

DRAWING NO.
PE-DG-392-506-E004

CONTROL LOGIC FOR 415V PMCC/MCC INCOMER, BUSCOUPLER & OUTGOING FEEDERS

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CUSTOMER'S DRAWING NO.

REV.	DATE	ALTD	CHD	APPD
03	15.12.14	MgS	AKR	SKG
LOGIC GENERALLY REVISED IN LINE WITH CUSTOMER COMMENTS DTD 25.11.14 & RESOLUTION DTD 04-12-2014				

RAJASTHAN RAJYA VIDYUT UTPADAN NIGAM LTD.

2 X 660 MW SUPER CRITICAL TPS, STAGE-V, UNITS #7 & 8 AT SURATGARH, RAJASTHAN.



TATA CONSULTING ENGINEERS LIMITED

MUMBAI

**2 X 660 MW SUPER CRITICAL TPS
(SURATGARH , STAGE-V, UNIT # 7 & 8)**

REV.	DATE	ALTD	CHD	APPD	REV.	DATE	ALTD	CHD	APPD
02	12.11.14	MgS	AKR	SKG	01	20.08.14	MgS	AK	SKG
LOGIC GENERALLY REVISED IN LINE WITH CUSTOMER COMMENTS DTD 24.09.14 & Resolution dated 22 & 23-09-2014					LOGIC GENERALLY REVISED IN LINE WITH CUSTOMER COMMENTS DTD 10.06.14				

JOB No.	392
STATUS	CONTRACT
DISTRIBUTION	
TO	
No.OFF	



BHARAT HEAVY ELECTRICALS LTD
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NOIDA

TITLE
**CONTROL LOGIC FOR 415V PMCC/MCC
INCOMER BUSCOUPLER & OUTGOING FEEDERS**

DEPT	DRN	NAME	SIGN	DATE
CODE	DSGN	MS	-SD-	15.05.14
E	CHD	AA	-SD-	15.05.14
	APPD	SKG	-SD-	15.05.14

DRAWING NO.	PE-DG-392-506-E004
SHEET	1 OF 30
REV.	03

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"*" Sheet no. 23 of R0 has been moved to sheet no. 25 of R1

'#' Name has been changed as mentioned above at S.no 11 & 12

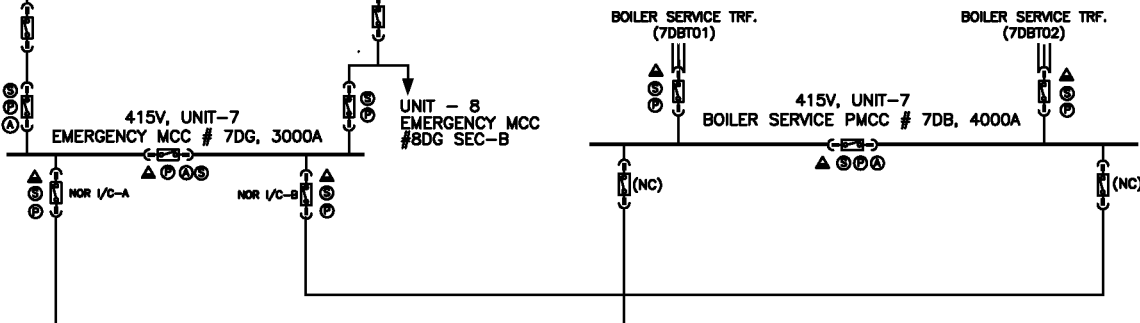


BHARAT HEAVY ELECTRICALS LTD.
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NOIDA, U.P.

**2X660MW SURATGARH
SUPERCritical TPS**

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**CONTROL LOGIC FOR 415V PMCC/MCC INCOMER,
BUSCOUPLER & OUTGOING FEEDERS**

DRAWING NO.
PE-DG-392-506-E004
SHEET 2 OF 30 REV. 03

DRAWING NO.
PE-DG-392-506-E004UNIT-7 DG
1750KVA, 0.8 PF,
415V,
3PH, 3W, 50Hz.STANDBY DG
1750KVA, 0.8 PF,
415V,
3PH, 3W, 50Hz.

LEGENDS:

- ▲ TWO OUT OF THREE CAN BE CLOSED (ELECTRICAL INTERLOCK)
- ⊙ SYNCHRONISING FACILITY
- ⊖ PLANNED CHANGEOVER FACILITY
- ⊕ AUTO-CHANGEOVER FACILITY

- ECP ELECTRICAL CONTROL PANEL
- DDCMIS DISTRIBUTED DIGITAL CONTROL, MONITORING & INFORMATION SYSTEM
- SMSS SYNC MODE SELECTOR SWITCH
- TSS TRIP SELECTOR SWITCH
- AMSS AUTO MANUAL SELECTOR SWITCH
- 51 IDMT OVERCURRENT PROTECTION
- 51N IDMT O/C EARTH FAULT PROTECTION
- 25C CHECK SYNC RELAY
- 25G GUARD RELAY
- 27 UNDERVOLTAGE RELAY
- 2 TIMER
- 87M BUS UNDERVOLTAGE RELAY
- 86 LOCKOUT RELAY
- K11 & K12 INERPOSING RELAY
- 52CS BREAKER CONTROL SWITCH
- 25SW CHECK SYNC FACILITY IN SWGR NUMERICAL RELAY
- S/R SS SWITCHGEAR/REMOTE SELECTOR SWITCH
- L/F/R SS LOCAL/FIELD/REMOTE SELECTOR SWITCH

NOTES: SPRING CHARGED I/L IS IN BUILT FEATURE OF BREAKER CLOSING

KEY DIAGRAM

BHARAT HEAVY ELECTRICALS LTD.
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NOIDA, U.P.

**2X660MW SURATGARH
SUPERCRITICAL TPS**

TITLE
**CONTROL LOGIC FOR 415V PMCC/MCC INCOMER,
BUSCOUPLER & OUTGOING FEEDERS**

DRAWING NO.
PE-DG-392-506-E004
SHEET 3 OF 30 REV. 03

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DRAWING NO.
PE-DG-392-506-E004

FIRST ANGLE PROJECTION

ALL DIMENSIONS ARE IN MM

DELETED

	BHARAT HEAVY ELECTRICALS LTD. POWER SECTOR PROJECT ENGINEERING MANAGEMENT NOIDA, U.P.		2X660MW SURATGARH SUPERCritical TPS	
	TITLE CONTROL LOGIC FOR 415V PMCC/MCC INCOMER, BUSCOUPLER & OUTGOING FEEDERS		DRAWING NO. PE-DG-392-506-E004	
			SHEET 4 OF 30 REV. 03	

DRAWING NO.
PE-DG-392-506-E004

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BHARAT HEAVY ELECTRICALS LTD.
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NOIDA, U.P.

TITLE
CONTROL LOGIC FOR 415V PMCC/MCC INCOMER,
BUSCOUPLER & OUTGOING FEEDERS

2X660MW SURATGARH
SUPERCRITICAL TPS

DRAWING NO. PE-DG-392-506-E004		
SHEET 5	OF 30	REV. 03

DRAWING NO.
PE-DG-392-506-E004

- NOTES :**
- 1 ALL INCOMER AND BUS COUPLER BREAKERS OF SWITCHBOARDS LISTED IN TABLE-1 SHALL BE CONTROLLED FROM ECP & DDCMIS.
 - 2 ALL INCOMER AND BUS COUPLER BREAKERS OF SWITCHBOARDS LISTED IN TABLE-2 SHALL BE CONTROLLED FROM LOCAL ECP & DDCMIS/PLC ONLY.
 - 3 INCOMER AND BUS COUPLER BREAKER OF ADMIN BLDG # ODE SWITCHBOARD SHALL BE CONTROLLED FROM LOCAL ECP
 - 4 INCOMER AND BUS COUPLER BREAKER OF EMERGENCY BOARD # 7DG/8DG SWITCHBOARD SHALL BE CONTROLLED FROM LOCAL GCP

TABLE-1

S. NO	DESCRIPTION	BOARD NO.	LOGIC REF. SHEET NO.
1	BOILER SERVICE PMCC	7DB & 8DB	7 TO 10
2	TURBINE SERVICE PMCC	7DA & 8DA	7 TO 10
3	STATION SERVICE PMCC	ODA	7 TO 10
4	VENTILATION MCC	7TA & 8TA	21 TO 24
5	TURBINE VALVE MCC	7KB & 8KB	27 TO 30
6	VALVE & DAMPER MCC	7HB & 8HB	27 TO 30
7	CCR AC MCC	OTA	21 TO 24
8	AIR WASHER MCC	7SA & 8SA	21 TO 24
9	STATION SERVICE MCC	0QA	21 TO 24
10	SERVICE BLDG SWBD	0TB	21 TO 24
11	ESP AREA MCC	7HD & 8HD	27 TO 30
12	ESP AC & VENT. MCC	7TB & 8TB	21 TO 24

TABLE-2

S. NO	DESCRIPTION	BOARD NO.	LOGIC REF. SHEET NO.
1	CW P/H PMCC	#ODC	7 TO 10
2	FILTERED WATER PMCC	#ODB	7 TO 10
3	FUEL OIL UNLOADING SWBD	#ODD	7 TO 10
4	INTAKE WATER SWBD	#ODF	7 TO 10
5	DM PLANT/CPU MCC	#OSA	21 TO 24
6	ETP/PT PLANT MCC	#OSB	21 TO 24
7	HYDROGEN PLANT MCC	#OSG	21 TO 24
8	STP MCC	#OSF	21 TO 24
9	FUEL OIL (LDO) MCC	#OSH	21 TO 24
10	ELECTROCHLORINATION MCC	#OSD	21 TO 24
11	RAW WATER/WORKSHOP	#OSC	21 TO 24

R2

- 1 THE OPERATIONAL LOGIC FOR DIFFERENT TYPE OF FEEDERS REALISED IN ECP/DDCMIS ARE DESCRIBED BELOW FEEDER WISE:

A) INCOMER BREAKER AT PMCC/MCC.

- a) MANUAL DEAD BUS CLOSING FROM REMOTE.
- b) MANUAL PLANNED CLOSING IN MOMENTARY PARALLELING MODE FROM REMOTE.
- c) MANUAL TRIPPING FROM REMOTE.
- d) INTER TRIPPING WHEN UPSTREAM BREAKER IS OPEN.

B) BUS COUPLER BREAKER AT PMCC/MCC

- a) MANUAL DEAD BUS CLOSING FROM REMOTE.
- b) MANUAL PLANNED CLOSING IN MOMENTARY PARALLELING MODE FROM REMOTE.
- c) AUTO CLOSING OF THE BUS COUPLER BREAKER CONSEQUENT UPON LOSS OF ONE OF THE TWO INCOMING SOURCES.
- d) MANUAL TRIPPING FROM REMOTE.
- e) INTER TRIPPING WHEN UPSTREAM BREAKERS ARE OPEN.

C) EMERGENCY INCOMER BREAKER AT EMERGENCY SWITCHBOARD

- a) MANUAL DEAD BUS CLOSING FROM REMOTE.
- b) MANUAL PLANNED CLOSING IN MOMENTARY PARALLELING MODE FROM REMOTE.
- c) AUTO CLOSING OF THE EMERGENCY INCOMER BREAKER CONSEQUENT UPON LOSS OF NORMAL SUPPLY & FULLFILLMENT OF OTHER CLOSING PERMISSIVES BUILT.
- d) MANUAL TRIPPING FROM REMOTE.
- e) PLANNED CHANGEOVER WHEN NORMAL SUPPLY IS RESTORED.

C) OUTGOING FEEDER FROM PMCC

- a) MANUAL CLOSING FROM REMOTE.
- b) MANUAL TRIPPING FROM REMOTE.
- c) INTER TRIPPING WHEN UPSTREAM BREAKER IS OPEN.

D) OUTGOING FEEDER TO MOTOR

AS PER DRIVE CONTROL PHILOSOPHY.

- 2 UNLESS OTHERWISE INDICATED, ALL COMPONENTS REQUIRED TO MEET THE FUNCTIONAL REQUIREMENTS AS PER THE LOGIC DIAGRAMS ARE LOCATED IN RESPECTIVE SWITCHGEAR.
- 3 THE INTERPOSING RELAYS FOR ON/OFF COMMAND (K12/K11) SHALL BE LOCATED IN RESPECTIVE SWITCHGEAR.

