

August 27, 1985

D MB-016

MEMORANDUM FOR: John F. Stolz, Branch Chief, ORB#4, DL  
FROM: Owen Thompson, Project Manager, ORB#4, DL  
SUBJECT: THREE MILE ISLAND, UNIT 1 (TMI-1), SPDS AUDIT

On August 12-14, 1985, the NRR staff performed an audit of the Three Mile Island, Unit 1 (TMI-1) Safety Parameter Display System (SPDS). The audit team consisted of Leo Beltracchi and Richard Shaker from Human Factors Engineering Branch (HFEB), and Joseph Joyce from Instrument and Control Systems Branch (ICSB). I was present on the first and last days of the audit.

The licensee provided a two-hour briefing of the overall SPDS system. Copies of the slides used are enclosed. The staff then audited the licensee's documents and observed the SPDS system in operation. The audit programs outlined in letters to the licensee dated April 5 and July 9, 1985 were basically followed.

At the exit briefing on Wednesday, August 14 the staff informed the licensee that the TMI-1 SPDS system is generally a good system which reflects the value resulting from Human Engineering input throughout development. The staff will be requesting the licensee to provide a copy of the validation test program report. Also, additional information will be requested to confirm the adequacy of certain isolation devices that protect the Class 1-E electrical circuits. The staff also indicated that the Procedures and Systems Review Branch (PSRB) review of the selection of critical parameters was not covered during the audit.

Original signed by

Owen Thompson, Project Manager  
Operating Reactors Branch #4, DL

Enclosure: As Stated

cc w/enclosure:

G. Lainas  
W. Regan  
L. Beltracchi  
R. Shaker  
F. Rosa  
J. Joyce  
D. Ziemann  
F. Orr  
J. Thoma  
O. Thompson  
PDR  
L. PDR

DISTRIBUTION

Docket File  
ORB#4 Rdg  
Memo File

ORB#4:DL  
OThompson;cr  
8/21/85

ORB#4:DL  
JThoma  
8/21/85

ORB#4:DL  
JStolz  
8/21/85

HFEB  
LBeltracchi  
8/21/85

ICSB  
JJoyce  
8/23/85

8508300494 850827  
PDR ADDCK 05000289  
F PDR

8/12/85

TMI-1 SPDS OVERVIEW

NRC AUDIT

AUGUST 12, 13, AND 14, 1985

H. C. CRAWFORD

## INTRODUCTION

- o EVOLUTION OF THE SPDS IDEA SLIDE 1
- o DESCRIPTION OF PT PLOT SLIDE 2

## CONCEPT OF SPDS

- o FLOW CHART (PAGE 1) SLIDE 3
- o USERS SS/STA
- o CSFs SLIDE 4
- o SELECTED PARAMETERS UNIQUELY  
DEFINE CSFs

## NUREG 0737 SUPPLEMENT 1 REQUIREMENTS

- o SAFETY ANALYSIS SUBMITTED 4/30/84
- o TMI-1 SPDS DEFINITION SLIDE 5
- o TMI-1 SPDS PURPOSE SLIDE 6
- o USED FOR OVERVIEW PURPOSES NOT TO  
CONTROL THE PLANT
- o TMI-1 SPDS HAS BEEN PROMPTLY  
IMPLEMENTED
- o NO TECH SPEC CHANGES OR UNREVIEWED  
SAFETY QUESTIONS
- o HUMAN FACTORS DESIGN PHILOSOPHY
- o USER TRAINING WITH & WITHOUT SPDS

## DISPLAY DESIGN

- o FLOW CHART (PAGE 1) SLIDE 7
- o USE EXISTING PLANT COMPUTER SYSTEM SLIDE 8
- RELIABLE OPERATING EXPERIENCE (5-10 YRS)
- ENHANCE USEFULNESS OF SPDS
- (FAMILIARITY, CONFIDENCE, LOCATION)
- V&V ONLY ITEMS ADDED TO SYSTEM BY SPDS

## SPDS IMPLEMENTATION

- o FLOW CHART (PAGE 2) SLIDE 9
- o DISPLAY HIERARCHY SLIDE 10
- o ALARM CRT SLIDE 11
- o CRT CONSOLE SLIDE 12
- o SPDS MENU SLIDE 13

## SPDS FINAL DISPLAYS

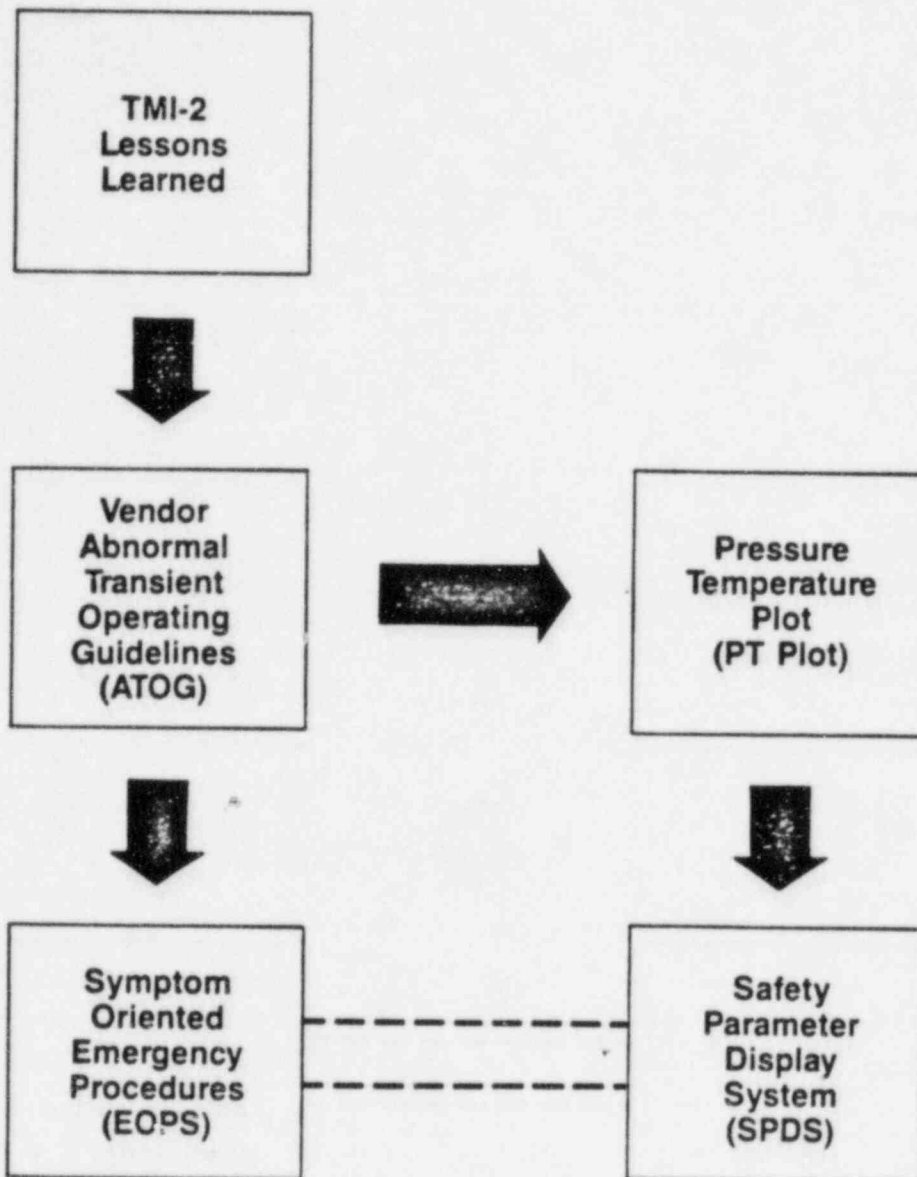
### POWER OPERATION

- o REACT/POWER DIST & PRIM SIDE HEAT REMOVAL
  - LOW POWER 3 RC PUMPS SLIDE 14
  - POWER > 20% 4 RC PUMPS SLIDE 15
  - POWER > 55% 4 RC PUMPS SLIDE 16
  - LEVEL 2 DISPLAY SLIDE 17
- o RCS INTEGRITY SLIDES 17 AND 18
- o RADIATION CONTROL SLIDES 19 AND 20
- o CONTAINMENT CONDITIONS SLIDES 21 AND 22

POST TRIP

- o REACTIVITY/POWER DISTRIBUTION SLIDES 23 AND 24
- o PRIMARY SIDE HEAT REMOVAL FORCED FLOW SLIDE 25
- o RCS INTEGRITY FORCED FLOW SLIDES 26 AND 27
- o PRIMARY SIDE HEAT REMOVAL  
NATURAL CIRCULATION SLIDES 28 AND 29
- o RCS INTEGRITY NATURAL CIRCULATION SLIDES 30 AND 31

## Evolution of the SPDS Idea



## **SPDS Definition**

**The Safety Parameter Display System (SPDS) will aid the control room personnel in determining the overall plant safety status and determining if the actions taken by the operators have brought the plant to a stable and safe condition.**

*Handwritten signature*

## SPDS Purpose

1. Provide organized information at one location.
2. Continuously monitor information. *Plant Computer*
3. Primary use for off normal events.
4. Secondary use during normal evolutions.
5. Critical safety function approach. ]

