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Piqua Nuclear Power Facility

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PIQUA NUCLEAR POWER FACILITY
MONTHLY OPERATING REPORT NO. 26

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June, 1965

CONTRIBUTORS

**K. L. Berrett
A. W. Garrett
F. J. Ross
K. V. Seyfrit**

**W. H. Sims
W. C. Spencer
W. L. Tabor
D. L. Ziemann**

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I. HIGHLIGHTS

A. REACTOR OPERATION

The reactor operated continuously through the month (720 hours). Reactor power levels have been arbitrarily limited to about 16 MWt pending replacement of the in-vessel filters, modification of the control rod lead-through flanges, and the completion of the final report of special test results in conjunction with the reactivity anomalies of February and March.

On 6/15, the in-vessel filter pressure drop reached 9.9 psi. One main pump (P-1A) was shut down to reduce total system flow and thus the pressure drop across the filters.

One of the raise coils for Control Rod 3 became inoperable; however, the rod is still operable using the remaining coil. Reactor control has been maintained with one inoperable control rod (No. 5) fully inserted, and rods 3 and 7 being used for the control function.

B. CONTROL AND SAFETY SYSTEMS

1. Nuclear Detectors

The Channel II (BF_3) detector can was removed, repaired, and reinstalled.

Filter capacitors were installed in the high voltage supply circuits for Channels 3 and 4.

The amplifiers for Channels 3 and 4 each required repair once during the month. The repair consisted of replacement of failed components. A capacitor had failed in one unit, and an electrometer tube had failed in the other unit.

2. Plant Control

The FR-101 transmitter (main loop total organic flow) was re-zeroed following the shutdown of one main pump.

C. ORGANIC SYSTEMS

1. Waste Gas

The degasifier tank pressure was reduced to about 7 psia on 6/9, in an effort to determine whether the argon activity would increase at the lower pressure, thus indicating the

C. ORGANIC SYSTEMS (Cont.)

presence of air inleakage. There was no evidence that more air inleakage was present at 7 psia than at 14 psia. However, there does appear to be a relationship between the degasifier operating pressure and the rate of pressure drop increase across the in-vessel filters. The degasifier operating pressure was returned to 14 psia during the period from 6/21 to 6/24. On 6/30, the pressure in the degasifier was started back down toward the 7 psia level in an effort to gain additional information concerning the relationship between in-vessel filter pressure drop and the degasifier operating pressure.

2. Purification

Except for partial plugging of the waste gas lines associated with the changes in degasifier tank operating pressures, the purification system operated satisfactorily through the month. The plugging of the waste gas lines led to increased column pressure (and thus loss of distillation efficiency) for short periods of time.

The Viking gear pump installed in the P-4B position on 3/11/65 for testing, is still functioning well after more than 90 days of continuous service. The pump is a stock item except for the idler and pin and the stationary seal face. The cost of this pump complete is approximately \$59.00 as compared to about \$178.00 for the specially modified units initially provided. The costs quoted do not include the motor, since the same motor is used for either pump.

P-21B has now failed. It will be replaced with a pump similar to the one in P-4B, except that the idler pin will be of a hardened steel rather than of ceramic material.

3. Waste Organic

The waste fired boiler operated for 13 days of the month. When a shutdown became necessary because of pumping problems, it was decided to leave the boiler down during the hot summer months. Temperatures in the Waste Fired Boiler Room were excessive (130 to 160°F) during boiler operation. There is adequate storage space available for the anticipated HB production during the next few months.

