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MONTHLY REPORT

**GENERAL ELECTRIC
COMPANY**

Fuels Preparation Department

January 1958

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53 pages, ~~page no. 1~~

MONTHLY REPORT

FUELS PREPARATION DEPARTMENT

68398

FOR

JANUARY, 1958

Compiled by

Fuels Preparation Department

February 28, 1958

Richland, Washington

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

5-17-73

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A-1

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FUELS PREPARATION DEPARTMENT
MONTHLY REPORT SUMMARY FOR
JANUARY-1958

MANUFACTURING OPERATION

During the month the Manufacturing Operation worked on a two-shift basis with five canning lines on each shift except for the week beginning January 13. For this week four canning lines were in operation on a two-shift basis. Six hundred forty-two tons of acceptable fuel elements were produced which was 104% of the 615 tons forecast in HW-53271-RD. Primarily the variance from forecast resulted from the higher ratio of solid to I & E production, and realization of finished inventory from reprocess material.

The inventory of bare uranium at the end of January totaled 346 tons or a 0.6 month supply. Finished inventory increased by 94 tons to 614 tons or approximately a 1.2 month supply.

The Manufacturing yield for solid elements improved from 77.8% in December to 82.7% in January and the I & E yield improved from 55.8% to 64.7%.

Operating efficiency reached an all time high of 93.2%. The previous high was 93.0% which was accomplished during December.

Beginning the third canning line for I & E production was rescheduled from January to February.

A new reject classification has replaced the one used through December, 1957. This was done in an attempt to eliminate tabulating large quantities of reject material into a "miscellaneous" category and to limit "brittle bonding" to one category.

A slow insertion process cycle is in use for canning of all solid fuel elements. To date the increase in can wall thickness ranges from two to five mils.

ENGINEERING OPERATION

Irradiation of normal I & E elements continued without incident but the I & E program is undergoing considerable discussion. This results from certain recommendations by the ACRS and the AEC, which may limit power and exposure increases short of the proposed conditions at 98 C bulk outlet temperature.

No unusual rupture trends were evident during the month. Investigation is in progress to determine whether certain types of M-388 can failures are due to non-uniform dispersion of nickel in the alloy.

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Evaluation of Sylvania hot press elements, dingot uranium, extrusion clad elements, blunt nose tru-line pieces and precision cast uranium continued on schedule. Initial evaluation of "C" size, precision cast washers received at HAP0 indicated good quality and satisfactory characteristics.

Category II and NPR development and testing is proceeding satisfactorily. Several irradiation tests utilizing dip canned, M-388 clad, washer I & E elements and stainless steel cluster elements are in process at KER. Exposures and evaluations are at various stages of appraisal. Mechanical difficulties in loops 2 and 3 have delayed testing. Out-of-reactor tests are proceeding for coextruded rods from NMI and for Hunter Douglas high temperature alloys. Alcoa is cooperating with HAP0 in determining the effects of metallurgical history of aluminum alloys in relation to their corrosion resistance.

Approval is expected shortly to proceed on an Assistance to Hanford contract with GE X-Ray Corporation to further develop electron beam welding. In the meantime, equipment is being procured to carry out certain developmental phases at HAP0. A contract for tool development for the lost punch process (\$17,000) has been signed and forwarded to Verson Allsteel. All other contracted work is proceeding satisfactorily.

Cost comparison studies for lead-dip, HAP0 hot-press, point closure, lost punch and cable cladding were completed during the month. Attractive economic potentials exist for several of the newer processes primarily because of large reductions in aluminum component costs.

All project work is proceeding on schedule and within costs.

FINANCIAL

Physical inventory of uninstalled capital equipment was completed. This included a total of 1,221 individual items valued at \$730,000. Present incomplete results indicate that all items, with the exception of 5 instruments valued at \$1,200, have been located.

Composite depreciation rates were reviewed and changes were made as warranted. The net rate reduction has an annual effect on depreciation expense of \$28,000.

A comprehensive review of equipment requirements in FY-1958 indicated a reduction in available funds from \$502,000 to \$465,000 could be made. This \$37,000 difference has since be reallocated to other Departments.

Necessary arrangements were made for the reporting and recording of one-half day absences of exempt employees in accordance with general Company practice.

Two procedural changes in the Product Cost Operation were placed in effect this month:

1. Revision of reporting media to show separate cost data for enriched I & E and solid fuel elements which is deemed necessary in view of increased enriched production.
2. Change in the basis of distributing operating labor to that of canning input. Result, no variance in distribution of costs to products; considerable reduction in operating clerical effort.

MAINTENANCE & POWER OPERATION

There were four cost reductions submitted during the month. Total annual savings achieved was \$2,534.

The revised traffic flow pattern for the 300 Area parking lot went into effect January 20. The new pattern is the result of a study made to increase the safety for both drivers and pedestrians using the lots. Considerable publicity was given to the change; hence, conversion to the new system was achieved without difficulty.

A new procedure for the calibration of thermocouples in the 313 Building has reduced the number of calibrations required by 60%.

A janitorial training program was initiated. A vendor's representative was the principal speaker at the first meeting. Conferees were provided manuals on standard cleaning methods and on the products used in their cleaning activities. Future meetings were scheduled for small groups to insure adequate training and use of sanitation techniques.

EMPLOYEE RELATIONS OPERATION

Personnel Development activity for January included:

The Work Simplification program was initiated with 20 participants; PBM-I class #4 commenced January 8 with 16 participants; the final session of a Labor Law and Contract Interpretation course was completed and another series is planned to start in April; 4 FPD employees are enrolled in the current PMS & L course being given by R & U.

A procedure was devised and used to analyze individually all 1958 Salary Review proposals. Approximately 11% of the proposed effective dates or amounts were modified as a result of this review. A method was developed for surveying, later in the year, changes in opinions (if any) concerning the exempt salary plan. A two-year exempt position auditing schedule was established.

Eleven grievances were processed at Step I during the month. Of this number 8 were jurisdictional, 2 involved seniority and one concerned absence payment. One of the jurisdictional grievances was from a non-unit CEO employee against FPD employees; however, the grievance was answered satisfactorily at Step I.

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The canning line grievance, which was pending arbitration, is now considered closed at the Step II level as the Council has advised orally that it was not their intent to process the matter further. The Council advised, however, intent to arbitrate the James grievance (an Engineering Assistant bumping back into the Chemical Workers) and the Feigum-Neal grievance (Electricians protesting the assignment of fire alarm box testing to the Firemen). These two grievances bring the total of pending, active FPD arbitration cases to five.

A detailed analysis of the Sensitivity Survey results was distributed selectively to management.

There was a significant increase in suggestions submitted during January.

At month end the Department had operated 518 consecutive days without a disabling injury. The medical frequency rate for January was 3.93 as compared to 3.29 for December.

The new 300 Area Defense Warning System was completed and accepted on January 21. Tests will be conducted routinely at 10:00 AM the first Monday of each month.

PERSONNEL STATISTICS:

Number of employees December 31, 1957
Number of employees January 31, 1958

775
768

<u>OPERATION</u>	<u>EXEMPT</u>	<u>NON-EXEMPT</u>	<u>TOTAL</u>
General	1	1	2
Manufacturing	59	298	357
Engineering	49	25	74
Financial	16	23	39
Maintenance & Power	39	230	269
Employee Relations	<u>15</u>	<u>12</u>	<u>27</u>
TOTAL	179	589	768

LLGerman/jak

MANUFACTURING OPERATION

January, 1958

I. CURRENT OPERATIONS

A. Production and Productivity

1. Statistics

	8" <u>Solid</u>	8" <u>Cored</u>	<u>Enriched</u>		<u>I & E</u>	<u>Total</u>
<u>Current Month's Production</u>						
Acceptable Fuel Elements Produced (Tons)	503	7	23	19	90	642
As % of Forecast Production	140		230	95	40	104
As % of Past 3 Months' Production Average	114	18	209	173	114	111
As % of Past 12 Months' Production Average	107	21	288	633	265	117
As % of June 1958 Goal (500 MWD/Ton)	183	4	58		45	95
As % of June 1958 Goal (750 MWD/Ton)	503	28	92		30	143
% 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 (%)						93
Forecast (%)						90
Previous Month (%)						93
<u>Manufacturing Yield</u>						
Current Month (%)	83	72	81	66	65	
Forecast (%)	81		81	65	65	
Previous Month (%)	78		47	40	56	
Bare Uranium in Storage (Tons)						346
Finished Product in Storage (Tons)						614
Uranium Utilization (%)						95.2
		<u>Poison</u>		<u>"N"</u>		
Special Products Finished		996		1,694		

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DECLASSIFIED2. Activitiesa. Production

During the month the Manufacturing Operation worked on a two-shift basis with five canning lines on each shift except for the week beginning on January 13, 1958. For this week, four canning lines were in operation on a two-shift basis. The reduction in the number of canning lines in operation made personnel available for a graveyard shift to work off reprocess material at the I & E bond and penetration testing equipment and reject material at the Slug Recovery Operation. Six hundred forty-two (642) tons of acceptable fuel elements were produced which was 104 percent of the six hundred fifteen (615) tons forecast in HW-53271-RD. The variance from forecast resulted primarily from the higher ratio of solid to I & E production and realization of finished inventory from reprocess material.

b. Manufacturing Yield - Solid Production

A new reject classification has replaced the reject classification used through December, 1957. So that the new reject categories will be most meaningful, the December 1957 rejects have been put in terms of the new classification. Comparisons made between December 1957 and January 1958 therefore, are made on the new classification basis. More information on the new reject classification is contained under operating plans.

The manufacturing yield for solid fuel element production was 82.7 percent as compared to 77.8 percent for December. Improvement is due in most part to lower reject rates for braze layer integrity and surface inclusions.

Component preparation rejects decreased slightly from 1.2 percent in December to 0.9 percent.

Assembly rejects decreased from 2.0 percent in December to 1.3 percent.

Braze layer integrity decreased from 4.0 percent in December to 3.3 percent. This decrease is related to a lower percent of material canned in M-388 alloy components and to the introduction of more recovered bare material.

Braze layer contamination increased from 3.1 percent for December to 3.9 percent.

Thin wall rejects remained steady at 1.1 percent in December compared to 1.0 percent in January.

Marred surface decreased from 3.4 percent in December to 2.8 percent. This was brought about by more careful handling and less material in-process.

Facing rejects remained about the same as last month moving from 0.1 percent to 0.2 percent.

