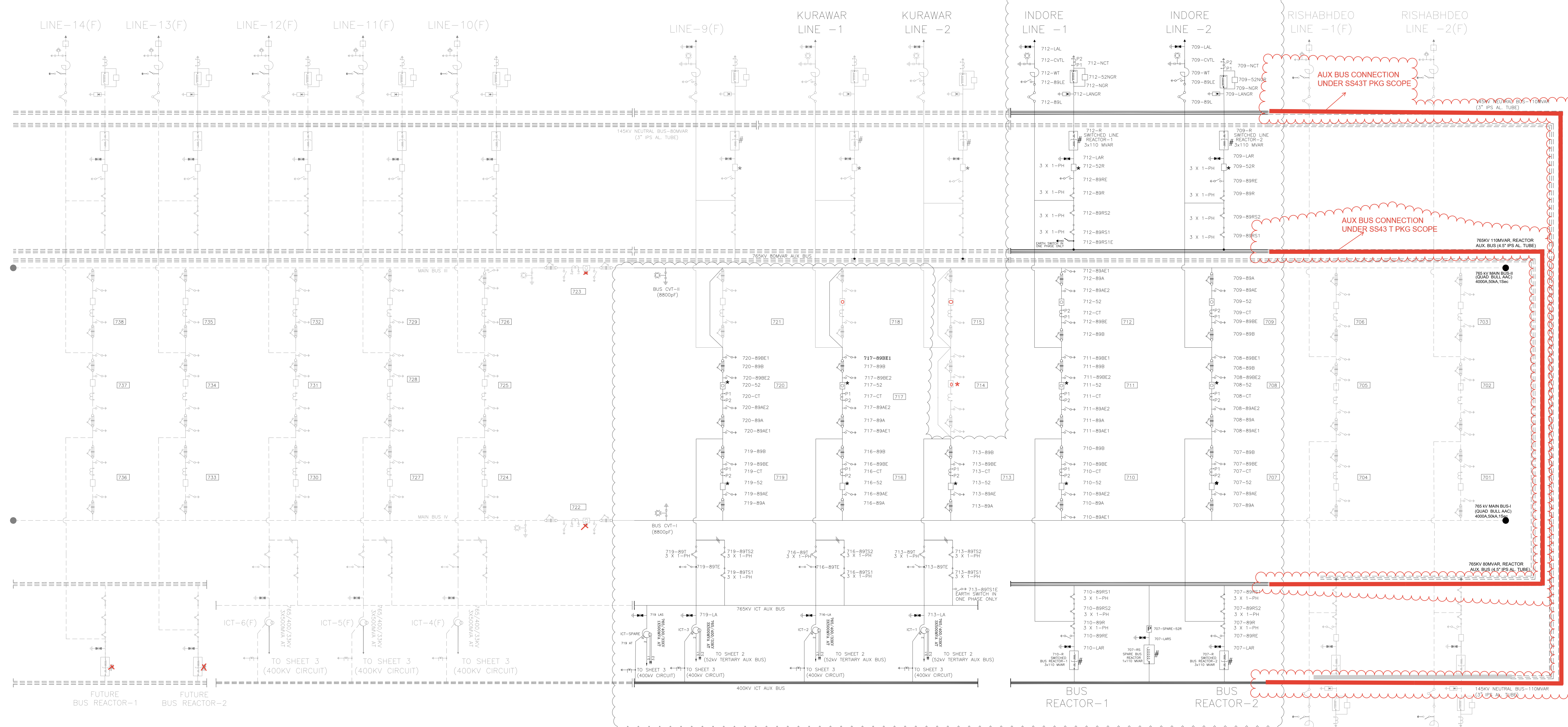


DRG. NO. TB-1431-510-001

SCOPE UNDER 43T MANDSAUR (NEW)



COMMENTS: MODIFICATIONS(IF ANY) W.R.T. LAYOUT DRAWING SHALL BE UPDATED IN SLD.

