

April 30, 1992

APPLICANT: ABB Combustion Engineering Nuclear Power (CE)

PROJECT: CE SYSTEM 80+

SUBJECT: MEETING HELD ON APRIL 9, 1992, REGARDING CONTROL ROOM DESIGN CERTIFICATION

On April 9, 1992, a public meeting was held at the Nuclear Regulatory Commission in Rockville, Maryland, to discuss the scope of the design to be certified for NUPLEX 80+, the control room for System 80+. A list of attendees is provided as Enclosure 1. The CE presentation is provided as Enclosure 2.

CE stated that the part of the control room design for which CE wanted certification would be defined in the system description provided with the inspection, test, and analysis acceptance criteria (ITAAC) submittal. At this meeting they stated that CE wanted the NRC to review and accept the design of the Reactor Coolant System Panel, the Integrated Process Status Overview and the control room configuration. An option of conducting a detailed control room design review like those conducted at operating plants in accordance with the U. S. Nuclear Regulatory Commission, "Clarification of TMI Action Plan Requirements, Requirements for Emergency Response Capability" NUREG-0737, Supplement 1 dated December 1982, for these three items was raised for future discussion.

NRC asked that CE review the ITAAC that was under consideration for the GE advanced boiling water reactor especially with regard to the design acceptance criteria. CE should provide comments or proposed alternatives for such an approach for NUPLEX 80+. NRC also stated that the documentation required to support the staff's review of the control room must be placed on the docket and, therefore, relying on the staff to obtain this information by reviewing documents in the CE offices was unacceptable. CE indicated that the required documentation would be provided. A meeting of technical reviewers and CE staff was scheduled for April 16 and 17, 1992.

(Original signed by)

Thomas V. Wambach, Project Manager
Standardization Project Directorate
Division of Advanced Reactors
and Special Projects
Office of Nuclear Reactor Regulation

Enclosures:

- 1. List of Attendees
- 2. CE presentation

cc w/enclosures:
See next page

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DATE:	04/27/92	04/30/92	04/30/92	04/ /92



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

April 30, 1992

Docket No. 52-002

APPLICANT: ABB Combustion Engineering Nuclear Power (CE)

PROJECT: CE SYSTEM 80+

SUBJECT: MEETING HELD ON APRIL 9, 1992, REGARDING CONTROL ROOM DESIGN
CERTIFICATION

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Thomas V. Wambach

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1. List of Attendees
2. CE presentation

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JWermiel, 10D24
JRoe, 10H5
CThomas, 10H5
DSmith, 10D24
HLi, 8H10
JStewart, 8H7
AEl-Bassioni, 10E9
SNewberry, 8H1
BPallo, 10E4
NSaltos, 10E4
JBongarra, 10D24

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Docket No. 52-002

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CE SYSTEM 80+ HUMAN FACTORS ENGINEERING CERTIFICATION

LIST OF ATTENDEES

April 9, 1992

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Jared Wermiel	NRC/NRR/DLPQ/LHFB
Jack Roe	NRC/NRR/DLPQ
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Ken Scarola	ABB/CE
Regis Matzie	ABB/CE
Charlie Brinkman	ABB/CE
Paul M. Simon	ABB/CE

SYSTEM 80+ HUMAN FACTORS

- o THIS PRESENTATION WILL DEFINE ABB-CE'S EXPECTATIONS REGARDING THE NRC APPROVAL TO BE STATED IN THE DSER FOR THE SYSTEM 80+ CONTROL ROOM DESIGN.

- o THIS PRESENTATION WILL NOT DEFINE WHAT WILL BE CERTIFIED.

DESIGN FEATURES FOR CERTIFICATION WILL BE DEVELOPED AS PART OF THE TIER 1 CERTIFICATION EFFORT.

ABB-CE EXPECTATIONS FOR THE CESSAR-DC CHAPTER 18 DSER

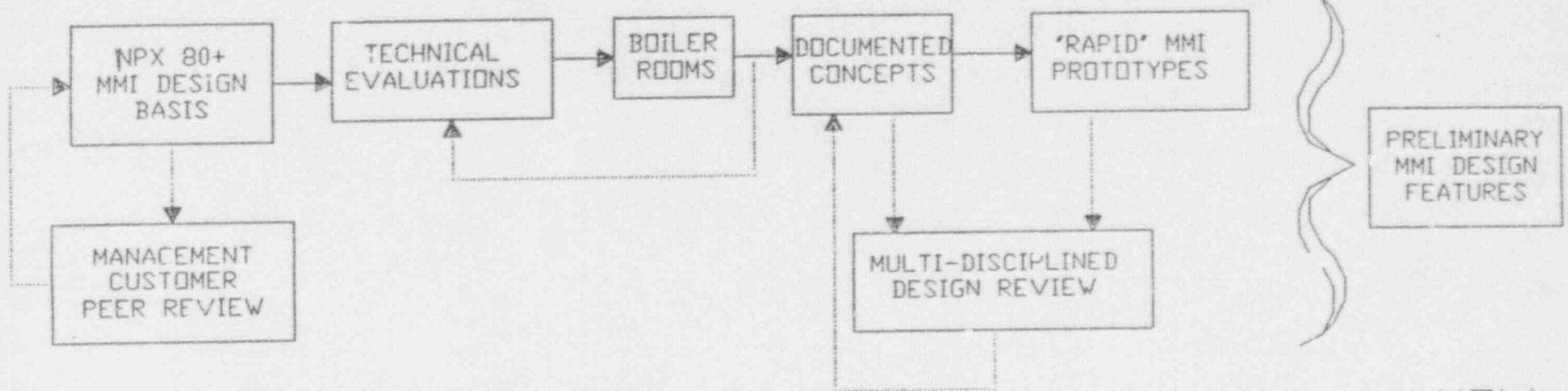
1. THE DESIGN PROCESS FOR THE RCS PANEL, CONTROL ROOM CONFIGURATION AND INTEGRATED PROCESS STATUS OVERVIEW (IPSO) IS ACCEPTABLE.
 - MAN-MACHINE INTERFACE DESIGN FEATURES DEVELOPMENT
 - FUNCTIONAL TASK ANALYSIS METHODOLOGY
 - RCS PANEL DESIGN PROCESS
 - VERIFICATION ANALYSIS PROCESS
 - CONTROL ROOM CONFIGURATION DESIGN PROCESS

NUPLEX 80+ MMI DESIGN PROCESS

1986

NUPLEX 80+ MAN MACHINE INTERFACE CONCEPTS

1988



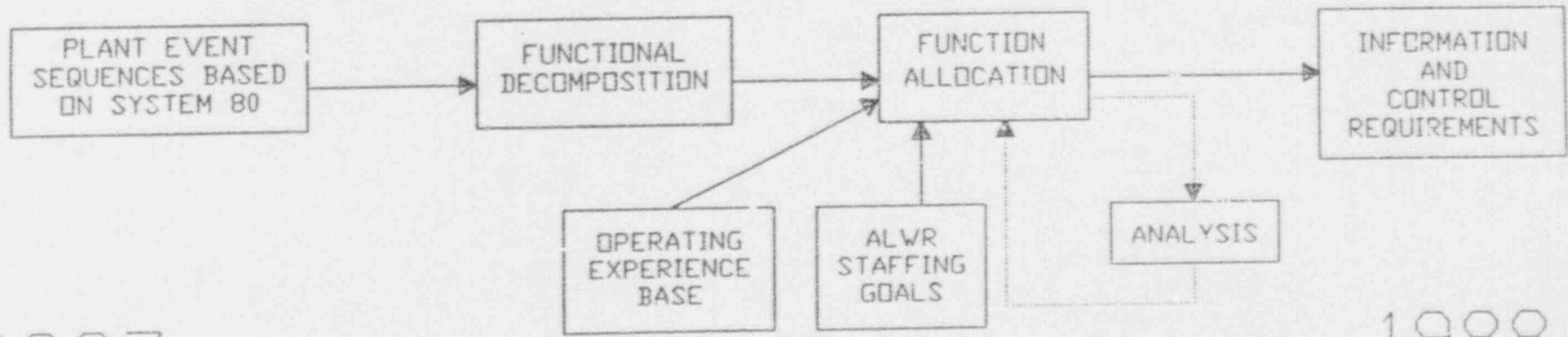
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WHAT

