to all components.

The methods for calculating Uranium Utilization and Uranium Inventory measures were agreed upon by Materials Operation and Product Cost Operation. It was determined that direct material inventory turnover was a more meaningful measure for the Department than the measure of months in supply.

PERSONNEL ACCOUNTING OPERATION

U. S. Savings Bonds purchased by FPD employees during 1952 and held in custody for the five-year holding period under the Stock Bonus Plan were distributed dur-

PERSONNEL ACCOUNTING OPERATION (Continued)

ing the month. Checks covering accumulated income on the Stock Bonus were also distributed. General Electric Company 1957 Annual Report indicates that 133 thousand of the Company's 280 thousand employees are participating in the Stock Bonus Plan. This represents a company-wide participation of 47.5%. At the end of February, FPD participation was 55.8%.

Personnel Accounting records were audited by Atomic Energy Commission representatives during the month.

Insurance claims submitted in March were approximately double the average month's activity. This was due primarily to the March 31 deadline for submission of claims covering charges incurred in the previous year. Metropolitan Life Insurance Company advised that claims covering charges for "bloodless surgery", performed by a specific chiropractor, would no longer be paid. An extensive investigation of claims of this nature was made by the Insurance Company before reaching this decision.

A special report on Exempt Salary Statistics was prepared for Consolidated Payroll Reports and Statistics.

In cooperation with the Data Processing Operation, a proposed program providing for standardization of procedures for maintenance of personnel source files was reviewed. This proposal provides a greater degree of flexibility since it allows each level 2 component to pursue separate courses of action without eliminating the economics inherent in a standardized data processing procedure. Although no dollar savings may be expected in regard to data processing cost, economics may be effected through standardization of forms and through elimination of training clerical employees on two different procedures.

PRODUCT COST OPERATION

Level 4 managers were contacted for the purpose of discussing their February cost reports. Cost-Budget relationships (VB%), terminology, supplemental reports, work order procedure, flow of costs, and distribution of costs were discussed in whole or part.

Each manager or specialist responsible for an operating code was furnished with a complete recap of eight months' costs by source. Since costs are reported monthly by the type of expense involved rather than source of expense, this information should prove helpful in future budgeting and in understanding particular costs for which they are responsible.

Effective with March reporting, essential material consumption will be partially estimated rather than waiting until actual costs are known. This will expedite operating cost reports by $1\frac{1}{2}$ days. No variances of any consequence between estimates and actual are anticipated.

Material transfer slips were revised to eliminate detailing individual materials under \$5.00 and to provide for the use of a \$10.00 miscellaneous figure per work order transfer slip. This accomplishes a considerable savings in time required for pricing, listing, and extending costs.

PRODUCT COST OPERATION (Continued)

A request was made to Data Processing for a tabulation of Stores withdrawals by description rather than the tabulation by stock numbers. Fulfillment of this request would enable us to furnish each manager with a weekly report of purchases made by his operation. In eight months' time, \$129 000 has been expended on indirect material. Requests for this detail are increasing and require a manual recap of stores withdrawals.

Excellent results have been reported by the Special Canning crew of the Finishing Operation in reclamation of fuel element rejects. Reclaimed pieces reported were from two different reject categories. Attempts will be made in the future to reclaim other types of rejects. Gross material and labor savings realized on reclaimed pieces amounted to \$6 540. Material and labor costs for reclaiming amounted to \$851, leaving a net savings to date of \$5 689. Other indirect savings will result from less scrap generated and reduced freight cost on scrap shipments.

The remaining schedules for fiscal year 1959 revised budget and the budget for fiscal year 1960 were submitted to Contract Accounting on March 28, 1958. The due date for final submission was April 1, 1958.

The following schedules were submitted:

1. Report 1701-A - Component Cost and Distribution by Level 3 Operation for FY-1958, 1959, and 1960.
2. Report 1701-B - Component Cost and Distribution by End Function for FY-1958, 1959, and 1960.
3. Supplemental Data - Maintenance for 1958, 1959, and 1960.
4. Report 1703-B - Proposals for Research and Development for FY-1959 and 1960. (Submitted on Document HW-55204)
5. Supplement I - Production Unit Cost for FY-1958, 1959 and 1960.

