

NOV 18 1982

Docket Nos.: 50-498
and 50-499

APPLICANT: Houston Lighting and Power Company

FACILITY: South Texas Project

SUBJECT: MEETING SUMMARY

On Tuesday, October 5, 1982 a meeting was held at the Bechtel Power Corporation (BPC) offices in Houston, Texas to discuss the control room design review program plan with Houston Lighting and Power Company (HL&P). A list of attendees is attached.

The initial presentation was made using the attached agenda and vu-graph charts and figures (also attached).

Several features that are unique to the South Texas Project (STP) were pointed out to the NRC staff. One is the establishment of a Project Review Team that reviews the preliminary and final program plan, criteria, design review findings, reports, and design implementation. The second unique feature is the preparation of a criteria document.

Within the BPC office in Houston is a full scale model of the control room that will be used for training and planning during the design phase.

HL&P indicated a desire to have in-process audits by the NRC staff. The staff agreed to perform such audits and HL&P committed to provide a schedule requesting such audits after the meeting.

131

Don Sells, Project Manager
Licensing Branch No. 3
Division of Licensing

Attachments:
As stated

cc: See next page

8212010443 821118
PDR ADOCK 05000498
A PDR

OFFICE	DL DB#3	DL DB#3					
SURNAME	D Sells/yt	GW Knighton					
DATE	11/17/82	11/15/82					

Attendees at Control Room Design Review
Meeting on October 5, 1982, Houston Texas

NRC

D. Tondi
D. Sells
D. Serig
W. Hill

HP&L

M. Wisenburg
S. Dew
M. McBurnett
G. Helgeson
P. Vande Visse
J. Dewease

BPC

J. Hurley
M. Moreton
R. Considine
R. Pence
H. Hancock

Westinghouse

F. Bursic

Torrey Pines

S. Luna

SOUTH TEXAS

Mr. G. W. Oprea, Jr.
Executive Vice President
Houston Lighting and Power Company
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Mr. J. H. Goldberg
Vice President - Nuclear Engineering
& Construction
Houston Lighting and Power Company
P. O. Box 1700
Houston, Texas 77001

Mr. D. G. Barker
Manager, South Texas Project
Houston Lighting and Power Company
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Houston, Texas 77001

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Mr. Nicholas M. Meiszer, City Manager
City of Austin
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Austin, Texas 78767

Mr. J. B. Poston
Assistant General Manager for Operations
City Public Service Board
P. O. Box 1771
San Antonio, Texas 78296

Jack R. Newman, Esq.
Lowenstein, Newman, Axelrad & Toll
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Melbert Schwarz, Jr., Esq.
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Mrs. Peggy Buchorn
Executive Director
Citizens for Equitable Utilities, Inc.
Route 1, Box 1684
Brazoria, Texas 77422

William S. Jordan, III Esq.
Harmon & Weiss
1725 I Street, N.W.
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Brian Berwick, Esq.
Assistant Attorney General
Environmental Protection Division
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Capitol Station
Austin, Texas 78711

William M. Hill
Resident Inspector/South Texas Project
c/o U. S. NRC
P. O. Box 910
Bay City, Texas 77414

Mr. Richard C. Balough
Assistant City Attorney
City of Austin
P. O. Box 1088
Austin, Texas 78767

Mr. Lanny Sinkin
Ms. Pat Coy
Citizens Concerned About Nuclear Power
5106 Case Ore
San Antonio, Texas 78233

Mr. Mark R. Wisenberg
Manager, Nuclear Licensing
Houston Lighting and Power Company
P. O. Box 1700
Houston, Texas 77001

Mr. Charles Halligan
Mr. Burton L. Lex
Bechtel Corporation
P. O. Box 2166
Houston, Texas 77001

Regional Administrator-Region IV
U.S. Nuclear Regulatory Commission
61 Ryan Plaza Drive
Suite 1000
Arlington, Texas 76011

SOUTH TEXAS PROJECT

CONTROL ROOM DESIGN REVIEW

PROGRAM PLAN PRESENTATION

OCTOBER 5, 1982



**SOUTH TEXAS PROJECT
CONTROL ROOM DESIGN REVIEW
AGENDA**

- | | |
|---|---------------------------|
| 1. OPENING COMMENTS | (HL&P – S. DEW) |
| 2. ORIENTATION | (BECHTEL – M. MORETON) |
| 3. CONTROL ROOM DESIGN | (BECHTEL. – R. CONSIDINE) |
| 4. CRDR PROGRAM PLAN | |
| A – ORGANIZATION | (HL&P – S. DEW) |
| B – REVIEW TEAM
COMPOSITION | (TPT – S. LUNA) |
| C – REVIEW | (TPT – S. LUNA) |
| D – ASSESSMENT | (TPT – S. LUNA) |
| E – REPORTING | (TPT – S. LUNA) |
| 5. SYSTEM FUNCTION AND
TASK ANALYSIS | (TPT – S. LUNA) |
| 6. CLOSING REMARKS | (HL&P – M. WISENBURG) |
| 7. NRC COMMENT | |

**SOUTH TEXAS PROJECT
UNITS 1 & 2**

NSSS

- **WESTINGHOUSE – PWR**
– 1250 MWE

T/G

- **WESTINGHOUSE**
– **TANDEM COMPOUND**
– 1800 RPM

COMMERCIAL OPERATING DATES

UNIT 1 – JUNE, 1987
UNIT 2 – JUNE, 1989



ARTIST'S REVISION OF SOUTH TEXAS PROJECT PLANT

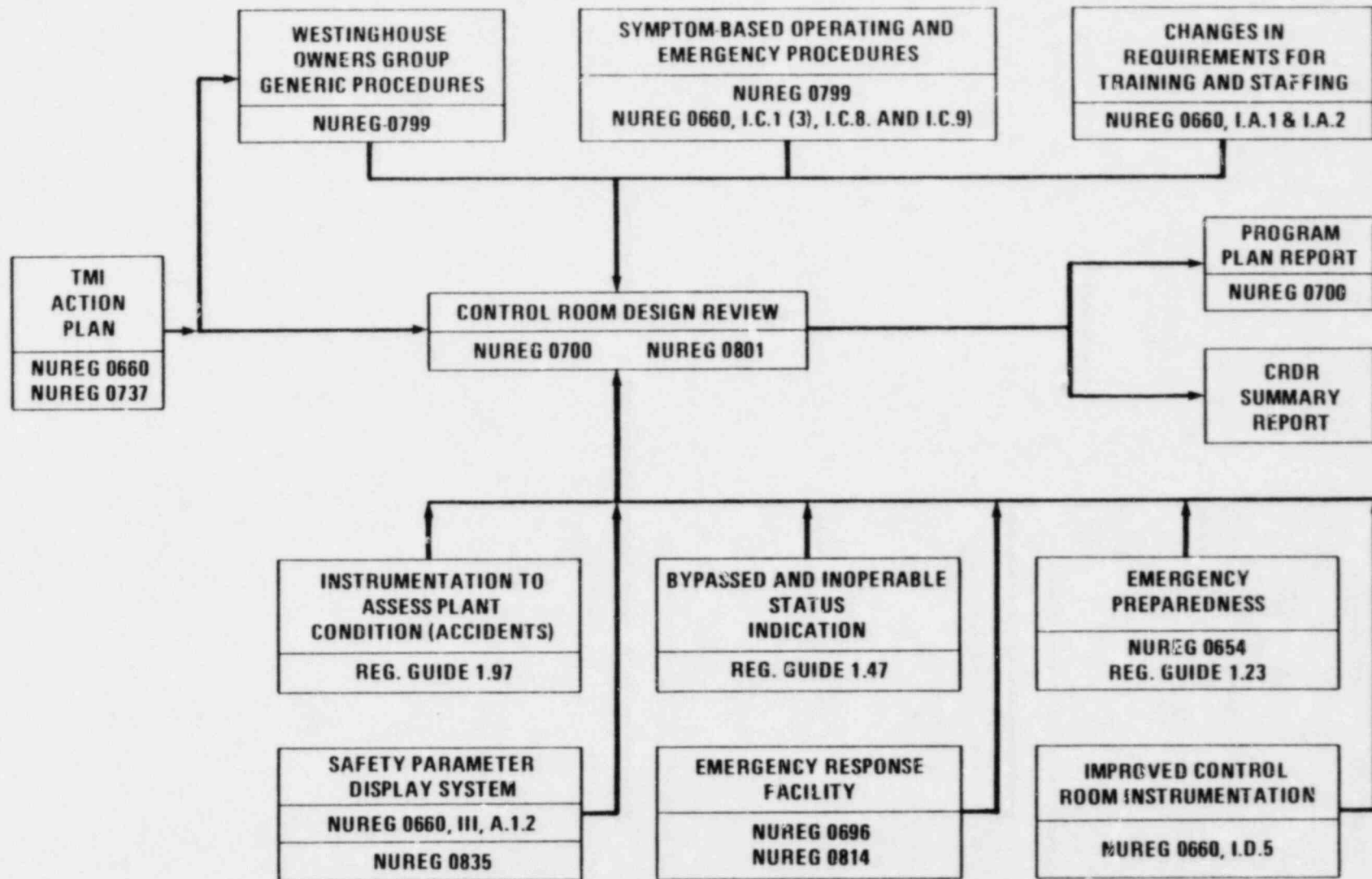
TMI ACTION PLAN

- NUREG 0660
- NUREG 0737
- SECY 82-111



- SAFETY PARAMETER DISPLAY SYSTEM (SPDS)
- ***CONTROL ROOM DESIGN REVIEW***
- POST ACCIDENT MONITORING (R. G. 1. 97)
- EMERGENCY OPERATING PROCEDURES (EOPS)
- EMERGENCY RESPONSE FACILITIES

RELATIONSHIP OF NUREG 0660 TASK ACTION ITEMS



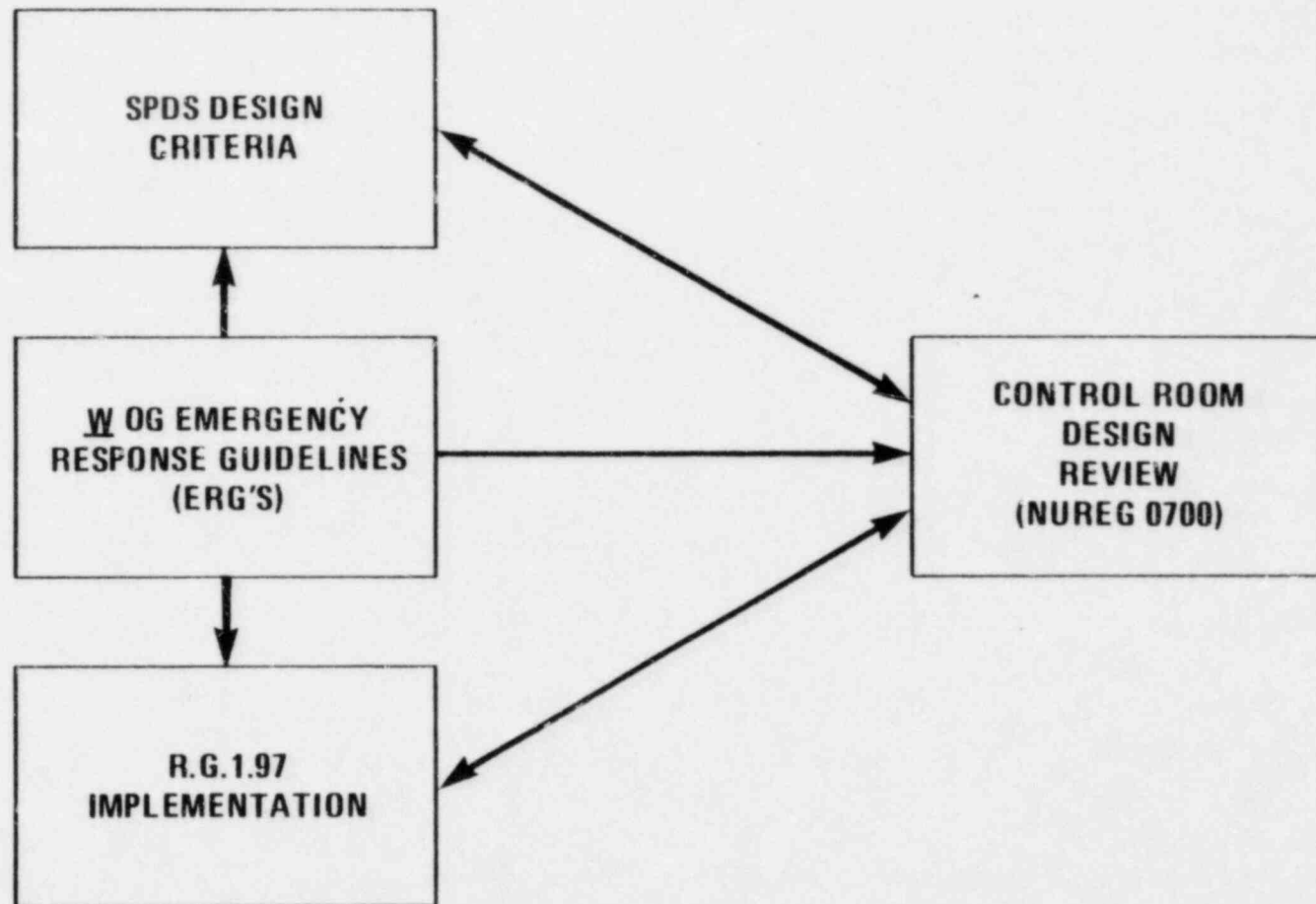
INTEGRATED TMI ACTION PLAN SCHEDULE

(ALL ITEMS DUE FOR COMPLETION BY FUEL LOAD)

