

*May 8/3/84*

PHILADELPHIA ELECTRIC COMPANY  
LIMERICK GENERATING STATION  
SURVEILLANCE TEST

ST-1-051-701-1 'A' RHR LOOP CONTAMINATED PIPING INSPECTION

Initial

Test Freq.: 18 Months

-OR- Initiating Events: 1. Reason Performance

Tech. Spec.: 6.8.4.a

FSAR 6.2.8.1

FSAR 6.2.8.3

2. MRF No. \_\_\_\_\_

TEST RESULTS:

A. All Asterisked(\*) Steps Completed SATISFACTORILY.

Performed By: (Sign/Date) *M.P.S.* 9/15/84

Performed By: (Sign/Date) \_\_\_\_\_

Informed Test Complete: (ACO or CO) (Sign/Date) *Royce* 9-15-84  
(Time) 14:10

Reviewed By: (SSVN or STA) (Sign/Date) *W.R. Dumas* 9/15/84

B. One or More Asterisked(\*) Steps Test Results UNSATISFACTORY.

Performed By: (Sign/Date) \_\_\_\_\_

Informed of Test Results: (CO or ACC) (Sign/Date) \_\_\_\_\_  
(Time) \_\_\_\_\_

Shift Supervision: (Sign/Date) \_\_\_\_\_

Corrective Action: MRF No.: \_\_\_\_\_

Initiated By: (Sign/Date) \_\_\_\_\_

IMMEDIATELY NOTIFY SENIOR PLANT STAFF MEMBER

Person Notified: (Name) \_\_\_\_\_

Date/Time Notified: (Date/Time) \_\_\_\_\_

Notified By: (Sign) \_\_\_\_\_

ADDITIONAL ACTION/TEST COMMENTS:

If any entry is made in Additional Action/Test Comments Section,  
person making initial entry sign here

(Sign/Date) \_\_\_\_\_

## 1.0 PURPOSE

To inspect and measure any leakage of RHR system components that are directly associated with system piping that could carry contaminated fluids during a serious accident or transient. This inspection shall be implemented while the RHR loop is operating in the shutdown cooling mode or in the test mode.

## 2.0 REFERENCES

- 2.1 8031-M-51, Residual Heat Removal, Sheet 1
- 2.2 8031-M-51, Residual Heat Removal, Sheet 2
- 2.3 NUREG-0737

## 3.0 TEST EQUIPMENT

- 3.1 Graduated cylinder(s)
- 3.2 One-liter bottle(s)
- 3.3 Assorted funnels
- 3.4 Stopwatch
- 3.5 Inspection mirror with handle
- 3.6 Radioactive disposal containers as needed

## 4.0 PRECAUTIONS & LIMITATIONS

- 4.1 If a procedural step cannot be completed, make a comment in the Additional Action/Test Comments section of the Data Sheet.
- 4.2 Signoff steps marked "SO" in the left-hand margin of the body of the procedure require a signoff on the Data Sheet or Procedure Cover Sheet.

- 4.3 Leakage rates of greater than 5 drops per min ( .25 cc/min) shall be quantified. Put "<.25 cc/min" on Data Sheet Attachment A for components with leakage rates of 5 drops per min or less.
- 4.4 Data Sheet steps marked (\*) are specific Tech. Spec. requirements which will fail the test if not completed satisfactorily.
- 4.5 If any component exhibits excessive leakage notify SSVN immediately.

## 5.0 PREREQUISITES

- 5.1 Request RWP and HP assistance when needed.
- 5.2 Inspector is familiar with the RHR system layout and location.
- 5.3 Obtain a copy of the previous inspection's Data Sheet Attachment A.
- 5.4 RHR piping is at operating pressure during this inspection for ST-6-051-231-1 or per Operating Procedures S51.8.A and S51.8.B.
- 5.5 Coordinate with operator running the system to allow pump run durations to be extended for the inspection.
- 5.6 If ST-1-051-702-1 for the "B" loop RHR system contaminated piping inspection ~~is not performed in the shutdown cooling mode during this outage this test must be performed in the shutdown cooling mode.~~

W/R  
LAA

does not include inspection of the Shutdown Cooling Suction during this outage this test must perform inspection of the shutdown cooling suction,

## 6.0 PROCEDURE

IT IS THE RESPONSIBILITY OF THE PERSON OR PERSONS PERFORMING THIS TEST TO ENSURE ALL BLANKS AND DATA SHEETS ARE CORRECTLY AND COMPLETELY FILLED IN.