The new method of distributing Service Assessments (General Plant Overheads) has been incorporated into the budget for FY-1959 and 1960. The basis for distribution of each Department or Operation is personnel assigned to end functions. Using this procedure, the overheads applied to end function direct cost for the Fuels Preparation Department are 20.6% for FY-1959 and 20.1% for FY-1960 compared to a current rate of approximately 22%.

The annual physical inventory of coal was conducted March 31, 1958. The 300 Area coal pile was surveyed on March 31, 1958, by the Construction Engineering Operation. Readings of the survey are presently being converted to tons and results will be distributed in April.

The semi-annual physical inventory of special materials was conducted March 31, 1958. Tentative results disclose a difference in platinum of 2.7 grams between physical inventory weights and book weights. This decrease is attributed to difference in actual weight and book weight on one pair of platinum-tipped tongs and material losses through operation wear. Results of the physical inventory will be issued in April.

PRODUCT COST OPERATION (Continued)

A current study reveals process material purchase commitments amount to approximately \$2 400 000 and cover requirements from 14 days to 6 months. Ninety-seven per cent of the commitment value is related to the pending acquisition of extruded components, and of this value, 60% is for acquisition of M-388 components and 40% for 1245 material.

Vendors' conversion cost relating to SS material in amount of \$215 174 was either transferred to the proper inventory account within the Fuels Preparation Department (\$170 075) or transferred to Hanford Laboratories Operation (\$45 099). Charges have been accumulated and maintained as material in transit since July, 1957. Values include conversion costs on washer-type material, solid normal, solid and I & E enriched, cored, normal, rods, and billets.

Pending approval of Irradiation Processing Department, costs on depleted, doe, and oversized K pieces will be transferred to IPD. Tentative values include costs of depleted and doe elements, and losses and costs related to oversized K elements for conversion, SS material, component parts and machining.

Manager - Finance

WS Roe:mh

MAINTENANCE AND POWER OPERATION

MARCH 1958

GENERAL

Productive Maintenance Program

Outstanding orders as of 2/28	90
Orders issued in March	53
Orders completed in March	45
Orders rescheduled	36
Outstanding orders as of 3/31	62

All safety-pop valves on record in the 300 Area have been inspected. They have been tagged as to inspection date and pressure setting.

There were two cost reductions submitted, representing a savings of \$5,892. Total realization for the quarter is \$21,181. This is 89 per cent of the first quarter's Cost Reduction Budget.

A maintenance management meeting has been scheduled for April 16. The purpose of this meeting is to present the FPD Sanitation Program to interested HAPO personnel.

General Accounting, Personnel Accounting, and Salary & Wage Administration Operations moved to the 300 Area on 3-15-58. This completes the movement of FPD personnel from 700 Area. All personnel of this Department are now located in the 300 Area.

AREA MAINTENANCE

Duplicating

<u>Process</u>	<u>No. of Orders Processed</u>	<u>No. of Copies Made</u>
Multilith	787	373,042
Verifax	78	3,310
Ozalid	62	2,007

There were 5 Formal Reports completed, consisting of 2,259 copies - 51,390 pages.

A torsion balance is being used for checking classified documents in the Duplicating facility. This balance is sensitive to small changes in weight. One document is thoroughly checked and its weight used as a standard. All other volumes are weight checked against this standard. This weight check detects double pages or skipped sheets in a document.

General Maintenance

Decontamination of the boring mill (HEW-400612), removed from the 3717 Shop, has been completed. Parts have been crated for shipment or storage. We are awaiting disposal instructions from HOO-AEC.

A new method of cleaning the air washer spray nozzles in the ventilation systems is now under study. Preliminary work indicates that the calcium deposit on these nozzles can be dissolved by emersion for a short time in a dilute solution of hydrochloric acid. If the method proves successful, it will replace present sand blasting of the nozzles to remove the calcium. This will further reduce maintenance costs on this equipment.

A titanium dissolver and a stainless steel acid storage tank, fabricated in the 328 Shop, have been installed in the 321 Building. In addition, new acid and caustic lines have been installed. This work is in support of the Darex Program.

Modification of the exhaust system of four hoods in Room 30-C of the 326 Building was completed. Previously, these hoods were exhausting through one duct. An additional filter box and necessary duct work was installed so that the hoods now exhaust in pairs.

