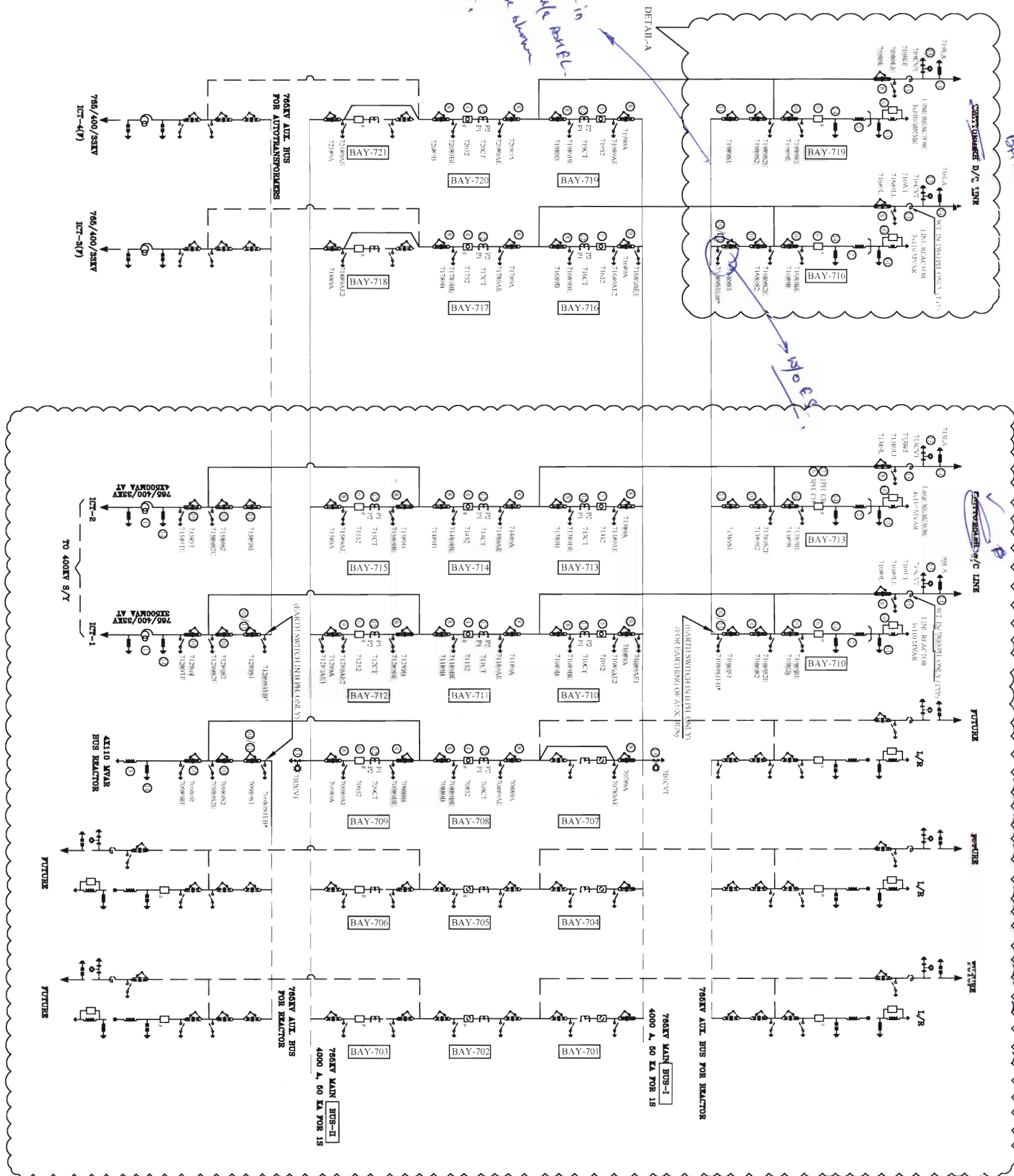
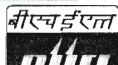


765KV SINGLE LINE DIAGRAM

[illegible]

NOA NO. :		CC-CS/484-WR2/SS-2953/11/G8/NOA-1&2/5727 & 5728 DT. 31.03.16													
ADDITIONAL INFORMATION W.O.No.		ब्राह्मक/परियोजना का नाम POWER GRID CORPORATION OF INDIA. LIMITED NAME OF CUSTOMER/PROJECT													
STATUS OF DRAWING		SUBSTATION PACKAGE-SS01 FOR CONSTRUCTION OF 765/400/220KV BHUJ S/S & EXT. OF 765KV BANASKANTHA S/S UNDER GREEN ENERGY CORRIDOR ISTS PART- C (PART-1)													
DISTRIBUTION OF PRINTS		 भारत हेवी इलेक्ट्रिकल्स लिमिटेड ट्रांसमिशन परियोजना विभाग BHARAT HEAVY ELECTRICALS LTD. TRANSMISSION PROJECTS DIVISION <table border="1"> <tr> <td>कजरा DRAWN</td> <td>नाम /NAME JS</td> <td>हस्ता./SIGN.</td> <td>दि./DATE 25.04.16</td> </tr> <tr> <td>जैका CHECKED</td> <td>SK/AA</td> <td></td> <td></td> </tr> <tr> <td>स्वीकृत APPROVED</td> <td>AS/RS</td> <td></td> <td></td> </tr> </table>		कजरा DRAWN	नाम /NAME JS	हस्ता./SIGN.	दि./DATE 25.04.16	जैका CHECKED	SK/AA			स्वीकृत APPROVED	AS/RS		
कजरा DRAWN	नाम /NAME JS	हस्ता./SIGN.	दि./DATE 25.04.16												
जैका CHECKED	SK/AA														
स्वीकृत APPROVED	AS/RS														
REV.	DATE	ALTERED CHECKED APPROVED	विभाग TBEM DEPT. कोड 422 CODE												
			अनुपात / SCALE NTS												
			कर्क कोड CARD CODE												
ZONE		शीर्षक/TITLE SINGLE LINE DIAGRAM FOR 765 kV BANASKANTHA EXTENSION.													
		ड्राईंग.क./DRAWING NO. TB-385-510-121													
		पुनः/REV. 0													
		पृष्ठ क./SHEET No. 01 / कुल पृष्ठ /NEXT SHEET 02													

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INVENTORY No.	SIGN. & DATE	REF. DRG. No.
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Aux bus not in BITE's scope. Hence may be shown in dotted.

