

ATTACHMENT # 5

FUNCTIONAL DESIGN SPECIFICATION
FOR THE
QUALIFIED SAFETY PARAMETER DISPLAY SYSTEM
DISPLAYS
FOR
TURKEY POINT, UNITS 3 & 4

QA Status: Verified

The safety related design information contained in this document has been reviewed and satisfies (where applicable) the items contained on check-list(s) 2, and of the Quality Assurance of Design Manual. This review is so certified.

Independent Reviewer B. L. Mathies

Date 2/11/83

FUNCTIONAL DESIGN SPECIFICATION NUMBER 16081-ICE-3220, REVISION 00

Nuclear Power Systems
COMBUSTION ENGINEERING, INC.
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Issue Date 2/15/83

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8303160304 830310
PDR ADOCK 05000250
PDR



RECORD OF REVISIONS

NUMBER	DATE	PAGES INVOLVED	PREPARED BY	REVIEWED BY	APPROVALS
00	2/15/83	A11	G.W.Starkweather	B. L. Mathies	K. R. Rohde J. L. Pucak T. P. Gates



ABSTRACT

This document describes the display design for the Qualified Safety Parameter Display System for Turkey Point, Units 3 and 4. This document has been quality assured according to the QADP, Revision 16.

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REFERENCES

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2. G. W. Starkweather, "Data Base Description for the Qualified Safety Parameter Display System for Turkey Point, Units 3 and 4," 16081-ICE-3219, Rev. 00, January 13, 1983.
3. G. W. Starkweather, "A Functional Design Description for the Qualified Safety Parameter Display System for Turkey Point, Units 3 and 4," 16081-ICE-3218, Rev. 00, October 6, 1982.
4. K. S. Khalsa, "A Functional Design Specification for the QSPDS Display," NPROD-ICE-3202, Rev. 00, February 11, 1982.



DISPLAY PAGES
TURKEY POINT, UNIT 3



448 28

384 24

320 20

256 16

192 12

128 8

64 4

0 0

DISPLAY DIRECTORY

100 DISPLAY DIRECTORY

101 CORE SUMMARY

211 SATURATION MARGIN

311 RCS SATURATION MARGIN

212 REACTOR VESSEL LEVEL

321 HJTC TEMPERATURES

213 CORE EXIT THERMOCOUPLES

331 CORE MAP

102 DIAGNOSTICS

XXXXXXXXXX
XXXXXXXXXX
XXXXXXXXXX

SAT

211

RVL

212

CET

213

SYSTEM ERR



CORE SUMMARY

10

Functional Design Specification No. 16081-ICE-3220, Rev. 00 , Page 8 of 44

448 28

384 24

320 20

256 16

192 12

128 8

64 4

0 0

CORE HEAT REMOVAL CONTROL

RCS/UPPER IID SATURATION MAR 1 0000 DEG F XXXXXXXXXX

CET SATURATION MARGIN 1 0000 DEG F XXXXXXXXXX

REACTOR VESSEL LEVEL 2
HEAD 0000 %
PLENUM 0000 %

REPRESENTATIVE CET TEMP 3 0000 DEG F

XXXXXXXXXX
XXXXXXXXXX
XXXXXXXXXX

SAT 211

RVL 212

CET 213

SYSTEM ERR

SUBCOOLED
OR
SUPERHEAT

TP-3 Channel A

0 8 16 24 32 40 48 56 64
100 120 140 160 180 200 220 240 260 280 300 320 340 360 380 400 420 440 460 480 500 520 540 560 580 600 620 640



448 28

SATURATION MARGIN

384 24

UPPER HEAD

DEG F

PSI

RCS (MIN) 1

CET

320 20

INPUTS

256 16

UPPER HEAD TEMP

HOT LEG A TEMP

HOT LEG B TEMP

HOT LEG C TEMP

192 12

COLD LEG A TEMP

COLD LEG B TEMP

COLD LEG C TEMP

128 8

REPRESENTATIVE CET TEMP

COOLANT SYSTEM PRESSURE

64 4

XXXXXXXXXX
XXXXXXXXXX
XXXXXXXXXX

SAT 211

RVL 212

CET 213

SYSTEM ERR

0 0

0

8

16

24

32

40

48

56

64

128

192

256

320

384

448

512

SATURATION MARGIN

21

"XXXXXXXXXX" means "subcooled" or "superheated"

TP-3 Channel A



448 28

RCS SATURATION MARGIN

DEG F

PSI

RCS (MIN)

0000

XXXXXXXXXX

0000

XXXXXXXXXX

384 24

LOOP A

0000

XXXXXXXXXX

0000

XXXXXXXXXX

LOOP B

0000

XXXXXXXXXX

0000

XXXXXXXXXX

LOOP C

0000

XXXXXXXXXX

0000

XXXXXXXXXX

320 20

INPUTS

256 16

HOT LEG A TEMP

0000

DEG F

HOT LEG B TEMP

0000

DEG F

HOT LEG C TEMP

0000

DEG F

192 12

COLD LEG A TEMP

0000

DEG F

COLD LEG B TEMP

0000

DEG F

COLD LEG C TEMP

0000

DEG F

128 8

COOLANT SYSTEM PRESSURE

0000

PSIG

64 4

XXXXXXXXXX
XXXXXXXXXX
XXXXXXXXXX

SAT 211

RVL 212

CET 213

SYSTEM ERR

0 0

16

24

32

40

48

56

64

"XXXXXXXXXX" = "SUPERHEAT" or "SUBCOOLED"

TP-3 Channel A



448 28

384 24

320 20

256 16

192 12

128 8

64 4

0 0

REACTOR VESSEL LEVEL

21

RVL SENSOR INDICATION

UNHEATED T/C 1

TOP OF HEAD

HEAD

VOID

0000 DEG F

0000 DEG F

UGSSP

PLENUM

0000 DEG F

0000 DEG F

0000 DEG F

0000 DEG F

0000 DEG F

0000 DEG F

FUEL ALIGN PLATE

CORE

REACTOR VESSEL LEVEL

HEAD

0000 %

PLENUM

0000 %

XXXXXXXXXX
XXXXXXXXXX
XXXXXXXXXX

SAT Z11

RVL Z12

CET Z13

SYSTEM ERR



448 28

384 24

320 20

256 16

192 12

128 8

64 4

0 0

H J T C T E M P E R A T U R E S

32

HJTC TEMPERATURES (DEG F)

UNHEATED

HEATED

DIFFERENTIAL

1	0000	0000	±0000
2	0000	0000	±0000
3	0000	0000	±0000
4	0000	0000	±0000
5	0000	0000	±0000
6	0000	0000	±0000
7	0000	0000	±0000
8	0000	0000	±0000