II. PLANT PERFORMANCE DATA

A. REACTOR OPERATION AND ENERGY PRODUCTION

	<u>Month</u>	<u>Year To Date</u>	
1. Reactor Critical	<u>720</u>	<u>3008.44</u>	hours
*Availability Factor	<u>100</u>	<u>69.3</u>	%
2. Heat Production	<u>410.56</u>	<u>2054.15</u>	MWtd
**Thermal Load Factor	<u>30.1</u>	<u>24.9</u>	%
3. Steam Production - Total	<u>29,600,665</u>	<u>151,199,500</u>	lb.
- Sales to Power Plant	<u>26,601,300</u>	<u>136,313,100</u>	lb.
4. Cumulative Thermal Energy Generation		<u>8244.70</u>	MWtd

$$*Availability\ Factor = \frac{No.\ Hrs.\ Critical}{No.\ Hrs.\ in\ Month\ or\ Year-to-Date} \times 100$$

$$**Thermal\ Load\ Factor = \frac{MWtd\ Produced}{45.5\ MWt \times No.\ Days} \times 100$$

B. DAILY AND CUMULATIVE ENERGY PRODUCTION

June, 1965

Figure 1

C. ORGANIC MATERIAL BALANCE1. Organic Inventory

Fresh organic unloaded 38,270 + beginning inventory 227,622
 - (ending inventory 226,666 + HB burned 37,787) = 1,439 Lb. (loss)

2. Purification

a. Irradiated coolant processed 622,876 lb.
 b. Fresh coolant processed 21,606 lb.
 c. HB discharged to T-9 18,435 lb.
 @ average HB content 98.4 %

3. Waste Organic

a. Waste Organic Burned
 1. HB 37,787 lb.
 2. Lightends 0 lb.
 b. Steam Produced (Estimate) 300,000 lb.

D. FUEL STATUS (End of Month)1. Fuel Inventory:

	<u>No. Elements</u>	<u>U-Total-Kg</u>	<u>U-235-Kg</u>
New Fuel Storage	<u>48</u>	<u>3,827.51</u>	<u>74.26</u>
Reactor	<u>67</u>	<u>5,339.49</u>	<u>95.14</u>
Pool	<u>3</u>	<u>239.01</u>	<u>4.01</u>
Reprocessing	<u>0</u>	<u>--</u>	<u>--</u>

D. FUEL STATUS (Cont.)2. Nuclear Transmutations:

	<u>Month</u>	<u>Total Incore</u>	
Pu Produced	<u>.26</u>	<u>4.79</u>	Kg
U-236 Produced	<u>.09</u>	<u>1.56</u>	Kg
U-235 Consumed	<u>.49</u>	<u>8.95</u>	Kg
U-238 Consumed	<u>.01</u>	<u>.63</u>	Kg

3. Average Core Burnup:

1397 MWd/Tonne

III. ADMINISTRATIONA. OFFICIAL VISITS

1. Mr. H. D. Thornburg, Division of Compliance, USAEC, performed a routine inspection of the operation on June 3.
2. Messrs. D. V. Geof, W. J. Museler, and M. Casparino of Combustion Engineering Inc. visited the facility on June 4. The specific purpose of their visit was to discuss our experience with pumps, seals and valves in organic systems.
3. A. W. Holmes and C. J. De Bevec, Division of Health and Safety, Chicago Operations Office, reviewed the plant's emergency procedures on June 10.
4. Messrs. D. M. Gardiner and F. X. Gavigan were at the site on June 17. The purpose of their visit was to review and evaluate the PNPf safety program and to determine the effectiveness of management in implementing the program. Dr. H. M. Epstein of Battelle Memorial Institute, as chairman of the PNPf Safety Review Committee participated in this review.
5. Mr. J. O. Hunze, Division of Health and Safety, Chicago Operations Office, performed a routine safety survey of the facility on June 22 and 23.

B. MEETINGS

1. D. L. Ziemann attended a meeting on the PNPf Hydrocracker at the Idaho Operations Office on June 7 and 8. The preliminary design and safety analysis of the hydrocracker was reviewed and discussed by the participants.
2. D. L. Ziemann attended a PNPf Budget Review Meeting in Chicago on June 16.

IV. TESTING AND ANALYSISA. SPECIAL TEST SUMMARYPROCESS

<u>STR No.</u>	<u>Date Initiated</u>	<u>Date Completed</u>	<u>Description</u>
69	5-4-65	6-15-65	Pump head vs flow data were obtained for one of the shield cooling pumps while it was in service.
70	6-18-65	6-22-65	System pressure drop vs. flow data were obtained for the shield cooling and seal cooling system while it was in operation.

