

October 20, 1987

NOTE TO: Dick Wessman, NHR  
Bill Paton, CCC

FROM: Mike Blume, CCC

SUBJECT: MASSP:RC v. NRC (PILGRIM 1ST CIRCUIT CASE)

Enclosed is a first cut of what is known as a "Certified Index of the Record," to be submitted to the Court of Appeals on November 10, 1987. The "Record" in this case is what was placed before the Agency by the petitioners, and whatever else the Agency relied upon. The attached list -- the "Certified Index" -- is a complete listing of all documents enclosed with or cited by the Petition and the Director's Decision. The advantage of the certified index is that we don't have to burden the Court with unnecessary documents. Unfortunately, though, the Commission Secretary, who will certify to the Court that the index represents the record, must have all of the documents that are listed. Accordingly, I'm requesting that you go over the list, and provide to me ASAP, copies of all of the listed documents that we have. Please note for me which ones we do not have. To the extent we don't have them, it's probably safe to assume that we didn't consider them or rely upon them, and thus they'll be deleted from the list. Also, please add to the list (and provide to me) any documents that we considered or relied upon, but which were not cited.

Many thanks for your continuing assistance!

Enclosure: As stated

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PDR FOIA  
JOHNSON88-198 PDR

## Historical Sequence of Pilgrim Offsite Issues

- 6/16 Director of MCDA submitted State RERP (for Pilgrim) to FEMA with statement that the plan was adequate.
- 10/81 FEMA and RAC reviewed and reported on the Massachusetts RERP. MCDA revised the RERP based upon FEMA's comments.
- 3/3/82 Annual exercise, FEMA observed; six deficiencies identified.
- 6/3/82 FEMA held a public meeting. The following issues were raised by the public:
- Ability to evacuate communities within the 10-mile EPZ
  - Ability to evacuate Cape Cod beyond the 10-mile EPZ
  - Reliability and effectiveness of sirens
  - Training of teachers, school bus drivers and hospital personnel
  - Public information brochures
  - KI policy
  - Procedures for elderly and special needs persons
- no date Commonwealth responded to all the above issues by stating the RERP addressed these concerns and pledging to work towards further plan improvement.
- 9/29/82 FEMA issued Interim Finding for Pilgrim; first FEMA evaluation; interim finding that State and local response is adequate. 72 deficiencies noted, 13 considered significant.
- 6/29/83 Annual exercise, FEMA observed; State and local response is adequate; 15 deficiencies noted.
- 8/15/84 Drill, FEMA observed; State and local response adequate; one deficiency noted.
- 3/85 Status of offsite RERP was:
- Many planning problems unresolved from 10/81 RAC review
  - Commonwealth had not responded to 9/82 RAC review
  - Commonwealth had not provided FEMA with schedule of corrective actions for problems identified in 1982 and 1983 exercises
- 3/6/85 FEMA suspended processing of Commonwealth request for 44 CFR 350 approval.

- 6/20/85 Commonwealth sent a schedule to FEMA delineating steps to be taken to correct 1982 and 1983 exercise problems. These revisions were not delivered to FEMA.
- 9/5/85 Annual exercise, FEMA observed; interim finding that State and local response is adequate; 4 deficiencies noted remedial drill planned for October 29, 1985.
- 10/29/85 Remedial exercise corrected deficiencies from September 5, 1985 exercise.
- 10/30/85 FEMA again informed the Commonwealth that 44 CFR 350 review was not progressing.
- Commonwealth provided RERP and local plans that were requested in 1985.
- 6/6/86 Commonwealth responded to FEMA. The reply did not provide a schedule for completion.
- 9/5/86 FEMA informed MCDA of intent to conduct self-initiated review. Review to be based upon 1982 RERP and 1985 local plans.
- 12/22/86 Commonwealth forwarded copy of Barry Report.
- 8/4/87 FEMA Self-Initiated Review issued; six deficiencies identified.
- 9/29/87 FEMA stated that satisfactory correction of deficiencies would necessitate plan changes and some demonstrations.
- 12/9/87 Exercise exemption was granted to allow full participation exercise to be conducted by June 30, 1988.

OZ B. J. 6/16

POTENTIAL DEGRADATION OF CONTAINMENT SPRAY SYSTEM

PROBLEM RUST FOUND IN THE PRIMARY CONTAINMENT SPRAY HEADER AND NOZZLES AT PILGRIM

SIGNIFICANCE

- SPRAY PATTERN AND FLOW RATE MAY NOT BE THAT ASSUMED
- INTEGRITY OF HEADER MAY BE COMPROMISED

BACKGROUND

- PILGRIM SHUTDOWN AND DEFUELED
- SPRAY NOZZLES BEING PLUGGED (6 OF 7 HOLES)
- CONTAINMENT SPRAY IS A REQUIRED SYSTEM AT PILGRIM
- QUALITATIVE AIR TEST OF CONTAINMENT SPRAY SYSTEM AT PILGRIM IN 1982
- SPRAY PIPING IN BWRs IS CARBON STEEL
- SPRAY PIPING IN PWRs IS STAINLESS STEEL

CONCLUSIONS

OPERABILITY TEST FOR CONTAINMENT SPRAY SYSTEMS MAY NOT BE ADEQUATE

FOLLOWUP

- LICENSEE TESTING NOZZLES WITH RUST
- STAFF TO ASSESS NEED FOR SPRAY

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TABLE 3.11-1  
OPERATING LIMIT MCPR VALUES

MCPR Operating Limit

<u>2</u> 0	<u>8x8</u>	<u>PSxSR</u>
0 to .1	1.41	1.44
.1 to .2	1.42	1.45
.2 to .3	1.42	1.45
.3 to .4	1.43	1.46
.4 to .5	1.43	1.46
.5 to .6	1.44	1.47
.6 to .7	1.44	1.47
.7 to .8	1.45	1.48
.8 to .9	1.45	1.48
.9 to 1.0	1.46	1.49
	1.46	1.49

FIGURE 3.11-4  
 MAXIMUM AVERAGE PLANAR LINEAR HEAT GENERATION RATE  
 VERSUS  
 PLANAR AVERAGE EXPOSURE  
 FUEL TYPE P8DRB265L

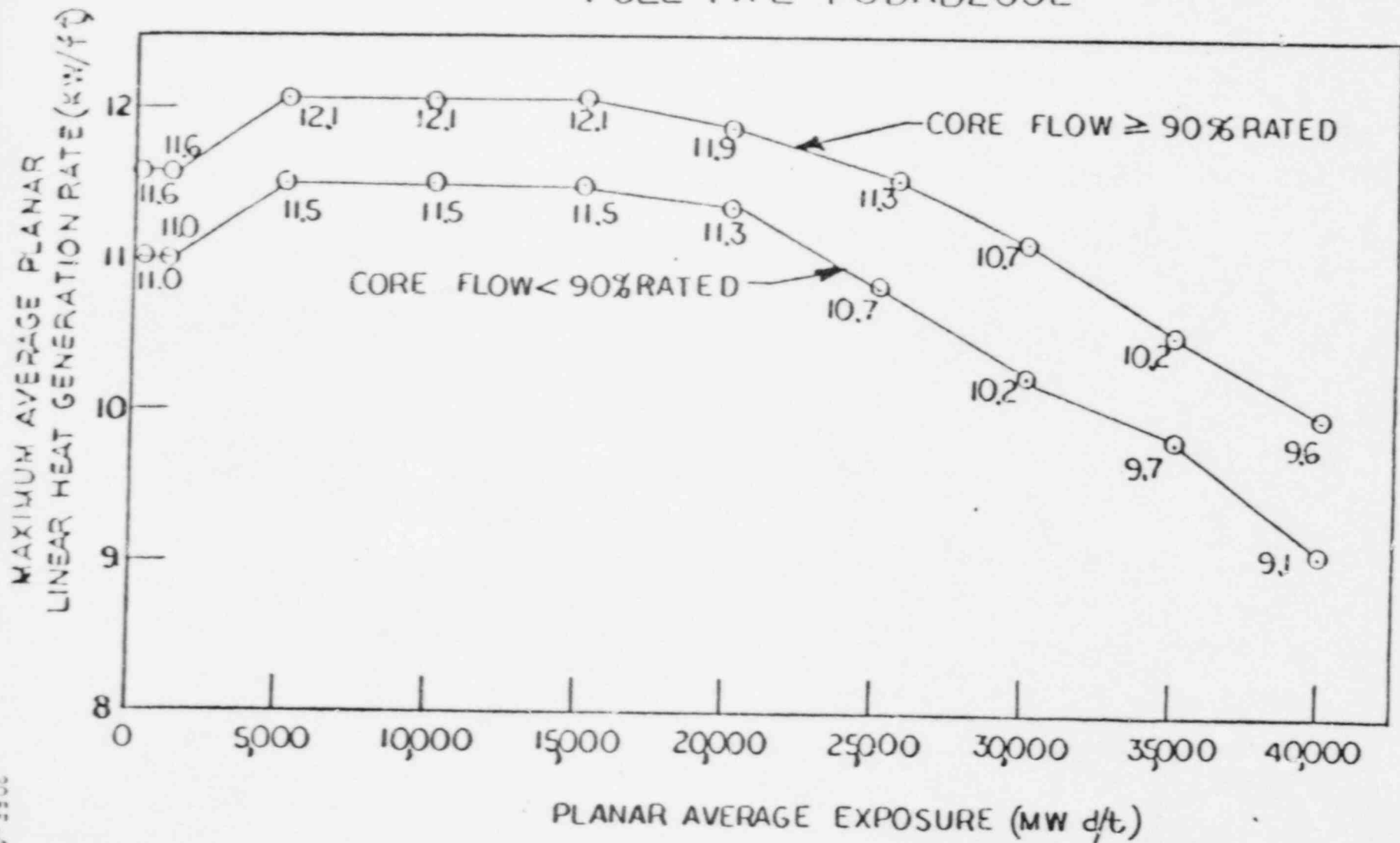


FIGURE 3.11-5  
 MAXIMUM AVERAGE PLANAR LINEAR HEAT GENERATION RATE  
 VERSUS  
 PLANAR AVERAGE EXPOSURE  
 FUEL TYPE P8DRB282

