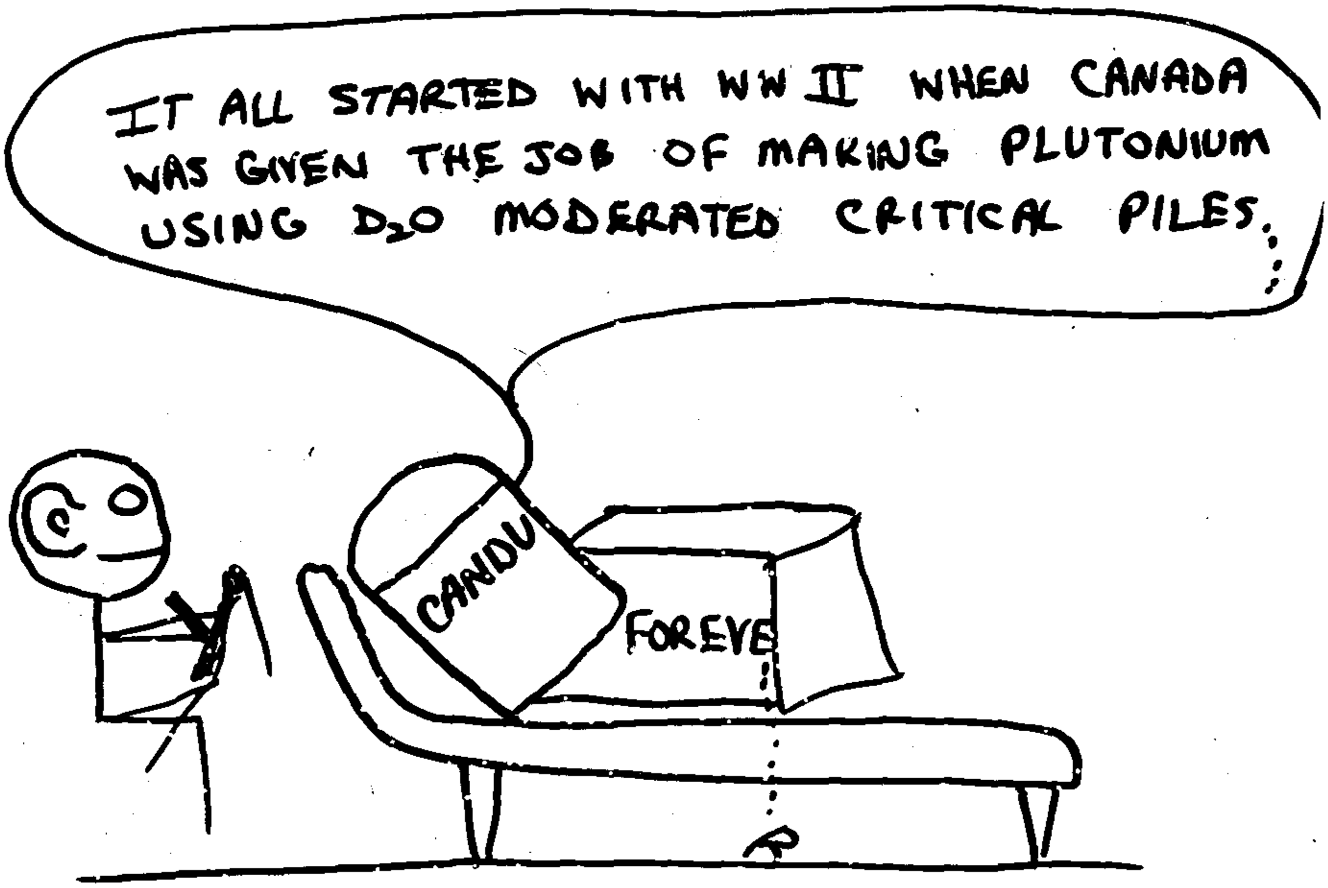
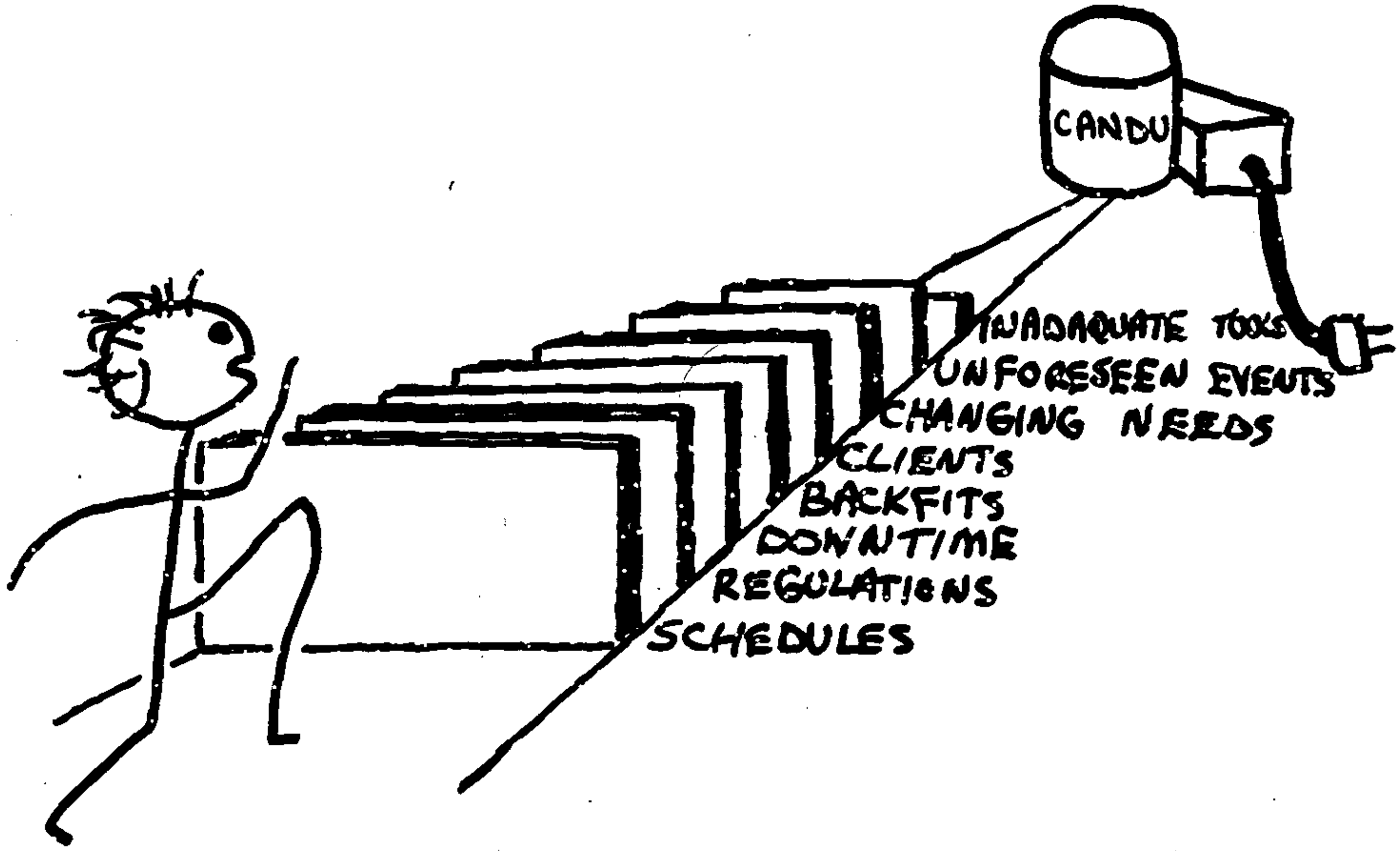
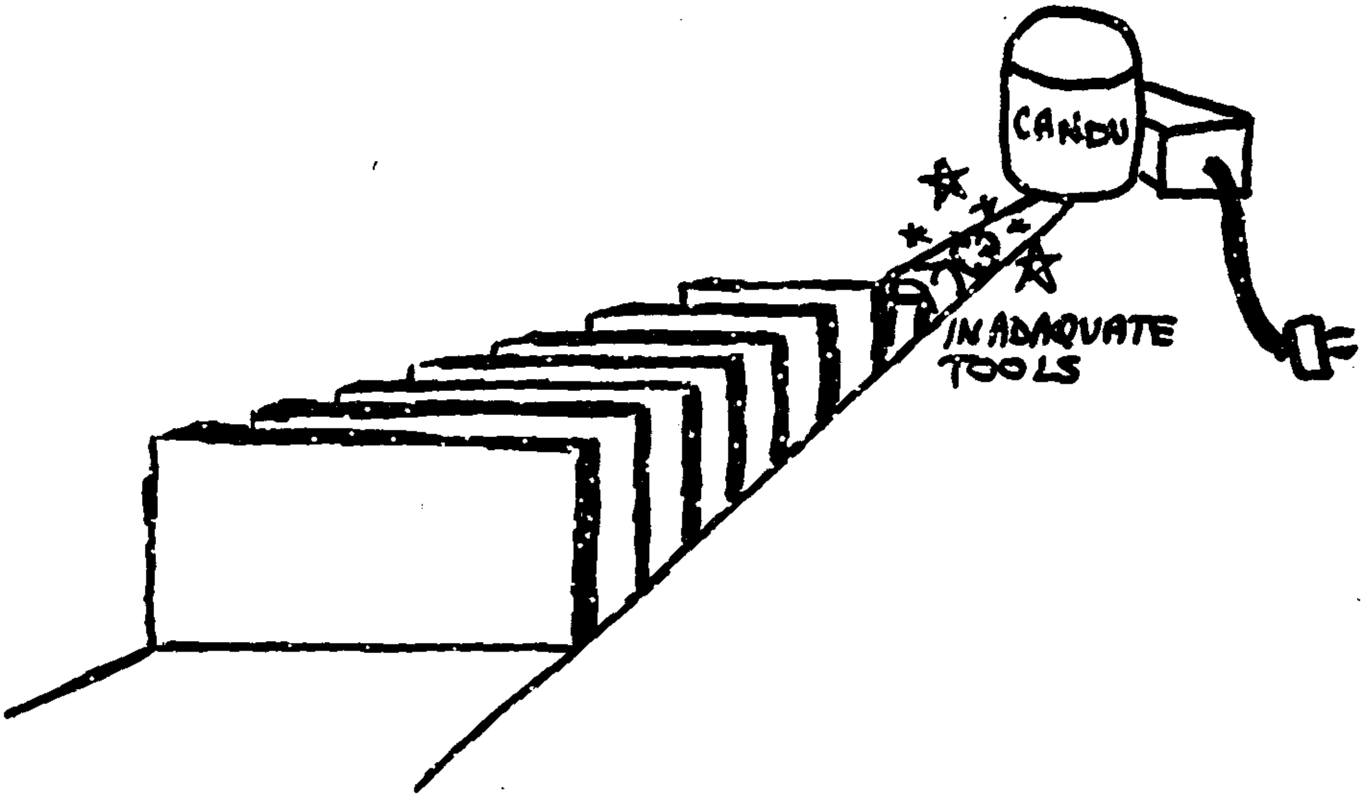