REFERENCES:

1	PE-DC-392-510-E101	LIST OF CIRCUIT BREAKERS FOR ELECTRICAL SYSTEM & THEIR CONTROL LOCATION
2	PE-DG-392-565-E001	ELECTRICAL SINGLE LINE DIAGRAM
3	PE-DG-392-510-E153	LOGIC DIAGRAM FOR ELECTRICAL CONTROL PANEL AND ASSOCIATED DDCMIS
4	PE-DG-392-510-E154	LOGIC DIAGRAM FOR CBs CONTROLLED FROM DDCMIS ONLY



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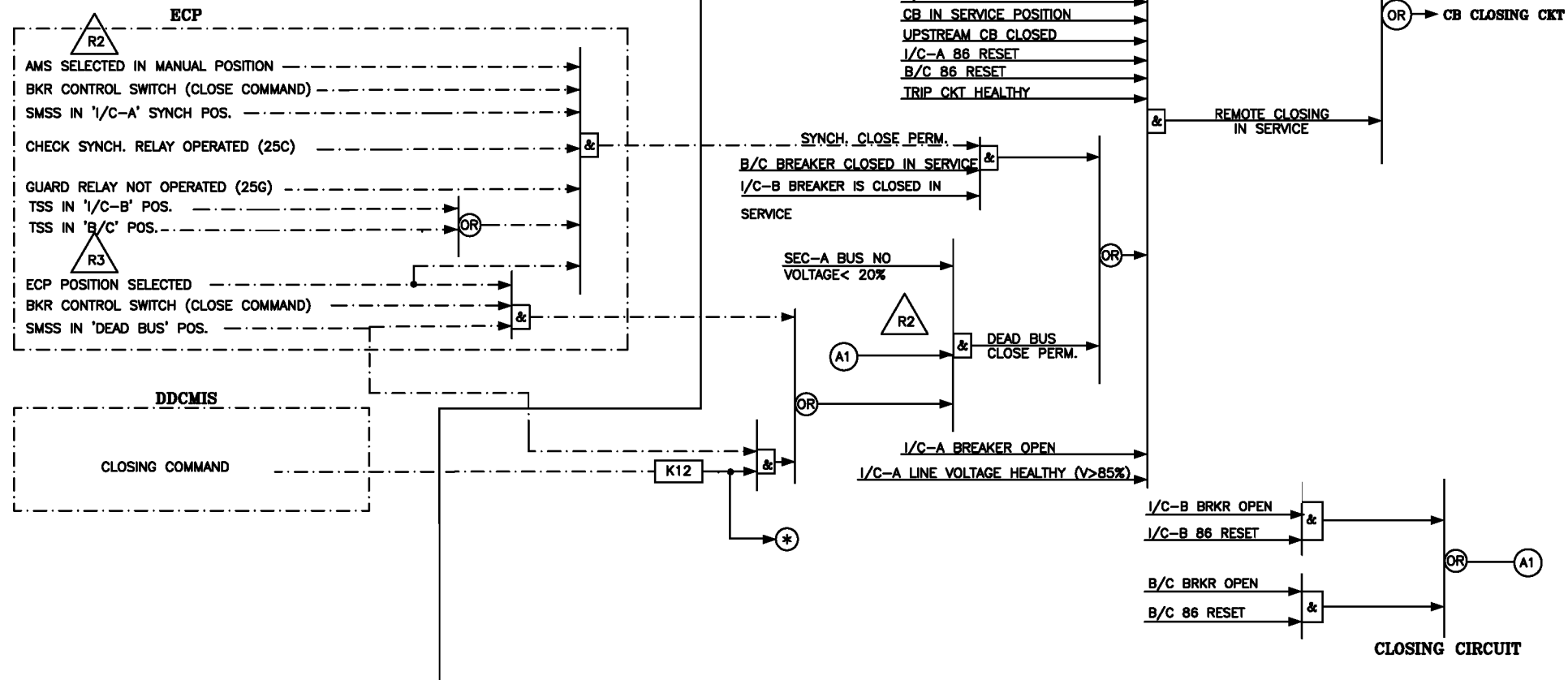
**2X660MW SURATGARH
SUPERCritical TPS**

TITLE
**CONTROL LOGIC FOR 415V PMCC/MCC INCOMER,
BUSCOUPLER & OUTGOING FEEDERS**

DRAWING NO.
PE-DG-392-506-E004
SHEET 6 OF 30 REV. 03

DRAWING NO. PE-DG-392-506-E004

415V SWITCHGEAR



LOGIC DIAGRAM FOR I/C-A TO 415V SWGR (PMCC) - TG BUILDING CONTROLLED FROM ECP & DDCMIS

SIMILAR LOGIC IS APPLICABLE FOR I/C-B. FOLLOWING CHANGES SHALL BE MADE :-

1. I/C-A SHALL BE REPLACED WITH I/C-B.
2. SEC-A SHALL BE REPLACED WITH SEC-B.
3. TSS IN I/C-B SHALL BE READ AS TSS IN I/C-A.



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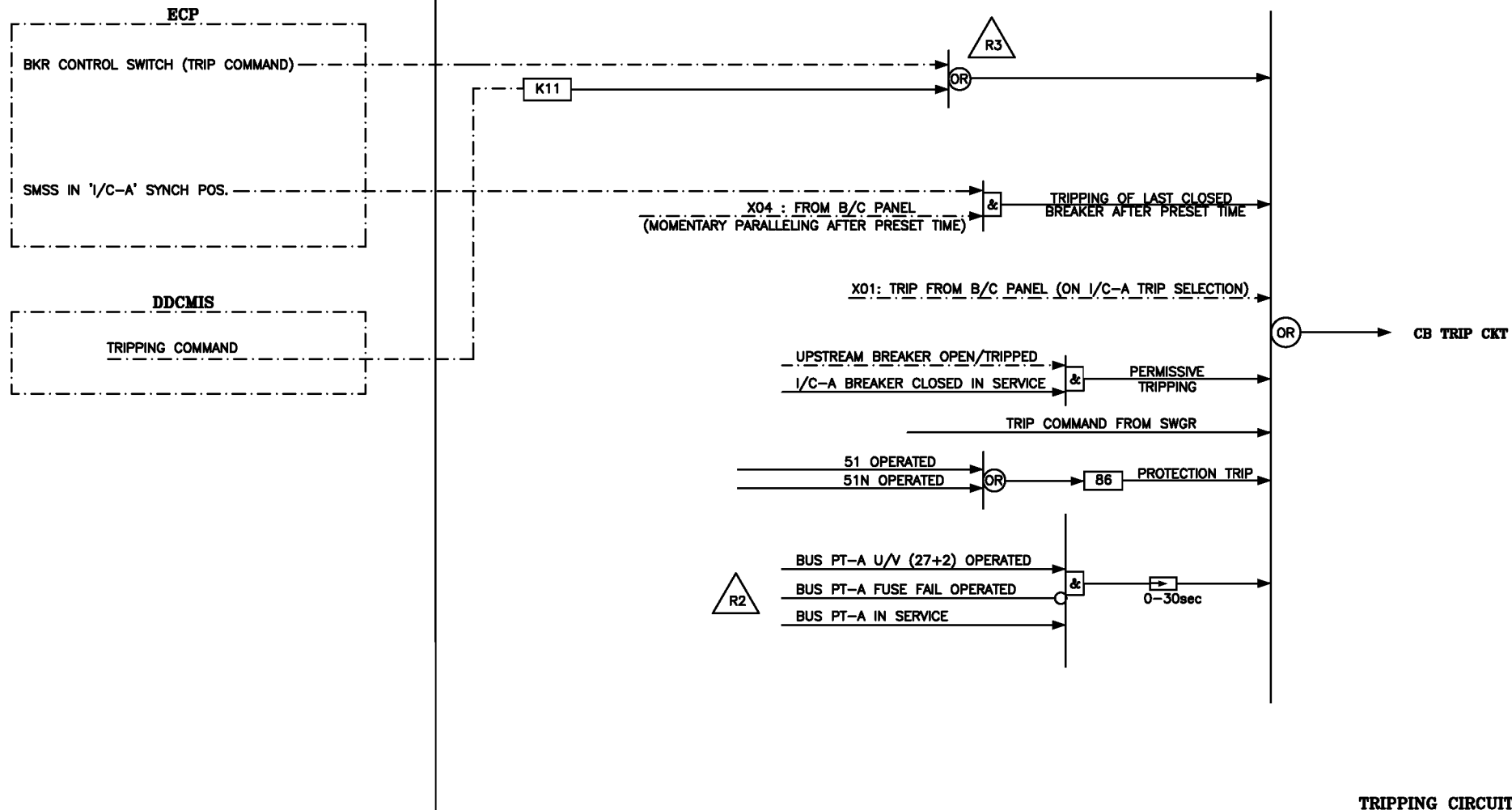
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**2X660MW SURATGARH
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DRAWING NO. **PE-DG-392-506-E004**
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PE-DG-392-506-E004

415V SWITCHGEAR



LOGIC DIAGRAM FOR I/C-A TO 415V SWGR (PMCC) - TG BUILDING CONTROLLED FROM ECP & DDCMIS

SIMILAR LOGIC IS APPLICABLE FOR I/C-B. FOLLOWING CHANGES SHALL BE MADE :-

1. I/C-A SHALL BE REPLACED WITH I/C-B.
2. BUS-A SHALL BE REPLACED WITH BUS-B.
3. X01: SHALL BE REPLACED WITH X02.



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**2X660MW SURATGARH
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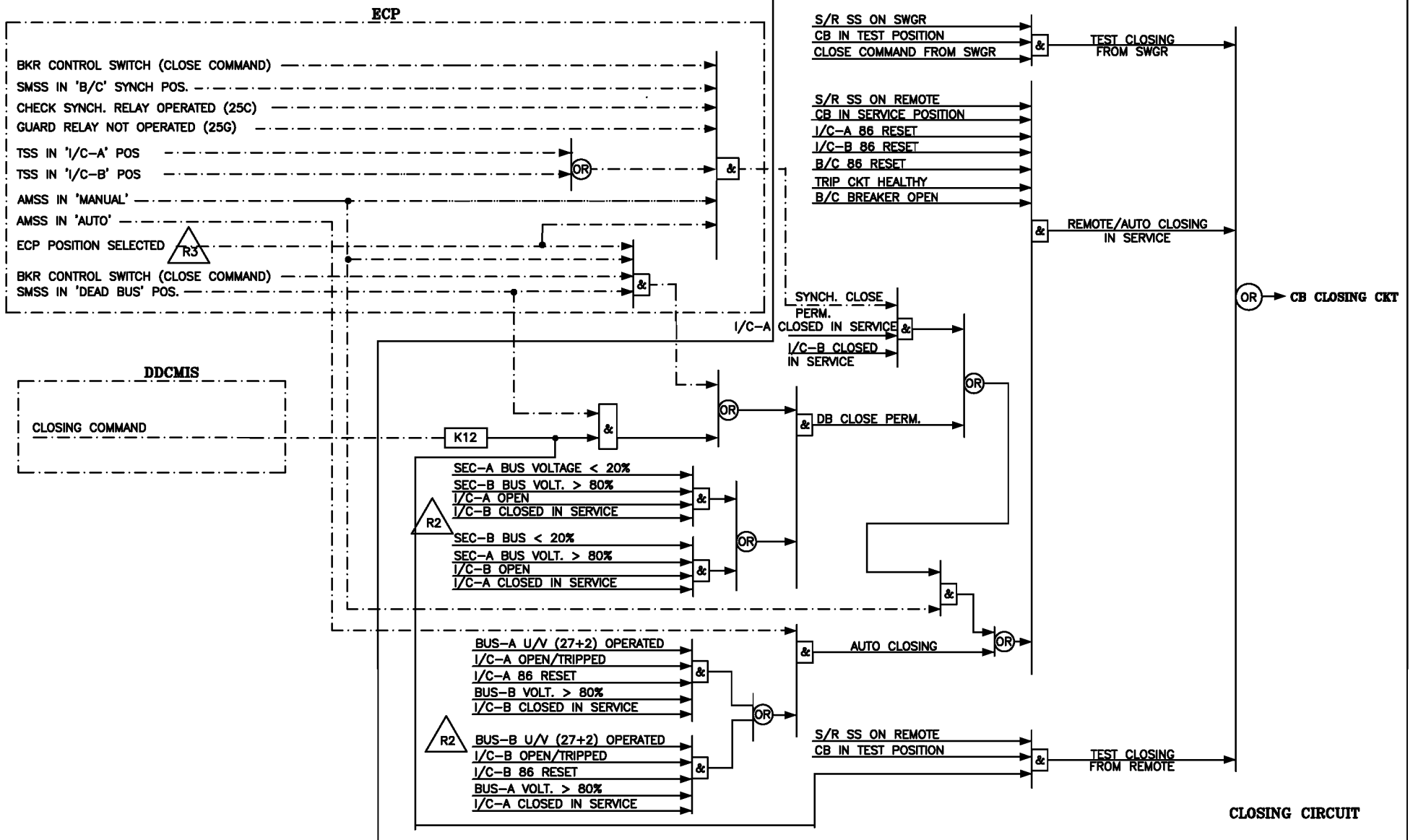
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DRAWING NO.
PE-DG-392-506-E004

SHEET 8 OF 30 REV. 03

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415V SWITCHGEAR



LOGIC DIAGRAM FOR B/C OF 415V SWGR (PMCC) - TG BUILDING CONTROLLED FROM ECP & DDCMIS



BHARAT HEAVY ELECTRICALS LTD.
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
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BUSCOUPLER & OUTGOING FEEDERS**

DRAWING NO. **PE-DG-392-506-E004**
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PE-DG-392-506-E004

DRAWING NO.

415V SWITCHGEAR

ECP

BKR CONTROL SWITCH (TRIP COMMAND)

TSS IN 'I/C-A' POS.

TSS IN 'I/C-B' POS.

TSS IN 'B/C' POS.

SMSS IN 'B/C' SYNCH POS.