1987

SYSTEM 80+ FUNCTIONAL TASK ANALYSIS

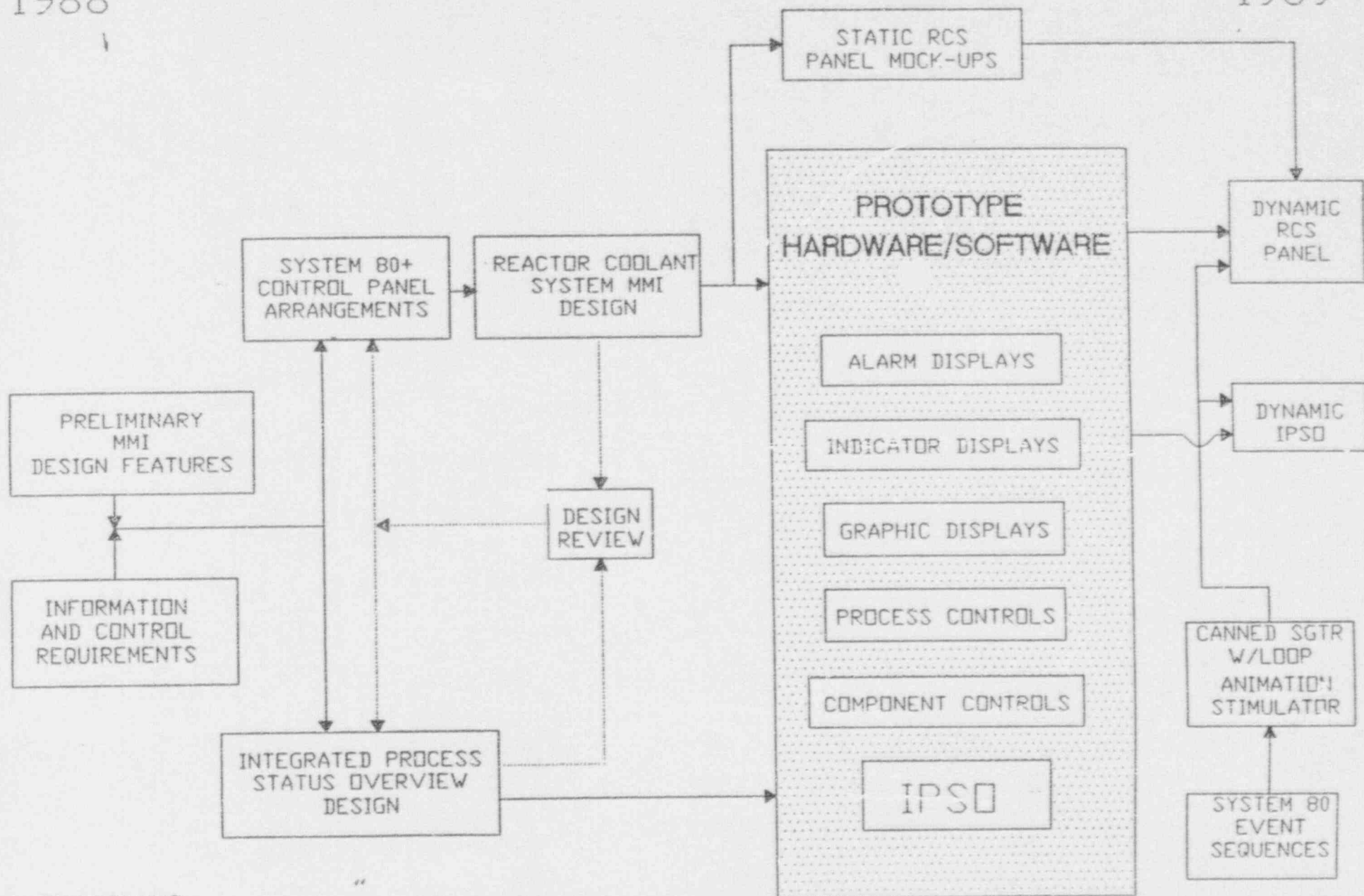
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NUPLEX 80+ MMI DESIGN PROCESS

