UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

August 15, 1979

Docket No. 50-286

LICENSEE: POWER AUTHORITY OF THE STATE OF NEW YORK

FACILITY: INDIAN POINT, UNIT NO. 3

SUBJECT: SUMMARY OF MEETING ON AUGUST 7, 1979, TO DISCUSS RESOURCE RECOVERY SYSTEM INTERFACE WITH INDIAN POINT, UNIT NO. 3

A meeting was held on August 7, 1979, between representatives of the Power Authority of the State of New York (PASNY), Black & Veatch, and the NRC staff. A list of attendees is given in Enclosure 1. The purpose of the meeting was to discuss the interface between Indian Point 3 and a municipal solid waste (MSW) incinerator plant being constructed by Westchester County. The material in Enclosure 2 was distributed at the meeting and summarizes the formal presentation given by the licensee.

In addition to the three plans listed in Enclosure 2, two other plans were discussed. Plan D uses the MSW facility as the heat input for a distillation plant, the output of which would be used for Indian Point 3 and others. Plan E involves constructing a turbine-generator at the MSW facility and tying its electrical output into the Indian Point 3 switchyard.

During the meeting the following comments were made by the NRC staff:

(1) In several of the plans (especially Plan A), a steam generator tube leak could result in the transfer of radioactive water to the MSW facility. Therefore, radiation monitoring of the return line to the MSW facility would be required.

(2) The licensee should determine if the proposed plan increases the consequences or probability of accidents or transients. For example, in Plan B, the loss of feedwater heating and, in Plan C, the partial loss of feedwater are transients that should be reviewed.

(3) The licensee should demonstrate that a sudden loss of MSW steam would not create a transient that may result in reactor thermal output greater than that which is licensed.

(4) If the plan chosen by the licensee requires a change to the license or Technical Specifications, the NRC must review the change. The review would probably be low priority and could take a significant amount of time. Although the licensee may conclude that a change tying Indian

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Point 3 with an incinerator plant could be made without prior Commission approval as provided for in 10CFR 50.59, it would be prudent to inform the NRC of such a conclusion before proceeding with the change.

(5) The licensee should consider what effect rupture of the steam pipe from the MSW facility could have on the nuclear plant.

The licensee said that our comments would be used in the final decision on the interface between Indian Point 3 and Worchester County's Municipal Solid Waste Incinerator Plant.

L. N. Olshan, Project Manager
Operating Reactors Branch #1
Division of Operating Reactors

Enclosures:
1. List of Attendees
2. Tentative Agenda for Meeting with NRC

cc: w/enclosures
See next page

Enclosure 1

LIST OF ATTENDEES

POWER AUTHORITY OF THE STATE OF NEW YORK MEETING

PASNY

G. Stillman
A. Thau
S. Wayne

NRC

T. Decker *
L. Olshan
R. Samworth
J. Wilson
R. Woods

BLACK & VEATCH

S. Day
K. Habiger
E. Smith

* Part-time attendance

Enclosure 2

WESTCHESTER COUNTY, NEW YORK
POWER AUTHORITY OF THE STATE OF NEW YORK
RESOURCE RECOVERY SYSTEM INTERFACE STUDY

MEETING WITH THE NUCLEAR REGULATORY COMMISSION, AUGUST 7, 1979

TENTATIVE AGENDA

I. Introduction

A. Introduction of meeting participants

B. Presentation of background information

1. Westchester County Plans for a municipal solid waste (MSW) incinerator plant. Study program and consultant input.

2. Location of MSW plant.

3. Potential uses of MSW plant steam.

C. Objectives of meeting

1. Describe the alternative uses of MSW steam under consideration for IP3.

2. Identify potential NRC concerns for each of the alternatives. Discuss potential solution to problem areas.

3. Obtain listing of licensing requirements (Types of licenses, applications and hearing requirements, etc.).

4. Obtain from the NRC preliminary estimates of the schedule for the licensing process. Identify differences between alternatives.

5. Determine effect on IP3 license.

II. Alternative Uses of Steam at IP3

A. Description of existing IP3 facilities

1. General arrangement.

2. Source of cooling water and makeup water.

3. Turbine plant.

B. Plan A - Inject MSW steam into IP3 secondary steam loop

1. Plan description

2. Advantages/disadvantages

3. Concerns/potential solutions.

C. Plan B - Use MSW steam to heat feedwater at IP3

1. Plan description.

2. Advantages/disadvantages.

3. Concerns/potential solutions.

D. Plan C - Use MSW steam to drive an additional steam generator feedpump, to produce makeup water for IP3 and area industry, and to supply the auxiliary steam reboiler.

1. Plan description.

2. Advantages/disadvantages.

3. Concerns/potential solutions.

E. Summary comparison

III. NRC Comments

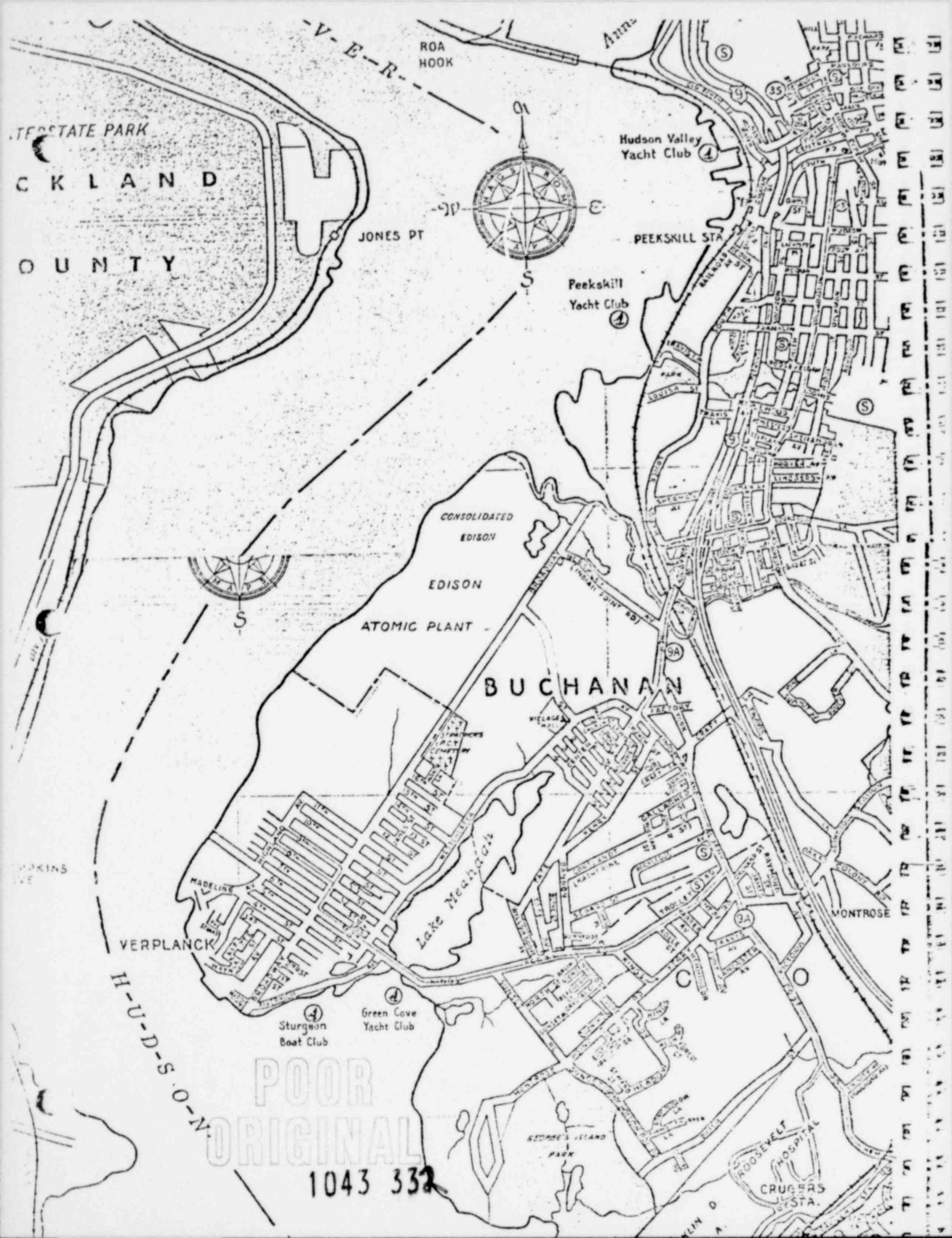
A. Potential problem areas/potential solutions