DDCMIS

TRIPPING COMMAND

K11

OR

REMOTE TRIP

X04 : FROM B/C PANEL
(MOMENTARY PARALLELING AFTER PRESET TIME)

&

TRIPPING OF LAST CLOSED
BREAKER AFTER PRESET TIME

X03: TRIP FROM B/C PANEL (ON B/C TRIP SELECTION)

OR

CB TRIP CKT

I/C-A BREAKER OPEN/TRIPPED

I/C-B BREAKER OPEN/TRIPPED

B/C BREAKER CLOSED IN SERVICE

&

PERMISSIVE
TRIPPING

TRIP COMMAND FROM SWGR

TRIPPING
FROM SWGR

51 OPERATED

51N OPERATED

OR

86

PROTECTION TRIP

I/C-A CLOSED IN SERVICE

I/C-B CLOSED IN SERVICE

B/C CLOSED IN SERVICE

&

&

&

&

TO TRIP I/C-A (SIGNAL REFERENCE : X01)

TO TRIP I/C-B (SIGNAL REFERENCE : X02)

TO TRIP B/C (SIGNAL REFERENCE : X03)

0.5 SEC

TO I/C-A, I/C-B & B/C,
FOR TRIPPING LAST CLOSED BREAKER,
IN CASE SELECTED BREAKER FAILS TO TRIP
(SIGNAL REFERENCE : X04)ALARM TO DDCMIS
(SOURCES PARALLELED BEYOND PRESET TIME)

TO ECP

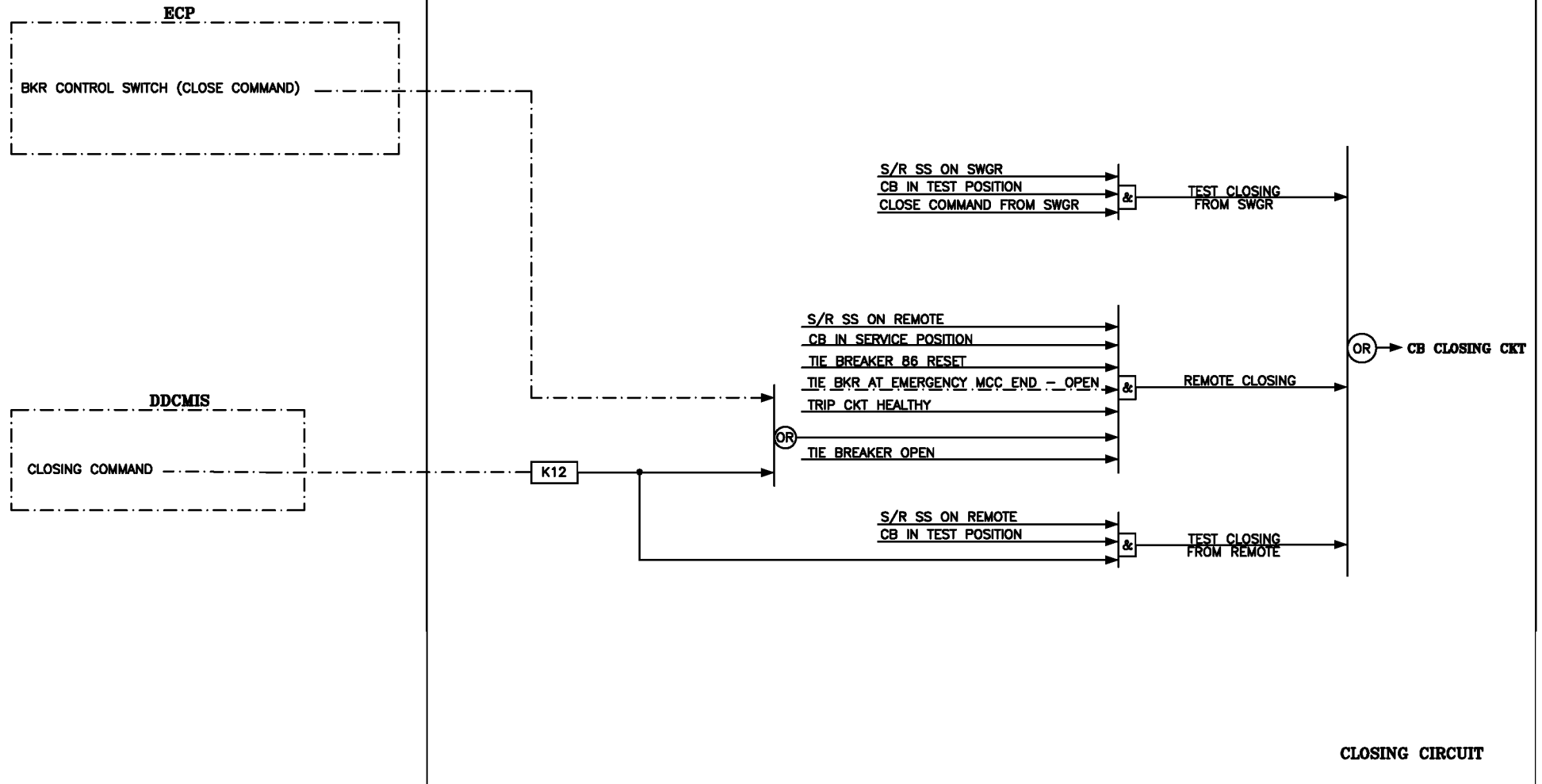
TRIPPING CIRCUIT

LOGIC DIAGRAM FOR B/C OF 415V SWGR (PMCC) - TG BUILDING CONTROLLED FROM ECP & DDCMIS

BHARAT HEAVY ELECTRICALS LTD.
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NOIDA, U.P.2X660MW SURATGARH
SUPERCritical TPSTITLE
CONTROL LOGIC FOR 415V PMCC/MCC INCOMER,
BUSCOUPLER & OUTGOING FEEDERSDRAWING NO.
PE-DG-392-506-E004
SHEET 10 OF 30 REV. 03

DRAWING NO.
PE-DG-392-506-E004

415V SWITCHGEAR



LOGIC DIAGRAM FOR TIE TO 415V EMERGENCY MCC AT BOILER SERVICE PMCC END CONTROLLED FROM ECP & DDCMIS



BHARAT HEAVY ELECTRICALS LTD.
POWER SECTOR
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NOIDA, U.P.

**2X660MW SURATGARH
SUPERCRITICAL TPS**

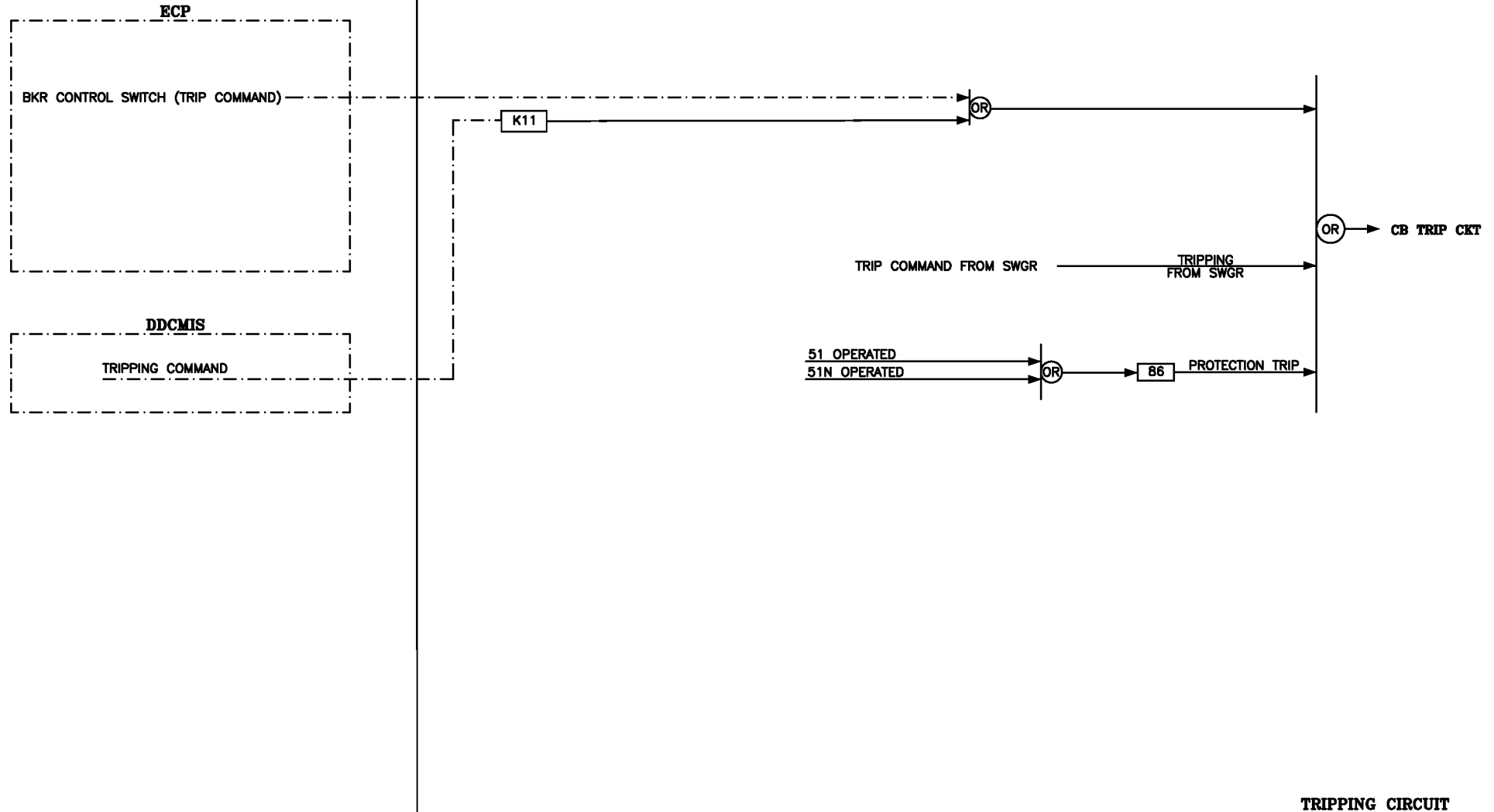
TITLE
**CONTROL LOGIC FOR 415V PMCC/MCC INCOMER,
BUSCOUPLER & OUTGOING FEEDERS**

DRAWING NO.
PE-DG-392-506-E004

SHEET 11 OF 30 REV. 03

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PE-DG-392-506-E004

415V SWITCHGEAR

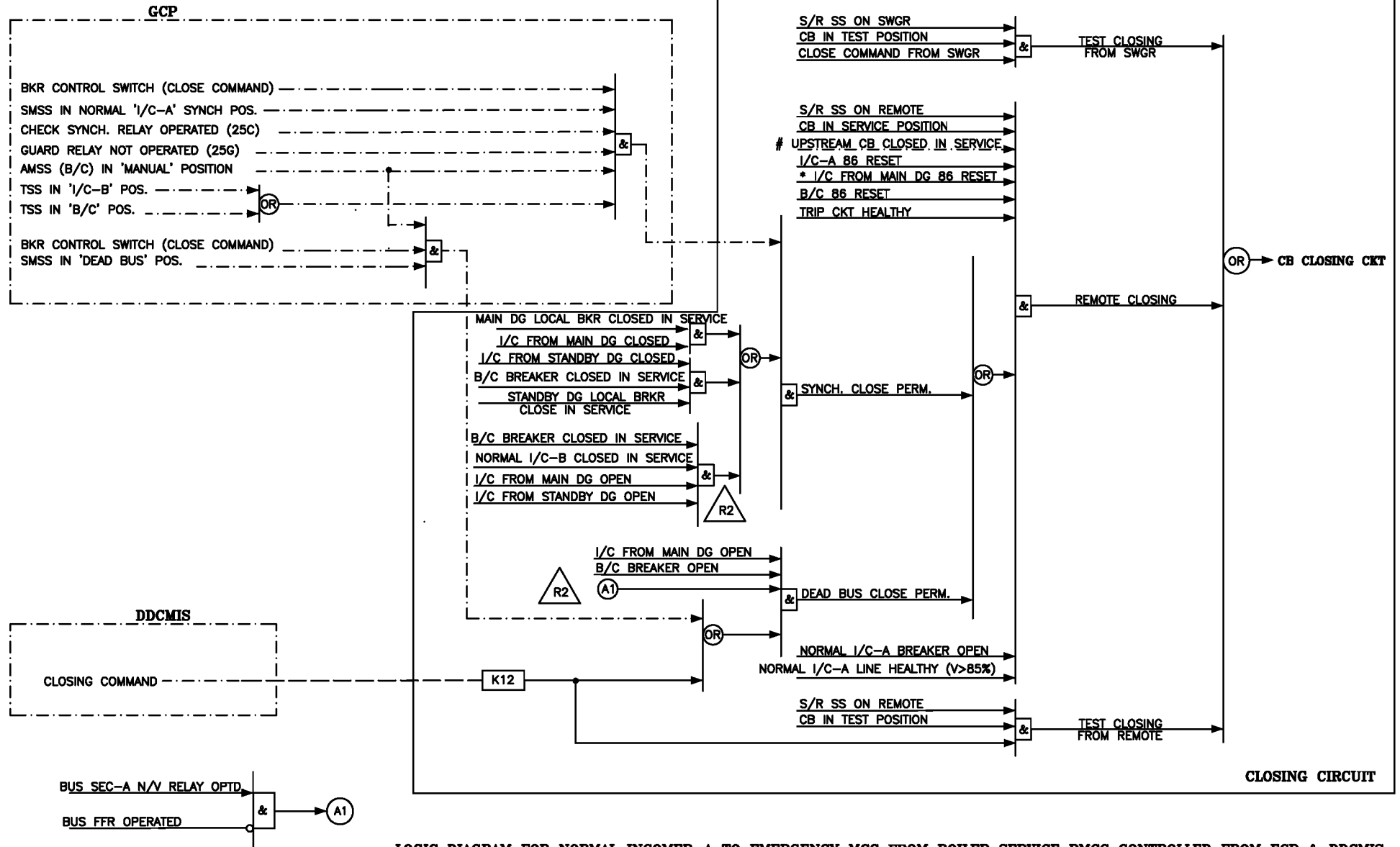


LOGIC DIAGRAM FOR TIE TO 415V EMERGENCY MCC AT BOILER SERVICE PMCC END CONTROLLED FROM ECP & DDCMIS

BHARAT HEAVY ELECTRICALS LTD.
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NOIDA, U.P.2X660MW SURATGARH
SUPERCRITICAL TPSTITLE
CONTROL LOGIC FOR 415V PMCC/MCC INCOMER,
BUSCOUPLER & OUTGOING FEEDERSDRAWING NO.
PE-DG-392-506-E004
SHEET 12 OF 30 REV. 03