A 16 gauge stainless steel tray was fabricated for use in one of the high radiation level experimental cells in the 327 Building. The purpose of this tray is to prevent the contamination of the cell bottom. A minimum of warp, due to welding, and a No. 4 finish on all surfaces were required.

Templates of the basket rails on the penetration etch machines in the 313 Building were fabricated. These templates will be used by an off-site vendor to fabricate new hardened stainless steel rails. The patterns were made of 20 gauge sheetmetal.

INSTRUMENT AND ELECTRICAL MAINTENANCE

The responsibility for determining that all necessary maintenance functions are supplied the PRTR development work was assigned to this Operation.

The Portable Shop repaired 987 portable radiation detection instruments. Average time per instrument was 1.13 man-hours.

Improvements in the method of fabricating the penetration tester probe in use in the 313 Building were completed. Improvements include a jig for rapidly winding coils on a lath and simplification of assembly and component parts recovery. It is estimated these modifications will reduce the cost of these probes by 50%.

A low level neutron source was obtained for use in the tube shop. This source will be used to check the operation of neutron counting devices, such as proportional counting tubes fabricated in this shop.

It was necessary to re-set all IBM time clocks in the 700, 1100 and 300 Areas as a result of the power outage on 3-16-58 (see Power Operation portion of this report).

The main drive motor on the canyon calciner in the 321 Building was completely overhauled. In addition, four heating units were fabricated for use in calciner experiments. These heating units consisted of two - 5 KW resistance heaters and two - 10 KW induction heaters.

A new 100 channel analyzer, manufactured by the Technical Measurements Group, and its associated equipment in the 326 Building were modified. These modifications permit fully automatic operation and release an operator for other duties. In addition, these modifications permit 24 hour counting periods.

A coil of #14 motor wire was fabricated. This coil is for use in the 3745-A Building to control the direction of the X-ray beam from the electron accelerator. The completed coil weighed approximately 100 lbs. Each of the 18 layers of wire was insulated from the others and taps were brought out from each layer. These taps permit the control and variation of the magnetic field generated by the coil.

Approximately \$300 in extra maintenance costs of instruments in the 325 and 329 Buildings was caused by a power failure on 3-16-58 (see Power Operation portion of this report). Most of the cost was associated in re-setting and recalibration of the instruments. However, several electronic tubes and one high voltage transformer were damaged and required replacement.

A new remote target drive on the electron accelerator in the 3745-A Building has been completed and is in operation. This drive permits the remote positioning of the gold leaf target in the electron beam. The gold target is used when X-rays rather than electrons are desired. The remote control permits positioning of the target while the equipment is operating at a predetermined power level. Previous practice has been to shut down the machine to manually position the target. After the target is positioned there is no practical way of determining the power level.

POWER

<u>Statistics</u>	<u>March</u>	<u>February</u>
Average Steam Generated (M lbs/hr)	53.3	52.1
Maximum Steam Generated (M lbs/hr)	93.0	70.0
Total Steam Generated (M lbs)	39,632	34,999
Coal Consumed (Tons)	2,620	2,288
Evaporation Rate (Steam/#Coal)	7.56	7.65
Efficiency - Actual	60.5	62.7
- Theoretical	66.4	66.7
No. Boilers on 2 3 4 3 4 3 2		
Date of Change: 1 3 17 18 20 21 24		
Sanitary Water from 3000 Area (Million Gallons)	65.7	56.1
Total Water from 3000 Area, Average Rate (GPM)	1,471	1,392
Total Water from #3 and #4 Wells (Million Gallons)	12.0	10.7
Total Water from #2 Well (M Gallons)	.30	.30
Peak Water Consumption for 24 Hours (Million Gallons)	2.5	2.3

As in previous months, steam generation operation was uneventful. Continued mild weather permitted several of the boilers to remain idle, and minor repairs were made to the #5 boiler. However, all units were available for service during the month.

