HL-26993

POWER RANGE DETECTOR ASSEMBLIES

28-21 28-37 28-45 36-29 36-21 36-13 36-05 04-21 04-29 04-37 12-37 12-45 12-29 12-21 12-13 20-05 20-13 20-21 28-29 20-45 20-37 28-37 36-37 44-37 04-29 44-29 44-45 44-21 44-13

4 WAY CONNECTION J006

1 2 3 4 5 6 7 8 9 10 A | 1 2 3 4 5 6 7 8 9 10 B | 1 2 3 4 5 6 7 8 9 10 C | 1 2 3 4 5 6 7 8 9 10 D

TIP INDEXING MECHANISMS

TABLE 2 ASSIGNMENTS OF TIP INDEXING MECHANISM PORTS TO POWER RANGE DETECTOR ASMS

AVERAGE POWER RANGE MONITOR

TO RECORDERS R603 ZONES G5 – G14, SH 1

POWER LEVEL | ALARM LEVEL

LOCAL APRM DISPLAY 0–125% POWER OR FLOW ALSO AVAILABLE ON 2H11–P603

AVERAGE POWER RANGE OUTPUTS

TRIPS & ALARMS				
UPSCALE TRIP ON LEVEL	UPSCALE ALARM ON LEVEL	DOWNSCALE ALARM ON LEVEL	UPSCALE TRIP ON INST INOP	UPSCALE THERMAL TRIP
		OPRM TRIP		OPRM ALARM (CORE INSTABILITY DETECTED)
FLOW UPSCALE				

DETAIL D

LOCAL LPRM READOUT AVAILABLE ON THE APRM CONTAINING THE LPRM AMPLIFIER MODULE AND ON THE OPERATOR DISPLAY ASSY. ON 2H11–P603

LPRM AMPLIFIER OUTPUTS

TRIPS		
UPSCALE ALARM ON LEVEL	DOWNSCALE ALARM ON LEVEL	BYPASS

DETAIL C

LOCAL FLOW READOUT AVAILABLE ON THE APRM CONTAINING THE LPRM AMPLIFIER MODULE AND ON THE OPERATOR DISPLAY ASSY. ON 2H11–P603

FLOW OUTPUTS

NOTES
UPSCALE ALARM ON LEVEL INCLUDED IN APRM TRIPS AND ALARMS SEE DETAIL D ABOVE

DETAIL F

ROD BLOCK MONITOR

TO RECORDERS R603 C & D ZONES F–9 & 10, SH 1

POWER LEVEL | ALARM LEVEL

LOCAL RBM READOUT AVAILABLE ON LOCAL RBM DISPLAY 0–125% POWER

RBM OUTPUTS

TRIPS & ALARMS					
FLOW ALARM ON COMPARATOR	UPSCALE ALARM ON LEVEL, HI MED LOW	DOWNSCALE ALARM ON LEVEL	ALARM ON INST INOP	INOP ALARM	ROD INHIBIT

DETAIL E

INPUTS FROM 62 DETECTORS

LPRMS (DETAIL C)

SIG BYPASS | SIG BYPASS

SEE TABLE 1A FOR LPRM TO APRM ASSIGNMENTS

SIG BYPASS | SIG BYPASS

APRM CHANNEL A | APRM CHANNEL C

FROM 2B31N014A & 2B31N024A FLOW XMTRS

FROM 2B31N014C & 2B31N024C FLOW XMTRS

RMS

BYPASS CH 1, 2, 3 OR 4

FIBER–OPTIC

FIBER–OPTIC TO RBM A | FIBER–OPTIC TO RBM B | FIBER–OPTIC TO RBM A | FIBER–OPTIC TO RBM B

0 TO 1VDC TO RECIRC FLOW RECORDER 2B31–R614 2H11–P602

TO RBM B

EACH APRM'S APRM, LPRM AND FLOW SIGNALS ARE AVAILABLE OVER THE FIBER–OPTIC CABLE FROM EITHER RBM

CHANNEL 4 SCRAM TRIP ANY 2 OF 4 APRM TRIPS TRIP SYS "A" 1

CHANNEL 3 SCRAM TRIP ANY 2 OF 4 APRM TRIPS TRIP SYS "A" 2

REACTOR PROTECTION SYSTEM TRIP SYSTEM "A" (FOR POWER BUS ASSIGNMENTS SEE SHT 1)