B. Licensing schedule

C. Comparative licensing feasibility

D. Unresolved issues

IV. Summary and conclusions



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WESTCHESTER COUNTY, NEW YORK
POWER AUTHORITY OF THE STATE OF NEW YORK
RESOURCE RECOVERY SYSTEM INTERFACE STUDY

MEETING WITH THE NUCLEAR REGULATORY COMMISSION
AUGUST 7, 1979

MEETING OBJECTIVES

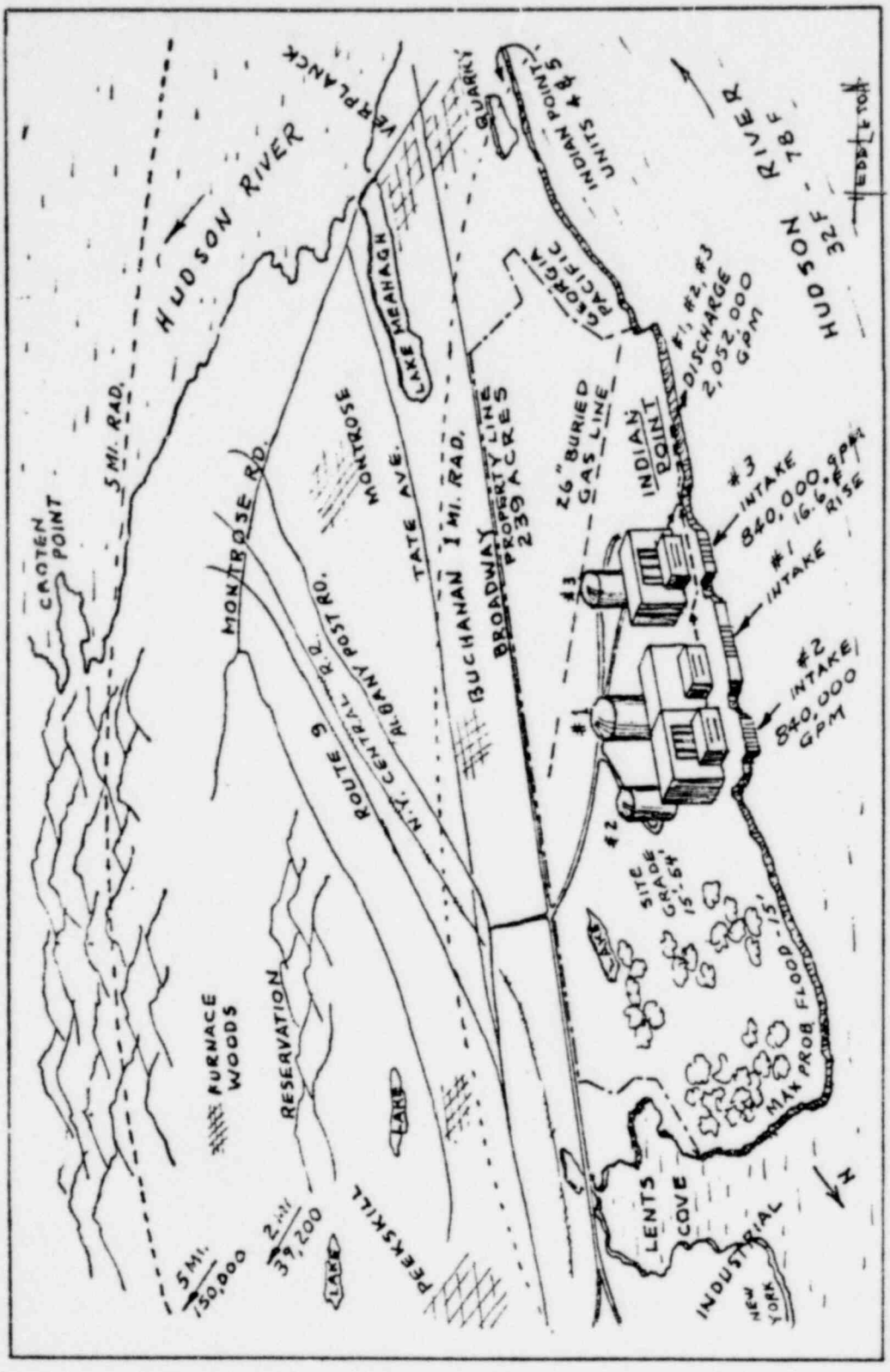
DESCRIBE ALTERNATIVE USES OF MSW STEAM AT IP3.

IDENTIFY POTENTIAL NRC CONCERNS. DISCUSS POTENTIAL SOLUTIONS.

OBTAIN LISTING OF LICENSING REQUIREMENTS.

OBTAIN ESTIMATES OF THE LICENSING SCHEDULE.

DETERMINE EFFECT ON THE CURRENT IP3 LICENSE.