<u>ACTIVITY</u>	<u>STATUS</u>
● WESTINGHOUSE OWNERS GROUP (W OG) GENERIC PROCEDURES	COMPLETE
● SYMPTON BASED OPERATING & EMERGENCY PROCEDURES	ONGOING
● TRAINING & STAFFING	ONGOING
● CONTROL ROOM DESIGN REVIEW (CRDR)	ONGOING
● INSTRUMENTATION TO ASSESS PLANT CONDITIONS (ACCIDENTS)	DESIGN CRITERIA ON GOING HARDWARE PROCUREMENT LATE '83 REVIEW BY CRDR ONGOING
● BYPASS & INOPERABLE STATUS INDICATION	DESIGN COMPLETE HARDWARE COMPLETE REVIEW BY CRDR ONGOING
● SAFETY PARAMETER DISPLAY SYSTEM (SPDS)	DESIGN CRITERIA ONGOING REVIEW BY CRDR ONGOING HARDWARE PROCUREMENT LATE '83
● EMERGENCY RESPONSE FACILITIES	DESIGN ONGOING HARDWARE PROCUREMENT LATE '83
● EMERGENCY PREPAREDNESS	EMERGENCY PLAN ONGOING

SECY 82-111

COORDINATION AND INTEGRATION CONTROL ROOM DESIGN REVIEW



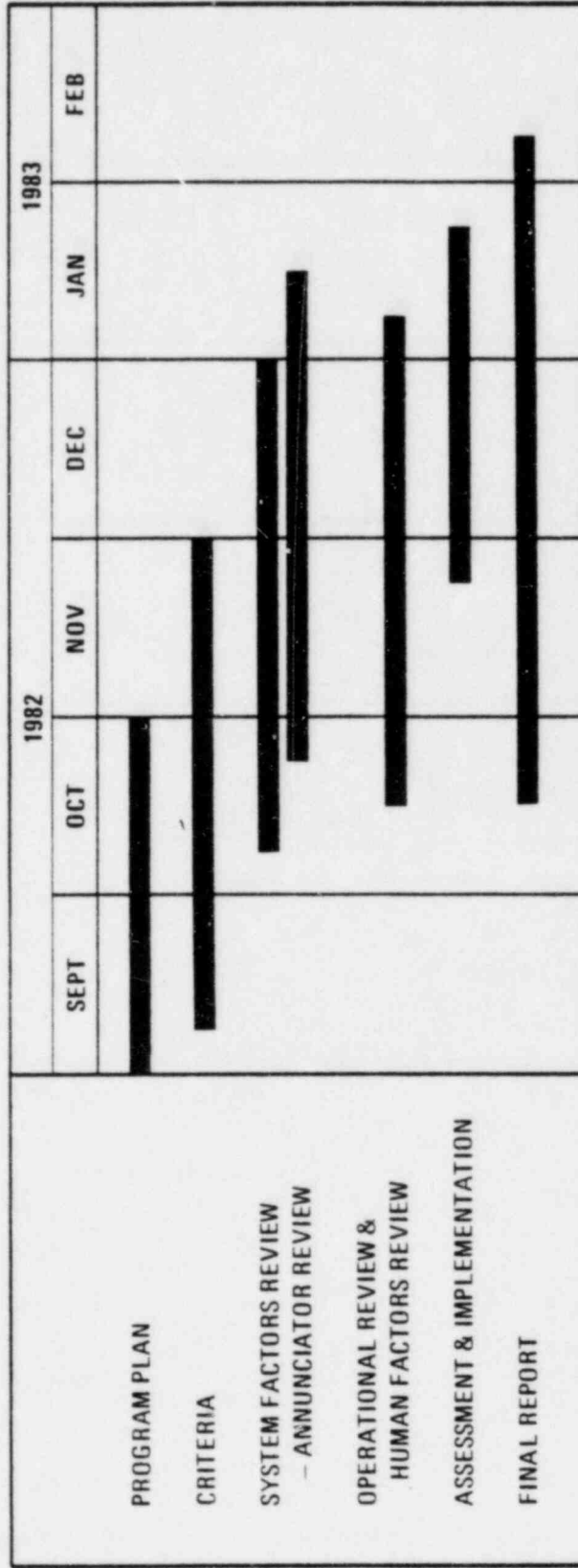
CONTROL ROOM DESIGN STATUS

- CONTROL ROOM LAYOUT COMPLETE
- CONTROL ROOM BUILDING STRUCTURE COMPLETE
- PANEL DESIGN COMPLETE
EXCEPTING TM! AND DESIGN EVOLUTION CHANGES
- PANEL FABRICATION METAL FABRICATION COMPLETE
HARDWARE PURCHASED 5 OUT OF 10 SECTIONS
READY FOR SHIPMENT
- AUXILIARY SHUTDOWN PANEL PRELIMINARY DESIGN COMPLETE
NO FABRICATION OR HARDWARE PROCUREMENT
- PLANT SPECIFIC TRAINING SIMULATOR PANELS COMPLETE
SOFTWARE DEVELOPMENT IN PROGRESS

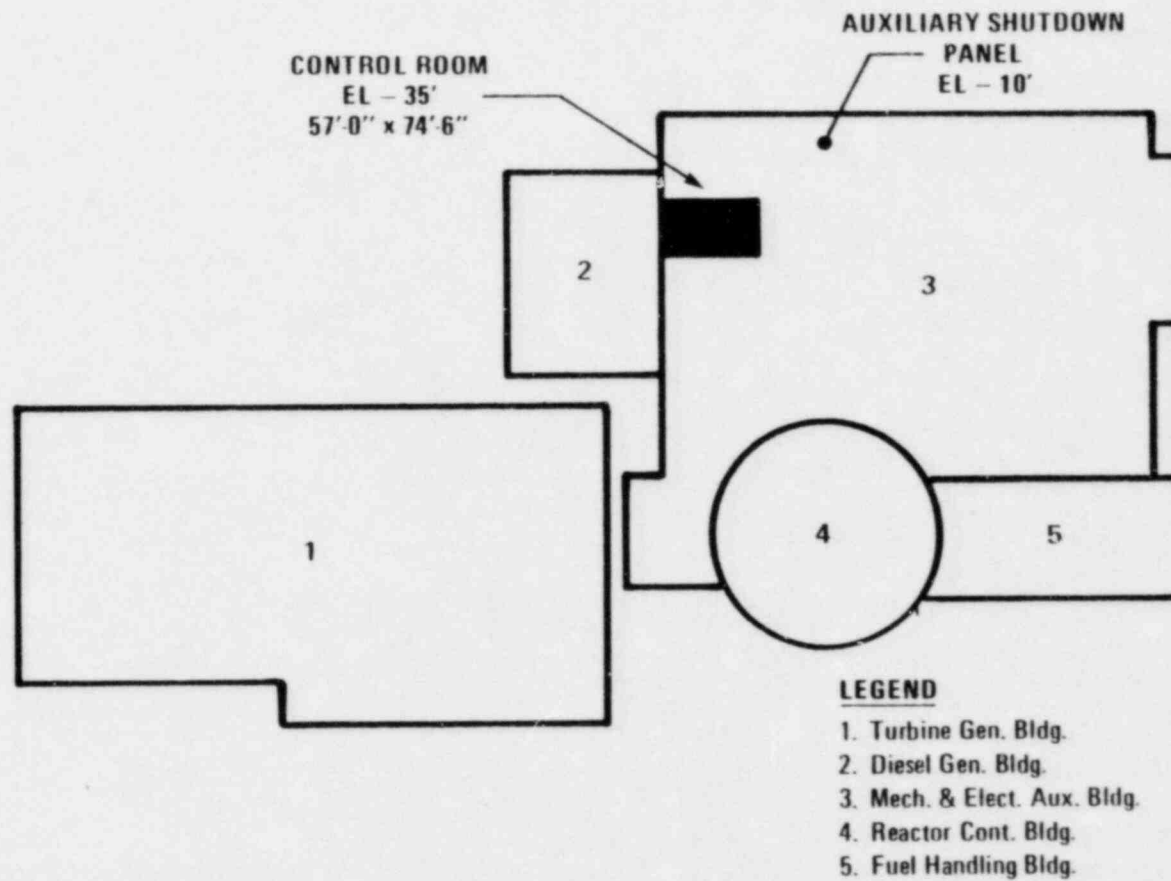
CONTROL ROOM SCHEDULE

- **CONTROL ROOM DESIGN REVIEW
OF MOCK-UP COMPLETE** 2/83
- **RETURN PANELS TO FABRICATION** 3/83
- **PANEL INSTALLATION** 1/84 THRU 6/84
- **CONTROL ROOM ARCHITECTURAL FEATURES
COMPLETE (LIGHTING, HVAC, ETC.)** EARLY '86
- **PANEL TURNOVER TO OPERATIONS – 80%** EARLY '86
- **SIMULATOR INSTALLATION COMPLETE
(AVAILABLE FOR TRAINING)** EARLY '84