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415V SWITCHGEAR



LOGIC DIAGRAM FOR NORMAL INCOMER-A TO EMERGENCY MCC FROM BOILER SERVICE PMCC CONTROLLED FROM ECP & DDCMIS

NOTES :-

- * SHALL BE READ AS I/C FROM STANDBY DG 86 RESET FOR NORMAL I/C-B LOGIC. TSS IN 'I/C-B' SHALL BE READ AS TSS IN 'I/C-A' FOR NORMAL I/C-B LOGIC.
- # UPSTREAM BREAKER IS TIE BREAKER AT BOILER SERVICE PMCC END FOR THE TIE TO EMERGENCY MCC



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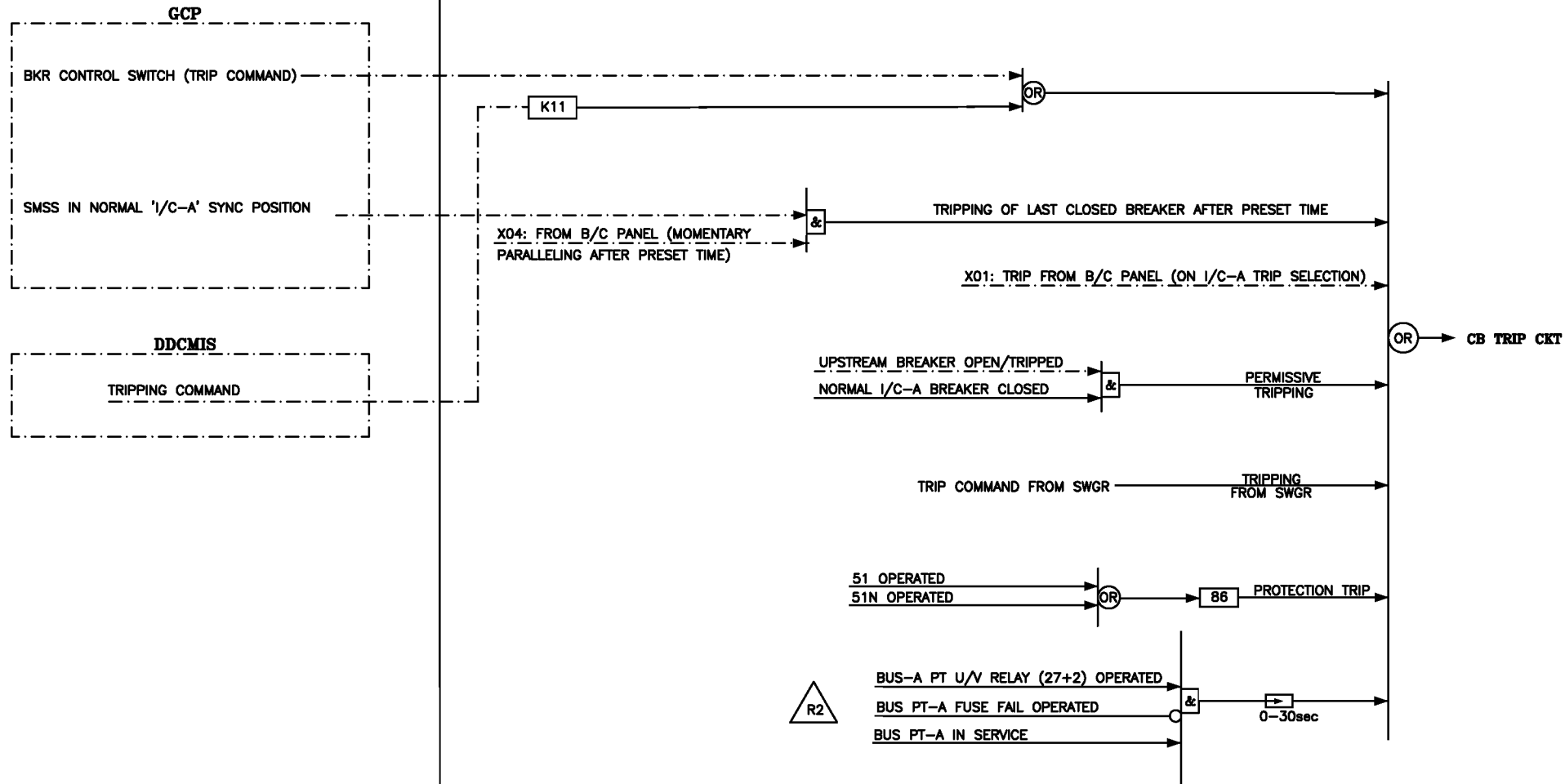
**2X660MW SURATGARH
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DRAWING NO. **PE-DG-392-506-E004**
SHEET 13 OF 30 REV. 03

PE-DG-392-506-E004
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415V SWITCHGEAR



TRIPPING CIRCUIT

LOGIC DIAGRAM FOR NORMAL INCOMER-A TO EMERGENCY MCC FROM BOILER SERVICE PMCC CONTROLLED FROM ECP & DDCMIS



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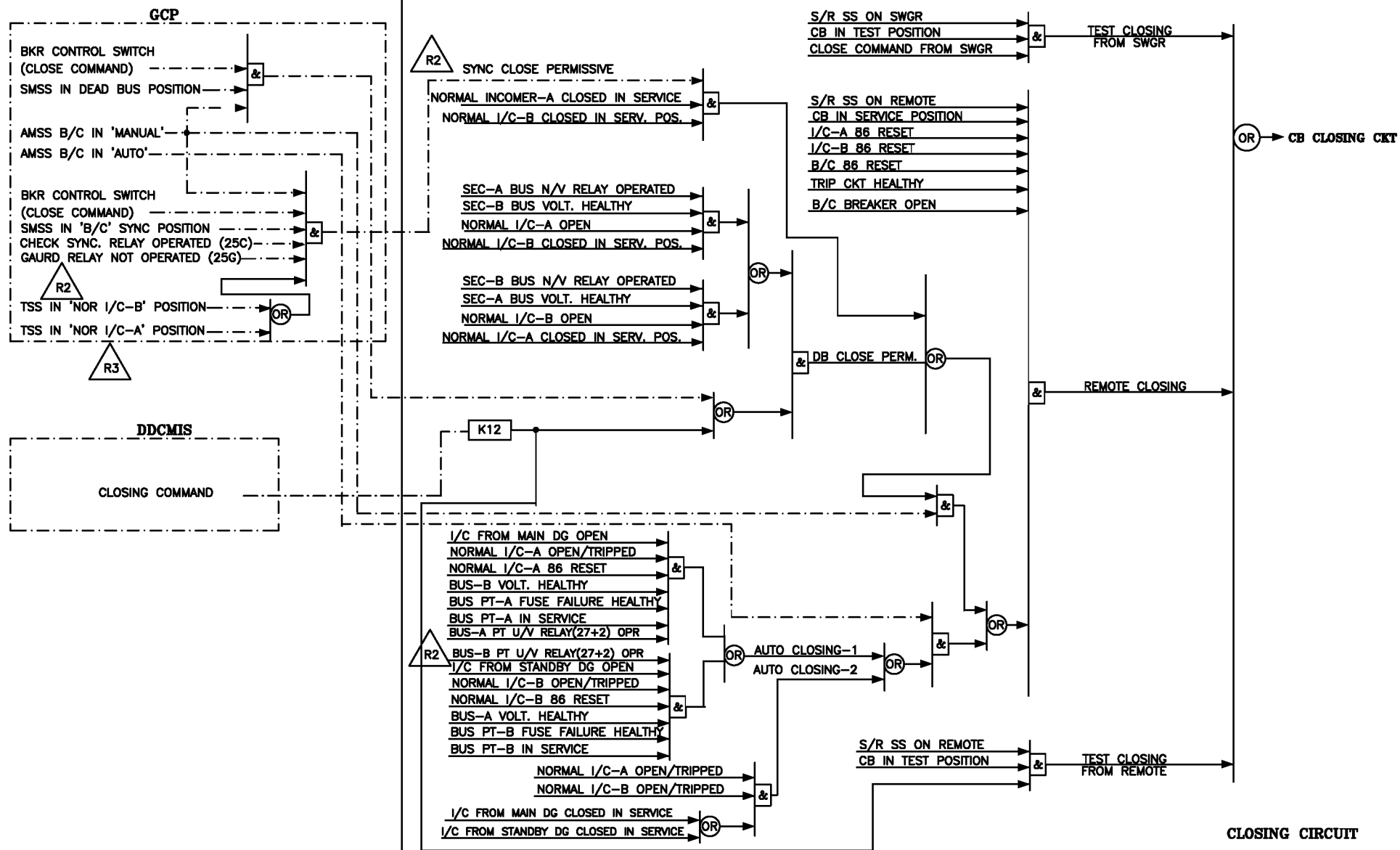
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PE-DG-392-506-E004
SHEET 14 OF 30 REV. 03

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415V SWITCHGEAR



LOGIC DIAGRAM FOR B/C OF EMERGENCY MCC CONTROLLED FROM ECP & DDCMIS



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SHEET 15 OF 30 REV. 03

PE-DG-392-506-E004

DRAWING NO.

415V SWITCHGEAR

GCP

BKR CONTROL SWITCH (TRIP COMMAND)

TSS IN 'NOR I/C-A' POS.

TSS IN 'NOR I/C-B' POS.

TSS IN 'B/C' POS.

SMSS IN 'B/C' POS.

DDCMIS

TRIPPING COMMAND

K11

X04: FROM B/C PANEL

(MOMENTARY PARALLELING AFTER PRESET TIME)

OR

TRIPPING OF LAST CLOSED BREAKER
BREAKER AFTER PRESET TIME

X03: TRIP FROM B/C PANEL (ON B/C TRIP SELECTION)

NORMAL I/C-A OPEN/TRIPPED
NORMAL I/C-B OPEN/TRIPPED
MAIN DG I/C OPEN
STANDBY DG I/C OPEN
B/C BREAKER CLOSED IN SERVICE

&

PERMISSIVE
TRIPPING

OR

CB TRIP CKT

TRIP COMMAND FROM SWGR

TRIPPING
FROM SWGR51 OPERATED
51N OPERATED

OR

86 PROTECTION TRIP

NORMAL I/C-A CLOSED IN SERV. POS.
NORMAL I/C-B CLOSED IN SERV. POS.
B/C CLOSED IN SERV. POS.

&

TO TRIP I/C-A
(SIGNAL REFERENCE : X01)TO TRIP I/C-B
(SIGNAL REFERENCE : X02)TO TRIP B/C
(SIGNAL REFERENCE : X03)TO NORMAL I/C-A, NOR I/C-B & B/C,
FOR TRIPPING LAST CLOSED BREAKER,
IN CASE SELECTED BREAKER FAILS TO TRIP
(SIGNAL REFERENCE : X04)

0.5 SEC

ALARM TO DDCMIS
(SOURCES PARALLELED BEYOND PRESET TIME)