- NOTES:-
- SYSTEM 765kV, 50ka FOR 1 SEC., 50Hz, 3Ph, SOLIDLY EARTHED
 - PRESENT FUTURE
 - PHASE LOCATION OF WAVE TRAPS TO BE DECIDED DURING DETAILED ENGINEERING
 - 765kV EQUIPMENTS FOR ICT AND REACTOR SWITCHING ARE ALSO INCLUDED IN THE BOQ OF QTY. FOR 765kV MAIN EQUIPMENTS.
 - AUXILIARY BUS ROUTING OF 110MVAR REACTOR SHALL BE SUBJECT TO COMMERCIAL SETTLEMENT AND TO BE READ IN CONJUNCTION WITH LETTER Ref:BHEL/TBEM/Mandsaur/01 Dtd:15.10.2024 & 22.01.2024
 - GANTRY WORK FOR BAY-713 & BAY-714 SHALL NOT COVERED UNDER THE SCOPE OF SS43T PACKAGE

NO COMMERCIAL SETTLEMENT APPLICABLE. COMPLETE AUX BUS CONNECTION FOR 110 MVAR REACTOR (AS MARKED IN SLD) IS UNDER PRESENT SCOPE OF BHEL.

NOA NO. : CC/T/W-AIS/DOM/A06/23/11955/NOA-1/24-108670/01 & NOA-2/24-108670/02 Dated 09/07/2024

ADDITIONAL INFORMATION W.O.No. **ग्राहक/परियोजना का नाम** POWERGRID CORPORATION OF INDIA LTD. **NAME OF CUSTOMER/CONSULTANT-** ESTABLISHMENT OF 3X1500MVAR, 765/400KV AND 5X500MVA, 400/220KV MANDSAUR POOLING STATION ALONG WITH **NAME OF PROJECT-** 2X330MVAR (765KV) BUS REACTOR AND 2X125MVAR 420KV BUS REACTOR.

STATUS OF DRAWING	डी.डी. /NAME	हस्ता. /SIGN.	दि./DATE
DISTRIBUTION OF PRINTS	PC	-SGD-	30.08.24
	JK	-SGD-	30.08.24
	VK	-SGD-	30.08.24

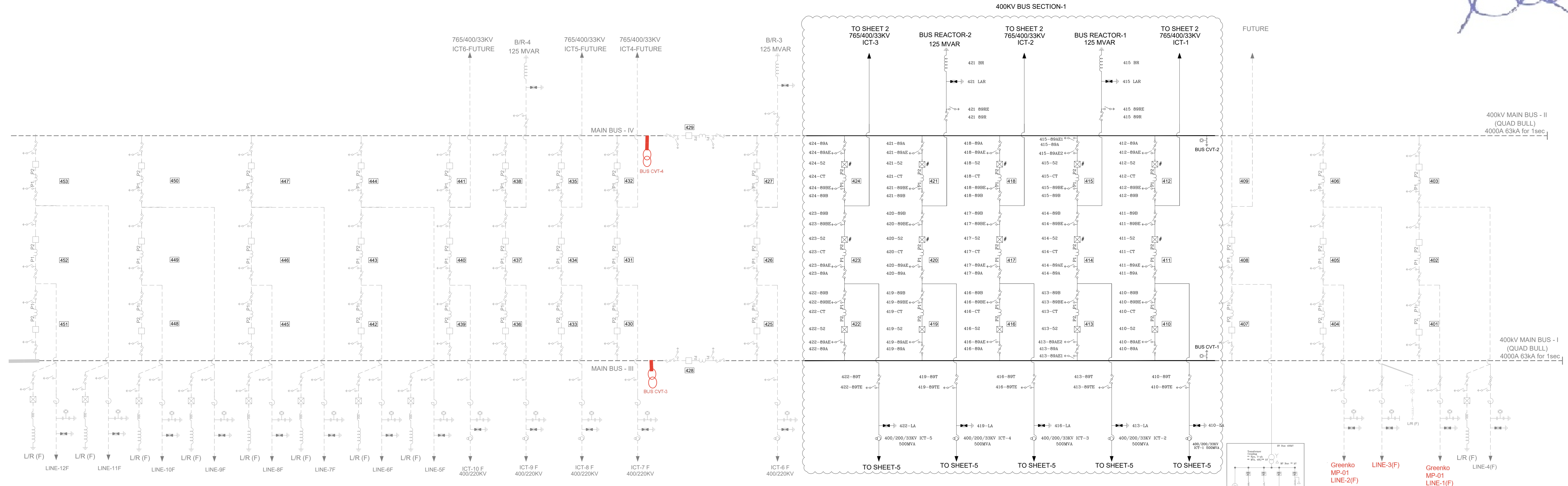
विभाग DEPT. अनुपात / SCALE कार्ड कोड CARD CODE