GET TO KNOW WHAT YOU HAVE TO MODEL.



IN THE GREAT SCHEME OF THINGS,

COMPUTATION IS NOT THE DESIGNER/ANALYST'S BIGGEST PROBLEM



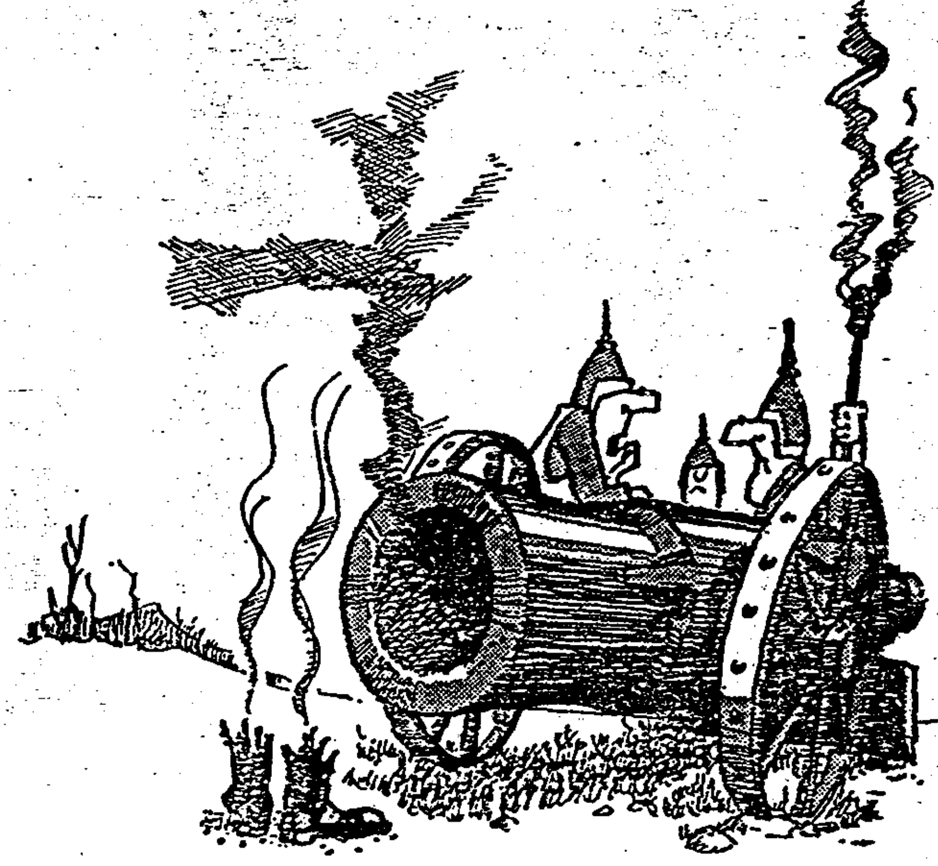
BUT IT CAN'T BE IGNORED!

- THE ISSUES OF COMPUTATIONAL ACCURACY, SPEED, EFFICIENCY, CONVERGENCE, STABILITY, CONSISTENCY, ETC. ARE GENERALLY NOT MAJOR ISSUES — BECAUSE ADVANCES HAVE BEEN MADE IN THESE AREAS.

- THE PROBLEM IS USUALLY ONE OF ACHIEVING A DESIGN OR ANALYSIS THAT IS GOOD ENOUGH, ON TIME AND WITHIN BUDGET.

KNOWING <u>HOW</u> TO DO A SPECIFIC TASK IS USUALLY EASY.

"Herman . . . two is load . . . THREE is fire!"



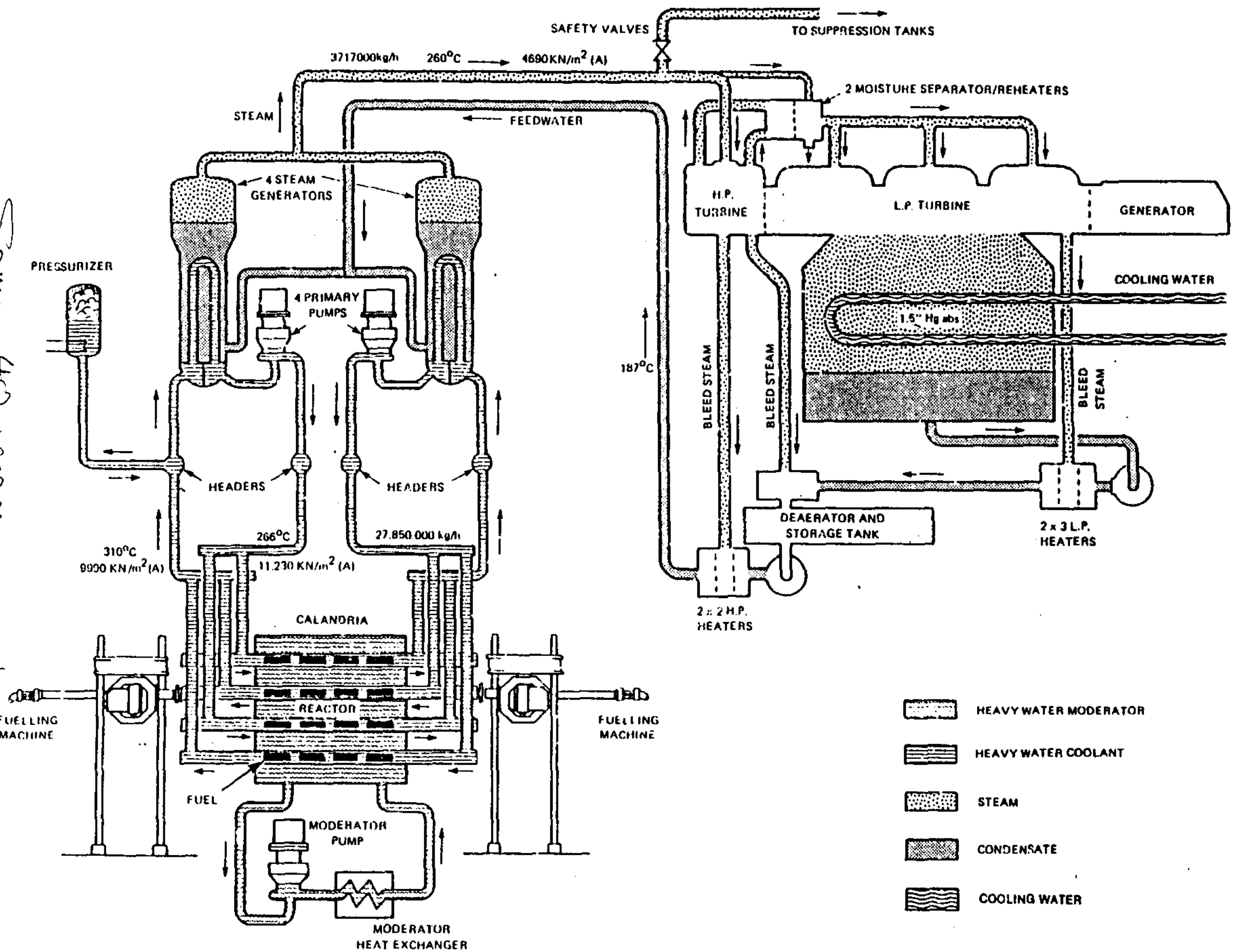
KNOWING <u>WHEN</u> IS USUALLY NOT SO EASY.