1988

1989



NUPLEX 80+ MMI DESIGN PROCESS

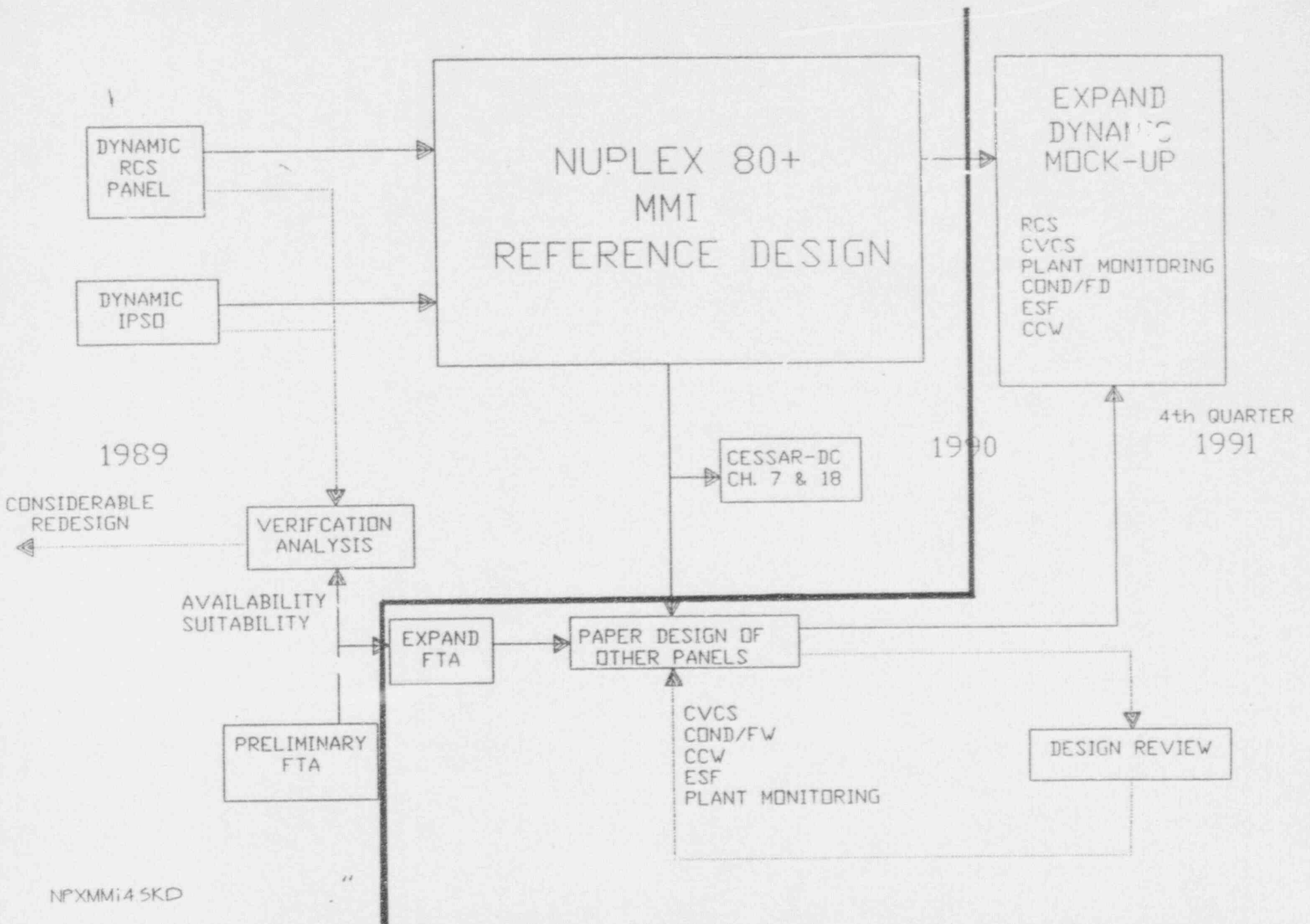


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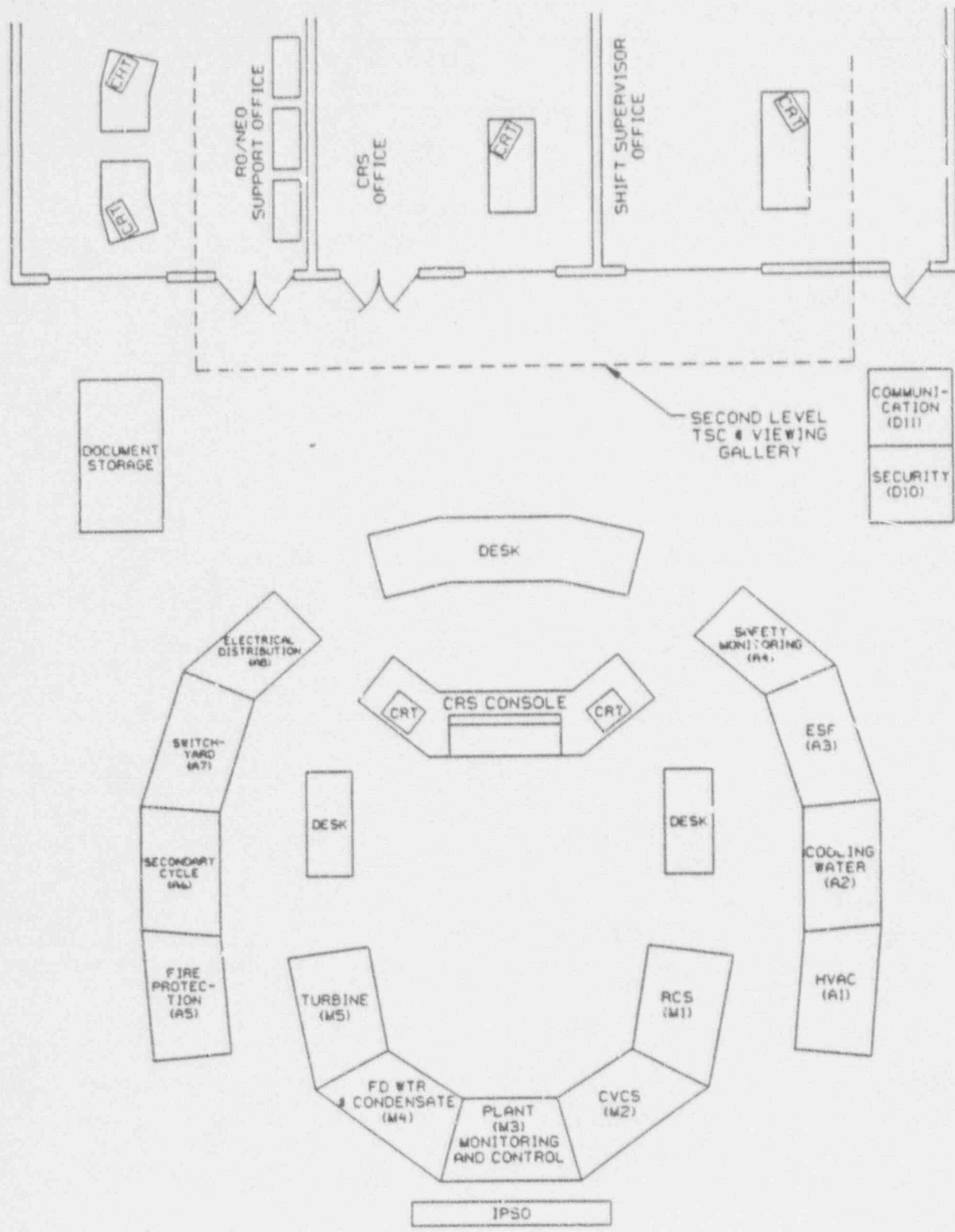
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ABB-CE EXPECTATIONS FOR THE CESSAR-DC CHAPTER 18 DSER

2. THE NUPLEX 80+ MAIN CONTROL ROOM CONFIGURATION IS ACCEPTABLE.
 - P^NEL FOOTPRINT
 - LOCATION OF IPSO
 - LOCATION OF OFFICES



Amendment E
 December 30, 1988

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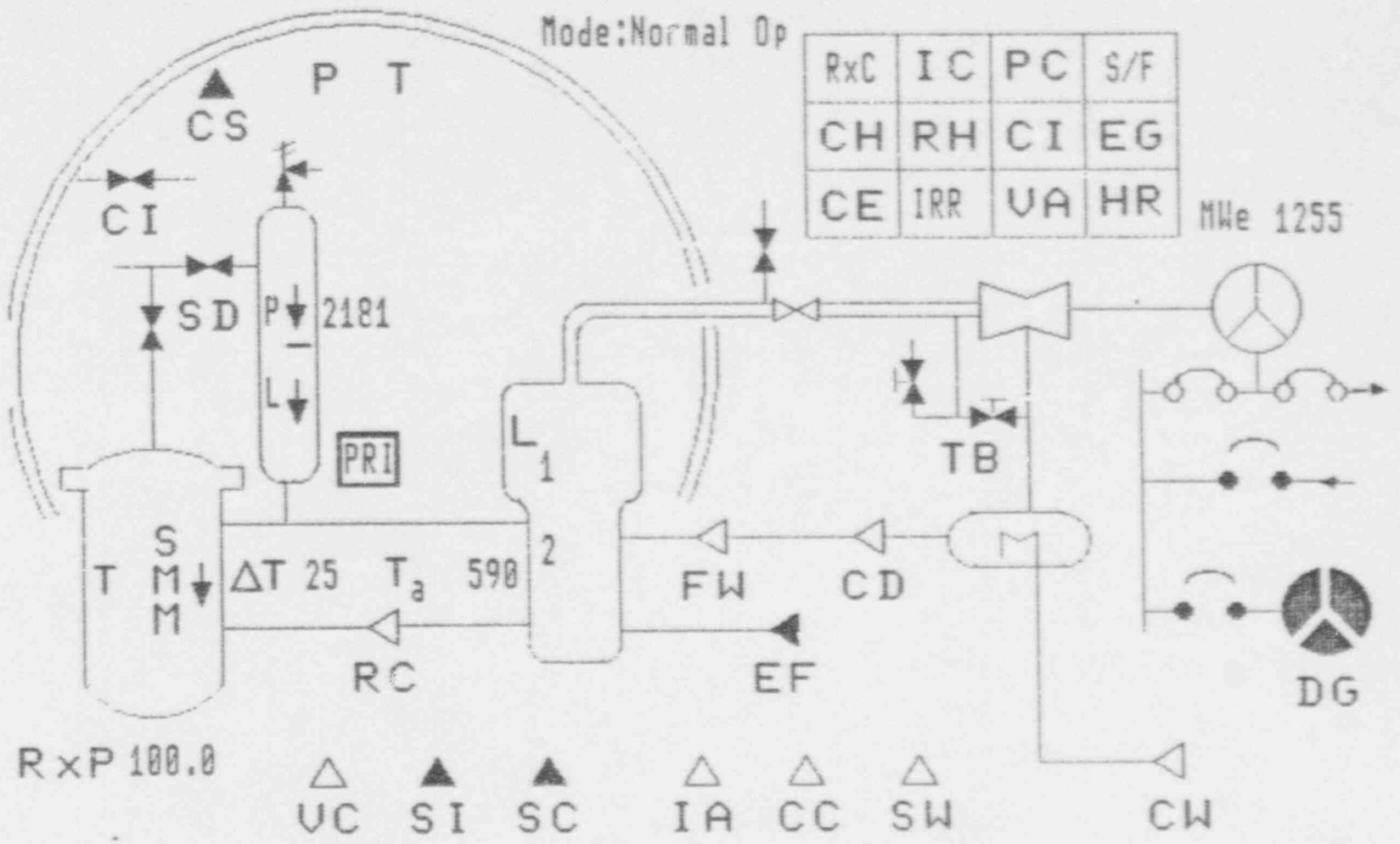
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ABB-CE EXPECTATIONS FOR THE CESSAR-DC CHAPTER 18 DSER

3. THE DESIGN OF THE INTEGRATED PROCESS STATUS OVERVIEW IS ACCEPTABLE.
 - FUNCTIONAL DESIGN
 - CONTINUOUS CRITICAL FUNCTION STATUS DISPLAY