POWER RANGE NEUTRON MONITORING

TABLE 1A

	APRM A	APRM C	LEVEL
12-45	X	X	A
			B
			C
			D
20-45	X	X	A
			B
			C
			D
28-45	X	X	A
			B
			C
			D
36-45 (NOTE 1)	X	X	A
			B
			C
			D
44-45	X	X	A
			B
			C
			D
04-37	X	X	A
			B
			C
			D
12-37	X	X	A
			B
			C
			D
20-37	X	X	A
			B
			C
			D
28-37	X	X	A
			B
			C
			D
36-37	X	X	A
			B
			C
			D
44-37	X	X	A
			B
			C
			D
04-29	X	X	A
			B
			C
			D
12-29	X	X	A
			B
			C
			D
20-29	X	X	A
			B
			C
			D
28-29	X	X	A
			B
			C
			D
36-29	X	X	A
			B
			C
			D
44-29	X	X	A
			B
			C
			D
04-21	X	X	A
			B
			C
			D
12-21	X	X	A
			B
			C
			D
20-21	X	X	A
			B
			C
			D
28-21	X	X	A
			B
			C
			D
36-21	X	X	A
			B
			C
			D
44-21	X	X	A
			B
			C
			D
12-13	X	X	A
			B
			C
			D
20-13	X	X	A
			B
			C
			D
28-13	X	X	A
			B
			C
			D
36-13	X	X	A
			B
			C
			D
44-13	X	X	A
			B
			C
			D
20-05	X	X	A
			B
			C
			D
28-05	X	X	A
			B
			C
			D
36-05	X	X	A
			B
			C
			D

"D" LEVEL | "C" LEVEL | "B" LEVEL | "A" LEVEL

POWER RANGE DETECTOR ASSEMBLY B11–D198 (TYP OF 31)

TRAVERSING IN–CORE PROBE N003

DUMMY TIP J010

BOTTOM OF VESSEL

TO LPRMS CARRYING SAME SUFFIX AS DETECTOR SEE TABLE 2

J008 GUIDE TUBE

J002 INDEXING MECHANISM

J004 VALVE ASM (GUIDE TUBE)