Welding rejects remained the same as last month at 1.2 percent.

b. Manufacturing Yield - Solid Production - continued

Surface rejects decreased from 6.1 percent in December to 2.7 percent because of the absence of abnormal inclusion reject rates.

c. Manufacturing Yield - Cored Production

Seven tons of in-process cored material were placed in finished inventory during the month. Most of the remaining cored material has been processed and recovered at least once. There is approximately ten tons of this bare material which is to be shipped as scrap to the National Lead Company of Ohio bringing the cored program to a close.

d. Manufacturing Yield - I & E Production

Yield for I & E production increased from 55.8 percent in December to 64.7 percent in January. The improvement was due in most part to realization of acceptable pieces from reprocess. These pieces were put into reprocess as internal penetration rejects but were proven to have a required residual can wall by a statistical procedure.

e. Manufacturing Yield - Enriched Production - I & E

Enriched I & E yield increased from 40.3 percent in December to 66.1 percent in January. Cocked caps were decreased by using the prototype automatic dip-quench machine which seats the cap in a direct line with the axis of the piece.

f. Manufacturing Yield - Enriched Production - Solid

Enriched solid yield increased from 47.2 percent in December to 80.5 percent in January. The yield increased primarily due to absence of any unusual can wall inclusions which occurred in December. The January yield follows the yield trend established over the last three months excluding December.

g. Manufacturing Yield - Lithium-Aluminum

The present schedule for manufacturing lithium aluminum (N) fuel elements was curtailed at the end of the month at the request of the Irradiation Processing Department. Present finished inventory of approximately 5,000 pieces is considered sufficient for several months.

h. Other Activities

The inventory of bare uranium at the end of January totaled 346 tons or a 0.6 month supply. Shift in production schedule from I & E to solid caused the supply of solid material to be at or below the minimum level. It may be necessary to maintain larger bare inventories of each type of material for the next few months in order to meet Irradiation Processing Department's changing needs and to prevent production line shut down.

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h. Other Activities - continued

Finished inventory increased by 94 tons to 614 tons or approximately a 1.2 month supply based on the Irradiation Processing Department charging schedule for February.

Inventory of essential materials remained steady at a 3.3 month supply for December and January.

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

	<u>Pieces</u>
8" Solid	44,755
8" Cored	3,585
C I & E	15,053
K I & E	19
O I & E	183
4" Solid	3,476
4" Cored	1,008
6" Solid Enriched	<u>1,237</u>
Total	69,315

There was one shipment of scrap during the month. Included in this shipment were 67,638 pounds of solid scrap, 1,197 pounds of enriched scrap. Three hundred sixty-four (364) empty boxes were also returned.

B. Plant Problems and Incidents

1. General

During January, the operating efficiency reached an all-time high of 93.2 percent. The previous high was 93.0 percent which was accomplished during December.

2. Autoclave Failure

No autoclave failures were experienced during January.

3. Rail Breakage - Cap and Can Machine

On January 8, 1958, a basket of cans dropped off a hanger into the diversey tank of the #2 cap and can machine. As a result, the transfer rail and degreaser spray banks were broken. To minimize a similar occurrence the following action was taken:

- a. Modified can basket latches.
- b. Issued a more specific operating procedure.
- c. Scheduled installation of (1) electrical switches to enable the operator to change chassis position without manually pushing solenoid contacts,

3. Rail Breakage - Cap and Can Machine - continued

and (2) a safety lock mechanism to lock the chassis in the up position while performing work on the machine.

C. Operating Plans

1. Slow Insertion - Canning Process

A slow insertion process cycle is in use for canning of all solid fuel elements. This process allows the fuel element core to seat freely by its own weight into the can during assembly. To date, the increase in can wall thickness ranges from two to five mils. As crews become accustomed to the cycle an average increase of four mils is anticipated.

2. New Reject Classification

A new reject classification has replaced the reject classification used through December 1957. This was done in an attempt to eliminate tabulating large quantities of reject material into a "miscellaneous" category and to limit "brittle bonding" to one category.

Three categories, thin walls, welding rejects and marred surfaces remain the same. Marred surfaces are now reported as Canning or Finishing marred surfaces. The miscellaneous category is no longer used; these rejects are tabulated as component preparation rejects, facing rejects, assembly rejects or surface rejects. Surface rejects are principally made up of can wall inclusions and stains. Assembly rejects are those that have origin in the assembly of the components. Braze layer integrity rejects are those rejects which are considered to adversely affect heat transfer, i.e., brittle bonding, bond test rejects, wide weld beads and radiograph voids. Braze layer contamination rejects are due to contamination in the braze layer prior to welding.

3. Manpower Utilization - Manufacturing Maintenance Operation

A work sampling study was made of the Manufacturing Maintenance Operation craft personnel to find out how available work time is spent. For comparison purpose a previous study was used. Craft productive time improved approximately 2 percent. This type of study points out areas where further improvements may be planned. One such improvement is the location of the tool crib from the 303-A Building to the 313 Building which is expected to decrease craft travel time.

4. Uninstalled Inventory - Catalogued Equipment

A physical inventory of uninstalled catalogued equipment in the custody of the Manufacturing Operation was made during the period January 13, 1958 to January 17, 1958. The inventory was completed one day ahead of schedule. Two portable instruments unaccounted for at the end of the inventory were located in about two days. The ability to locate all items on record by a physical inventory is a result of efficient property control and accounting practice.

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5. Third Line I & E Production

Start of the third canning line of I & E elements was rescheduled from January to February because of Irradiation Processing Department's modified requirement for I & E fuel elements.

6. Cleaning Solution - Cap and Can Machine

Some better method of cleaning 1245 cans and M-388 spires is desirable. Non-wetting by AlSi is evident on some of these components even though the pieces appear clean. Preliminary tests utilizing Wyandotte "Altrex" in place of Dupanol in the cap and can cleaning machines indicate better cleaning. Further tests are planned.

7. Dingot Uranium - Fuel Element Yield

As a means of reducing the cost of primary fabrication of uranium, the Mallinckrodt Chemical Works developed the dingot process. The word dingot is a contraction of "direct ingot". Dingot uranium is produced directly from UF_4 without the vacuum recasting step used to produce ingot uranium.

To date, only small quantities of dingot uranium have been used at HAPO principally because of the relatively high hydrogen content which seemed to produce a porous bonding layer during canning. This resulted in a high bond test and void reject rate.

During the month, 4,100 dingot fuel elements were canned to determine the effect of various hydrogen content and different heat treating media. Half of the material had been heat treated in carbonate salt at FMPC and half had been heat treated in a 50-50 mixture of sodium chloride and potassium chloride (Nu-Sal) at Mallinckrodt.

Based on incomplete data, an apparent improvement in canning yield is shown when the dingot material is heat treated in Nu-Sal.

D. Employee Relations

Members of the Operation were treated for 27 minor injuries for a frequency rate of 4.36.

Frequency of exposures greater than 200 mrad per two-week badge period was 0.5. An incident occurred in which a Manufacturing Operation employee received an exposure of 630 mrad during a five-day period which is in excess of the HAPO weekly permissible dose limit. The exposure resulted from the employee working very close to large quantities of bare uranium fuel cores for nearly a full work week. Full details of the incident are available in report HW-54657.

The frequency of exposures greater than 100 mrad per two-week badge period was 13.0.

II. PERSONNEL MATTERS

A. Visits and Visitors

J. A. Cowan attended a Plant Maintenance and Engineering Conference in Chicago, and also visited the Ajax Engineering Corporation in Trenton, New Jersey.

A. Visits and Visitors - continued

Mr. Cowan also visited the Marine Outboard Corporation in Waukegan, Illinois to discuss dye casting.

W. M. Mathis attended the Feed Materials Meeting in Washington, D.C. and also visited the Alcoa Plant in Edgewater, New Jersey to discuss aluminum component problems.

R. R. Cahall visited Oregon State College and the University of Washington for the purpose of recruiting BS/MS technical and engineering candidates. K. V. Stave also visited the University of Washington for recruiting purposes.

During the month D. W. Haught visited Mr. Walker of Oak Ridge and the Savannah River Plant to discuss and observe facilities for processing "N" material.

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 January, 1958.

C. Meetings

Members of the Operation attended 21 staff meetings, 9 information and 22 safety and security meetings.

D. Significant Reports Issued

1. Routine

<u>Number</u>	<u>Title</u>	<u>Author</u>	<u>Date</u>
HW-41288-RD	Monthly Production & Inventory Report FPD - Manufacturing Operation, December 1957	HP Kraemer	1-9-58
HW-54327	Monthly Report, Quality Control Operation, Fuels Preparation Department, December 1957	KV Stave	1-2-58
HW-54482	Production Report, FPD - Manufacturing, Month Ending December 31, 1957	HE Berg	1-20-58
HW-54528	Uranium Quality Control Analytical Results	GB Hansen	1-14-58
HW-54623	General Analytical Control Program I	GB Hansen	1-21-58

2. Non-Routine

HW-54606-RD	Official Production Forecast, Fuels Preparation Department, January 1958 through June 1963	HE Berg	1-20-58
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2. Non-Routine Reports continued

<u>Number</u>	<u>Title</u>	<u>Author</u>	<u>Date</u>
HW-54607	Slow Insertion Canning of Solid and Cored Fuel Elements.	DD Stone	1-20-58

WM Mathis / KW Stone
Manager-Manufacturing

WM Mathis:RRC:rhs

8" CANNING REJECTS BREAKDOWN BY MAJOR CLASSIFICATIONS

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8" CANNING REJECTS
BREAKDOWN BY MAJOR CLASSIFICATIONS

LEGEND
1&E
1957

CR BW PB BT - VOID TW INC MISC. MS

1958
CPR AR BLI BLC TW MS CAN FR WR MS FIN SURF

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PREPARED BY G.X. BEARD

ENGINEERING OPERATION
January, 1958

VISITORS

<u>Name</u>	<u>Company</u>	<u>Contact</u>	<u>Date</u>	<u>Reason</u>
JW Hansen	Mallinckrodt Chemical Works, St. Louis, Mo.	OW Rathbun	1-8/ 1-11	Observe canning of the variable hydrogen content dingot metal produced at MCW.
LL Gidley	MCW, St. Louis, Mo.	OW Rathbun	1-15/ 1-18	" " " "
WO Stevens	WO Stevens Co., Seattle	TW Gore	1-14	Consult on boiler facility.
RR Harries	duPont, Wilmington, Del.	HF Zuhr LT Hagie	1-27/ 1-31	To discuss 100 and 300 area operations.

TRIPS

<u>Name</u>	<u>Company Visited</u>	<u>Contact</u>	<u>Date</u>	<u>Reason</u>
SM Gill	American Bearing Corp., Indianapolis, Ind.	H Lambertus	1-6	Discuss uranium casting contract.
	SRP, Augusta, Ga.	TC Evans	1-7/ 1-10	Attend meeting of Working Committee of FEDC.
AJ Karnie	G.E., Syracuse, N.Y.	WJ Day	1-27	Interview
LE Kusler	Glenn L. Martin Co., Baltimore, Maryland	C Yoeman WA Maxwell	1-7/ 1-8	Discuss fuel element fabricating techniques.
	Babcock & Wilcox, Lynchburg, Va.	NC Jessen	1-9	" " " "
	Minnesota Mining Co. St. Paul, Minnesota	JR Johnson H Sowman	1-10	" " " "
WA Blanton	duPont, Savannah River	TC Evans	1-21/ 1-24	E-N technology
	ORNL, Oak Ridge, Tenn.	RA Walker	1-20	E-N technology

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TRIPS (cont'd.)