Amendment 1
December 21, 1998

Figure

18.7.1-2

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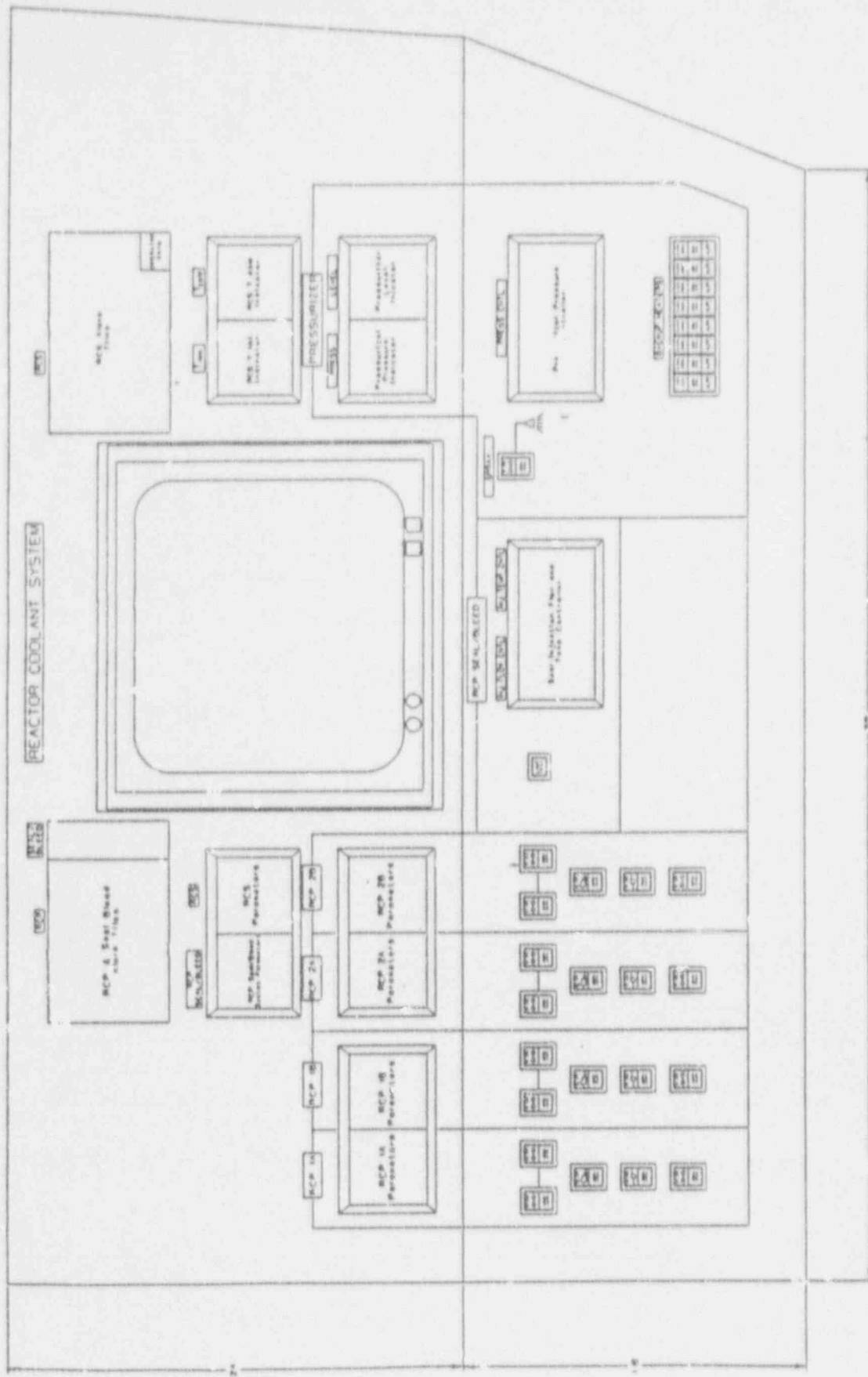
ABB-CE EXPECTATIONS FOR THE CESSAR-DC CHAPTER 18 DSER

4A. THE DESIGN PRODUCT FOR THE RCS PANEL IS ACCEPTABLE.

- RCS ALARM TILES
- RCS DISCRETE INDICATORS
- RCS CRT PAGES
- RCS PROCESS AND COMPONENT CONTROLS
- RCS PANEL LAYOUT

4B. THE MMI FEATURES USED FOR THE RCS ARE ACCEPTABLE FOR USE IN EQUIVALENT APPLICATIONS FOR ALL REMAINING PANELS. EXAMPLES OF THESE FEATURES ARE:

- DIAS ALARM TILE DISPLAY FORMAT/FEATURES
- DIAS DEDICATED PARAMETER DISPLAY
FORMAT/FEATURES
- DIAS MULTIPLE PARAMETER DISPLAY FORMAT/FEATURES
- CCS PROCESS CONTROLLER DISPLAY FORMAT/FEATURES
- CCS COMPONENT CONTROLS



Amendment I
 D. October 21, 1990

SYSTEM 80+

RCS PANEL LAYOUT

Figure
 18.7.3-39

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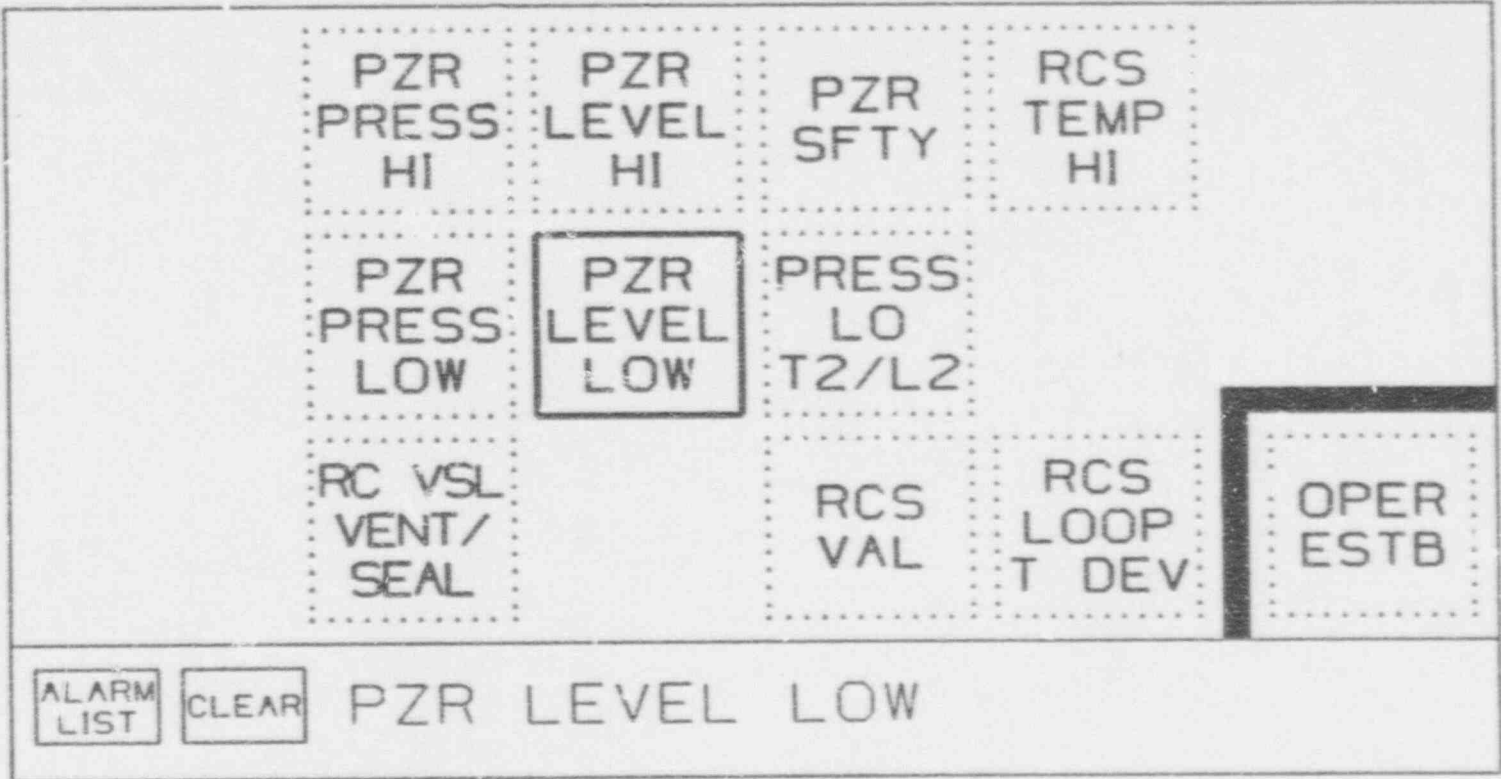
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ALARM TILE PANEL DISPLAY SHOWING ALARM LISTING FORMAT

18.7.1-11

Figure

Amendment 1
December 21, 1990

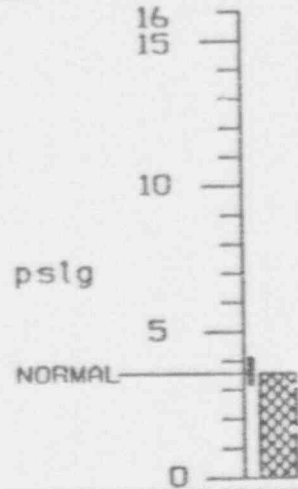
<u>ALARM TILE</u>	<u>STATUS</u>	<u>ALARM DESCRIPTION</u>
<div style="border: 1px solid black; padding: 5px; text-align: center;">PZR LEVEL LOW</div>	<div style="border: 1px solid black; padding: 2px; display: inline-block;">2</div> 2	PZR LEVEL LOW PZR LEVEL ERROR LOW
<div style="border: 1px solid black; padding: 5px; text-align: center;">ALARM STATUS</div>		
<div style="border: 1px solid black; padding: 2px; display: inline-block;">ALARM LIST</div>	<div style="border: 1px solid black; padding: 2px; display: inline-block;">CLEAR</div>	