HEATER CONTROL SIGNAL 1	0000 %	FULL POWER
HEATER CONTROL SIGNAL 2	0000 %	FULL POWER

REACTOR VESSEL LEVEL

HEAD	0000 %
PLENUM	0000 %

XXXXXX
XXXXXX
XXXXXX

SAT 211

RVL 212

CET 213

SYSTEM ERR

TP-3 Channel A

8

16

24

32

40

48

56

64

768

170

384

448

512



448 28

384 24

320 20

256 16

192 12

128 8

64 4

0 0

CORE EXIT T/C TEMP 1

REPRESENTATIVE CET TEMP

0000 DEG F

CET SATURATION MARGIN

0000 DEG F

XXXXXXXXXX

HIGHEST VALID T/C TEMPERATURES

QUAD

ID

HIGHEST TEMP

ID

NEXT HI TEMP

1

XX

0000 DEG F

XX

0000 DEG F

2

XX

0000 DEG F

XX

0000 DEG F

3

XX

0000 DEG F

XX

0000 DEG F

4

XX

0000 DEG F

XX

0000 DEG F

XXXXXXXXXX
XXXXXXXXXX
XXXXXXXXXX

SAT 211

RVL 212

CET 213

SYSTEM EAR

SUBCOOLED
OR
SUPERHEAT

TP-3 Channel A

212

0 8 16 24 32 40 48 56 64
0 384 448 512



448 28

384 24

320 20

256 16

192 12

128 8

64 4

0 0

QUADRANT 1

CET TEMP

1	P7	0000
2	N10	0000
3	N8	0000
4	L6	0000
5	K8	0000

QUAD 4

QUADRANT 4

CET TEMP

1	L14	0000
2	L12	0000
3	J12	0000
4	J10	0000
5	H11	0000
6	G15	0000
7	F13	0000
8	F11	0000

XXXXXXXXXX
XXXXXXXXXX
XXXXXXXXXX

SAT 211

RVL 212

CET 213

SYSTEM ERR

C O M A P

3

QUADRANT 2

CET TEMP

1	M3	0000
2	H5	0000
3	H3	0000
4	G2	0000
5	E4	0000
6	D3	0000

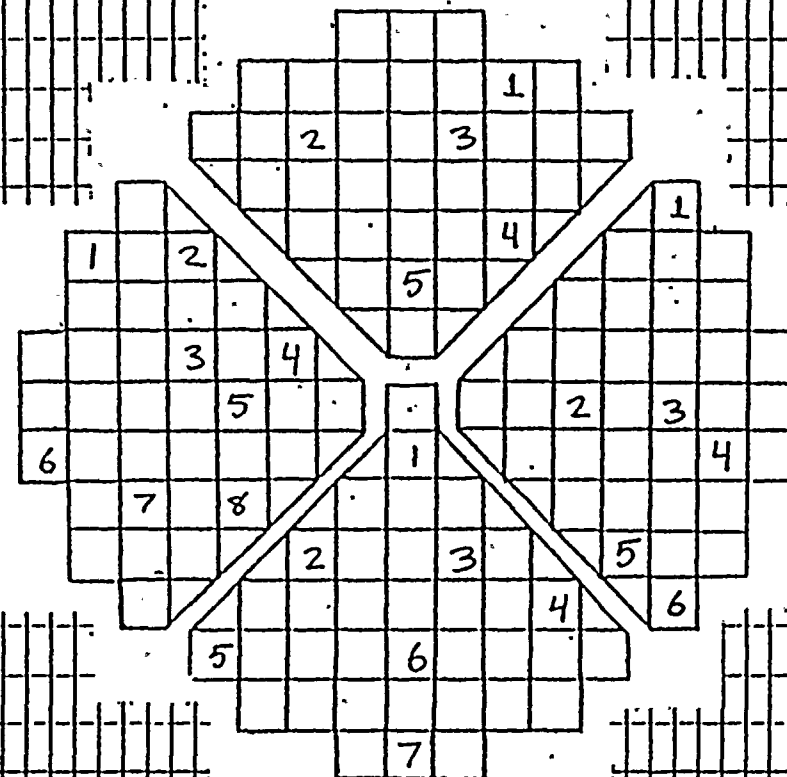
QUAD 2

QUADRANT 3

CET TEMP

1	G8	0000
2	E10	0000
3	E7	0000
4	D5	0000
5	C12	0000
6	C8	0000
7	A8	0000

IF-3 Channel A



QUAD 1

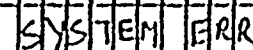
QUAD 3



105

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TP-3 Channel A



34

51

448 28

384 24

320 20

256 16

192 12

128 8

64 4

0 0

D I S P L A Y D I R E C T O R Y

100 DISPLAY DIRECTORY

101 CORE SUMMARY

211 SATURATION MARGIN

311 RCS SATURATION MARGIN

212 REACTOR VESSEL LEVEL

321 HJTIC TEMPERATURES

213 CORE EXIT THERMOCOUPLES

331 CORE MAP

102 DIAGNOSTICS

XXXXXXXXXX
XXXXXXXXXX
XXXXXXXXXX

SAT 211

RVL 212

CGT 213

SYSTEM ERR



448 28

384 24

320 20

256 16

192 12

128 8

64 4

0 0

C O R E M I N A R Y

101

CORE HEAT REMOVAL CONTROL

RCS/UPPER HD SATURATION MAR 1 0000 DEG F XXXXXXXXXX

CET SATURATION MARGIN 1 0000 DEG F XXXXXXXXXX

REACTOR VESSEL LEVEL 2

HEAD

0000 %

PLENUM

0000 %

REPRESENTATIVE CET TEMP 3 0000 DEG F

XXXXXX
XXXXXX
XXXXXX

SAT 211

RVL 212

CET 213

SYSTEM ERR

SUBCOOLED
OR
SUPERHEAT

TP-3 Channel B

8
128

16
128

24
128

32
756

40
370

48
384

56
448

64
512



448 28

384 24

320 20

256 16

192 12

128 8

64 4

0 0

SATURATION MARGIN																21
SATURATION MARGIN																
DEG F																FSI
UPPER HEAD																0000 XXXXXXXXXXXX
RCS (MIN) 1																0000 XXXXXXXXXXXX
CET																0000 XXXXXXXXXXXX
INPUTS																
UPPER HEAD TEMP																0000 DEG F
HOT LEG A TEMP																0000 DEG F
HOT LEG B TEMP																0000 DEG F
HOT LEG C TEMP																0000 DEG F
COLD LEG A TEMP																0000 DEG F
COLD LEG B TEMP																0000 DEG F
COLD LEG C TEMP																0000 DEG F
REPRESENTATIVE CET TEMP																0000 DEG F
COOLANT SYSTEM PRESSURE																0000 PSIG