<u>Name</u>	<u>Company Visited</u>	<u>Contact</u>	<u>Date</u>	<u>Reason</u>
EA Weakley	GE X-Ray, Milwaukee, Wis.	G. Edwards	1-2	Discuss electron beam welding
JT Stringer	Westinghouse, Baltimore, Md.	WJ Delany	1-3	" "
	Phillips Electronics, N.Y.	CJ Woods	1-6	" "
	Triplett-Barton, Los Angeles	Triplett	1-7	" "

PERSONNEL

<u>Name</u>	<u>Title</u>	<u>Nature of Change</u>	<u>Date</u>
<u>Materials Engineering</u>			
JD Hoffman	Eng'g. Assist.	Terminated	1-24
<u>Research & Projects</u>			
VL Hammond	Rot. Tech. Grad.	Transferred from R&U	1-7

PROCESS ENGINEERING

Regular Production Rupture Experience

Two cored and six solid normal uranium fuel element ruptures occurred during the month. One rupture was classified as a core split, four as side hot spot, one as side other, and two were not examined. The distribution of ruptures by reactor was two in DR, two in KE, two in B, one in KW, and one in H. One solid enriched rupture occurred at C reactor and was not examined. Two of the normal uranium failures were clad in M-388 jackets; both were classified as side hot spots but neither have been examined in Radiometallurgy. One of the M-388 failures was in a blunt nose tru-line jacket and was a cored fuel element. There were no I & E failures during the month.

I & E Program

Irradiation of normal I & E elements continued without incident but the I & E program is undergoing considerable discussion. This results from certain recommendations by the ACRS and the AEC, which may limit power and exposure increases short of the proposed conditions at 98 C bulk outlet temperature. At C reactor approximately 500 tubes of normal uranium I & E have been discharged to date at a goal exposure of 800 MWD/T without rupture.

Approximately 1000 tubes of I & E are loaded in the KW reactor and approximately 100 tubes of I & E in KE. Four tubes of I & E fuel elements have achieved an exposure of 630 MWD/T in D reactor. Pilot loading of D reactor with I & E is scheduled to begin in May.

Six inch enriched I & E C size pieces were canned in components having a 38 mil wall (vs. normal 45) and the AlSi gap was reduced from 14 to 8 mils. A 65% yield to autoclave was obtained and the pieces had average residual wall thicknesses of 26 to 29 mils. Based on the results to date, it is not expected that any difficulty will be encountered in obtaining good yields using thin wall (38 mil) components.

The I & E yield in January was 64.7%, an improvement of 11% over December. High yield any one day was 75%.

A prototype automatic quench machine for I & E has been operating about two weeks on production material. Canning rejects from cocked caps have been reduced about 25% over the rejects encountered using the manual quench machine.

M-388 and Blunt Nose Tru-Line Program

Four ruptures have occurred in fuel elements jacketed in M-388 alloy. The first rupture has been examined and shows evidence of operation at extremely high temperatures. Beta phase operation was indicated and U-Al diffusion took place. The second rupture was classified as a cap failure and the last two ruptures were classified as side hot spots. Two of the failed fuel elements are in Radiometallurgy awaiting examination to determine if intergranular corrosion took place. One of the M-388 failures was in a tru-line can. Approximately 683 tubes of M-388 standard and 1400 tubes of M-388 blunt nose tru-line solid and cored pieces are undergoing irradiation. In addition, approximately one-half of the I & E fuel elements being shipped to the reactors are clad in M-388 jackets. Full utilization of M-388 as a jacket material will depend upon the results of a reactor test being charged this month to determine the conditions under which a groove type pitting has been observed to occur on M-388 jackets under high flow, high temperature operation, and upon the results of Radiometallurgy examination of failed M-388 jacketed fuel elements to determine if the side hot spot failures were due to intergranular attack.

Light grey streaks which appear on the normally dark grey autoclave film of up to 90% of the M-388 jackets have been found to indicate non-uniform dispersion of Ni in the aluminum. These streaks vary in depth up to 6 mils, may extend the length of the can and are from 1/8 to 1/2 inches in width. Investigation of the cause of this Ni segregation and its possible relationship to groove pitting in the reactors is in progress.

Dingot Program

Limited quantities of low hydrogen dingot material were received during January. To date approximately 360 out of 447 tubes of low hydrogen dingot material have been discharged at an exposure of 500 MWD/T. Current exposure of the run-to-rupture test of 20 tubes is 80 MWD/T.

E-N Program

Components and cores (both solid and I & E) are being requested as part of the initial test program to evaluate E-N loadings. Final procurement of E-N material depends on approval of the program by the AEC. In the meantime studies are continuing to define the requirements of a production facility should FPD become

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involved in large scale fabrication of E and N pieces. A report describing the Oak Ridge and Savannah River facilities and processes for producing N material will be issued shortly. It has been determined that SRP cannot readily process lead dip canned N pieces.

Electron Beam Welding

Approval is expected at any time from the AEC to proceed on an assistance to Hanford contract with G.E. X-Ray to develop electron beam welding. In the meantime, basic vacuum and high voltage equipment is being procured to carry out development at Hanford.

Sylvania-Corning Hot Press Program

Approximately 1500 hot press C size I & E fuel elements prepared by Sylvania-Corning Nuclear Corp. are undergoing out-of-reactor evaluation. Significant findings to date are:

1. No apparent can or spire wall thinning was observed.
2. No uranium-aluminum diffusion was found on the cylindrical surfaces of the core but a few small areas were found on the ends where there was incomplete nickel coverage.
3. Large aluminum grains were found in the cap and spire wall near the core base and cap end. This is probably due to excessive cold work during the processing operation followed by grain growth after the aluminum reaches operating temperature.
4. Normal fuel element welding methods do not give satisfactory welds. The nickel between the can and cap-spire forms a high melting intermetallic compound which is not easily mixed.
5. The pieces as received have a heavy smut on the surface, which must be removed by acid etch before facing and welding.

Examination and out-of-reactor testing is continuing.

Process Technology

All of the production I & E base welds and over half of the solid and I & E cap welds were made on the high speed (9 sec.) weld cycle. Essentially all of the production equipment has been converted to this weld cycle. Weld quality and yield were satisfactory.

Modification of the bronze work carriers (by facing with plastic) for the second sleeve and the cap and can machine was completed.

Operation of the Automatic welder on 8" solid and 6 and 8" I & E fuel elements has been satisfactory. Design of the mechanical portion is essentially complete. Also design of a weld buffer for the Automatic welders is complete.

A prototype automatic loader for the etch machine has operated satisfactorily on the production line.

MATERIALS ENGINEERINGDingot Uranium - Canning Evaluation of Varying Hydrogen Analyses

Approximately 4100 solid dingot fuel element cores, containing hydrogen in amounts ranging from 2.0 to 5.3 ppm, were canned in January in the 306 Semi-Works, to determine the effect of the various hydrogen analyses and two different heat treating media on the resulting AlSi braze layer porosity. Twenty-six dingots were forged at MCW and finish rolled at Fernald for this test. Alternate rods from each dingot product were heat treated at the two respective sites. NLO (Fernald) used the lithium-potassium carbonate salt; MCW used Nu-Sal, a fifty-fifty mixture of potassium and sodium chlorides. The cores from each rod were canned in a predetermined sequence as separate lots at Hanford.

Finishing and testing of the canned pieces was done in 313 Building production facility and all of the test pieces were bond tested on the same instrument. Controlled pieces of typical ingot production in four groups of about fifty per group were canned and tested prior to, during, and after canning of the test pieces.

Considerable brittle bonding was experienced during the canning of this test material, and hence the rejection level for bond and radiograph defects was considerably higher than those due to actual porosity. Autoradiographs are being obtained on each bond test reject and these should permit distinction between rejects for actual voids present and for brittle bonding. At the present time no conclusions can be drawn as to the relationship between original dingot hydrogen analysis and porosity rejection for this material. One conclusion, however, is rather definitely indicated: Braze layer porosity on fuel elements heat treated in Nu-Sal, the chloride salt, are definitely less than those encountered with uranium heat treated in the lithium-potassium carbonate salt.

Precision Cast Uranium Washers

Three sample "C" reactor size washers, precision cast by the American Bearing Company, have been received at HAPO. One of these represented the latest techniques developed and is therefore of immediate interest. This piece showed a good dimensional control and generally satisfactory surface characteristics, although a light surface grinding on the washer faces might be necessary before it would be classed as "acceptable". This washer showed excellent density, 18.95, and is probably free of porosity, although this has not yet been determined metallographically.

American Bearing is now working with a mold design which permits casting of 48 washers simultaneously. Recent casts have shown as good quality as the best of the three washers received at Hanford, and the product of one of these casts should be received at HAPO early in February.

All of the above development work has been performed using the technique of pouring the uranium into a central riser with individual graphite molds surrounding the riser and molten uranium being fed to the mold through a small sprue.

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American Bearing is also experimenting with a strip mold. This is a multiple mold which is drawn underneath a standpipe of uranium with the mold cavities being filled in succession and wiped clean at the top. Development work looks encouraging in that this process might be utilized if it had a finish grinding operation afterwards on the washer faces. It is also planned to investigate this same principle using a motor-driven rotary mold which would be a possible production type of mechanism.

Extrusion Cladding of Fuel Elements

The fuel elements clad on the General Cable Corporation press in December have been subjected to destructive tests and preliminary metallographic examination to evaluate the bonding between the jacket and the uranium core and the jacket and aluminum spacers separating the cores. Conforming preliminary tests performed at the General Cable plant, peel tests revealed that a metallurgical bond between the aluminum jacket and the uranium core was not achieved. At core preheat temperatures of above 400 C some spotty diffusion of the nickel plating into the aluminum did occur, but this was not a general condition. Peel tests and stud pulling tests have indicated that metallurgical bonding was achieved between the aluminum jacket and both the bare aluminum and nickel plated spacers used in the test work. However, present information does not warrant a firm correlation between these bond strengths and process conditions except that the temperatures were above 400 C and included extrusion speeds of up to 15 feet per minute.

Exploratory experiments were carried out to determine whether any jacket-core bonding could be achieved by post cladding heat treatment. These consisted of bake tests at atmospheric pressure and at 1000 psi. At temperatures of 250 C and 450 C with times of up to eight hours, there was no jacket to fuel core bonding developed. Neither was any bonding achieved at 450 C and 1000 psi, although there was some slight evidence of nickel aluminum bonding.

One of the rods clad during the test at General Cable stalled in the press and a solid aluminum bar was extruded behind one of the fuel elements. The metal flowed in tightly behind the fuel element and metallographic examination has shown it to be sound and of good quality. This suggests that integral end plugs might be formed in the process by controlled stalling of the fuel element during extrusion and thereby eliminating the need for aluminum spacers between the uranium pieces.

Pilot Plant Development Activities

Initial canning of new "C" size I & E fuel elements having a 40 mil "thinwall" can was undertaken in the pilot plant to develop a satisfactory process and to provide a small quantity of fuel elements for test charging in "C" reactor. The main process variations introduced were those which would conserve residual can wall thickness, such as bath temperature and canning cycle. Approximately 1000 pieces were canned and a final yield of about 30% was obtained. Highest yield in any one lot (450 pieces) was about 50% to autoclave. The highest reject category was external penetration based on a 20 mil standard. The canning of an additional 2000 pieces will begin in February for further process development and to provide additional fuel elements for charging.

About 4100 solid dingot fuel elements were canned to determine the effect of different fabrication and heat treatment processes on residual metal hydrogen content as measured by braze porosity in canned fuel elements. The purpose of this test was to provide information effecting economies in metal fabrication technology. The Pilot plant operated at a canning rate of about 900 pieces per day in completing this test. Although canned fuel elements were finished in 313 Building, it was demonstrated that the component preparation facilities were capable of maintaining a throughput capacity equal to the canning rate on a 45 second cycle.

Several other development tests were completed during the month. These involved the canning of eccentric internal-external core diameters and "C" size I & E in "O" cans to evaluate thin braze widths.