On March 16, 1958 a total electrical power outage occurred at 12:30 A.M. The emergency turbo-generator in the 384 Building came on line automatically and carried the emergency load without incident. Normal power was restored at 1:44 A.M. However, when Power personnel attempted to switch from emergency power to normal power, difficulty was experienced in synchronizing the frequency of the electrical output of the emergency generator with the frequency of the normal feed. This resulted in tripping a breaker in the 300 Area substation. When the power failure occurred, a breaker in the normal feed line to the 384 Building had opened. When normal service was restored this breaker could not be closed and the emergency breaker was opened when normal power returned. As a result of these two breakers being in open position, the 384 Building power house was without electrical service to the boilers and auxiliaries and steam pressure dropped. An electrical foreman was called. The breakers in the main substation and in the 384 Building generator room were closed and service restored to the 384 Building at 3:32 A.M. As a result of this incident, re-instruction and additional training sessions are being held with all power operators to prevent a recurrence.

In an effort to reduce the emission of fly ash from the 384 Building, additional emphasis has been placed on proper operation of the firing equipment to reduce the generation of fly ash at its source. A noticeable improvement in the situation has resulted. A concentrated effort to determine origin of these particles and possible changes to existing equipment to reduce the emission is being made.

The sanitary sewage septic tanks were pumped and flushed by the Transportation and Maintenance Operation of R&UO.

PLANT ENGINEERING

There were 29 training classes held for craftsmen of HLO and FPD. In addition, 6 training classes were held for janitorial personnel of FPD. This represents 335 man-hours of craft training and 81 hours of janitorial training. The Janitorial Training Program was completed. Each of the 24 janitors received 9 hours of training on standard cleaning methods and the use of janitorial supplies.

A lubrication schedule has been set up for all equipment in the 328 Shop. Lubrication schedule cards have been provided for each machine.

Preliminary Architect-Engineer drawings for the sanitary water supply expansion were received and reviewed. It was requested that two items be re-evaluated to improve the water supply system. These were: Revision of piping at the proposed reservoir to allow a separate inlet-outlet pipe to permit the use of the reservoir as a sand trap and the elimination of four 90° turns in the 16" line between the 300 Area Parking Lot and the 382 Building.

All work was completed on the steam meters for the 313 and 321 Buildings and equipment is operating satisfactorily.

FIRE PROTECTION

<u>Fire Responses</u>		<u>Loss</u>
H&PO	4	\$10.00
Construction	0	---
Private	0	---
Outer Area	0	---

There were no significant fires reported.

INVENTIONS

No information has been received from the Instrument Department at West Lynn, Massachusetts concerning their tests on the Swaged Thermocouples developed by the Instrument and Electrical Operation.

The remote target drive (see Instrument and Electrical Maintenance portion of this report) was submitted as an invention by an individual in HLO. Supplemental information is being prepared which will reflect the contribution made by George Allen of the Instrument and Electrical Maintenance Operation. Agreement has been reached by all concerned that this invention should properly be classed as a joint invention.

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 March 1958.

SAFETY, SECURITY AND RADIATION EXPERIENCE

Medical Treatment Injuries	20
Frequency Rate	4.59
Disabling Injuries	0
Near Serious Accidents	0

There were no radiation overexposure cases reported.

There were no security violations reported.

MEETINGS

Round Table-Staff	21
Safety and Security	31
Information	8

Manager
Maintenance and Power Operation

E. Hilgeman:JPF:mkm

EMPLOYEE RELATIONS OPERATION
March, 1958

SALARY AND WAGE ADMINISTRATION

Although no positions have been audited this month to date, resumption is expected by month end. Audit of 1958 performance assignments and thoroughness of appraisal discussions also will be started by month end.

The First Line Supervisor Differential Study was updated and issued February 26, 1958. The study indicated significant improvement in differentials during 1957 and favorable progress forecast for 1958.

Several comparisons of FPD engineers with data charts issued by Employee Compensation Services are being made. The analyses and charts will be issued about March 26, 1958. The issue will also include a comparison with Los Alamos survey information.

The position of Supervisor, Maintenance Engineering was approved and established in the Manufacturing Operation with an effective date of March 1, 1958. A revised organization chart was also issued for the Manufacturing Maintenance Operation.

Cost statistics concerning two pending arbitration cases were provided to the Manager, Union Relations. This information included an estimate of probable costs assuming unfavorable outcome, from the Company's standpoint, of these arbitration cases.

Revisions to the Secretarial Plan were made and distributed to FPD management. The information issued included promotional and transfer guides and the Secretarial Evaluation Plan. The changes which were made did not alter the basic operation of the Plan in any respect.

Offices of the Salary and Wage Administration Operation were relocated to the 300 Area during the month. No target dates were missed and there was a minimum interruption to the work.