NUCLEAR SAFETY INFORMATION CENTER

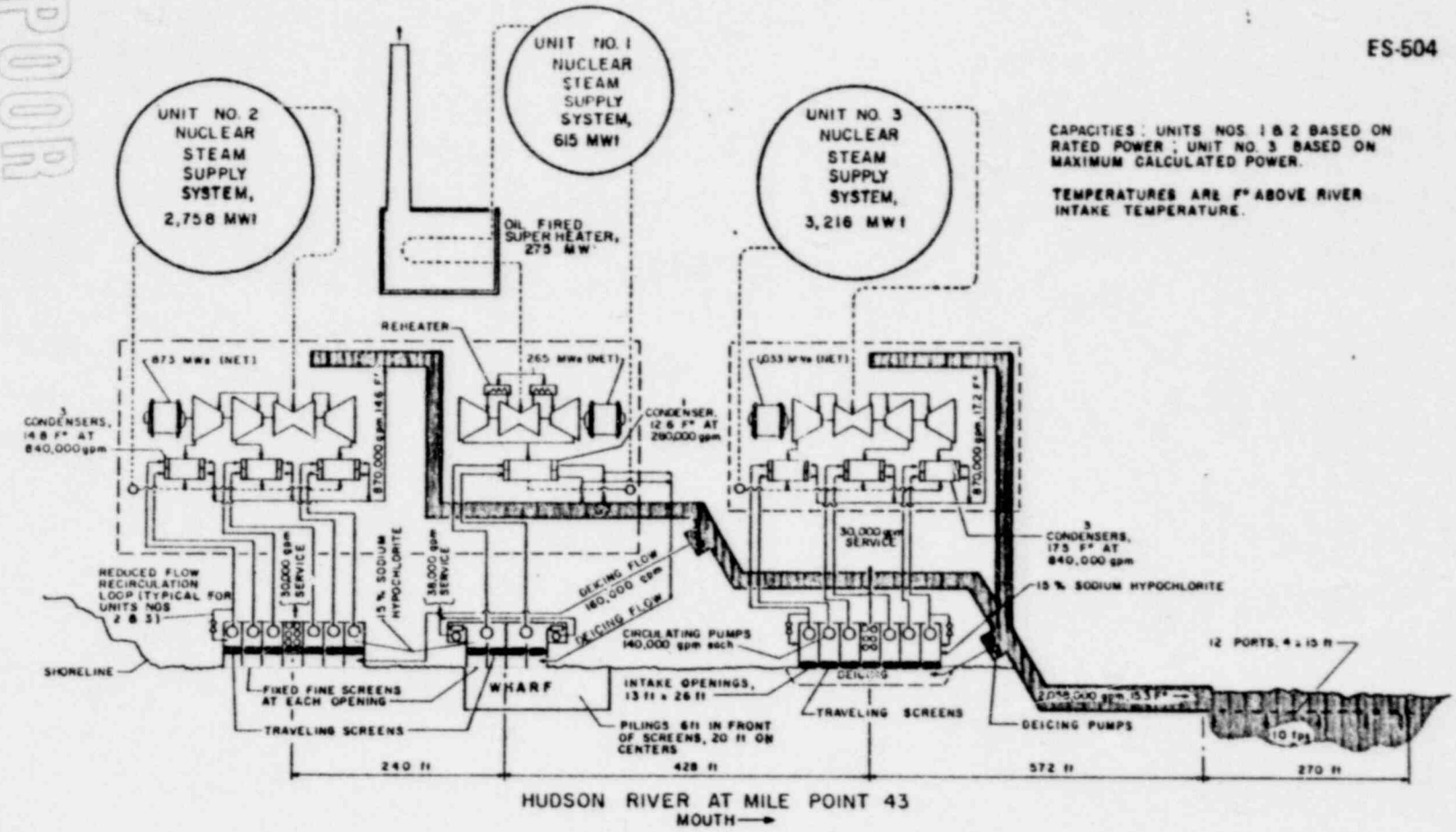
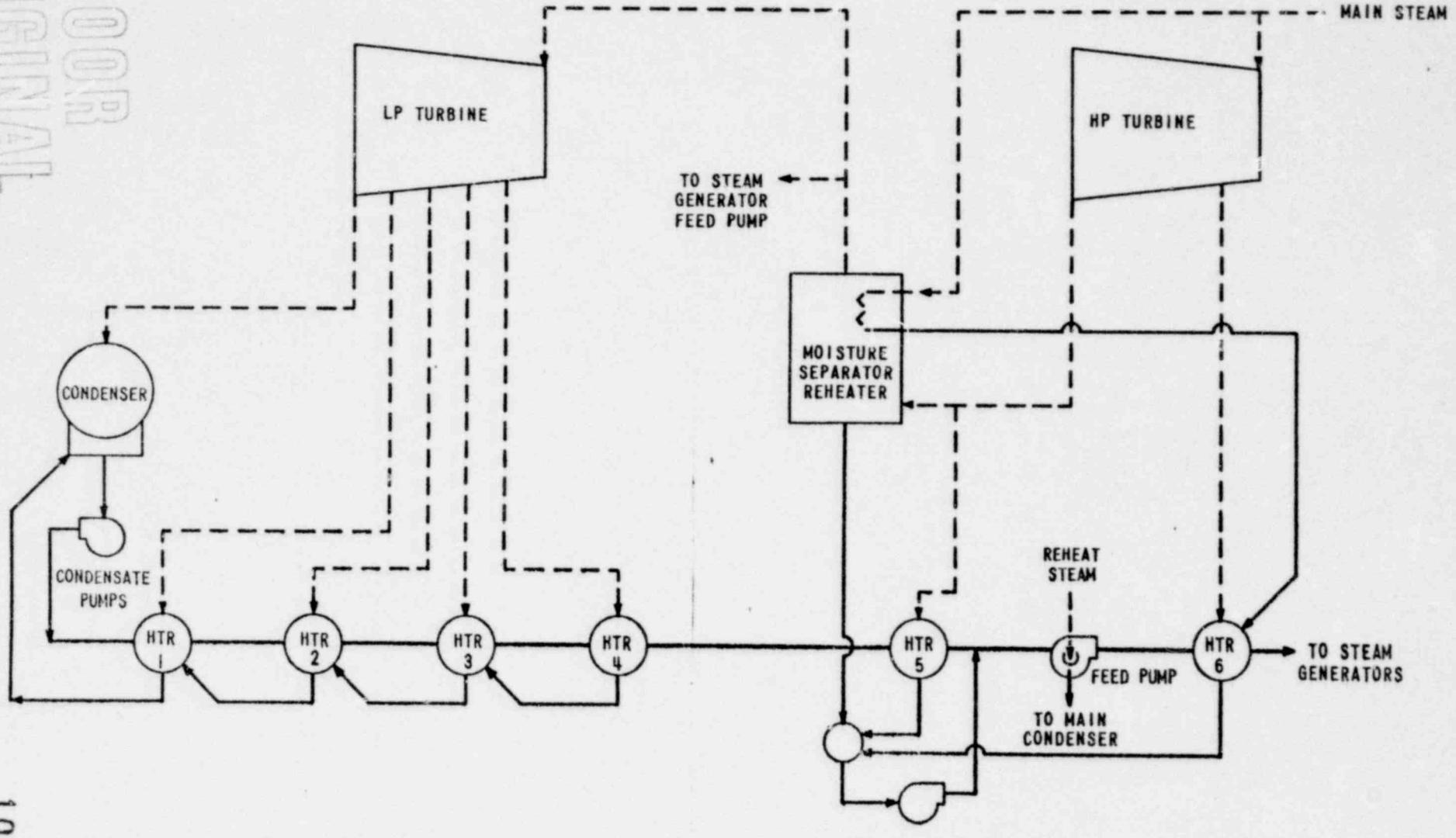


Fig. III-2. Schematic representation of Indian Point Plant cooling water systems.