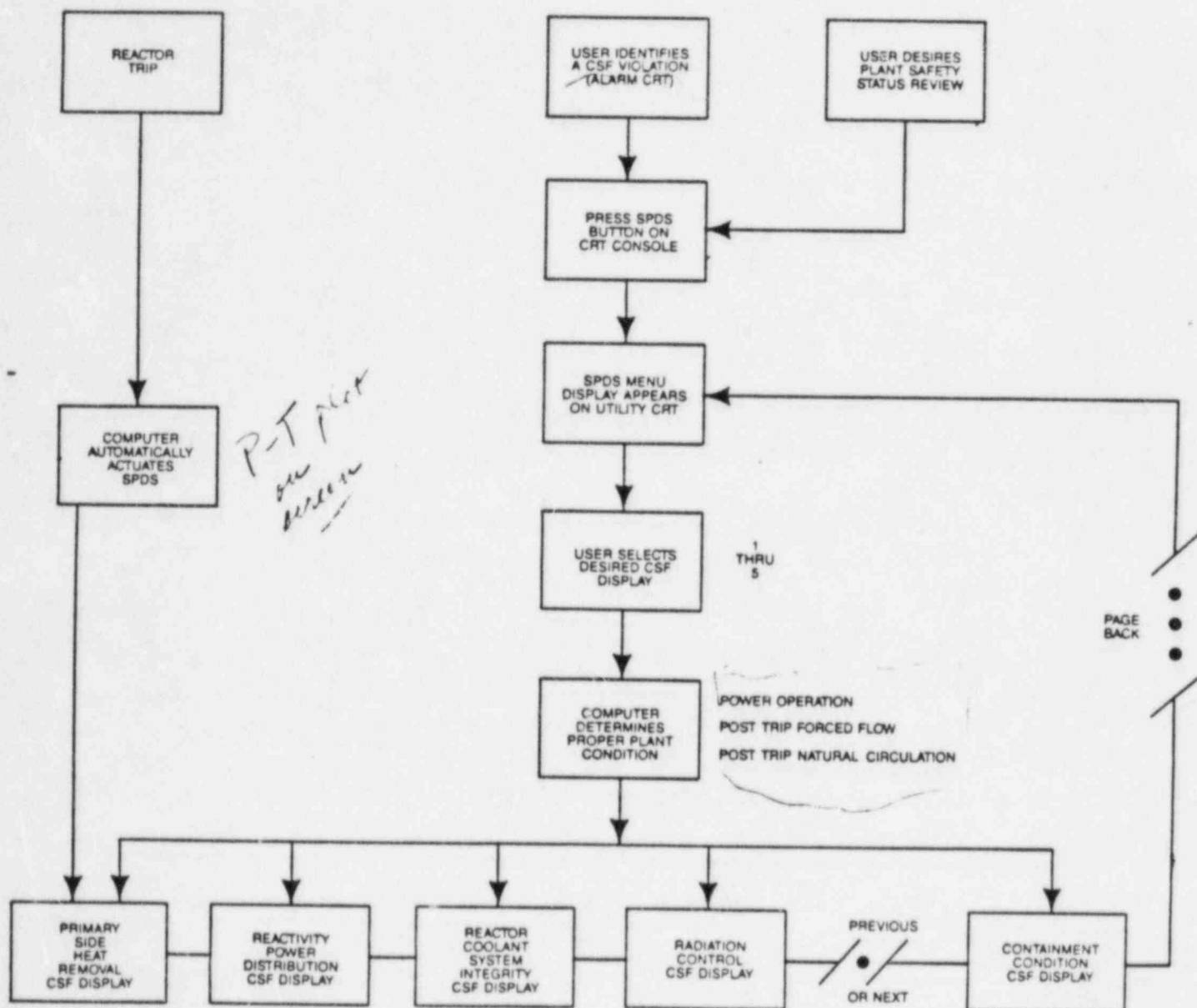
III-1  
Operational 11/85

- no tech specs -

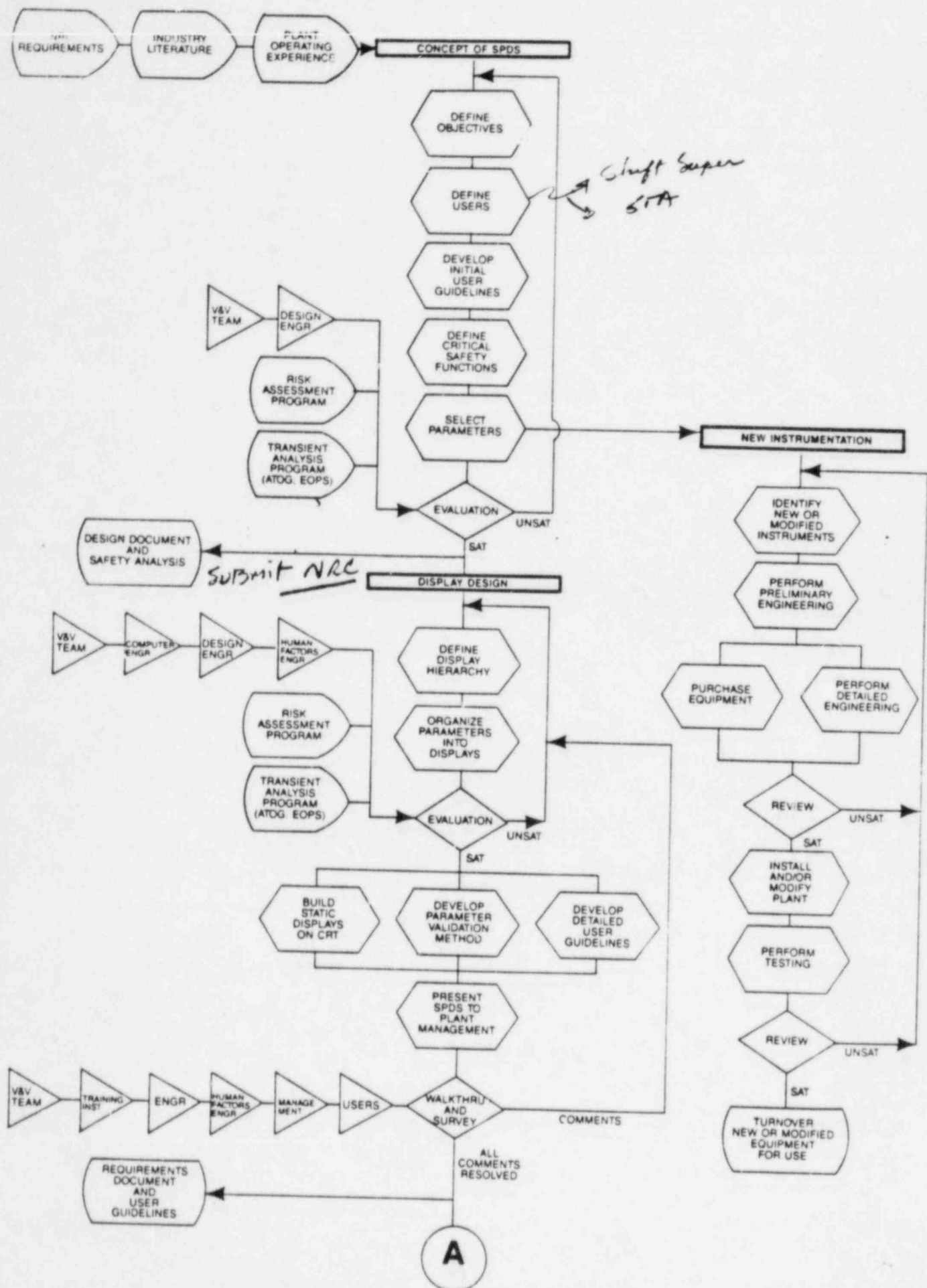
CR personnel trained w/ w/o SPDS.