The bond and penetration tester has been approved by Quality Control as being reliable for the testing of production fuel elements. Previously, fuel elements passed as good by the external penetration test were retested in the 313 Building tester before acceptance as production material. Approval of this equipment as being equal to 313 test equipment will allow more dependable evaluation of data and will accelerate development work in the Pilot plant.

TESTING METHODS OPERATION

Fuel Element Testing

A series of tests were completed by Quality Control comparing the sensitivities and reproducibilities of the two I & E Bond-Penetration testing stations in the 313 Building and the one station in the Pilot plant. Good agreement was obtained and all three testers have been accepted for normal production testing.

Further study continued on the problem of testing fuel elements canned in thin-walled (38 to 40 mil) cans. It was anticipated that reduction of the residual can wall below 30 mils would make it difficult to test for AlSi penetrations at 20 mils without risking some false rejection of elements having acceptable can-wall thickness variations which extend over larger areas. Results to date from testing 6" enriched pieces (38 mil initial can wall) are encouraging. These indicate that the erosion of the can wall may be decreased and the sensitivity of the testers increased sufficiently to provide testing at 20 mil sensitivity without incurring a prohibitive "false" rejection rate. Further experiments are underway to confirm these results.

Seventy-six special fuel elements, etched to simulate the new thin wall "C" size, were tested for unbonds and 15 of these were then destructively examined. Good results were obtained, demonstrating that there will be no loss of bondtester sensitivity as a result of reducing the can wall thickness.

It was found that small untransformed surface areas in uranium cores can be detected better by using an angled transducer method similar to that used in Transformation testing hollow cores. A straight through ultrasonic transmission method is currently used for solid elements to insure detection of axial untransformed volumes. Studies are continuing to determine the equipment modifications required to improve the surface sensitivity of the existing Transformation Testers.

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Project CG-713 - 313 Building I & E Conversion

Previous plans for providing Nondestructive Testers for Project CG-713 have been modified. Two new automatic mechanical systems are being built instead of five. The two prototypes now in use will continue to be used and a fifty station will be provided by modifying one of the existing solid testers. The latter will also provide increased I & E testing capacity prior to project completion. Orders have been placed with the Tech. Shops for the two new units at an estimated total cost of \$17,900.

Five new integrated and standardized electronic systems are being built as planned. Ordering of components and fabrication is proceeding on schedule.

NPR and Category II Development

Eight short lengths of zircaloy clad coextruded rods were received for testing late in the month. Preliminary bondtests indicate the bond to be uniform and free of voids.

Methods Development

Formal report HW-53632, "Plating Thickness Tester," C.E. Fitch, was issued. The instrument and operating instructions were completed and are ready for delivery to the plutonium metallurgy group of HLO.

A research study has been started on inductive thermometry fuel element testing. Previous analytical and experimental work showed that localized metal surface temperatures can be rapidly measured with eddy current techniques. This can be used to detect hot spots in the cladding which appear over poorly bonded regions when or after a fuel element is heated inductively. Both analytical and experimental studies are planned to define the sensitivity of this technique as an indicator of the heat transfer characteristics of fuel elements.

Laboratory development is continuing on the refinement of the prototype Ultrasonic Attenuation Tester and the prototype Ultrasonic Surface Tester. The new mechanical scanner assembly for these tests is about 50% complete.

Hanford Test Reactor

Metal testing continued routinely. The Operating Specifications were completed, approved, and are being duplicated for issuance as HW-54563.

The gamma-ray spectrometer for foil counting has been completed and set up in the 326 laboratory. An inventory of foils for special experiments is being accumulated.

Development of the sub-critical neutron flux monitor is proceeding satisfactorily. Preliminary tests were made using the HLO Standard (Sigma) Pile as a neutron source, and a few tests have been completed in the 305 reactor. The parts for the permanent fission chamber are being fabricated and the U-235 sleeve for the chamber is on order.

RESEARCH AND PROJECTS

Status of Projects

CG-713 - Conversion to I & E Lead-Dip Fuel Elements: Design is essentially complete. Work orders have been written for assembly of the Electronic Components, Lathe, Bond and Penetration Testers and for fabrication of two new Bond and Penetration Tester Tanks. Conversion of Semi-Automatic Welders to 9-second cycle is complete. All critical procurement items will be on order by 2-15-58. The square wave transformer has been delivered and is undergoing tests.

CG-737 - Electric-Pneumatic Control System - 313 Building: All canning lines have been converted to electric-pneumatic timing and the old poppet system removed and excessed. Field work was completed January 20, 1958. Project directive date is April 1, 1958. It is anticipated that project costs will underrun authorized funds significantly.

CG-759 - Additional Steam Generating Facility - 300 Area: AEC Directive No. HW-448, dated January 21, 1958, authorizes project management by General Electric Company. Advance authorization of \$8,000 was granted to prepare scope for a design-construct contract. Preliminary rough draft for management review is nearly complete.

IR-228 - 300 Area Evacuation Warning System: A Physical Completion Notice has been issued with one minor exception. Project was completed on time and with an indicated underrun of \$500.

CA-774 - 300 Area Sanitary Water System Modification: Criteria were completed and transmitted to AEC January 15, 1958. Gray & Osborn, Architect-Engineers of Yakima, will perform detail design. It is anticipated that this portion of the project will start about February 17, 1958, and be completed in approximately two months.

CG-787 - Sprinkler System - 313 Building Addition: Project proposal was transmitted to AEC January 10, 1958. It is on the agenda of the February 6, 1958 meeting of the AEC Review Board. Estimated project cost is \$49,000.

Research and Development

Irradiation Testing - Status of KER Test Facilities

Loop 1

Conversion from organic to water coolant on schedule. Facility to be ready for test material about March 15, 1958. Shakedown runs with dummy fuel elements are now in progress.

Loop 2

The dip-canned M-388 clad washer I & E fuel elements operating at 325 C outlet temperature discharged on 1-30-58 due to failure of the dump valve on the rear face. Exposure was about 400 MWD/T. No visual examination has been made to date.

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Loop 3

The dump valve on this loop failed 1-14-58. The 4-rod stainless steel clad cluster charge was left in the tube and is being cooled with process water at 100 C outlet. Exposure as of 2-1-58 was about 850 MWD/T.

Loop 4

The dip-canned M-388 clad washer I & E fuel elements operating at 235 C outlet temperature were discharged on 1-22-58, after two week irradiation. On 1-14-58, the dump valve was taken out of service and the charge was operated with process water at 100 C outlet until discharge. The exposure was about 130 MWD/T. No corrosion data obtained because of the process water operation. No defects were observed on the surface which could be attributed to the wafered core.

Dump valve parts are on order and will be shipped from the vendor on 2-15-58. Loops 2, 3 and 4 will be out of service until these parts are received and can be installed, probably about 3-1-58.

Cladding

Fifteen 3" samples from the co-extruded rod received from NMI have been assembled and autoclaved using the same procedure intended for the KER test pieces. No corrosion occurred during a 240 hour autoclave in 360 C water. Dynamic, Elmo 7, corrosion tests are being run on 4-rod clusters assembled from these short test pieces. Fabrication of the remaining rod into 4-rod clusters is in progress.

Corrosion coupons out from Hunter-Douglas high temperature alloy components are being tested in Elmo 6 at 300 C. All four alloys showed slight pitting at 140 hours. Canned fuel elements run in Elmo 7 at 315 C show only slight uniform corrosion after about 500 hours. The difference in performance may be due to differences in flow. The flow in Elmo 7 (5 FPS) was much lower than in Elmo 6 (20 FPS). The flow rate in Elmo 7 has been increased to 20 FPS and the test is being continued, but no data is available for the high flow condition. Alloys A2 and C2 show only slight, uniform corrosion after 438 hours in 360 C autoclave using deionized water. A1 and C1 failed at 46 hours in the same autoclave test.

Alcoa has agreed to cooperate with HLO in a study to determine the effect of metallurgical history on the corrosion resistance of aluminum alloys. Alloys A1 and A3 will be used to check the effect of melt cooling rates, heat treatment and cold working. Corrosion testing will be done at HAPO and at Alcoa.

Fuels Fabrication Development Operation is having difficulty with the hot-press canning process. All elements canned appear to have an oxide coating between the uranium and the nickel plate. Development work is continuing.

Rupture Testing (HW-54686, Reference)

Two simulated ruptures were performed with hot-press-canned, KER washer elements at 240 C and 280 C in Elmo 4. The elements did not damage the tube or completely plug the flow passage. The conclusion was that longitudinal growth of the pieces will prevent reactor damage in event of a rupture. In KER loops, a 1/6 flow reduction might result from a complete rupture.

Restraint of Uranium

An experiment is being planned by HLO to determine the effects, if any, of restraint on uranium during irradiation. The restraining material will be zirconium, co-extruded with uranium, cladding thickness of 30, 20 and 0 mils. These will be tested at approximate core temperatures of 450 and 600 C, surface temperatures of 250 and 300 C, and to an approximate exposure of 1300 and 3000 MWD/T. The pieces with 0 thickness for cladding will serve as controls. The present work is directed towards a workable design of the capsule for containing the above experiments.

The MIR experiment to determine the effect of restraint on uranium growth was again delayed. Charging is expected to take place during March.

Lost Punch (HA-58-88-1828)

The contract (HA-58-88-1828) for tool development by Verson Allsteel Company has been signed and forwarded to Verson by the AEC. Contract cost - \$17,875.

Cable Cladding

No work was done on this project during the past month. Schloemann's and Feller's proposal for R & D work has not been received.

NPR Fuel Element Study

HW-54861 summarizing the capital and the operating costs for facilities to produce fuel elements for the NPR was completed. The document will be issued formally in the first week of February, 1958.

DRAFTING AND FILES

Major Jobs in Drafting

306 Building:	Basket cover for Agitator I & E Tester Radiographic Inspection Trays
313 Building:	Several new & revised component drawings Fully automatic welder (large set of drawings) Conveyor layout Welding and 4th Lathe Power and lighting Automatic Fuel Element Switch

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384 Building: Railroad access map - 300 Area

Miscellaneous: Railroad access map - 284 Building
Plutonium plant - 4 drawings
Proposed 16" water line to 300 Area
3706 Building modification
Segmental Recorder modifications

Drawings Produced:

New	65
Revised	119
Large Charts	25
Small Charts	23
Miscellaneous	9

ADVANCED ENGINEERING

Predicted Aluminum Component Costs

Components account for approximately 90% of direct material costs at the present and as such represent a major portion of our shop costs for the lead dip process. In order that more accurate estimation of the potential of alternate processes can be made it is necessary to anticipate the probable component cost for the lead dip process when the new processes would be placed in use. The following costs are predicted for various component sets.

<u>Components</u>	<u>Present Cost per set</u>	<u>1963 Cost(present dollar) per set</u>
I & E Cap and Can M-388 Alloy	\$ 1.71	\$ 1.06
Solid Cap and Can M-388 Alloy	0.67	0.43
Solid Cap and Can 1245 Alloy	0.53	0.41

In order to achieve these reductions, continued effort is necessary in the fields of price negotiation and material development.