INDIAN POINT 3 THERMAL CAPACITIES

	Capacities		
	Rated (Licensed)	Maximum Guaranteed	Maximum Calculated
Reactor Power, MW(t)	3,025	3,087	3,216
Gross Electrical Power, MW(e)	1,001	1,021	1,068
Net Electrical Power, MW(e)	965	986	1,033
Main Steam Flow, 10^6 lb/hr	12.97	13.28	13.95

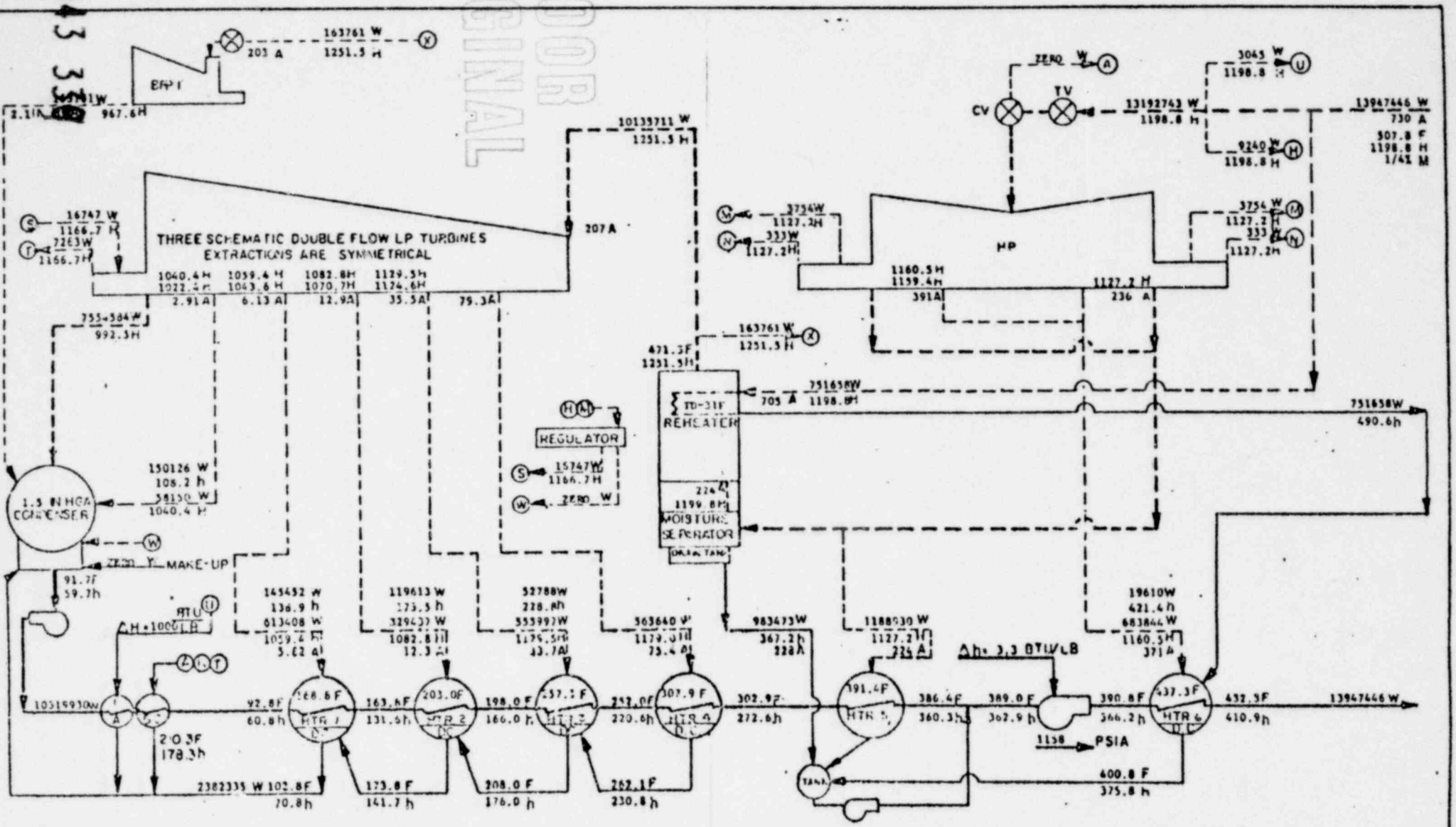


EXISTING INDIAN POINT 3 TURBINE CYCLE ARRANGEMENT

TABLE 10.1-1

STEAM AND POWER CONVERSION SYSTEM COMPONENT DESIGN PARAMETERS

Turbine-Generator	
Turbine Type	Four element, tandem-compound six - flow exhaust
Turbine Capacity (KW)	
Maximum guaranteed	1,021,793
Maximum calculated	1,068,701
Generator Rating (KVA)	1,125,600
Turbine Speed (rpm)	1800
Condensers	
Type	Radial flow, single pass, divided water box, deaerating
Number	3
Condensing Capacity (lbs of steam/hr)	7,230,000
Condensate Pumps	
Type	8 stage, vertical pit type, centrifugal
Number	3
Design Capacity (each-gpm)	7860
Motor Type	Vertical Induction
Motor Rating (hp)	3000
Feedwater Pumps	
Type	High Speed, barrel coring, single stage, centrifugal
Number	2
Design Capacity (each-gpm)	15,300
Pump Drive	Horizontal steam turbine
Drive Rating (hp)	8350



NET HEAT RATE = 13947446 (1158.8-610.9) / 1068701 = 10283 BTU/KW HR

1) CALCULATIONS ARE BASED ON NO RADIATION LOSSES TO HEATERS OR EXTRACTION PIPING LOCATED IN THE CONDENSER NECK.
2) PRIMARY VALVE AND ABOVE HEAT RATES ARE CALCULATED ON LOCUS OF VALVE POINTS.

STEAM GEN FLOW AT MAX CALC. IS NOT GUARANTEED.
MAX GUAR. SG. FLOW = 13283282 LB/HR. MAX.CALC. SG. FLOW = 13947446 LB/HR.