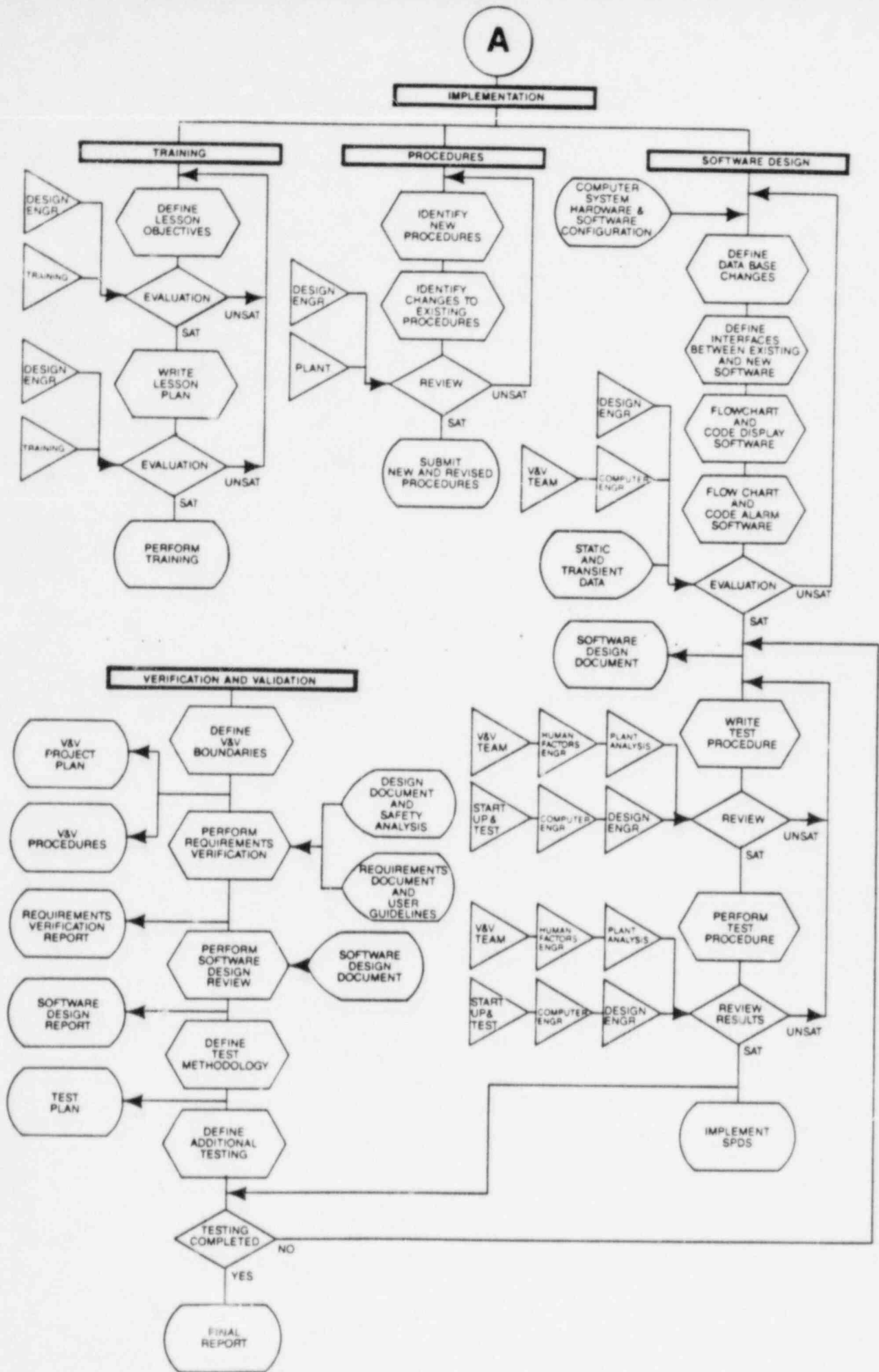


## SPDS DISPLAY HIERARCHY



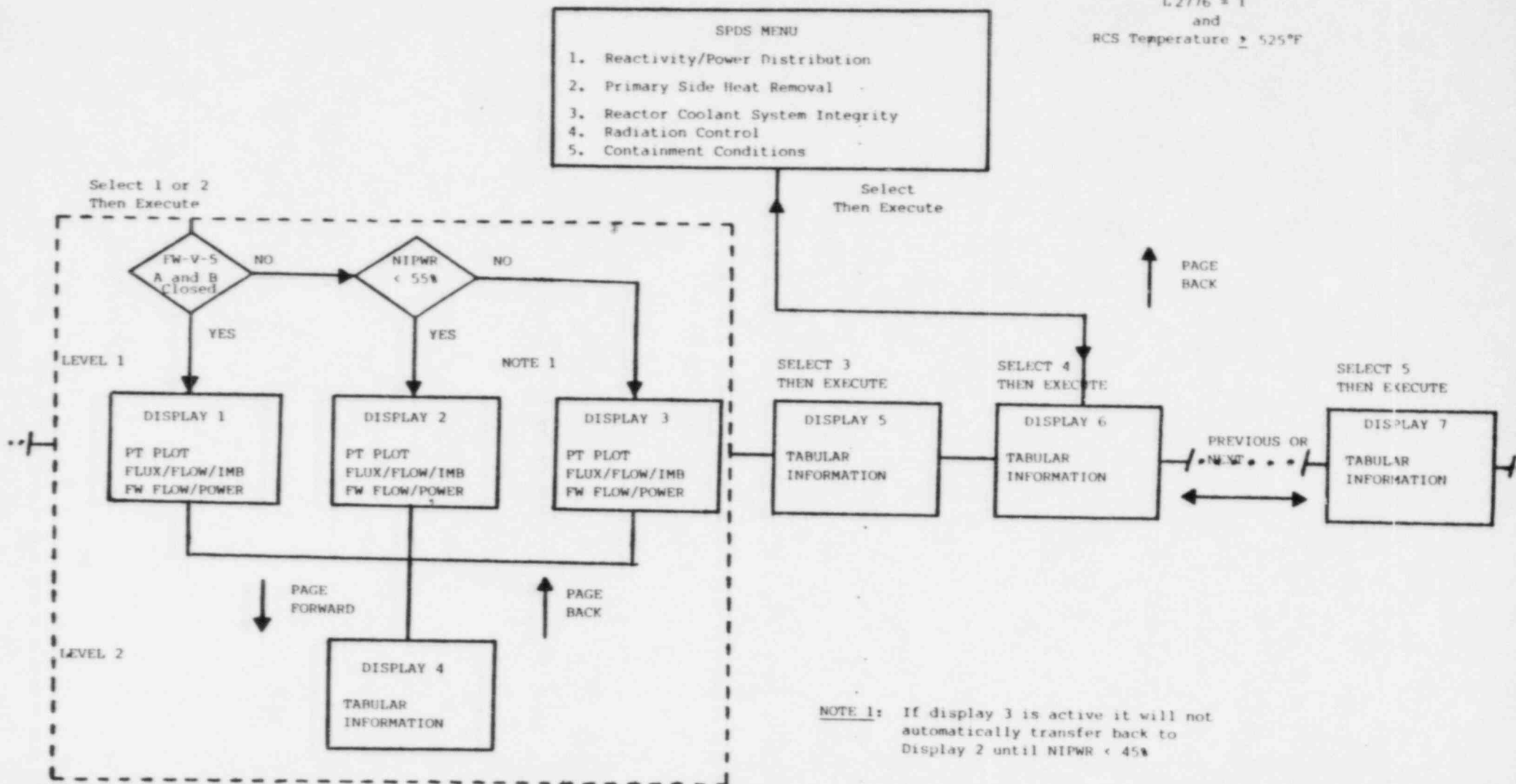
# DESIGNING AND IMPLEMENTING AN SPDS





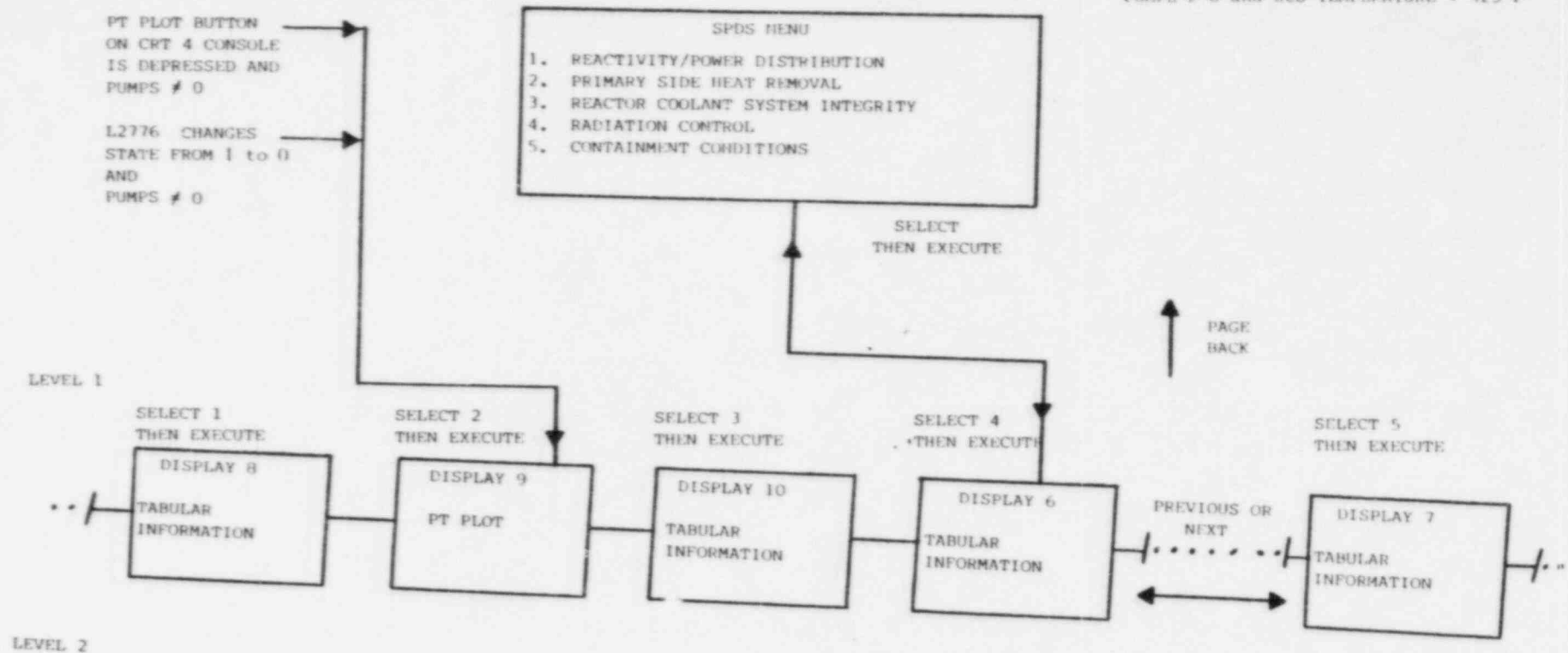
# SPDS DISPLAY HIERARCHY POWER OPERATION

L2776 = 1  
and  
RCS Temperature  $\geq 525^{\circ}\text{F}$

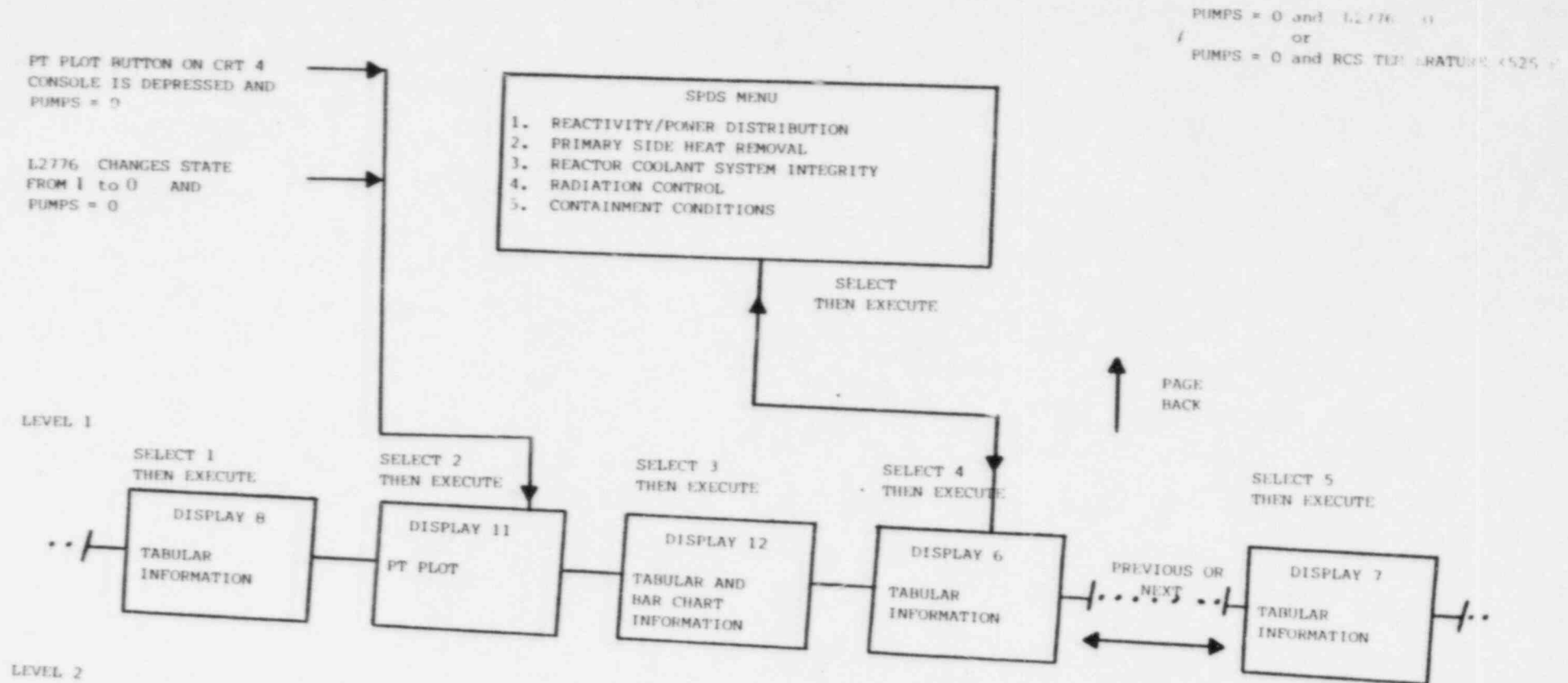


# SPDS DISPLAY HIERARCHY POST TRIP FORCED FLOW

PUMPS # 0 and L2776 = 0  
or  
PUMPS # 0 and RCS TEMPERATURE < 525°F



# SPDS DISPLAY HIERARCHY POST TRIP NATURAL CIRCULATION



SAFETY PARAMETER DISPLAY SYSTEM MENU

---

1. REACTIVITY / POWER DISTRIBUTION
2. PRIMARY SIDE HEAT REMOVAL
3. REACTOR COOLANT SYSTEM INTEGRITY
4. RADIATION CONTROL
5. CONTAINMENT CONDITIONS

ENTER :  
DISPLAY NO. 0

THEN EXECUTE

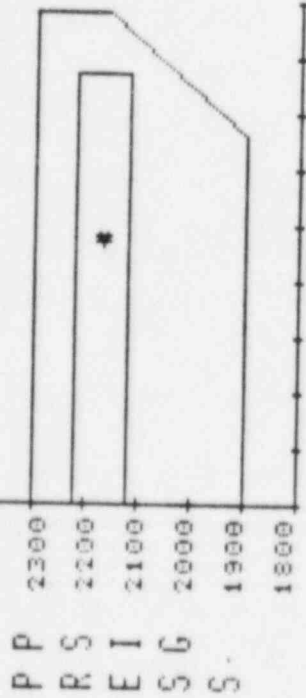
DISPLAY 0

# □ REACT/POWER DIST & PRIM SIDE HEAT REMOVAL - POWER OPERATION

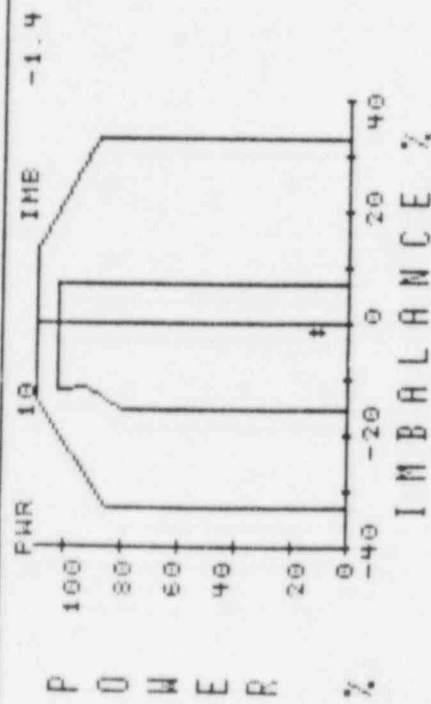
PA 2164.0 THA 578.0  
PB 2165.0 THB 577.0

W FNA 0.55  
W FNB 0.57  
PWR 10

SGSULA 30.0  
SGSULB 30.0

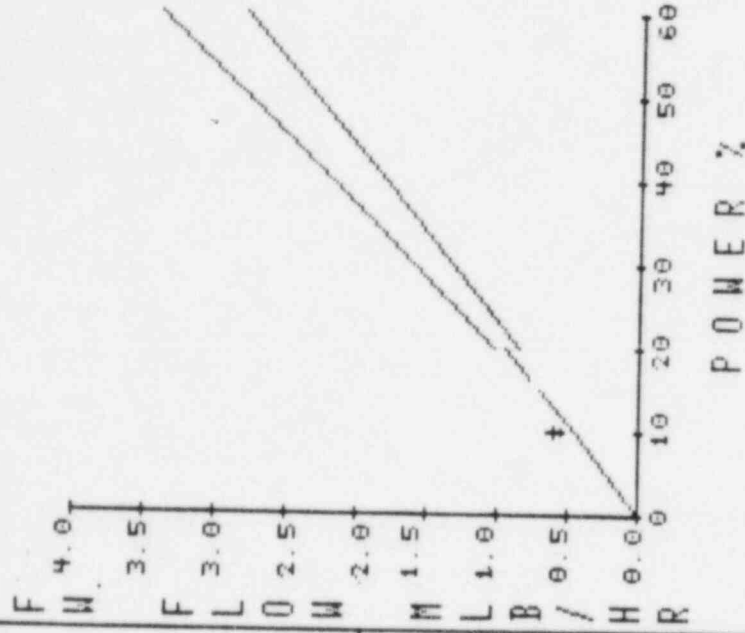


HOT LEG TEMP °F



POWER %

IMBALANCE %



POWER %

— \* LOOP A  
- - - + LOOP B

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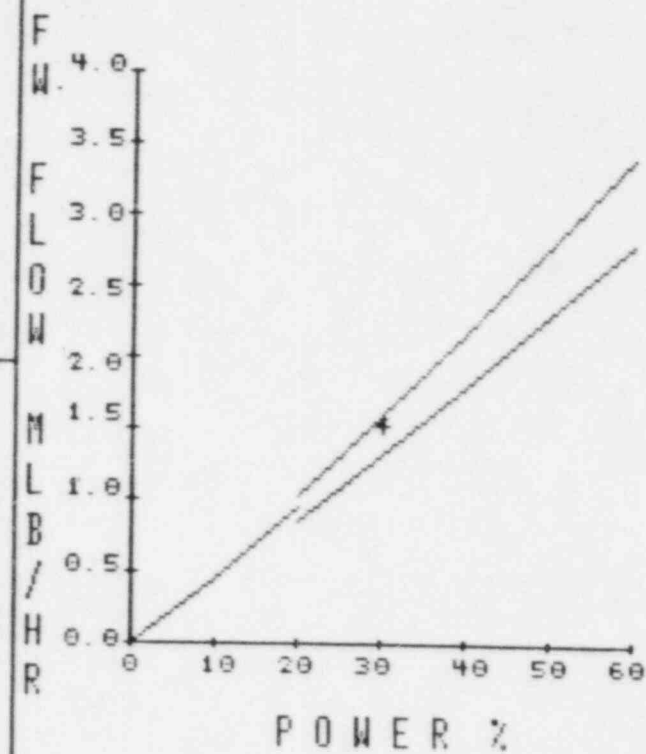
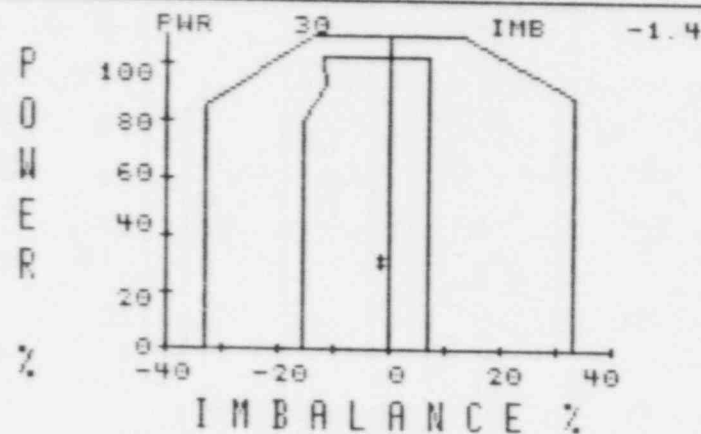
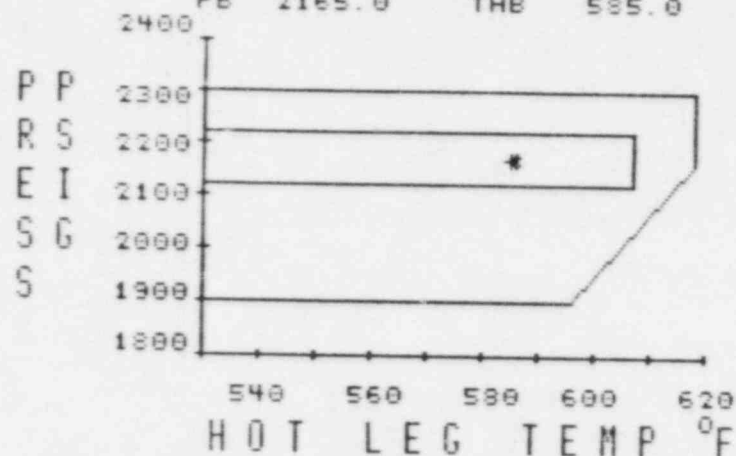