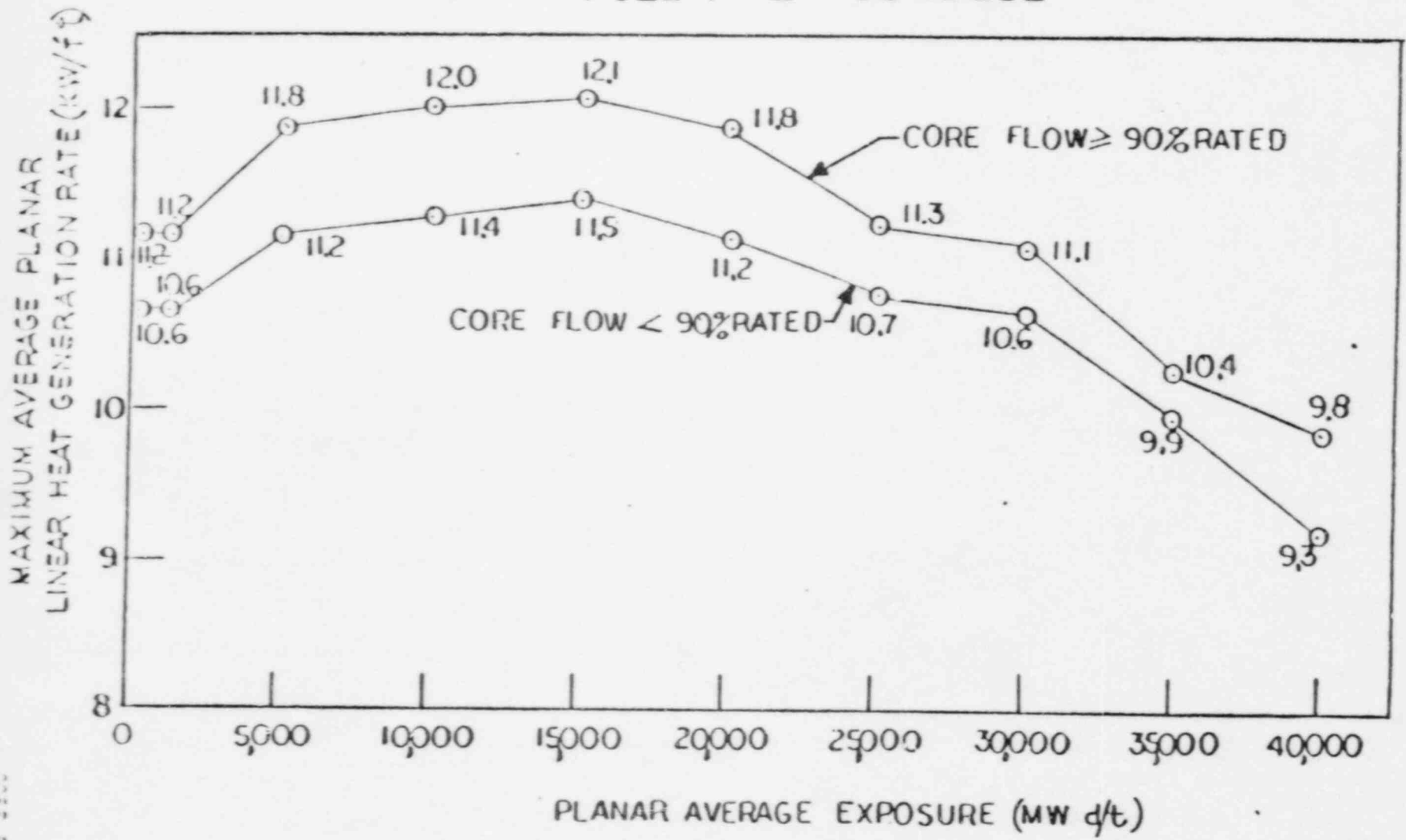
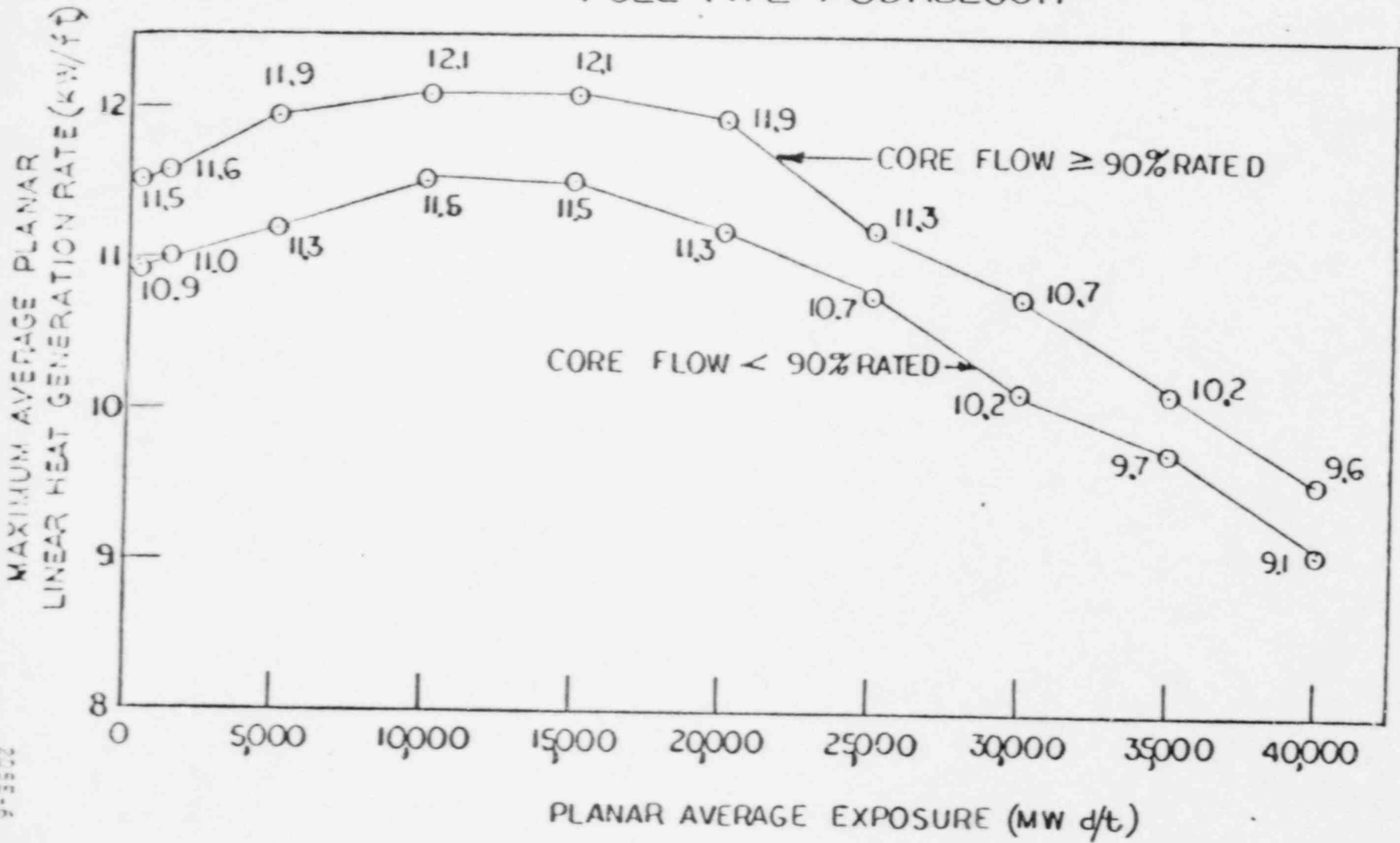


FIGURE 3.11-6  
 MAXIMUM AVERAGE PLANAR LINEAR HEAT GENERATION RATE  
 VERSUS  
 PLANAR AVERAGE EXPOSURE  
 FUEL TYPE P8DRB265H





## MAJOR DESIGN FEATURES

### 5.1 SITE FEATURES

Pilgrim Nuclear Power Station is located on the Western Shore of Cape Cod Bay in the Town of Plymouth, Plymouth County, Massachusetts. The site is located at approximately 41° 51' north latitude and 70° 35' west longitude on the Manomet Quadrangle, Massachusetts, Plymouth County 7.5 Minute Series (topographic) map issued by U.S. Geological Survey. UTM coordinates are 19-46446N-3692E.

The reactor (center line) is located approximately 1800 feet from the nearest property boundary.

### 5.2 REACTOR

- A. The core shall consist of not more than 580 fuel assemblies of 8x8 (63 fuel rods) and P8x8R (62 fuel rods).
- B. The reactor core shall contain 145 cruciform-shaped control rods. The control material shall be boron carbide powder ( $B_4C$ ) compacted to approximately 70% of theoretical density.

### 5.3 REACTOR VESSEL

The reactor vessel shall be as described in Table 4.2.2 of the FSAR. The applicable design codes shall be as described in Table 4.2.1 of the FSAR.