GENERAL STRATEGY:

1) ROUGH IN ENTIRE PROBLEM/SOLUTION
2) REFINE
3) ITERATE

THIS IS NOT SO DIFFERENT FROM ANY CONVERGENCE ALGORITHM.

SO WHY IS IT SO OFTEN IGNORED?



Some 40 process systems involving thermohydraulics.

FIGURE 1.1 CANDU NUCLEAR POWER SYSTEM

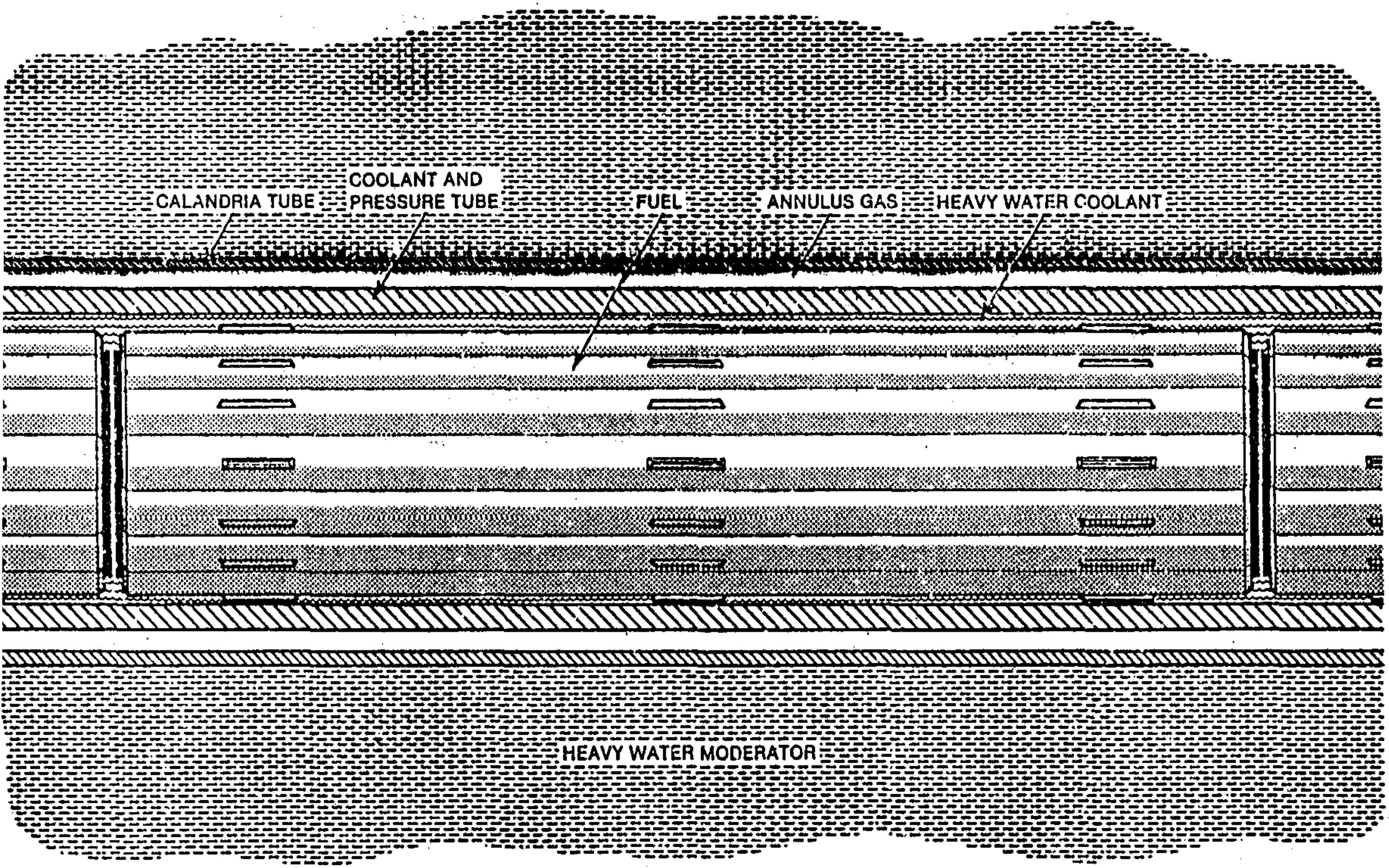


FIGURE 1.2 FUEL CHANNEL ARRANGEMENT

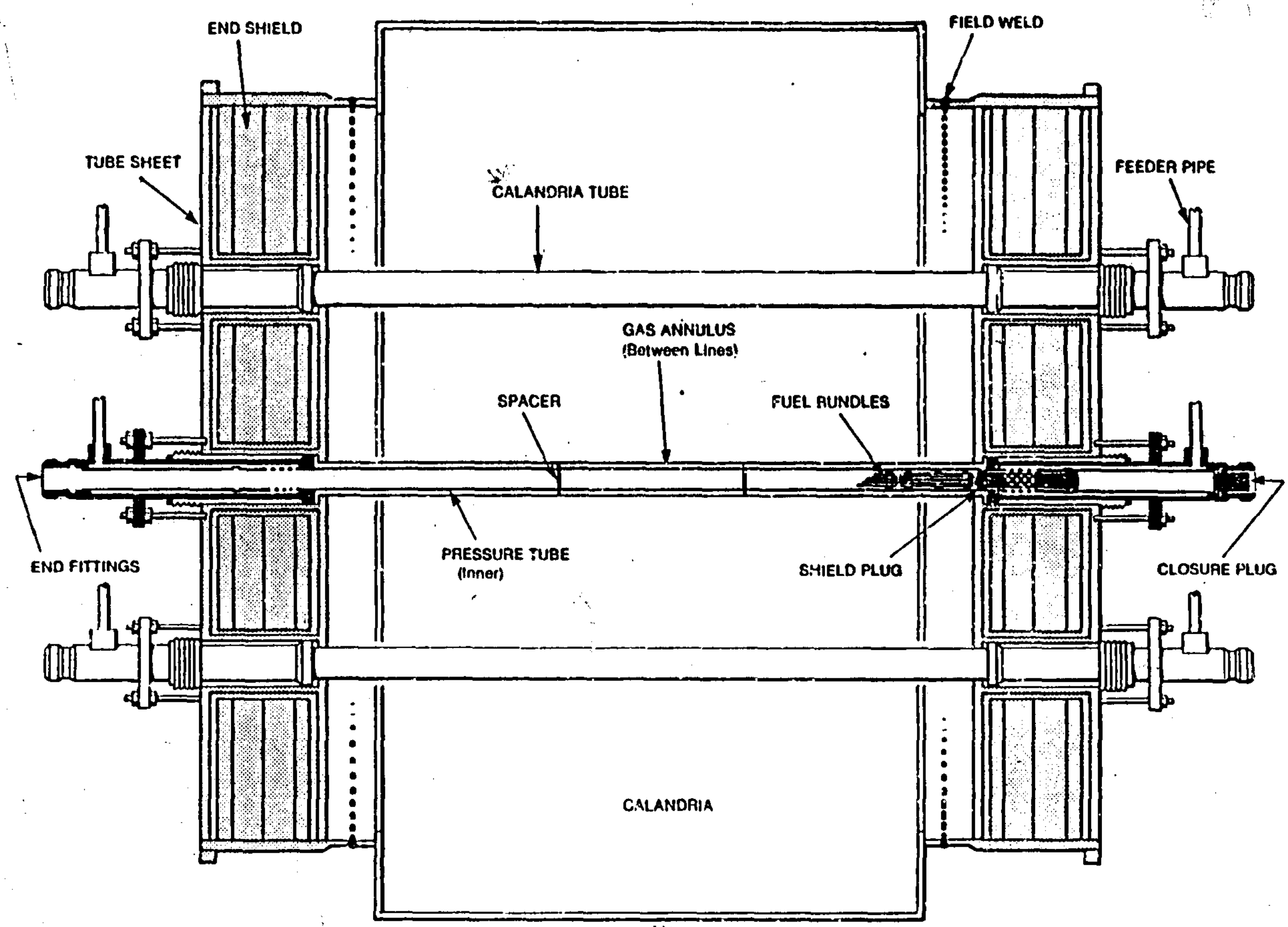
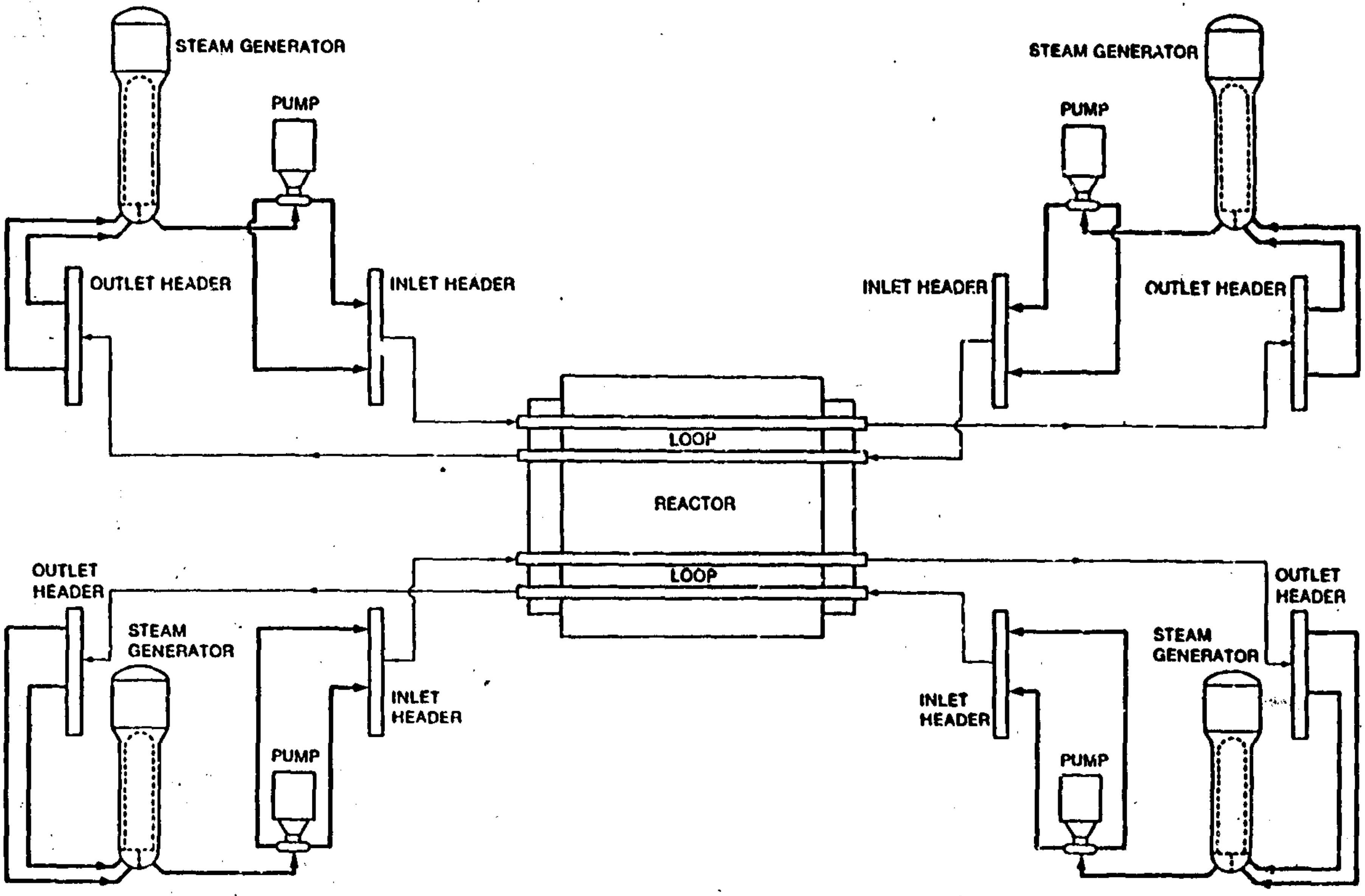
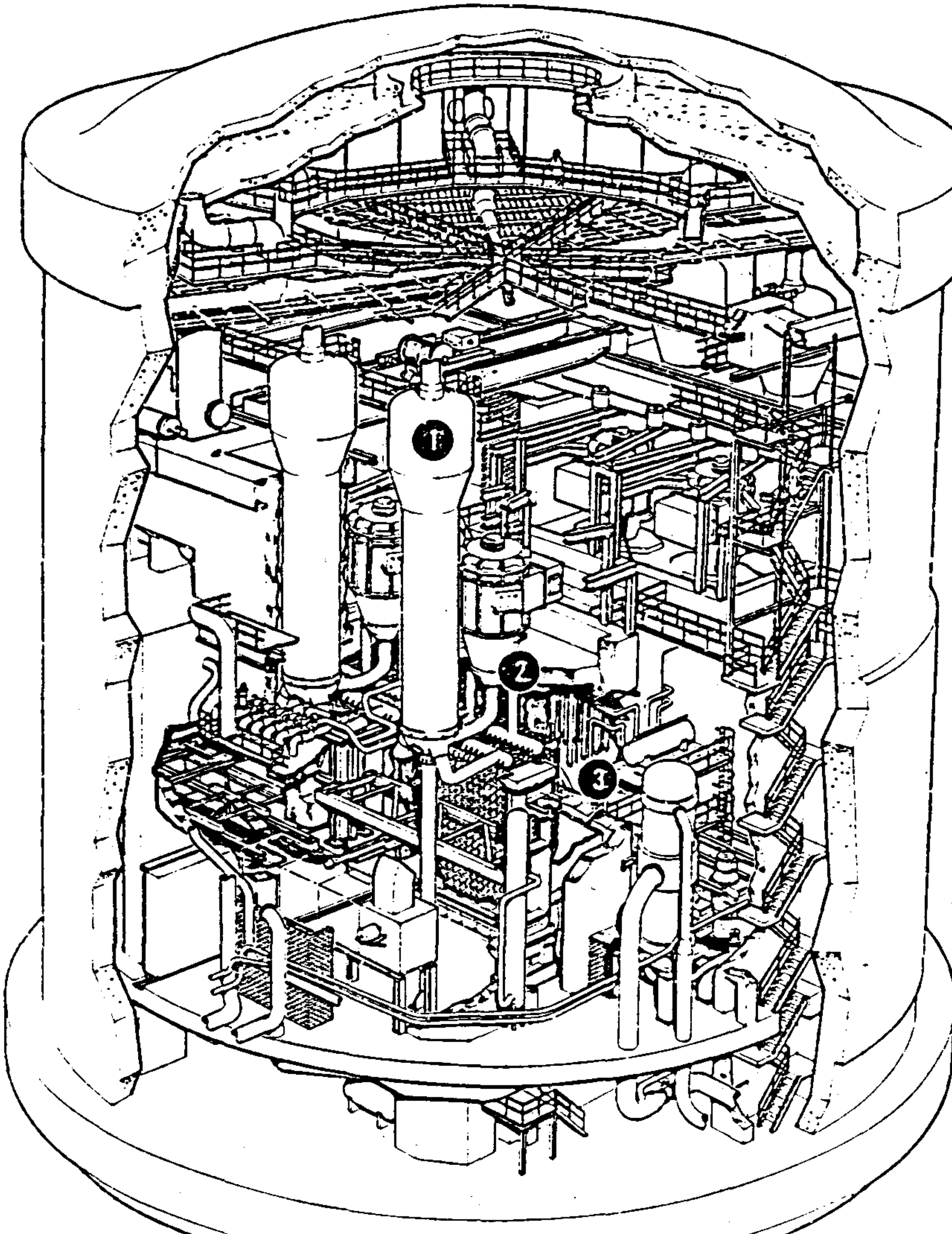