(A more detailed description of the above two tests is given in Section C. 3.c below.)

B. NUCLEAR ENGINEERING1. Reactivity Checks

Reactivity checks* were performed at four hour intervals to the 15th, and twice daily after the 15th. The variation was $\pm 0.10\% \Delta k$ uncorrected for power or burnup effects. Partial coil failure in Control Rod #3 and 11, and inoperability of Control Rod #5 complicated the checks due to slippage of Rod 11 and increased number of steps required to withdraw No. 3 rod.

B. NUCLEAR ENGINEERING (Cont.)

2. General

The fuel element located in core position E-12 has displayed a gradual temperature increase during the month. The E-12 ΔT at the beginning of the month was about 3.5°F lower than the hottest element, F-9. At the end of the month, the ΔT for E-12 had increased to about 0.5°F above F-9. No other core elements exhibited such an increase.

The special test data reported in the Monthly Operating Report No. 25 was reduced during the first part of the month, and the results sent to the task force for incorporation in the final report on the reactivity anomaly. Since the control rod calibrations performed in May did not differ significantly from those performed in March, 1965, for the control rod configuration used during the month, we have continued to use the March calibration curves until the new data is fitted on the computer by the Operational Analysis Program. The power coefficient measurements performed in May have not been incorporated in the reactivity calculations, pending completion of the task force evaluation. Since the maximum power level during the month was approximately 18 MWt, use of the original power coefficient has not caused appreciable variation in the reactivity checks.

*The reactivity check is the calculated reactivity effects for changes in temperature, power, burnup, samarium and xenon poisoning compared to a base point minus the measured reactivity effects in per cent delta k.

C. PROCESS ENGINEERING

1. Organic Systems

All systems operated in a normal manner throughout the month.

2. Analysis of Organic Samples

a. The trends of the activation analyses of the coolant as given by a gamma scintillation spectrometer are as follows for the three isotopes which are normally reported herein:

1. Magnesium 27 shows a fairly constant level at about 940 disintegrations per minute per gram per thermal megawatt. There is no obvious correlation between the shape of the curve of data points and the operating conditions of the reactor - suffice it to say

C. PROCESS ENGINEERING (Cont.)

that the maximum power level reached during this month was about 16 megawatts (thermal) and in January, 1965, when the reactor was in operation throughout the month, with power levels up to 24 megawatts (thermal), the magnesium 27 levels showed a continuing decrease through the month from about 600 dpm per gram per MWt to about 300 dpm per gram per MWt.

2. Chlorine 38 appears to show a weekly cycle, with lower values at the beginning and end of the week, and peaks in the middle of the week, for all weeks of the month. The pattern is more noticeable in the graph of dpm per gram than in the graph of normalized points (dpm per gram per MWt). While at first glance it might seem that such a pattern of activation results would reflect the normal pattern of power level, that is, steady at a low level on weekends, and higher on weekdays, the pattern of power level changes does not have the same shape: it was held constant at about 15.5 MWt from Wednesday, June 16th through Tuesday, June 22nd.
3. Sodium 24 shows a level trend, in general, with an average of about 7.5 dpm per gram per MWt for the first half of the month, and an average of about 8.5 dpm per gram per MWt for the last half of the month.
- b. Ash content of the coolant shows a greater range of fluctuation from day to day than has been observed for some time: there were four analyses at about 4 ppm, and six analyses at zero ppm. Since there have been few system perturbations and the plant has been operated at near equilibrium conditions much of the period, these fluctuations are attributed to sampling and analytical deviation.
- c. Membrane stain test index results show quite a level trend throughout the month, indicating no sudden upsets in bulk coolant inventory in the main systems; and, because of their low level, indicating good coolant quality for the month.
- d. Analyses of main loop samples for high boiling compounds showed less than five per cent HB throughout the month. Five analyses for HB in the bottoms from the flash column were all above 97 per cent.