### 6.1 Preparation

- SO 6.1.1 Verify all prerequisites are satisfied.

6.1.2 Record appropriate information for each piece of measurement and test equipment used with a PECO number and verify the equipment is within it's calibration period.

6.2 Shift Permission to Test

- SO 6.2.1 Obtain Shift Supervision's (SSVN's) permission to start test.
- SO 6.2.2 Obtain Assistant Control Room Operator's permission to start test.

6.3 RHR System Contaminated Piping Inspection

ACTUAL LEAKAGE RATE MEASUREMENT METHODS WILL BE LEFT TO THE DISCRETION OF THE INSPECTOR. THE ONLY GUIDELINES BEING THAT ALL DATA WILL BE A MEASURED QUANTITY OF FLUID OVER TIME USING A STOPWATCH. DROPS PER MINUTE CAN BE USED AS A MEASUREMENT WHERE 20 DROPS = 1CC. ALL RECORDED DATA SHALL BE IN CUBIC CENTIMETERS PER MIN. (CC/MIN.)

6.3.1 Mark in the data section the mode of operation for the "A" Loop during this inspection.

6.3.2 For all in line components that exhibit leakage, within boundaries of Attachment B, record on the Data Sheet the leakage rate and a description of the location of the leak. Pay particular attention to system components identified as having exhibited measurable leakage in the previous inspection.

SO <sup>WRT 9/15/84</sup> <sub>LAH</sub> 6.3.3 ~~If this test is being run in the Shutdown Cooling Mode~~ also include the components within the dashed boundaries of Attachment B.

6.3.4 From the leakage rate data on Attachment A, calculate the total system leakage rate and document the results on the Data Sheet Section 6.3.

6.4 Test Results Evaluation

- SO 6.4.1 Compare the leakage limit in 8.1 to the total system leakage rate. If the limit is exceeded prepare a MRF to reduce the system leakage rate so that it is within the limit.

<sup>WRT 9/15/84</sup>  
<sub>LAH</sub>

TO TEST FOR LEAKAGE in the shutdown cooling suction, have the SYSTEM running in the Shutdown Cooling mode OR have the suction piping filled with the vessel near or above normal level AND

- 6.4.2 If any component's leakage rate has increased significantly since the last inspection prepare a MRF to repair the component.
- 6.4.3 If any component's leakage is a major portion of the overall system leakage limit prepare a MRF for its repair.

## 7.0 RETURN TO NORMAL

- SO 7.1 Inform SSVN ACO the inspection is complete

## 8.0 ACCEPTANCE CRITERIA

- 8.1 The "A" RHR system shall not exhibit a total leak rate of greater than (LATER).

AT TEST COMPLETION, ENSURE COVER SHEET IS CORRECTLY AND COMPLETELY FILLED IN.



'A' RHR LOOP CONTAMINATED PIPING INSPECTION

DATA SHEET (1 of 2)

ACTION REQUIRED

INITIALS

6.0 PROCEDURE

6.1 Preparation

6.1.1 All prerequisites satisfied

MPS

6.1.2 Test Equipment

MPS

| <u>INSTRUMENT</u> | <u>MFR./MODEL</u>   | <u>SER. NO.</u> | <u>CAL. DUE DATE</u> |
|-------------------|---------------------|-----------------|----------------------|
| <u>STOPWATCH</u>  | <u>VICTOR WYLER</u> | <u>53-0030</u>  | <u>8/3/85</u>        |
| _____             | _____               | _____           | _____                |
| _____             | _____               | _____           | _____                |
| _____             | _____               | _____           | _____                |
| _____             | _____               | _____           | _____                |

6.2 Shift Permission to Test

6.2.1 SSVN permission obtained

MPS

6.2.2 ACO permission to test

J/K  
CO/ACO

9-23-84 5<sup>05</sup> PM  
Date Time

6.3 'A' RHR Loop Contaminated Piping Inspection

6.3.1 Inspection of "A" RHR Loop is being performed while the system is operating per Full Flow Test

6.3.3 Inspection includes Shutdown Cooling Section

~~NA~~ NA

6.3.4 RHR Loop 'A' total leak rate:

4.5 CC/MIN

.00119 GAL/MIN

(1 cc/min = .000264 gal/min)