### 5.4 CONTAINMENT

- A. The principal design parameters for the primary containment shall be as given in Table 5.2.1 of the FSAR. The applicable design codes shall be as described in Section 12.2.2.8 of the FSAR.
- B. The secondary containment shall be as described in Section 5.3.2 of the FSAR.
- C. Penetrations to the primary containment and piping passing through such penetrations shall be designed in accordance with standards set forth in Section 5.2.3.4 of the FSAR.

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# Pilgrim Nuclear Power Station

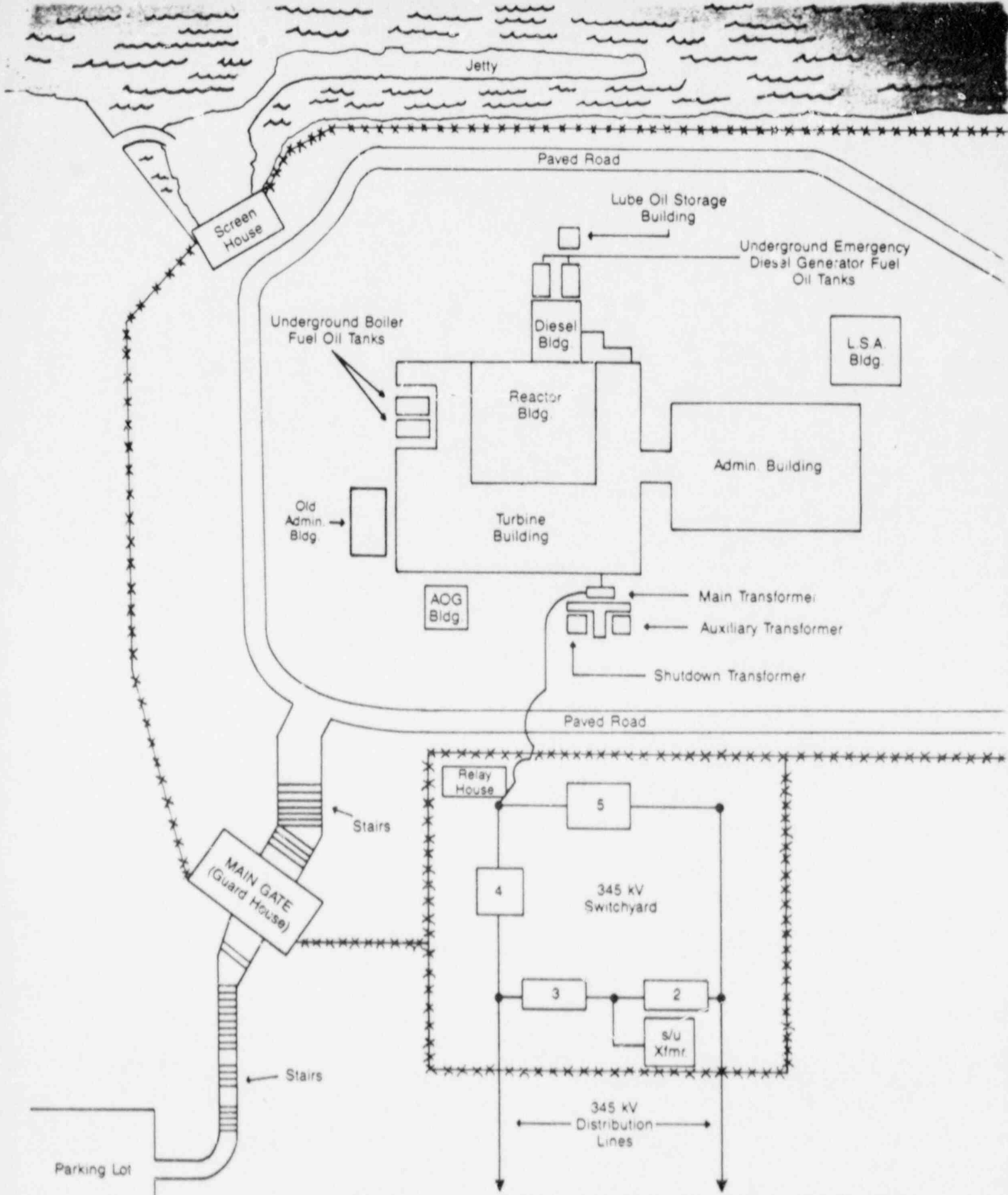
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## *Plant Familiarization Handout*

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Basic Floor-by-Floor Drawings  
of the Reactor and Turbine Buildings  
at Pilgrim Station.

*\* These drawings are meant for training purposes ONLY. They are designed to give the student an insight of the major barriers and pieces of equipment on each level and their relative locations.*



BASIC OVERHEAD VIEW OF PILGRIM STATION

THERE ARE 4 MAIN STEAM LINES

THERE ARE 3 CONDENSATE PUMPS

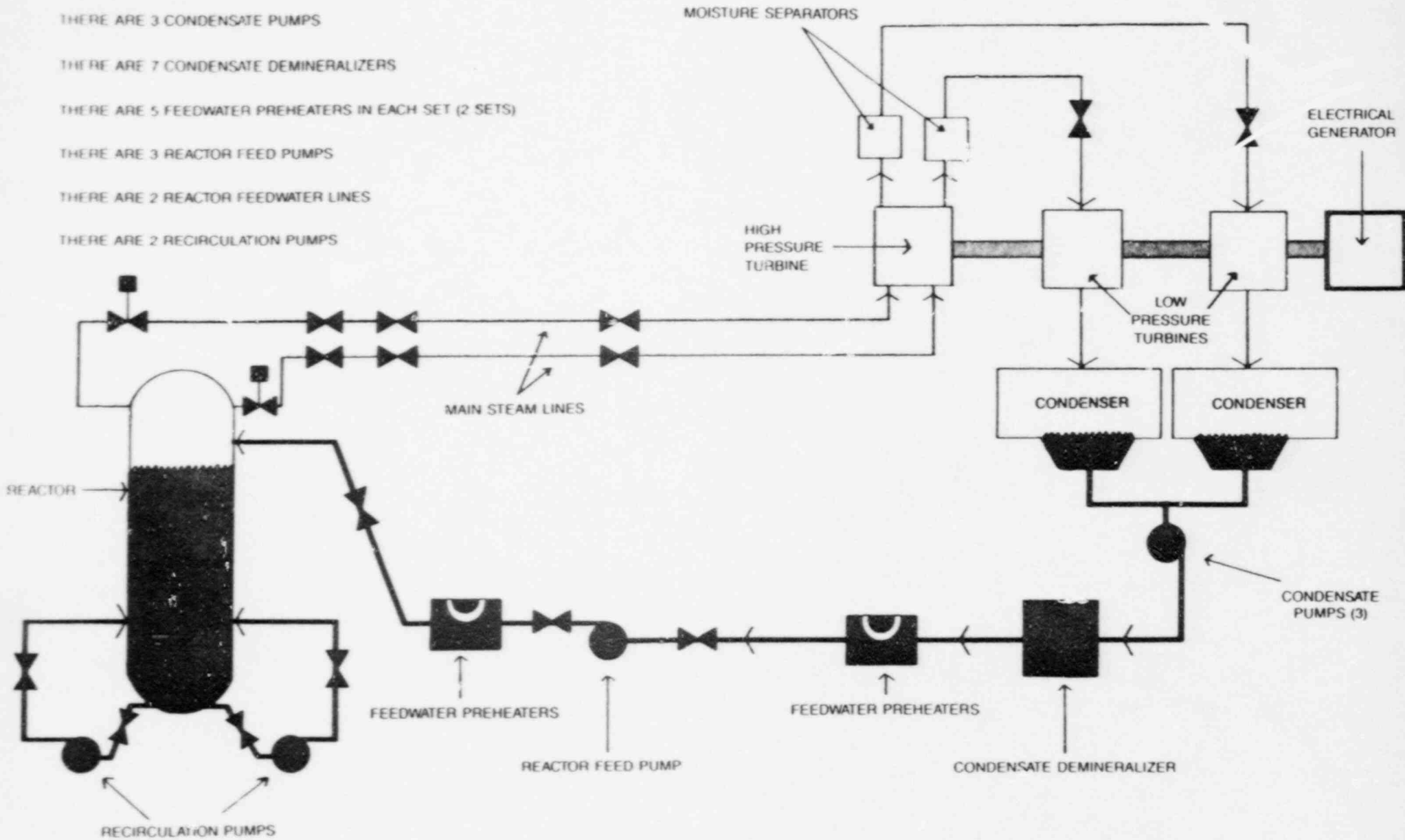
THERE ARE 7 CONDENSATE DEMINERALIZERS

THERE ARE 5 FEEDWATER PREHEATERS IN EACH SET (2 SETS)