C. PROCESS ENGINEERING (Cont.)

- e. Analyses of samples of main loop coolant showed a continuing decrease in the content of carbonyl compounds, indicating that they may be decomposed by radiation or that they may have a greater tendency to polymerize than the other terphenyl molecules, and are removed from the coolant in the purification system. The complete explanation for the reduction in carbonyl compounds remains to be discovered.

3. Water and Steam Systems

- a. Water conditions in the main boiler, B-1, were normal throughout the month.
- b. Waste fired boiler, B-2, operated normally for the first part of the month. It was put into wet lay-up on the 21st when it was shut down for the remainder of the summer.
- c. Two additions of lithium hydroxide were made to the water in the shield cooling system early in the month to maintain the pH of the water at the recommended value.

Two special tests were performed on the shield cooling system pumps to determine the margin for increasing cooling water flow without making any major changes in the pumps or in the system piping. The tests showed that the pumps are operating at a point on the sloping part of the head-flow curve, with the result that any increase in flow rate in one part of the system tends to reduce the pump outlet pressure, and to reduce flow rates in other, parallel piping circuits. They also show that system pressure drop varies as the square of the flow, and that present operating conditions are at a point where a considerable increase in pressure will be required to make a significant increase in flow rate of cooling water to the various parts of the system. The cooling provided by the system is marginal during the hottest months of the year; during the colder months of the year, when city water is normally cooler, the system is adequate. Therefore, no change is contemplated in either the pumps or the system until such time as the cooling capabilities might become definitely inadequate.

- d. The decay heat removal loop required one addition of corrosion inhibitor and three additions of neutralizing amine during the month.
- e. Six additions of lithium hydroxide were made to maintain the recommended pH value in the spent fuel storage pool water.

C. PROCESS ENGINEERING (Cont.)

4. Analysis of Water and Steam Samples

Routine analyses of boiler water were made daily for B-1, and eight times during the operating period for B-2. Other water samples analyzed were: shield cooling system - five; decay heat removal loop condensate - eight; decay heat removal loop water - three; spent fuel storage pool - seven.

5. Auxiliary Systems and Miscellaneous

A preliminary report entitled Space Cooling and Water Conservation Study, was completed by A. M. Kinney, Inc. The objective of the study was that of developing a means of reducing the operating costs of the plant with regard to costs for cooling water; a second objective was that of making recommendations of changes or additions to the Heating and Ventilating System to reduce temperatures in the hotter sections of the buildings. The installation of suitable cooling towers, and a steam-vacuum refrigeration system to produce chilled water at 55°F, along with the addition of several more unit coolers in the buildings was recommended.

6. Laboratory Analysis Data

Steam and Water:

Steam Generator:	Monthly			
	Max.	Min.	Avg.	
"B" Reading	<u>13.2</u>	<u>3.7</u>	<u>8.0</u>	ml
Solids - Dissolved	<u>2400</u>	<u>1050</u>	<u>1690</u>	ppm
Sulfite	<u>54</u>	<u>17</u>	<u>39</u>	ppm
Phosphate	<u>60</u>	<u>20</u>	<u>35</u>	ppm
Waste Fired Boiler:				
"B" Reading	<u>8.7</u>	<u>6.1</u>	<u>7.5</u>	ml
Solids - Dissolved	<u>1425</u>	<u>1050</u>	<u>1250</u>	ppm
Sulfite	<u>39</u>	<u>24</u>	<u>32</u>	ppm
Phosphate	<u>30</u>	<u>25</u>	<u>28</u>	ppm
Pool: pH	<u>9.0</u>	<u>8.3</u>	<u>8.7</u>	
Shield Cooling: pH	<u>11.0</u>	<u>10.7</u>	<u>10.9</u>	