TO ECP

TRIPPING CIRCUIT

LOGIC DIAGRAM FOR B/C OF EMERGENCY MCC CONTROLLED FROM ECP & DDCMIS

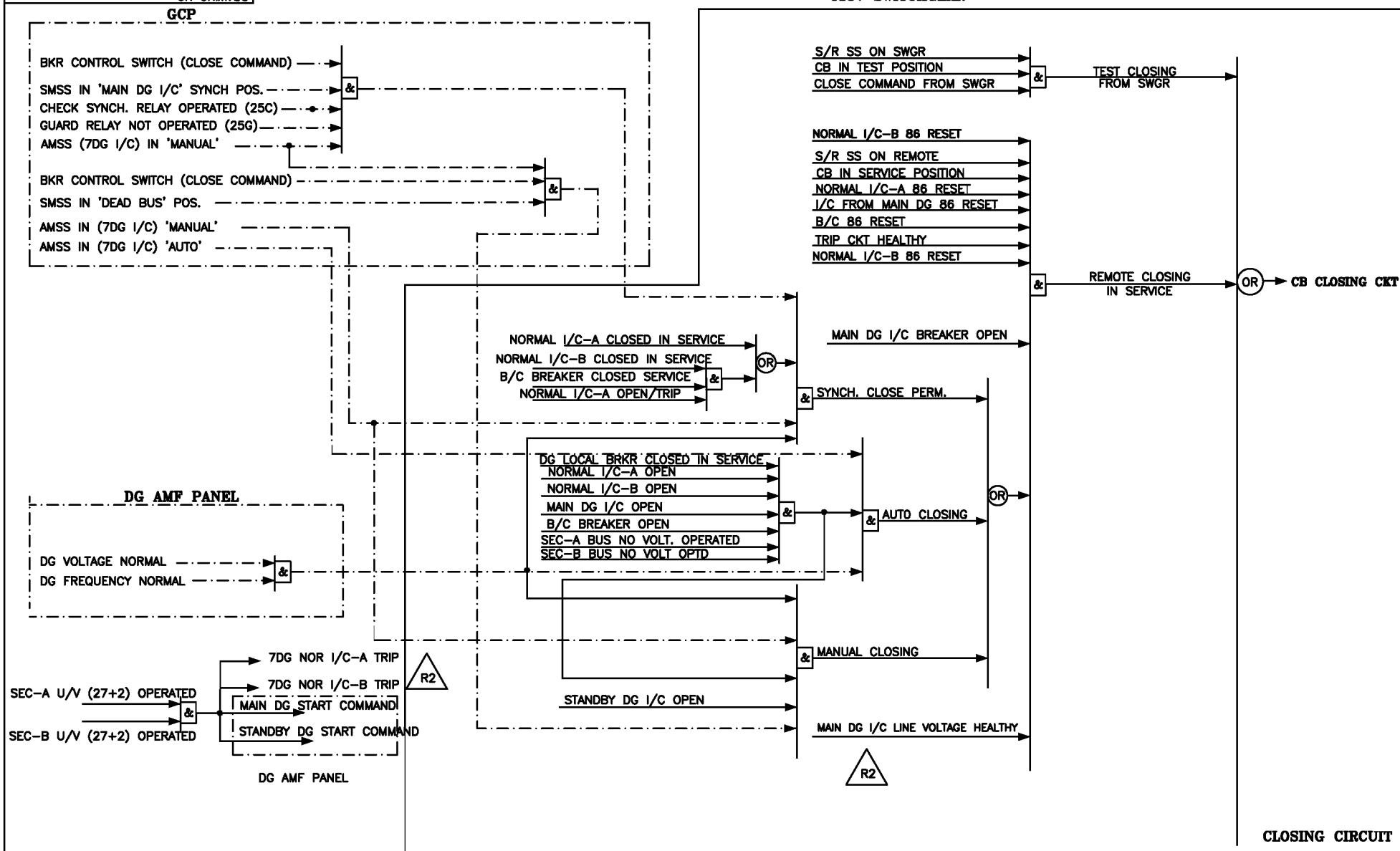
BHARAT HEAVY ELECTRICALS LTD.
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NOIDA, U.P.2X660MW SURATGARH
SUPERCritical TPSTITLE
CONTROL LOGIC FOR 415V PMCC/MCC INCOMER,
BUSCOUPLER & OUTGOING FEEDERSDRAWING NO.
PE-DG-392-506-E004
SHEET 16 OF 30 REV. 03

PE-DG-392-506-E004

DRAWING NO.

GCP

415V SWITCHGEAR



LOGIC DIAGRAM FOR MAIN DG INCOMER OF EMERGENCY MCC CONTROLLED FROM ECP & DDCMIS

NOTE: ONLY TRIP IS ENVISAGED FOR DG INCOMER OF EMERGENCY MCC FROM DDCMIS
 THE ABOVE LOGIC IS APPLICABLE FOR MAIN DG INCOMER FOR EMERGENCY MCC 7DG.
 SIMILAR LOGIC IS APPLICABLE FOR MAIN DG INCOMER OF EMERGENCY MCC 8DG.
 FOLLOWING CHANGES SHALL BE MADE:-
 1. 7DG SHALL BE REPLACED WITH 8DG.
 2. 8DG SHALL BE REPLACED WITH 7DG.



BHARAT HEAVY ELECTRICALS LTD.
 POWER SECTOR
 PROJECT ENGINEERING MANAGEMENT
 NOIDA, U.P.

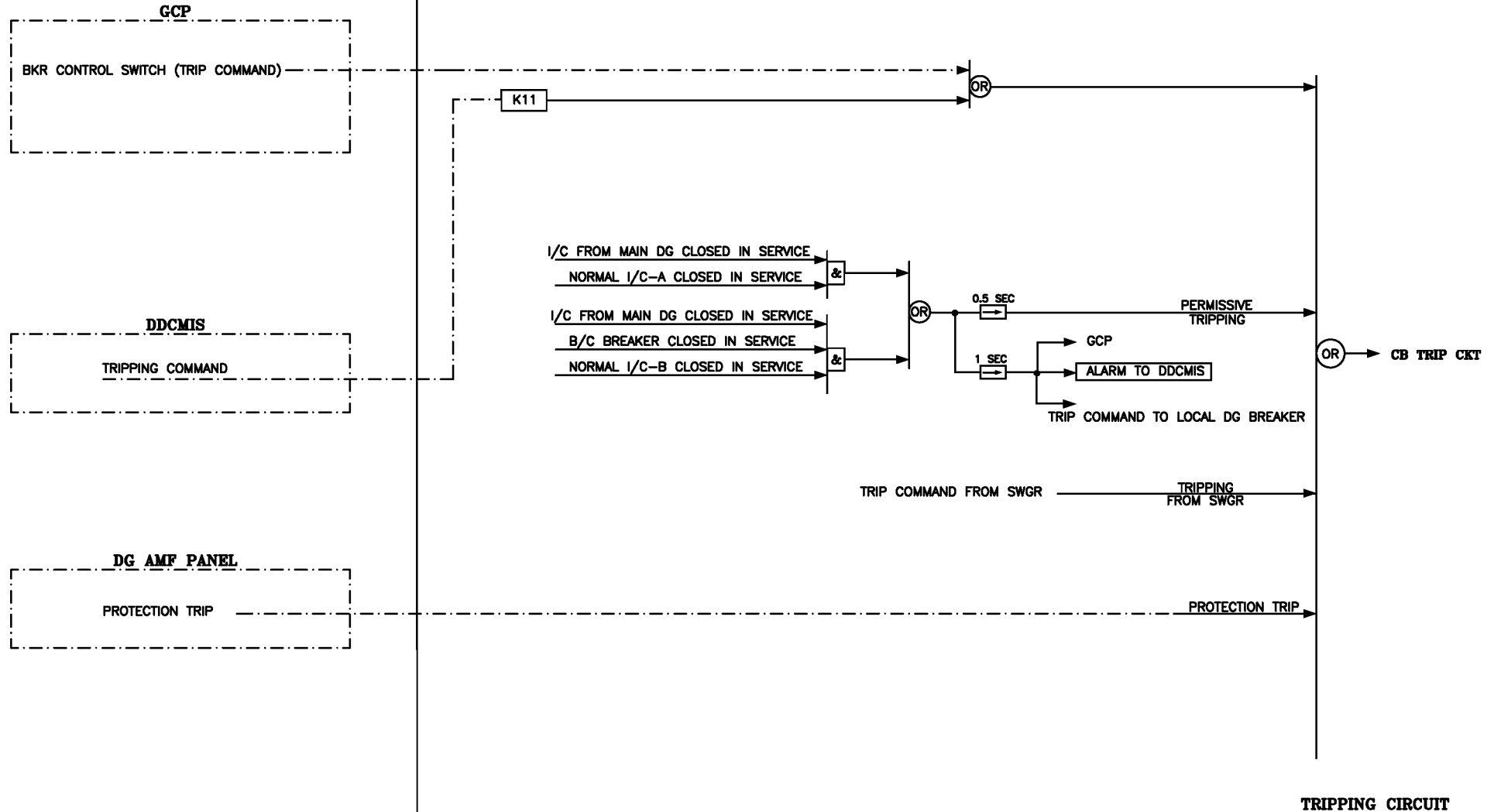
TITLE
**CONTROL LOGIC FOR 415V PMCC/MCC INCOMER,
 BUSCOUPLER & OUTGOING FEEDERS**

**2X660MW SURATGARH
 SUPERCritical TPS**

DRAWING NO.
PE-DG-392-506-E004
 SHEET 17 OF 30 REV. 03

DRAWING NO.
PE-DG-392-506-E004

415V SWITCHGEAR



LOGIC DIAGRAM FOR MAIN DG INCOMER OF EMERGENCY MCC CONTROLLED FROM ECP & DDCMIS

NOTE:

THE ABOVE LOGIC IS APPLICABLE FOR MAIN DG INCOMER FOR EMERGENCY MCC 7DG.
SIMILAR LOGIC IS APPLICABLE FOR MAIN DG INCOMER OF EMERGENCY MCC 8DG.

FOLLOWING CHANGES SHALL BE MADE:-

1. 7DG SHALL BE REPLACED WITH 8DG.
2. 8DG SHALL BE REPLACED WITH 7DG.

R2



BHARAT HEAVY ELECTRICALS LTD.
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NOIDA, U.P.

TITLE
**CONTROL LOGIC FOR 415V PMCC/MCC INCOMER,
BUSCOUPLER & OUTGOING FEEDERS**

**2X660MW SURATGARH
SUPERCritical TPS**

DRAWING NO.
PE-DG-392-506-E004

SHEET 18 OF 30 REV. 03

DRAWING NO.
PE-DG-392-506-E004

415V SWITCHGEAR

GCP

SDGSS SELECTED IN DG-7 POSITION
BKR CONTROL SWITCH (CLOSE COMMAND)
SMSS IN 'STANDBY DG I/C' SYNCH POS.
CHECK SYNCH. RELAY OPERATED (25C)
GUARD RELAY NOT OPERATED (25G)
AMSS (7DG STANDBY I/C)
IN 'MANUAL'

BKR CONTROL SWITCH (CLOSE COMMAND)
SMSS IN 'DEAD BUS' POS.

S/R SS ON SWGR
CB IN TEST POSITION
CLOSE COMMAND FROM SWGR

TEST CLOSING
FROM SWGR

S/R SS ON REMOTE
CB IN SERVICE POSITION
NORMAL I/C-B 86 RESET
I/C FROM STANDBY DG 86 RESET
B/C 86 RESET
TRIP CKT HEALTHY

OR → CB CLOSING CKT

STANDBY DG I/C OPEN (7DG)

SYNCH. CLOSE PERM.

REMOTE CLOSING

NORMAL I/C-B CLOSED IN SERVICE
B/C BREAKER CLOSED IN SERVICE
NORMAL I/C-A OPEN
NORMAL I/C-A CLOSED IN SERVICE
B/C BREAKER CLOSED IN SERVICE
NORMAL I/C-B OPEN

OR

OR

STANDBY DG LOCAL BRKR CLOSED IN SERVICE
NORMAL I/C-A OPEN
NORMAL I/C-B OPEN
MAIN DG-7 I/C OPEN
STANDBY DG I/C OPEN (7DG)
B/C BREAKER OPEN
SEC-B BUS N/V OPERATED
STANDBY DG I/C OPEN (8DG)
SEC-A BUS N/V OPERATED

MANUAL CLOSING

I/C LINE VOLTAGE HEALTHY

CLOSING CIRCUIT

STANDBY DG AMF PANEL

DG VOLTAGE NORMAL
DG FREQUENCY NORMAL

R2

LOGIC DIAGRAM FOR STANDBY DG INCOMER OF EMERGENCY MCC CONTROLLED FROM ECP & DDCMIS

NOTE:

THE ABOVE LOGIC IS APPLICABLE FOR STANDBY DG INCOMER FOR EMERGENCY MCC 7DG.
SIMILAR LOGIC IS APPLICABLE FOR MAIN DG INCOMER OF EMERGENCY MCC 8DG.

FOLLOWING CHANGES SHALL BE MADE:-

1. 7DG SHALL BE REPLACED WITH 8DG.
2. 8DG SHALL BE REPLACED WITH 7DG.