LAK  
WAT 9/1/84

'A' RHR LOOP CONTAMINATED PIPING INSPECTION

DATA SHEET (2 of 2)

ACTION REQUIRED

INITIALS

6.4 Test Results Evaluation

6.4.1 The total "A" RHR system leakage rate is within Acceptable Limits

mfs (\*)

7.0 RETURN TO NORMAL

7.1 SSVN and ACO informed of test completion.

mfs

IF ANY ENTRY IS MADE IN THIS SECTION, SIGN COVER SHEET IN APPROPRIATE SPACE.

ADDITIONAL ACTION/TEST COMMENTS

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

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KSK/RSE:mjl'A' RHR LOOP CONTAMINATED PIPING INSPECTION

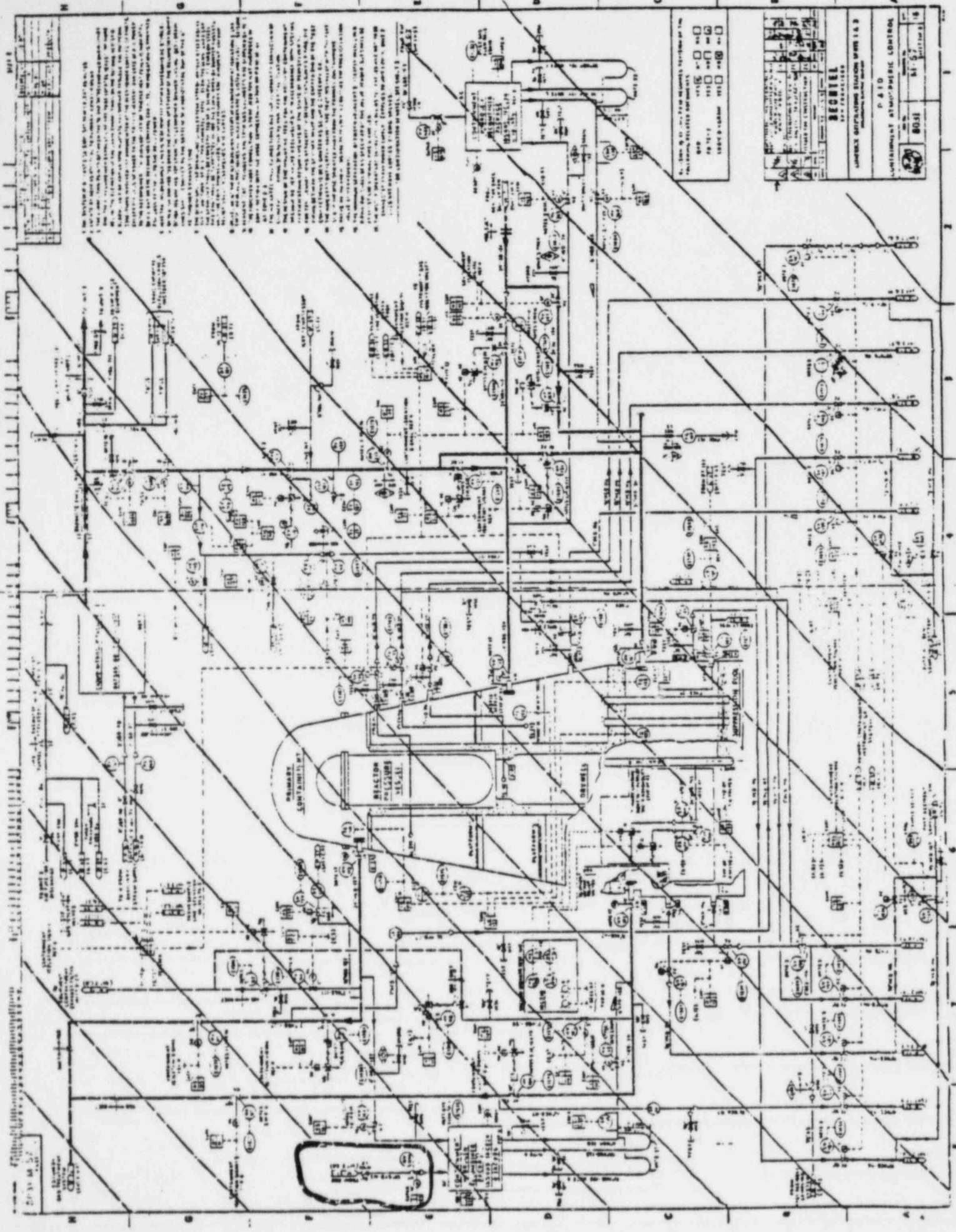
## ATTACHMENT A

Inspector: M. P. GallagherSystem Mode Full Flow test Date: 9/13/89Lack Shutdown Cooling Suction Inspected YES/NO NO

| Component No. | Component Description | Comp. Mode (on/off) (open/shut) | Leak Rate  | Corrective Action Date | Remarks |
|---------------|-----------------------|---------------------------------|------------|------------------------|---------|
| HV-51-1F015A  | S/D COOLING RETURN    | CLOSED                          | 1.5 cc/min |                        |         |
| HV-51-1F052A  | HPCI STEAM INLET      | CLOSED                          | 1.5 cc/min |                        |         |