C. PROCESS ENGINEERING (Cont.)

Decay Heat Exchanger:	Monthly		
	Max.	Min.	Avg.
pH (Condensate)	<u>9.8</u>	<u>6.4</u>	<u>8.0</u>
CS Inhibitor	<u>2000</u>	<u>1800</u>	<u>1950</u> ppm

Organic:

Ash	<u>4</u>	<u>0</u>	<u>1.6</u> ppm
MST	<u>17</u>	<u>8</u>	<u>11.4</u>
Carbonyl Compounds	<u>55</u>	<u>35</u>	<u>47</u>

Analysis Results for Daily Organic Coolant Samples - June 1965

Figure 2

V. HEALTH AND SAFETY

A. PERSONNEL RADIATION EXPOSURES

R. S. Landauer Jr. and Company reported two (2) detectable exposures of personnel badges for the month of May. The maximum dose was 290 mrem gamma which was received by Health Physicist personnel during reactor shutdown monitoring and calibration of portable radiation survey instruments.

B. PLANT RADIATION AND CONTAMINATION SURVEYS

1. Organic Coolant Systems

Radiation levels from the main heat transfer and process system piping remained low during the month of June. The gamma radiation from the 20-inch organic coolant line reached 2.5 mrad/hr during reactor operation at approximately 18 MWt.

2. Waste Gas

Ar⁴¹ levels in the waste gas system were practically normal. The degasifier was operated from 7 to 14 psia with no detectable activity above RCG in personnel work areas.

3. Radioactive Material Handling

A maximum reading of 20 mrad/hr beta-gamma was observed on the depleted filter media of the pool purification system. A gamma spectrum of a sample of the filter showed the activity largely due to Co⁵⁸ and Fe⁵⁹. A detectable amount of Co⁶⁰ was also present in the filter.

C. SAFETY

A survey of ambient room temperatures in work areas was performed on June 9, 1965. The maximum temperature recorded was 170°F at the upper level in the Waste Fired Boiler Room. The Main Heat Transfer Room, 82° level of the Reactor Building, was generally 132°F during the month.

Time limits were recommended for personnel who were to work in elevated temperature areas. Personnel showed some minor symptoms of heat fatigue, but no serious after effects were observed.

D. HEALTH PHYSICS DATA

1. <u>Radiation*:</u> (Representative)	<u>Max.</u>	<u>Min.</u>	<u>Avg.</u>	
F-2A Filter	<u>80</u>	<u>55</u>	<u>65</u>	mr/hr
T-5 Tanks - Inlet	<u>.7</u>	<u>.15</u>	<u>.35</u>	mr/hr
- Outlet	<u>.1</u>	<u>Bkqd.</u>	<u>Bkqd.</u>	mr/hr

2. Contamination:

System Coolant (2 hrs. decay time)	<u>3.8×10^{-3}</u>	<u>2.1×10^{-3}</u>	<u>2.9×10^{-3}</u>	μ c/gm
Process Gas:				
Inlet	<u>1.9×10^{-3}</u>	<u>1.2×10^{-3}</u>	<u>1.5×10^{-3}</u>	μ c/cc
Outlet (After Decay)	<u>2.8×10^{-4}</u>	<u>1.2×10^{-4}</u>	<u>2×10^{-4}</u>	μ c/cc
Stack Effluent (Calculated)				
Est. 54,000 CFM	<u>7.2×10^{-10}</u>	<u>7.7×10^{-11}</u>	<u>4.5×10^{-10}</u>	μ c/cc**
Aqueous Waste:				
Before Dilution	<u>9.9×10^{-6}</u>	<u>7.2×10^{-7}</u>	<u>4.8×10^{-6}</u>	μ c/cc
After Dilution (Max. & Min., during Batch Discharges)	<u>9.3×10^{-7}</u>	<u>4.5×10^{-8}</u>	<u>1×10^{-8}</u>	μ c/cc**
Environmental Air Filters (Long lived Beta-Gamma)	<u>5.3×10^{-13}</u>	<u>3×10^{-13}</u>	<u>3.7×10^{-13}</u>	μ c/cc
On-Site Air Filters (Long lived Beta-Gamma)	<u>1.4×10^{-13}</u>	<u>4.2×10^{-14}</u>	<u>8.2×10^{-14}</u>	μ c/cc

*During reactor operation.