# □ REACT/POWER DIST & PRIM SIDE HEAT REMOVAL - POWER OPERATION

PA 2164.0 THA 586.0  
PB 2165.0 THB 585.0

W FWA 1.53  
W FWB 1.51  
FWR 30

TCA 572.0  
TCB 570.0



— \* LOOP A  
..... + LOOP B

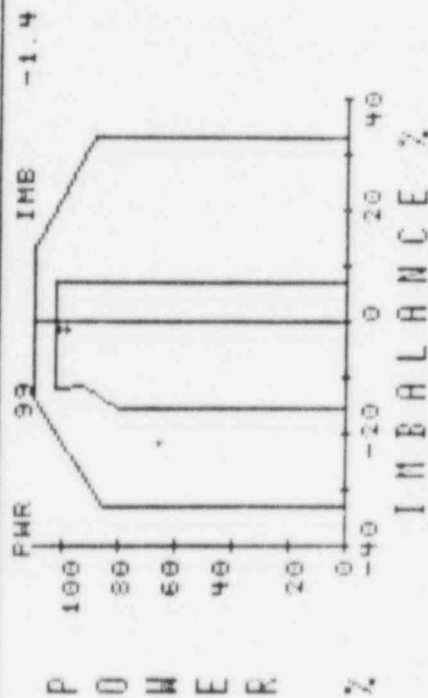
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# REACT/POWER DIST & PRIM SIDE HEAT REMOVAL - POWER OPERATION

PA 2154.0 THA 601.6  
PB 2155.0 THB 601.1

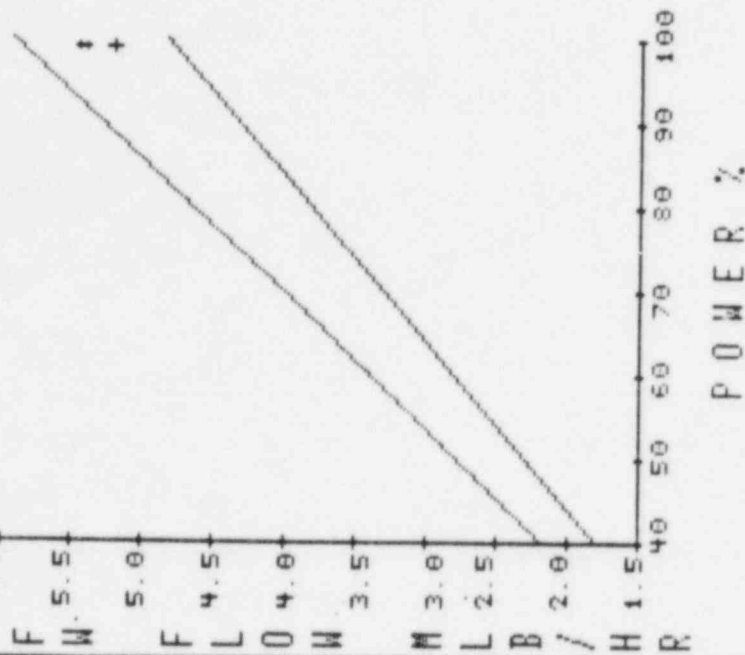


540 560 580 600 620  
HOT LEG TEMP °F



FWR 92 IMB -1.4

MFHA 5.40 TCA 558.0  
MFHB 5.18 TCB 556.0  
FHR 93



— LOOP A  
... LOOP B

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REACTIVITY / POWER DISTRIBUTION  
POWER OPERATION

POWER RANGE					INTERMEDIATE RANGE		
		<u>POWER</u>		<u>IMBALANCE</u>	<u>STARTUP RATE</u>		
NI - 5	99.2	PCT	-1.1	PCT	NI - 3	0.0	DPM
NI - 6	99.1	PCT	-1.4	PCT	NI - 4	0.0	DPM
NI - 7	99.2	PCT	-1.0	PCT			
NI - 8	99.3	PCT	-1.0	PCT			
RCS TOTAL FLOW 102.6 PCT							

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REACTOR COOLANT SYSTEM INTEGRITY  
POWER OPERATION

RB SUMP		RCS FLOW BALANCE	
LEVEL A	45.00 IN	VOID FRACTION	9.1 GPM
LEVEL B	45.00 IN	AVG PRESSURIZER LEVEL	0.00 PCT
MASS BALANCE	0.0 GPM	SUBCOOLING MARGIN	220.00 IN
RADIATION			
RM-A5 CONDENSER EXHAUST	2.7E01 CPM		
RM-A2 RB ATMOSPHERE	2.0E01 CPM		
RM-G8 RB DOME	5.0E00 MR/HR		
RM-L9 ICCW	1.0E00 CPM		

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## RADIATION CONTROL

RM - L1 LO      2.0E01   CPM  
LETDOWN

RM - A4 GAS    2.5E01   CPM  
F H BLDG

RM - A6 GAS    1.0E01   CPM  
AUX BLDG

RM - A8 GAS    3.0E01   CPM  
PLANT STACK

RM - A9 GAS    4.0E01   CPM  
RB STACK

RM - A5        2.7E01   CPM  
CNDSR EXH

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# CONTAINMENT CONDITIONS

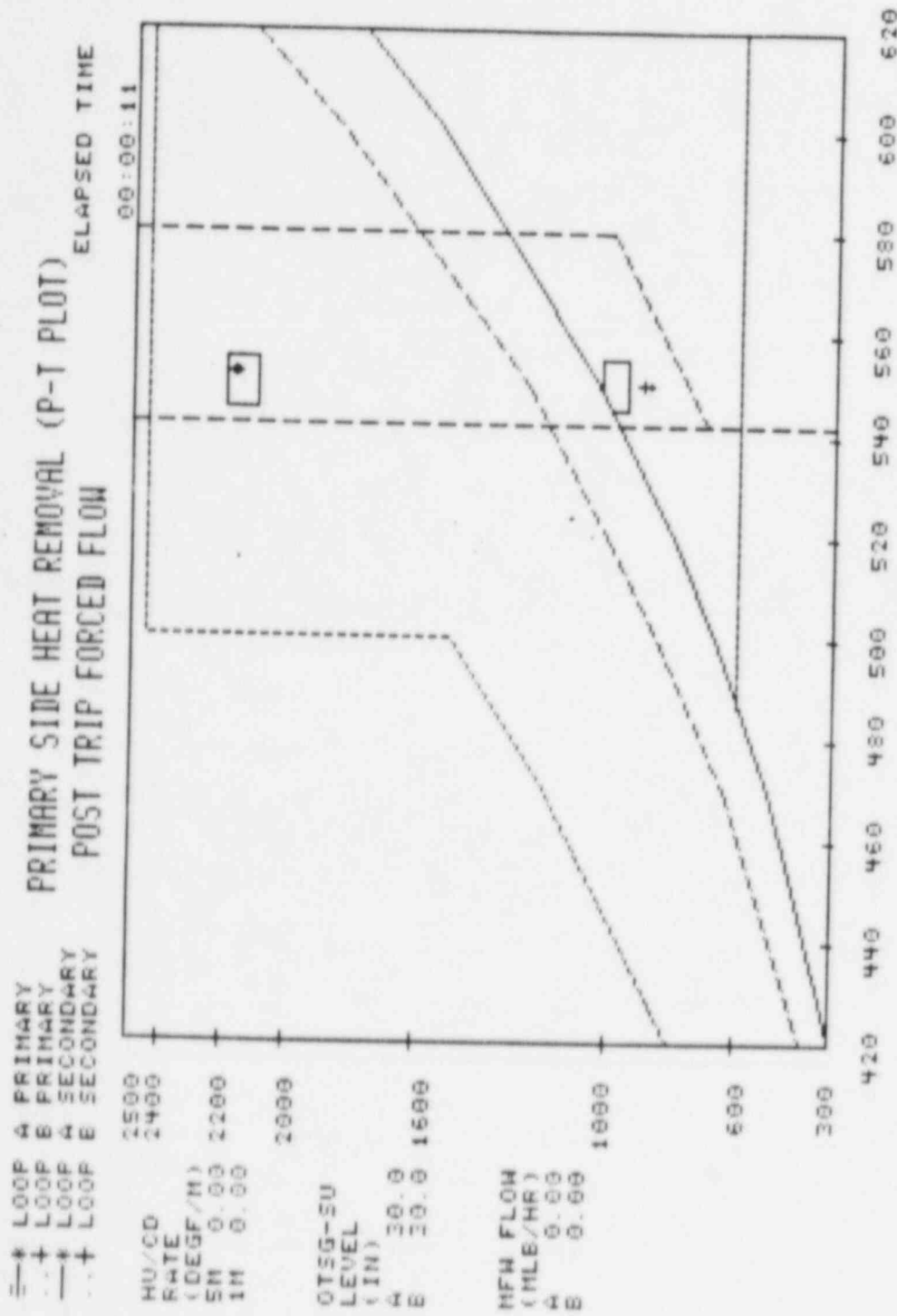
PRESSURE		RADIATION		
A	0.0 PSIG	RM-A2 RB ATMOSPHERE	2.0E01	CPM
B	0.0 PSIG	RM-G8 RB DOME	5.0E00	MR/HR
TEMPERATURE (TE655)				
W (NE SEC SHIELD ELV 364)	110.0 DEGF			
A (SE WALL ELV 352)	109.0 DEGF			
K (S SEC SHIELD ELV 352)	111.0 DEGF			
I (NW WALL ELV 352)	112.0 DEGF			
LEVEL		HYDROGEN CONCENTRATION		
SUMP		A 0.0 PCT		
A	45.0 IN			
B	45.0 IN			
FLOOD				
A	0.0 IN			
B	0.0 IN			

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# REACTIVITY / POWER DISTRIBUTION POST TRIP

POWER RANGE			INTERMEDIATE RANGE		
<u>POWER</u>			<u>STARTUP RATE</u>		
NI - 5	8.0	PCT	NI - 3	0.0	DPM
NI - 6	8.0	PCT	NI - 4	0.0	DPM
NI - 7	8.0	PCT			
NI - 8	8.0	PCT			
			SOURCE RANGE		
			<u>STARTUP RATE</u>		
			NI - 1	0.0	DPM
			NI - 2	0.0	DPM