| HV-51-1F023A  | OUTBOARD HEAD SPRAY   | CLOSED                          | 1.5 cc/min |                        |         |



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**FIGURE 1** - REACTOR SYSTEM

1. The reactor system consists of the following major components:

- REACTION PRESSURE VESSEL
- REACTOR CONTAINMENT
- STEAM GENERATOR
- CONDENSER
- DRUM
- HEAT EXCHANGER
- PUMP
- VALVE
- ELECTRICAL CONNECTIONS

2. The reactor system is designed to operate at a pressure of 15.5 MPa (2250 psi) and a temperature of 300°C (572°F).

3. The reactor system is designed to produce a maximum power output of 1000 MW (1341 million BTU/hr).

4. The reactor system is designed to operate for a minimum of 30 years.

5. The reactor system is designed to be safe and reliable.

6. The reactor system is designed to be easy to maintain.

7. The reactor system is designed to be cost-effective.

8. The reactor system is designed to be environmentally friendly.

9. The reactor system is designed to be flexible.

10. The reactor system is designed to be adaptable.

REACTOR SYSTEM

1. REACTOR SYSTEM

2. REACTOR SYSTEM

3. REACTOR SYSTEM

4. REACTOR SYSTEM

5. REACTOR SYSTEM

6. REACTOR SYSTEM

7. REACTOR SYSTEM

8. REACTOR SYSTEM

9. REACTOR SYSTEM

10. REACTOR SYSTEM

**SECRET**

UNCLASSIFIED EXCEPT WHERE SHOWN OTHERWISE

CLASSIFICATION AUTHORITY: 1.4(f)