FIGURE 1.3 REACTOR CORE SCHEMATIC



6

FIGURE 1.4 A HEAT TRANSPORT SYSTEM



1 STEAM GENERATORS
2 HTS PUMPS
3 REACTOR

FIGURE 1.5 LOCATION OF HEAT TRANSPORT SYSTEM EQUIPMENT

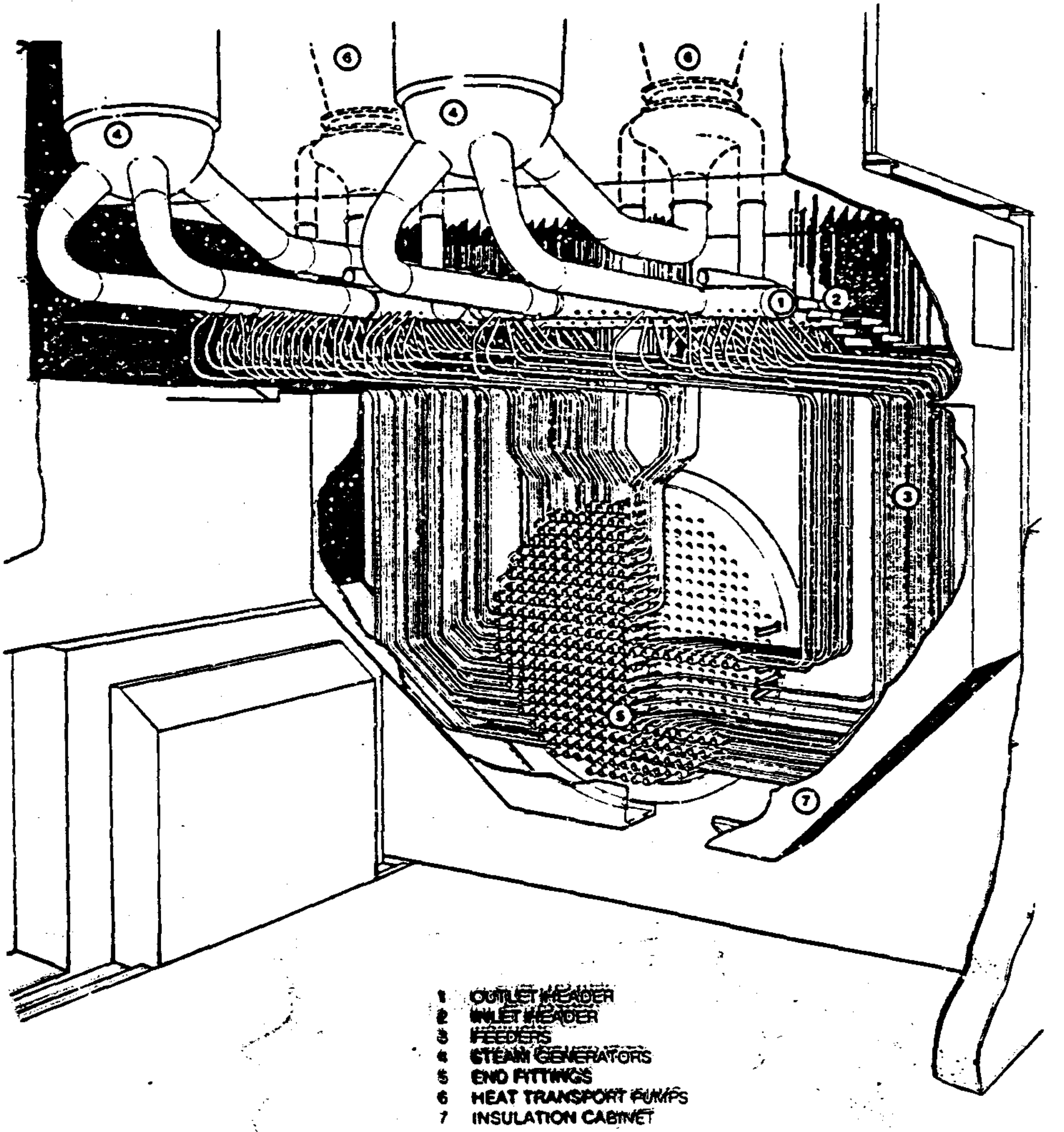
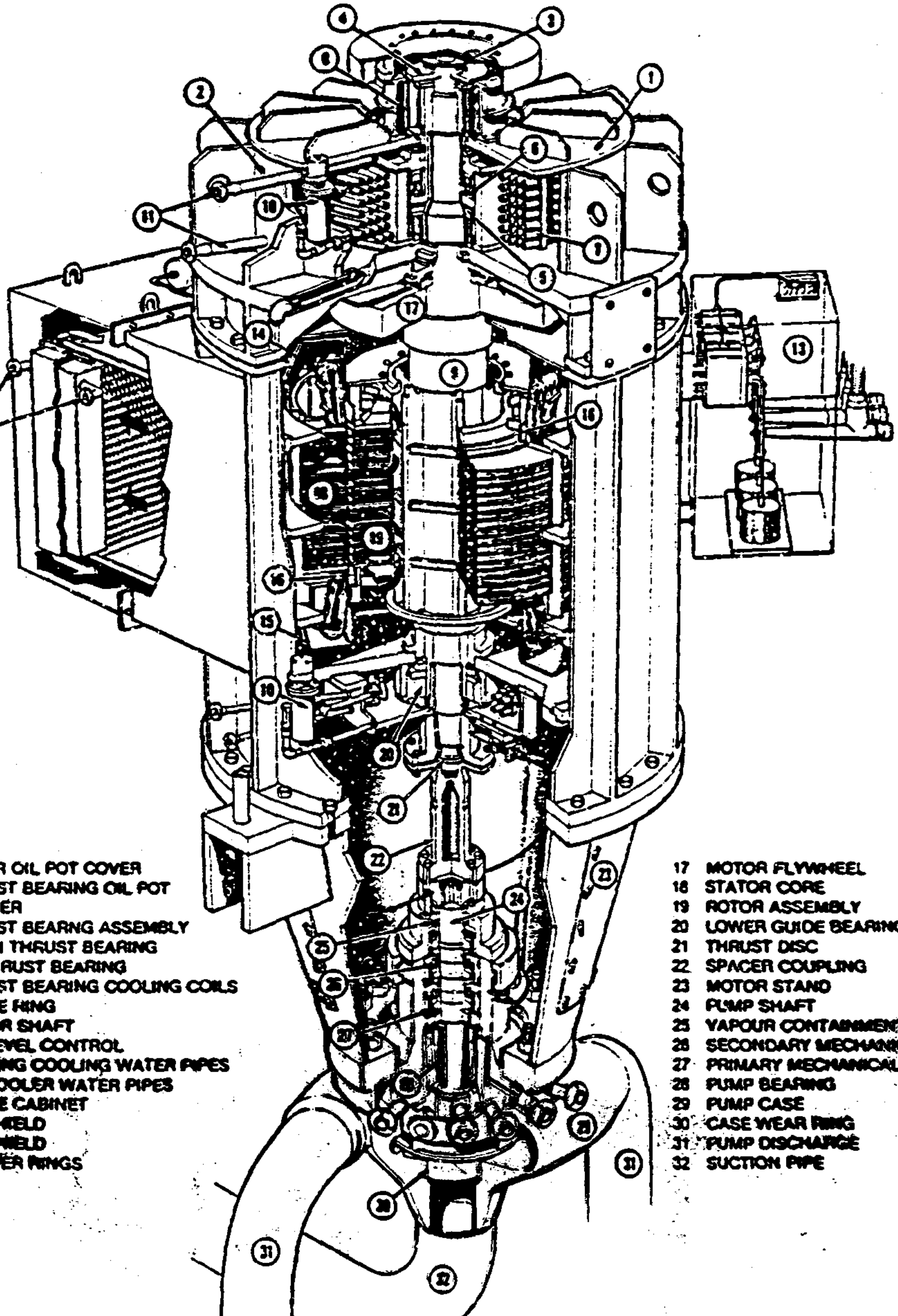