"XXXXXXXXXX" means "subcooled" or "superheat" TP-3 Channel B

64 512

64 4

"XXXXXXXX" = "SUPERSEAT" or "SUBSCHOLED" TP-3 Channel B



448 28

384 24

320 20

256 16

192 12

128 8

64 4

0 0

REACTOR VESSEL LEVEL

2

RVL SENSOR INDICATION

UNHEATED T/C 1

TOP OF HEAD

VOID

HEAD

UGSSP

PLENUM

FUEL ALIGN PLATE

CORE

REACTOR VESSEL LEVEL

HEAD

PLENUM

0000 %

0000 %

SAT 211

RVL 212

CET 213

SYSTEM ERR



448 28

384 24

320 20

256 16

192 12

128 8

64 4

0 0

H J T C T E M P E R A T U R E S

321

HJTC TEMPERATURES (DEG F)

UNHEATED

HEATED

DIFFERENTIAL

1

0000

0000

±0000

2

0000

0000

±0000

3

0000

0000

±0000

4

0000

0000

±0000

5

0000

0000

±0000

6

0000

0000

±0000

7

0000

0000

±0000

8

0000

0000

±0000

HEATER CONTROL SIGNAL 1

0000 % FULL POWER

HEATER CONTROL SIGNAL 2

0000 % FULL POWER

REACTOR VESSEL LEVEL

HEAD

0000 %

PLENUM

0000 %

XXXXXXXXXX
XXXXXXXXXX
XXXXXXXXXX

SAT 211

RVL 212

CET 213

SYSTEM ERR

TF-3 Channel B

0 8 16 24 32 40 48 56 64

100

100

100

100

100

100

100



448 28
384 24
320 20
256 16
192 12
128 8
64 4
0 0

CORE EXIT THERMOCOUPLES																2			
CORE EXIT T/C TEMP 1																			
REPRESENTATIVE CET TEMP												0000				DEG F			
CET SATURATION MARGIN												0000				DEG F		XXXXXXXXXX	
HIGHEST VALID T/C TEMPERATURES																			
QUAD		ID		HIGHEST TEMP				ID		NEXT HI TEMP									
1		XX		0000 DEG F				XX		0000 DEG F									
2		XX		0000 DEG F				XX		0000 DEG F									
3		XX		0000 DEG F				XX		0000 DEG F									
4		XX		0000 DEG F				XX		0000 DEG F									
XXXXXXXXXX				SAT 211				RVL 212				CET 213				SYSTEM ERR			
XXXXXXXXXX																			
XXXXXXXXXX																			