CALMA FILE:
LSYS80JRCPDWG2

RCP SEAL/BLEED

RCP 1A CNTL BLEED FLOW F-156

4.0 gpm



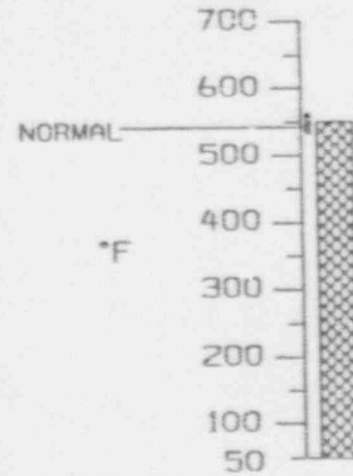
CRT

MENU

RCS

RCP 1A SPRAY LINE TEMP T-103

557 °F



CRT

MENU SUB-COOLING

PZR

VESSEL

ALMS

RCP D/P

NPS-PANELFRONTS (SHT5)

Amendment E
December 30, 1983

SYSTEM 80+

RCP SEAL/BLEED AND RCS SUBCOOLING MENU PAGES

Figure

7.3-15

Amendment E
December 30, 1988

RCP
SEAL/BLEED

RCP 1A CNTL
BLEED FLOW

F-156

4.0 gpm

CRT

MENU

RCP-1A CNTL BLEED FLOW F-156

RCP-1B CNTL BLEED FLOW F-166

RCP-2A CNTL BLEED FLOW F-176

RCP-2B CNTL BLEED FLOW F-186

SEAL INJ HX INLET TEMP T-231E

ANALOG
DISPLAY

RCS

PZR WATER
TEMP

T-101A

653 F

CRT

MENU
SUB-
COOLING

PAMI

PZR

RCS SUBCOOLED MARGIN °F

VESSEL

RCS SUBCOOLED MARGIN PSI

ALMS

CET SUBCOOLED MARGIN °F

RCP G/P

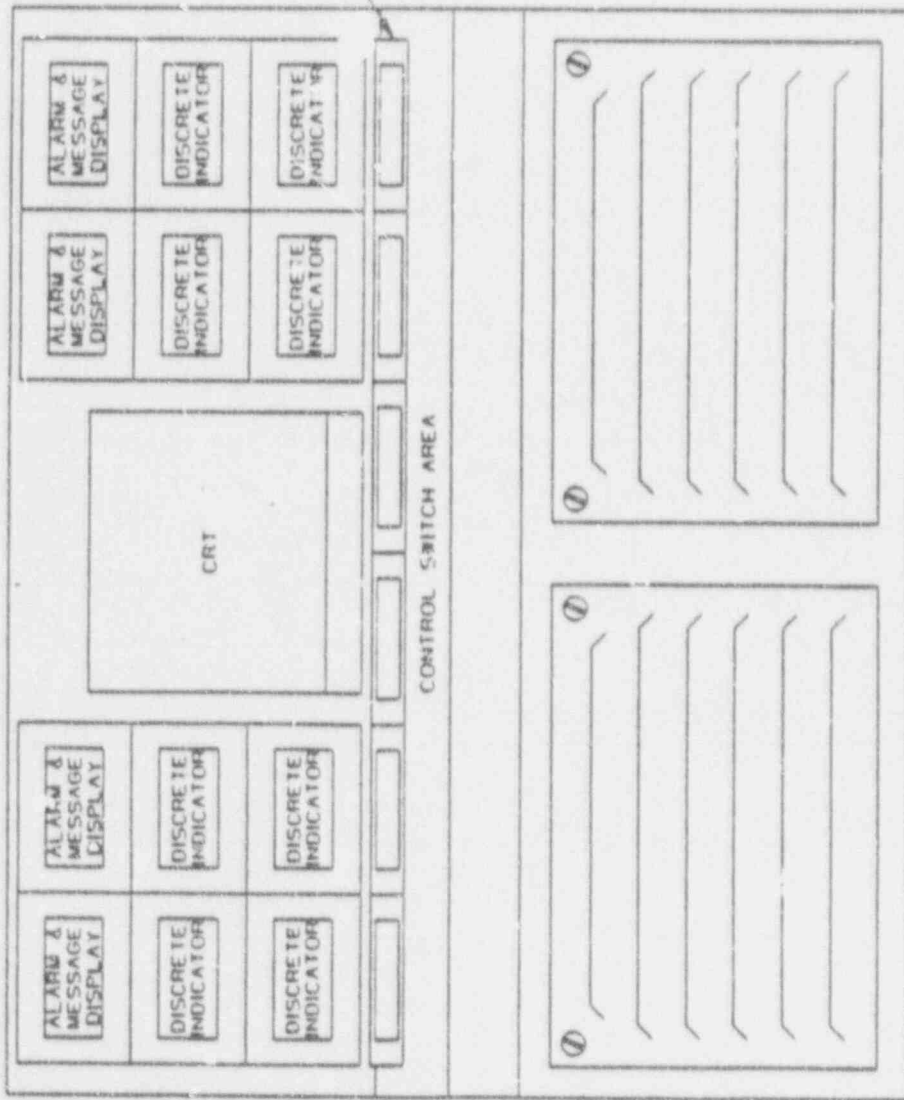
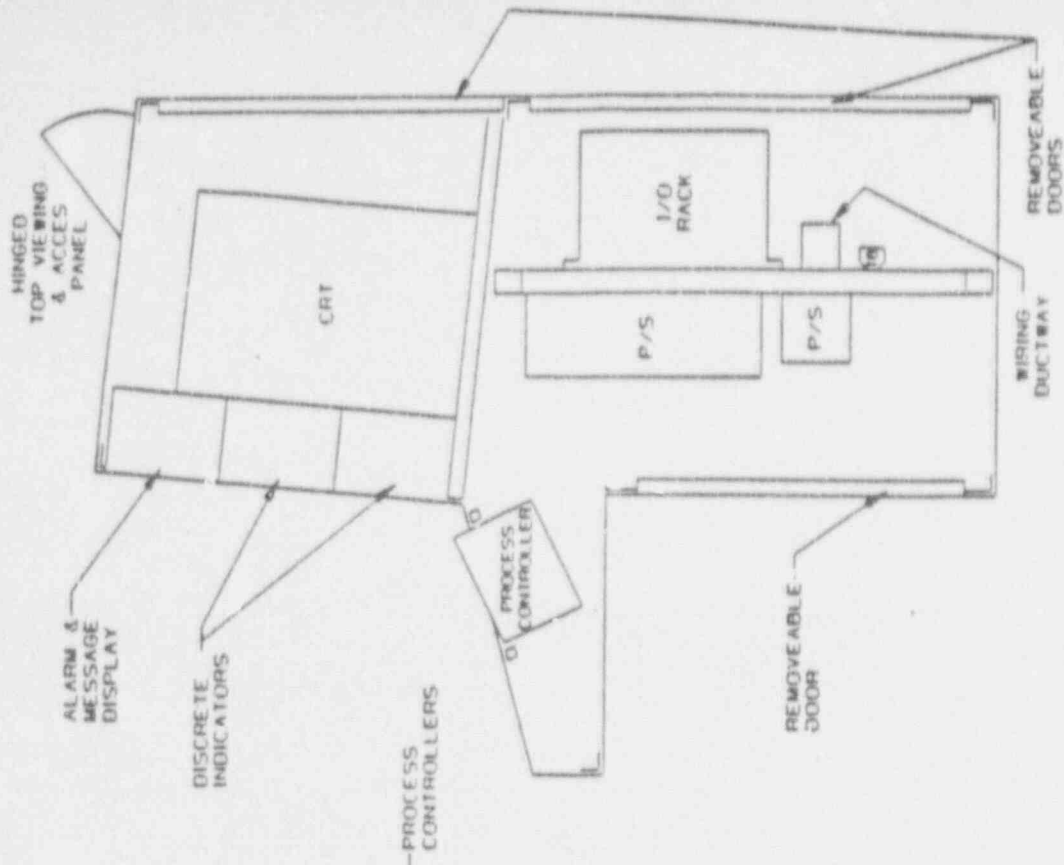
CET SUBCOOLED MARGIN PSI

UP HEAD SUBCOOLED MARGIN °F

UP HEAD SUBCOOLED MARGIN PSI

ANALOG
DISPLAY

NPS-PANELFRONTS (SHT13)