Cost Comparison of Various Jacketing Processes

Comparison of direct labor and direct material costs for lead dip, HAPO hot press, point closure and cable cladding processes applied to the production of 8" solid fuel elements jacketed in aluminum alloy 1245 has been made. These costs vary almost directly as the cost of the aluminum stock used for jacket fabrication plus \$25 per ton of canned fuel elements (100% yield) for other material. The reason cable cladding costs are lower is because formed aluminum components (caps, rods, cups, etc.) are used in the other processes.

<u>Process</u>	<u>Aluminum Cost per ton of 8" solid canned</u>	<u>Other Material per ton of 8" solid canned</u>	<u>Total Material per ton of 8" solid canned</u>
Lead Dip or HAPO Hot Press	\$ 131	\$ 25	\$ 156
Point Closure			
Starting with cup	126	25	151
Starting with rod	43	25	68
Lost Punch	48	25	73
Cable Cladding	27	25	52

It has been estimated that the labor for all processes other than lead dip and hot press will be between \$37.50 and \$50.40 per ton canned. It has further been estimated that expenditures for automation of the lead dip process can bring direct labor costs into the same range.

It is perhaps not commonly recognized that the aluminum industry pricing schedules clearly define these costs. The following example is typical for the industries.

<u>Form</u>	<u>Cost \$/pound of Aluminum</u>
Billet	0.30
Rod	0.55
Thin Wall Tubing	1.00
Shaped discs (caps, thick cups, etc.)	1.20 - 1.65
Thin wall cans	1.90

Gas Cooled Reactor Fuels

Contributions to the HAPO gas cooled reactor study were made and may be found in the reports of the Process Design Operation of the Irradiation Processing Department.

Cable Cladding and Lead Dip Cost Comparison

A detailed analysis of direct costs for cable cladding and lead dip has been made to reconcile previous studies. Cable cladding would have a payout time varying linearly from 0.8 years for a product mix of I & E solid of 4:1 to 2.1 years with complete solid production. The comparison used material and labor costs projected to 1960, the earliest that cable cladding might be expected to be used on a production basis.

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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 January, 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

F.H. Reinker

Manager - Engineering

PH Reinker:mbs

FINANCIAL OPERATION

JANUARY, 1958

AUDITS AND PROCEDURES

Auditing - Internal auditing activities this month consisted primarily of initiating a complete study of the various responsibilities for control of essential materials, providing several items of information requested by auditors of other departments, and assisting in final disposition of findings and recommendations developed in earlier audits.

The fiscal year 1958 audit schedule will be reviewed, and if necessary, revised in consideration of the audit to be made by the Company Traveling Auditors.

Office Procedures - Assistance was rendered in guiding the work simplification training program started this month. A number of promising projects in the area of office work improvement are being initiated by participants in the two training sessions.

Preliminary investigation of the new IBM 8200 Time Punch has indicated that additional study of possible applications in FPD is justified. In addition to recording attendance, the time clock is also designed to completely punch cards. Distribution of Operating and Maintenance Employees' time may be affected through this means.

Two profitable meetings were held with Office Procedures Specialists of other departments to discuss progress in areas of mutual interest and to explore advantages of possible plant-wide systems and procedures changes.

Forms Control - Review of 33 forms was made this month. New forms of particular interest are:

1. Daily Work Distribution - An IBM card implementing a system developed by Manufacturing Maintenance for recording both employee time distribution and preventive maintenance data.
2. Suggestion Statistics - A monthly report form to consolidate all previous monthly suggestion reports and to facilitate wider distribution of information to interested managers.
3. Tank Farm Daily Report - An improved form for recording material consumption and activities of the Tank Farm.

GENERAL ACCOUNTING OPERATION

AEC approval was requested for a feasibility study on a focused electron beam welding process. Proposed work falls within the provisions of Approval Letter No. 119, "Consulting Work or Other Special Services to be performed by Other

GENERAL ACCOUNTING OPERATION (Continued)

General Electric Company Components as Assistance to Hanford," which authorizes \$35,000 for FY 1958. Since estimated cost of \$15,000 exceeds the \$5,000 limitation established for individual requests, AEC approval is required. General Electric X-Ray Department is designated to perform the work. Other commitments against the FY 1958 allocation of \$35,000 total \$5,400 covering a \$5,000 authorization to Research Laboratory for metallurgy consultation, and a \$400 authorization to General Engineering Laboratory for magnetic permeability and resistivity measurements.

The 10% accrual to operating cost through continuity of service accounts for calendar year 1957 totaled \$477,991. The best information available at this time indicates an over-accrual of \$64,129. Following is a breakdown of amounts accrued as well as estimates for actual costs of each item comprising the overall accrual.

	<u>Accrued</u>		<u>Estimated</u>	<u>Estimated</u>
	<u>Rate</u>	<u>Amount</u>	<u>Actual</u>	<u>Over (Under)</u>
Insurance Plan	1.8	\$ 86 037	\$ 61 831	\$24 206
Pension Plan	4.8	229 432	203 448	25 984
Stock Bonus Plan	.5	23 898	22 093	1 805
F.I.C.A. Taxes	1.5	71 703	72 857	(1 154)
Federal Unemployment Tax	.2	9 562	7 055	2 507
State Unemployment Tax	1.0	47 798	46 327	1 471
Workman's Compensation	.2	9 561	251	9 310
	<u>10.0</u>	<u>\$477 991</u>	<u>\$413 862</u>	<u>\$64 129</u>

The calendar year 1957 over-accrual will be restored to costs, or used to provide needed reserves, in the fiscal year 1958 closing. The aggregate rate of 10% was continued for calendar year 1958 by all HAPO Departments.

Effective January 1, 1958, a new travel ledger sheet was installed. The new ledger sheet lends itself readily toward accumulation of data for development of statistics on any item of expense incurred. This is accomplished simultaneously with the record of advances made and settlements thereof.

January travel activity was unusually light. Amount reimbursed by the AEC totaled \$2,047 compared with \$7,672 for December, a decrease of \$5,625. A total of 31 days were spent in travel status. January activity compared with December is summarized below:

	<u>January</u>	<u>December</u>	<u>Increase or</u> <u>(Decrease)</u> <u>Over December</u>
Travel advances to employees:			
Balance at beginning of month	\$2 022	\$ 5 353	\$(3 331)
Current month charges	<u>6 198</u>	<u>7 466</u>	<u>(1 268)</u>
	<u>8 220</u>	<u>12 819</u>	<u>(4 599)</u>

GENERAL ACCOUNTING OPERATION (Continued)

	<u>January</u>	<u>December</u>	<u>Increase or (Decrease) Over December</u>
Less:			
Expenses accounted for	\$2 045	\$ 8 919	\$(6 874)
Advances refunded	<u>1 507</u>	<u>1 878</u>	<u>(371)</u>
	<u>3 552</u>	<u>10 797</u>	<u>(7 245)</u>
Balance at end of month	<u>\$4 668</u>	<u>\$ 2 022</u>	<u>\$ 2 646</u>
Outstanding travel advances:			
Current	\$4 668	\$ 2 022	\$ 2 646
Outstanding over 15 days	<u>-0-</u>	<u>-0-</u>	<u>-0-</u>
	<u>\$4 668</u>	<u>\$ 2 022</u>	<u>\$ 2 646</u>
Number of expense reports submitted	7	31	(24)
Number of cash advances	14	16	(2)

Inventory of uninstalled equipment began January 13, 1958 and was completed on February 3 as scheduled. Preliminary results indicate 5 items are missing. All five are portable instruments with an aggregate value of \$1,123. Items inventoried totaled 1,221 with a valuation of \$727,778. Final and complete results will not be available until inventory reconciliation is completed. Results of the inventory are scheduled for publication on or before March 15, 1958.

Composite depreciation rates were reviewed in January. Few changes from rates in effect were deemed necessary; those necessary arose from adjustments in item composition of individual accounts. The most significant change was in Process Equipment where, based on December 31, 1957 first cost, a reduction of 3/4 of 1% in the composite rate reduces annual depreciation \$27,529. Total depreciation for calendar year 1957 was \$638,268. Shown below is a summary of net changes and total effect on annual depreciation costs.

	<u>First Cost 12-31-57</u>	<u>Old Rate</u>	<u>New Rate</u>	<u>Annual Depreciation Increase/(Decrease)</u>
Process Equipment	\$3 670 534	6.50%	5.75%	\$(27 529)
Electrical Equipment	178 053	3.50%	3.25%	(445)
Shop Equipment - Mfg.	28 672	6.50%	6.25%	(71)
Laboratory Equipment - Mfg.	166 175	7.25%	8.00%	1 247
Miscellaneous Equipment - Mfg.	24 399	7.25%	7.75%	123
Protection Equipment	7 203	9.25%	19.25%	720
Laboratory Equipment - General	6 038	7.00%	8.00%	61
Miscellaneous Equipment - General	40 691	6.00%	5.75%	(102)
Shop Equipment - Research	1 298	6.50%	7.50%	13
Laboratory Equipment - Research	139 717	7.50%	8.00%	699
Miscellaneous Equipment - Research	<u>8 336</u>	<u>6.25%</u>	<u>5.75%</u>	<u>(42)</u>
	<u>\$4 271 116</u>			<u>\$(25 326)</u>

GENERAL ACCOUNTING OPERATION (Continued)

A review to determine the adequacy of depreciation reserves for each plant account is underway and will be completed in February.

Information in regard to FPD budget requirements was forwarded to the various Relations and Utilities Operations responsible for submission of the FY 1959 Revised Budgets and FY 1960 Budgets for Office Equipment, Radio and Audio Visual Equipment, Automotive and Heavy Mobile Equipment, and Photographic Equipment.

The revised FY 1959 budget and FY 1960 Budget for Equipment is due March 14, 1958. Operating components were requested to submit Equipment requests to General Accounting on or before February 28, 1958.

Design and Projects Operation was contacted relative to completing information for the Plant Acquisition and Construction Budget for FY 1960 and Review of Budget for FY 1959. This budget is due to Contract Accounting on or before March 17, 1958.

As a result of the review of equipment requirements occasioned by the quarterly expenditure pattern submission for January, \$37,000 of the \$502,000 allocated for Equipment Not Included In Construction Projects was found to be in excess of FPD requirements and funds were released to Contract Accounting for use elsewhere at HAPO. In addition, a transfer of \$20,872 was made from Manufacturing Operation equipment allocation to the Engineering Operation.

Equipment commitment activity increased considerably during January. Three appropriation requests totaling \$24,700 were processed and approved. One request for \$5,250 is in process for approval and three requests totaling \$21,608 are under review.

The FY 1958 financial plan for Plant Acquisition and Construction was received. The status of Budget Items of direct concern to Fuels Preparation Department is as follows:

<u>Budget Item</u>	<u>Title</u>	<u>Funds Allotted</u>	<u>Bureau of the Budget Reserve</u>	<u>Mid-Year Review</u>	
				<u>AEC</u>	<u>G.E.</u>
58-b-4	Improvement to Production and Supporting Installa- tions	\$ 1 122 000	\$1 878 000	\$6 250 000	\$6 200 000
58-L	General Plant Projects- FY 1959	2 500 000		2 500 000	2 500 000
5013	Alterations & Additions to the 100, 200, & 300 Areas	10 000 000		9 900 000	9 850 000

GENERAL ACCOUNTING OPERATION (Continued)

Project CG-713, Conversion to I & E Lead Dip Fuel Elements, was funded under Budget Item 5013, Alteration and Additions to the 100, 200, and 300 Areas. Of the \$10,000,000 allotted for this Budget Item \$9,900,000 is needed to meet existing requirements. This leaves \$100,000 available for other work falling within the scope and definition of this Budget Item.