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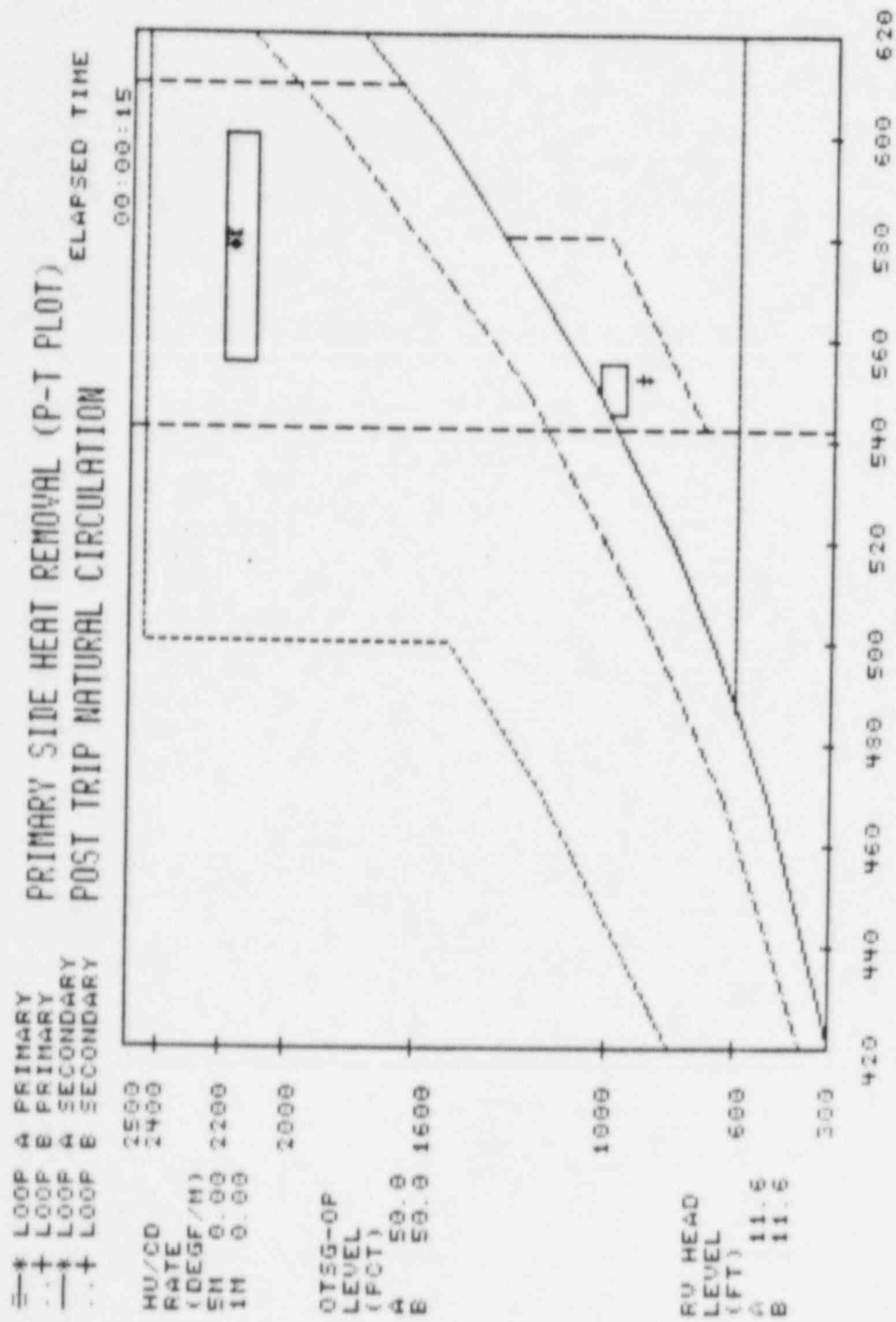




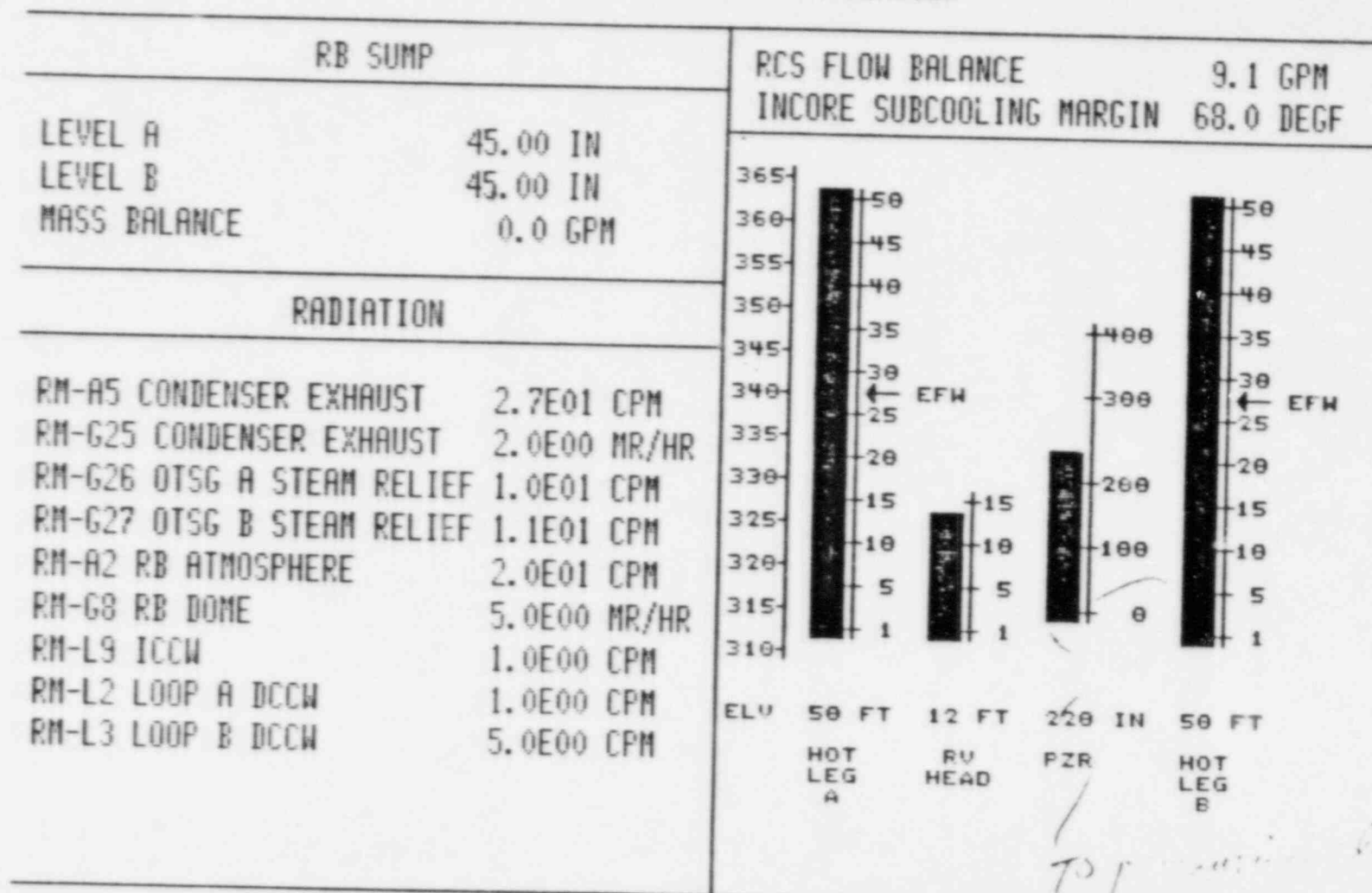
# REACTOR COOLANT SYSTEM INTEGRITY POST TRIP FORCED FLOW

RB SUMP		RCS FLOW BALANCE	
LEVEL A	45.00 IN	VOID FRACTION	9.1 GPM
LEVEL B	45.00 IN	AVG PRESSURIZER LEVEL	0.00 PCT
MASS BALANCE	0.0 GPM	SUBCOOLING MARGIN	220.00 IN
RADIATION		88.00 DEGF	
RM-A5 CONDENSER EXHAUST	2.7E01 CPM		
RM-G25 CONDENSER EXHAUST	2.0E00 MR/HR		
RM-G26 OTSG A STEAM RELIEF	1.0E01 CPM		
RM-G27 OTSG B STEAM RELIEF	1.1E01 CPM		
RM-A2 RB ATMOSPHERE	2.0E01 CPM		
RM-G8 RB DOME	5.0E00 MR/HR		
RM-L9 ICCW	1.0E00 CPM		
RM-L2 LOOP A DCCW	1.0E00 CPM		
RM-L3 LOOP B DCCW	5.0E00 CPM		

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# REACTOR COOLANT SYSTEM INTEGRITY POST TRIP NATURAL CIRCULATION



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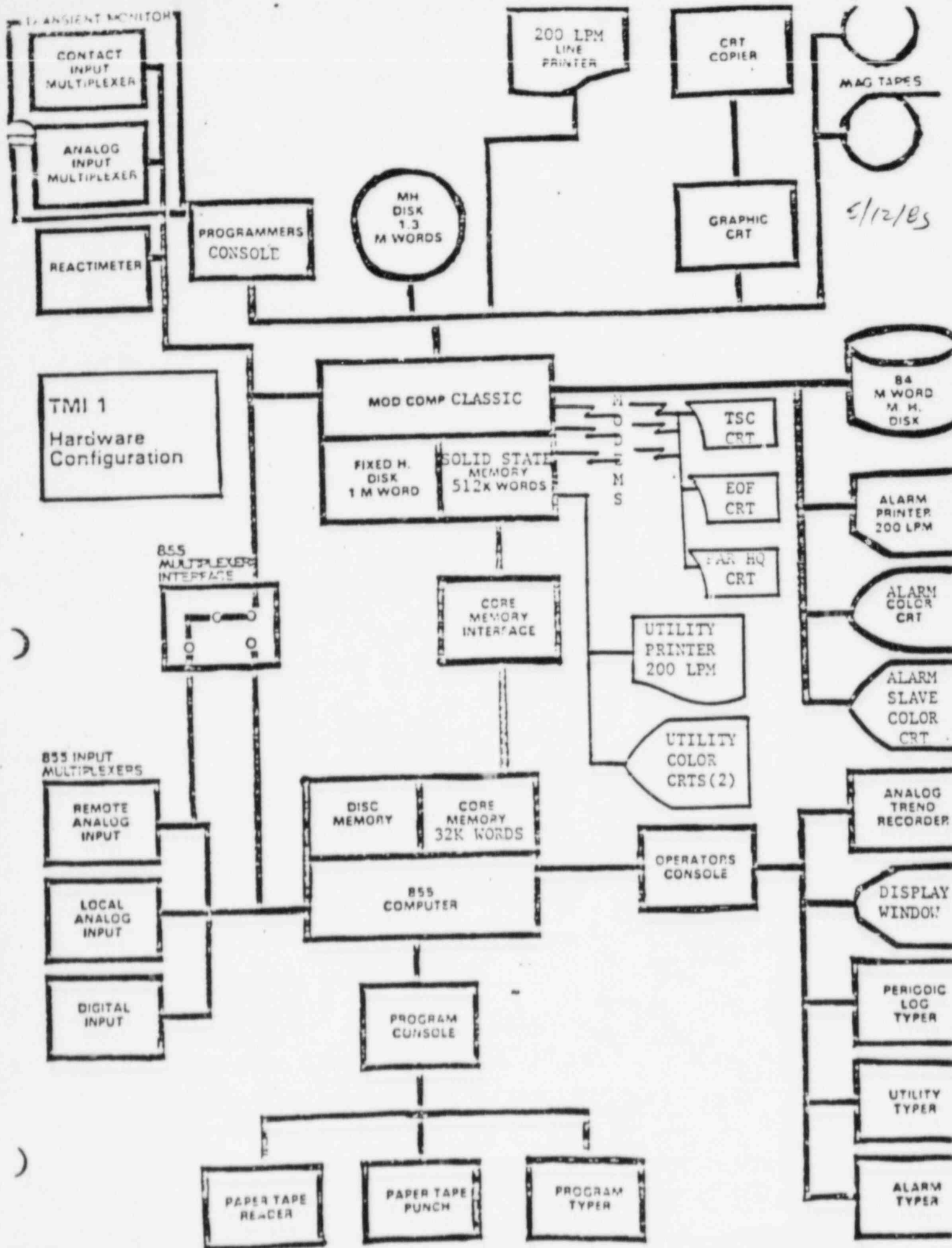