शीर्षक/TITLE **SINGLE LINE DIAGRAM FOR 765KV MANDSAUR S/S** ड्राईंग.क./DRAWING NO. TB-1431-510-001 पुनः/REV. 03

पृष्ठ क्र./SHEET No. 01 अगला पृष्ठ/NEXT SHEET 02

REV. 03	DATE 24-01-25	ALTERED CHECKED	PC JK	REV. 02	DATE 04-01-25	ALTERED CHECKED	PC JK	REV. 01	DATE 14-11-24	ALTERED CHECKED	PC JK
AS PER POWERGRID COMMENTS VIDE EMAIL DTD:24.01.25				AS PER POWERGRID COMMENTS				AS PER POWERGRID COMMENTS			

DRG. NO. TB-1431-510-001



BILL OF QTY. FOR 400kV MAIN EQUIPMENTS (BHEL'S SCOPE):

SL NO.	DESCRIPTION	RATING	S. C. RATING	SLD QTY. (NO.)	NOA QTY. (NO.)	SYMBOL	LEGEND	MAKE	
1	125MVAR BUS REACTOR (3-PH)	420 kV	63 KA FOR 1 S.	2	2		BR	BHEL	
2	SP6 CIRCUIT BREAKER WITHOUT CR WITH CSD (3 PH) WITH SUPPORT STRUCTURE	3150A	63 KA FOR 1 S.	15	10 with CSD		52	MAKE TO BE INDICATED IN FINAL AS BUILT DRAWING	
3	SP6 CIRCUIT BREAKER WITHOUT CR (3-PH) WITH SUPPORT STRUCTURE	3150A	63 KA FOR 1 S.	5	5 without CSD		52		
4	ISOLATOR WITH ONE E/S (3 PH) DOUBLE BREAK TYPE	3150A	63 KA FOR 1 S.	35	35		89/89E		
5	ISOLATOR WITH TWO E/S (3 PH) DOUBLE BREAK TYPE	3150A	63 KA FOR 1 S.	2	2		89/89E1/89E2		
6	ISOLATOR WITH ONE E/S (1 PH) DOUBLE BREAK TYPE	3150A	63 KA FOR 1 S.	10	10		89/89E		
7	ISOLATOR WITHOUT E/S (1 PH) DOUBLE BREAK TYPE	3150A	63 KA FOR 1 S.	8	8		89		
8	CURRENT TRANSFORMER (1 PH.) WITH 120% EXTENDED CURRENT RATING.	3000A	63 KA FOR 1 S.	45	45		CT		BHEL
9	SURGE ARRESTER (1 PH.)	336 kV	NA	31	31		LA		BHEL
10	500MVA, 400/220/33KV ICT	400KV	NA	5	5		ICT		T&R
11	CVT (1-Ph)	400KV	4400pF	6	6		CVT		BHEL
12	CONTROLLED SWITCHING DEVICE	400KV	NA	10	10		CSD		TBD