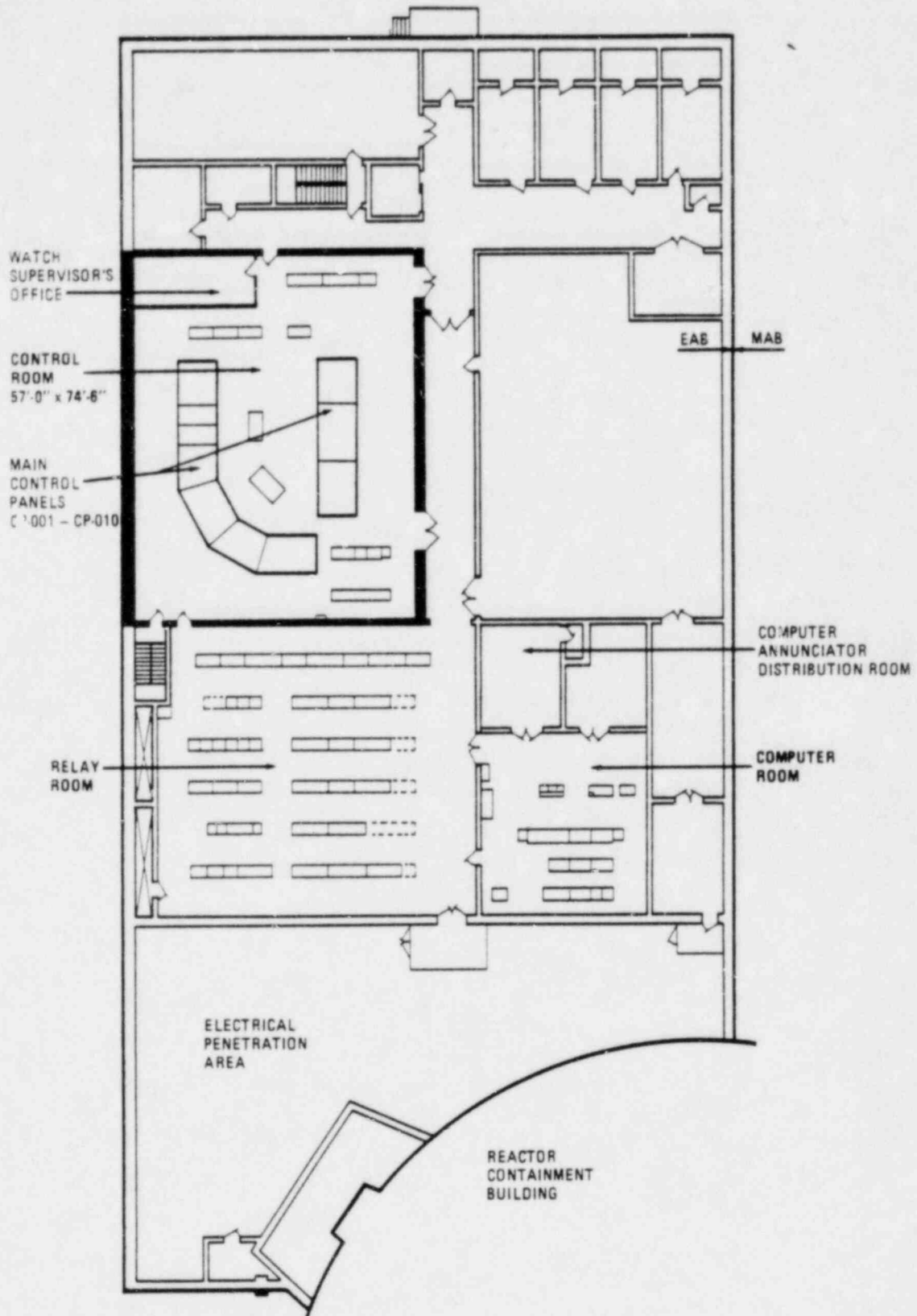
CONTROL ROOM DESIGN REVIEW SCHEDULE



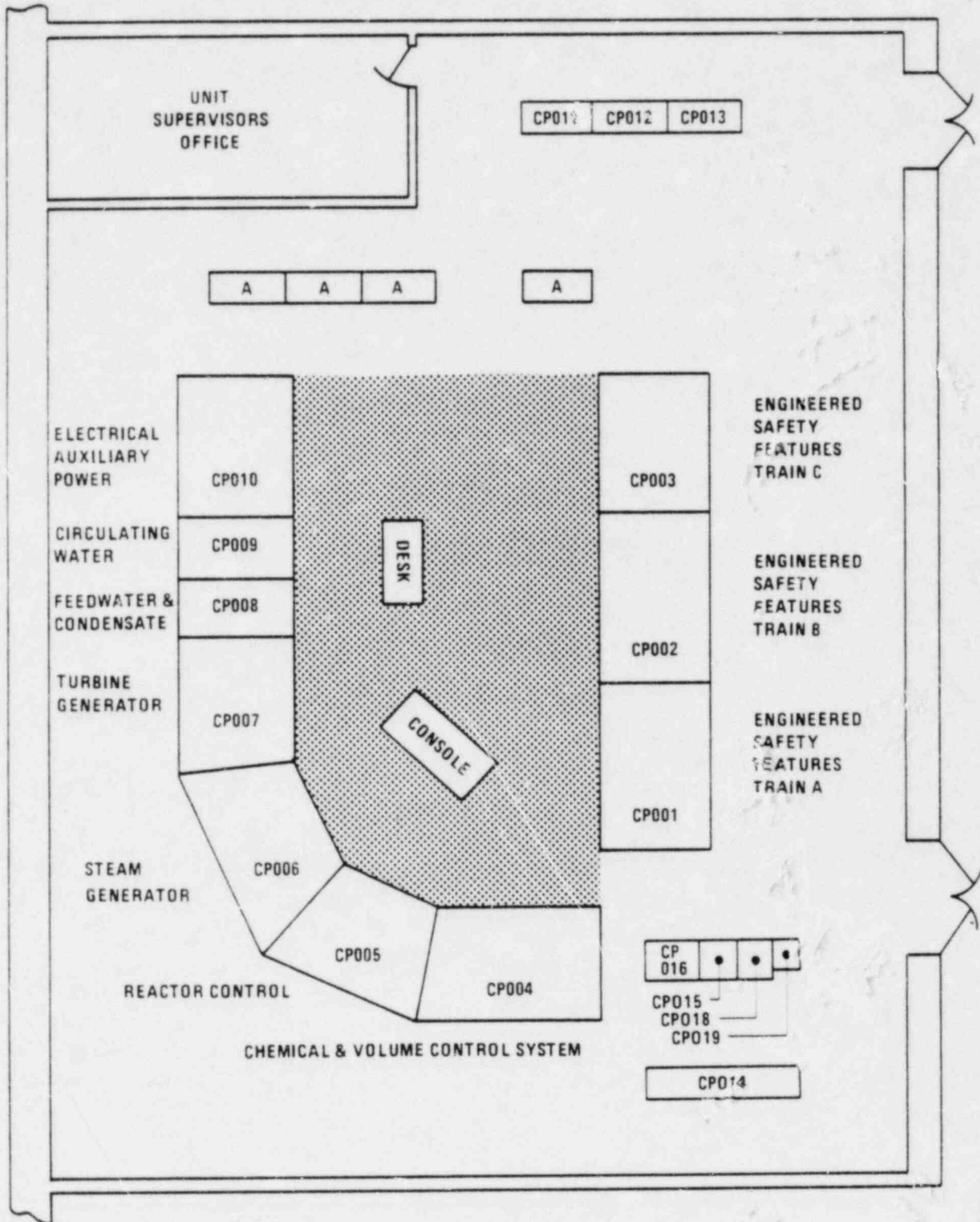
STP CONTROL ROOM LOCATION




EAB ELEVATION DRAWING
CR/RR/COMPUTER ROOM
AT 35'-0" ELEVATION



CONTROL ROOM LAYOUT



- | | |
|--|--------------------------------|
| CP011 - NUCLEAR INSTR. PANEL | CP015 - LOOSE PARTS MONITORING |
| CP012 - FLUX MAPPING | CP016 - AUX. OBIER PANEL |
| CP013 - MOTION SEISMIC MONITORING | CP018 - RECORDER PANEL |
| CP014 - VIBRATION MONITORING | CP019 - FIRE PROTECTION PANEL |
|  CRDR EVALUATION AREA | A - COMPUTER TYPER |

PANEL HARDWARE

- SWITCHES
 - GE SBM
 - GE SB-1
 - GE CR 2940

- INDICATING LIGHTS
 - GE ET-16

- METERS
 - SIGMA 1151
 - SIGMA 1152
 - GE DB-40
 - WESTINGHOUSE VX-252

- RECORDERS
 - HAGAN STRIP CHART
 - WESTRONICS-MULTIPOINT
 - L&N STRIP CHART

- CRT'S & KEYBOARDS
 - ALARM
 - UTILITY
 - OPERATOR

- ANNUNCIATORS & ESF STATUS MONITORING
 - BETA
 - (~ 1200 ALARM WINDOWS)
 - (~ 1000 ESF STATUS WINDOWS)

- MAJOR INSERTS
 - INDIVIDUAL ROD POSITION INDICATION - W
 - T/G CONTROL - W

CONTROL PANEL MOCK-UP

ACCURATE REPRESENTATION OF PANEL DESIGN

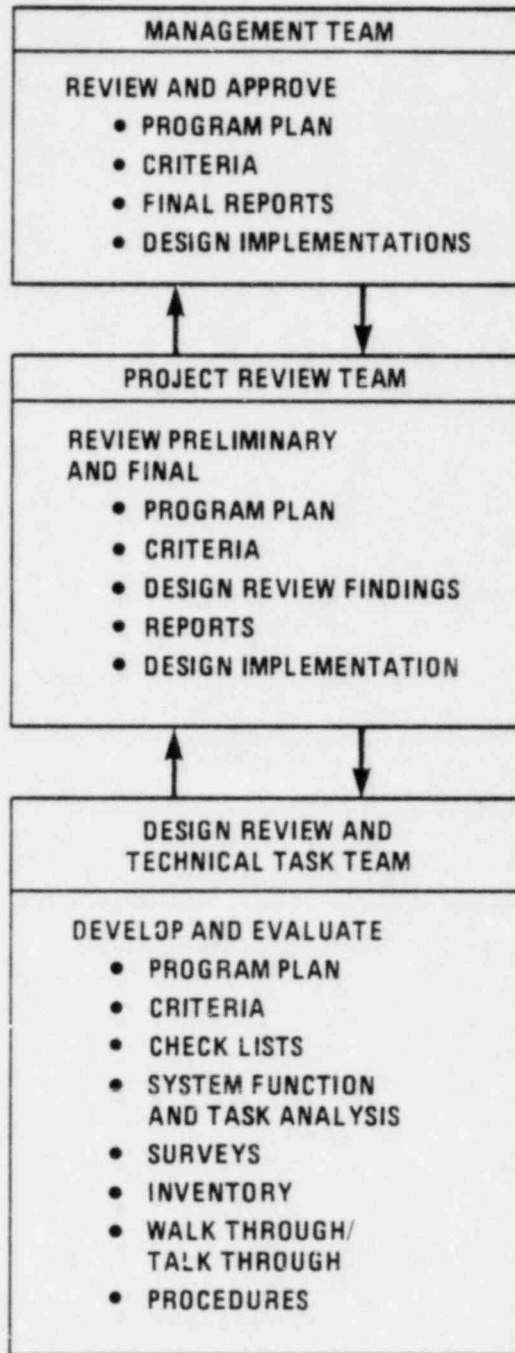
- **ALL CONTROL & DISPLAY HARDWARE**
- **ALL NAMEPLATES & ANNUNCIATOR ENGRAVINGS**
- **ESSENTIAL COLOR REPRESENTATION**
- **PRECISE DIMENSIONING**

CONTROL PANEL MOCK-UP

REVIEW TOOL FOR CRDR

- **OPERATIONAL REVIEW**
- **HUMAN FACTORS REVIEW**
- **CONTROL ROOM INVENTORY**
- **SYSTEM FUNCTIONS AND TASK ANALYSIS**
- **IMPLEMENTATION OF TMI & CRDR MODIFICATIONS**
- **HUMAN FACTORS VERIFICATION**

CRDR ORGANIZATION



CRDR MANAGEMENT TEAM

MANAGEMENT TEAM
<p><u>HL&P</u> MANAGER, ENGINEERING VICE PRES., OPERATIONS</p> <p><u>BECHTEL</u> PROJECT ENGINEER – SYSTEMS</p>

CRDR PROJECT REVIEW TEAM

PROJECT REVIEW TEAM
<p><u>HL&P</u> LEAD, INSTRUMENTS & CONTROLS OPERATIONS GENERAL SUPERVISOR</p> <p><u>BECHTEL</u> CONTROL SYSTEMS DEPUTY GROUP SUPVR</p>