TEP = 992.3 BTU/LB
ELEP = 973.4 BTU/LB
MECH LOSS = 3648 KW
ELECT LOSS = 11940 KW
0.90PF 75 #H2
FWP POWER = 13624 KW
FWP EFF = 85%

1021793 KW TURB-GEN. UNIT TC6F-44 IN.
730 PSIA- 507.8 F 1.5 IN. HGA
1125600 KVA 0.90 PF 22000 VOLTS 75 #H2

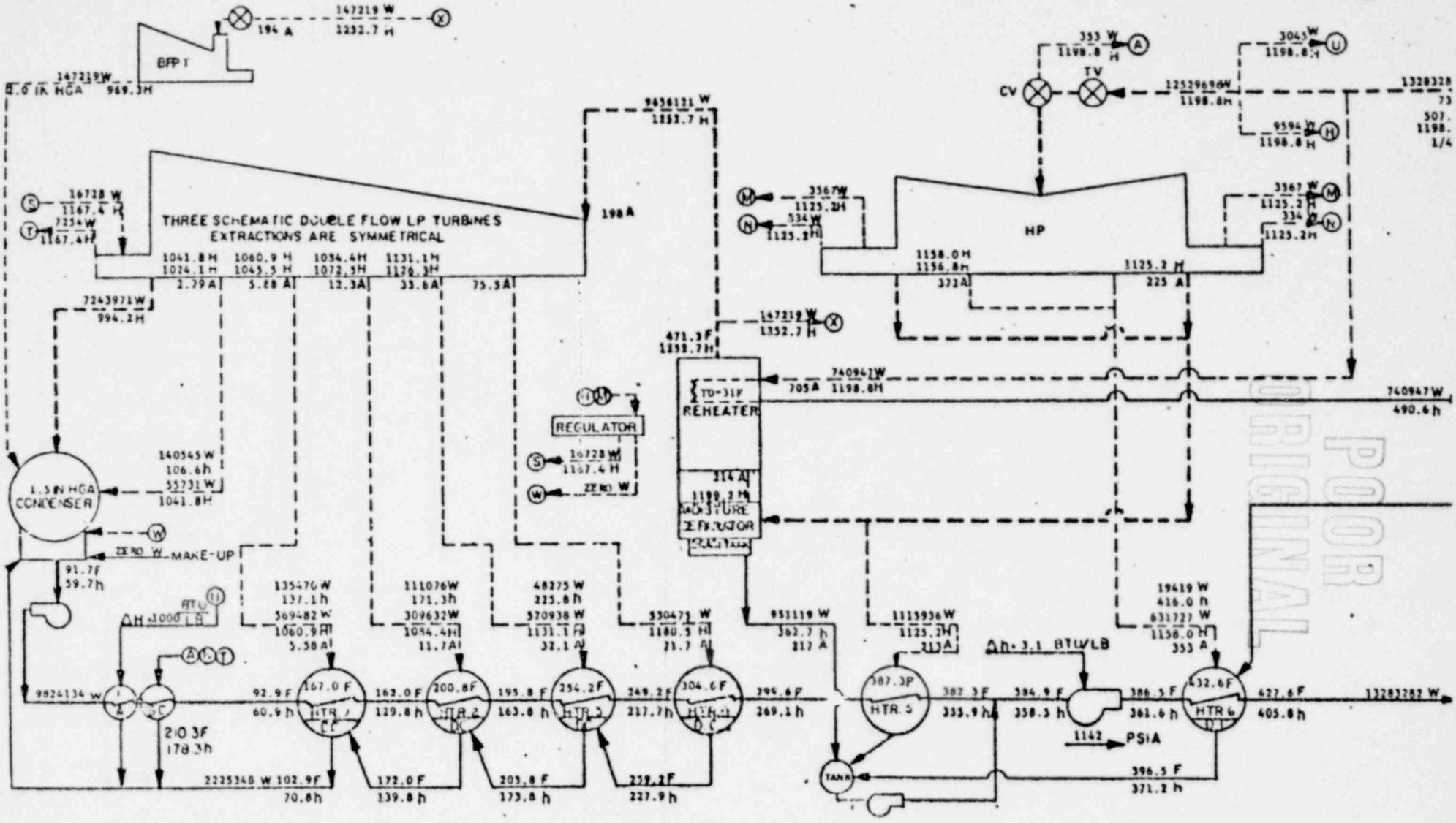
1068701 KW NET LOAD HEAT BALANCE

MAXIMUM CALCULATED - NOT GUARANTEED

FIGURE 10-2

LESTER, PENNA.

ENGR. VJN
LCD-2099
DATE: 2/13/68
CT-21369
REV. A 7/1/68



NET HEAT RATE = 13283282 (1198.8-405.8) / 1021793 = 10309 BTU/KW HR

① CALCULATIONS ARE BASED ON NO RADIATION LOSSES TO HEATERS OR EXTRACTION PIPING LOCATED IN THE CONDENSER NECK.
② PRIMARY VALVE AND ABOVE HEAT RATES ARE CALCULATED ON LOCUS OF VALVE POINTS.

STEAM GEN. FLOW AT MAX CALC. IS NOT GUARANTEED.
MAX GUAR. SG. FLOW = 13283282 LB/HR. MAX. CALC. SG. FLOW = 13947446 LB/HR.

TEP = 994.0 BTU/LB
ELEP = 976.7 BTU/LB
MECH LOSS = 3648 KW
ELECT LOSS = 12661. KW
0.90 PF 75 #H2
FWP POWER = 13226 KW
FWP EFF = 86%

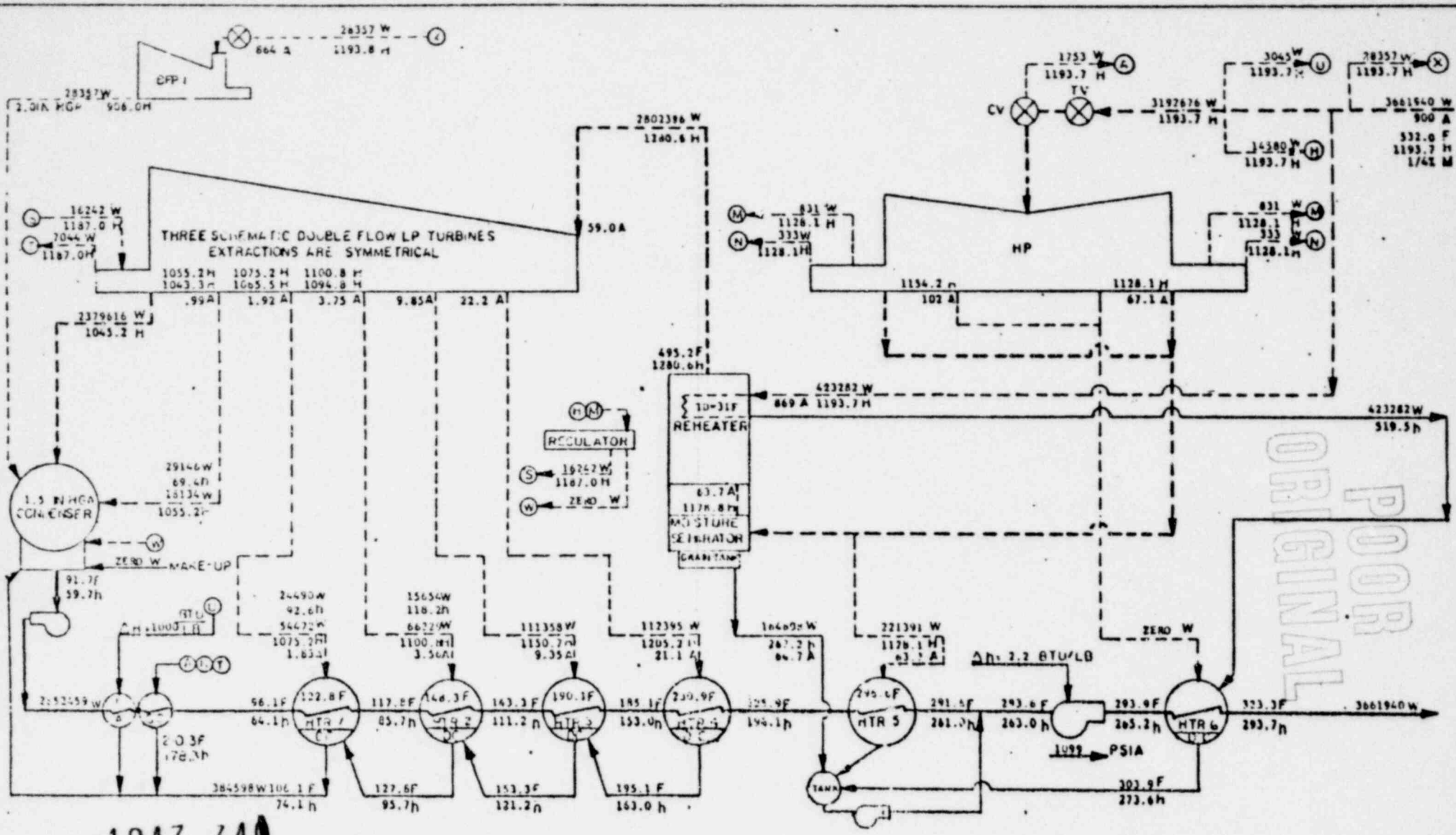
1021793 KW TURB-GEN. UNIT TC6F-44 IN.
730 PSIA - 507.8F 1.5 IN. HGA
1125600 KVA 0.90 PF 22000 VOLTS 75 #H2