SUBCOOLED
OR
SUPERHEAT

TP-3 Channel B

512



448 28

384 24

320 20

256 16

192 12

128 8

64 4

0 0

QUADRANT 1

CET TEMP

1	R7	0000
2	P8	0000
3	N6	0000
4	N4	0000
5	M11	0000
6	M9	0000
7	L8	0000

QUAD 4

QUADRANT 4

CET TEMP

1	K11	0000
2	H15	0000
3	H13	0000
4	H9	0000
5	E14	0000
6	E12	0000

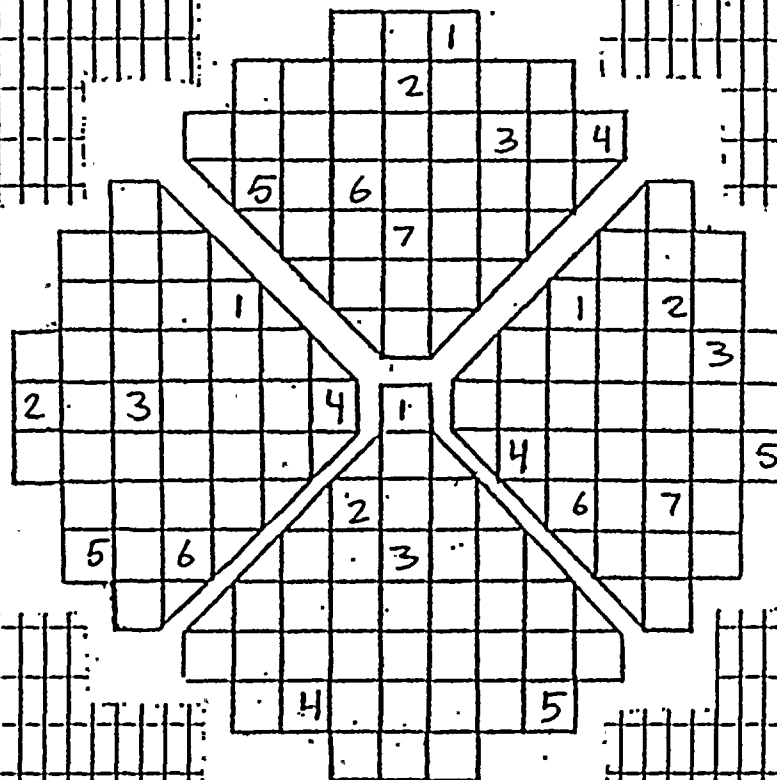
XXXXXXXXXX
XXXXXXXXXX
XXXXXXXXXX

SAT

C O E M A P

NORTH

QUAD 1



QUAD 3

QUADRANT 2

CET TEMP

1	K5	0000
2	K3	0000
3	J2	0000
4	G6	0000
5	G1	0000
6	F5	0000
7	F3	0000

QUAD 2

QUADRANT 3

CET TEMP

1	H8	0000
2	F9	0000
3	E8	0000
4	B10	0000
5	B5	0000

SYSTEM ERR

16

24

32

40

48

56

64

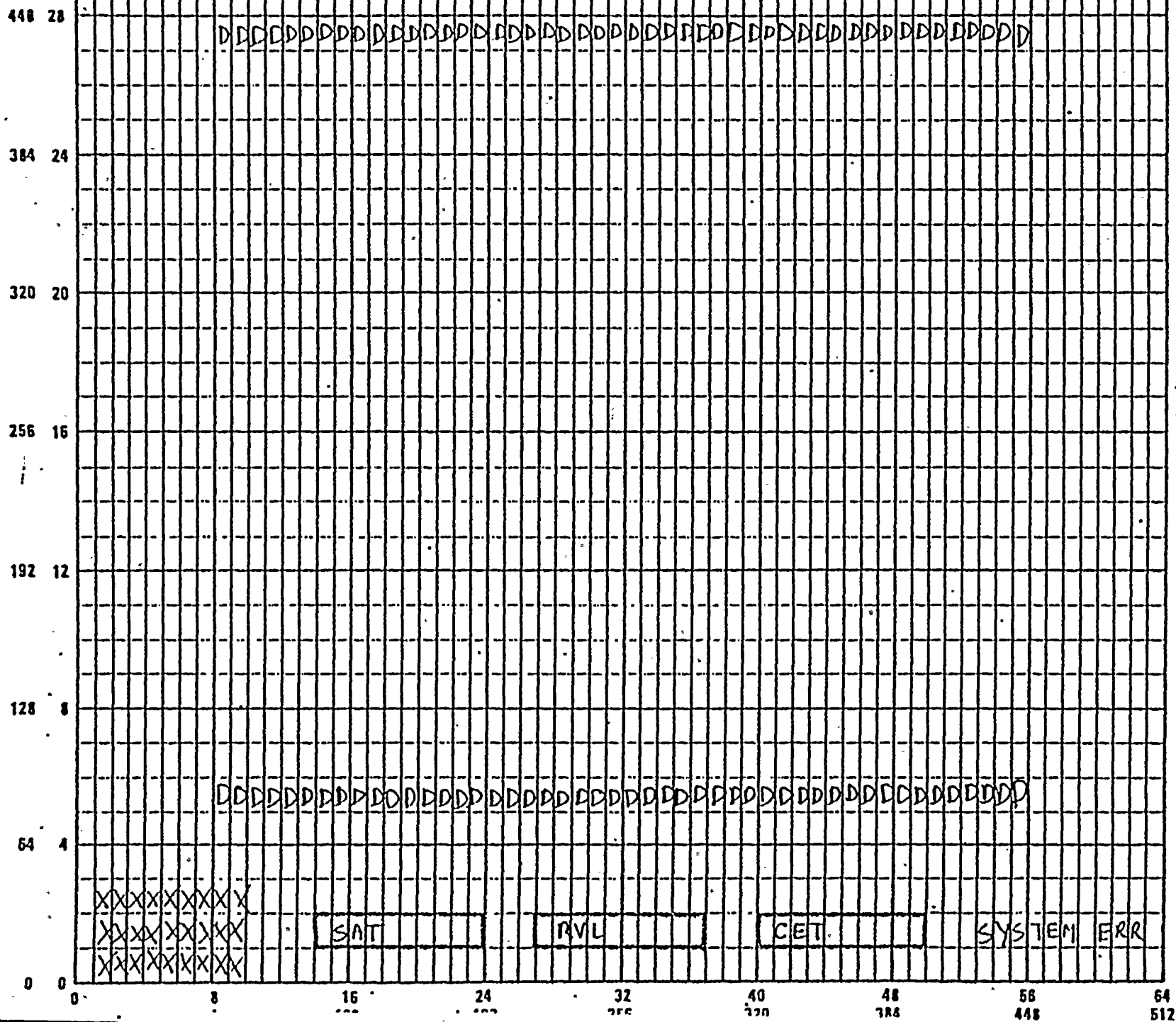
512



11

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TP-3 Channel B





DISPLAY PAGES
TURKEY POINT, UNIT 4



TP-4

Functional Design Specification No. 16081-ICE-3220, Rev. 00

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448 28

384 24

320 20

256 16

192 12

128 8

64 4

0 0

D I S P L A Y D I R E C T O R Y

100 DISPLAY DIRECTORY

101 CORE SUMMARY

211 SATURATION MARGIN

311 RCS SATURATION MARGIN

212 REACTOR VESSEL LEVEL

321 HJTC TEMPERATURES

213 CORE EXIT THERMOCOUPLES

331 CORE MAP

102 DIAGNOSTICS

XXXXXXXXXX
XXXXXXXXXX
XXXXXXXXXX

SAT 211

RVL 212

CET 213

SYSTEM ERR

16

24

32

40

48

56

64

TP-4 Channel A



CORE SUMMARY

101

Functional Design Specification No. 16081-ICE-3220, Rev. 00

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448 28
384 24
320 20
256 16
192 12
128 8
64 4
0 0

CORE HEAT REMOVAL CONTROL										
RCS/UPPER HD SATURATION MAR 1					0000	DEG F	XXXXXXXXXX			
CET SATURATION MARGIN 1					0000	DEG F	XXXXXXXXXX			
REACTOR VESSEL LEVEL 2										
HEAD					0000	%				
PLENUM					0000	%				
REPRESENTATIVE CET TEMP 3					0000	DEG F				

XXXXXXXXXX
XXXXXXXXXX
XXXXXXXXXX

SAT 211

RVL 212

CET 213

SYSTEM ERR

SUBCOOLED
OR
SUPERHEAT
TP-4 Channel A

16 24 32 40 48 56 64
107 175 270 384 448 512



448 28

384 24

320 20

256 16

192 12

128 8

64 4

0 0

SATURATION MARGIN

2

SATURATION MARGIN

DEG F

PSI

UPPER HEAD

0000

XXXXXXXXXX

0000

XXXXXXXXXX

RCS (MIN) 1

0000

XXXXXXXXXX

0000

XXXXXXXXXX

CET

0000

XXXXXXXXXX

0000

XXXXXXXXXX

INPUTS

UPPER HEAD TEMP

0000

DEG F

HOT LEG A TEMP

0000

DEG F

HOT LEG B TEMP

0000

DEG F

HOT LEG C TEMP

0000

DEG F

COLD LEG A TEMP

0000

DEG F

COLD LEG B TEMP

0000

DEG F

COLD LEG C TEMP

0000

DEG F

REPRESENTATIVE CET TEMP

0000

DEG F

COOLANT SYSTEM PRESSURE

0000

PSIG

XXXXXXXXXX
XXXXXXXXXX
XXXXXXXXXX

SAT 211

RVL 212

CET 213

SYSTEM ERR

"XXXXXXXXXX" means "subcooled" or "superheat" IP-4 Channel A

16

24

32

40

48

56

64

176

208

240

272

304

336

416



448 28

RCS SATURATION MARGIN

384 24

	DEG F	PSI
RCS (MIN)	0000 XXXXXXXXXXXX	0000 XXXXXXXXXXXX
LOOP A	0000 XXXXXXXXXXXX	0000 XXXXXXXXXXXX
LOOP B	0000 XXXXXXXXXXXX	0000 XXXXXXXXXXXX
LOOP C	0000 XXXXXXXXXXXX	0000 XXXXXXXXXXXX