DATE OF DECLASSIFICATION: N/A

GROUP 1

EXEMPT FROM AUTOMATIC DOWNGRADING AND DECLASSIFICATION

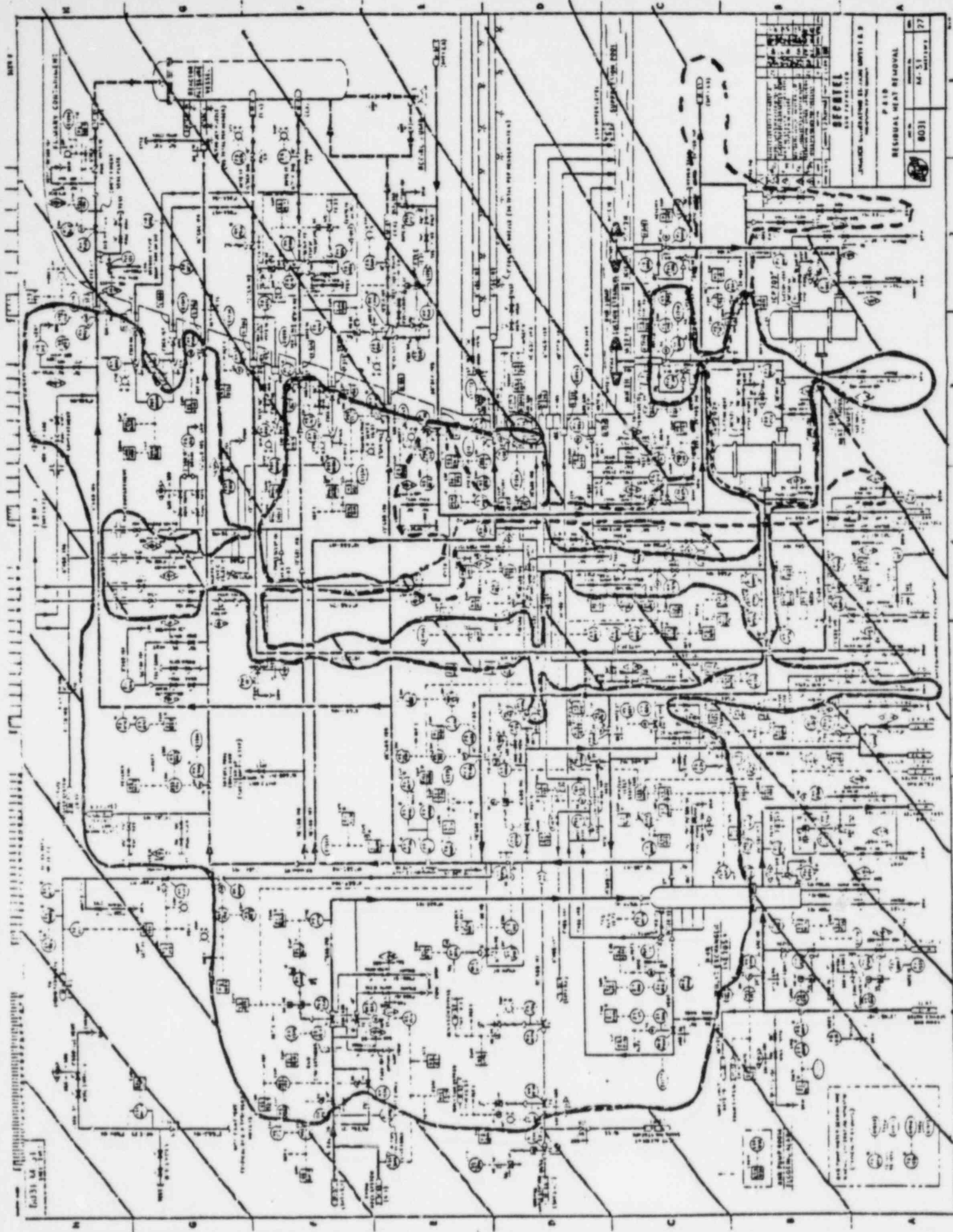
DATE OF REVIEW: N/A

REVIEW AUTHORITY: N/A

FORM NO. 104-101 (10-65)