NPXB0 • MCC

STANDARD TOP LEVEL ASSEMBLY
& CROSS SECTIONAL VIEW

ABB-CE EXPECTATIONS FOR THE CESSAR-DC CHAPTER 18 DSER

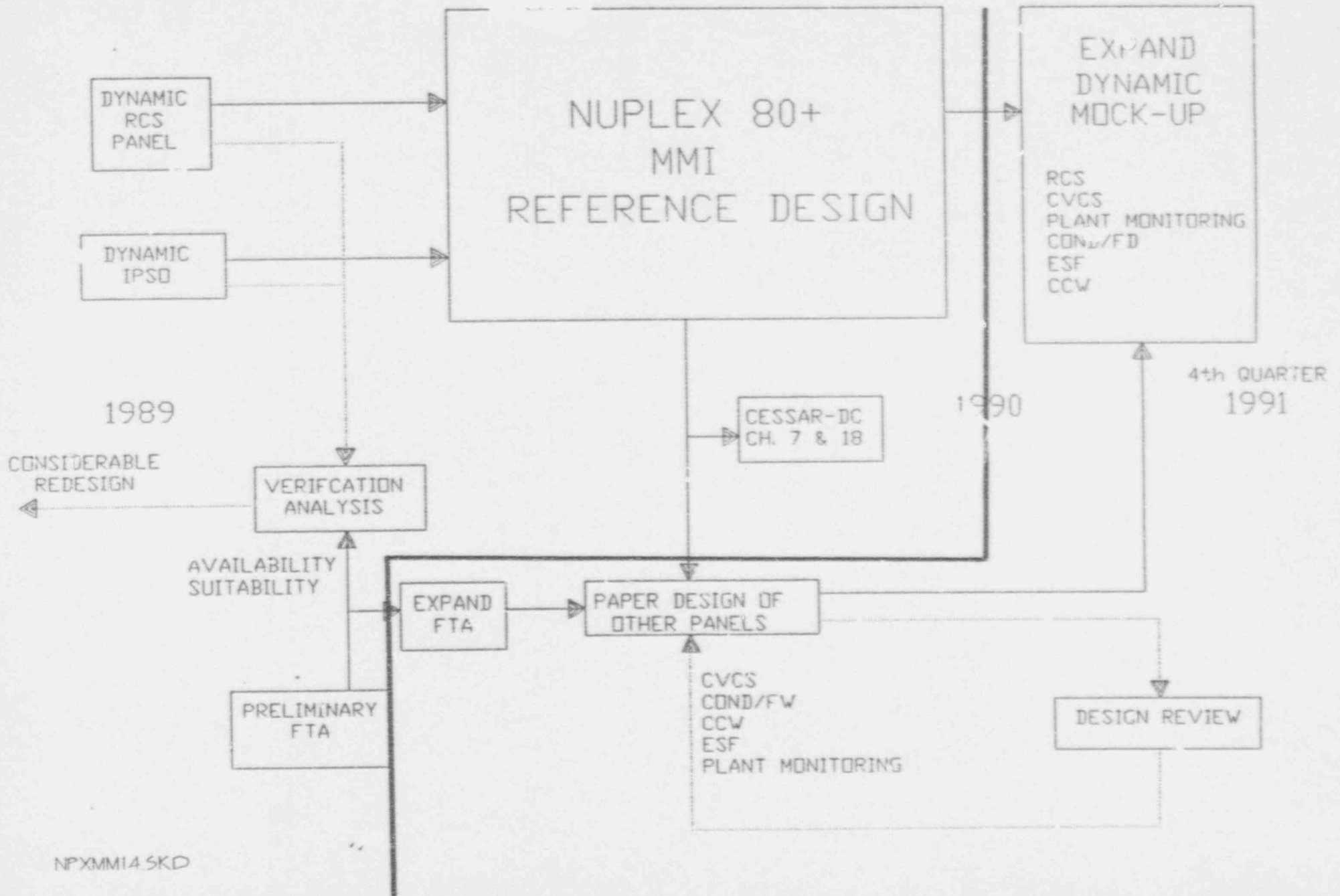
5A. THE DESIGN PROCESS FOR THE REMAINING CONTROL ROOM PANELS IS ACCEPTABLE.

- FUNCTIONAL TASK ANALYSIS EXPANSION
- PANEL DESIGN PROCESS
- DESIGN REVIEW
- DYNAMIC PROTOTYPE EXPANSION
- VERIFICATION ANALYSIS

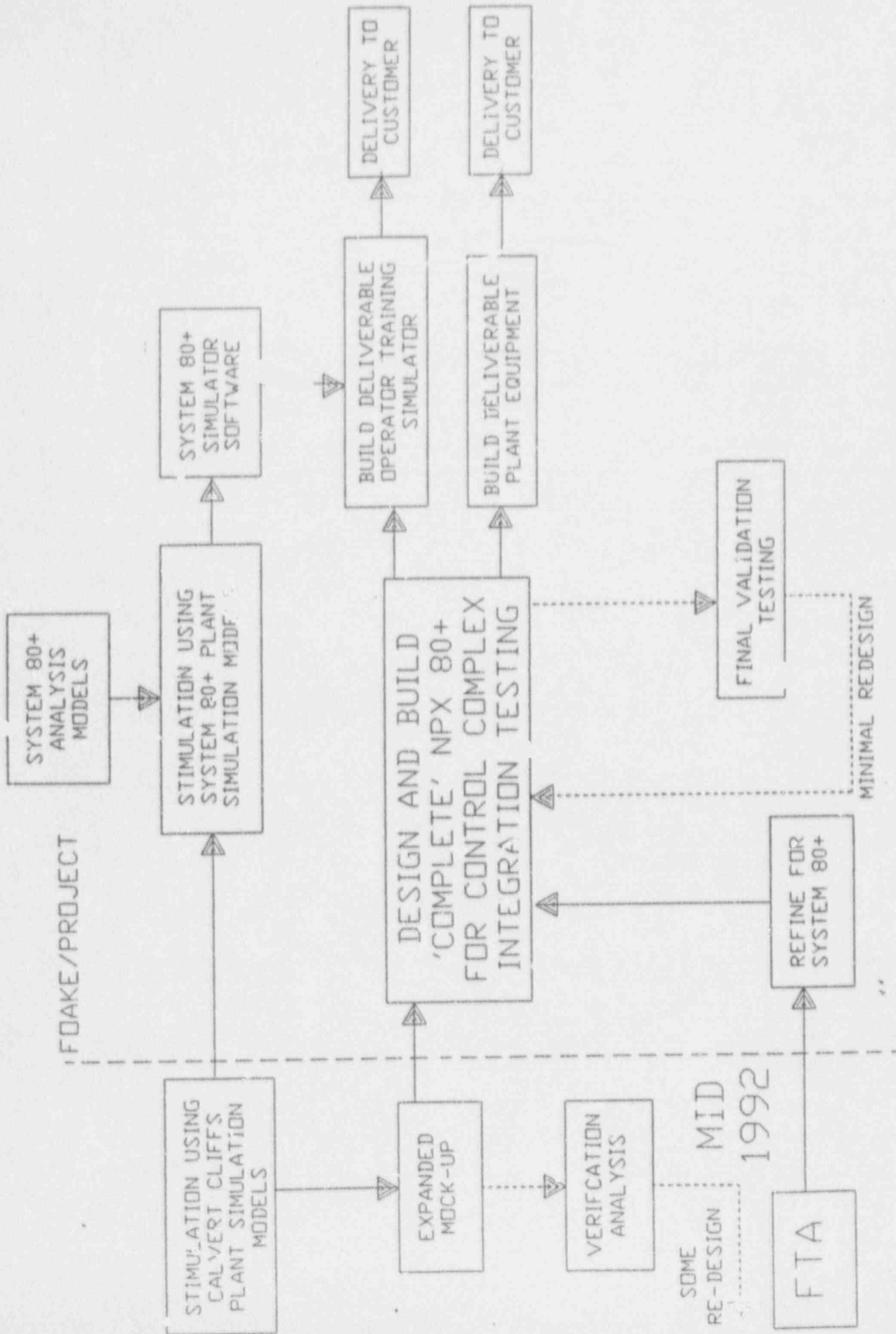
5B. THE ITAAC WILL DEMONSTRATE THAT THE REMAINING PANELS HAVE BEEN CONSTRUCTED IN ACCORDANCE WITH THE REFERENCE RCS PANEL AND THAT THE REQUIRED INVENTORY OF INFORMATION AND CONTROLS IS AVAILABLE.