320 20

INPUTS

256 16

HOT LEG A TEMP	0000 DEG F
HOT LEG B TEMP	0000 DEG F
HOT LEG C TEMP	0000 DEG F

192 12

COLD LEG A TEMP	0000 DEG F
COLD LEG B TEMP	0000 DEG F
COLD LEG C TEMP	0000 DEG F

128 8

COOLANT SYSTEM PRESSURE	0000 PSIG
-------------------------	-----------

64 4

XXXXXXXXXX
XXXXXXXXXX
XXXXXXXXXX

SAT

211

RVL

212

CET

213

SYSTEM ERR

0 0

16

24

32

40

48

56

64

"XXXXXXXXXX" = "SUPERHEAT" or "SUBCOOLED" TP-4 Channel A



448 28

384 24

320 20

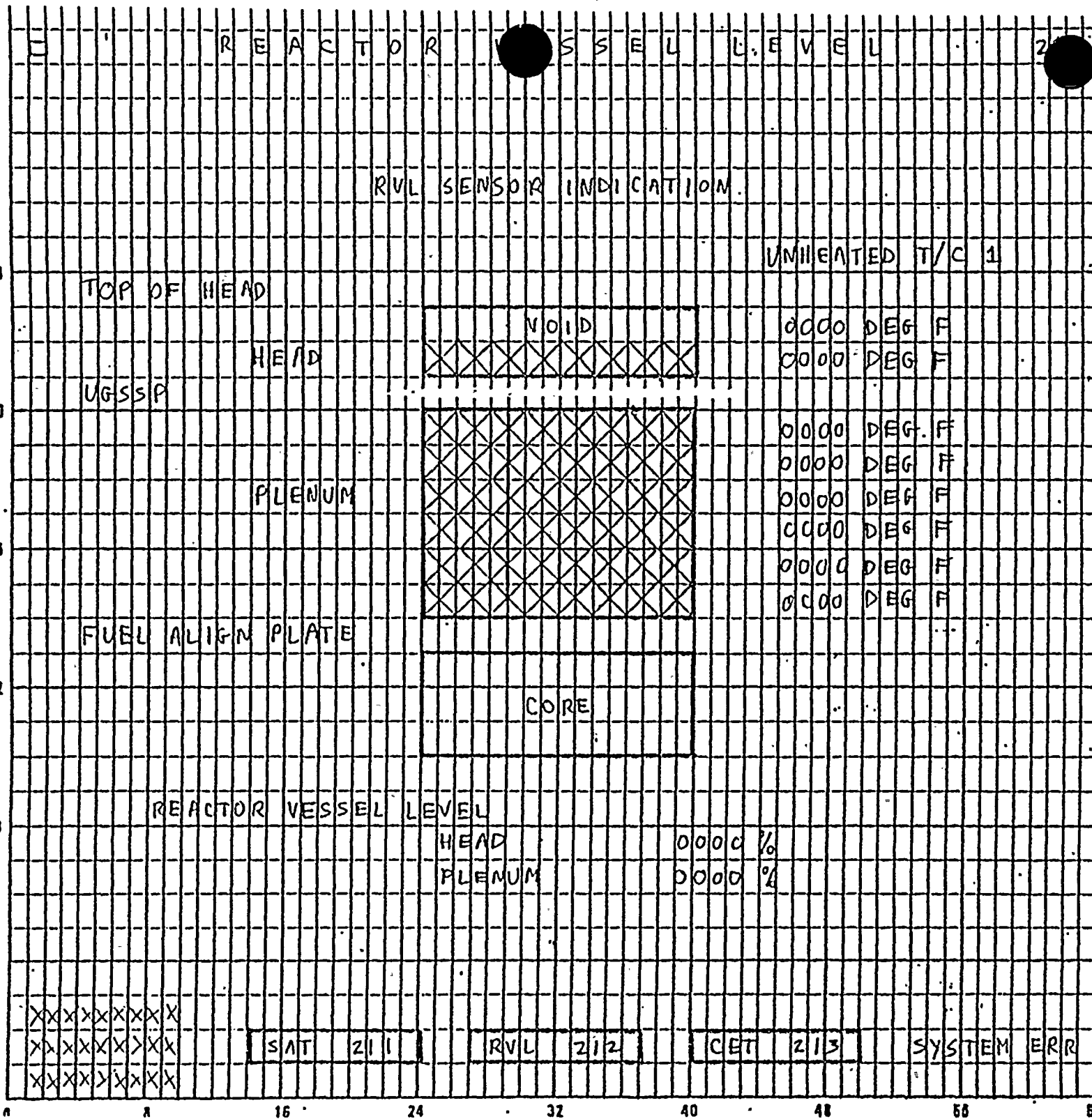
256 16

192 12

128 8

64 4

0 0





448 28

384 24

320 20

256 16

192 12

128 8

64 4

0 0

H J T C T E M P E R A T U R E S

32

HJTC TEMPERATURES (DEG F)

UNHEATED

HEATED

DIFFERENTIAL

1	0000	0000	±0000
2	0000	0000	±0000
3	0000	0000	±0000
4	0000	0000	±0000
5	0000	0000	±0000
6	0000	0000	±0000
7	0000	0000	±0000
8	0000	0000	±0000

HEATER CONTROL SIGNAL 1	0000	%	FULL POWER
HEATER CONTROL SIGNAL 2	0000	%	FULL POWER

REACTOR VESSEL LEVEL

HEAD	0000	%
PLENUM	0000	%

XXXXXXXXXX
XXXXXXXXXX
XXXXXXXXXX

SAT 211

RVL 212

CET 213

SYSTEM ERR

TP-4 Channel A

0	8	16	24	32	40	48	56	64
0	28	112	184	256	328	400	472	544

448 28
384 24
320 20
256 16
192 12
128 8
64 4
0 0

CORE EXIT THERMOCOUPLES															
CORE EXIT T/C TEMP 1															
REPRESENTATIVE CET TEMP										0000 DEG F					
CET SATURATION MARGIN										0000 DEG F XXXXXXXX					
HIGHEST VALID T/C TEMPERATURES															
QUAD		ID		HIGHEST TEMP				ID		NEXT HI TEMP					
1		XX		0000 DEG F				XX		0000 DEG F					
2		XX		0000 DEG F				XX		0000 DEG F					
3		XX		0000 DEG F				XX		0000 DEG F					
4		XX		0000 DEG F				XX		0000 DEG F					
XXXXXX		SAT		211		RVL		212		CET		213		SYSTEM ERR	