FIGURE 1 - CURRENT HARDWARE CONFIGURATION

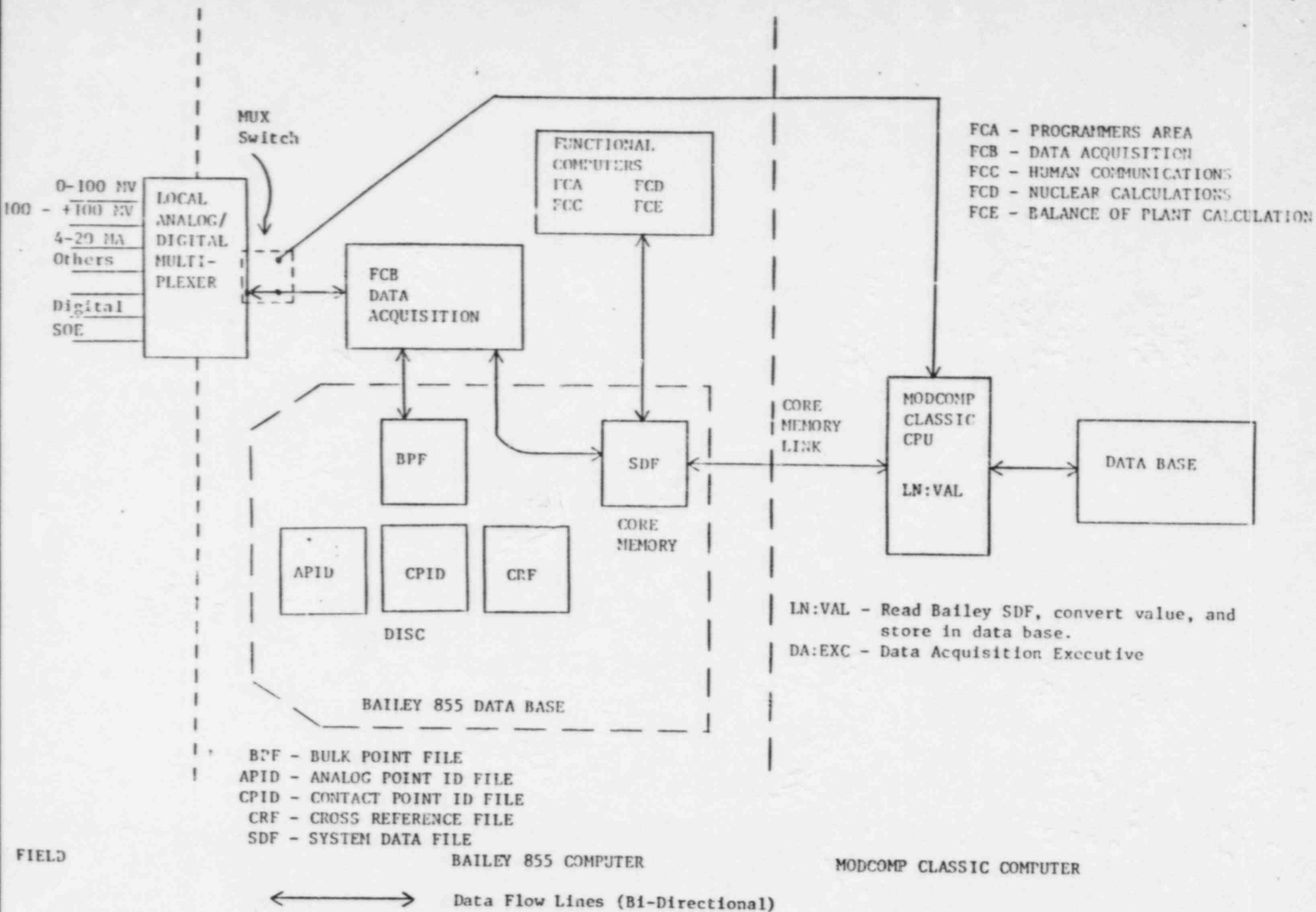


FIGURE 2  
NORMAL OPERATION  
DATA FLOW FROM FIELD TO DATA BASES

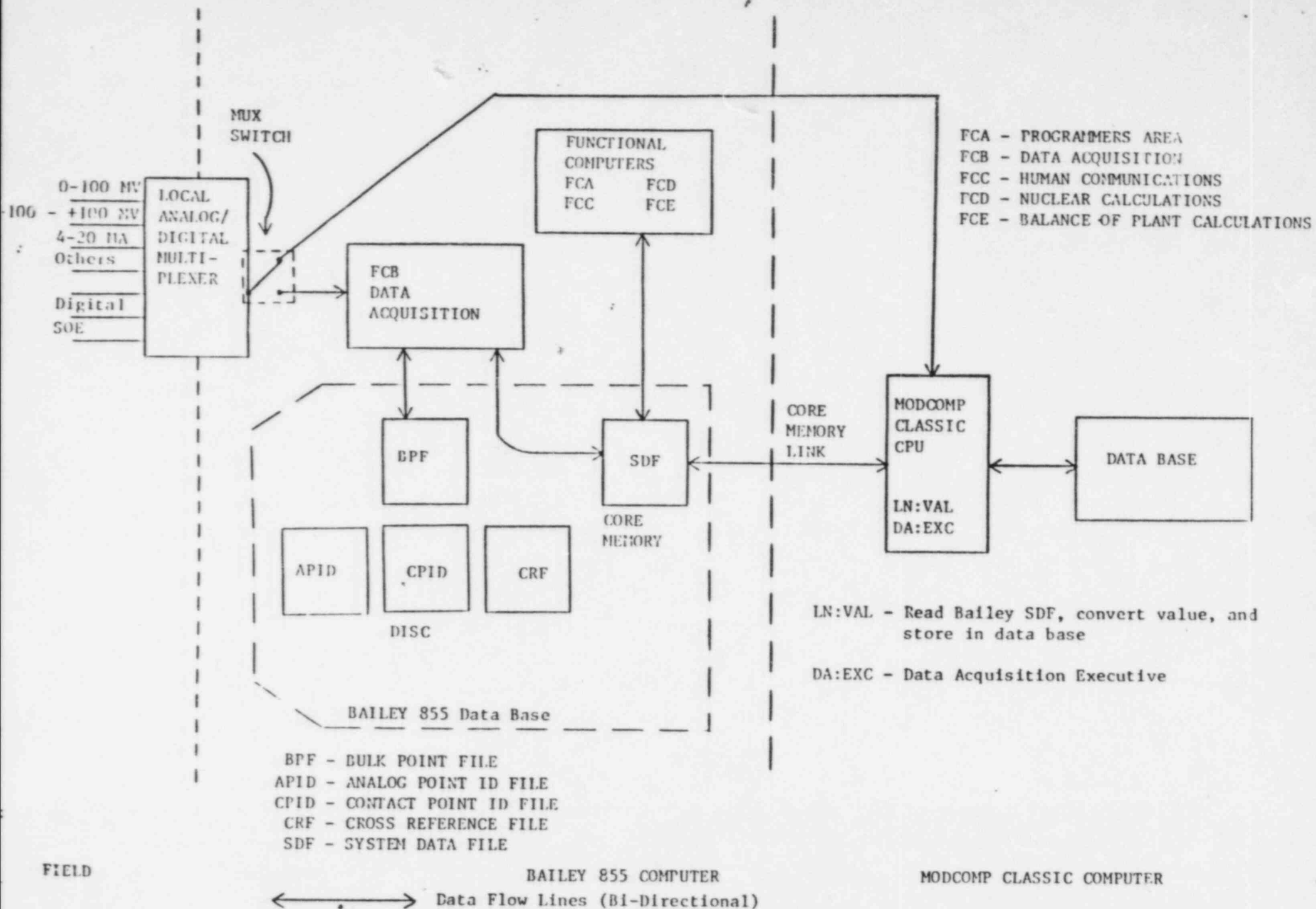


FIGURE 3  
BAILEY 855 OUT OF SERVICE  
DATA FLOW FROM FIELD TO MODCOMP DATA BASE

HF  
5/12/85

HUMAN FACTORS AT GPU NUCLEAR

Staff: Manager, 2 full time HF Engineers, Co-Op student (grad)

Location: Corporate HQ, Parsippany, NJ

Organization: Computer Appl./Human Engineering Dept, Systems Engineering,  
Technical Functions Division, GPU Nuclear

Involvement in  
Projects:

Reviews all new modifications to plant, reviews existing  
control stations. Reviews all op/maint. mods.  
INVOLVEMENT BEGINS AS EARLY AS POSSIBLE IN EACH DESIGN

DEGREE OF INVOLVEMENT SELF-DETERMINED (DEPENDS ON NATURE OF MMI)

One HF Engineer Assigned to Each Project

HF GROUP WILL INITIATE NEW PROJECTS TO CORRECT Human Engineering  
Deficiencies WHICH ARE FOUND IN THE PLANT.

HF will review and aid in preparation of applicable documents,  
drawings, hardware selection, etc. and follows through to project  
installation.

Other areas  
of HF involvement:

Ambient Environment surveys

Assigns Control Room hardware/alarm locations

—▶ Formats all CRT displays

All plant labels ordered through HF

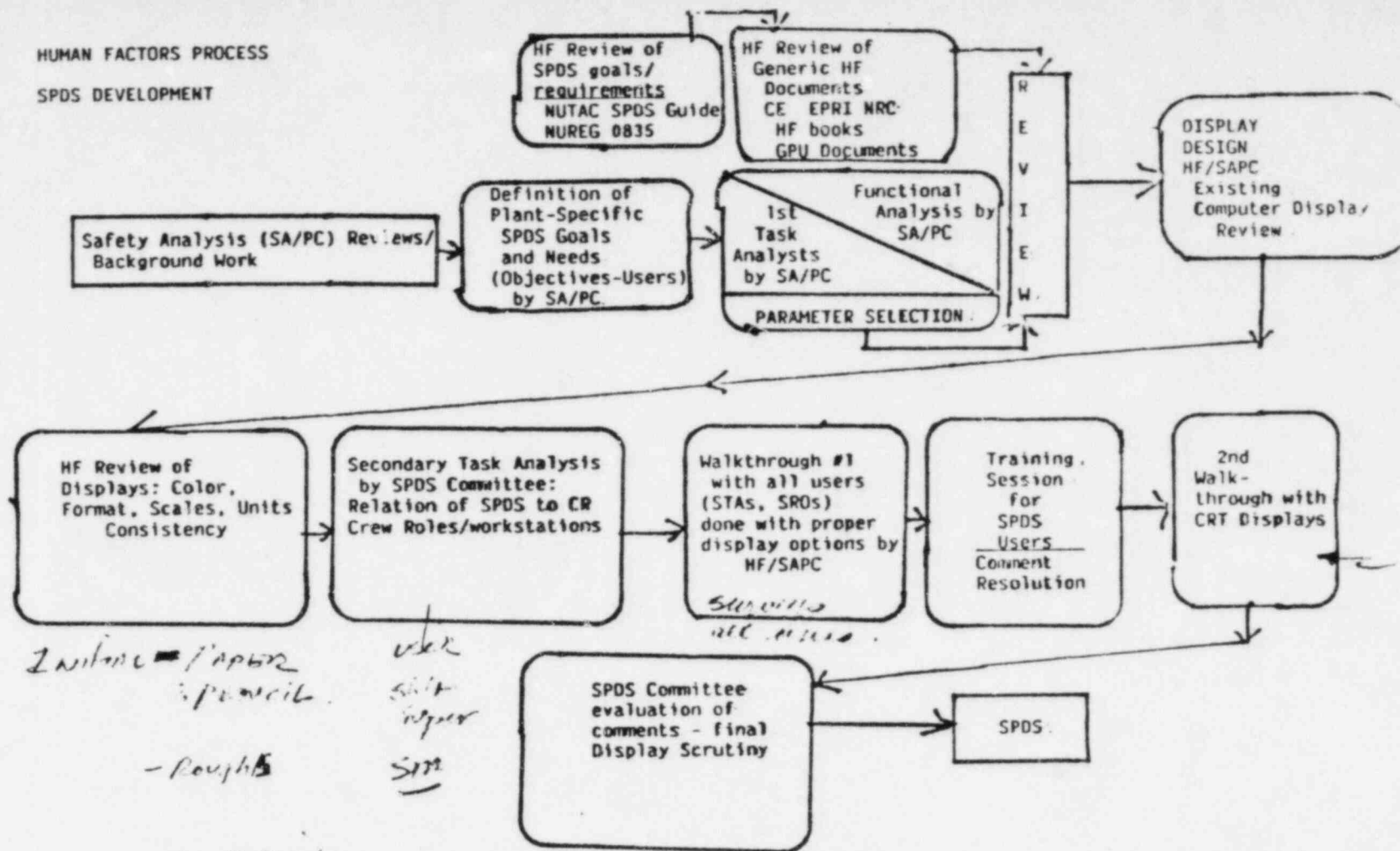
All wording (labels, alarms, etc) chosen by HF

Reviews/Formats plant procedures on request, Formats all EOPs

Attendance: HF attends all applicable PEDR and OMCR meetings

SUMMARY: COMPREHENSIVE, FULLY INVOLVED HF PROGRAM

HUMAN FACTORS PROCESS  
SPDS DEVELOPMENT



8/12/85



8/13/85

V&V TEAM MEMBERS

- o BRUCE OLAF - SOFTWARE DEVELOPER
- o JIM P. HEIL - Q.A. ENGINEER
- o TAE Y. BYOUN - NUCLEAR ENGINEER

*Dsc*

## SPDS V&V SCOPE

1. INDEPENDENT REVIEW & EVALUATION OF THE SPDS SOFTWARE (5 CSF's & 9 DISPLAY PROGRAMS).
2. REVIEW AND COMMENTS ON SYSTEM REQUIREMENTS DOCUMENTS AND DESIGN DOCUMENTS PER V&V PROCEDURE.
3. REVIEW AND COMMENTS ON TEST PROCEDURES AND TEST MANUALS PRIOR TO AND AFTER THE TESTING COMPLETION.
4. MONITOR AND EVALUATE THE TESTING PROCESS.