BALL VALVE

SHEAR VALVE

FLANGE J003

F3017

J005 CHAMBER SHIELD

TIP INSTRU–MENTATION J600

SHIELD WALL

J001

DRIVE MECHANISM

TIP PURGE EQUIPMENT

E001 DISPOSAL CASK

TIP CONTROL UNIT

VALVE CONTROL MONITOR

FLUX VERSUS POSITION RECORDER

X AXIS

Y AXIS

ICS

REACTOR MANUAL CONTROL SYSTEM ROD GROUP SELECT INPUTS TO RBM'S

SEE DETAIL E

LPRM SELECTIONS APRM A & C IN RBM A

LPRM SELECTIONS APRM B & D IN RBM B

EDGE ROD

RMS

BYPASS RBM CH A OR B

FROM APRM B | FROM APRM A | FROM APRM D | FROM APRM C

RBM CHANNEL A | RBM CHANNEL B

FIBER–OPTIC

RTAD TRA FORMATTERS

TO COMPUTERS

RBM CH A | RBM CH B

RBM BYPASS LAMPS

TABLE 1B

	LEVEL	APRM D	APRM B
12-45	A		
	B		
	C	X	
	D		X
20-45	A		
	B	X	
	C		
	D		X
28-45	A		
	B		X
	C		
	D		
36-45	A		
	B		X
	C		
	D	X	
44-45	A		
	B		
	C	X	
	D		X
04-37	A		X
	B		
	C	X	
	D		
12-37	A		
	B		X
	C	X	
	D		
20-37	A		
	B	X	
	C		X
	D		
28-37	A		
	B		X
	C		
	D		
36-37	A		
	B		X
	C	X	
	D		
44-37	A		X
	B		
	C	X	
	D		
04-29	A		
	B		X
	C		
	D		
12-29	A		X
	B		
	C		
	D		
20-29	A		
	B	X	
	C		
	D		
28-29	A		
	B		
	C	X	
	D		X
36-29	A		
	B		X
	C		
	D		
44-29	A		X
	B		
	C		
	D		
04-21	A		
	B	X	
	C		X
	D		
12-21	A	X	
	B		
	C		X
	D		
20-21	A		X
	B		
	C		
	D	X	
28-21	A		X
	B		
	C	X	
	D		
36-21	A		
	B	X	
	C		X
	D		
44-21	A	X	
	B		
	C		X
	D		
12-13	A		
	B	X	
	C	X	
	D		X
20-13	A	X	
	B		X
	C		
	D		
28-13	A	X	
	B		X
	C		
	D		
36-13	A		
	B		X
	C		
	D	X	
44-13	A		
	B		
	C	X	
	D		X
20-05	A		
	B	X	
	C		X
	D		
28-05	A	X	
	B		
	C	X	
	D		
36-05	A		X
	B		
	C		
	D	X	

VESSEL

APRM CHANNEL D	RBM CHANNEL A	APRM CHANNEL B	APRM CHANNEL C	APRM CHANNEL A
	RBM CHANNEL B			

ARRANGEMENT OF PANEL 2H11–P608

PRIMARY CONTAINMENT

INPUTS FROM 62 DETECTORS

LPRMS (DETAIL C)

BYPASS SIG | BYPASS SIG

SEE TABLE 1B FOR LPRM TO APRM ASSIGNMENTS

BYPASS SIG BYPASS SIG | BYPASS SIG

APRM CHANNEL B | APRM CHANNEL D

FROM 2B31N014B & 2B31N024B FLOW XMTRS

FROM 2B31N014D & 2B31N024D FLOW XMTRS

BYPASS INPUT

FIBER–OPTIC TO RBM B | FIBER–OPTIC TO RBM A | FIBER–OPTIC TO RBM A | FIBER–OPTIC TO RBM B

0 TO 1MA TO RECIRC FLOW FLOW METERS 2B31–R617 2B31–R613 2H11–P602

EACH APRM'S APRM, LPRM AND FLOW SIGNALS ARE AVAILABLE OVER THE FIBER–OPTIC CABLE FROM EITHER RBM

TO RBM A

CHANNEL 2 SCRAM TRIP ANY 2 OF 4 APRM TRIPS TRIP SYS "B" 1

CHANNEL 1 SCRAM TRIP ANY 2 OF 4 APRM TRIPS TRIP SYS "B" 2

REACTOR PROTECTION SYSTEM TRIP SYSTEM "B" (FOR POWER BUS ASSIGNMENTS SEE SHT 1)

TWINAXIAL PENETRATIONS TYPICAL

PURGE N'2 CONTROL CABINET

E–8 | R001 | 1/2" | F002 | F3020 | F3019 | F001 | 3/8"

PRIMARY CONTAINMENT

SHIELD WALL

FLANGE J003 | F3017

2C51–03 | 2123–01 | 2C51–03

F3016 | FLOW METER R752 | F3014 | F3015

N'2 ~PURGE PANEL J009 | R751 | F3013 | F3012 | F3011 | F3010

E–8

D–7 | F3004 | DRYER D001 | F3002 | F3003

DRYER D002 | F3009 | F3007 | F3008

REF.7(H–11) | INST. AIR PURGE | F3000 | FILTER D010 | F3001 | F3005 | F3006 | REF.8(H–3)

BOUNDARY DIAGRAM NO.:2T23–B01–15

FUNCTION(S) NO.: 2T23–01

PREPARED BY: FAROOK CHANDIWALA

DATE: 10–20–98

REVIEWED BY: LARRY ORR

DATE: 12–09–98

NOTES:

1. FOR NOTES AND REFERENCES SEE DRAWING H–26992.

LICENSE RENEWAL DOCUMENT

ACAD14 | HL26993

SOUTHERN COMPANY

LICENSE RENEWAL SCREENING FOR INFORMATION ONLY

EDWIN I. HATCH NUCLEAR PLANT UNIT No.2

NEUTRON MONITORING SYSTEM IED SHEET 2 OF 2

Revision: A | Date: 1–7–2000

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