SUBCOOLED
OR
SUPERHEAT

TP-4 Channel A

64
512



448 28

384 24

320 20

256 16

192 12

128 8

64 4

0 0

QUADRANT 1

CET TEMP

1	P7	0000
2	N11	0000
3	N10	0000
4	N8	0000
5	L6	0000
6	K8	0000

QUAD 4

QUADRANT 4

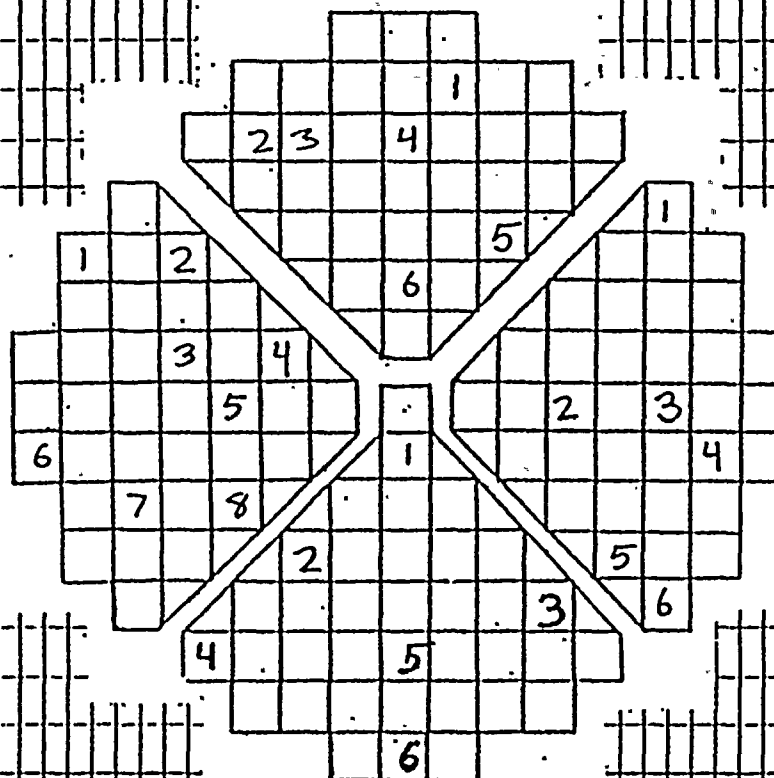
CET TEMP

1	L14	0000
2	L12	0000
3	J12	0000
4	J10	0000
5	H11	0000
6	G15	0000
7	F13	0000
8	F11	0000

XXXXXXXXXX
XXXXXXXXXX
XXXXXXXXXX

NORTH

QUAD 1



QUAD 3

QUADRANT 2

CET TEMP

1	M3	0000
2	H5	0000
3	H3	0000
4	G2	0000
5	E4	0000
6	D3	0000

QUAD 2

QUADRANT 3

CET TEMP

1	G8	0000
2	E10	0000
3	D5	0000
4	C12	0000
5	C8	0000
6	A8	0000

SAT 211

RVL 212

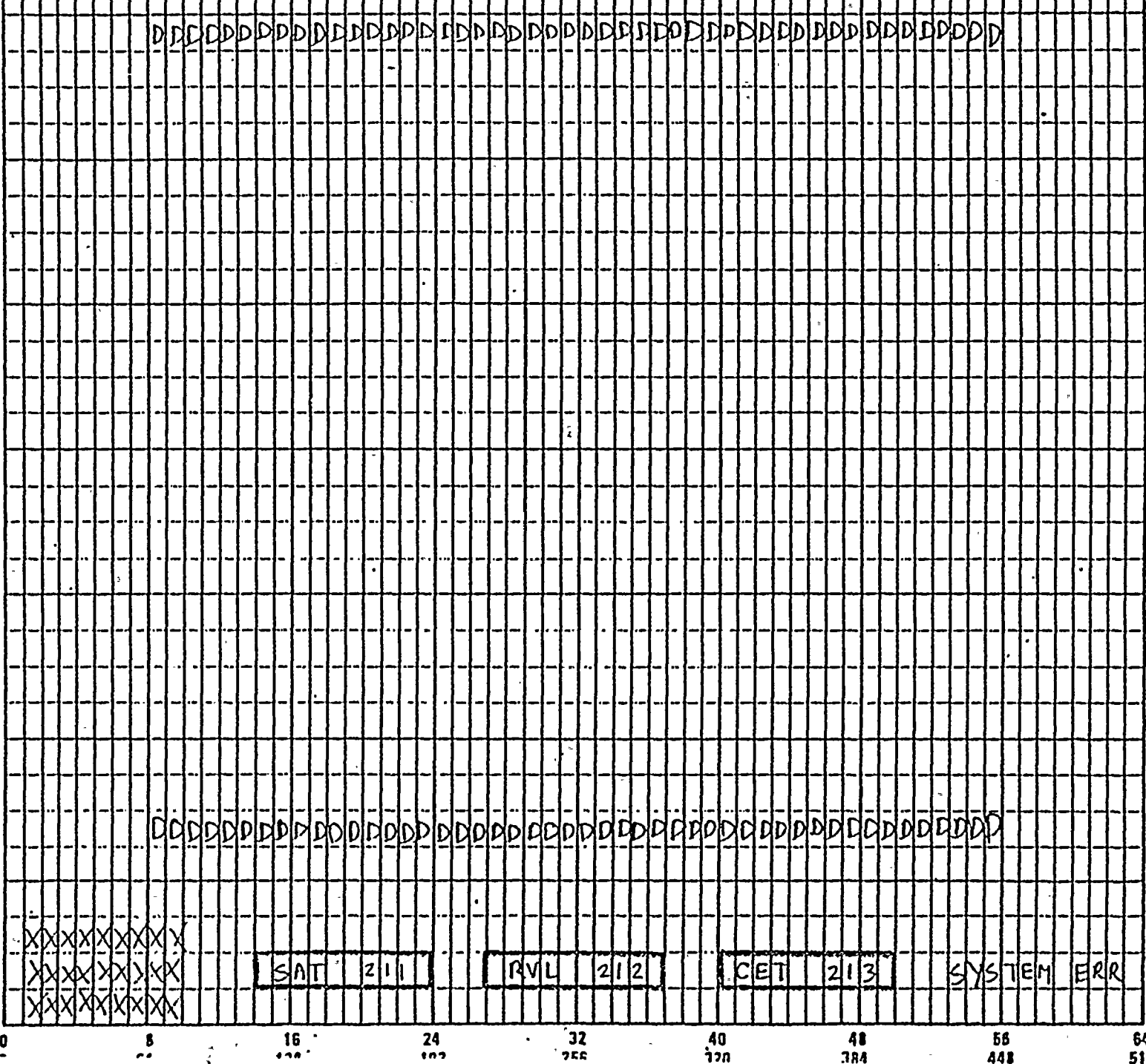
CET 213

SYSTEM ERR

11

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TP_{π4} Channel A





448 28

384 24

320 20

256 16

192 12

128 8

64 4

0 0

DISP L A DIRECTOR Y

100 DISPLAY DIRECTORY

101 CORE SUMMARY

211 SATURATION MARGIN

311 RCS SATURATION MARGIN

212 REACTOR VESSEL LEVEL

321 HIJTC TEMPERATURES

213 CORE EXIT THERMOCOUPLES

331 CORE MAP

102 DIAGNOSTICS

XXXXXXXXXX
XXXXXXXXXX
XXXXXXXXXX

SAT

211

RVL

212

CET

213

SYSTEM ERR



CORE SUMMARY

10

448 28

384 24

320 20

256 16

192 12

128 8

64 4

0 0

CORE HEAT REMOVAL CONTROL

RCS/UPPER HD SATURATION MAR 1

0000 DEG F XXXXXXXXXX

CET SATURATION MARGIN 1

0000 DEG F XXXXXXXXXX

REACTOR VESSEL LEVEL 2

HEAD

0000 %

PLENUM

0000 %

REPRESENTATIVE CET TEMP 3

0000 DEG F

XXXXXXXXXX
XXXXXXXXXX
XXXXXXXXXX

SAT 211

RVL 212

CET 213

SYSTEM ERR

SUBCOOLED
OR
SUPERHEAT

TP-4 Channel B

16

24

32

40

48

56

64

000

000

000

000

000

000

000

512



448 28

SATURATION MARGIN

DEG F

PSI

UPPER HEAD

0000

XXXXXXXXXX

0000

XXXXXXXXXX

384 24

RCS (MIN) 1

0000

XXXXXXXXXX

0000

XXXXXXXXXX

CET

0000

XXXXXXXXXX

0000

XXXXXXXXXX

320 20

INPUTS

UPPER HEAD TEMP

0000

DEG F

256 16

HOT LEG A TEMP

0000