5. NOT INCLUDED ARE:

o HARDWARE CONFIGURATION DESIGN REVIEW

- PLANT PROCESS COMPUTER HARDWARE AND SOFTWARE WAS INSTALLED PRIOR TO AND INDEPENDENT OF THE SPDS DESIGN.
- THERE IS NO SPDS HARDWARE.

o HUMAN FACTOR REVIEWS

HUMAN FACTORS CONSIDERATIONS HAVE BEEN INCLUDED IN THE SPDS AS AN INTEGRAL PART OF DESIGN PROCESS. THE HUMAN FACTORS EVALUATIONS HAVE BEEN PERFORMED SEPARATELY AND DOCUMENTED.

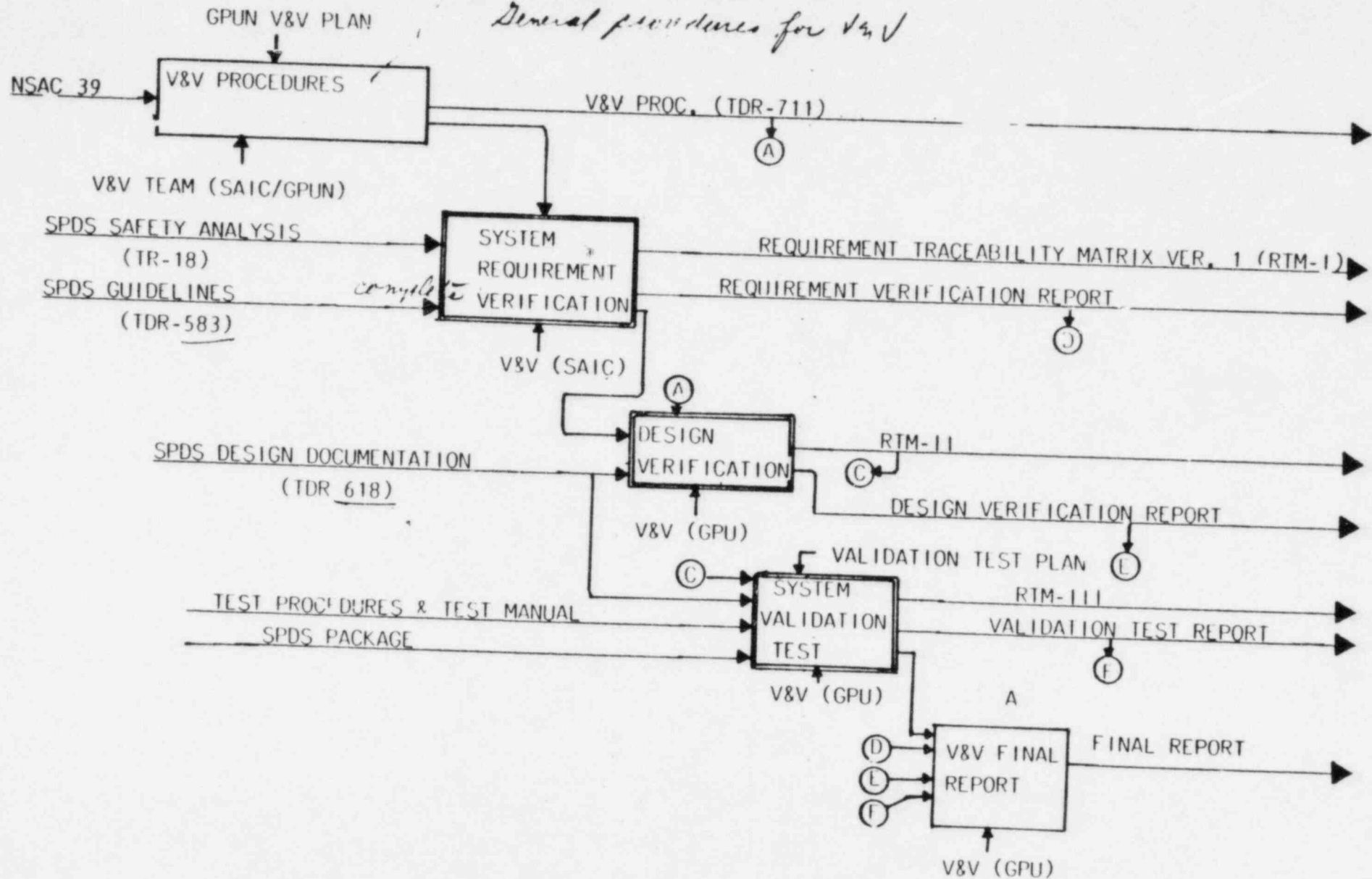
o SPDS OBJECTIVES AND REGULATORY REQUIREMENTS

THREE MILE ISLAND UNIT 1  
SAFETY PARAMETER DISPLAY SYSTEM  
REQUIREMENTS TRACEABILITY MATRIX (RTH II)

GPLN RTH ITEM	REQUIREMENT DESCRIPTION	REQUIREMENT REFERENCE(S)	DESIGN/CODE REFERENCE(S)	TEST MAN. REFERENCE(S)	TEST PROC. REFERENCE(S)	REMARKS
13.30	Radiation Control Priority 2 CSF flowchart.	(A) P.103 (A) P.350	(A) P.144, 145			VER-005I VER-005J
13.35	Radiation Control Priority 1 CSF flowchart.	(A) P.103 (A) P.350	(A) P.143, 144			
13.40	Containment Condition warning CSF flowchart.	(A) P.104 (A) P.351	(A) P.133- 157			
13.45	Containment Condition alarm CSF flowchart.	(A) P.104 (A) P.351	(A) P.136- 152			
14.00	SPDS parameters organized into 5 critical safety functions (CSF).	(A) P.12	(A) P.7,19			
15.00	Reactivity/Power Distribution CSF Parameters.					
15.05	Parameters for CSFs, Table 3.1.	(B) P.28	(A) P.26, 116-118			VER-004N
15.10	Reactivity/Power Distribution parameter names.	(B) P.30	(A) P.27,27			
15.15	Reactivity/Power distribution critical safety function parameters, point numbers (Table 6.1).	(A) P.39	(A) P.26,27			
15.20	R/PD & PSHR power operation level 1 display computer points - PT Plot.	(A) P.354	(A) P.27			
15.25	R/PD & PSHR power operation level 1 display computer points - Flux Flow Imbalance Plot.	(A) P.355	(A) P.26			
15.30	R/PD & PSHR power operation level 1 display computer points - Feedwater Flow Plot.	(A) P.355	(A) P.26,27 28			VER-004D VER/DR-006
15.33	Correction to R/PD and PSHR power operation level 1 display computer points.	(C) RC # 0022				VER-001A
15.35	R/PD power operation level 2 display - computer points.	(A) P.361	(A) P.26			VER-004E
15.40	Reactivity/Power Distribution post trip Level 1 display - computer points.	(A) P.378	(A) P.26			

# OVERVIEW OF SPDS V&V ACTIVITIES

SAI - Product Phase  
General procedures for V&V



# COMMENT/RESOLUTION STATUS SHEET

REVIEWER'S COMMENT

SERIAL NO: VER-003

PAGE 1 OF 2

PROJECT: TMI-1 SFDS V&V

DATE: 06/27/85

V&V TASK: Design Verification

ISSUED BY: T. Byoun/J. Heil

DOCUMENT(S) UNDER REVIEW: TDR-618, Rev 0

## COMMENT:

- A. RTM 05.30 - TDR does not address that removal of points from scan is required if instrument string feeding SFDS computer input is removed.  
( RESPONSE ACCEPTABLE 08/08/85)
- B. RTM 05.35 - TDR does not address that redundant sensors are to be used if available.  
( RESPONSE ACCEPTABLE 08/08/85)
- C. RTM 09.05 - TDR does not address when more than one computer point provided for a parameter, use point closest to limit to compare against alarm setpoint.  
( RESPONSE ACCEPTABLE 08/08/85)
- D. RTM 09.15 - TDR does not address any valid point for parameter exceeding limit causes CSF alarm or warning.  
( RESPONSE ACCEPTABLE 08/08/85)
- E. RTM 10.00 - TDR does not address that SFDS spurious alarms, including L293i, may occur during cooldowns, cold shutdowns, and heatups, and should clear.  
( RESPONSE UNACCEPTABLE - SEE VER/DR-001 08/08/85)
- F. RTM 45.23 - TDR does not address accuracy for hot leg A/B level bar chart.  
( RESPONSE UNACCEPTABLE - SEE VER/DR-002 08/08/85)
- G. RTM 45.28 - TDR does not address accuracy for RV Head level bar chart.  
( RESPONSE UNACCEPTABLE - SEE VER/DR-002 08/08/85)
- H. RTM 45.33 - TDR does not address accuracy for Pressurizer level bar chart.  
( RESPONSE UNACCEPTABLE - SEE VER/DR-002 08/08/85)
- I. RTM 46.00 - TDR does not address audible alarm or user acknowledgment of alarms.  
( RESPONSE ACCEPTABLE 08/08/85)

## RESPONSE:

(SEE S.M.CAFRELL1 MEMO 5421-85-0062, 07/18/85)

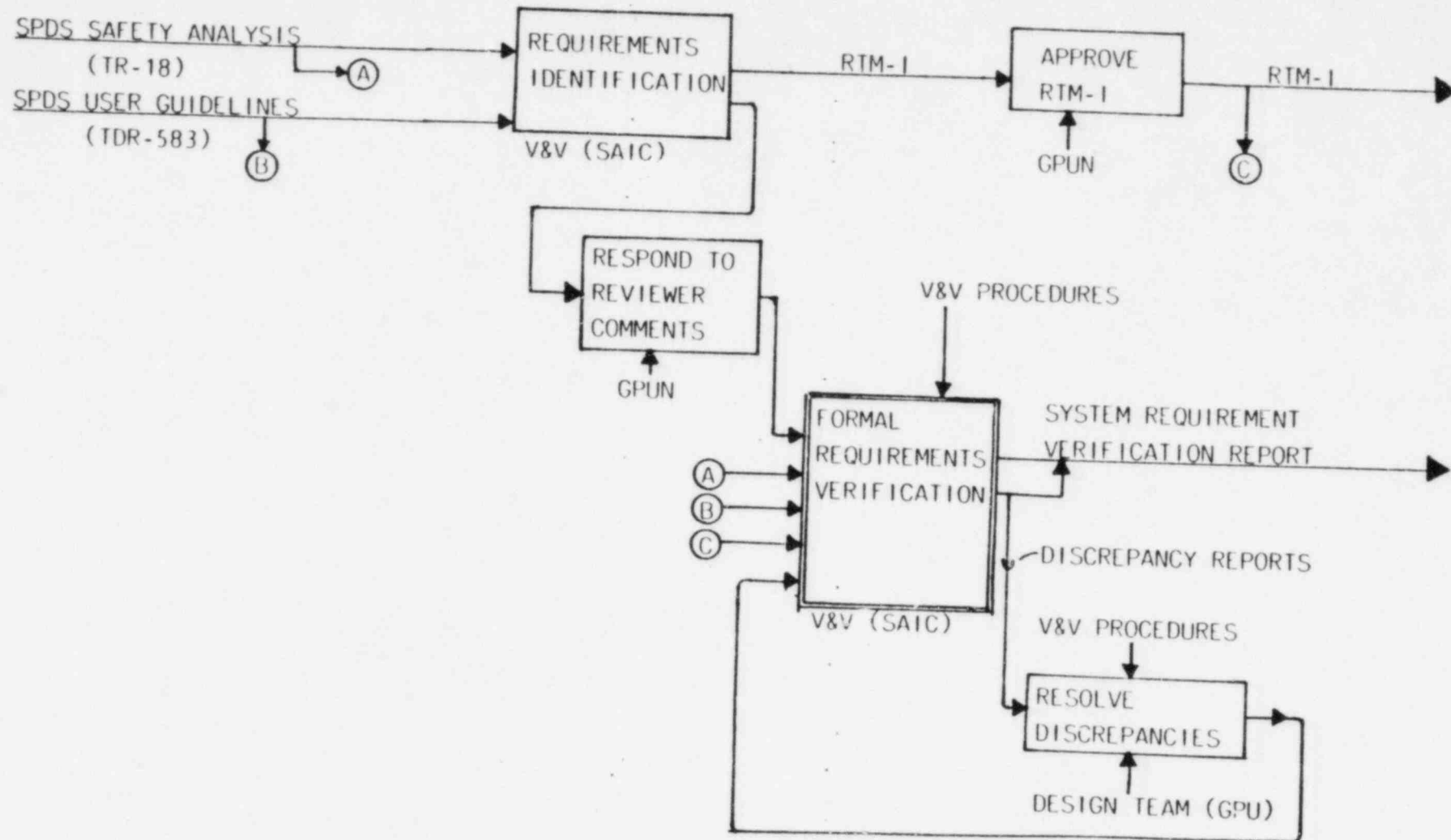
RESPONSE BY: (SC)