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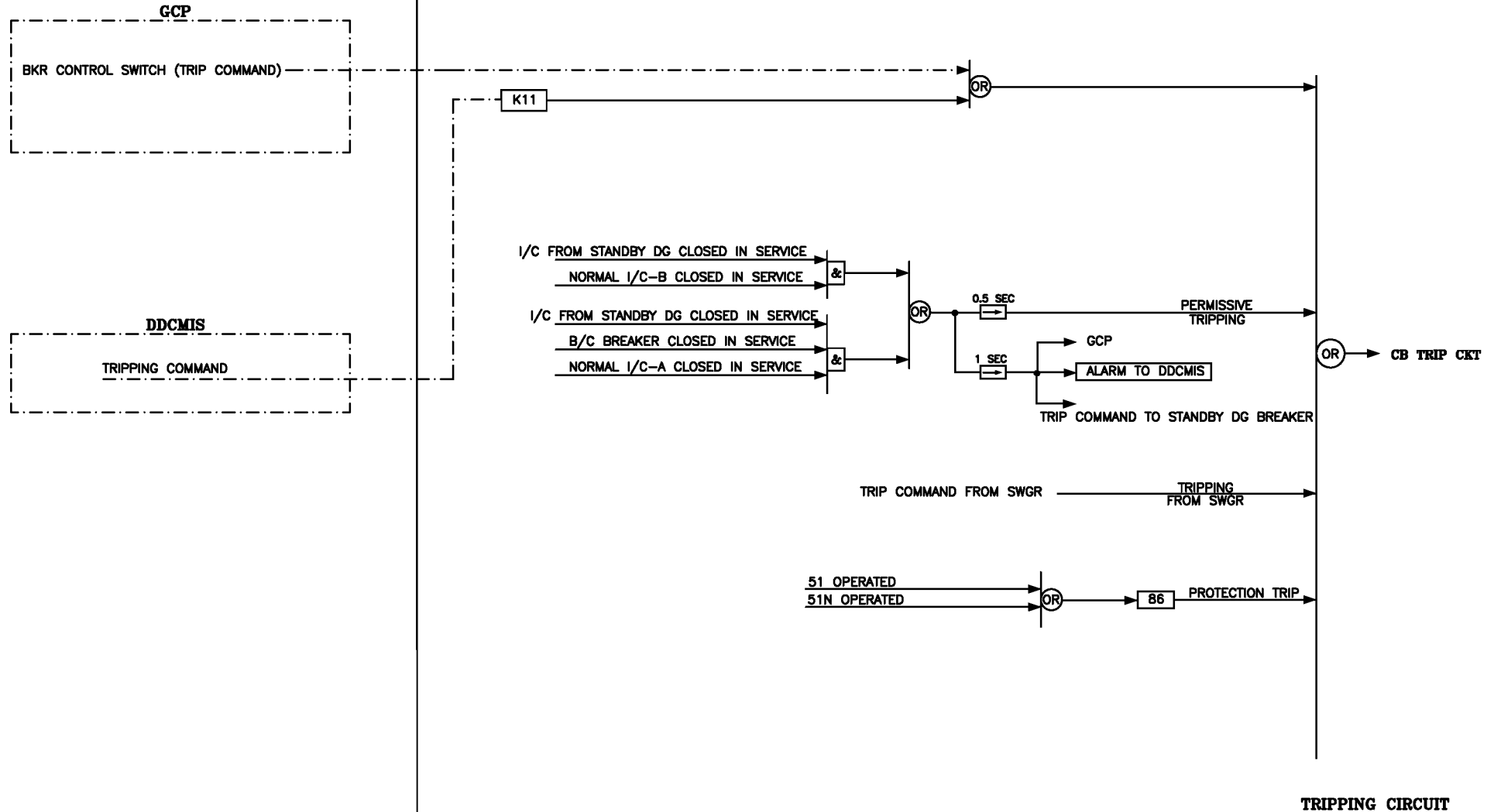
2X660MW SURATGARH
SUPERCritical TPS

TITLE
CONTROL LOGIC FOR 415V PMCC/MCC INCOMER,
BUSCOUPLER & OUTGOING FEEDERS

DRAWING NO.
PE-DG-392-506-E004
SHEET 19 OF 30 REV. 03

DRAWING NO.
PE-DG-392-506-E004

415V SWITCHGEAR



LOGIC DIAGRAM FOR STANDBY DG INCOMER OF EMERGENCY MCC CONTROLLED FROM ECP & DDCMIS

NOTE:

THE ABOVE LOGIC IS APPLICABLE FOR STANDBY DG INCOMER FOR EMERGENCY MCC 7DG.
SIMILAR LOGIC IS APPLICABLE FOR MAIN DG INCOMER OF EMERGENCY MCC 8DG.



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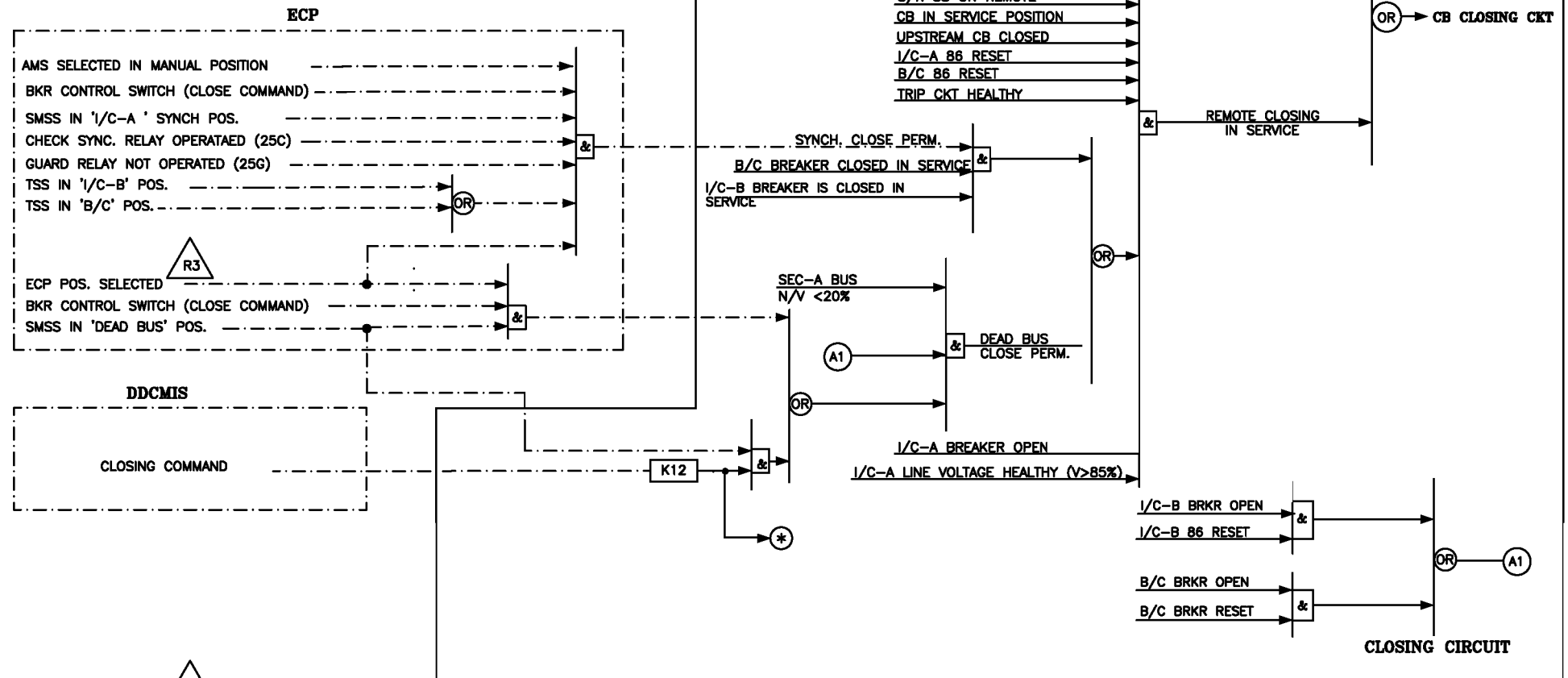
**2X660MW SURATGARH
SUPERCritical TPS**

TITLE
**CONTROL LOGIC FOR 415V PMCC/MCC INCOMER,
BUSCOUPLER & OUTGOING FEEDERS**

DRAWING NO.
PE-DG-392-506-E004
SHEET 20 OF 30 REV. 03

DRAWING NO. PE-DG-392-506-E004

415V SWITCHGEAR



- 1) SIMILAR LOGIC IS APPLICABLE FOR I/C-B. FOLLOWING CHANGES SHALL BE MADE :-
- I/C-A SHALL BE REPLACED WITH I/C-B. b. SEC-A SHALL BE REPLACED WITH SEC-B.
 - TSS IN I/C-B SHALL BE READ AS TSS IN I/C-A.



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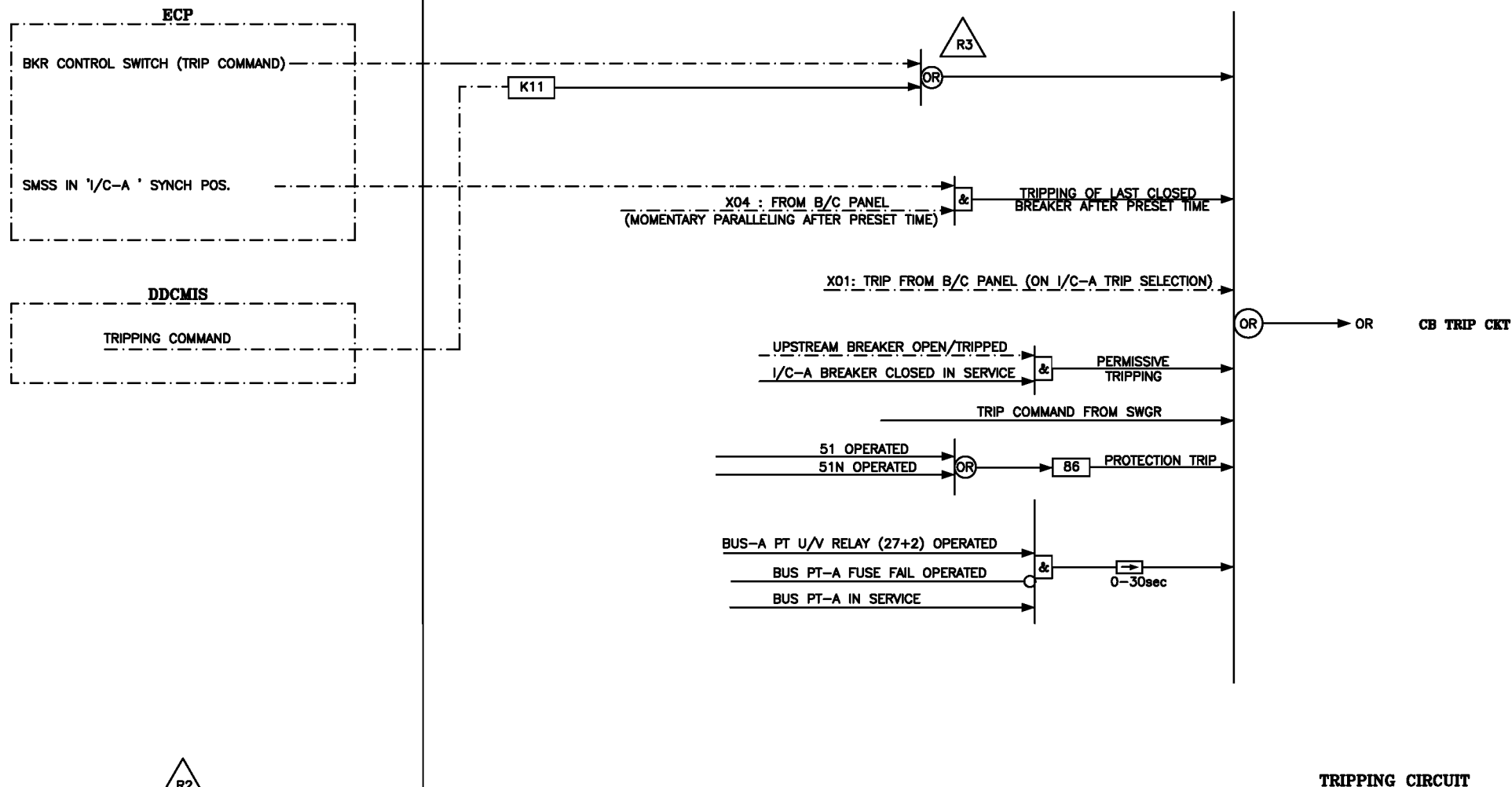
**2X660MW SURATGARH
SUPERCritical TPS**

TITLE **CONTROL LOGIC FOR 415V PMCC/MCC INCOMER,
BUSCOUPLER & OUTGOING FEEDERS**

DRAWING NO. **PE-DG-392-506-E004**
SHEET 21 OF 30 REV. 03

DRAWING NO. PE-DG-392-506-E004

415V SWITCHGEAR



LOGIC DIAGRAM FOR I/C-A OF 415V MCC CONTROLLED FROM ECP & DDCMIS
SIMILAR LOGIC DIAGRAM FOR I/C OF 415V MCC CONTROLLED FROM OFF SITE AREA ECP & DDCMIS/PLC

- 1) SIMILAR LOGIC IS APPLICABLE FOR I/C-B. FOLLOWING CHANGES SHALL BE MADE :-
a. I/C-A SHALL BE REPLACED WITH I/C-B.
b. BUS-A SHALL BE REPLACED WITH BUS-B.



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**2X660MW SURATGARH
SUPERCRITICAL TPS**

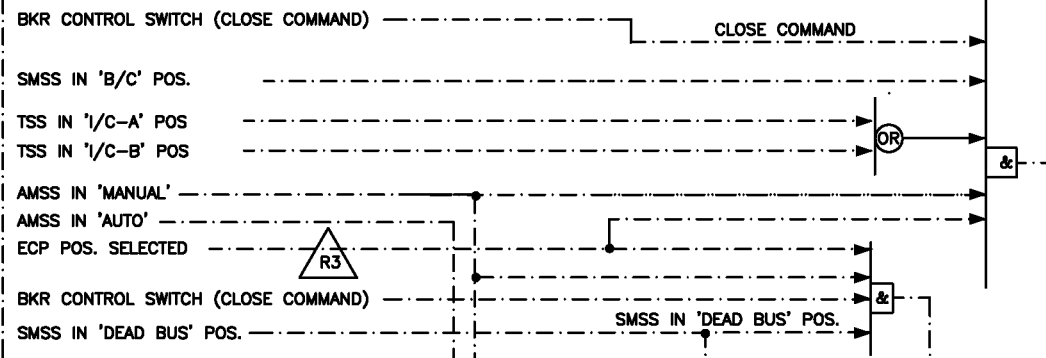
**TITLE CONTROL LOGIC FOR 415V PMCC/MCC INCOMER,
BUSCOUPLER & OUTGOING FEEDERS**

DRAWING NO.	
PE-DG-392-506-E004	
SHEET 22 OF 30	REV. 03

PE-DG-392-506-E004

DRAWING NO.