1021793 KW NET LOAD HEAT BALANCE

MAXIMUM GUARANTEED

LESTER, PE
ENGR. VJN-J
LCD-209
DATE 2/13/6
CT-21370
REV. A 4/1

FIGURE 10-3



NET HEAT RATE = 3661940 (1193.7-293.7) / 285446 = 12902 BTU/KW HR

CALCULATIONS ARE BASED ON NO RADIATION LOSSES TO HEATERS OR EXTRACTION PIPING LOCATED IN THE CONDENSER NECK

Ⓟ PRIMARY VALVE AND ABOVE HEAT RATES ARE CALCULATED ON LOCUS OF VALVE POINTS

STEAM GEN FLOW AT MAX CALC. IS NOT GUARANTEED.

MAX GUAR. SG FLOW = 13283282 LB/HR. MAX CALC. SG FLOW = 13967446 LB/HR

TEP = 1044.7 BTU/LB
CLEP = 1038.2 BTU/LB
MECH LOSS = 3648 KW
ELECT LOSS = 5032 KW
0.85 PF 75 $^{\circ}H_2$
FWP POWER = 2391 KW
FWP EFF. = 80%

1021783KW TURB-GEN UNIT TC6F-44 IN.
730 PSIA - 507.8 F 1.5 IN. HGA
1125600KVA 0.90 PF 22000VOLTS 75 $^{\circ}H_2$

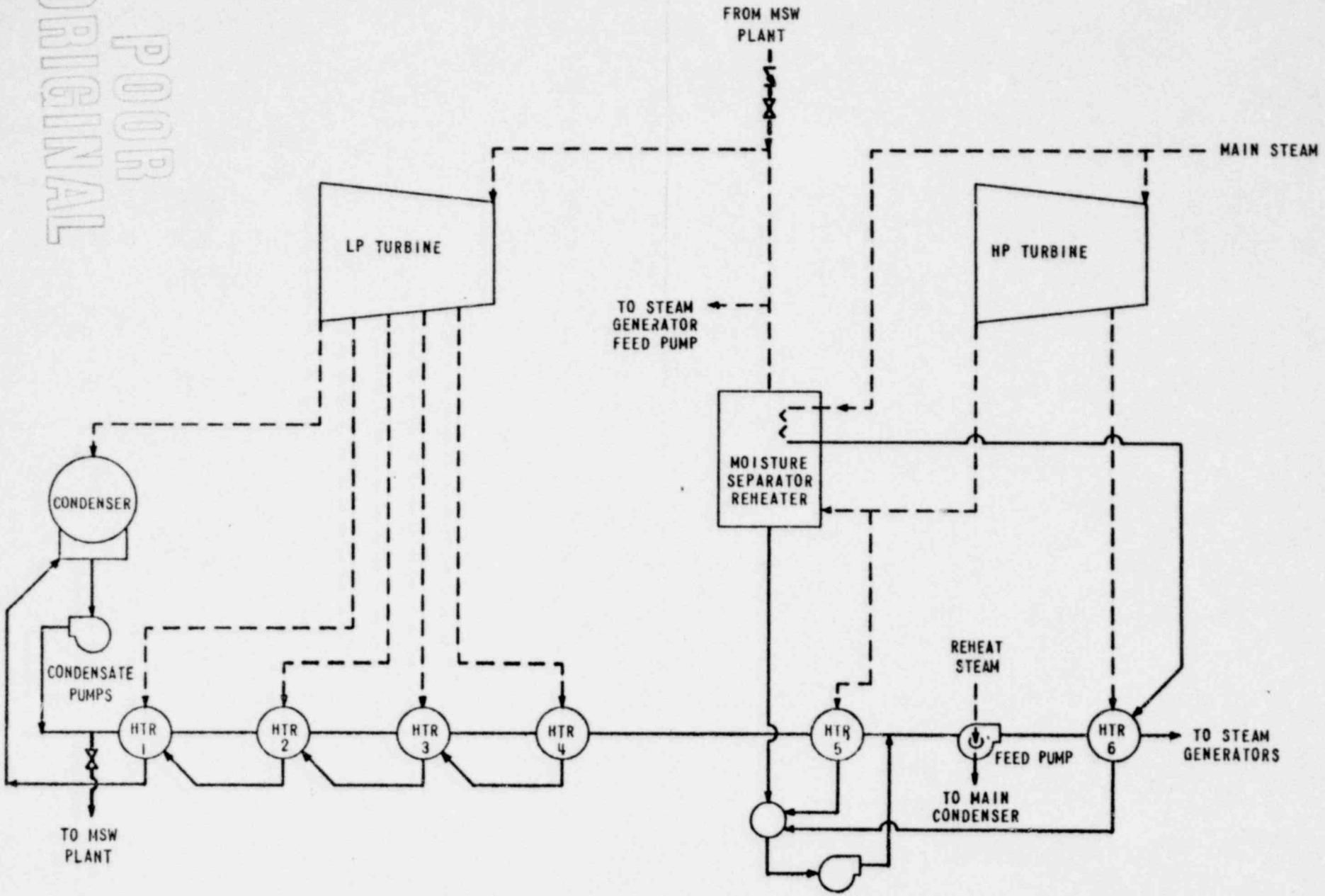
285446 KW NET LOAD HEAT BALANCE

25% LOAD

FIGURE 10-7

WESTINGHOUSE
LESTER, PENNA.