THERE ARE 3 REACTOR FEED PUMPS

THERE ARE 2 REACTOR FEEDWATER LINES

THERE ARE 2 RECIRCULATION PUMPS



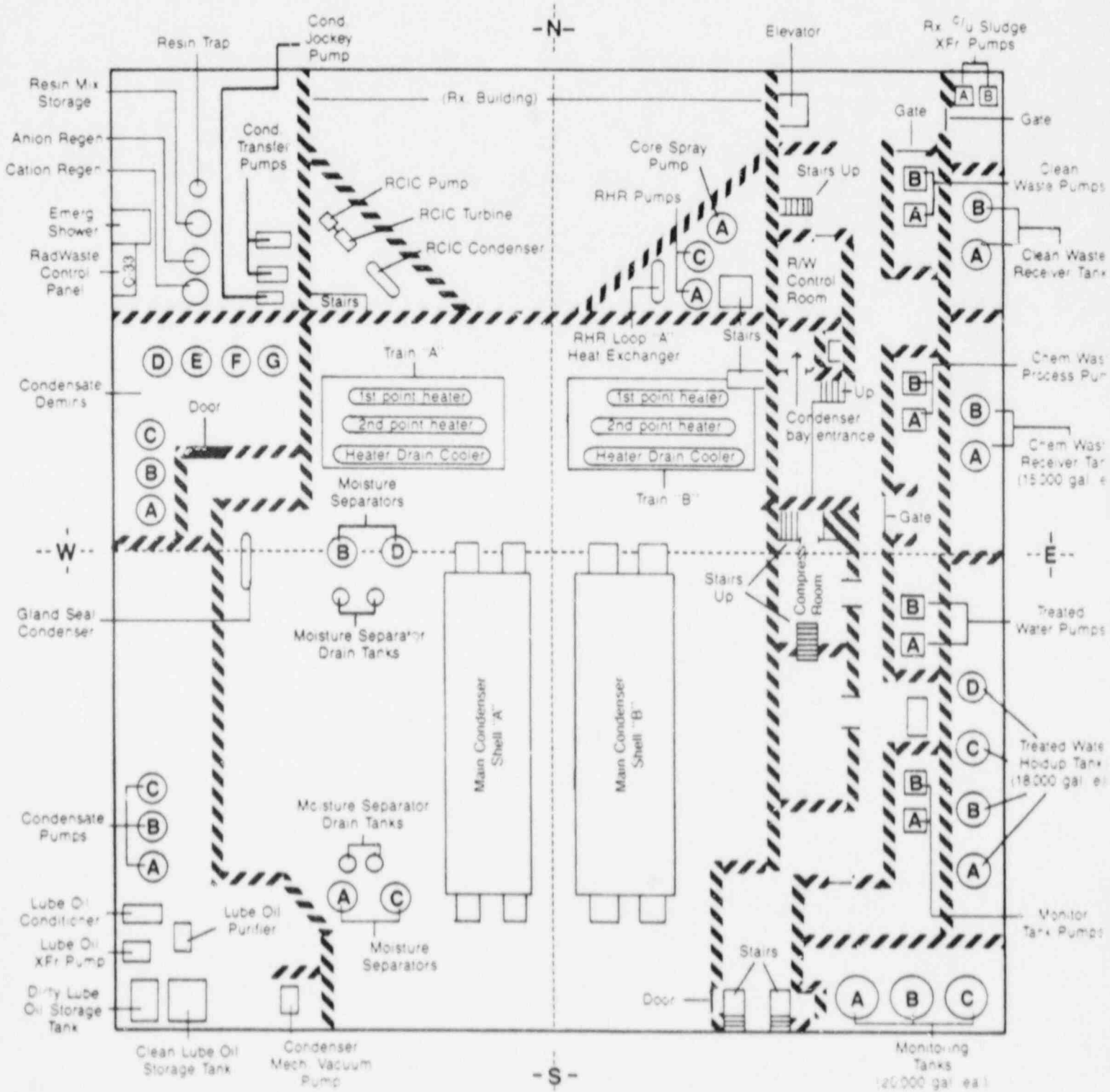
Pictorial Representation of a Basic  
Boiling Water Reactor (BWR) Power Cycle

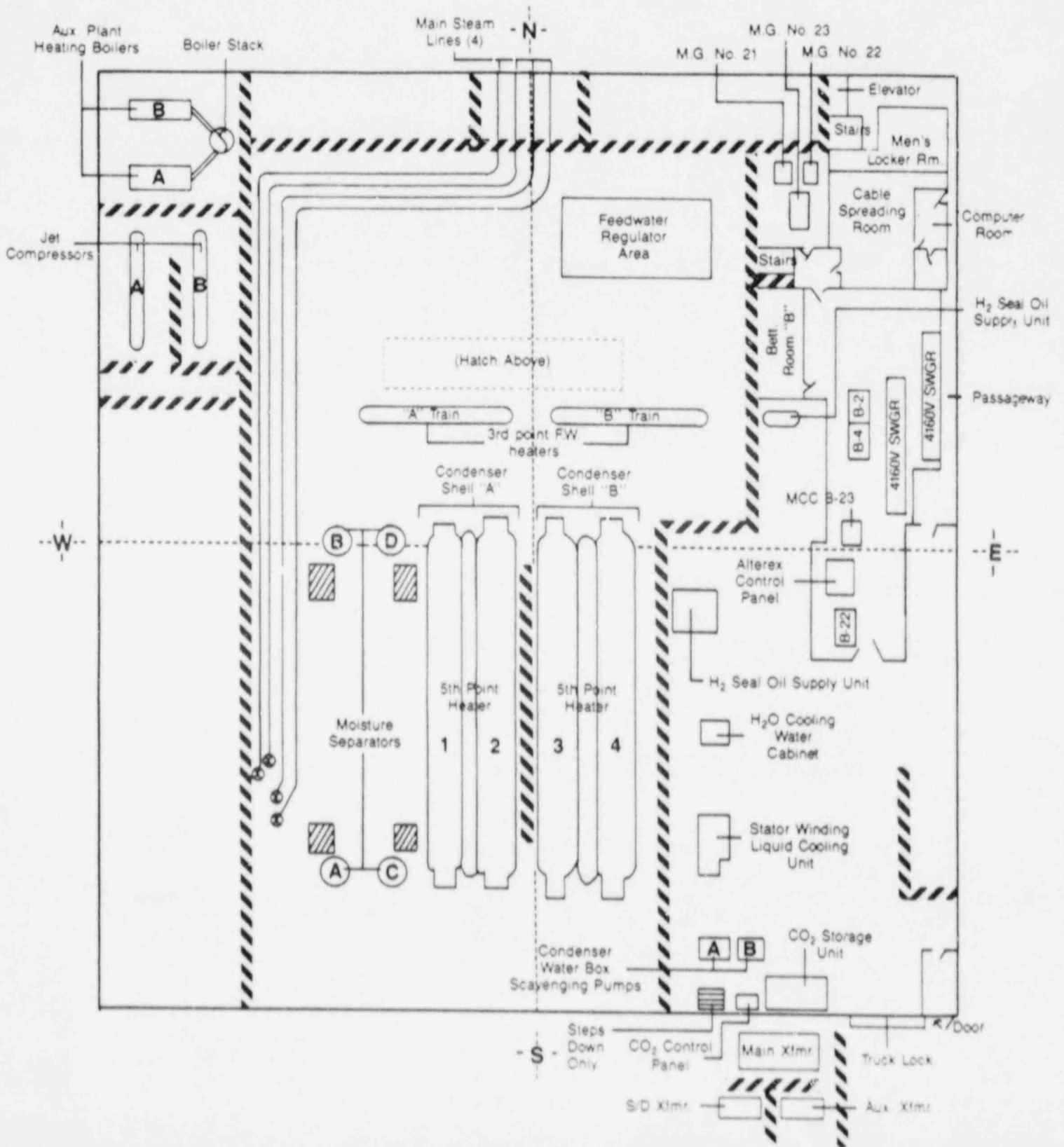
**NOTE:**

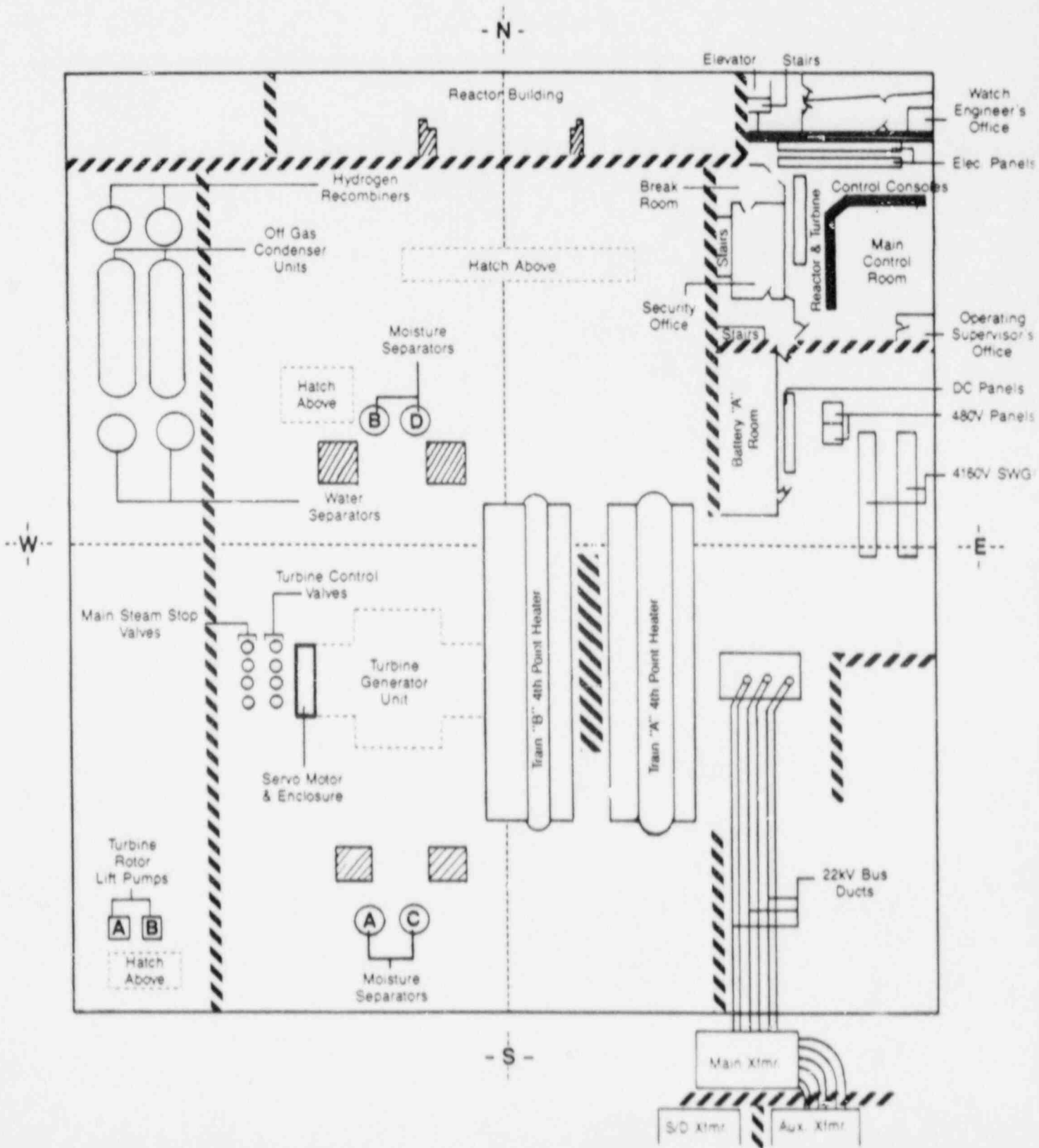
When you are inside the turbine building or reactor building at Pilgrim Station, you will be able to find your way around much more effectively, if you can identify the major components on each level, and can distinguish North from South at all times. Your task will become easier, if you simply remember that regardless of the floor/level you are on, the North wall will always be the wall which is facing the ocean.