**CRDR DESIGN REVIEW
AND TECHNICAL TASK TEAM**

**DESIGN REVIEW AND
TECHNICAL TASK TEAM**

HL&P

**ENGINEERING, OPERATIONS AND
LICENSING PERSONNEL AS REQUIRED**

BECHTEL

**PRINCIPAL INVESTIGATOR
ENGINEERING AS REQUIRED**

WESTINGHOUSE

**ENGINEERING AND TRAINING
AS REQUIRED**

CONSULTANTS

PROJECT ENGINEER

ASST. PROJECT ENGINEER

TASK ANALYSIS LEADER

OPERATING EXPERIENCE REVIEW LDR

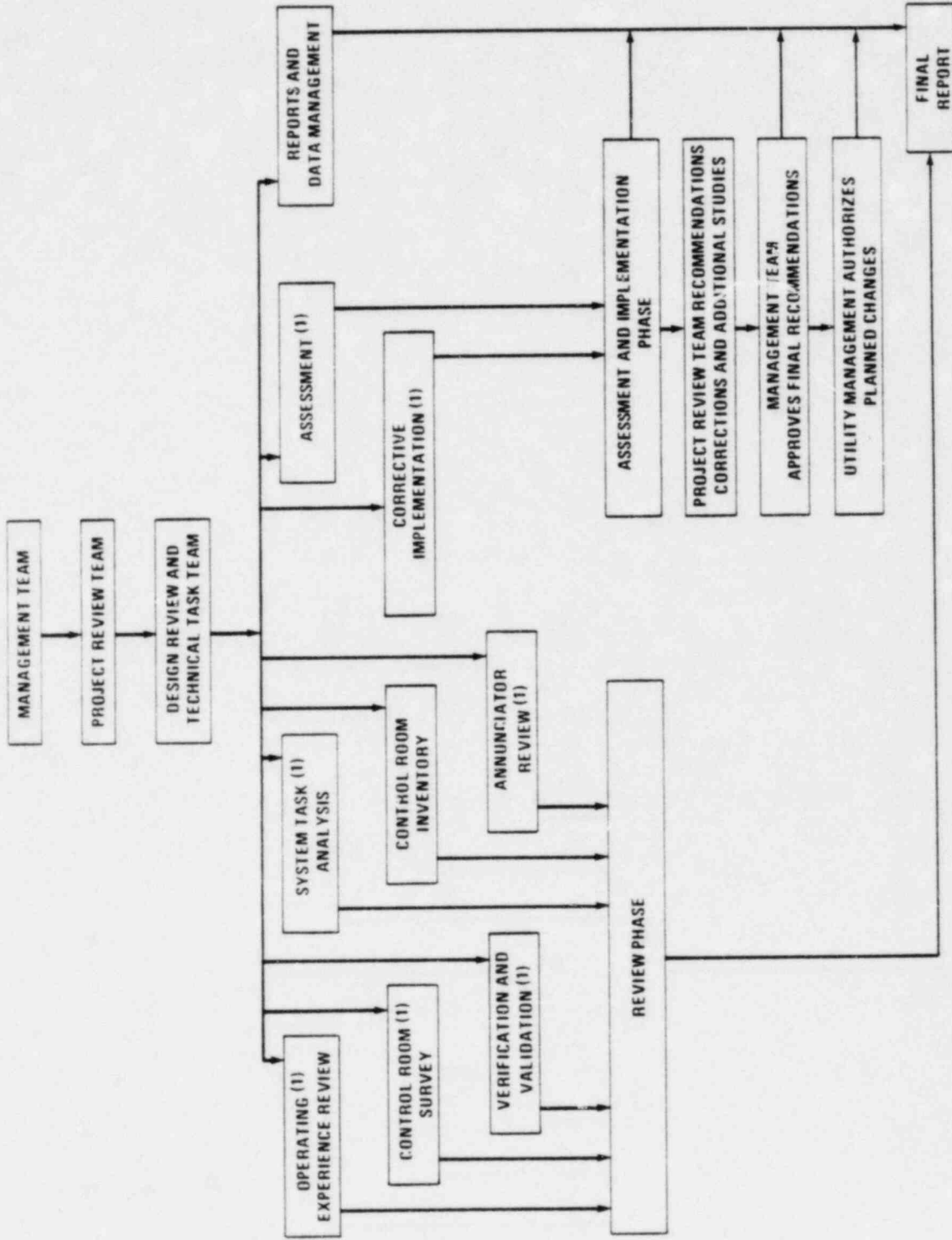
CONTROL ROOM SURVEY LDR

ANNUNCIATOR REVIEW LEADER

VERIFICATION & VALIDATION LDR

ASSESSMENT & IMPLEMENTATION LDR

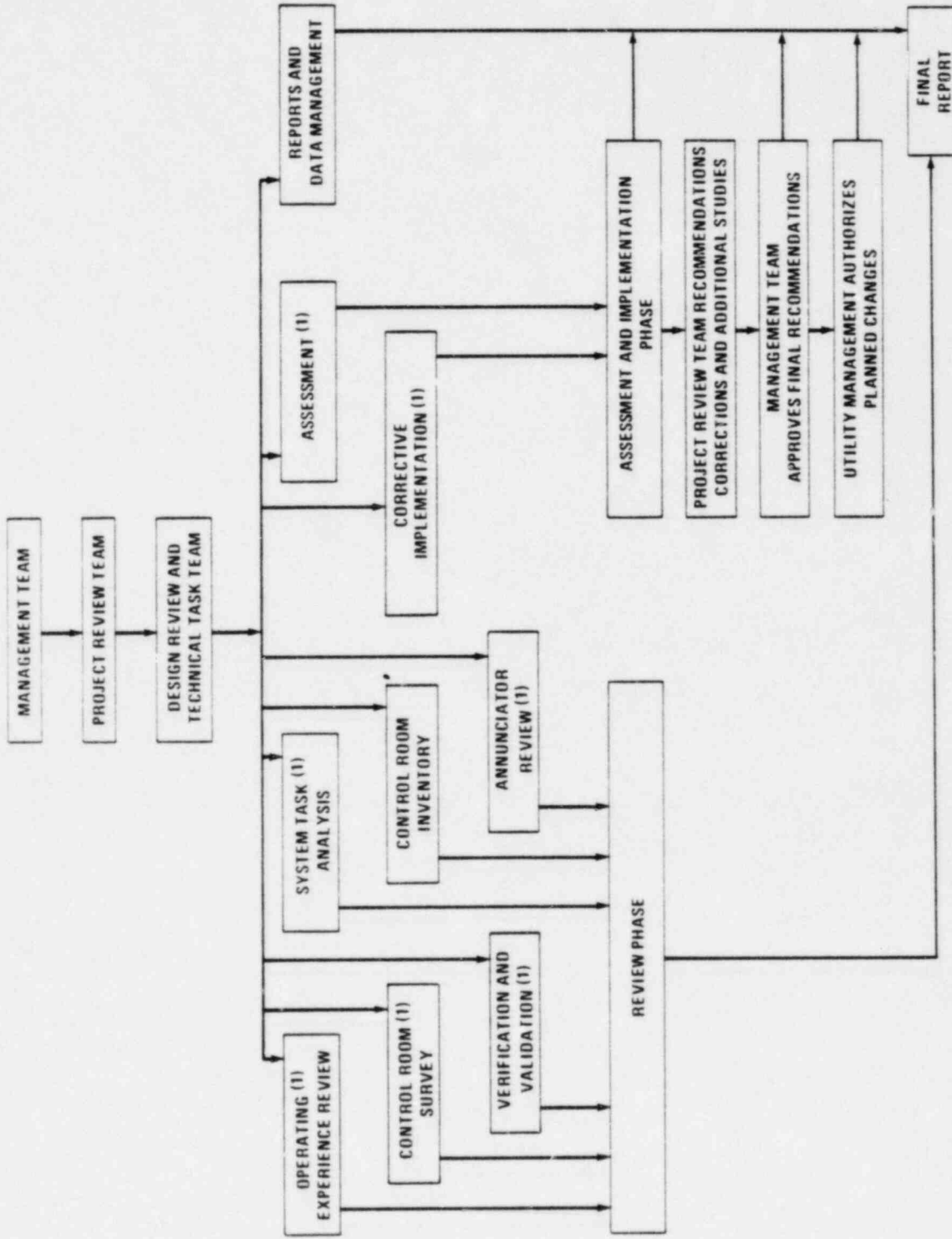
PROGRAM TASK ORGANIZATION



(1) SPECIALITY GROUP ORGANIZED FOR THIS SPECIFIC ACTIVITY

REVIEW

PROGRAM TASK ORGANIZATION



(1) SPECIALITY GROUP ORGANIZED FOR THIS SPECIFIC ACTIVITY

ASSESSMENT
&
IMPLEMENTATION

VALIDATION

VERIFICATION

ANNUNCIATOR
REVIEW

CONTROL
ROOM
SURVEY

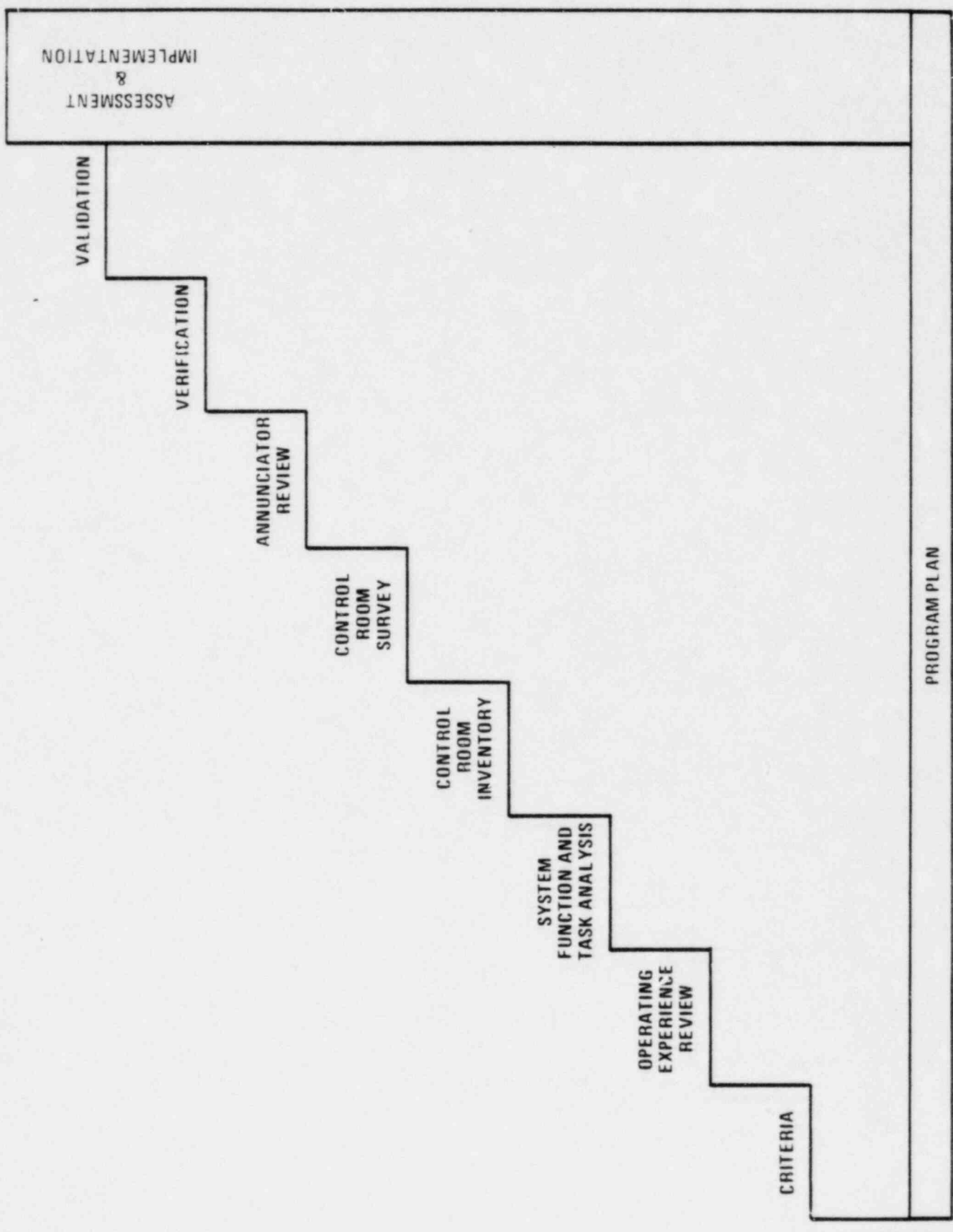
CONTROL
ROOM
INVENTORY

SYSTEM
FUNCTION AND
TASK ANALYSIS

OPERATING
EXPERIENCE
REVIEW

CRITERIA

PROGRAM PLAN



CRITERIA

INTRODUCTION

GENERAL

CONTROL ROOM LAYOUT FEATURES

MAIN CONTROL PANEL LAYOUT FEATURES

HUMAN FACTORS GUIDELINES

COMMUNICATIONS

CONTROL ROOM ANNUNCIATION FEATURES

POST ACCIDENT MONITORING FEATURES

BYPASS AND INOPERABLE STATUS FEATURES

SPDS FEATURES

CRITERIA WILL CONSIDER

- **INDUSTRY PRACTICES**
- **NUREGS AND RG'S**
- **GOVERNMENT SOURCES**
- **HL&P, WESTINGHOUSE AND BECHTEL MATERIAL**
- **SUPPLIER MATERIAL**