DATE: 07/18/85

## TMI-1 SPDS V&V DOCUMENTATION

- o VERIFICATION & VALIDATION PROCEDURES (TDR-711)
- o VALIDATION TEST PLAN (TDR-710)
- o SYSTEM REQUIREMENTS VERIFICATION REPORT (COMPLETED)  
(RTM-1, COMMENTS/RESOLUTIONS, DISCREPANCY REPORTS)
- o DESIGN VERIFICATION REPORT (DRAFT)  
(RTM-II, COMMENTS/RESOLUTION, AND DISCREPANCY REPORTS)
- o VALIDATION TEST REPORT  
(RTM-III, TEST MONITORING RESULTS, DISCREPANCY REPORTS,  
AND COMMENTS/RESOLUTIONS)
- o FINAL V&V REPORT

# SPDS SYSTEMS REQUIREMENTS VERIFICATION



## DESIGN VERIFICATION PROGRAM

### SOURCES OF DESIGN VERIFICATION

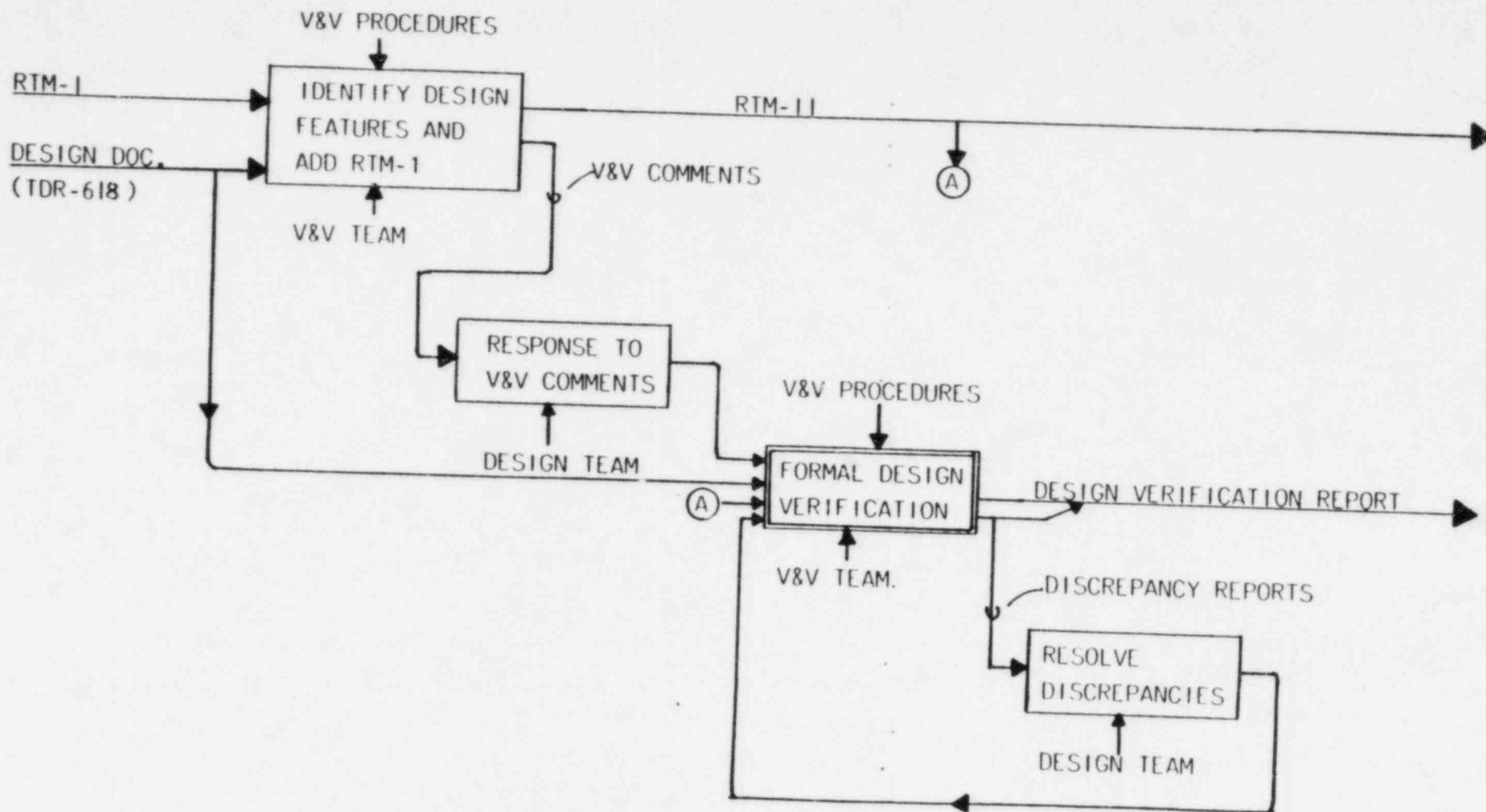
- o SPDS COMPUTER DESIGN AND IMPLEMENTATION (TDR-618)
- o BACKGROUND - SPDS CODE, RESULTS OF REQUIREMENTS VERIFICATIONS AND ANY IDENTIFIED REQUIREMENTS UPDATES

### DESIGN VERIFICATION

- o CORRELATION OF DESIGN TO SYSTEM REQUIREMENTS
- o REQUIREMENTS TRACEABILITY MATRIX VER. II
- o REVIEW & EVALUATION OF DESIGN DOCUMENTATION FOR TECHNICAL CORRECTNESS AND COMPLETENESS
- o IMPLICATION ON THE VALIDATION TESTING
- o COMMENTS/RESOLUTION AND DISCREPANCY REPORTS



# DESIGN VERIFICATION ACTIVITIES (GPUN)



## VALIDATION TEST PROGRAM

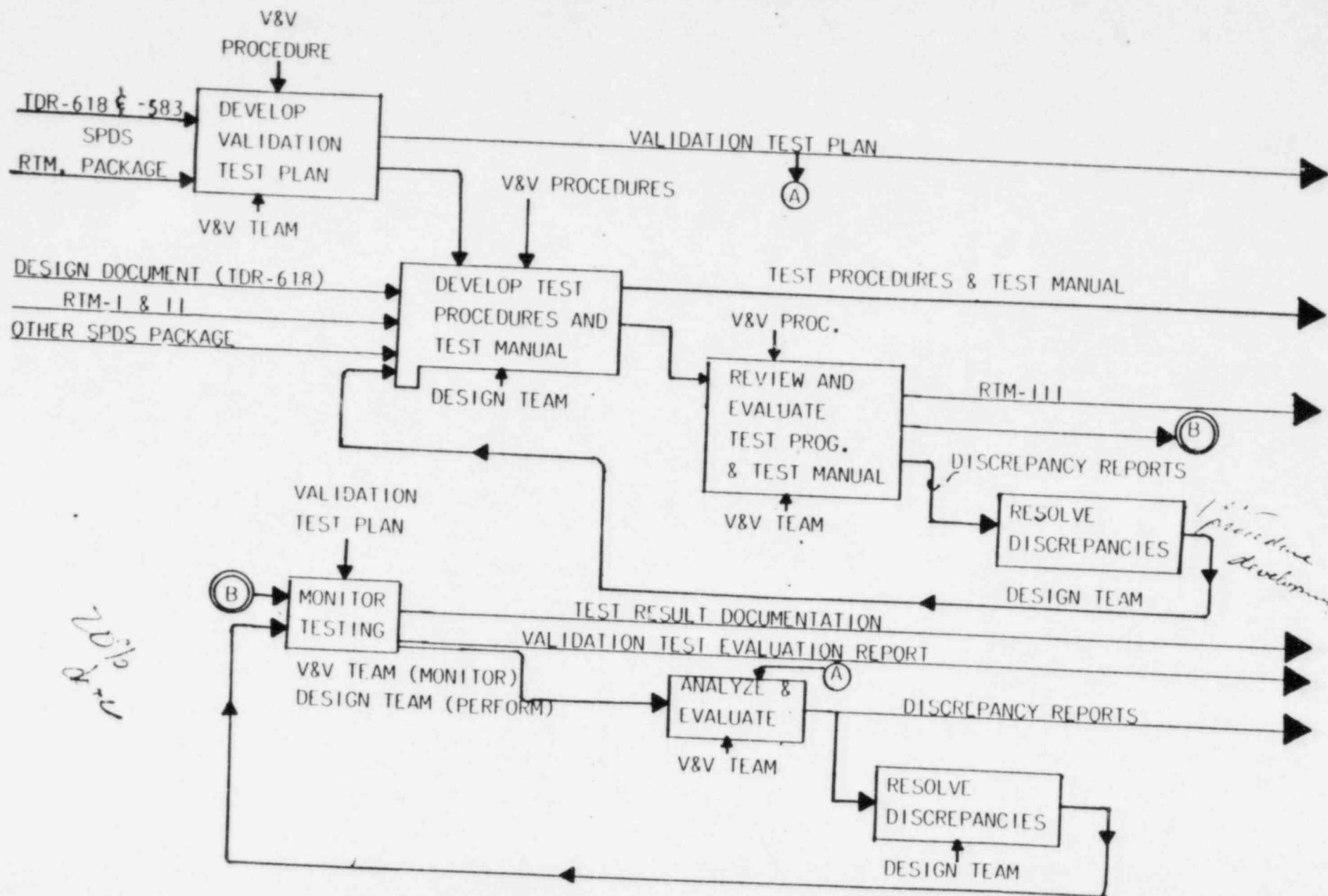
### o OVERVIEW OF VALIDATION TEST ACTIVITIES

1. PREP. VALIDATION TEST PLAN (GPU V&V TEAM)
2. PREP. TEST PROCEDURES & TEST MANUAL (GPU DESIGN TEAM)
3. UPDATE TEST PROC. & TEST MANUAL REFERENCE TO RTM-III AND TEST PLAN (GPU V&V TEAM)
4. PERFORM (GPU DESIGN TEAM) AND MONITOR (GPU V&V TEAM) VALIDATION TESTING
5. PREP. VALIDATION TEST EVALUATION REPORT (GPU V&V TEAM)

### o SOURCE MATERIALS

- o COMPLETED SPDS PACKAGE (CODE, DESIGN DOC. AND ANY DOCUMENTED DESIGN UPDATES)
- o RESULTS OF REQUIREMENTS VERIFICATION
- o RESULTS OF DESIGN VERIFICATION

# VALIDATION TEST AND ANALYSIS (GPUN)



## CURRENT V&V PROGRAM STATUS

### ITEM DESCRIPTIONS

### STATUS

- o V&V PROCEDURES
  - o DRAFT BY SAIC (10/22/84)
  - o ISSUED BY GPU (8/8/85)
- o VALIDATION TEST PLAN
  - o DRAFT BY SAIC (3/29/85)
  - o ISSUED BY GPU (8/8/85)
- o SYSTEM REQUIREMENTS VERIFICATION
  - o COMPLETED BY SAIC (3/29/85)
  - o REQ'T VERIFICATION REPORT (3/29/85)
  - o RTM-I (3/29/85)
  - o 29 V&V COMMENTS ISSUED AND RESPONDED
  - o 2 DISCREPANCY REPORTS ISSUED
  - o CONCLUSION:  
REQ'T DOCUMENTS (TR-18, AND TDR-583)  
DEFINE THE SPDS SOFTWARE REQUIREMENTS
- o DESIGN VERIFICATION
  - o DESIGN VERIFICATION REPORT (DRAFT)
  - o RTM-III COMPLETED SUBJECT TO  
RESOLUTION OF DISCREPANCY REPORTS
  - o 36 COMMENTS WERE ISSUED AND  
RESPONDED
  - o 9 DISCREPANCY REPORTS WERE ISSUED
- o VALIDATION TEST
  - o TEST PROCEDURES (DRAFT) AND TEST  
MANUAL (DRAFT) WERE REVIEWED AND  
COMMENTS WERE ISSUED
  - o REVISED TEST PROCEDURES BEING  
REVIEWED & COMMENTED
  - o 16 TESTS HAVE BEEN PERFORMED
  - o RTM-III BEING ADDED