Prior to receipt of the FY 1958 financial plan for Plant Acquisition and Construction, AEC had requested the Bureau of the Budget to release necessary funds for financing Project CG-759, Increased Steam Capacity-300 Area. This project had been approved against Budget Item 58-b-4, Improvements to Production and Supporting Installations; however, it is not known locally whether funds allotted by the financial plan for this budget item are intended to cover CG-759 or whether funds for this project are still retained in the Bureau of the Budget Reserve. A request for clarification of this situation and permission to accomplish financing from allotted funds was forwarded to Washington AEC January 31, 1958.

Funds have been provided from the Budget Item - General Plant Projects FY 1957 and FY 1958 for all other construction projects currently active.

The OPG Review Council met twice during January. Numerous recommendations for improving the system are being summarized and will be presented to Management for approval in February.

The regular quarterly meeting of all HAPO OPG representatives was held in January. The achievement of the February 1 goal for merging the OPG and Advice systems was accomplished. Complete cooperation by those making the conversion was enjoyed.

AEC approval was received in January on Contract Modification No. 12 - Benefits for Employees Entering and Returning from the Armed Forces. Advice C 1.8.1 is being revised to include details of the modification.

An Approval Letter requesting a \$12 per diem allowance for travel and living expenses was submitted to the AEC by Contract Accounting in January. Another Approval Letter requesting approval of the proposed Suggestion Award budget for 1958 was prepared by Contract Accounting and will be submitted for approval in February.

MEASUREMENTS

Considerable time was spent during January developing plans, forecasts, and measurement criteria for CY 1958. A standard format is being used by each operation to provide a better method for integrating total department activities and the measurement program. Attention was directed towards individual discussions with level 3 managers in regard to the overall measurements program.

PERSONNEL ACCOUNTING OPERATION

The December 1957 Consumer Price Index of 121.6 represented an increase of 5.8% over the September 1955 Index. This resulted in an increase of .59% to the "adder" factor to nonexempt salaries, effective January 27, 1958. Total "adder" factor now equals 30.49% compared to the September 1955 figure of 18.0% and is comprised of two 3% general increases (October 1, 1956 and October 1, 1957) and 6.49% cost-of-living.

All monthly, quarterly, and annual reports and returns relative to earnings, taxes and Employee Benefit plans were prepared and submitted on or before established due dates. This was accomplished in spite of unexpected difficulties encountered. Responsibility and cause of discrepancies have been determined and action taken to prevent recurrence.

Arrangements were completed for recording absences for exempt salaried employees on the basis of one-half days rather than full days. This change conforms with general Company practice.

Six additional employees authorized mailing salary checks to out-of-town banks making a total of sixteen nonexempt and five exempt employees utilizing this recently inaugurated service.

During calendar year 1957, FPD employees participating in the Pension Plan, Savings and Stock Bonus Plans, and Group Insurance Plan authorized deductions totaling \$410,987 from their salaries. Of this total, \$89,158 was for contributions to the Pension Plan, \$99,133 was for insurance premiums, and \$222,696 was for purchase of U. S. Savings Bonds. Benefits derived from the Pension Plan and Savings and Stock Bonus Plan are more or less pre-determined; however, it is interesting to note that the total amount paid to FPD employees as benefits under the Group Insurance Plan exceeded premiums paid by the employees by approximately \$66,000.

PRODUCT COST OPERATION

Revisions to existing procedures were issued to all concerned on the following subjects:

1. Coding operating labor
2. Loaned labor and premium time
3. 306 Facility Cost coding and distribution
4. Use of Engineering end-function codes
5. Account Class codes for coding.

PRODUCT COST OPERATION (Continued)

Essential Material liquidation unit prices for the third quarter FY 1958 were computed and distributed during the month. In conjunction with establishing liquidation prices, unit prices for the FY 1959 Revised Budget and 1960 Annual Budget were also computed.

The following captions were added to the list of material captions in the interest of future cost allocations:

009	Aluminum Cans I & E Long	K-1
014	Aluminum Cans I & E Short	M-1
052	Aluminum Caps I & E Long	K-1
054	Aluminum Caps I & E Short	M-1
867	Steel Sleeves	Short M

A review of records controlling quantities of material in the 313 Building was made to simplify procedures. A trial form was designed and submitted to interested parties for comment.

Notice of an increase of 2% in freight rates tentatively effective February 15, 1958, was received during the month from the railroads. Postponement of the effective date of this increase and/or a suspension of the increase by the Interstate Commerce Commission is a distinct possibility. Based on calendar year 1957 freight charges, estimated increase is \$3,600 for Essential Materials.

Approval to charge Costs-Prior Months' for \$267,066 salvage processing charges on June, 1956 shipments of Doe and Ray fuel elements was received from the AEC.

A meeting was held to discuss a proposed change in the method of reporting SS Material receipts. The change will be effected, pending design of required form.

Effective with January, 1958 reporting, separate cost data will be accumulated for Solid and I & E Enriched fuel elements. Since the current production forecast does not include Cored and Depleted fuel elements, these products will be omitted from future production cost reports.

Beginning with the January report, operating labor will be distributed to products on the basis of input pieces at Canning. Recent studies indicated no appreciable variance in labor distribution from using the new method, whereas clerical effort was greatly reduced.

Conversion, depreciation, and feed material unit cost data were furnished the Department General Manager for the E. J. Bloch information meeting.

The productivity report for CY 1957 was revised to reflect November and December actual costs and production. In addition, the report format was simplified. Future reporting will be confined to the development of productivity indices for fuel element production.

PRODUCT COST OPERATION (Continued)

A report comparing productivity results for CY 1957 and anticipated performance for CY 1958 will be issued early in February. Productivity reports will be issued quarterly during CY 1958.

Instructions for preparation of FY 1959 revised budget and FY 1960 annual budget were received from Contract Accounting on January 16, 1958. Forms for forecasting personnel and overtime hours were designed and submitted to budget representatives on January 22 with a request that completed forms be returned by February 7 in order to meet the February 14 due date to Contract Accounting. On February 3, forms covering costs other than salaries were distributed to budget representatives with first six months actual costs for FY 1958 detailed by source and function to aid in forecasting subsequent periods. In order to meet due dates on remaining budget schedules, forms to be used internally were prepared and average salary rates through FY 1960 were calculated.

Manager - Finance

WS Roe:mls

MAINTENANCE AND POWER OPERATION

JANUARY 1958

GENERAL

Productive Maintenance Program

Outstanding orders as of 12/31	156
Orders issued in January	90
Orders completed in January	74
Outstanding orders as of 1/31	172

There were four cost reductions submitted during the month. Total annual savings achieved were \$2,534. This amount represents 11 per cent of the Quarterly Budget.

A study was completed on the replacement of the 20" Monarch lathe in the 3713 Shop with a new lathe. The present equipment is in poor condition, necessitating excessive operator time for the performance of work.

Functional-Structural charts for Level 3 and 4 Managers in the Operation were revised. These revisions will be incorporated in the charts when they are reissued by Salary Administration.

The responsibility for maintaining and issuing the Overtime Hours Paid List for all maintenance craft personnel in the 300 Area was transferred to the Personnel Accounting Operation.

The Third Maintenance Management Meeting has been scheduled for February 24, 1958. The topic for this meeting is Craft Training. Messrs. Amacker, Carlberg, Clement Leach and Lee have been scheduled to speak.

A meeting was held with personnel associated with the Plutonium Research Test Reactor (PRTR) and the Plutonium Fabrication Pilot Plant (PFPP) projects to determine their personnel requirements when these projects are completed. Personnel forecasts for FY-1960 were developed from the information obtained in this meeting.

The revised traffic flow pattern for the 300 Area parking lot went into effect January 20, 1958. The new pattern is the result of a study made to increase the safety for both drivers and pedestrians using the lots. Considerable publicity was given to the change. As a result, the new system went into effect with no difficulty.

Rain gutters were installed on the 3703 Building.

AREA MAINTENANCE

Duplicating

<u>Process</u>	<u>No. of Orders Processed</u>	<u>No. of Copies Made</u>
Multilith	661	426 515
Verifax	64	1 451
Ozalid	<u>58</u>	<u>1 936</u>
Total	783	429 902

There were 12 Formal Reports completed, consisting of 4,831 copies and 143,881 pages.

General Maintenance

The ventilation duct of No. 1 penetration etch machine in the 313 Building was replaced. The original duct was fabricated of galvanized iron and had been eaten through. The replacement duct is of stainless steel.

An 800 gallon nitric acid storage tank was installed on the roof of the 321 Building. Due to the weight of the tank when filled (10,000 lbs) it was placed over a building column to ensure adequate support. Approximately 120 ft of 1" pipe was replaced in the 325 Building. This pipe was in the condensate line of the No. 2 air conditioner. Excessive corrosion in the line necessitated the replacement.

INSTRUMENT AND ELECTRICAL MAINTENANCE

The Portable Shop repaired 971 portable radiation detection instruments. Average time per instrument was 1.31 man-hours.

A new procedure for the calibration of thermocouples in the 313 Building has reduced the number of calibrations required by 60 per cent. The new procedure provides the field with a spare standardized calibration standard. By referencing their "in use" calibration box to the spare box, it can be determined when re-calibration is necessary. Increased accuracy, in addition to economic savings, are the benefits derived from this method.

The air conditioning system in the 713 Building was repaired. Electro-Dispositioning equipment in the Bio-Assay Lab in the 700 Area was adjusted.

A 4 pt temperature controller recorder was installed on the dissolver tower in the 321 Building. In addition, a 20" manometer was installed.

Unused conduit in A-Cell in the canyon, 321 Building, was removed to improve the housekeeping in this area.

A Controlled Potential Coulometer was fabricated for use in the 325 Building. It is a precision instrument developed for use in the potentiometric titration of plutonium. Instrumentation consisted of three amplifiers (Cathode, Anode and Integrater), Power Supply and Brown Recorder. The over-all accuracy of this system

is better than 1/10 of 1%. By the use of this equipment, one microgram of plutonium, in solution, can be measured.

The Analog Computer in the 326 Building was given a routine overhaul. This was the first overhaul since it was placed in service approximately one year ago. Tube replacement rate, about 40 per cent, is considered normal for this type of equipment.

The G.E. X-ray diffraction spectrograph in the 327 Building was converted from the Geiger Mueller type to scintillation type. The use of scintillation permits the discrimination between unwanted gamma radiation and deflected X-rays. This discriminating ability permits the analysis of high radioactive samples without resorting to extensive shielding.

The installation of electrical baseboard heating units in the 3706 Building was completed.

POWER

<u>Statistics</u>	<u>January</u>	<u>December</u>
Average Steam Generated (M lbs/hr)	61.6	60.2
Maximum Steam Generated (M lbs/hr)	83.0	79.0
Total Steam Generated (M lbs)	45 842	44 156
Coal Consumed (Tons)	3 074	2 949
Evaporation Rate (Steam/#Coal)	7.46	7.49
Efficiency - Actual	59.8	---
" - Theory	67.5	---
No. Boilers on	4 3 4 3 2 3 2	
Date of Change	8 10 21 22 25 27 28	
Sanitary Water from 3000 Area (Million Gallons)	63.5	66.1
Total Water from 3000 Area, Average Rate (GPM)	1 422	1 480
Soft Water from #3 and #4 Wells (Million Gallons)	11.9	11.8
Water from #2 Well (M Gallons)	.30	.30
Peak Water Consumption for 24 Hours (Million Gallons)	2.3	2.5

Operation of the power house was normal. No major operating problems arose, and continued mild weather permitted several of the boilers to remain idle.