**Considers all dilution for the month.

3. Waste Disposal:

Water:	<u>Month</u>	<u>Year To Date</u>
Process Water	<u>50,474</u>	<u>337,624</u> gal.
Dilution Water	<u>19,792,000</u>	<u>98,346,000</u> gal.
Curie Content	<u>9.1×10^{-4}</u>	<u>2.5×10^{-3}</u> curies

D. HEALTH PHYSICS DATA (Cont.)

Gas:	Month	Year To Date	
Total Effluent	<u>4,850</u>	<u>30,935</u>	cu. ft.
Curie Content	<u>2.9×10^{-2}</u>	<u>2.014</u>	curies
Identified Isotopes	<u>Ar⁴¹</u> <u>Xe¹³³</u>	<u>Xe^{135m}</u> <u>Xe¹³⁵</u>	
	<u>Kr^{85m}</u> <u>Kr⁸⁷</u>	<u>Kr⁸⁸</u>	
Solids:			
No. of Packages	<u>22</u>	<u>277</u>	
Cubic Feet	<u>211.35</u>	<u>2,136.25</u>	
Curie Content	<u>2.6×10^{-2}</u>	<u>4.5×10^{-1}</u>	curies
Principal Isotopes	<u>Co⁵⁸</u> <u>P³²</u>		
Organic:			
HB Burned	<u>27,787</u>	<u>170,108</u>	lb.
Curie Content	<u>8.2×10^{-2}</u>	<u>1.7×10^{-1}</u>	curies

VI. MAINTENANCE AND MODIFICATIONSA. INSTRUMENT1. Plant Control

The automatic-flux and Reactor Outlet Temperature Control (ROTC) systems were disabled. The flux error and temperature error alarms were left in service.

2. Plant Protection

- a. A spare core temperature trip unit, previously removed from TXH-384 Channel B, was repaired.
- b. The prealarm trip point for TXH-384B was adjusted.

A. INSTRUMENT (Cont.)

3. Nuclear Instruments

- a. Repaired a water leak in Channel 2 detector assembly.
- b. Repaired and calibrated Channel 3 Log N amplifier.
- c. Gears in NR-1 recorder were replaced.
- d. Channel 4 Log N amplifier was repaired.

4. Control Rods

- a. A spare control rod jumper was repaired.
- b. Control Rod 3 was checked after excessive steps were required to withdraw the rod. In addition to the hold coil which had been disconnected, a raise coil was found shorted and was disconnected. The rod remains operable.

5. Pressure

- a. The calibration of PdI-529 (in-vessel filter ΔP recorder) was checked several times during the month.
- b. Calibrated PR-663 and PR-662 recorders.
- c. Regulators on the nitrogen supply tank were adjusted.
- d. PI-684 on T-7 was replaced.
- e. F-4 filter differential pressure switch was adjusted.
- f. Calibrated PI-565.

6. Temperature

- a. TAH-424-9 was repaired. TAH-424 and TAH-329 trip points were adjusted to the required values to compensate for drift of the alarm units.
- b. TR-437 and TR-8 were calibrated.
- c. TR-382 standardizing switches were adjusted.
- d. TdR-383A scanning switches were adjusted.
- e. TR-304 was repaired and calibrated.

A. INSTRUMENT (Cont.)

7. Flow

- a. FtR-197 integrator, FtR-197 recorder, FtR-8, FR-148, FtR-7, FtR-196 and FR-101 were calibrated.
- b. FtR-111-1 integrator was repaired.
- c. FRC-106 controller and P-3A and P-3B speed controllers were adjusted to achieve better control of the pressurizing loop flow.

8. Control Valves

- a. A solenoid valve on CV-221 was repaired.
- b. A diaphragm in CV-409C operator was replaced.