# Turbine Building

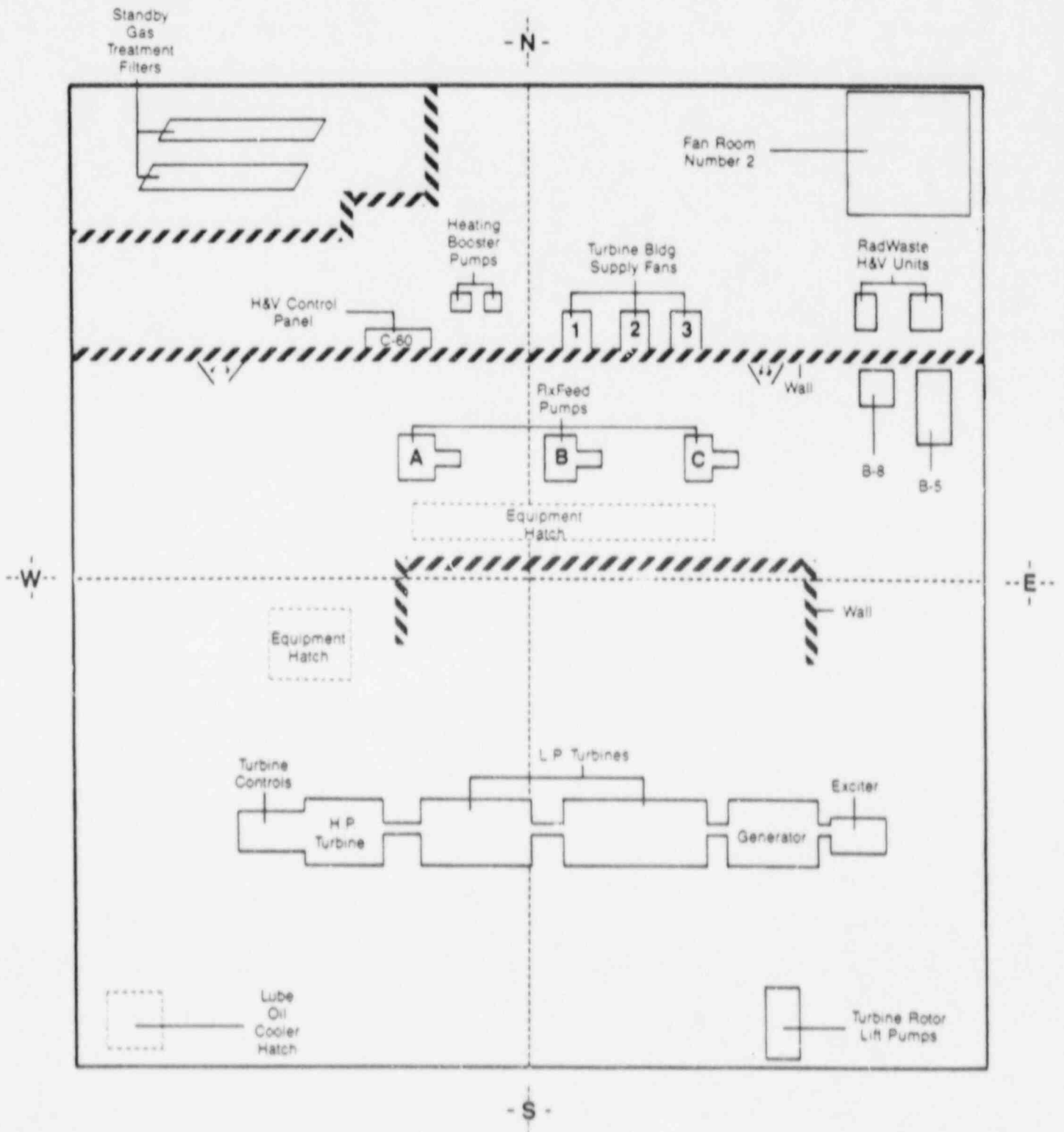
# Level-6' and Below





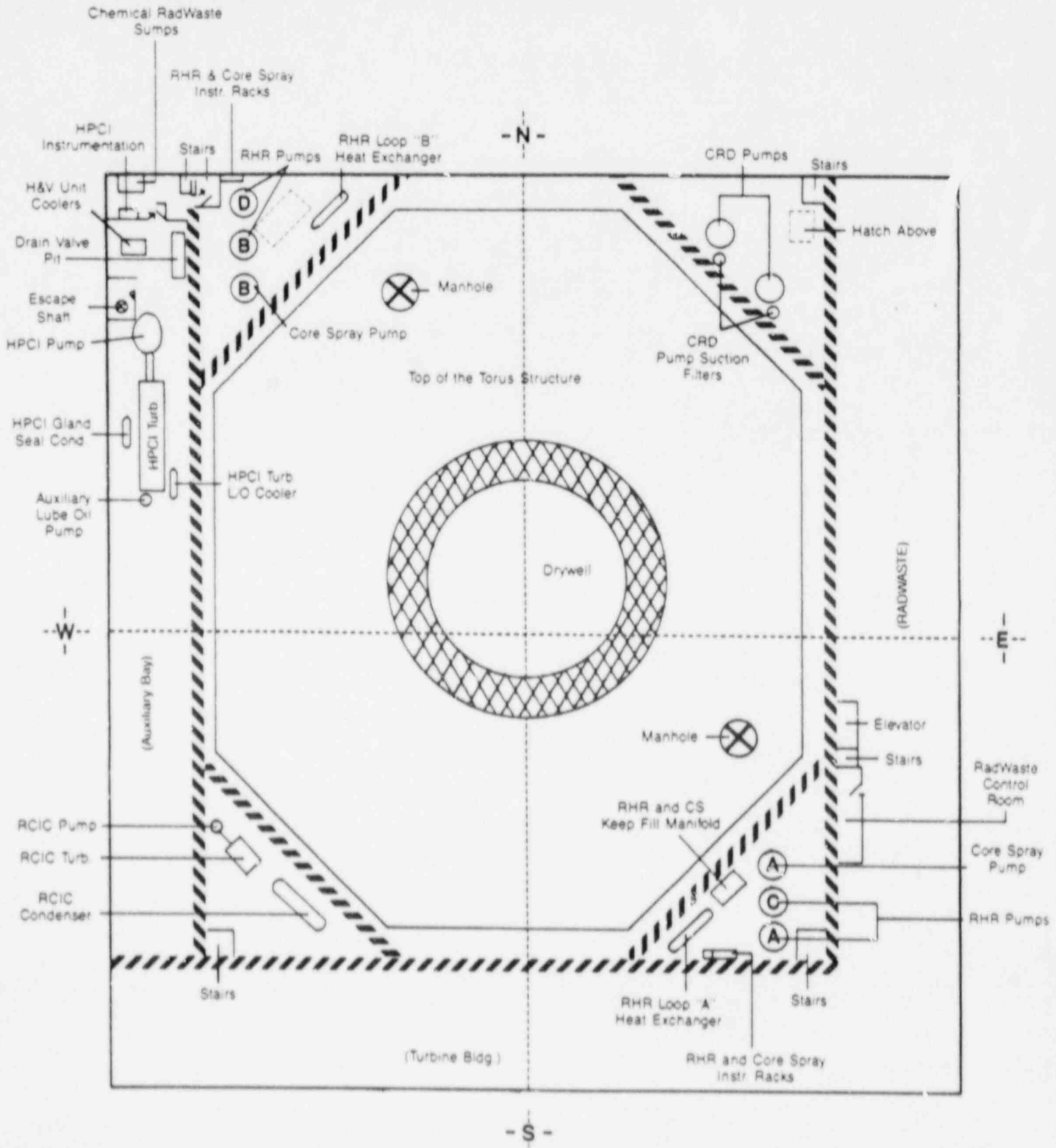