OPERATING EXPERIENCE REVIEW

- **TEAM STRUCTURE**
- **RELATED PLANT EXPERIENCE**
- **TASK TEAM WORK**
 - **QUESTIONNAIRES AND INTERVIEW FORMS**
 - **INTERVIEWS**
 - **EVALUATIONS**
 - **CHECKLIST OBSERVATIONS**
 - **SUMMARIES**

RELATED PLANT EXPERIENCE

- DATA SEARCH

- EPRI
- LER'S
- SER'S

- OPERATING EXPERIENCE

- VARIOUS UTILITY
BACKGROUNDS

CATEGORY OF RESPONDENTS

- **SHIFT AND UNIT SUPERVISORS**
- **REACTOR OPERATORS**
- **AUXILIARY OPERATORS**
- **GENERAL SUPERVISOR**

DATA CONSIDERS

- **SPECIAL KNOWLEDGE OF OPERATORS**
- **IDENTIFICATION OF TROUBLESOME OPERATIONS**
- **PAST EXPERIENCES**
 - **NEAR-MISS SITUATIONS**
- **0700 TOPICS**

CONTROL ROOM INVENTORY

- **COMPUTER BASED DATA**
- **COMPONENT USES**
- **CHARACTERISTICS**

CONTROL ROOM SURVEY

- **TEAM STRUCTURE**
- **USE OF MOCK-UP**
- **TASK TEAM WORK**
 - **CHECKLISTS**
 - **SURVEY**
 - **EVALUATIONS**
 - **CHECKLIST OBSERVATIONS**
 - **SUMMARIES**

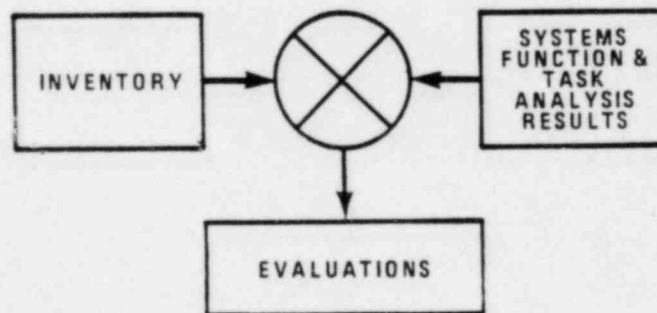
ANNUNCIATOR REVIEW

- **TEAM STRUCTURE**

- **TASK TEAM WORK**
 - **CRITERIA**
 - **REVIEW DESIGN DOCUMENTS**
 - **ASSIGN PRIORITY LEVELS**
 - **RECOMMEND LAYOUT CHANGES**
 - **HUMAN FACTORS CONSIDERATIONS**
 - **OBSERVATIONS**
 - **EVALUATIONS/REPORT**

VERIFICATION

- TEAM STRUCTURE
- COMPUTERIZED DATA
- WORK
 - EVALUATIONS
 - OBSERVATIONS
 - SUMMARY



VALIDATION

- **TEAM STRUCTURE**
- **TASK TEAM WORK**
 - **STATIC WALK THRU/TALK THRU**
 - **DYNAMIC WALK THRU/TALK THRU**
 - **EVALUATIONS**
 - **OBSERVATIONS**
 - **SUMMARIES**

ASSESSMENT & IMPLEMENTATION

ASSESSMENT & IMPLEMENTATION

- **TEAM STRUCTURE**

- **METHODOLOGY**

- **CRITERIA**

- **PROCESSING OBSERVATIONS**

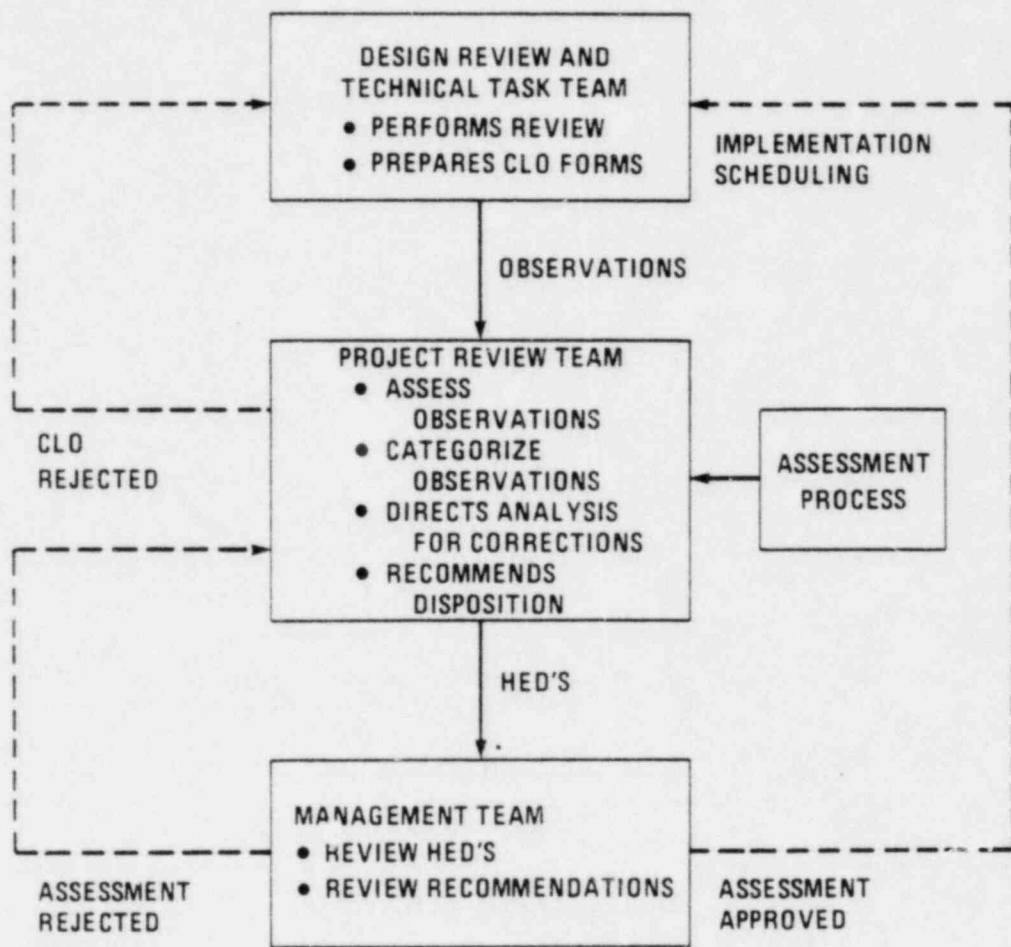
- **HED'S ANALYSIS AND FORMS**

- **IMPLEMENTATION CONSIDERATIONS**

- **HED PROCESSING**

- **DOCUMENTATION**

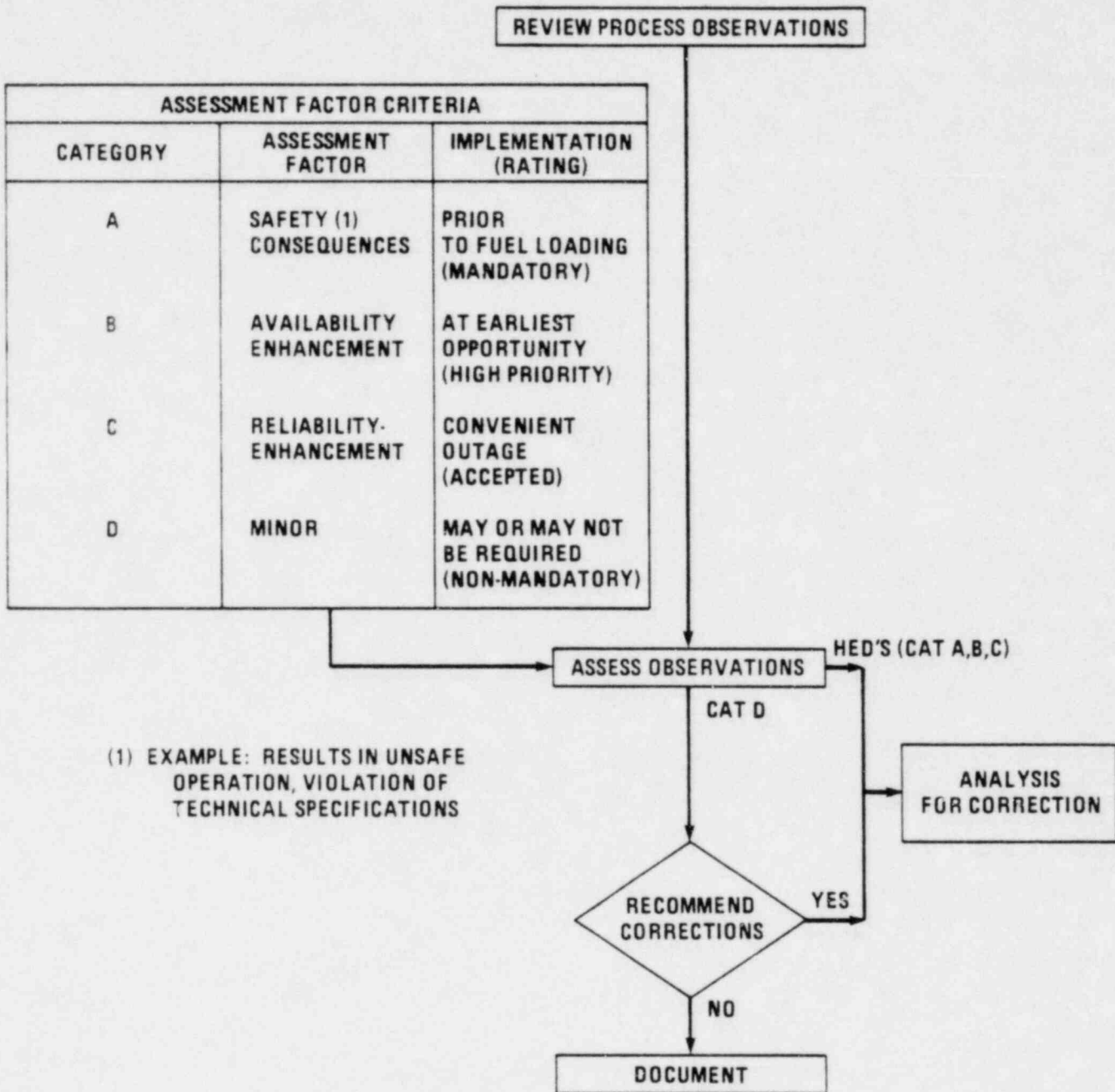
**ASSESSMENT AND
IMPLEMENTATION METHODOLOGY**