All steam generating units were available for service during the month, with no excessive maintenance being required at any time.

Relief operator assignments have been modified to achieve improved utilization of their time. One operator will provide shift relief coverage in the Lab Area and power house, the second relief operator will provide vacation, sickness, emergency and training relief.

Annual savings of \$3,000 through the reduction in overtime formerly required is anticipated.

PLANT ENGINEERING

There were 32 training classes held for craft personnel of HLO and FPD. This represents 372 man-hours of craft training.

A Janitorial Training Program was initiated. A vendor's representative was the principal speaker at the first meeting. Conferees were provided manuals on standard cleaning methods and on the products used in their cleaning activities. Future meetings were scheduled for small groups to ensure adequate training and sanitation techniques.

A special training program was initiated for Instrument Technicians and Instrument Trainees. This program will cover the non-destructive test equipment in the 303 Area. This program is covering personnel of the Manufacturing Maintenance Operation and the Instrument and Electrical Maintenance Operation to help solve the problem of equal distribution of overtime in the 300 Area. It is also expected that this program will familiarize all instrument personnel in the maintenance of this type of equipment and will permit the use of personnel not assigned in the 313 Building.

Final AEC approval for the Steam Plant Expansion was received and design scope moneys directed to Project Engineering. The release of funds by the Bureau of the Budget is pending. Washington AEC has requested that a review of the possibilities of using electrical heat for new facilities be investigated. Due to the general condition of the Northwest electrical power supply, this is not considered a serious competitor to the project as written.

The addition to the 3707-A Building was completed and personnel are now occupying the new facility.

A test was run on the emergency generator in the 384 Building to determine the maximum output capacity of the unit. Apparent generator capacity is 1020 K.V.A. However, turbine capacity is 920 K.W. At loads above 830 K.W., erratic noise is emitted from the turbine. The cause and seriousness of this noise is uncertain. It will be observed and studied during routine weekly tests.

FIRE PROTECTION

<u>Fire Responses</u>		<u>Loss</u>
H.A.P.O.	- 5	---
Construction	- 0	---
Private	- 0	---
Outer Area	- 0	---

There were no significant fires.

REPORTS OF INVENTION

Swaged Thermocouples fabricated in the 3713-B Shop were forwarded to Mark A. Princi, Manager, Engineering, Instrument Department, Measurements and Industrial Products Division for patent potential evaluation. A tentative reply indicates this method

of fabrication may not be a new art; however, they are continuing their investigation.

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

Improved Methods

Stainless sheathed thermocouples are now being used in corrosive atmospheres. The life of all these thermocouples will be ten to twelve times greater than the former type.

Small fans have been installed in approximately twenty instruments. The lower ambient temperatures have greatly increased tube life. Mylar (trade name of a plastic film) screens are now being used on four-fold and poppy probes. The use of this material has increased the life of these probes due to screen failure.

SAFETY, SECURITY AND RADIATION EXPERIENCE

Medical Treatment Injuries	20.0
Frequency Rate	4.28
Disabling Injuries	0
Near Serious Accidents	0

There were no radiation overexposure cases reported.

There were no security violations reported; however, one potential violation occurred. A Registered Document was delivered by 300 Area Mail personnel without receiving a signature of acceptance. Because the sender could not identify the contents of the package, it is not known if a security violation occurred. Security has been notified of the incident.

MEETINGS

Round Table-Staff	25
Safety and Security	33
Information	6

Manager
Maintenance and Power Operation

E. Hilgeman:JPF:mkm

EMPLOYEE RELATIONS OPERATION
JANUARY, 1958

PERSONNEL DEVELOPMENT

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

1. The 1958 Fuels Work Simplification program was initiated with 20 participants, two of whom are nonexempt standards technicians.
2. The final session of the current Contract Interpretation series, presented by the Manager-Union Relations was completed this month. A 1958 series is being planned for April, May, September and October.
3. The January, 1958, PBM-I presentation was initiated with the pre-course meeting held Wednesday, January 8; there are 16 participants.
4. Four FPD participants were enrolled in the current R&U PMS&L program.

The self-development brochures for exempt employees were distributed to all Fuels managers and the intent of this new program was discussed personally with them.

Three new tech. grads. joined the Department during the month and one completed his assignment, leaving a total of six tech. grads. in FPD assignments at month's end.

COMMUNICATION

Communication programs carried out during the month included the testing of the civil defense warning system, the revised 300 Area parking lot traffic flow pattern, and the integration of the Fuels OPG-Advice system. In addition, an "improved janitorial service" communication program was outlined.

An estimate of force reduction HAPO-wide among inter-departmental seniority groups during the third and fourth quarters of FY-1958 was completed. The information was made available to all HAPO employment specialists and to Fuels first-line supervisors through channels to strengthen their communication on this subject with employees concerned.

The annual General Manager's meeting with employees was scheduled for Thursday, February 27 and Monday, March 3, in the Jason Lee School Auditorium starting at 7:30 p.m.

The January safety meeting for FPD women employees was conducted, and the safety topic of the month for February was developed and distributed.

The FPD Five-Year Relations Program report was developed, in addition to the PD&C Operation's quarterly report for the second quarter of FY-58. The PD&C objectives, goals and plans for the current year were developed.

A total of 235 column inches of GE News space were devoted during the month to Department and employee activities. This represents more than seven-tenths of a page per issue. Routine items accounted for 54 column inches; 177 column inches were devoted to planned communication programs and activities.

Five Management News Bulletins and two FPD Newsletters were developed and distributed during the month. One General Manager's information meeting with nonexempt employees was arranged.

One article authored by an FPD employee was published in the January issue of Mill & Factory under the title of "Clocking the Supervisor's Day." At month's end, one signed article and four papers were awaiting Company approvals.

SALARY AND WAGE ADMINISTRATION

A two-year position auditing schedule of the 112 individual positions, excluding organizational levels 2 and 3 and fixed rates, has been established.

A procedure was devised and used to analyze individually all 1958 Salary Review proposals. By means of the analysis, proposals which did not appear to recognize factor trends adequately, or where significant pay-performance deviations were obvious, were discussed in detail with the appropriate managers. Approximately 11% of the proposed effective dates or amounts were modified as a result of this review.

Forms recording final approval of salary review actions effective December through March were distributed to the field upon notification of the HAPO General Manager's approval of the review. It was our recommendation that supervisors of employees scheduled for adjustments during this period explain the reasons for individual adjustments at this time.

A method for conducting a survey to determine changes in opinions concerning exempt salary during July was completed.

Conferences have been completed by the Specialist, Salary Administration and the Specialist, Wage Administration with all Level 4 Managers whose components' attitude survey results differed significantly from the Department norm. In the case of exempt employees it is believed that the scheduled 1958 salary review actions will be the most significant factor in creating more favorable opinions.

An annual report of the compensation portions of the HAPO 5-year relations program was submitted.

Under the position guide review program, begun June 1957, all Department position guides currently occupied have been reviewed.

Revisions of the Position Evaluation Guide were accepted by Managers of Salary and Wage operations of all HAPO components and are being processed as a revision to the Salary Manual.

The FPD organization directory was issued on January 3, 1958. The position relationship data sheet revised effective January 1, 1958 was issued. A functional chart showing re-alignment of foreman duties within the Area Maintenance Operation, Maintenance and Power Operation was issued December 6, 1957.

A detailed analysis was made of the Northwest Area wage survey conducted during 1957 by Relations and Utilities Operation. The resulting report included Fuels Preparation Department and HAPO-wide comparative data. The report was directed to the Manager, Union Relations with copies to other HAPO Salary and Wage Administration operations.

A recommendation by Fuels Preparation Department was made to the Manager, Union Relations, Relations and Utilities Operation on behalf of all HAPO Salary and Wage groups that the automatic promotion of Instrument Trainees to Technicians be discontinued effective February 1, 1958. The recommendation was accepted.

The "rate of transfer" status of three exempt employees being returned to the nonexempt roll were studied and proper pay rates determined.

UNION RELATIONS

The HAMTC has advised the Company that it desires to arbitrate the grievance involving the Engineering Assistant from IPD returning to the Chemical Workers seniority group.

On January 6, a military reactivate was assigned to the Instrument Worker classification. This employee had previously been a General Clerk. As expected the Council filed a grievance on January 17, alleging that the Company refused to negotiate, in good faith, a job description for Instrument Workers several years ago. In the Step I answer the Company advised the Council that inasmuch as more than 10 days had expired since the occurrence of the grievance the matter can not be processed at Step II. Despite this the Council scheduled this grievance for Step II discussion for January 24. A letter will be written the Council advising that there is no obligation to discuss the matter at Step II and the matter is therefore considered to be closed.

On January 1, the Firemen assumed the responsibility for testing fire alarm boxes and as a result of this decision the Electricians filed a grievance which was subsequently discussed at Step II. We have since been advised by the Council that it is their intent to take this case to arbitration. It is interesting that the Firemen advised the Electricians, by letter, that it is the intent of the Firemen to remain neutral as between the Company and the Electricians in this matter so long as the work of testing boxes is assigned to the Firemen. It is presumed, therefore, that the basis for taking this matter to arbitration is that the Company allegedly undertook to settle craft boundaries in violation of Article V of the Agreement.

The Council and the Company entered into an agreement whereby stewards will not be transferred during periods of reduction of force. This agreement applies only to transfers involved in a reduction of force and does not apply when a steward is due to be laid off because of lack of seniority.

The arbitration case involving the canning line grievance can be considered as closed inasmuch as the Council advised us orally that it is not their intent to process this matter further.

There are no new developments in the FPD Lynch arbitration case. The Claypool and Jensen FPD arbitration cases which involve the assignment of incidental work to crafts other than Sheetmetal Workers may be settled on the basis of a letter which was written by R&U Union Relations to the Council explaining our intent in the assignment of such work while recognizing that the jurisdiction was that of the Sheetmetal Workers.

The Council filed a grievance following the transfer of a Junior Power Operator involved in an ROF who was replaced by a supervisor who exercised his rights to return to the bargaining unit. It is the contention of the Operating Engineers that the supervisor should have been returned as a Miscellaneous Operator rather than a Junior Power Operator. The Company's position is that the supervisor should be returned as a Junior Power Operator at the very minimum.

The meetings involving Labor Law and contract interpretation and application were concluded. A revised series will be initiated in the spring of 1958.

Grievance Statistics:

The following is a report of grievance activity:

	<u>Unit</u>	<u>Nonunit</u>
Received this month	10	1***
Received since 1/1/58	10	1
Step I		
Answer unsatisfactory	10	0
Answer satisfactory	0	1
*Pending time limit	16	0
Settled this month	4	1
Step II		
Discussed this month	6	0
**Pending time limit	5	0
Settled this month	2	0

*Includes Step I grievances which Council indicated desire to discuss at Step II but not scheduled, are considered settled at Step I at two months.