FIGURE 1.6 FEEDER AND HEADER ARRANGEMENT



1 UPPER OIL POT COVER
2 THRUST BEARING OIL POT
3 RUNNER
4 THRUST BEARING ASSEMBLY
5 DOWN THRUST BEARING
6 UP THRUST BEARING
7 THRUST BEARING COOLING COILS
8 BRAKE RING
9 MOTOR SHAFT
10 OIL LEVEL CONTROL
11 BEARING COOLING WATER PIPES
12 AIR COOLER WATER PIPES
13 SURGE CABINET
14 AIR SHIELD
15 AIR SHIELD
16 BLOWER RINGS
17 MOTOR FLYWHEEL
18 STATOR CORE
19 ROTOR ASSEMBLY
20 LOWER GUIDE BEARING
21 THRUST DISC
22 SPACER COUPLING
23 MOTOR STAND
24 PUMP SHAFT
25 VAPOUR CONTAINMENT SEAL
26 SECONDARY MECHANICAL SE
27 PRIMARY MECHANICAL SEAL
28 PUMP BEARING
29 PUMP CASE
30 CASE WEAR RING
31 PUMP DISCHARGE
32 SUCTION PIPE

FIGURE 1.7 HEAT TRANSPORT SYSTEM PUMP

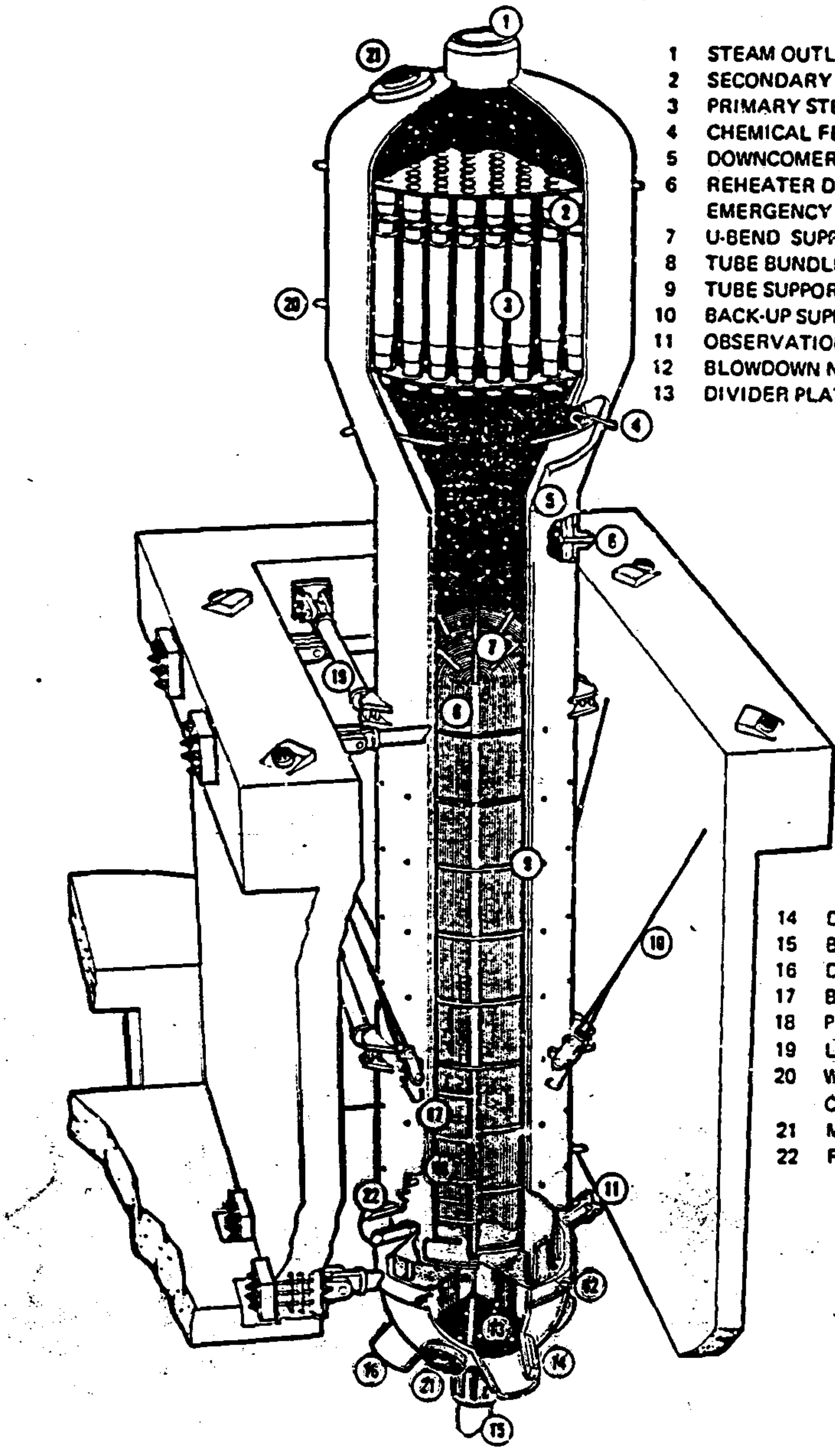
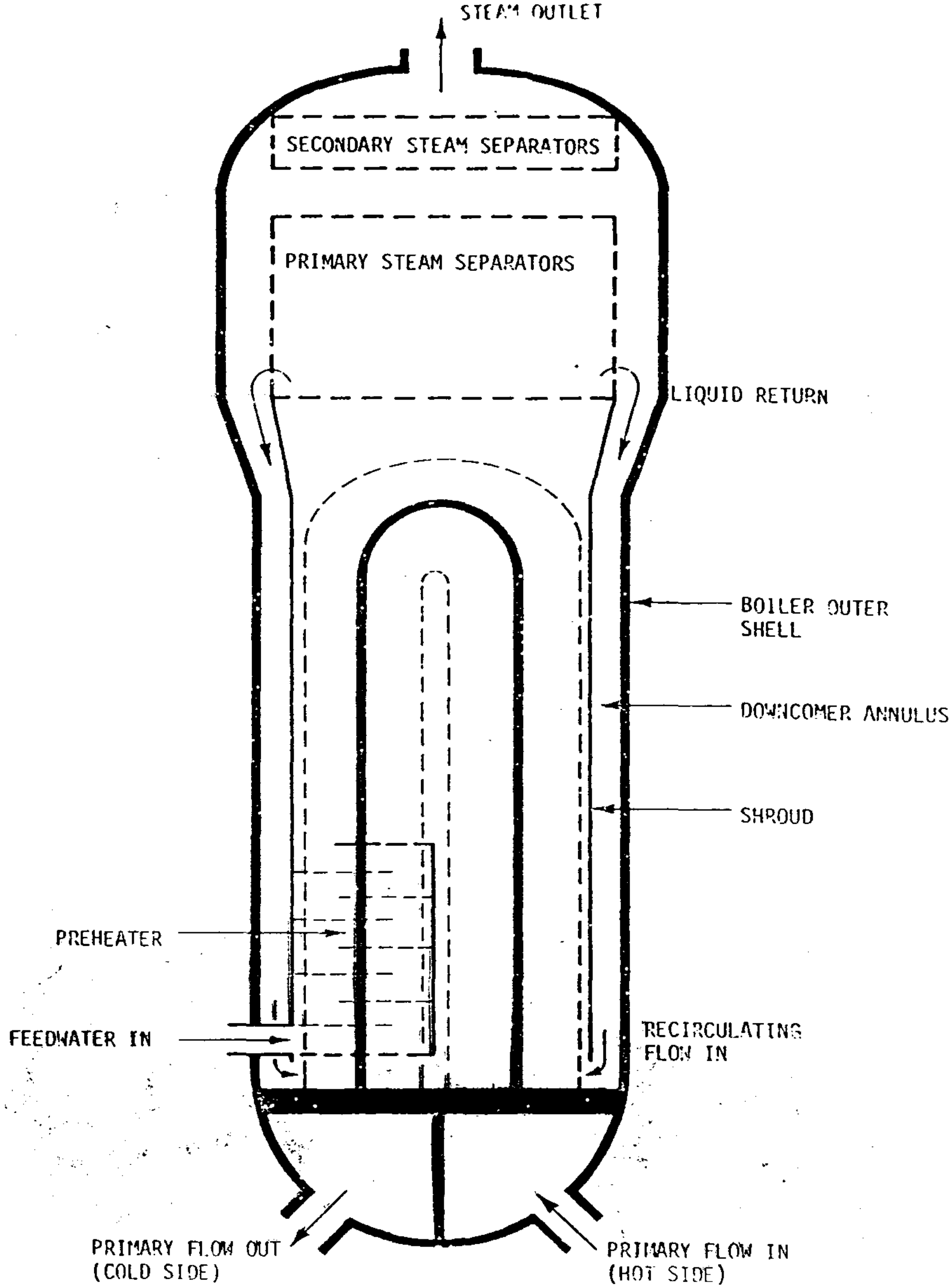