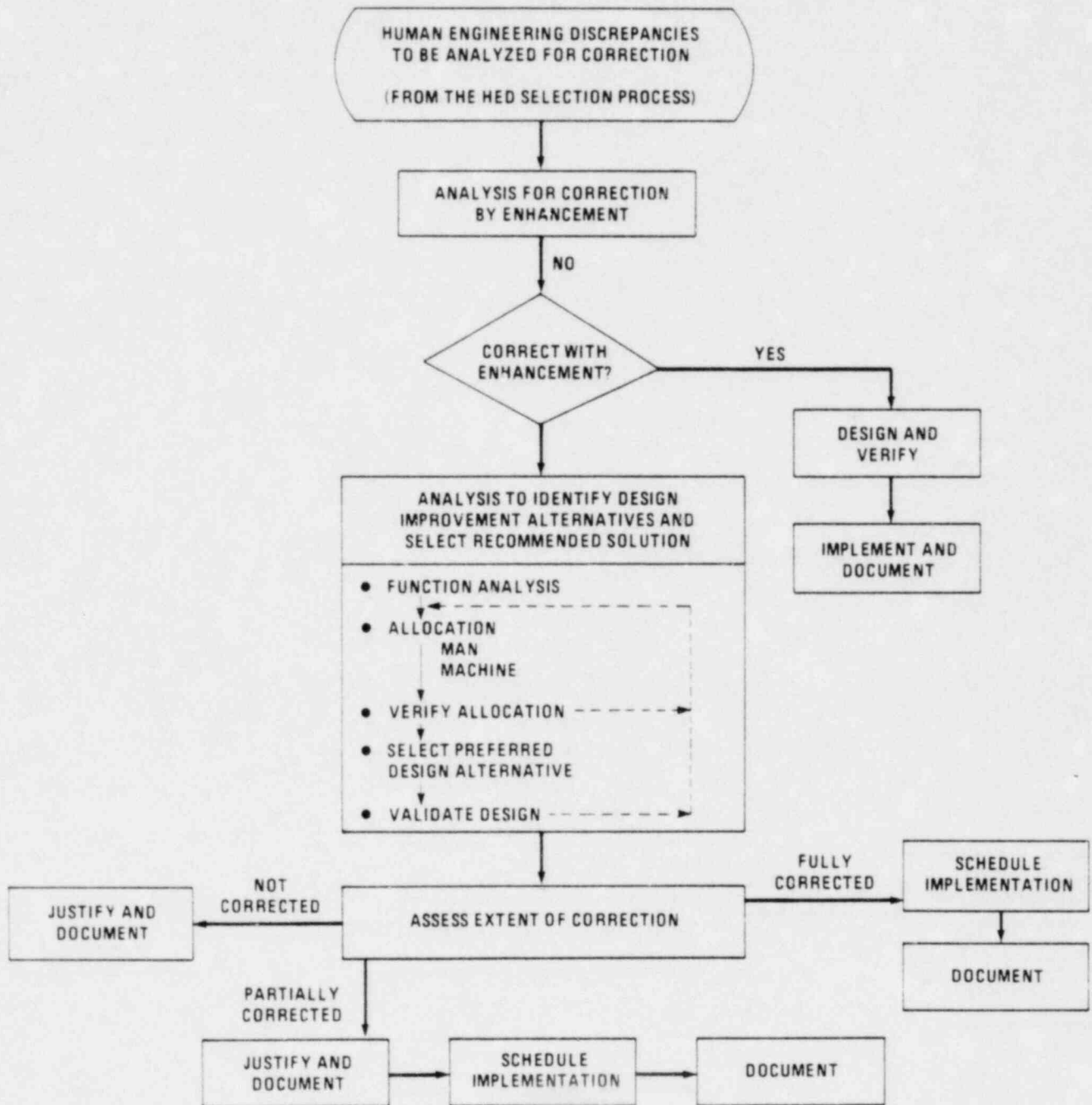
LEGEND:

- CLO - CHECKLIST OBSERVATIONS
- HED - HUMAN ENGINEERING DISCREPANCY

SELECTION OF HED'S TO BE ANALYZED FOR CORRECTION



SELECTION OF DESIGN IMPROVEMENTS



**REPORTING
(DOCUMENTATION)**

DOCUMENTATION

- **DATA**
 - **COMPUTERIZED**
 - **INDEXED AUDITABLE FILE**

- **FINAL REPORT:**
 - **EXECUTIVE SUMMARY**
 - **DISCUSSION AND DATA**

**SYSTEM FUNCTION
AND
TASK ANALYSIS**

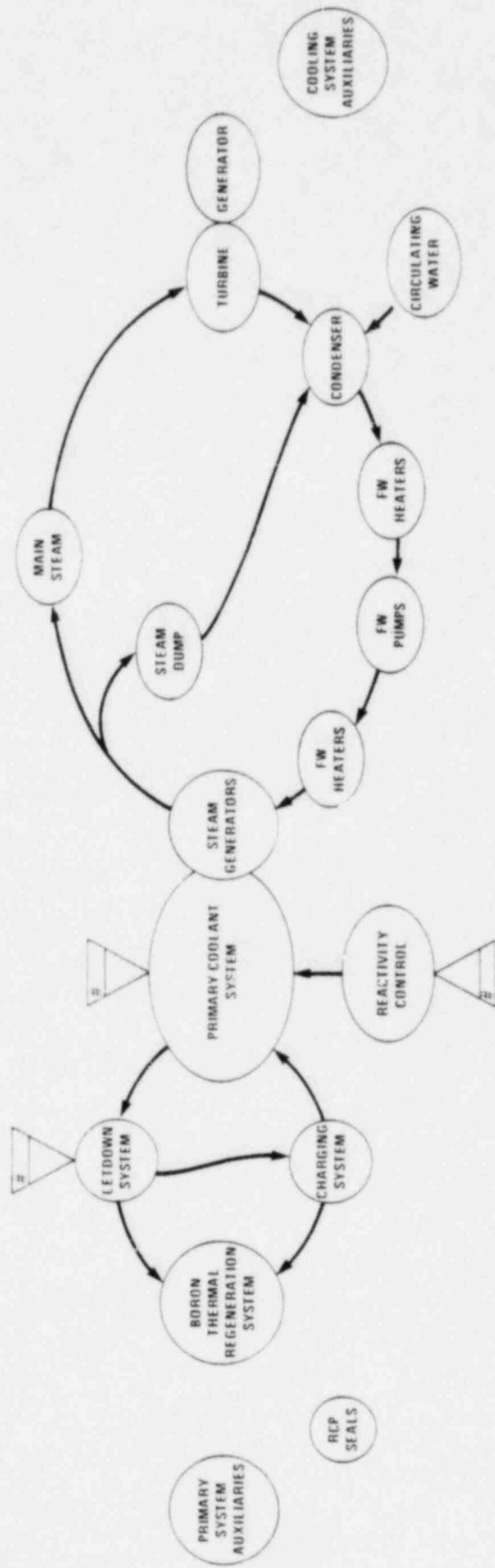
SYSTEM FUNCTION & TASK ANALYSIS

- **TEAM STRUCTURE**

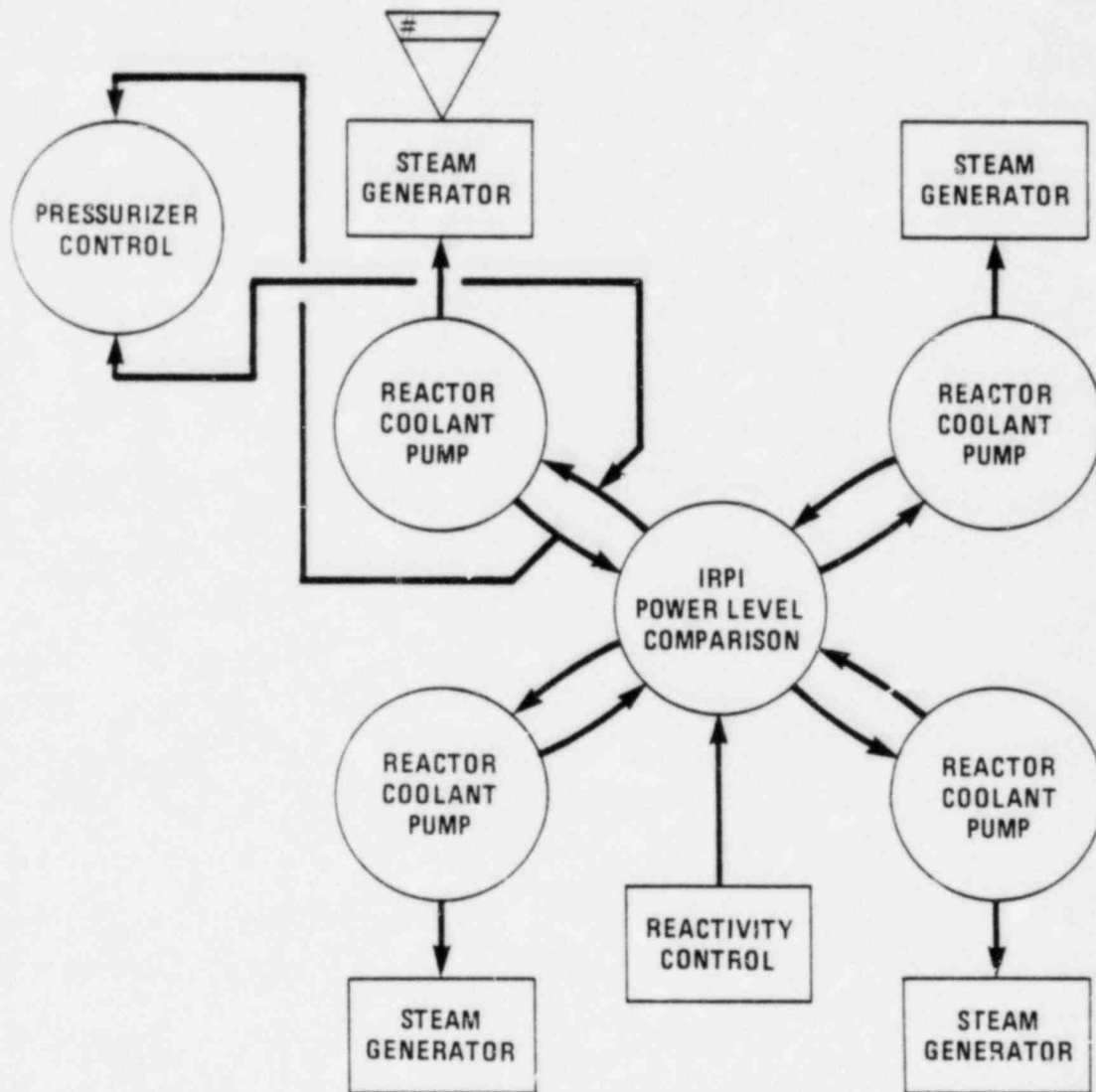
- **WORK**

- REVIEW PERTINENT DOCUMENTS
- COMPLETE SYSTEM FIGURES AND TABULATIONS
- SELECT SELECTED OPERATING EVENTS
- FUNCTION AND TASK REVIEWS
- OBSERVATIONS
- SUMMARIES