PERSONNEL DEVELOPMENT

Five Personnel Development programs were concluded, initiated, or in progress during the month.

1. Professional Business Management I course sessions 7 through 10 were completed during the month by 16 participants.
2. Thirteen participants completed the Written Communication course.
3. Eighteen participants continued their work in Work Simplification.
4. One employee participated in a Creative Thinking course presented in IPD.
5. Two employees completed the Data Processing course provided by R&U.

Total in-plant training, appropriate portions of which were conducted on employee's own time, totaled 1.36% of exempt employees' normal working hours.

Personal interviews conducted with all Department Managers revealed that the exempt Personnel Development Review is being used appropriately and that information concerning required courses to implement self-development planning will be provided to Personnel Development and Communication.

The GENE enrollment for the school year '57 - '58 shows a 27% increase in FPD participation over last year. The exempt employees participation increased 16% - the nonexempt 40%. During the Spring GENE courses, there were 16.6% of exempt employees from FPD participating, second highest exempt participation at HAPO.

One Technical Graduate assignment was filled during the month and two were vacated by Tech Grads completing their rotation, leaving a total of five in FPD rotational assignments at month's end.

COMMUNICATION

The second presentation of the General Manager's annual meeting with employees was held on Monday, March 3. Ninety-one employees and 58 guests attended.

Four Management News Bulletins were issued during the month. In addition, two regularly scheduled FPD Newsletters and one special edition were developed and distributed.

GE News column inches devoted during the month to Fuels' activities and employees totaled 190. Of this number, 48 column inches were devoted to routine items and 142 column inches to planned communication in support of Department programs. This represents an average of slightly less than three-quarters of a GE News page per issue.

Programs given extensive publicity during the month included: "Operation New Broom" clean-up campaign, movement of FPD personnel from the 700 area to the 300 area, the FPD "Safety Essay Contest", and the Janitorial Training Program.

Other internal communication activities during the month included preparation and distribution of the Safety Topic of the month, material to assist supervisors in conducting Round Table meetings during the 4th quarter of FY 1958, and planning communication to support a Savings and Stock Bonus Plan re-canvass.

Assistance was provided in preparing communication material concerning the drive to organize office workers, and information explaining the Company's position on compulsory unionism was distributed to all Fuels' exempt employees.

A possible method of using the Employee Relations Index to measure communication within work groups was investigated.

Three speeches were presented by Fuels' employees before community groups.

HEALTH AND SAFETY

	<u>March</u>	<u>February</u>
Disabling Injuries	0	0
Serious Accidents	0	1
Medical Treatment Cases	54	47
Medical Treatment Frequency	4.25	3.88
Employee Hours of Exposure	127,095	121,147
Orientation Presentations	1	1
Attendance	4	2
Inspections	20	16
Suggestions Evaluated	12	7
Safety Talks	1	1
Attendance	20	58

Medical examinations during February totaled 88, which was 137.5% of quota.

Program

Fuels Preparation Department completed 577 days without a disabling injury through March 1958.

The Medical Treatment Frequency rate dropped from 3.93 in January to 3.88 in February, then climbed to 4.25 in March. This is the first time since September 1956 that the rate has exceeded 4.00. An intensive effort to encourage reporting of all injuries has been made during the past months. This activity may have contributed to the frequency increase.

"Operation New Broom - 1958", the annual housekeeping campaign sponsored by the Health and Safety Program Council was completed at the end of March. There has been obvious improvement in the overall appearance of area grounds and building interiors.

The monthly meeting for women office employees was held on March 19. Chairman T. D. Gibbs presented a talk entitled, "The Birth of Industrial Safety".

Activities

March work activity included contacts on the following items: Office equipment safety, materials handling, safety shower installation, steam use, shop equipment, lighting, floor surface, ventilation, acids and caustics, publicity, safety standards, tank construction, mosquito control programming, safety meetings, accident statistics, rigging procedures, building design, traffic, production equipment, inspections, molten metal hazards, cranes, powder actuated tools, building exits, storage facilities, protective clothing, vehicle use, toxic solvents, compressed gases and manifolds, eye protection, medical services, housekeeping activity, disposal, and barricades.