400kV CT DETAILS

CORE	CURRENT RATIO	ACCURACY CLASS	OUTPUT BURDEN(VA)	MIN KPV (V)	MAX RCT (OHMS)	MAX IM AT KPV (MA)	PURPOSE
1	3000/2000/500/1	PX	-	3000-2000-500	15-10-2.5	20mA on 3000/1 Tap 30mA on 2000/1 Tap 120mA on 500/1 Tap	BUS DIFF. MAIN-1
2	3000/2000/500/1	PX	-	3000-2000-500	15-10-2.5	20mA on 3000/1 Tap 30mA on 2000/1 Tap 120mA on 500/1 Tap	BUS DIFF. MAIN-2
3	3000/2000/500/1	0.2S 0.2S 0.2S	20 20 20	-	-	-	METERING
4	3000/2000/500/1	0.2S 0.2S 0.2S	20 20 20	-	-	-	METERING
5	3000/2000/500/1	PX	-	3000-2000-500	15-10-2.5	20mA on 3000/1 Tap 30mA on 2000/1 Tap 120mA on 500/1 Tap	LINE PROT.N.MAIN-2/ TRAF0 BACKUP
6	3000/2000/500/1	PX	-	3000-2000-500	15-10-2.5	20mA on 3000/1 Tap 30mA on 2000/1 Tap 120mA on 500/1 Tap	LINE PROT.N.MAIN-1/ TRAF0 DIFF

400kV, 4400 PF CVT DETAILS

CORE DETAILS	APPLICATION	VOLTAGE RATIO	OUTPUT (VA)	ACCURACY
SEC-I	PROTECTION	400kV / 0.11kV	50	3P
SEC-II	PROTECTION	400kV / 0.11kV	50	3P
SEC-III	METERING	400kV / 0.11kV	50	0.2

- NOTES:-
 1. SYSTEM 400kV, 63KA FOR 1 SEC., 50Hz, 3Ph, SOLIDLY EARTHED
 2. PRESENT FUTURE
 3. PHASE LOCATION OF WAVE TRAPS TO BE DECIDED DURING DETAILED ENGINEERING
 4. 400kV EQUIPMENTS FOR 765/400/33kV ICT SWITCHING ARE ALSO INCLUDED IN THE BOQ OF QTY. FO 400KV MAIN EQUIPMENTS.

NO 400KV WAVE TRAP UNDER PRESENT SCOPE

NOA NO. : CC/TW-AIS/DOM/A10/23/01956/NOA-1/24-102643/01 POWERGRID CORPORATION OF INDIA LIMITED LTD

NAME OF CUSTOMER: Establishment of 6x1500 MVA, 765/400 kV & 5x500 MVA
 NAME OF CONSULTANT: 400/220 kV Mandsaur Pooling Station Along With 2x330MVAR (765KV) Bus Reactor And 2x125MVAR 420KV Bus Reactor.

STATUS OF DRAWING: [Blank]
 DISTRIBUTION OF PRINTS: [Blank]

REV. 03	DATE 21-01-25	CHECKED JK	APPROVED VK	PC
REV. 02	DATE 04-01-25	CHECKED JK	APPROVED VK	PC
REV. 01	DATE 14-11-24	CHECKED JK	APPROVED VK	PC