9. Health, Safety and Lab

Five H.P. portable instruments were repaired.

10. Annunciators

- a. All smoke detectors were cleaned, adjusted and repaired as necessary.
- b. The wiring for the waste fired boiler flame out alarm and P-16 stop circuit was changed to provide for alarms and shutdown to occur without a time delay.
- c. A remote switch for W.F.B. shutdown was installed in the Control Room.

B. ELECTRICAL

1. Emergency Power Supply

One tray of the emergency diesel starting batteries was disassembled to locate a leaking cell. The leaking cell will be jumpered and returned to the manufacturer for repairs.

B. ELECTRICAL (Cont.)

2. Lighting and General Services

- a. The incandescent lighting fixtures in the hot change room were replaced with fluorescent fixtures to reduce heat and electrical loads.
- b. The necessary wiring, conduit and two 7.5 KVA transformers were installed for the Lunch Room and Switch Gear Room air conditioning system.

C. MECHANICAL

1. Drain, Vent and Relief System

The precoat tank (T-34) was moved from the particulate loop to the Reactor Building Drain Tank Room. The tank was modified and piping was fabricated for the drain tank (T-1) vent modification. This modification is to be completed during the next plant shutdown.

2. Waste Organic System

- a. The suction strainer for the high boiler's pump (P-16) was replaced.
- b. The filter elements were replaced in the waste fired boiler flue gas dust collector and filter (F-6 and F-5).
- c. The valve seats were replaced in the flue gas dust collector dump valves.

3. Fresh Coolant

A loading chute was fabricated and installed for the new coolant storage tank (T-8B).

4. Process Steam Systems

- a. The fabrication and installation of the steam tracing for the FELS tank rupture disc flange was completed.
- b. Three bucket steam traps were removed for annual preventive maintenance, and replaced.
- c. One Sarco steam trap was replaced with a newer model (TD-52).

C. MECHANICAL (Cont.)

5. Condensate Return System

The condensate transfer pump (P-23) was disassembled for the replacement of the shaft mechanical seal. During re-assembly the pump cooling water lines were cleaned and two flow meters were installed.

6. Auxiliary System and Equipment

a. Heating and Ventilation System

1. The installation of the air conditioning units in the Lunch Room and the Switch Gear Room was completed.
2. A broken fan was replaced in air conditioning unit AH-13.
3. The exhaust filters were changed throughout the Reactor and Auxiliary Buildings. The filters in the Main Heat Transfer Room were changed twice during the month.
4. The prefilter pads were changed for exhaust fans E-2A, E-2B and E-3.
5. The cooling coils were cleaned and the filters were changed twice for unit coolers 101, 102 and 104.
6. The filters were changed twice in the Reactor Building supply fan (AH-5). The filters were changed once in all other unit coolers and supply fans.
7. The Chemistry Lab exhaust filter was changed four times during the month.

b. Utility Air System

The drive belts were replaced on the utility air compressor.

7. H.P. and Safety

- a. Completed the fabrication and installation of guard rails on top of the plenum for the Reactor Building exhaust fans.
- b. Completed the repairs to one environmental air sampler.

8. Reactor Vessel and Associated Components

- a. Started the fabrication of a special instrumented fuel element cut off tool and locking device.

C. MECHANICAL (Cont.)

- b. A thermocouple was installed on the control rod lead through flange.
- c. The spare control rod was assembled after repairs were completed.
- d. The cable was replaced in the medium size fuel handling grapple.

9. Structure and Grounds

Repaired a leak in the Switch Gear Room wall at the 480 volt bus entrance duct.

10. Shop and Miscellaneous

- a. Continued the removal of piping and equipment associated with the particulate removal system.
- b. Completed the fabrication of three steam trap manifolds consisting of isolation valves, strainers, strainer blow off valves and Sarco $\frac{1}{2}$ " TD-52 steam traps. These manifolds are to replace the existing banks of steam traps under the surge tank T-2.