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

***The nonunit grievance was received by CEO alleging that FPD Millwrights and Engineers were using field survey equipment. A Step I answer was provided by FPD to CEO which was answered satisfactorily. In accordance with agreed upon procedure among UR Managers this grievance has been accepted by FPD as a statistic in view of the fact that the employee was grieving against FPD personnel.

Subject of January Grievances: (11 Total)	<u>Nonunit</u>	<u>Mfg. Oper.</u>	<u>Eng. Oper.</u>	<u>Maint. & Power Oper.</u>	<u>Emp. Rel.</u>	<u>Fin. Oper.</u>
Jurisdiction	1	2		5 *		
Seniority				2		
Absence		1				

*Does not include nonunit grievance

HEALTH AND SAFETY

	<u>January</u>	<u>December</u>
Disabling Injuries	0	0
Serious Accidents	0	0
Medical Treatment Cases	53	42
Medical Treatment Frequency	3.93	3.29
Employee Hours of Exposure	134,721	127,436
Orientation Presentations	1	2
Attendance	3	5
Inspections	20	16
Suggestions Evaluated	9	10
Safety Instruction		
Supervisors	1	0
Technical Graduates	6	0

Medical examinations completed during 1957 totaled 750, which was 100% of quota.

Program Development

Fuels Preparation Department worked 518 days without a Disabling Injury through January 1958.

The monthly meeting for women office employees was held on January 22. Subject of the meeting was "Self Examination For Cancer," which was covered by a film presentation. Questions from the audience were answered by Industrial Medical personnel. A short film on home safety was also shown.

Six Technical Graduates were given an orientation on the Health and Safety Operation.

Safety instruction for supervisors was given to one member of the exempt roll during January. Items covered included the basic program in FPD, accident investigation and injury reporting, development of a reasonable growth of safety mindedness, and the value of accident prevention in a supervisor's industrial growth.

A safety training program for fork lift operators is being conducted at Central Stores. Personnel from interested Level #2 organizations are invited to attend. Selected operators from Fuels Preparation Department are scheduled for instruction.

Area Maintenance has started a training program for janitors that should result in improved housekeeping in offices. Health and Safety is participating in the safety phase of the training meetings.

Activities

Work activity during January included contacts on the following items: Color codes, publicity, eye protection, statistics, safety meeting preparation, protective clothing, job hazard evaluation, hand protection, ladders and staging, barricades, walks, traffic, ear protectors, valve maintenance, inspection procedures, materials handling, chemical hazards, process control equipment, guarding, vehicles, compressed gas cylinders and controls, face shields, roads, special tools, equipment layout, lock and tag procedures, nonslip surfacing, electrical grounding, hoisting apparatus, ventilation, stairs, exits, compressed air usage, storage, housekeeping, home safety, welding, safety showers, explosive solvents and gases, power equipment, pressure vessels, railroads, toxic materials, trash disposal, safety awards, medical schedules and rechecks, work restrictions, and lighting.

FIRE PREVENTION AND CIVIL DEFENSE

	<u>December</u>	<u>January</u>
Fires and Investigations	1	0
Fire Loss	\$5.00	0
Number of Inspections	38	29
Fire Surveys Conducted	0	1
Hazard Reports Submitted	5	6
Orientation Presentations	2	3
Attendance - Nonexempt Employees	5	3
Attendance - Technical Graduates	0	6
Fire Prevention Talks Given	0	1
Number Employees in Attendance	0	24
Suggestions Evaluated	1	2

Program Development

Initiated plans for a Spring Clean-up Week program to be sponsored by the Health and Safety Program Council during March 1958.

Supervised quarterly test of all fire doors in FPD buildings. The tripping device on one door in 313 Building was repaired after the door failed to operate during test.

Assisted the Fire Protection Operation in developing a schedule for testing the area fire alarm system in accordance with National Fire Codes, as they assumed the responsibility for testing the system on January 1, 1958.

The new 300 Area Defense Warning System was completed and accepted on January 21. The Advice and Emergency Evacuation Plan were revised to conform with the new system and a schedule was approved to test the audible signals on a monthly basis commencing February 3, 1958.

The project proposal for installing an automatic sprinkler system in the 313 Building addition was approved by FPD and submitted to HOO-AEC for final approval. It is planned to install a system over the canning area that is equipped with a rate-of-rise unit to prevent any accidental discharge of water.

Conducted a study of fire fighting methods for enriched uranium storage buildings and promoted further study of nuclear safety problems in an effort to up-date fire procedures in Manufacturing Operation property by March 1.

General Activities

Issued two welding and cutting permits. Reviewed and approved 11 construction blueprints. Approved revised HAPO Standards M-4-5 and DL-M-4-5. Suggested a safe way of melting wax for shop fabricated shielded containers. Caused Minor Construction to apply a coat of fire-resistive paint to ceiling of the new office addition to 3707-A Building to reduce the fire hazard of the highly flammable accoustical tile.

Other activities and service dealt with occupancy uses, solvents, paint storage requirements, water main shutoff valves, air compressor repairs, methanol storage and uses, and approval for testing methods.

PERSONNEL PRACTICES

Technical Personnel Placement

An offer has been made to Professor J. P. CoVan of Texas A & M for a Summer Program assignment with the Engineering Operation, Fuels Preparation Department. R. E. Curtis was notified that the Fuels Preparation Department is interested in offering Robert E. True, Richland High School teacher a Summer Program assignment in the Process Engineering Operation.

Resumes of six Fuels Preparation Department exempt personnel were prepared and submitted to Mr. W. E. Johnson to be considered for recommendation to AEC - International.

Exploration through level 3 managers of the Fuels Preparation Department was made to consider any possible interested candidates for AEC - Idaho Falls openings referred to us by Robert W. Richardson, Chief Personnel and Services Branch, HOO-AEC. Mr. Richardson was notified that no candidates were available from the Fuels Preparation Department.

Two candidates from the Fuels Preparation Department have been referred to Mr. Hooper - HOO-AEC for consideration in filling local AEC opening.

Fuels Preparation Department has recommended one candidate and plans to recommend three more to the Light Military Electronics Equipment Department, Johnson City, New York for consideration in filling their referred engineering openings.

The Fuels Preparation Department was notified by the Relations & Utilities Operation that they had upgraded one of their people to fill the opening of Supervisor - Telephone Business Office. F. P. D. was also notified by them that two of our candidates had been eliminated from further consideration for their opening of Electrical Engineer. However, the other candidate has been interviewed by them and is still under active consideration.

Received referral of two available exempt people from the Industrial Heating Department, Shelbyville, Indiana and three from the Knolls Atomic Power Laboratory, Schenectady, for consideration as possible candidates for placement in the Fuels Preparation Department. The two components were notified that F. P. D. had no current openings for which they could consider these people.

Received referral of two exempt people on ROF status from the Construction Engineering Operation for consideration for placement in the Fuels Preparation Department. They were notified that F. P. D. had no current openings for which they could consider these people.

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

	Cases Con- sidered FPD	INVITATIONS - FPD				OFFERS - FPD			On The FPD Roll
		Ext.	Visited	To Vis.	Open	Ext.	Acc.	Open	
<u>Engineering</u>									
Chemical	0	0	0	0	0	0	0	0	0
Electrical	1	0	0	0	0	0	0	0	0
Mechanical	1	0	0	0	0	1	0	0	0
Industrial	1	0	0	0	0	0	0	0	0
Metallurgical	0	0	0	0	0	0	0	0	0
Civil	0	0	0	0	0	0	0	0	0
Geological	0	0	0	0	0	0	0	0	0
<u>Science</u>									
Chemistry	0	0	0	0	0	0	0	0	0
Physics	1	0	0	0	0	0	0	0	0
Math-Stat.	0	0	0	0	0	0	0	0	0
<u>Other</u>	6	0	0	0	0	0	0	0	0
	10	0	0	0	0	1	0	0	0

PhD Recruiting

An offer is to be made to D. C. Worlton of the Atomic Products Equipment Department at San Jose to transfer to the Engineering Operation - Fuels Preparation Department. If he accepts, although he is not a PhD, he will satisfy the opening for PhD - Physicist or Electrical Engineer in the Testing Methods Operation.

	F P D			F P D	
	January	1958 To Date		January	1958 To Date
Cases Considered:	30	30	Offers Extended:	0	0
Interviewed:	0	0	Accepted Offers	0	0
To Be Interviewed:	0	-	On The Roll:	0	0

Terminations and Transfers, Technical and/or exempt personnel

There were two employees who terminated employment from the F. P. D. exempt roll during the month of January. F. P. Roberts was transferred to the Hanford Laboratories Operation and J. E. Mattingly was transferred to the Fuels Preparation Department non-exempt roll.

	January	1958 To Date
Transfers Considered:	-	*27
Transfers Completed:	2	2
Closed Cases:	4	4
Active Cases:	20	-
Dormant Cases:	1	-

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

Employment

Unfilled Requests for Personnel	2
Personnel Requirements Cancelled	3
Employees Added to the Rolls	5
Employees Removed From the Rolls	12
Reduction of Force Initiated by F.P.D.	3
Reduction of Force Issued Due to Seniority Bumping	1
Transfer Data (Requests for Transfer - F.P.D.)	

Active at Start of Month	50
Received	4
Interviewed	3
Effectuated During Month	2
Cancelled	2
Active at Month's End	50

Procurement

Offers	3
Interviews	2
Requests for Personnel Received	7
Transfers (all)	2
Upgrades within F.P.D.	3
Letters to Outside Agencies Regarding Information	20
Perfect Attendance Recognition Awards	12
Service Recognition Pins	10 Year - 8 5 Year - 6

Employee Benefits and Service

Participation in the Employee Benefit Plans as of January 31, 1958 for the Fuels Preparation Department is as follows: Pension Plan 99.6, Insurance Plan 99.9, Savings and Stock Bonus 55.9.

Thirty-two non-veteran employees are subject to military service training through Selective Service System. There are 12 in classification 1-A, 9 in 2-A and 11 in all other classifications.

There are 2 occupational deferments active for technical and engineering personnel.

There are 58 Reservists on the roll, 19 Standby and 39 are Ready.

Three employees are on military leave.

Special arrangements were made for a group of 9 military personnel, here for six weeks of radiation protection training under the Armed Forces Special Weapons Program, to tour the Department's manufacturing facilities. The Acting Manager of Manufacturing briefed this group on the Operation's functions.

Arrangements were made for six F.P.D. employees to tour the 105 KE Reactor facilities.

Suggestion Plan Statistics

	<u>January 1958</u>	<u>Year to Date</u>	
		<u>1958</u>	<u>1957</u>
Average number of eligible employees	589	589	579
Number of FPD suggestions received	82	82	41
Number per 100 eligible employees	13.9	13.9	7.08
Number of suggestions adopted	0	0	16
Net annual savings	0	0	\$2 531.63
Amount of awards	0	0	\$ 375.00
Percent of total awards to savings	0	0	14.8
Average amount of awards	0	0	\$ 23.44

In addition, 9 suggestions have been received from other departments of which 1 has been adopted, resulting in net savings of 0 and awards of 0.

General

On January 7, 1958, the Sensitivity Survey was distributed to level 2 and 3 managers, Personnel Practices people in other components, and the New York Office.

Leaves of absence were approved by the Pension Board during the month.

Completed the AEC Annual Report on Professional Personnel during the month.

There were three security violations during January.

Manager - Employee Relations

END

DATE
FILMED
2 / 8 / 93