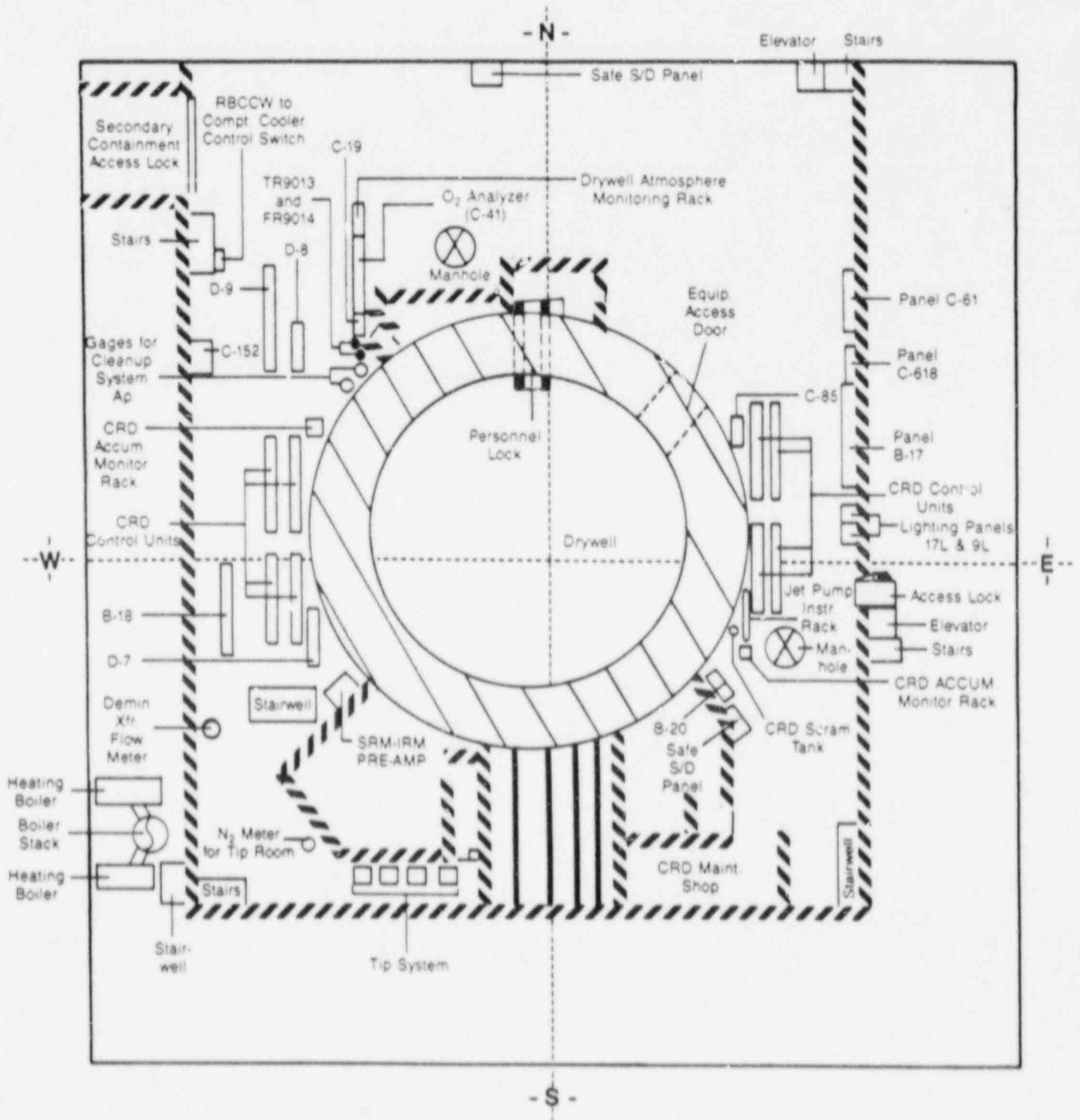


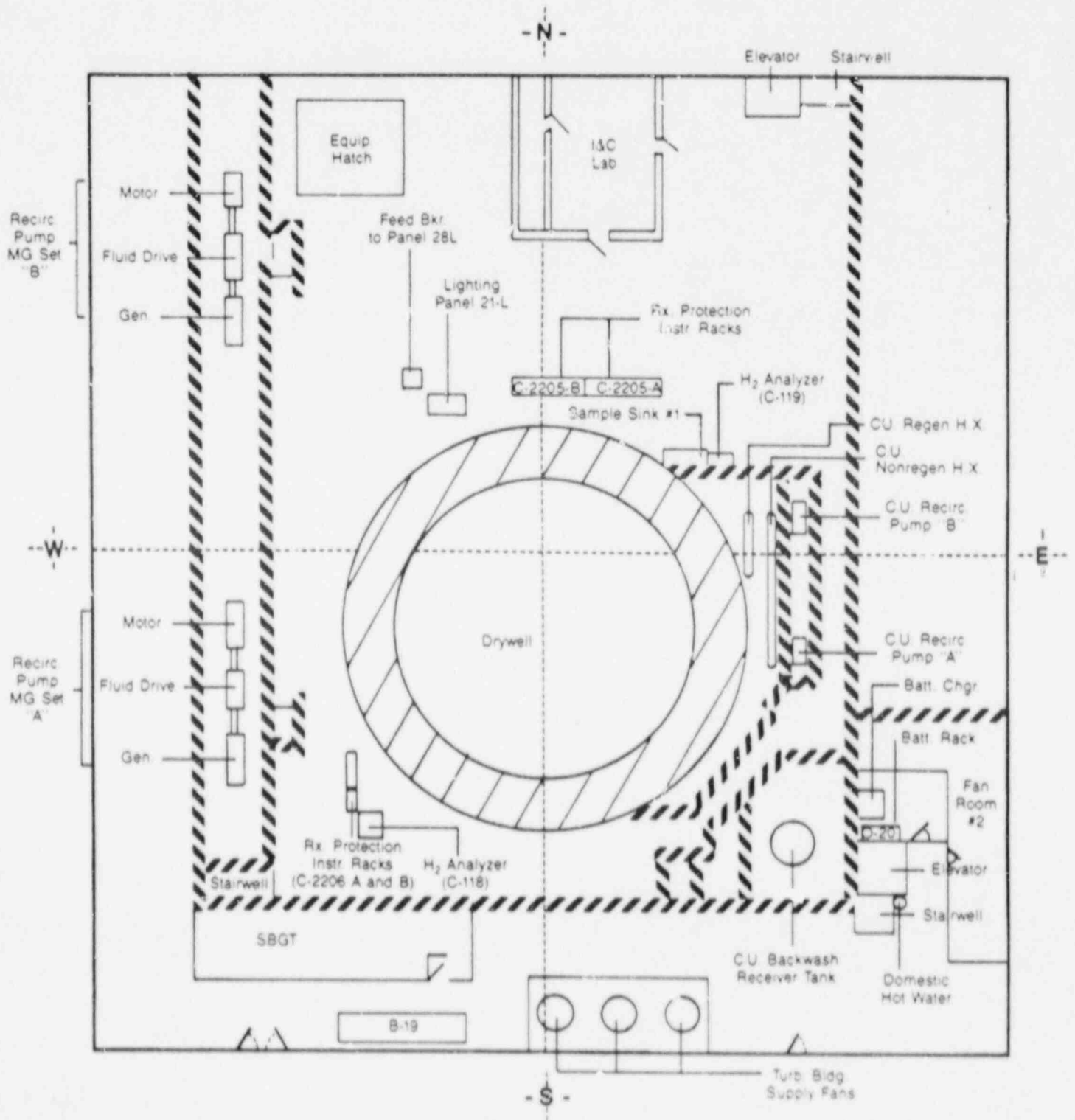


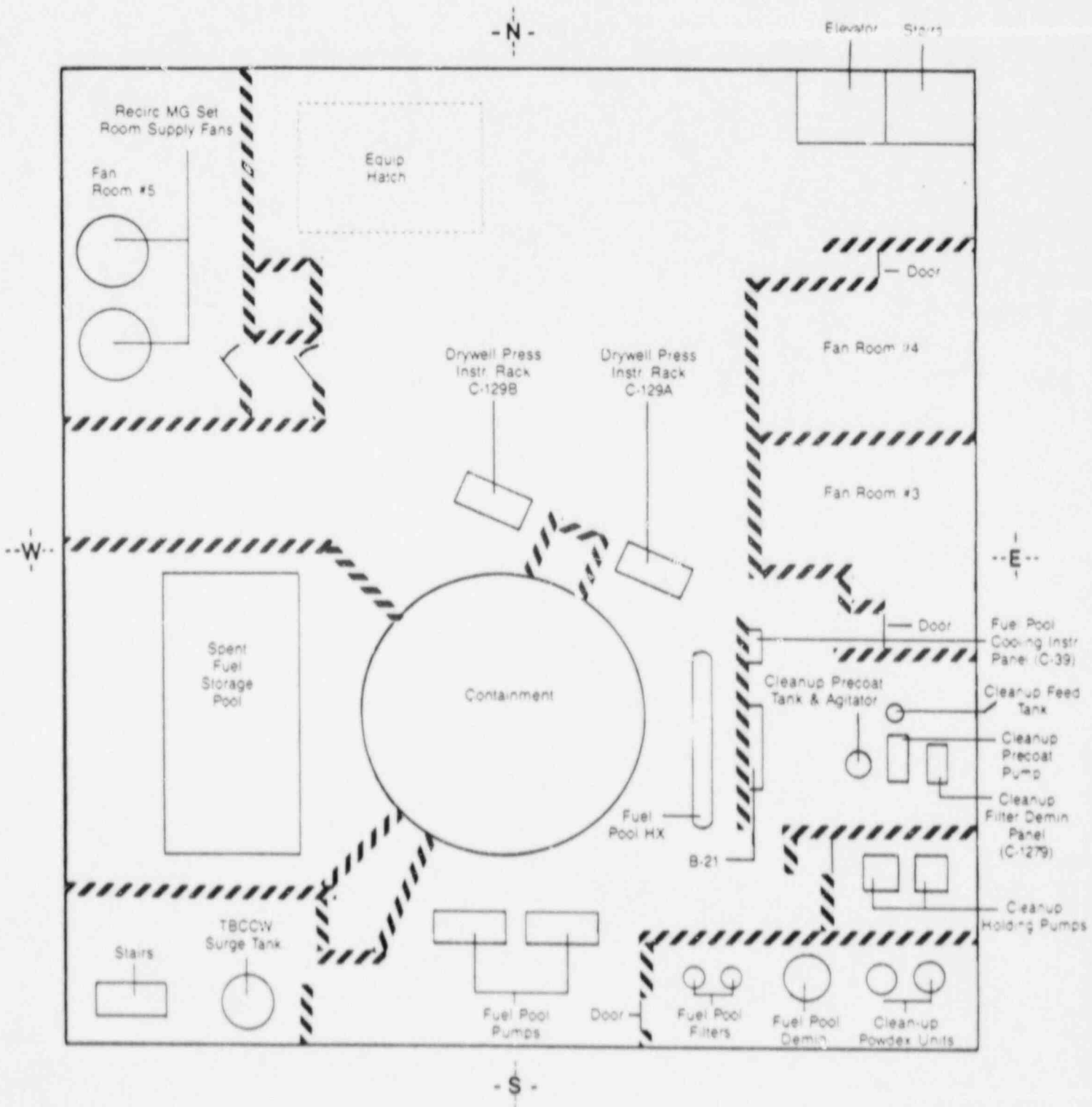
# Reactor Building