FIGURE 1.8 600 MW STEAM GENERATOR

CROSS-SECTION OF A TYPICAL STEAM GENERATOR



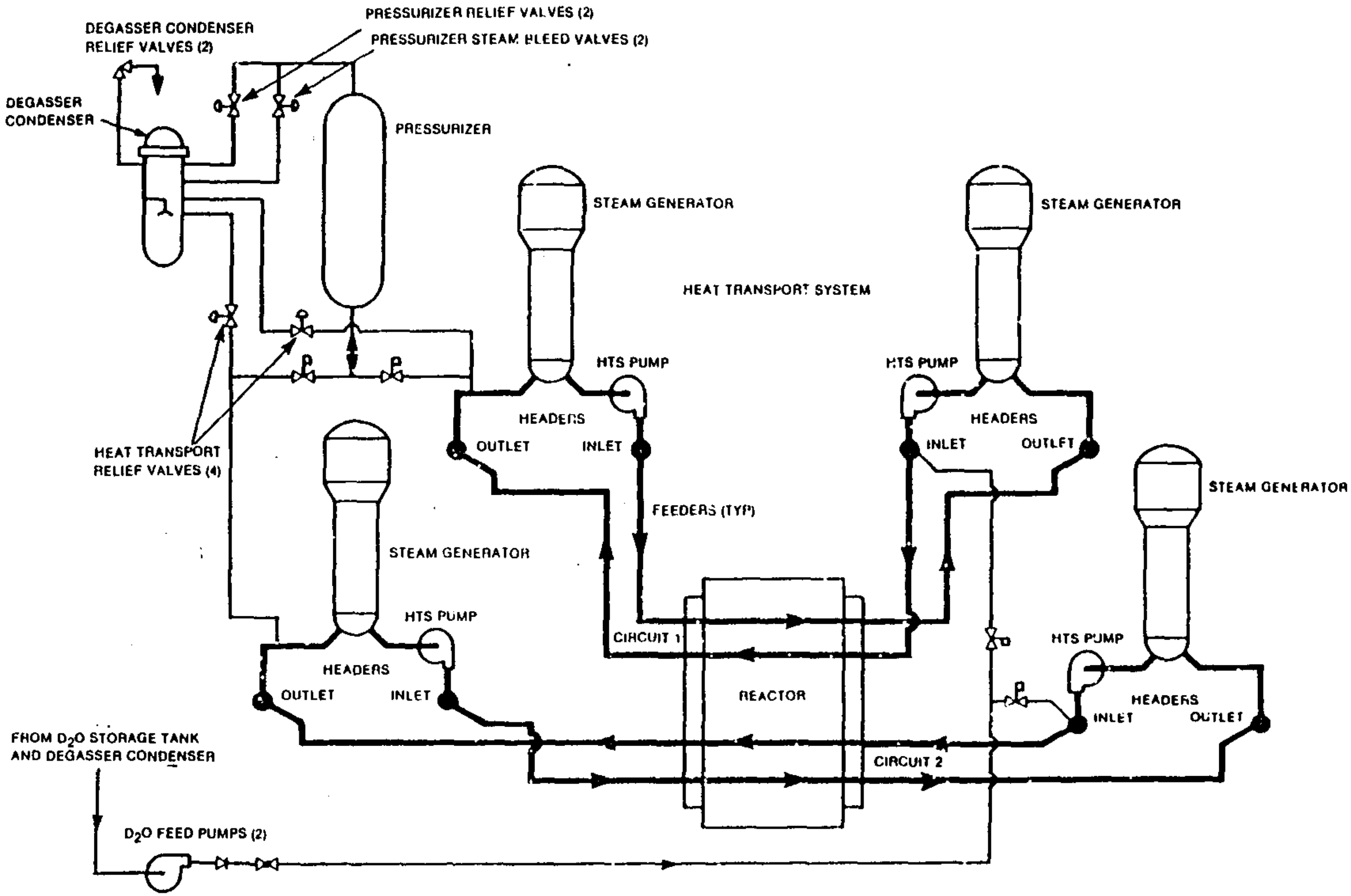
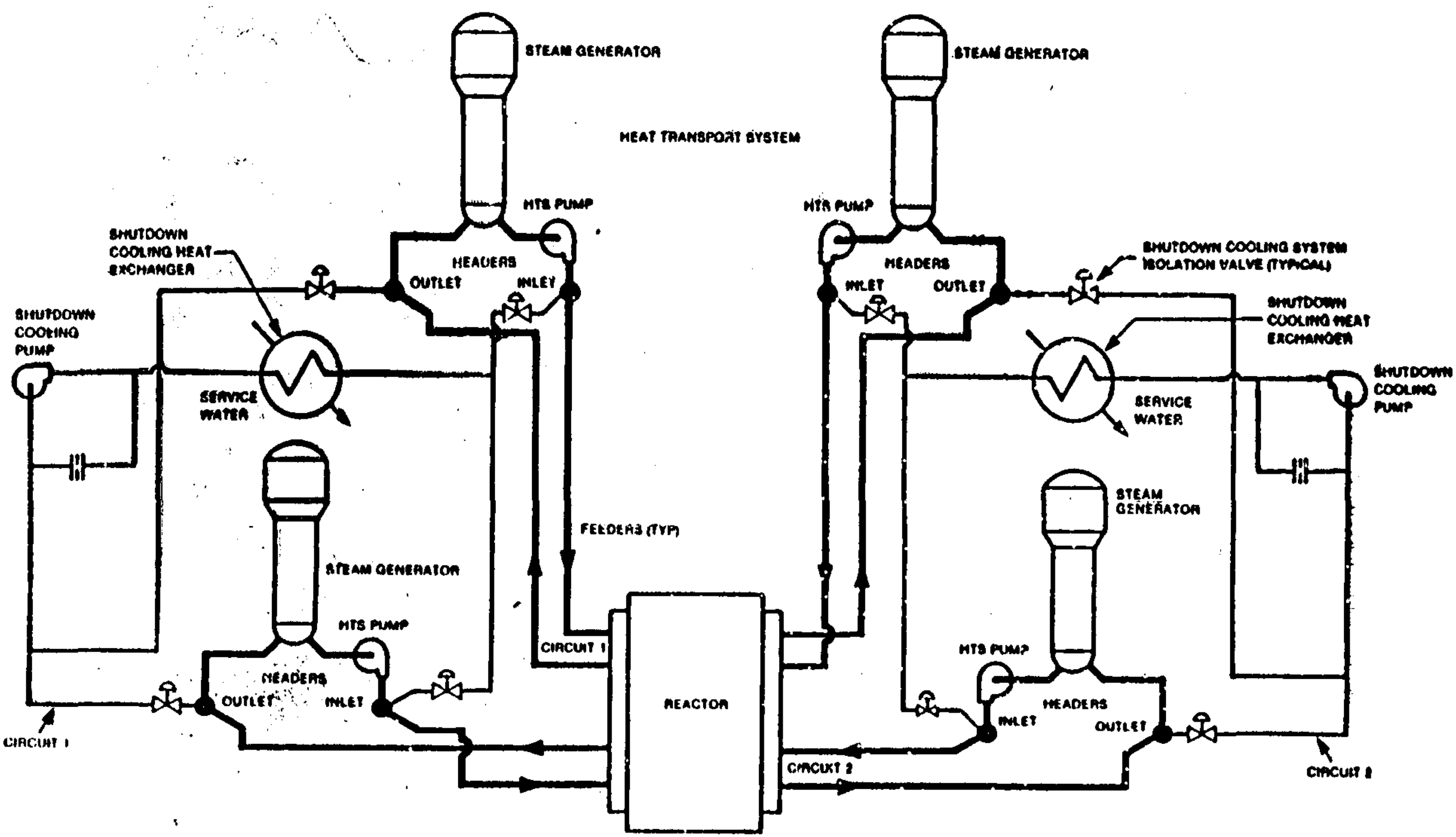


FIGURE 1.9 HEAT TRANSPORT PRESSURE AND INVENTORY CONTROL SYSTEM


HEAT TRANSPORT SYSTEM
STEAM GENERATOR
STEAM GENERATOR
STEAM GENERATOR
STEAM GENERATOR
HTS PUMP
HTS PUMP
HTS PUMP
HTS PUMP
SHUTDOWN COOLING HEAT EXCHANGER
SHUTDOWN COOLING HEAT EXCHANGER
SHUTDOWN COOLING SYSTEM ISOLATION VALVE (TYPICAL)
SHUTDOWN COOLING PUMP
SHUTDOWN COOLING PUMP
HEADERS
OUTLET
INLET
SERVICE WATER
SERVICE WATER
FEEDERS (TYP)
CIRCUIT 1
CIRCUIT 1
CIRCUIT 2
CIRCUIT 2
REACTOR