ECP



S/R SS ON SWGR

CB IN TEST POSITION

CLOSE COMMAND FROM SWGR

TEST CLOSING
FROM SWGR

S/R SS ON REMOTE

CB IN SERVICE POSITION

I/C-A 86 RESET

I/C-B 86 RESET

B/C 86 RESET

TRIP CKT HEALTHY

B/C BREAKER OPEN

REMOTE/AUTO CLOSING
IN SERVICE

SYNCH. CLOSE
PERM.
CLOSED IN SERVICE

I/C-B CLOSED
IN SERVICE

DB CLOSE PERM.

CB CLOSING CKT

AUTO CLOSING

S/R SS ON REMOTE

CB IN TEST POSITION

TEST CLOSING

CLOSING CIRCUIT

LOGIC DIAGRAM FOR B/C OF 415V SWGR (MCC) - CONTROLLED FROM ECP & DDCMIS

SIMILAR LOGIC IS APPLICABLE FOR B/C TO 415 V MCC CONTROLLED FROM OFFSITE AREA ECP & DDCMIS



BHARAT HEAVY ELECTRICALS LTD.
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NOIDA, U.P.

**2X660MW SURATGARH
SUPERCritical TPS**

TITLE
**CONTROL LOGIC FOR 415V PMCC/MCC INCOMER,
BUSCOUPLER & OUTGOING FEEDERS**

DRAWING NO.
PE-DG-392-506-E004
SHEET 23 OF 30 REV. 03

PE-DG-392-506-E004

DRAWING NO.

415V SWITCHGEAR

ECP

BKR CONTROL SWITCH (TRIP COMMAND)

TSS IN 'I/C-A' POS.

TSS IN 'I/C-B' POS.

TSS IN 'B/C' POS.

SMSS IN 'B/C' POS.

DDCMIS

TRIPPING COMMAND

TRIP COMMAND FROM SWGR

X04 : FROM B/C PANEL
(MOMENTARY PARALLELING AFTER PRESET TIME)

X03: TRIP FROM B/C PANEL (ON B/C TRIP SELECTION)

I/C-A BREAKER OPEN/TRIPPED
I/C-B BREAKER OPEN/TRIPPED
B/C BREAKER CLOSED IN SERVICE

REMOTE TRIP

PERMISSIVE
TRIPPINGTRIPPING
FROM SWGR51 OPERATED
51N OPERATED

PROTECTION TRIP

I/C-A CLOSED IN SERVICE
I/C-B CLOSED IN SERVICE
B/C CLOSED IN SERVICE

TO TRIP I/C-A (SIGNAL REFERENCE : X01)

TO TRIP I/C-B (SIGNAL REFERENCE : X02)

TO TRIP B/C (SIGNAL REFERENCE : X03)

0.5 SEC

TO I/C-A, I/C-B & B/C,
FOR TRIPPING LAST CLOSED BREAKER,
IN CASE SELECTED BREAKER FAILS TO TRIP
(SIGNAL REFERENCE : X04)ALARM TO DDCMIS
(SOURCES PARALLELED BEYOND PRESET TIME)

TO ECP

TRIPPING CIRCUIT

LOGIC DIAGRAM FOR B/C OF 415V SWGR (MCC) - CONTROLLED FROM ECP & DDCMIS

BHARAT HEAVY ELECTRICALS LTD.
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NOIDA, U.P.2X660MW SURATGARH
SUPERCritical TPS

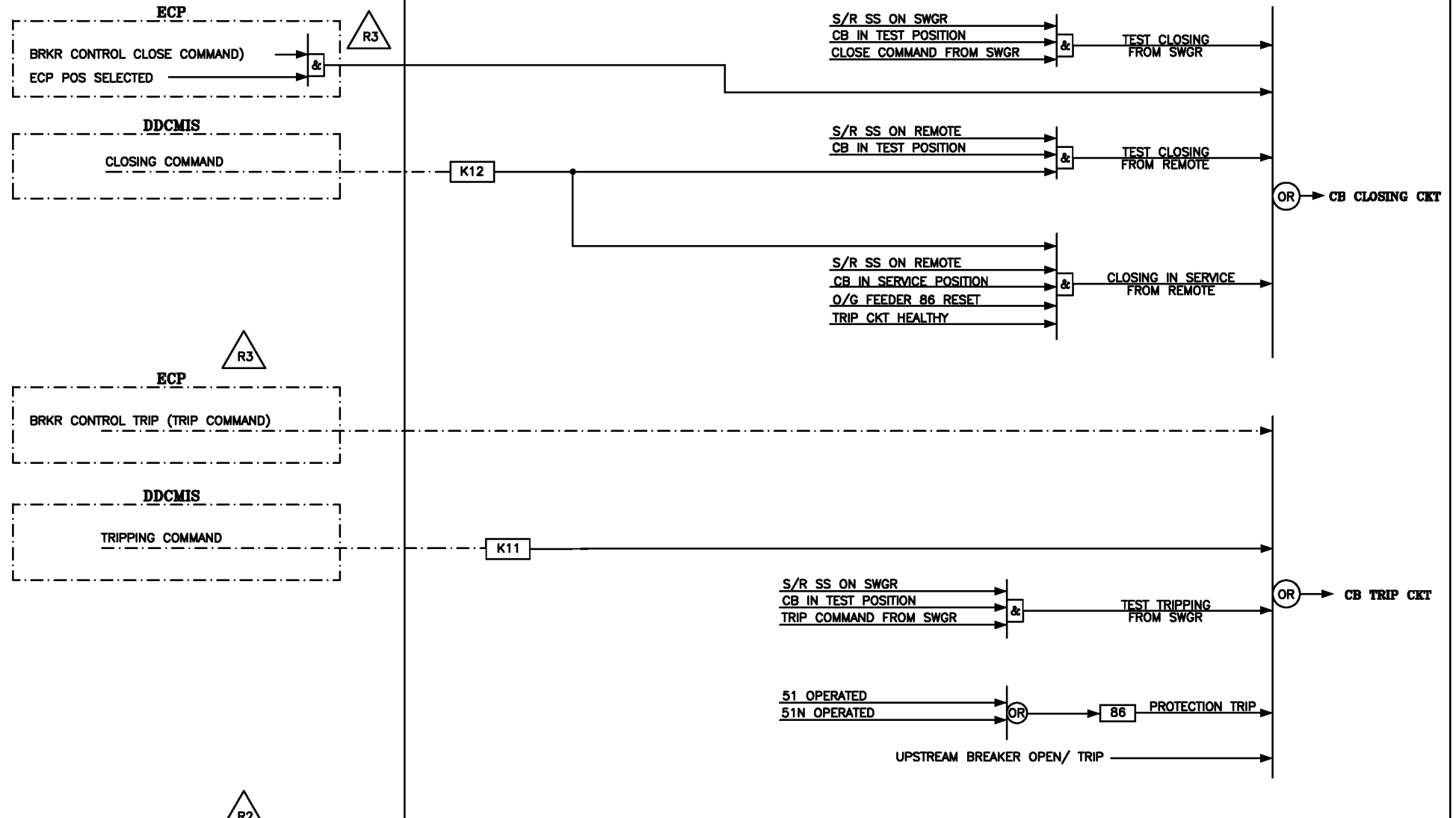
SIMILAR LOGIC IS APPLICABLE FOR B/C OF 415V MCC CONTROLLED FROM OFFSITE ECP & DDCMIS

TITLE
CONTROL LOGIC FOR 415V PMCC/MCC INCOMER,
BUSCOUPLER & OUTGOING FEEDERSDRAWING NO.
PE-DG-392-506-E004
SHEET 24 OF 30 REV. 03

R2

DRAWING NO.
PE-DG-392-506-E004

415V SWITCHGEAR



LOGIC DIAGRAM FOR O/G FEEDERS FROM PMCC/PCC CONTROLLED FROM DDCMIS

NOTE:-

1. I/C BREAKER IMPLIES THE BREAKER CONNECTED TO THE SAME SECTION FROM WHICH O/G FEEDER IS CONNECTED.
2. BUS VOLT. IMPLIES THE VOLTAGE OF THE BUS FROM WHICH O/G FEEDER IS CONNECTED.
3. CONTROL OF OUTGOING FEEDERS FROM DDCMIS IS ONLY ENVISAGED



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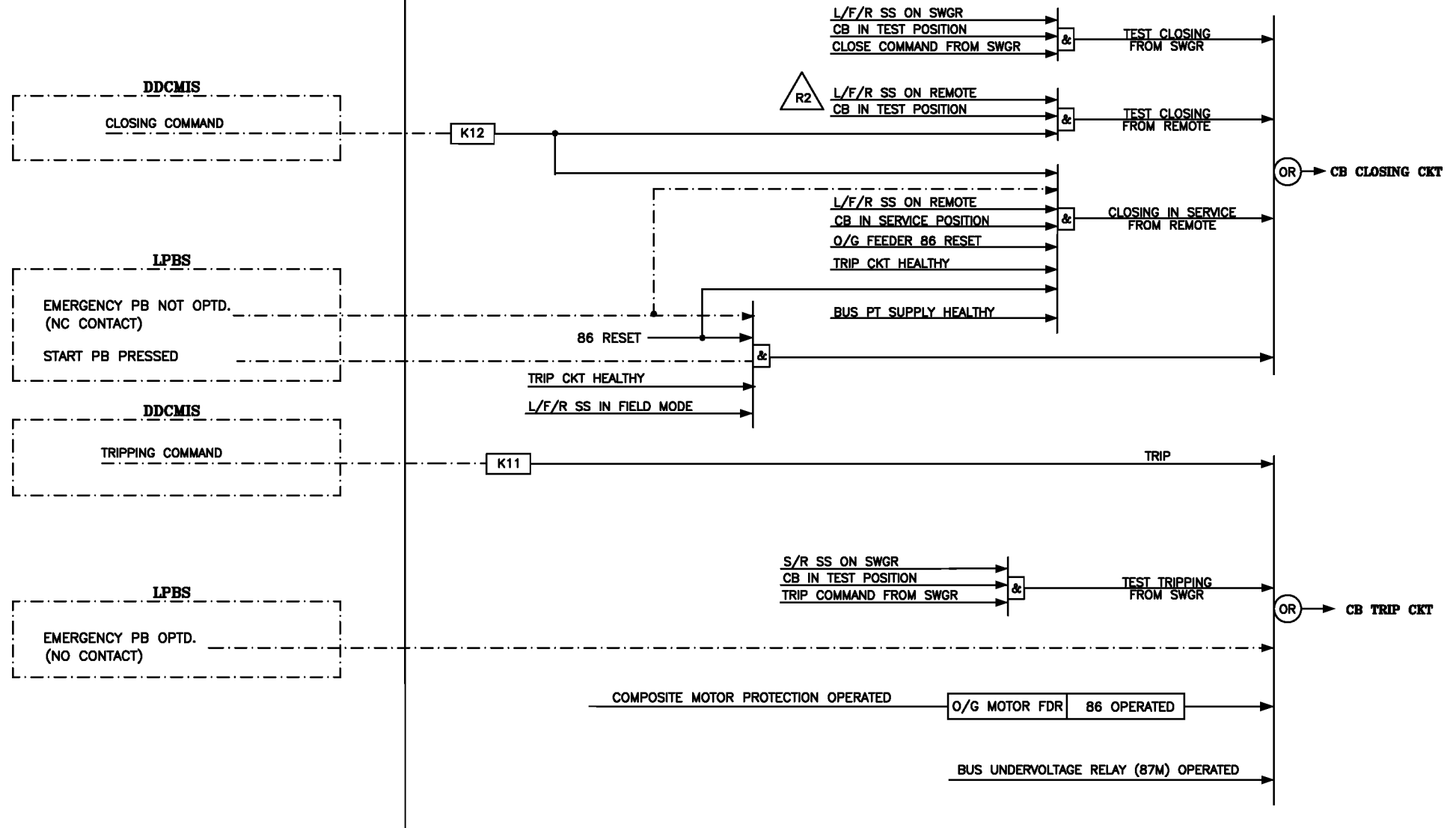
**2X660MW SURATGARH
SUPERCritical TPS**