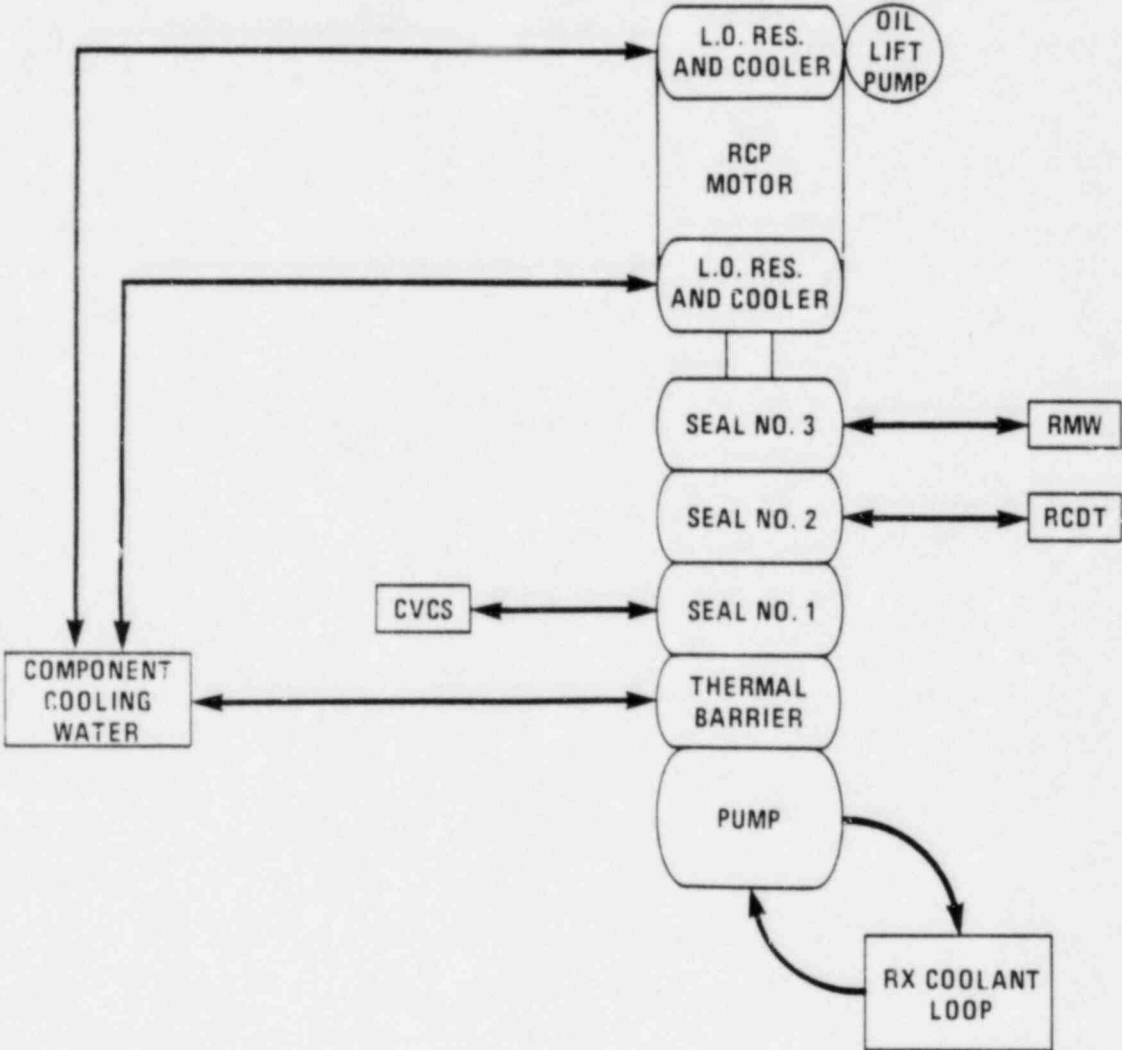
CONTROL PANEL FLOW DIAGRAM



PRIMARY COOLANT SYSTEM CONTROL PANEL FLOW DIAGRAM



REACTOR COOLANT PUMP SYSTEM





CONTROL ROOM DESIGN REVIEW
BACKGROUND SYSTEM INFORMATION

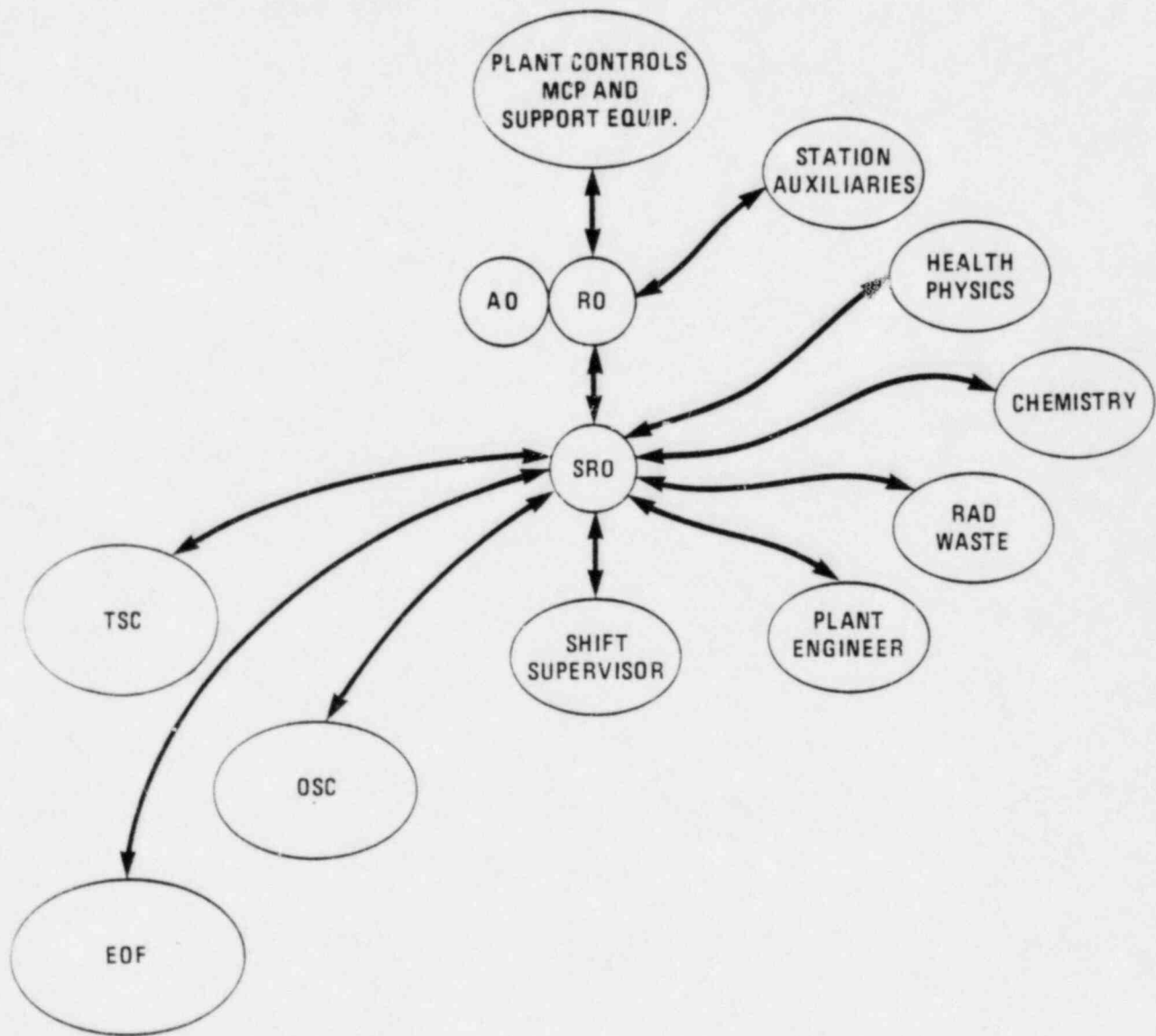
EVALUATOR
SIGNATURE
DATE
PAGE OF
REF

SYSTEM TITLE _____ SYSTEM DES. _____

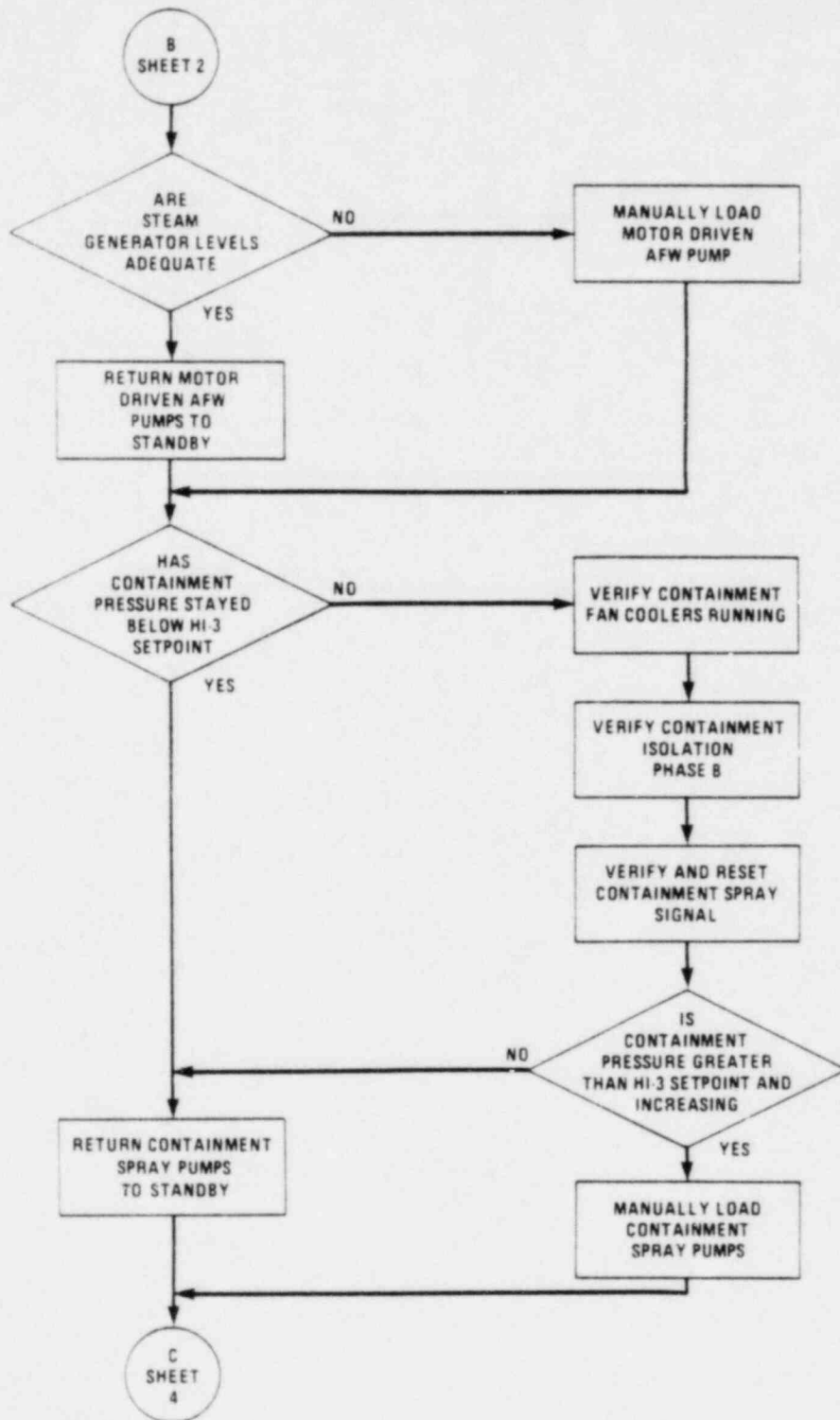
6.0 NOTE DEGREE OF INTERCONNECTION OF EACH SYSTEM TO NON CLASS 1E SYSTEMS:

Lined area for notes and system descriptions.