- CVCS ALARM TILES
- CVCS DISCRETE INDICATORS
- CVCS CRT PAGES
- CVCS PROCESS AND COMPONENT CONTROLS
- CVCS PANEL LAYOUT

NUPLEX 80+ MMI DESIGN PROCESS



NUPLEX 80+ MMI DESIGN PROCESS

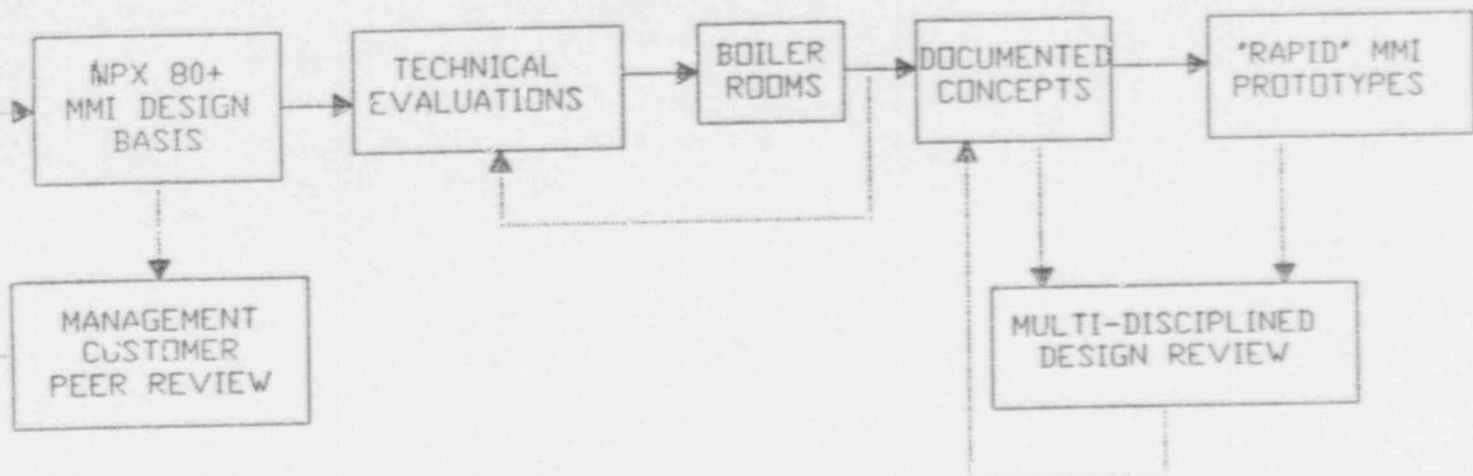


NUPLEX 80+ MMI DESIGN PROCESS

1986

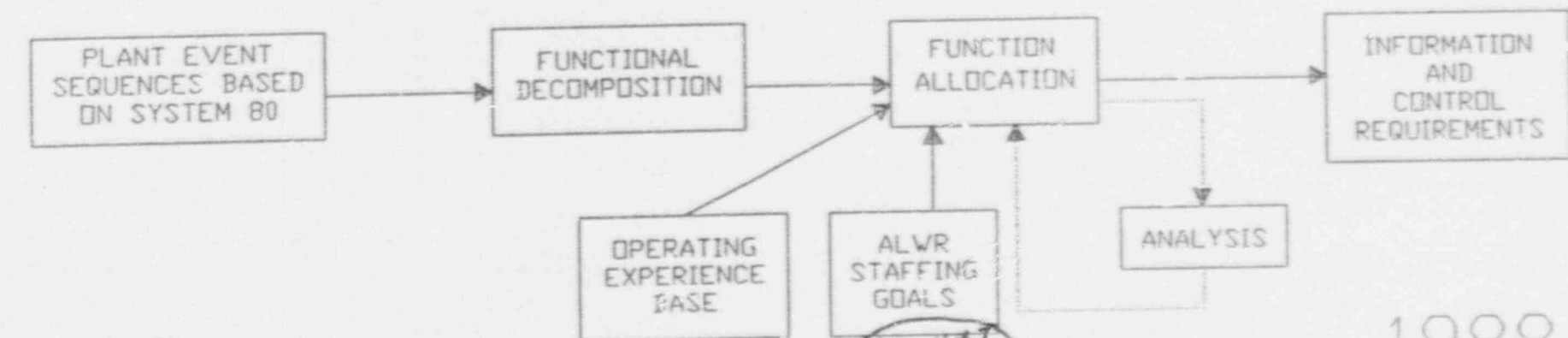
NUPLEX 80+ MAN MACHINE INTERFACE CONCEPTS

1988



HOW

WHAT



1987

SYSTEM 80+ FUNCTIONAL TASK ANALYSIS

1988

NUPLEX 80+ MMI DESIGN PROCESS

1988

1989

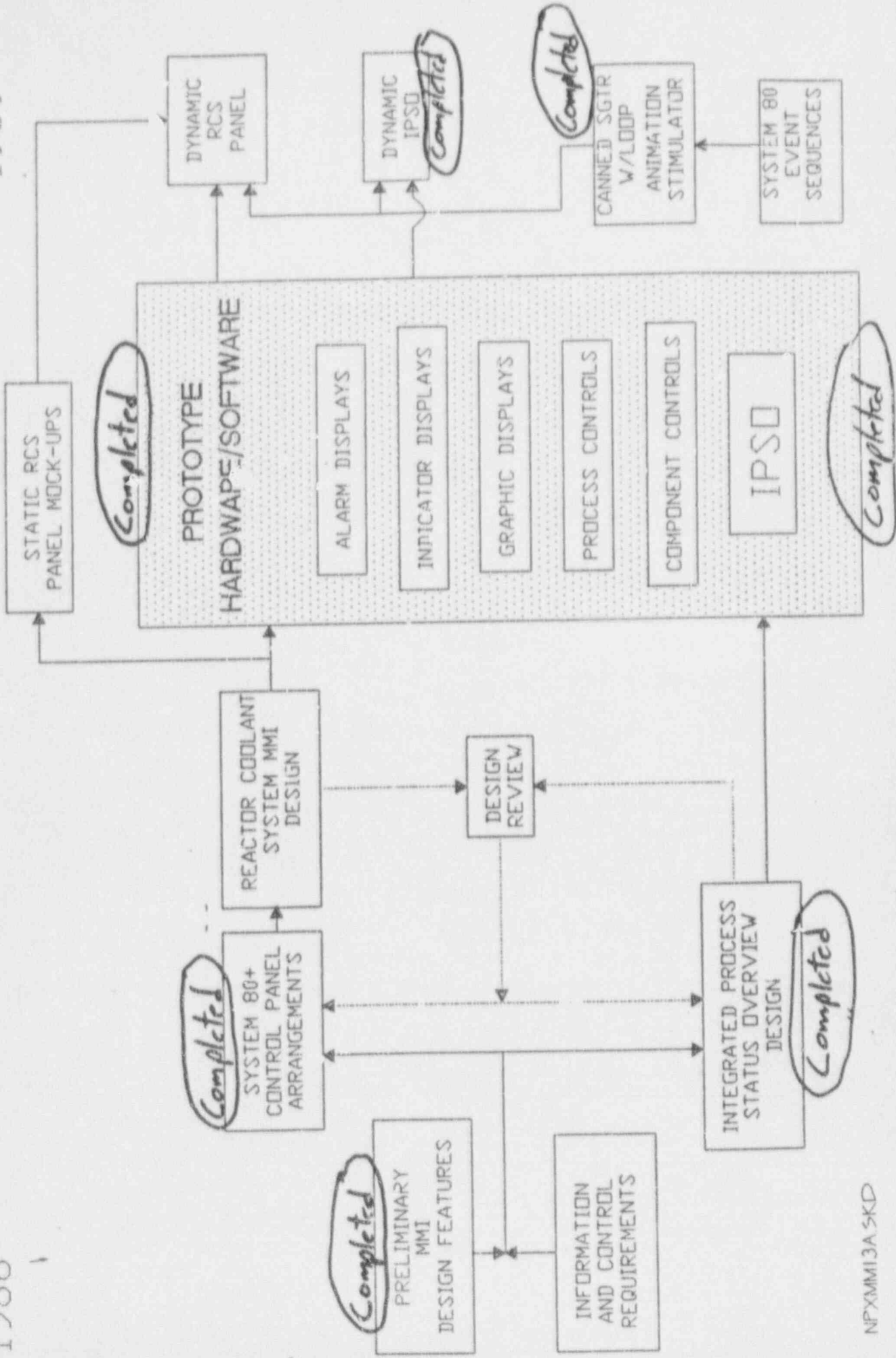
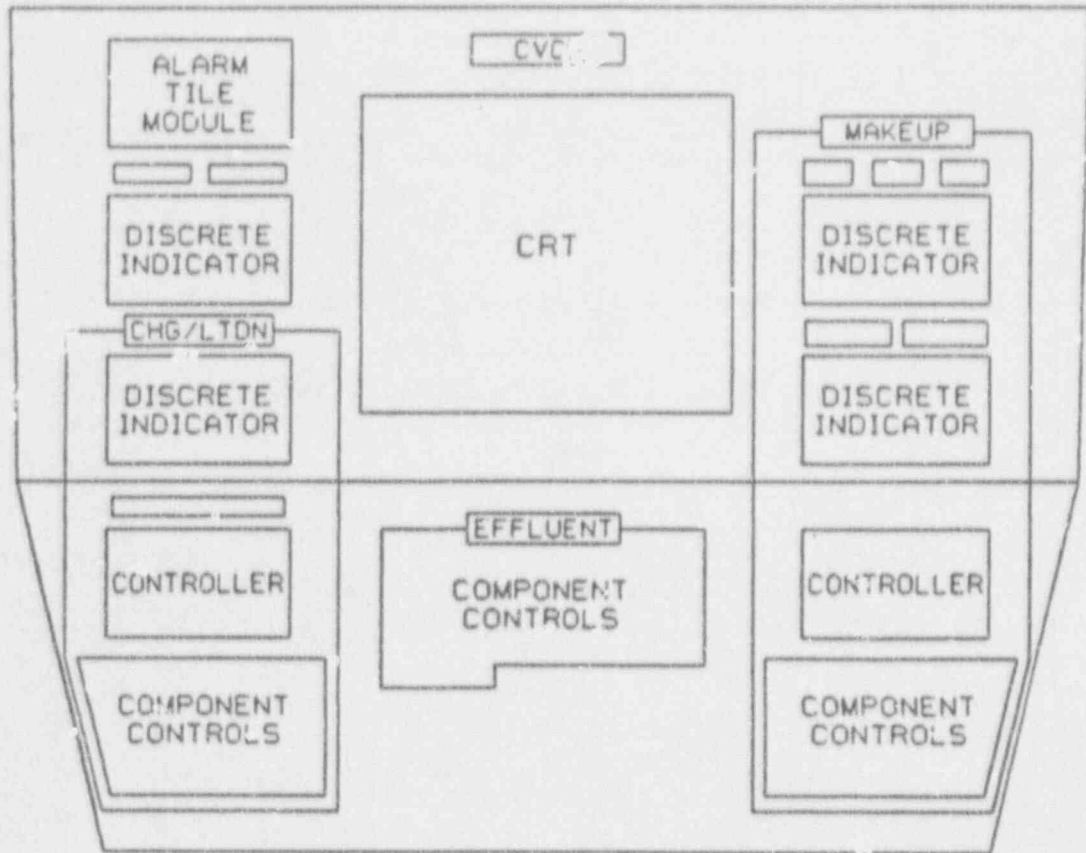