TITLE
**CONTROL LOGIC FOR 415V PMCC/MCC INCOMER,
BUSCOUPLER & OUTGOING FEEDERS**

DRAWING NO.
PE-DG-392-506-E004
SHEET 25 OF 30 REV. 03

DRAWING NO.
PE-DG-392-506-E004

415V SWITCHGEAR



LOGIC DIAGRAM FOR BREAKER OPERATED LT MOTOR FEEDERS CONTROLLED FROM DDCMIS

NOTE:-

1. BUS VOLT. IMPLIES THE VOLTAGE OF THE BUS FROM WHICH O/G FEEDER IS CONNECTED.



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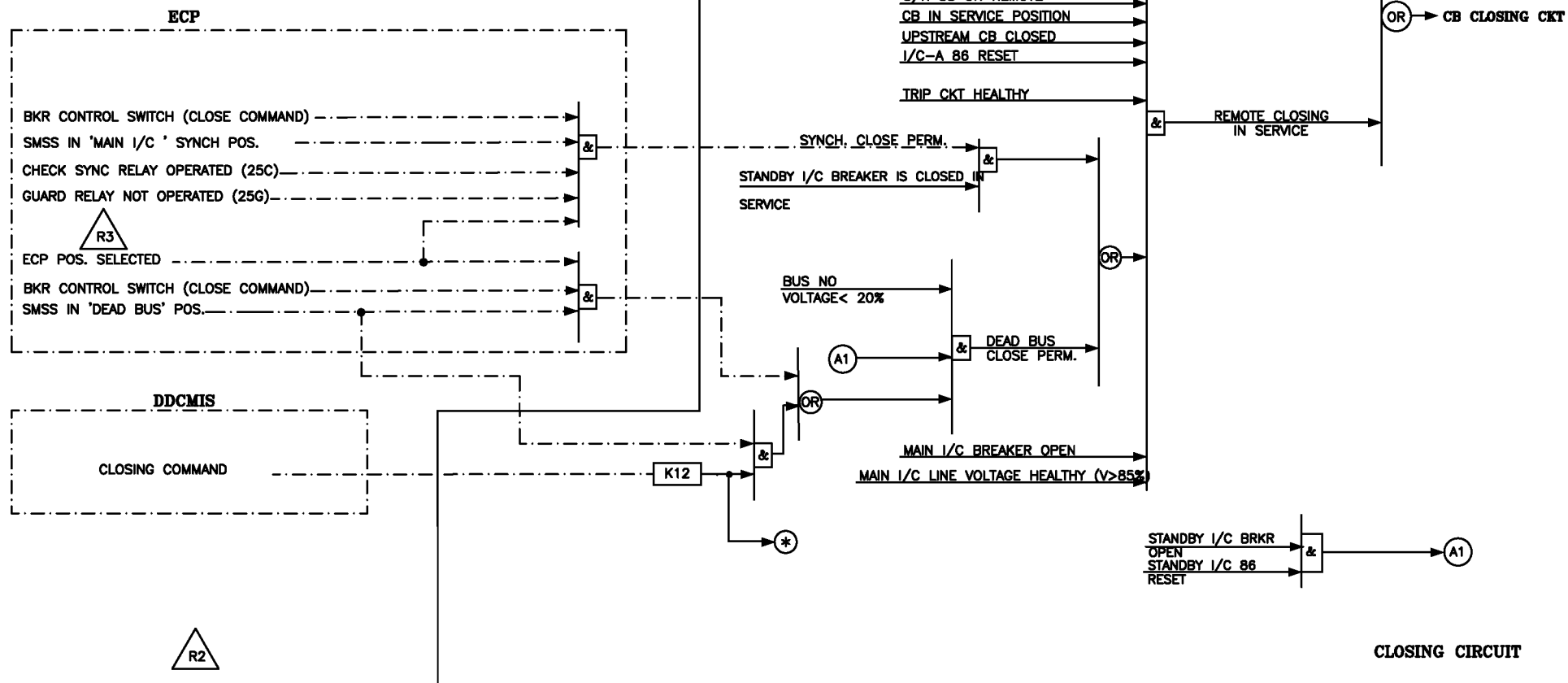
**2X660MW SURATGARH
SUPERCritical TPS**

TITLE
**CONTROL LOGIC FOR 415V PMCC/MCC INCOMER,
BUSCOUPLER & OUTGOING FEEDERS**

DRAWING NO.
PE-DG-392-506-E004
SHEET 26 OF 30 REV. 03

DRAWING NO.
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415V SWITCHGEAR



LOGIC DIAGRAM FOR MAIN I/C TO 415V SWGR (MCC) (WITHOUT B/C) - CONTROLLED FROM ECP & DDCMIS



BHARAT HEAVY ELECTRICALS LTD.
POWER SECTOR
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NOIDA, U.P.

**2X660MW SURATGARH
SUPERCritical TPS**

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**CONTROL LOGIC FOR 415V PMCC/MCC INCOMER,
BUSCOUPLER & OUTGOING FEEDERS**

DRAWING NO.
PE-DG-392-506-E004
SHEET 27 OF 30 REV. 03

DRAWING NO.
PE-DG-392-506-E004

415V SWITCHGEAR

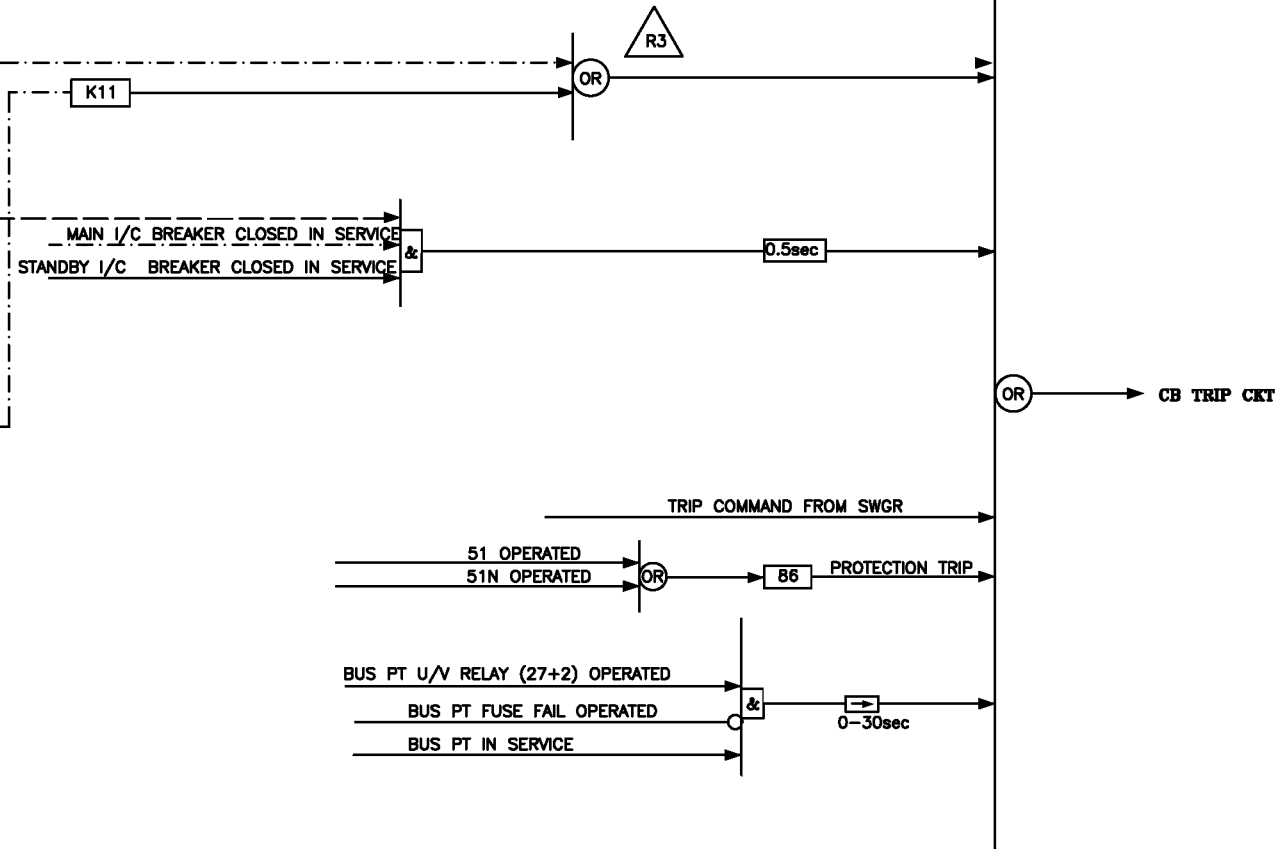
ECP

BKR CONTROL SWITCH (TRIP COMMAND)

SMSS IN 'MAIN I/C' SYNCH POS.

DDCMIS

TRIPPING COMMAND



TRIPPING CIRCUIT

LOGIC DIAGRAM FOR MAIN I/C TO 415V SWGR (MCC) (WITHOUT B/C) -CONTROLLED FROM ECP & DDCMIS



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**2X660MW SURATGARH
SUPERCritical TPS**

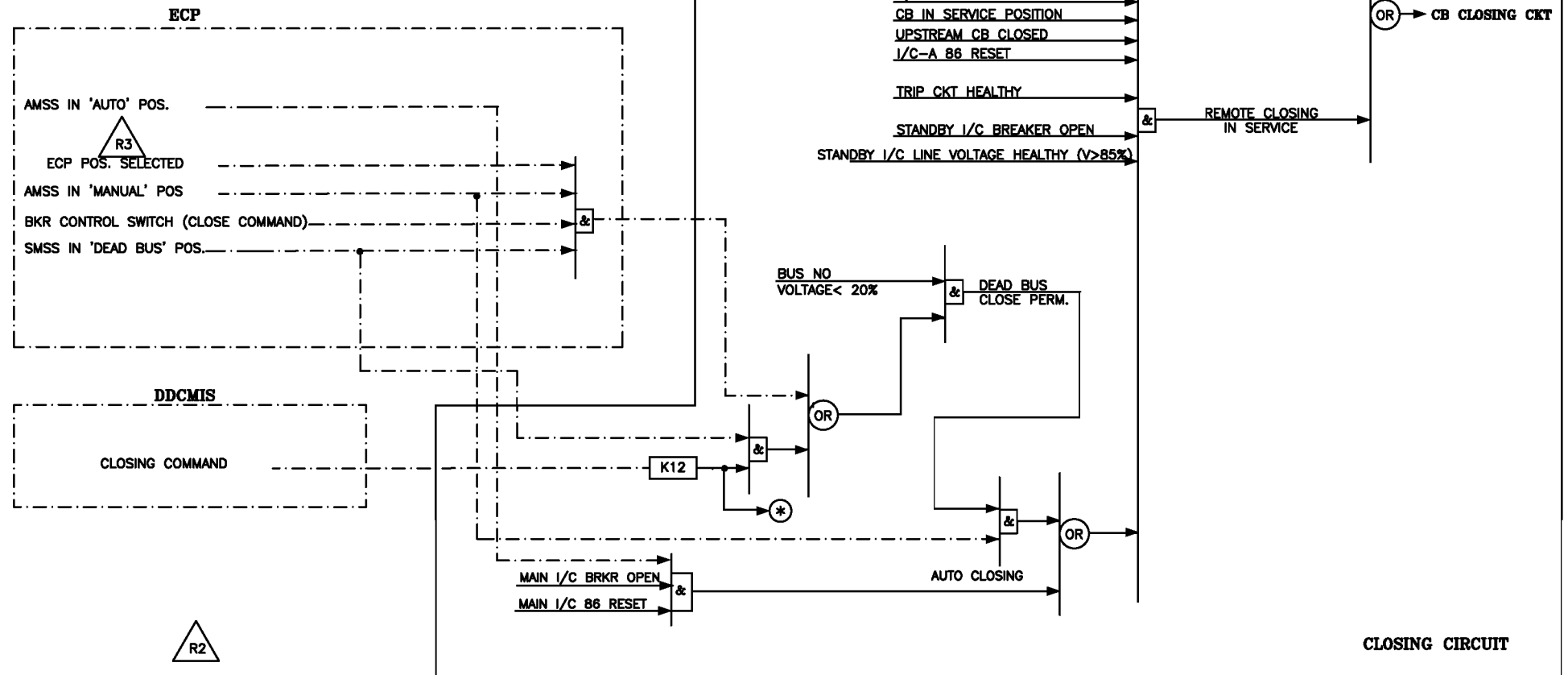
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**CONTROL LOGIC FOR 415V PMCC/MCC INCOMER,
BUSCOUPLER & OUTGOING FEEDERS**

DRAWING NO.
PE-DG-392-506-E004

SHEET 28 OF 30 REV. 03

DRAWING NO.
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415V SWITCHGEAR



LOGIC DIAGRAM FOR STANDBY I/C TO 415V SWGR (MCC) (WITHOUT B/C) -CONTROLLED FROM ECP & DDCMIS



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**2X660MW SURATGARH
SUPERCritical TPS**

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DRAWING NO.
PE-DG-392-506-E004

SHEET 29 OF 30 REV. 03

DRAWING NO.
PE-DG-392-506-E004

ECP

BKR CONTROL SWITCH (TRIP COMMAND)

SMSS IN 'MAIN I/C' SYNCH POS.

DDCMIS

TRIPPING COMMAND

K11


 MAIN I/C BREAKER CLOSED IN SERVICE
 STANDBY I/C BREAKER CLOSED IN SERVICE


OR → CB TRIP CKT

TRIP COMMAND FROM SWGR

 51 OPERATED
 51N OPERATED


86 PROTECTION TRIP

BUS PT U/V RELAY (27+2) OPERATED

BUS PT FUSE FAIL OPERATED

BUS PT IN SERVICE



0-30sec

TRIPPING CIRCUIT

LOGIC DIAGRAM FOR STANDBY I/C TO 415V SWGR (MCC) (WITHOUT B/C) -CONTROLLED FROM ECP & DDCMIS


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 POWER SECTOR
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 NOIDA, U.P.

 2X660MW SURATGARH
 SUPERCRITICAL TPS

 TITLE
 CONTROL LOGIC FOR 415V PMCC/MCC INCOMER,
 BUSCOUPLER & OUTGOING FEEDERS

 DRAWING NO.
 PE-DG-392-506-E004
 SHEET 30 OF 30 REV. 03