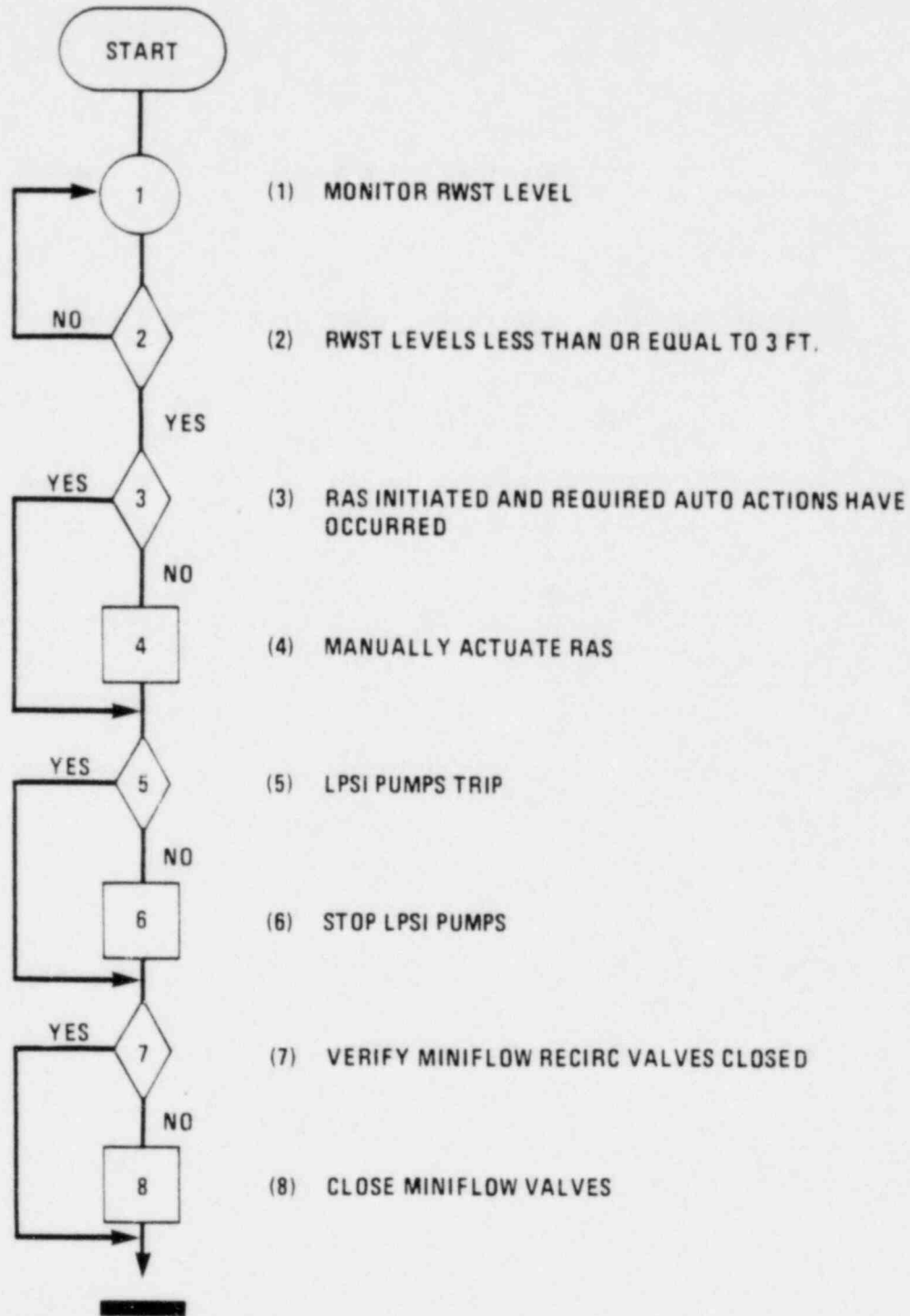
BASIC ELEMENTS INVOLVED IN REVIEW OF A SELECTED OPERATIONAL EVENT



FUNCTIONAL (DECISION-ACTION) FLOW DIAGRAM



DETAILED TASK(S) DECISION ACTION DIAGRAM





HOUSTON
LIGHTING
&
POWER CO.

CONTROL ROOM DESIGN REVIEW
TASK DETAILS

EVALUATOR _____
SIGNATURE _____
DATE _____
PAGE _____ OF _____
REF _____

TASK OBJECTIVE DESCRIPTION: _____ _____								
SYSTEMS AND SUBSYSTEMS INVOLVED: _____								
INPUTS REQUIRED:								
PARAMETERS	DEVICE NOS.	PANEL NOS.	RANGES	ACCURACIES	INITIAL VALUES	CONTROL DEVICES NUMBERS	PANEL NOS.	STATUS
1. _____								
2. _____								
3. _____								
4. _____								
5. _____								
6. _____								
7. _____								
8. _____								
9. _____								
10. _____								
11. _____								
12. _____								

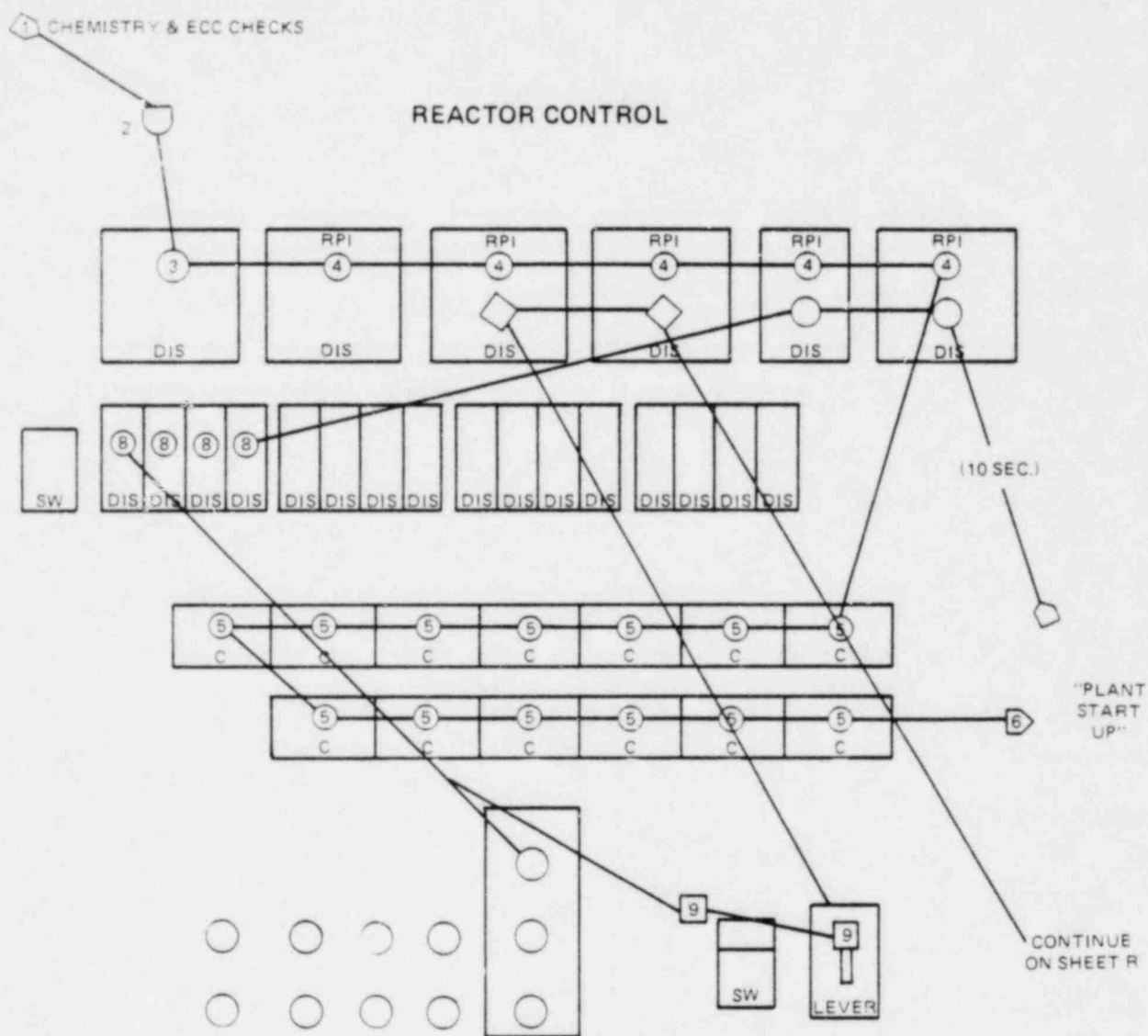


CONTROL ROOM DESIGN REVIEW
TASK DETAILS

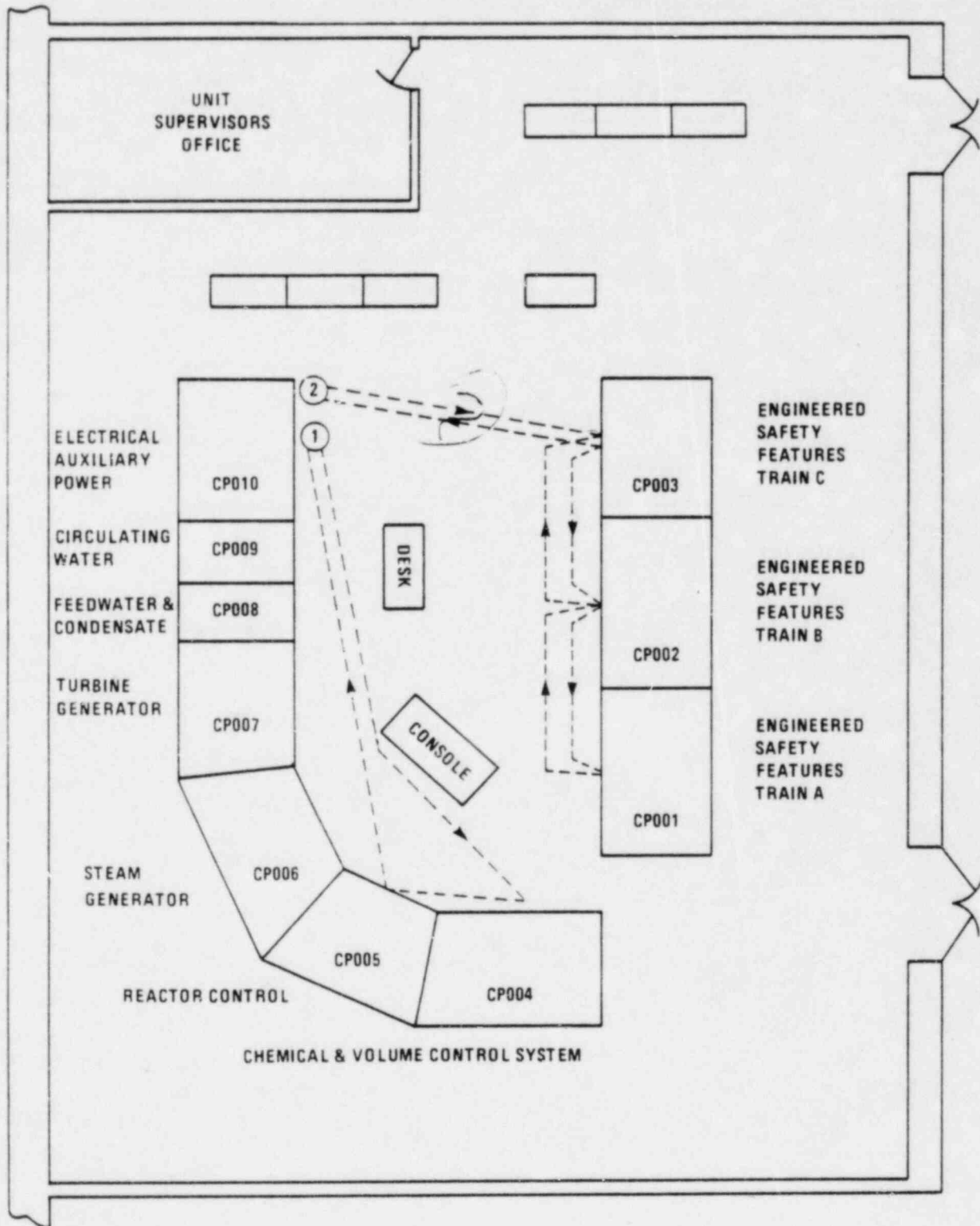
EVALUATOR _____
SIGNATURE _____
DATE _____
PAGE _____ OF _____
REF _____

TASK ACTIVITY NUMBER	TASK OBJECTIVE DESCRIPTION
STEP NO.	SYSTEMS AND SUBSYSTEMS INVOLVED: LIST ACTION REQUIRED, EQUIPMENT TO BE MONITORED AND/OR CONTROLLED, NEED FOR CONTINUOUS OR DISCRETE SETTINGS, DEGREE OF PRECISION REQUIRED, DECISIONS TO BE MADE, INPUTS REQUIRED FOR DECISIONS, RESULTS EXPECTED, AND PERFORMANCE CRITERIA IF APPLICABLE TO ACTIVITY. COMPLETE CR EQUIPMENT REQUIREMENT SHEETS, LIST POTENTIAL ERROR OR OMISSION, CONSEQUENCE THEREOF AND CORRECTIVE ACTION.

OPERATIONAL SEQUENCE DIAGRAM



TRAFFIC LINK DIAGRAM



MEETING SUMMARY

Document Control (50-490/499)
NRC PDR
L PDR
NSIC
TERA -

NOV 1 8 1987

LB#3 Reading
J. Lee
G. Knighton
Project Manager DSe11s
Attorney, OELD
E. L. Jordon
Regional Administrator, Region IV
J. M. Taylor

PARTICIPANTS (NRC):

D. Tondi
D. Se11s
D. Serig
W. Hill