FIRE PREVENTION AND CIVIL DEFENSE

	<u>February</u>	<u>March</u>
Fires and Investigations	0	0
Fire Loss	0	0
Number of Inspections	34	43
Fire Surveys Completed	0	1
Hazard Reports Submitted	5	10
Orientation Attendance - Nonexempt	2	4
Supervisor Training in Fire Prevention and CD	0	1

Program Development

Operation New Broom - 1958 program was concluded during the month except for the evaluation of results. A total of 37 selected inspection teams made thorough inspections of all FPD property. Twenty-one pieces of communications were released. Housekeeping throughout the area shows a high degree of improvement.

A program was developed to reduce the potential fire hazards created by employees forgetting to disconnect hot plates and coffee makers at shift end. Security Patrol and Fire Protection personnel will disconnect such units when encountered during their off-shift inspection and fire watch tours.

A program was initiated to replace all Rockwood Sprink-a-larm units on wet-pipe sprinkler systems with factory rebuilt units on a ten-year schedule required by National Fire Codes. One unit in 3717 Building was replaced on a factory exchange basis and the other four systems were scheduled for replacements during their annual overhaul next fall.

A meeting with Engineering and Manufacturing Management was held to satisfy all concerned that the project proposal to install a special sprinkler system in the 313 Canning Area would not present a safety problem to personnel.

General Activities

Explosion-proof thermostats were installed in the 3734-A Building to complete the explosion-proof wiring system; issued one excavation and two welding permits; obtained correction of code violating wiring in three buildings; reviewed and approved six construction blueprints; approved changes in exit facilities for the 313 Building mezzanine offices; submitted plans for modifying the water fog system and emergency dumping facility for flammable liquid tanks in the 306 Building; obtained approval for installing draft-stop walls and emergency escape hatch in the attic of the 3703 Building; selected location of a transformer pole that would not interfere with fire fighting access to 313 Building; caused Maintenance to order parts for the 3706 Building air accelerator unit on the sprinkler system when tests revealed the unit was inoperative; provided assistance to Engineering in preparing specifications for sprinkler system project proposals and upon request, assisted HLO, CEO, and CPD in interpreting Fire Codes and solving fire engineering problems.

PERSONNEL PRACTICES

Technical Personnel Placement

Professor J. P. CoVan of Texas A & M and Mr. J. C. Kindred, graduate student at BYU have accepted the Fuels Preparation Department's offer for a Summer Program assignment with the Engineering Operation. Mr. George Brown, Junior student at Colorado School of Mines, accepted Relations and Utilities Operation's offer for the Summer Program and will be assigned to the Engineering Operation - Fuels Preparation Department.

The quarterly report covering the Fuels Preparation Department Forecast of Technical and Exempt Personnel Requirements for the period 4-1-58 to 4-1-59, was completed and submitted on 3-21-58. Conforming with the most recent thinking on the subject, and from analysis of this report, it was forecast that a total of 8 technical and exempt personnel may be needed during this period, (possibly 5 from the Program and 3 from other sources) all of which however, to be only on a replacement basis.

The Fuels Preparation Department notified the Irradiation Processing Department and the Construction Engineering Operation that they had no current opening for which they could consider their exempt people currently on ROF status.

The Fuels Preparation Department recommended a candidate for the Irradiation Processing Department opening of Supervisor - Maintenance Engineering. However, they were notified by I.P.D. that the candidate recommended was not accepted.

The Hanford Laboratories Operation notified the Fuels Preparation Department that their opening of Foreman - Mechanical Shop for which the Fuels Preparation Department had recommended a candidate did not materialize.

Vallecitos Laboratory representative interviewed the Fuels Preparation Department's Supervisor - Test Reactor for opening's in their Test Reactor Supervisory group. They plan to extend an offer to the F.P.D. candidate.

The Television Receiver Department - Electronics Park, Syracuse, New York, referred their Supervisor - Methods Planning and Time Standards, to the Fuels Preparation Department for consideration. They were notified that F.P.D. had no opening for which he could be considered.

The Relations and Utilities Operation notified the Fuels Preparation Department that their opening for Electrical Engineer for which F.P.D. had submitted a candidate for consideration, would be filled by a candidate from the Irradiation Processing Department.