ENGR. VJM-JLF
LCD-2111
DATE 2/12/68
CT-21374
REV A 4/1/68



PLAN A - INJECT MSW STEAM INTO IP 3 SECONDARY STEAM CYCLE

RESOURCE RECOVERY SYSTEM INTERFACE STUDY

PLAN A - INJECT MSW STEAM INTO THE IP3

SECONDARY STEAM CYCLE

ADVANTAGES AND DISADVANTAGES

ADVANTAGES

- LARGE POTENTIAL FOR INCREASED ELECTRICAL OUTPUT
- LOW CAPITAL COSTS

DISADVANTAGES

- WATER CHEMISTRY AND MATERIAL REQUIREMENTS
- LOAD FOLLOWING REQUIREMENTS
- ADDITIONAL BOUNDARY SEPARATION REQUIREMENTS
- RADIATION DOSE CONSIDERATIONS
- TIME AND EFFORT REQUIRED FOR LICENSING

RESOURCE RECOVERY SYSTEM INTERFACE STUDY

PLAN A - INJECT MSW STEAM INTO THE IP3

SECONDARY STEAM CYCLE

LICENSING CONCERNS AND POTENTIAL SOLUTIONS

CHEMISTRY AND MATERIALS

- ALL VOLATILE MSW CHEMISTRY
- MSW MATERIAL SPECIFICATIONS

LOAD FOLLOWING

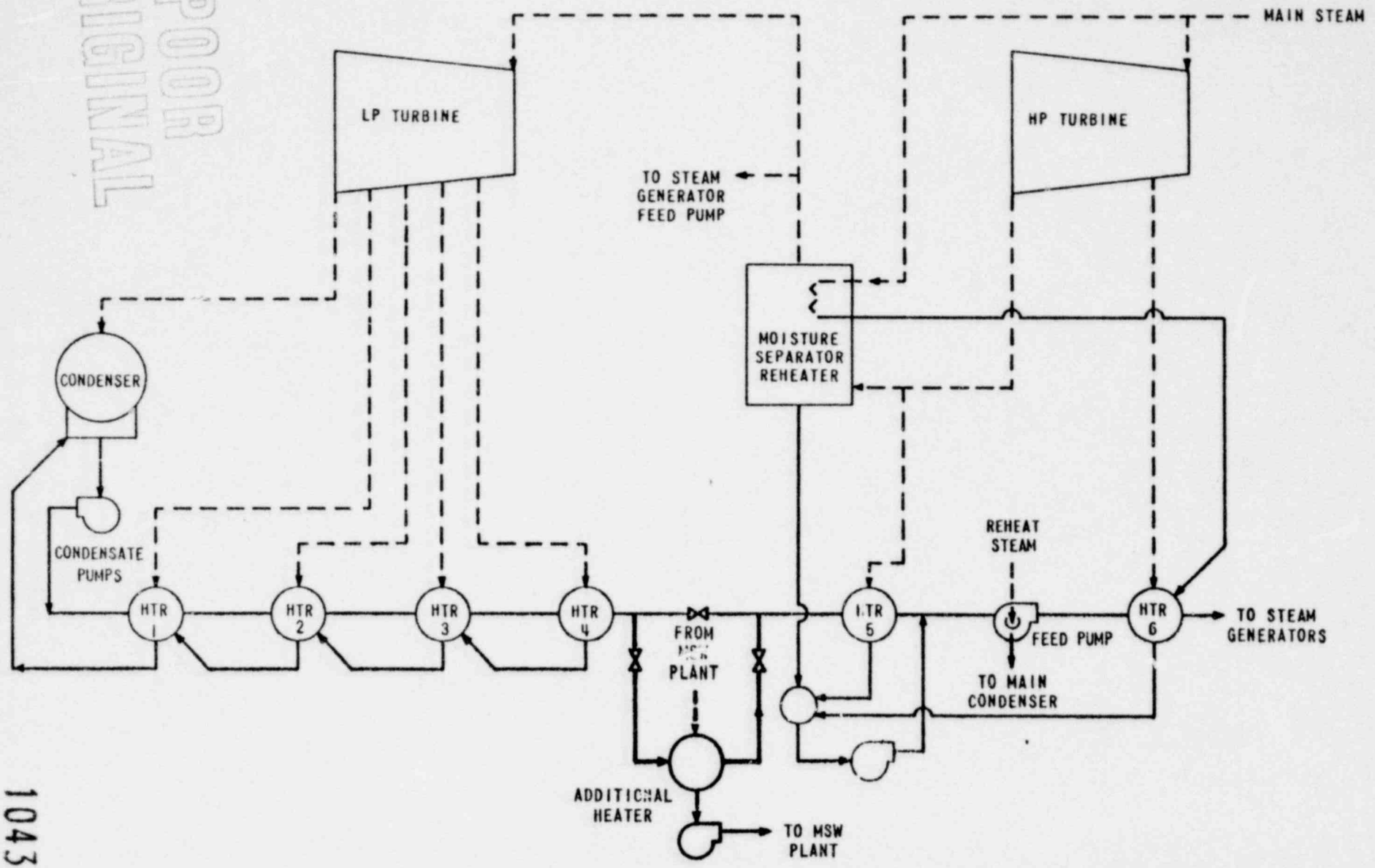
- CONTROL VALVES

BOUNDARY SEPARATION

- STEAM ANALYZERS
- ISOLATION VALVES (AUTOMATIC ISOLATION)

RADIATION DOSE

- ADDITIONAL DOSE CALCULATIONS
- RADIATION MONITORS
- ISOLATION VALVES (AUTOMATIC ISOLATION)



PLAN B - USE MSW STEAM TO HEAT AN ADDITIONAL IP 3 FEEDWATER HEATER

RESOURCE RECOVERY SYSTEM INTERFACE STUDY
PLAN B - USE MSW STEAM TO HEAT FEEDWATER
AT IP3

ADVANTAGES AND DISADVANTAGES

ADVANTAGES

- MODERATELY LARGE POTENTIAL FOR INCREASED ELECTRICAL OUTPUT
- INTERMEDIATE CAPITAL COSTS
- SIMPLIFIED CONTROL
- BARRIER BETWEEN IP3/MSW FLUIDS
- MODERATE LICENSING REQUIREMENTS

DISADVANTAGES

- REQUIRES NEW BUILDING
- POTENTIAL HEAT EXCHANGER TUBE LEAKS (OFFSITE DOSE POTENTIAL)