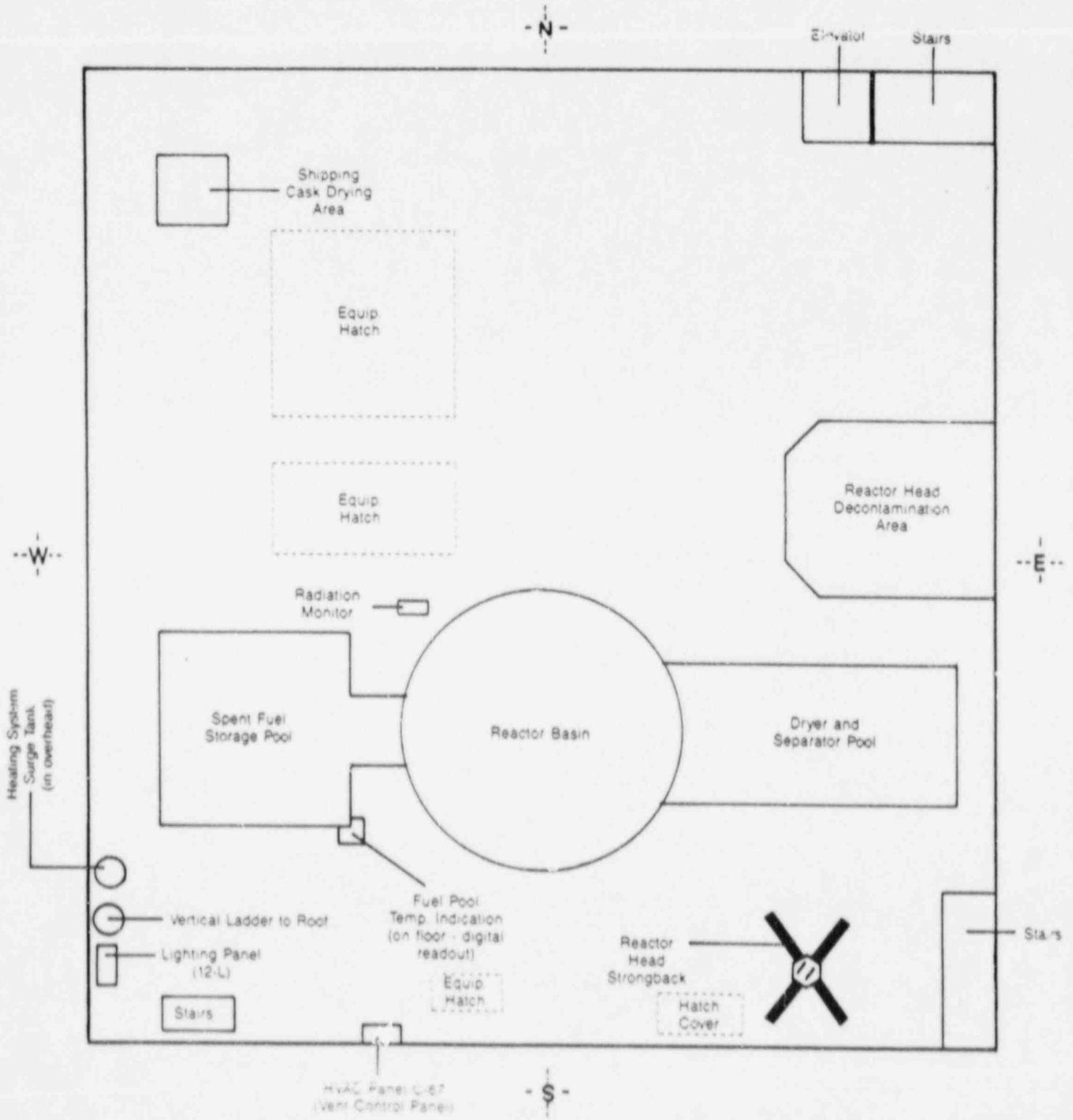
Level: -17'6"





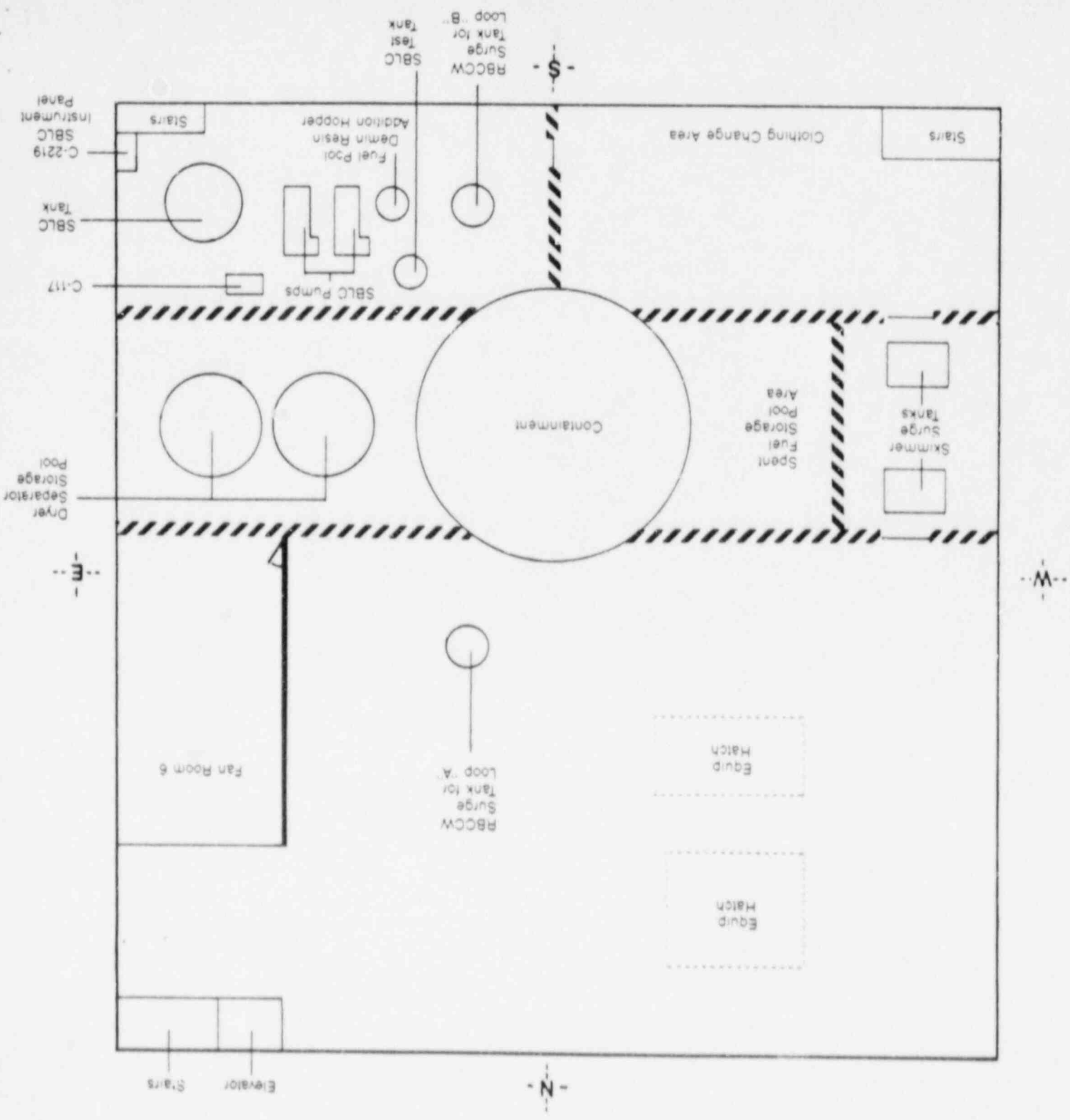






Reactor Building

Level: 91:3"