AS PER POWERGRID COMMENTS VIDE EMAIL DTD:24.01.25

AS PER POWERGRID COMMENTS

AS PER POWERGRID COMMENTS

DATE: 30.08.24
 TIME: 10:00 AM
 SCALE: 1:1
 SHEET NO: 05 OF 06

TITLE: SINGLE LINE DIAGRAM FOR 400kV MANDSAUR S/S

DRAWING NO. TB-1431-510-001

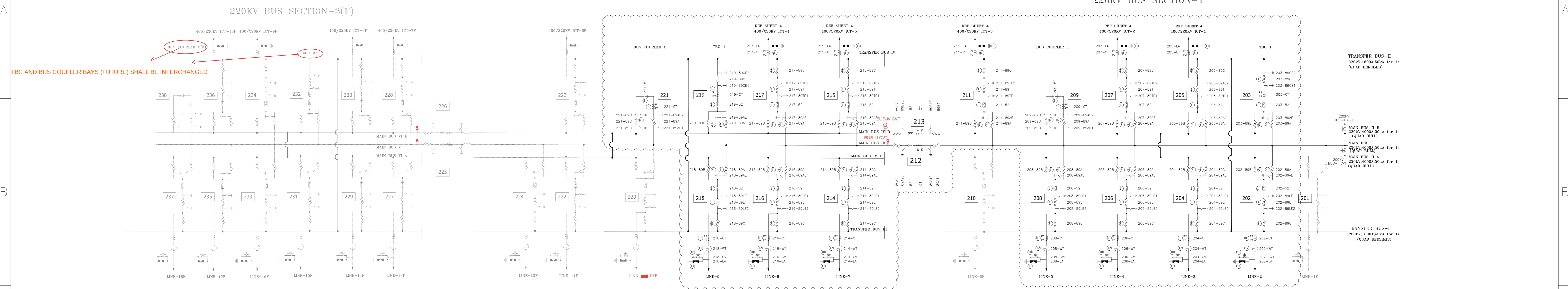
REV. 03

DRG. NO.

220KV BUS SECTION-2

220KV BUS SECTION-1

220KV BUS SECTION-3(F)



BHEL SCOPE

BILL OF QUANTITY FOR 220kV EQUIPMENTS (BHEL SCOPE)

ITEM CODE	DESCRIPTION	SYMBOL	NOA QTY. (NOS.)	SLD QTY. (NOS.)	LEGEND	MAKE
1	245KV, 1600A, 50kA/1s CIRCUIT BREAKER (3-Ph) WITH SUPPORT STRUCTURE		14	14	52	MAKE TO BE INDICATED IN FINAL AS-BUILT DRAWINGS
2	245KV, 3150A, 50kA/1s CIRCUIT BREAKER (3-Ph) WITH SUPPORT STRUCTURE (BUS COUPLER & BUS SECTIONALISER BAYS)		4	4	52	
3	245KV, 1600A, 50kA/1s HDB ISOLATOR WITH 2E/S (3-Ph)		14	14	89/89E1/89E2	
4	245KV, 1600A, 50kA/1s HDB ISOLATOR WITH 1E/S (3-Ph)		14	14	89/89E1	
5	245KV, 1600A, 50kA/1s HDB TANDEM ISOLATOR WITHOUT E/S (3-Ph)		26	26	89	
6	245KV, 3150A, 50kA/1s HDB ISOLATOR WITH 2E/S (3-Ph) (BUS COUPLER BAYS)		04	04	89/89E1/89E2	
7	245KV, 3150A, 50kA/1s HDB ISOLATOR WITH 1E/S (3-Ph)(BUS SECTIONALISER BAYS)		04	04	89/89E1	
8	245KV, 1600A (120%), 50kA/1s CURRENT TRANSFORMER (1-Ph)		42	42	CT	
9	245KV, 2500A (150%), 50kA/1s CURRENT TRANSFORMER (1-Ph) (BUS COUPLER & BUS SECTIONALISER BAYS)		12	12	CT	
10	245KV CAPACITIVE VOLTAGE TRANSFORMER (4400 pF) (1-Ph)		33	33	CVT	
11	216KV SURGE ARRESTER (1-Ph)		36	36	LA	
12	220KV, 1600A, 0.5mH, 50kA/1s LINE TRAP (1-Ph)		14	14	WT	

220kV, 1600A, 50kA/1s CT DETAILS

CORE	RATIO	MAX. EXCITING (mA) CURRENT AT V _k	KNEE POINT VOLTAGE (V _k)	ACCURACY	OUTPUT BURDEN	RCT
1	1600-800/1A	25 ON 1600/1 TAP 50 ON 800/1 TAP	1600/800V	PX		8/4
2	1600-800/1A	25 ON 1600/1 TAP 50 ON 800/1 TAP	1600/800V	PX		8/4
3	1600-800/1A	-	-	0.2S	20VA	-
4	1600-800/1A	25 ON 1600/1 TAP 50 ON 800/1 TAP	1600/800V	PX		8/4
5	1600-800/1A	25 ON 1600/1 TAP 50 ON 800/1 TAP	1600/800V	PX		8/4