Experienced and BS/MS Recruiting (1-1-58 through 3-31-58)

	Cases Con- sidered FPD	INVITATIONS - FPD				OFFERS - FPD			On The FPD Roll
		Ext.	Visited	To Vis.	Open	Ext.	Acc.	Open	
<u>Engineering</u>	7	0	0	0	0	3	3	0	0
<u>Science</u>	3	0	0	0	0	0	0	0	0
<u>Other</u>	29	0	0	0	0	0	0	0	0
TOTAL	39	0	0	0	0	3	3	0	0

PhD Recruiting

	F P D				F P D		
	March	1958	To Date		March	1958	To Date
Cases Considered:	4		39	Offers Extended:	0		*1
Interviewed:	0		0	Accepted Offers:	0		0
To Be Interviewed:	0		-	On The Roll:	0		0

* - Carry over of 1 case from 1957

Terminations and Transfers, Technical and/or Exempt Personnel

There were two employee's who terminated employment from the Fuels Preparation Department exempt roll during the month of March. O. W. Rathbun terminated employment to transfer to the Atomic Energy Commission at Hanford. D. M. Polinsky terminated employment on ROF.

	March	1958 To Date
Transfers Considered:	-	*31
Transfers Completed:	1	4
Closed Cases:	4	15
Active Cases:	11	-
Dormant Cases:	1	-

* - Carry over of five cases from 1957, three active and two dormant.

Employment

Personnel added - 13; removed - 5.

Reduction of Force:	By F.P.D.	1
	By Seniority Bumping	0

Transfer requests active at month's end 50

Procurement

Offers	5	Requests for personnel	8
Interviews	6	Transfers (all)	11

Upgrades within F.P.D. 4

Perfect attendance recognition awards	9
Service recognition pins	10 Year - 3 5 Year - 6

Employee Benefits and Service

Employee Benefit Plans participation is as follows: Pension 99.7% ; Insurance 99.9% ; Stock Bonus 55.6% .

Non-veteran employees subject to Selective Service are classified as follows: 1A - 10; 2A - 9; and all others - 11. In addition there are: 9 technical occupational deferments active; 20 Standby and 36 Ready Reservists; 3 employees on military leave.

General

One request for a leave of absence was processed during the month.

There was one security violation during March.

UNION RELATIONS

FPD arbitration case - James grievance: The Council and the Company have agreed on a third party member of the arbitration panel, namely, Paul L. Kleinsorge of the University of Oregon. Professor Kleinsorge has agreed to serve and the hearing will be conducted on April 19, 1958 in Portland. W. M. Mathis will represent the Company and H. E. Shelton will represent the Council.

A revised maintenance overtime distribution procedure has been instituted within the Fuels Preparation Department with several seniority groups reverting to zero overtime hours. A revised overtime distribution procedure has been submitted to the Chemical Workers for their review and concurrence.

A special graveyard shift in the Finishing and Special Products Operation was approved by the HAMTC. This shift will be worked for a limited period of time probably through July.

Meetings were held with the Teamsters as well as with the Pipecoverers and Pipefitters for the purpose of resolving problems concerning jurisdiction.

Sixty-eight percent of the grievances received during the month involved jurisdiction. This is slightly higher than the annual average of jurisdictional grievances processed during 1957.

Grievance Statistics:

	<u>Unit</u>	<u>Nonunit</u>
Received this month	22	0
Received since 1/1/58	40	1
Step I		
Answer unsatisfactory	14	0
Answer satisfactory	8	0
Pending time limit to close	6	0
Settled this month	12	0
Step II		
Discussed this month	11	0
Pending time limit to close	10	0
Settled this month	5	0
Pending arbitration	6	0

Subject of March Grievances:
(22 Total)

	<u>Mfg.</u> <u>Oper.</u>	<u>Eng.</u> <u>Oper.</u>	<u>Maint. &</u> <u>Power Oper.</u>	<u>Emp.</u> <u>Rel.</u>	<u>Fin.</u> <u>Oper.</u>
Jurisdiction	3		12		
Absence	3				
Unsafe Equipment	1				
Overtime	3				

Subject of Grievances for 1958:
(41 Total)

				<u>Nonunit</u>
Jurisdiction	5	23		1
Seniority		2		
Absence	6			
Unsafe Equipment	1			
Overtime	3

Manager - Employee Relations

END

**DATE
FILMED**

1 / 28 / 93