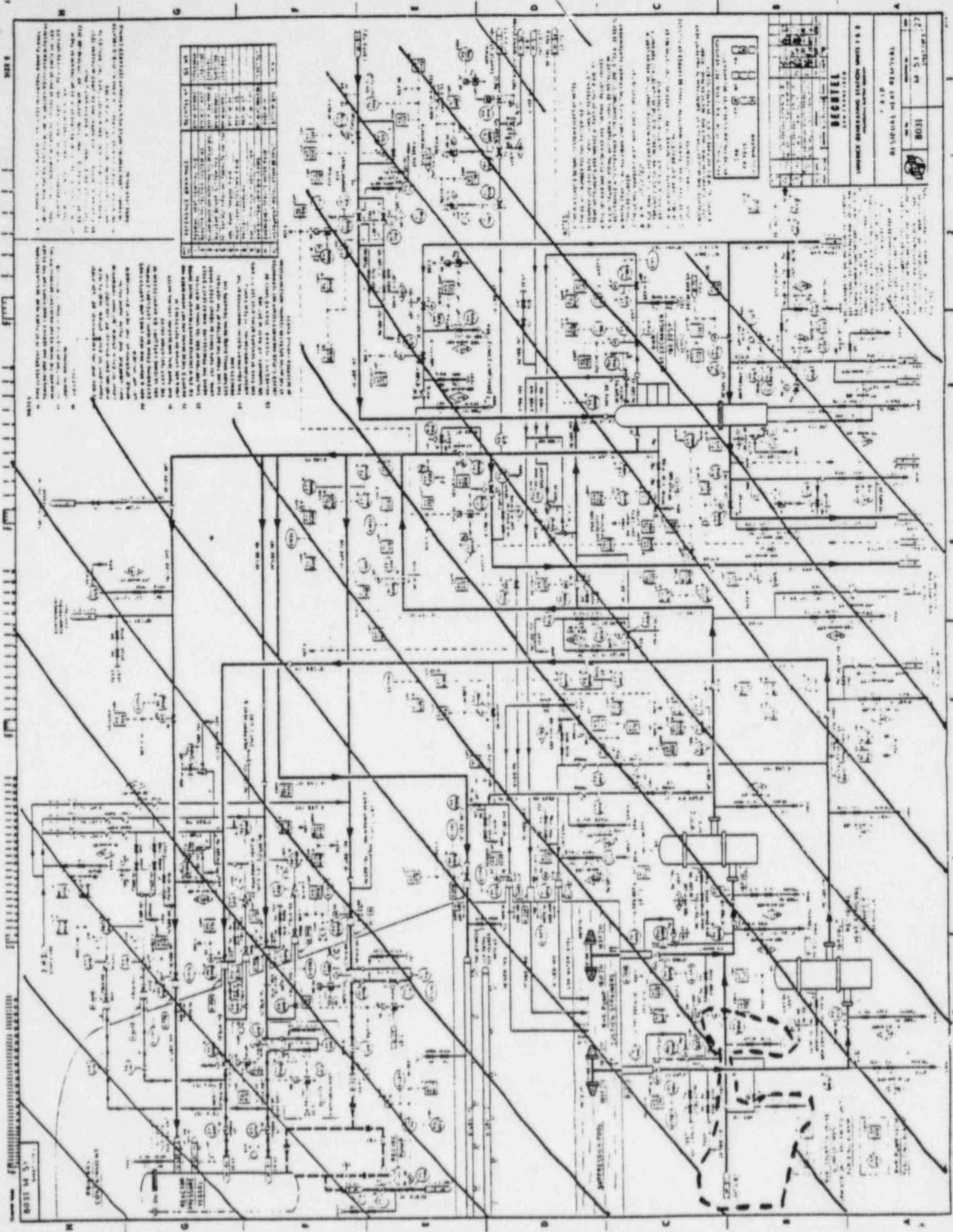
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| SECRET   |    |
| CLASSIFIED BY: 6031                                |    |
| REASON FOR DECLASSIFICATION: RESIDUAL HEAT REMOVAL |    |
| 6031   | 77 |

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| RELAY | CONTACTS         | WIRING           |
|-------|------------------|------------------|
| R1    | 1-1, 1-2, 1-3    | 1-1, 1-2, 1-3    |
| R2    | 2-1, 2-2, 2-3    | 2-1, 2-2, 2-3    |
| R3    | 3-1, 3-2, 3-3    | 3-1, 3-2, 3-3    |
| R4    | 4-1, 4-2, 4-3    | 4-1, 4-2, 4-3    |
| R5    | 5-1, 5-2, 5-3    | 5-1, 5-2, 5-3    |
| R6    | 6-1, 6-2, 6-3    | 6-1, 6-2, 6-3    |
| R7    | 7-1, 7-2, 7-3    | 7-1, 7-2, 7-3    |
| R8    | 8-1, 8-2, 8-3    | 8-1, 8-2, 8-3    |
| R9    | 9-1, 9-2, 9-3    | 9-1, 9-2, 9-3    |
| R10   | 10-1, 10-2, 10-3 | 10-1, 10-2, 10-3 |

SECRET  
 UNCLASSIFIED  
 SECURITY INFORMATION  
 CONTROLLED DATA  
 CONTROLLED INFORMATION  
 CONTROLLED TECHNOLOGY  
 CONTROLLED DATA  
 CONTROLLED INFORMATION  
 CONTROLLED TECHNOLOGY

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81 P  
 DISQUALIFIED PERSONNEL

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