RESOURCE RECOVERY SYSTEM INTERFACE STUDY

PLAN B - USE MSW STEAM TO HEAT FEEDWATER

AT IP3

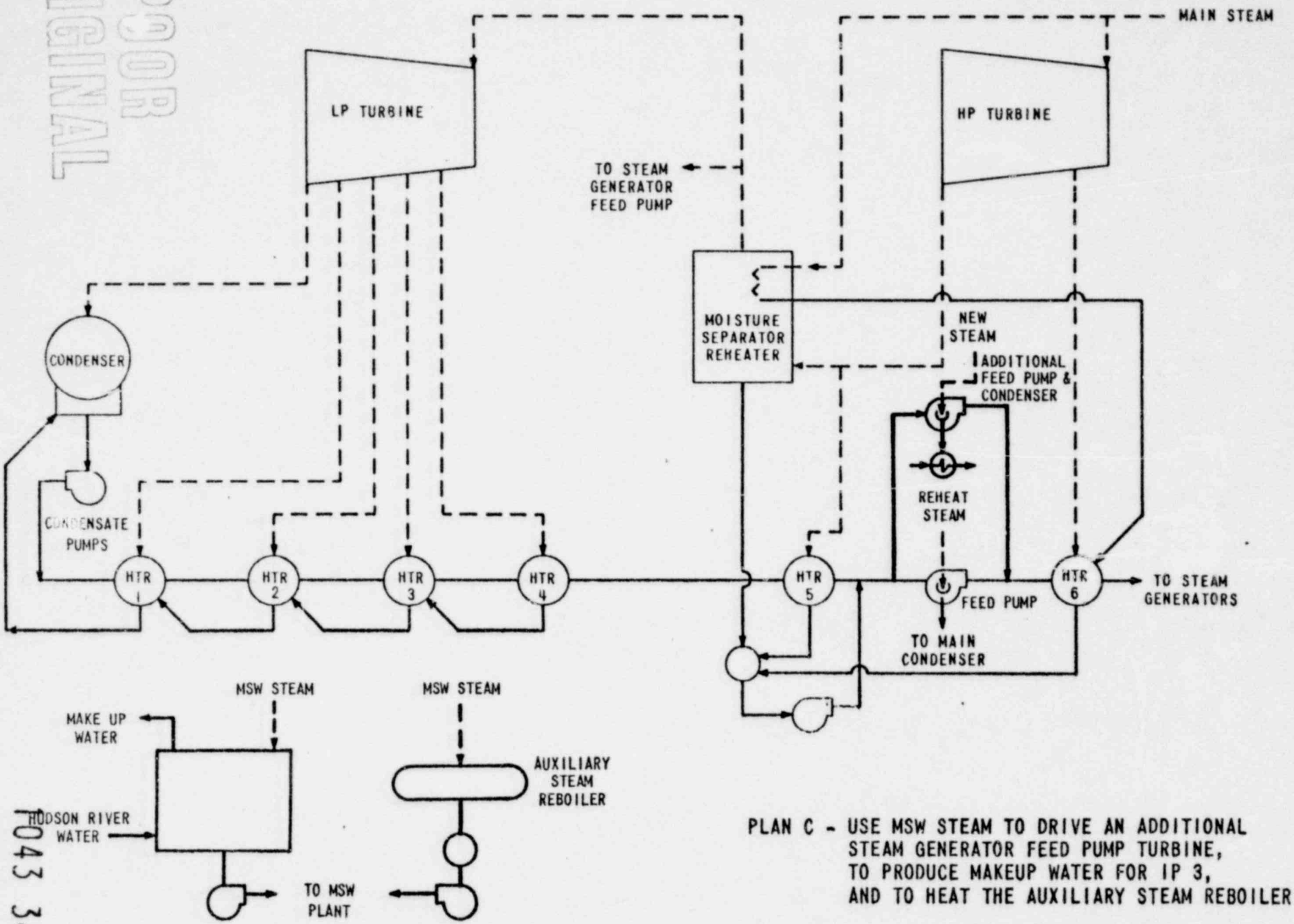
LICENSING CONCERNS AND POTENTIAL SOLUTIONS

HEAT EXCHANGER TUBE LEAKS

- ADDITIONAL DOSE CALCULATIONS
- RADIATION MONITORS
- ISOLATION VALVES (AUTOMATIC ISOLATION)

POTENTIAL CHANGE IN FEEDWATER TEMPERATURES

- STEADY STATE/TRANSIENT ANALYSES



PLAN C - USE MSW STEAM TO DRIVE AN ADDITIONAL STEAM GENERATOR FEED PUMP TURBINE, TO PRODUCE MAKEUP WATER FOR IP 3, AND TO HEAT THE AUXILIARY STEAM REBOILER

RESOURCE RECOVERY SYSTEM INTERFACE STUDY
PLAN C - USE OF MSW STEAM TO PROVIDE MAKEUP WATER FOR IP3, TO HEAT THE AUXILIARY STEAM REBOILER, AND TO DRIVE AN ADDITIONAL STEAM GENERATOR FEEDPUMP

ADVANTAGES/DISADVANTAGES

ADVANTAGES

- PROVIDES ALTERNATE SOURCE OF MAKEUP WATER
- IMPROVED PLANT AVAILABILITY
- NO POTENTIAL FOR IP3/MSW FLUID MIXING
- PARTIAL USER OF MSW STEAM WHEN IP3 IS DOWN
- SIMPLIFIED LICENSING
- ADDITIONAL ELECTRICAL OUTPUT

DISADVANTAGES

- HIGH CAPITAL COSTS
- REQUIRES NEW BUILDING
- COMPLICATES FEEDPUMP CONTROL
- REQUIRES ADDITIONAL INTAKE STRUCTURE OR MODIFICATION OF EXISTING CIRCULATING WATER SYSTEM

LICENSING CONCERNS AND POTENTIAL SOLUTIONS

FEEDPUMP CONTROL

- DETAILED STEADY STATE AND TRANSIENT ANALYSES

WESTCHESTER COUNTY, NEW YORK
POWER AUTHORITY OF THE STATE OF NEW YORK
RESOURCE RECOVERY SYSTEM INTERFACE STUDY

POTENTIAL INCREASE IN ELECTRICAL
GENERATING CAPACITY

Plan	Additional Generating Capacity, MWe
A (Inject steam into LP turbine)	18.2
B (Additional feedwater heater)	23.7
C (Feedpump turbine, aux. steam reboiler)	
Feedpump turbine	4.6
Aux. steam reboiler	5.5

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Power Authority of the State of New York

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Meeting Summary for
Indian Point 3

Docket File
NRC PDR
Local PDR
NRR Reading
ORB1 Reading
H. Denton
E. Case
D. Eisenhut
G. Zech
W. Gammill
J. Miller
L. Shao
R. Vollmer
W. Russell
B. Grimes
T. J. Carter
T. Ippolito
R. Reid
A. Schwencer
D. Ziemann
V. Noonan
P. Check
G. Lainas
G. Knighton
Chief, Systematic Evaluation Branch
Project Manager
DOR Licensing Assistant
OELD
OI&E (3)
R. Fraley, ACRS (16)
Program Support Branch
TERA
J. R. Buchanan
NRC Participants
Short Service List