# AGENDA

- Problems-Solutions-Commitment
- Mgmt. Oversight & Self-Assessment

- Overall Facility
- Plant Operations
- Radiological Controls
- Maintenance & Mods
- Surveillance

- Emergency Preparedness
- Security & Safeguards
- Refueling & OM
- Licensing

- Summary

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## **FUNDAMENTAL PROBLEMS** **HAVE BEEN IDENTIFIED**

- "Problem Ownership" Is Not Understood
- Comprehensive Work Plan Does Not Exist
- "Work Plans" Are Not Widely Communicated
- PNPS Leadership Is Reactive

# PROBLEM SOLUTIONS ARE SIMPLE - BUT NOT EASY

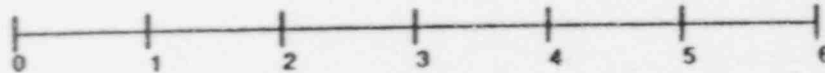
- Instituted Strict Accountability
  - Every Problem Has One Owner
  - Owners Are Accountable To Get Solutions
- Develop Organizational Work Control Process
  - Incorporates Long Term Plan
  - Define Process (By 7/3/86)
- PNPS Leaders Will Be Pro-Active

**CORPORATE RESOURCES COMMITTED**  
**TO THE PNPS STATION MANAGER**

Message Personally Delivered By:

- Vice-President – Nuclear Operations
- Sr. Vice-President – Nuclear
- Chief Executive Officer, BECO

# SIX WEEK ACTION PLAN



Schedule II Items - Hardware

Schedule III Items - Work Control System

Goals & Objectives

Plan & Schedule  
SALP / INPO  
Action Items

Test

Strengthen Selective SALP / INPO Items

# PNPS RECOGNIZES NEED FOR MANAGEMENT OVERSIGHT/SELF-ASSESSMENT

- **Seven Day Self-Assessment**
  - Result of 5/19 Meeting Preparation
  - Determined Some Fundamental Problems
  
- **Six Week Plan**
  - Measure the Goals/Objective Program
  - Develop Comprehensive Work Control Plan
  - Develop Information Management System
  - Complete Schedule III Tasks
  
- **In Addition**
  - Expand Management/Manager Training
  - Establish Monthly Nuclear Self-Assessment Program Meeting
  - Enhance Corrective Action Programs

# OVERALL FACILITY

- **Staffing**
  - Authorized 39 Positions  
(22 in 4/86)
  - Filled 10 Positions  
(Labor Action Impacted)
  - Seek Additional Positions
  
- **Attitude**
  - Compliance Is Not Enough
  - "Good Enough" Is Not Good Enough
  
- **Management Oversight**
  - To Determine Root Cause In Management Systems
  
- **Self-Assessment**
  - Establish Performance Evaluation Approach To Identify Problems/Weaknesses
  
- **Summary**
  - Changed Leadership
  - Company Resources Committed
  - Goal Is Excellence

## OPERATIONS PERSONNEL MATTERS RECEIVING INCREASED ATTENTION

- Aggressive Hiring
  - Hired Cps. Section Manager (5/86)
  - Reassigned 2 Staff Engineers for Chief Operations Engineer (6/86)
  - Hired Chief Chemical Engineer (4/86)
  - Hired 3 Shift Technical Advisors (2/86)
  - Hired 10 Nuclear Plant Operators (2/86) (33% Increase)
- Long Term Staffing Analysis/Plan In Progress (12/86)
  - Apprenticeship Program (Pending Union Contract)
- Restructured Shift Schedule/Reemphasized Accountability for Overtime Control (3/86)
- Four Nuclear Plant Operators Passed Licensed Exam (5/86)
  - Increases Staff From 8 to 12 RO's

# BECO CORRECTING RADIOLOGICAL CONTROL WEAKNESSES

- Management Oversight Enhancements
  - Designated Radiological Project Liaisons (3/86)  
and lead Technicians (4/86)
  - Strengthened Radiological Occurrence Report Program (5/86)
  - Radiological Information Management System Operational (5/86)
  
- Staffing
  - Chief Radiological Engineer (Offer extended 5/86)
  - Added Second ALARA Engineer (4/86)
  - Hired Rad' Materials Inventory Supervisor (5/86)
  - Authorized Eight (8) Technicians (5/86) (35% Increase)  
(Labor Action Impacted)
  
- Addition Of Corporate Radiological Engineering Group (7/86)
  - Staffed With 3 Senior Radiological Engineers
  - Provides Independent Oversight And Support



# BECO IMPROVING MAINTENANCE AND MODIFICATIONS ACTIVITIES

## ORGANIZATIONAL IMPROVEMENTS

- Established Maintenance Planning Function
- Created Centralized Site Procurement Support
- Refocused First-Line Supervisors Toward Field Activities

## MATERIAL CONDITION INITIATIVES

- Backlog MR Reduction
- Fire Protection Project Manager
- Housekeeping "Area Owners"

## TRAINING

- Formal Labs/Classroom Training
- INPO Self-Evaluation
- Apprenticeship Program

# INDEPENDENT TECHNICAL REVIEW OF SURVEILLANCE PROGRAMS

## PHASE I

- Protective Instrumentation Review
- ECCS Simulated Automatic Initiation
- Results: HPCI Testing and RCIC Relays
- Procedures Revised Thru Inter-Departmental Review

## PHASE II

- Complete Remaining Surveillance Requirements Target (6/86)
- Revise Implementing Procedures

## PROGRAM IMPROVEMENTS

- Improved Response to Abnormal Results
- Independent Verification Incorporated into Surveillance Procedures
- Incorporate Comments from Independent Technical Review

# BECO UPGRADING EMERGENCY RESPONSE CAPABILITY

- New EOF Functional (6/86)
  - "State Of The Art" Protected Facility (PF-5)
  - Improved Communications and Layout
  - Reorganization of Emergency Reponse Team
- Emergency Preparedness Staff Increased
  - Hired Assistant Coordinator (3/86)
  - Authorized 3 Additional Positions (5/86)
  - Expected On-Board(9/86)
- Increased Emphasis on Drills/Exercises
  - Tested New Critique Form (4/86)
  - Performed Successful Re-Entry/HP Drill (4/86)
  - Reviewing Tested Scenarios From Other Utilities
  - Increasing Frequency of Drills

# COMPREHENSIVE ACTIONS TO UPGRADE SECURITY

- **Augmenting Security Improvement Program  
(Previously Submitted to NRC)**
  - Including Clarification of Security Objectives-Plan (6/86)
  - Scheduling Equipment Repairs
  - Integrating Security Corrective Action Program with NUORG
  
- **Increased Staffing**
  - BECO Supervisors - Hired 4 of 5 (6/86)
  - Corporate Nuclear Security Specialist Hired (4/86)
  - 20 Additional Security Officers In Training

## CONTINUED EXCELLENCE IN REFUELING/OUTAGE MANAGEMENT

- Instituted "System Window" Concept For RFO-7
- Monitoring Paperwork Closeout as a Scheduled Activity
- Reviewing Recommendations/Good Practices
  - New I&E Module
  - Other Plants

## TO CONTINUE THE STRONG LICENSING PROGRAM

- Assessed Tech Specs for Improvement Areas
  - Streamlined Review Process
  - Prioritized Pending Changes
  - Enhanced Tech Spec Change Control Process
- Developed Policy on Tech Spec Interpretation

## CHANGES TO QA PROGRAM

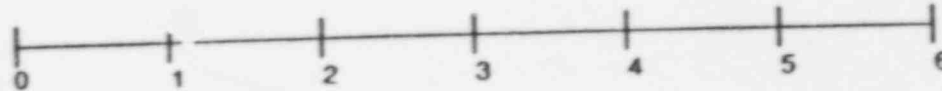
- Improve Timely Corrective Action for DR's
  - Revised BEQAM
  - Daily Meetings With NOM
- Extension of a QA Program to Balance of Plant
  - Incorporate INPO Good Practices
- Developed Training Module on Corrective Action
- Corrective Action Program Being Revised to
  - Incorporate Provisions for Identification and
  - Designation of Non-Regulatory Problems at PNPS

# INCREASED FIRE PROTECTION - DECREASED FIRE WATCHES

- Organization/Staffing
  - Assigned Fire Protection Project Manager (3/86)
  - Re-Assigned Fire Protection Engineer To Operations (1/86)
  - Improved Oversight
- Program Issues
  - Revised Equipment Spec (Allows Catalog Purchase) (3/86)
  - Issuing Fire Watch Trending/Weekly Reports
- Current Results
  - Fire Watches Reduced By 70 %



# SIX WEEK ACTION PLAN



Schedule II Items - **Hardware**  
\_\_\_\_\_

Schedule III Items - **Work Control System**  
\_\_\_\_\_

**Goals &  
Objectives**

\_\_\_\_\_ **Plan & Schedule  
SALP / INPO  
Action Items**

\_\_\_\_\_

**Test**

\_\_\_\_\_

**Strengthen Selective SALP / INPO Items**

\_\_\_\_\_

## SUMMARY

- Changing Management Attitudes
- Strong Direction
- Continuing Support

# IMPROVEMENT INHIBITORS

- Incomplete Staffing  
(Operators, Key Middle Management)
- Prevailing Attitude  
(Improvements Already Made Have Fixed The Problem)
- Reluctance To Acknowledge  
Identified Problems
- Lack Of A Program To  
Identify Weaknesses