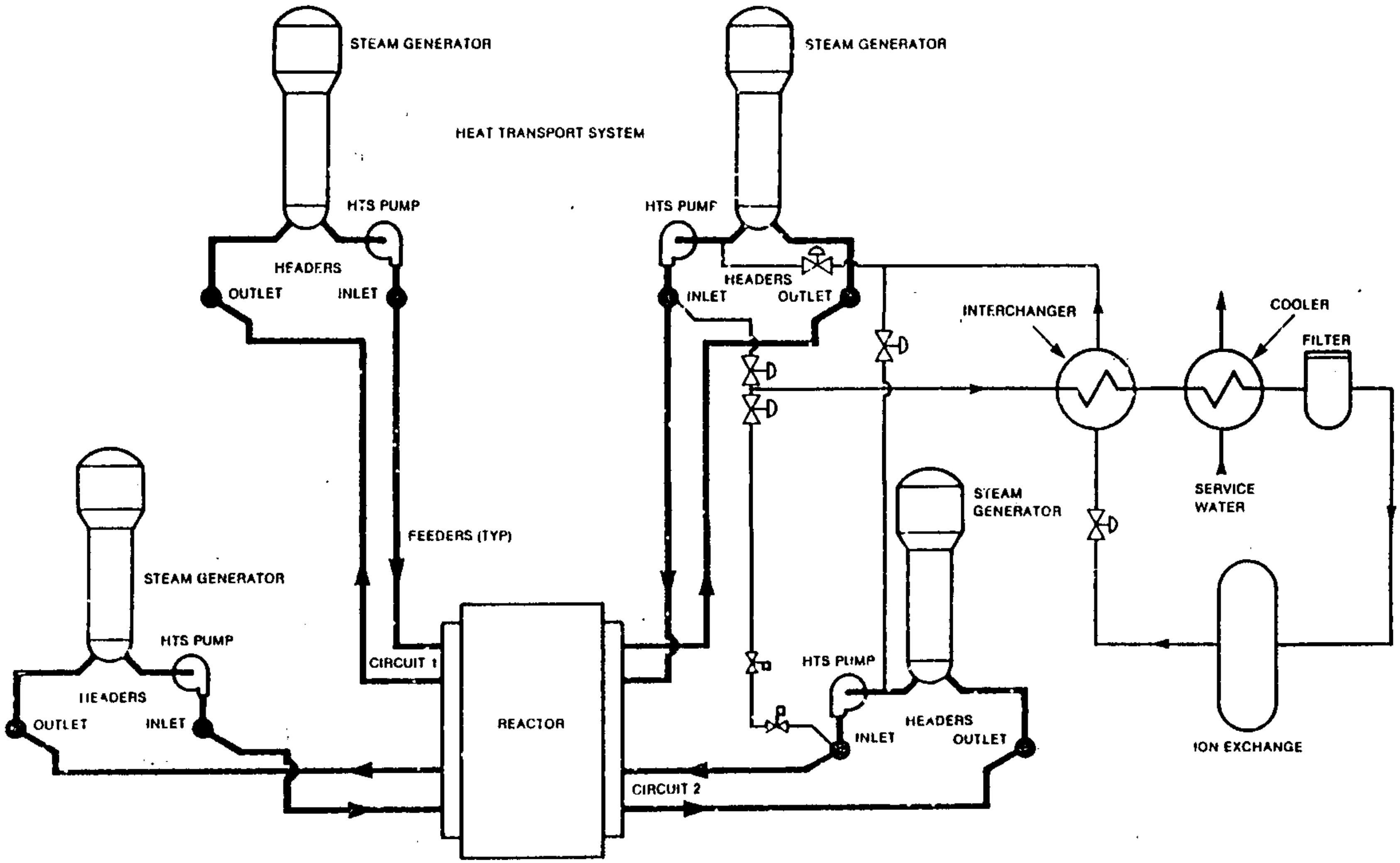


FIGURE 1.11 HEAT TRANSPORT PURIFICATION SYSTEM

SUMMARY OF SUGGESTIONS FOR EFFECTIVE COMPUTATION

1) KNOW YOUR SYSTEM
(FLOW IS MAJOR PARAMETER
FOR H.T.S. T/H.)

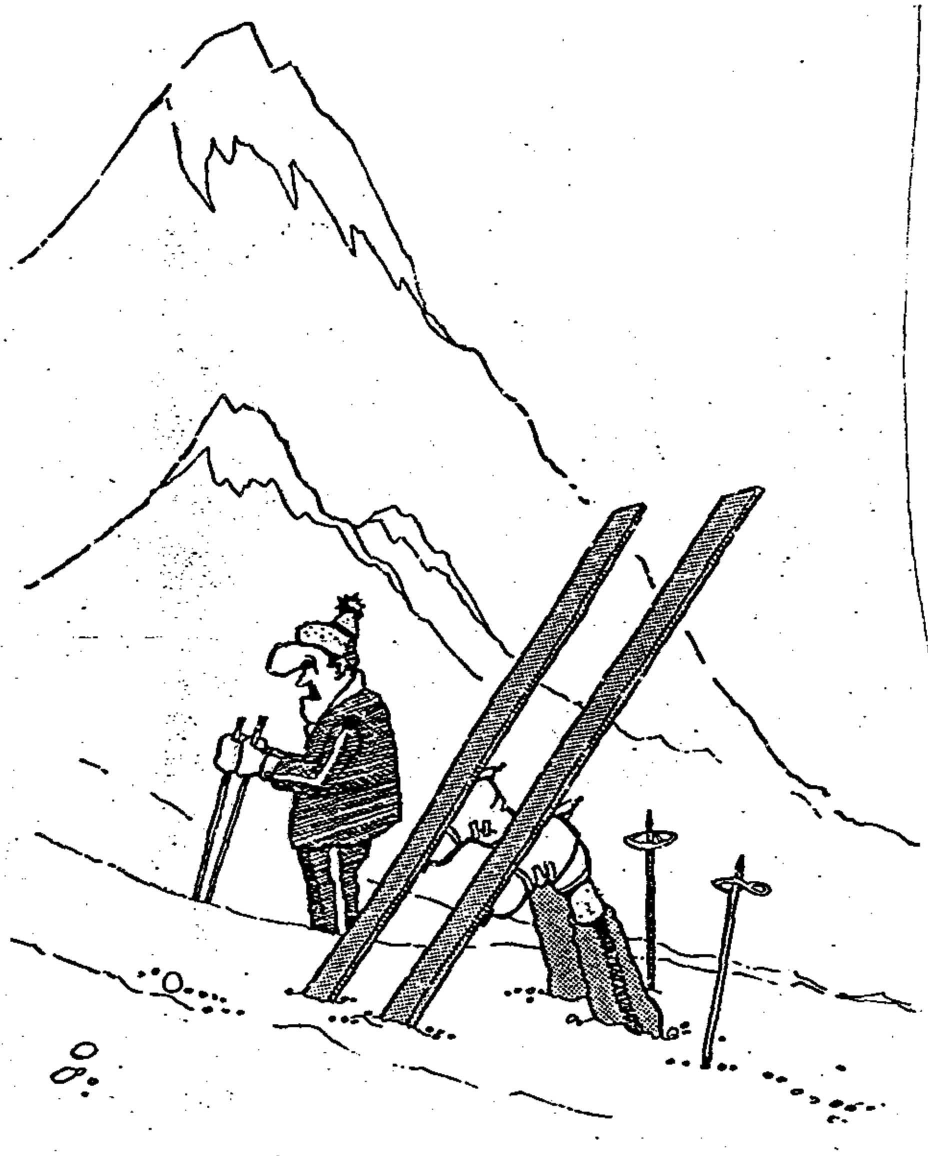
2) COMPUTATION IS JUST PART OF A BIGGER JOB. PUT YOUR NEXT $ WHERE IT WILL DO THE MOST GOOD.
(DON'T OVER OPTIMIZE)
(UTILIZE COMMON DATA BASE)

3) MAKE FRIENDLY CODES
(COMPUTER ALGEBRA)
(ESTABLISH BASIC BUILDING BLOCKS)
(MICROS)

4) DO DETAILS AFTER BIG PICTURE IS IN PLACE.
(STABILITY PROBLEM, FOR EXAMPLE)
(OR VERIFICATION)

— END —

IN CONCLUSION ....



"Okay class...name four things he did wrong."