DEG F

HOT LEG B TEMP

0000

DEG F

HOT LEG C TEMP

0000

DEG F

192 12

COLD LEG A TEMP

0000

DEG F

COLD LEG B TEMP

0000

DEG F

COLD LEG C TEMP

0000

DEG F

128 8

REPRESENTATIVE CET TEMP

0000

DEG F

COOLANT SYSTEM PRESSURE

0000

PSIG

64 4

XXXXXXXXXX
XXXXXXXXXX
XXXXXXXXXX

SAT 211

RVL 212

CET 213

SYSTEM ERR

0 0

0	8	16	24	32	40	48	56	64
000	000	000	000	000	000	000	000	000

"XXXXXXXXXX" means "subcooled" or "superheated"

TP-4 Channel B

448 28

RCS SATURATION MARGIN

384 24

	DEG F	PSI
RCS (MIN)	0000 XXXXXXXXXXXX	0000 XXXXXXXXXXXX
LOOP A	0000 XXXXXXXXXXXX	0000 XXXXXXXXXXXX
LOOP B	0000 XXXXXXXXXXXX	0000 XXXXXXXXXXXX
LOOP C	0000 XXXXXXXXXXXX	0000 XXXXXXXXXXXX

320 20

INPUTS

256 16

HOT LEG A TEMP	0000 DEG F
HOT LEG B TEMP	0000 DEG F
HOT LEG C TEMP	0000 DEG F

192 12

COLD LEG A TEMP	0000 DEG F
COLD LEG B TEMP	0000 DEG F
COLD LEG C TEMP	0000 DEG F

128 8

COOLANT SYSTEM PRESSURE	0000 PSIG
-------------------------	-----------

84 4

XXXXXXXXXX
XXXXXXXXXX
XXXXXXXXXX

SAT 211

RVL 212

CET 213

SYSTEM ERR

0 0

R

16

24

32

40

48

56

64

"XXXXXXXXXX" = "SUPERHEAT" or "SUBCOOLED"

TP-4 Channel B



448 28

384 24

320 20

256 16

192 12

128 8

64 4

0 0

R E A C T O R V E S S E L L E V E L

21

RVL SENSOR INDICATION

UNHEATED T/C 1

TOP OF HEAD

HEAD

UGSSP

PLENUM

FUEL ALIGN PLATE

VOID

CORE

REACTOR VESSEL LEVEL

HEAD

PLENUM

0000 DEG F

0000 DEG F

0000 DEG F

0000 DEG F

0000 DEG F

0000 DEG F

0000 DEG F

0000 DEG F

0000 %

0000 %

XXXXXXXXXX
XXXXXXXXXX
XXXXXXXXXX

SAT Z11

RVL Z12

CET Z13

SYSTEM ERR



448 28

384 24

320 20

256 16

192 12

128 8

64 4

0 0

H J T C T E M P E R A T U R E S

32

HJTC TEMPERATURES (DEG F)

UNHEATED

HEATED

DIFFERENTIAL

1	0000	0000	±0000
2	0000	0000	±0000
3	0000	0000	±0000
4	0000	0000	±0000
5	0000	0000	±0000
6	0000	0000	±0000
7	0000	0000	±0000
8	0000	0000	±0000