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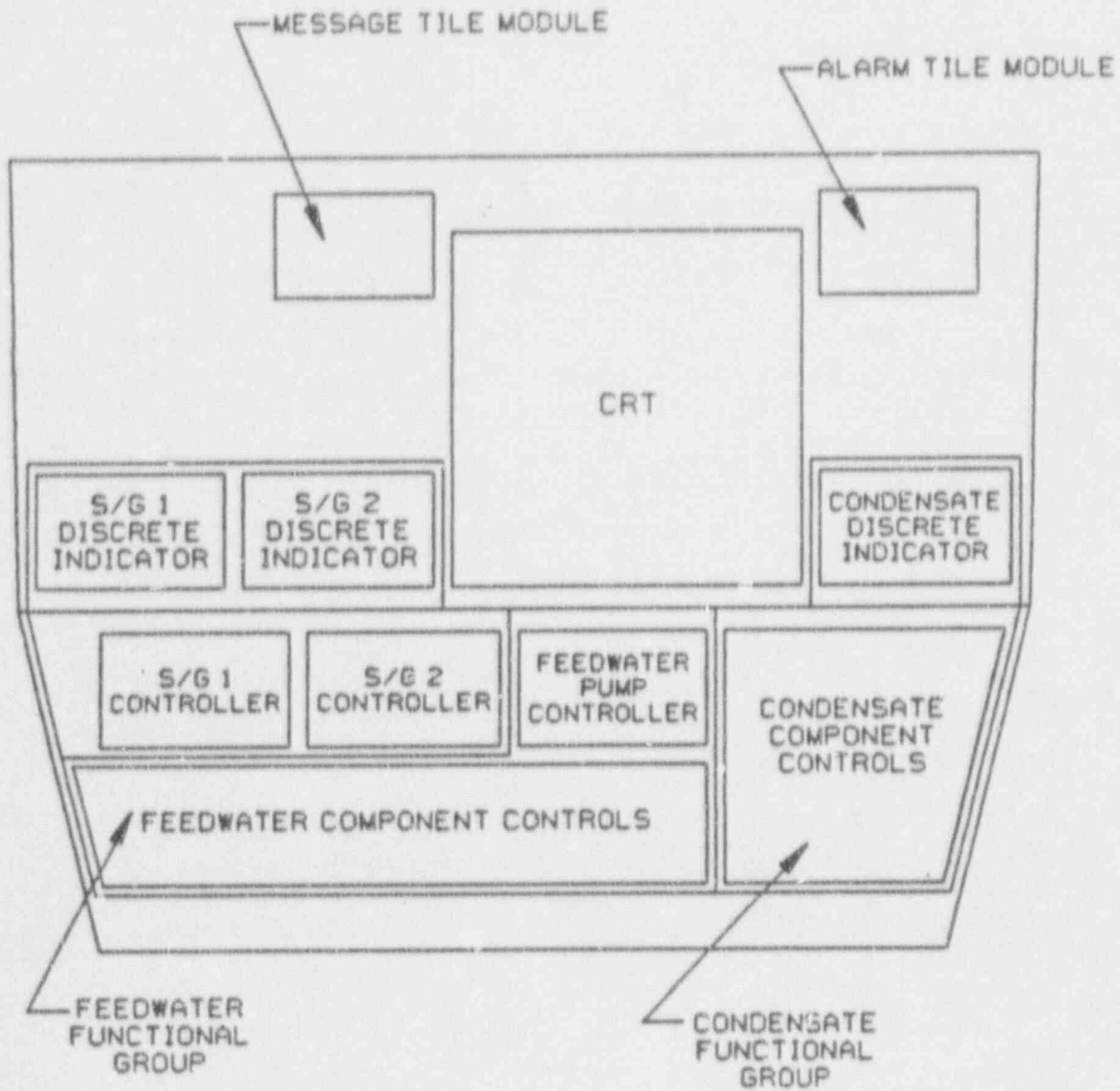


Amendment I
December 21, 1980



CVCS PANEL LAYOUT

Figure
18.7.4-1



Amendment I
December 21, 1990



FEEDWATER AND CONDENSATE PANEL LAYOUT

Figure

18.7.4-3

ABB-CE EXPECTATIONS FOR THE CESSAR-DC CHAPTER 18 DSE/R

6. THE ITAAC WILL DEMONSTRATE ACCEPTABLE OPERATOR PERFORMANCE IN THE COMPLETE CONTROL ROOM.
 - ACCEPTANCE CRITERIA FOR NORMAL OPERATION
 - ACCEPTANCE CRITERIA FOR ABNORMAL OPERATION

CONTROL ROOM DESIGN VERIFICATION ACCEPTANCE CRITERIA

- Main Control Room Evaluated with Complete Complement of Reference and Support Material (e.g., Procedures)
- Operational Verification Using Full Scope Simulator

Normal Operation

- Heatup
- Startup
- Power Changes
- Shutdown
- Cooldown
- Refueling

- Achieve Desired States Without Tech. Spec. Violations or Plant Protection System Pre-Trips

CONTROL ROOM DESIGN VERIFICATION ACCEPTANCE CRITERIA

- Operational Verification Using Full Scope Simulator

Abnormal Conditions - Identify Event, Satisfy
Safety Function Status Checks, Meet EPG Event
Specific Criteria

- Uncomplicated Reactor Trip
- Loss of Coolant Accident
- Steam Generator Tube Rupture
- Excess Steam Demand Event
- Loss of Offsite Power
- Loss of All Feedwater
- Station Blackout

N+1 Event - Using Functional Recovery Meet
Critical Safety Function Acceptance Criteria

CESSAR-DC CHAPTER [REDACTED] DOCUMENTATION

SIGNIFICANT DOCUMENTATION EXISTS SUPPORTING CHAPTER 18.

ABB-CE WILL CLEARLY IDENTIFY DOCUMENTS AND INFORMATION LOCATION WITHIN DOCUMENTS WHEN THEY ARE REFERENCED.

ABB-CE DOES NOT DESIRE TO PLACE BACKUP DOCUMENTS IN THEIR ENTIRETY ON THE DOCKET.

THOSE SECTIONS OF DOCUMENTS USED TO MAKE THE SAFETY DETERMINATION MAY BE PLACED ON THE DOCKET.