220kV, 2500A, 50kA/1s CT DETAILS

CORE	RATIO	MAX. EXCITING (mA) CURRENT AT V _k	KNEE POINT VOLTAGE (V _k)	ACCURACY	OUTPUT BURDEN	RCT
1	2500-1600-800/1A	16-25-50mA	2500-1600-800V	PX		12.5-8-4
2	2500-1600-800/1A	16-25-50mA	2500-1600-800V	PX		12.5-8-4
3	2500-1600-800/1A	-	-	0.2S	20VA	-
4	2500-1600-800/1A	16-25-50mA	2500-1600-800V	PX		12.5-8-4
5	2500-1600-800/1A	16-25-50mA	2500-1600-800V	PX		12.5-8-4

220kV, 4400 PF CVT DETAILS

CORE DETAILS	APPLICATION	VOLTAGE RATIO	OUTPUT (VA)	ACCURACY
SEC-I	PROTECTION	220kV / 0.11kV	50	3P
SEC-II	PROTECTION	220kV / 0.11kV	50	3P
SEC-III	METERING	2200kV / 0.11kV	50	0.2

10 NOS OF ISOLATORS ARE NOT CONNECTED DIRECTLY TO ANY BUS, HENCE FOR THESE 10 NOS OF ISOLATORS BUS TRANSFER CURRENT SWITCHING DUTY IS NOT REQUIRED.
WT QTY SHALL BE FINALIZED BASED ON LINE DETAILS.

- NOTES:-
- SYSTEM 220kV, 50kA FOR 1 SEC., 50Hz, 3Ph, SOLIDLY EARTHED
 - PRESENT _____
FUTURE _____
 - PHASE LOCATION OF WAVE TRAPS TO BE DECIDED DURING DETAILED ENGINEERING

NOA NO. : CC/T/W-AIS/DOM/A06/23/11955/NOA-1/24-108670/01 & NOA-2/24-108670/02 Dated 09/07/2024

ADDITIONAL INFORMATION W.O.No.	ग्राहक/परियोजना का नाम NAME OF CUSTOMER/CONSULTANT- NAME OF PROJECT-	POWERGRID CORPORATION OF INDIA LTD. ESTABLISHMENT OF 3X1500MVAR, 765/400KV AND 5X500MVA, 400/220KV MANDSAUR POOLING STATION ALONG WITH 2X330MVAR (765KV) BUS REACTOR AND 2X125MVAR 420KV BUS REACTOR.
STATUS OF DRAWING	वित्त/परियोजना का नाम Bharat Heavy Electricals Limited	वर्ग/परियोजना का नाम POWERGRID CORPORATION OF INDIA LTD.
DISTRIBUTION OF PRINTS	वित्त/परियोजना का नाम Bharat Heavy Electricals Limited	वर्ग/परियोजना का नाम POWERGRID CORPORATION OF INDIA LTD.
वित्त/परियोजना का नाम Bharat Heavy Electricals Limited	वर्ग/परियोजना का नाम POWERGRID CORPORATION OF INDIA LTD.	वर्ग/परियोजना का नाम POWERGRID CORPORATION OF INDIA LTD.
वित्त/परियोजना का नाम Bharat Heavy Electricals Limited	वर्ग/परियोजना का नाम POWERGRID CORPORATION OF INDIA LTD.	वर्ग/परियोजना का नाम POWERGRID CORPORATION OF INDIA LTD.

अनुपात / SCALE: 1:1
कार्ड कोड / CARD CODE: 06

शीर्षक/TITLE: SINGLE LINE DIAGRAM FOR 220KV MANDSAUR S/S

ड्राईंग.क./DRAWING NO.: TB-1431-510-001

पुनः/REV.: 03

पृष्ठ क्र./SHEET No. 06 अगला पृष्ठ/NEXT SHEET --

REV. 03	DATE	ALTERED	PC	REV. 02	DATE	ALTERED	PC	REV. 01	DATE	ALTERED	PC
	24-01-25	CHECKED	JK		04-01-25	CHECKED	JK		14-11-24	CHECKED	JK
		APPROVED	VK			APPROVED	VK			APPROVED	VK

ZONE: AS PER POWERGRID COMMENTS VIDE EMAIL DTD:24.01.25