HEATER CONTROL SIGNAL 1 0000 % FULL POWER

HEATER CONTROL SIGNAL 2 0000 % FULL POWER

REACTOR VESSEL LEVEL

HEAD 0000 %

PLENUM 0000 %

XXXXXXXXXX
XXXXXXXXXX
XXXXXXXXXX

SNT 211

RVL 212

CET 213

SYSTEM ERR

TP-4 Channel B

8

16

24

32

40

48

56

64

160

320

480

640

800

960

1120

1280



448 28

CORE EXIT T/C TEMP 1

384 24

REPRESENTATIVE CET TEMP

0000 DEG F

320 20

CET SATURATION MARGIN

0000 DEG F

XXXXXXXXXX

256 16

HIGHEST VALID T/C TEMPERATURES

QUAD

ID

HIGHEST TEMP

ID

NEXT HI TEMP

192 12

1

XX

0000 DEG F

XX

0000 DEG F

2

XX

0000 DEG F

XX

0000 DEG F

3

XX

0000 DEG F

XX

0000 DEG F

128 8

4

XX

0000 DEG F

XX

0000 DEG F

64 4

XXXXXXXXXX

XXXXXXXXXX

XXXXXXXXXX

SAT 211

RVL 212

CET 213

SYSTEM ERR

0 0

8

16

24

32

40

48

56

64

0

8

16

24

32

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48

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0

8

16

24

32

40

48

56

64

0

8

16

24

448 28

384 24

320 20

256 16

192 12

128 8

64 4

0 0

QUADRANT 1

CET TEMP

1	R7	0000
2	P8	0000
3	N6	0000
4	N4	0000
5	M11	0000
6	M9	0000
7	L8	0000

QUAD 4

QUADRANT 4

CET TEMP

1	K11	0000
2	H15	0000
3	H13	0000
4	H9	0000
5	E14	0000
6	E12	0000

XXXXXXXXXX
XXXXXXXXXX
XXXXXXXXXX

SAT 211

RVL 212

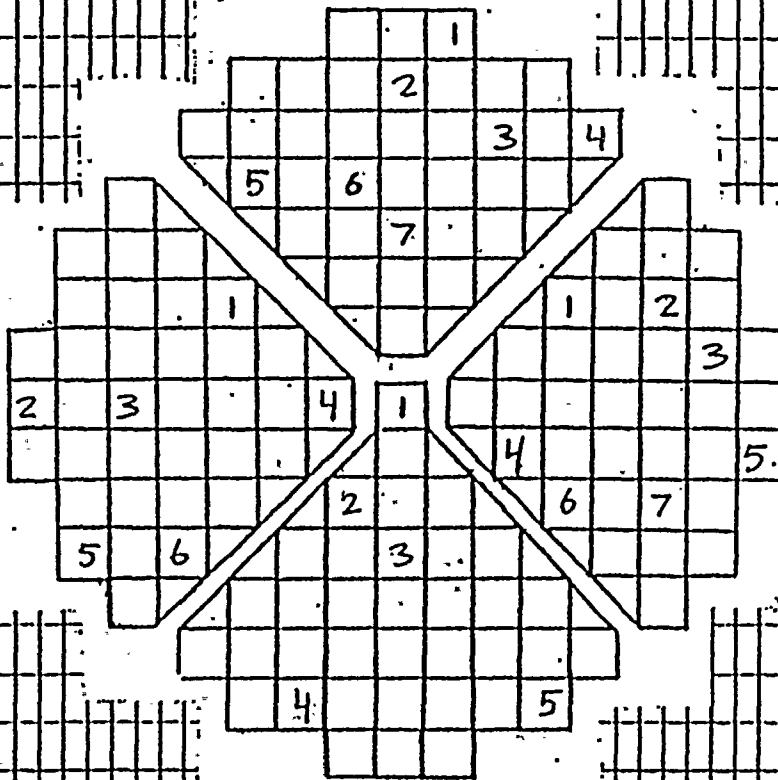
CET 213

SYSTEM ERR

C O E M A P

NORTH

QUAD 1



QUAD 3

QUADRANT 2

CET TEMP

1	K5	0000
2	K3	0000
3	J2	0000
4	G6	0000
5	G1	0000
6	F5	0000
7	F3	0000

QUAD 2

QUADRANT 3

CET TEMP

1	H8	0000
2	F9	0000
3	E8	0000
4	B10	0000
5	B5	0000

TP4 Channel B

3

512



105

TP-4 Channel B

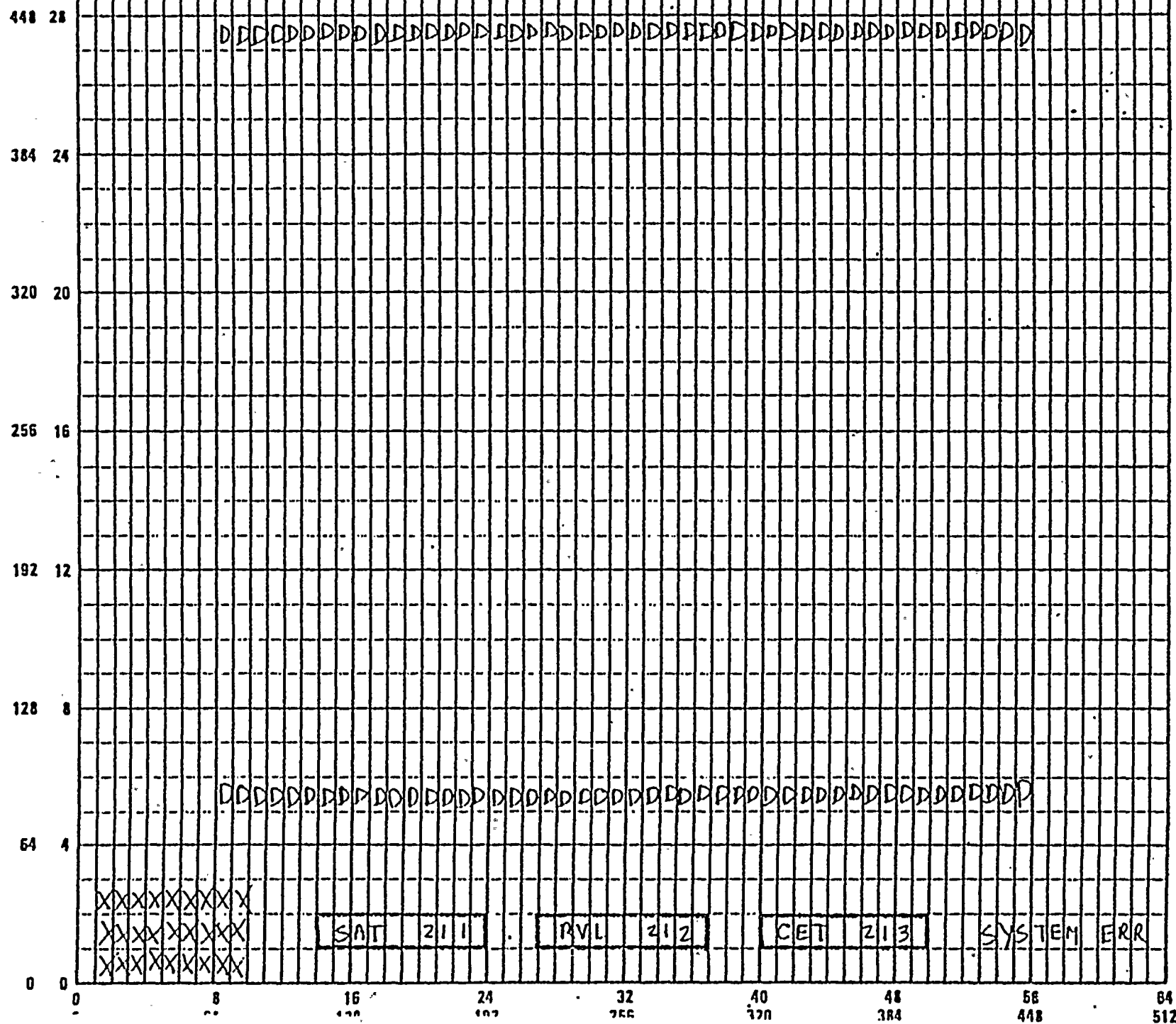




Figure 1 DISPLAY HIERARCHY