NOA NO. : CC-CS/483-WR2/SS-2803/11/G8/NOA-1&2/5507 & 5508 DTD. 01.09.15	
ADDITIONAL INFORMATION W.O.No. STATUS OF DRAWING CONTRACT DISTRIBUTION OF PRINTS	
भारतीय बिजली ग्रिड कॉर्पोरेशन लिमिटेड NAME OF CUSTOMER/PROJECT SUBSTATION PACKAGE-SS01 FOR CONSTRUCTION OF 765/400 /220KV BHU S/S & EXT. OF 765KV BANASKANTHA S/S UNDER GREEN ENERGY CORRIDOR ISTS PART- C (PART-1)	
REV. DATE ALTERED CHECKED APPROVED ZONE	डिजाइन TBEW ड्राईंग 422 कोड कोड कोड
भारतीय बिजली ग्रिड कॉर्पोरेशन लिमिटेड भारतीय बिजली ग्रिड कॉर्पोरेशन लिमिटेड BHARAT HEAVY ELECTRICALS LTD. TRANSMISSION PROJECTS DIVISION	अनुपात / SCALE NTS कार्ड कोड कार्ड कोड
शीट/टाइटल SINGLE LINE DIAGRAM FOR 765 BANASKANTHA EXTENSION	ड्राईंग/REV. TB-385-510-021 0
पृष्ठ नं./SHEET No. 02 अगला पृष्ठ/NEXT SHEET 03	ड्राईंग/REV. TB-385-510-021 0

BILL OF QTY. FOR 765KV MAIN EQUIPMENTS:

SL.NO	DESCRIPTION	RATING	QTY. (NO PART-1)	SYMBOL	SCOPE OF SUPPLY	LEGEND
1	500 MVA, (1-PH) AUTOTRANSFORMER	765/400/33KV	---			T
2	110MVAR LINE REACTOR (1-PH) WITH NGR(550 Ohm)	765KV	6		PGCIL	LRNGR
3	110MVAR BUS REACTOR (1-PH)	765KV	---			BR
4	SF6 CIRCUIT BREAKER WITH CR WITH CSD (3-PH)	3150A	2		PGCIL	52
5	SF6 CIRCUIT BREAKER WITH CR WITHOUT CSD (3-PH)	3150A	2			52
6	SF6 CIRCUIT BREAKER WITHOUT CR WITH CSD (3-PH)	3150A	2			52
7	SF6 CIRCUIT BREAKER WITHOUT CR WITH CSD (1-PH)	3150A	---		PGCIL	52
8	ISOLATOR WITH ONE E/SW (3 PH) VERTICAL KNEE TYPE	3150A	12		BHEL	89/89E
9	ISOLATOR WITH TWO E/SW (3 PH) VERTICAL KNEE TYPE	3150A	---		BHEL	89/89E1 /89E2
10	ISOLATOR WITH ONE E/SW (1 PH) VERTICAL KNEE TYPE	2000A	12		BHEL	89/89E1
11	ISOLATOR WITHOUT E/SW (1 PH) VERTICAL KNEE TYPE	2000A	6		BHEL	89
12	CURRENT TRANSFORMER (1 PH) WITH 120% EXTENDED CURRENT RATING	3000A	24		BHEL	CT
13	CVT (1 PH)	8800pF	6		BHEL	CVT
14	SURGE ARRESTER (1 PH)	624 kV	12		BHEL	LA
15	WAVE TRAP (1 PH) PEDESTAL TYPE	1mH, 3150A	04		BHEL	WT

BILL OF QTY. FOR 132 & 33kv MAIN EQUIPMENTS:

SL.NO	DESCRIPTION	RATING	QTY. (NO)	SYMBOL	SCOPE OF SUPPLY	LEGEND
60	SF6 CIRCUIT BREAKER FOR NGR BYPASS (1-PH)	132KV, 1250A	2		BHEL	52
61	SURGE ARRESTER (1 PH)	132KV, 10 KA 5 KJ/KV	2		PGCIL	LA
62	NEUTRAL CT (1 PH) WITH 120% EXTENDED CURRENT RATING	33KV	42		PGCIL	CT

NOTES:

1. ELECTRICAL CONNECTION SHALL BE MADE MANUALLY DEPENDING UPON 765KV SIDE SWITCHING OF DIFFERENT FEEDERS OF AUTOTRANSFORMER REACTOR.
2. SUPPLY, ERECTION, TESTING & COMMISSIONING INCLUDING FORMATION OF HV, LV, NEUTRAL, TERTIARY & AUXILIARY BUSES OF 3x500MVA, (765KV / /3) / (400KV / /3) / 33KV 1Q AUTO TRANSFORMERS AND LINE/BUS REACTOR ARE NOT IN BHEL SCOPE.
3. 765KV WAVE TRAP SHALL BE PROVIDED IN TWO PHASE ONLY.

SYSTEM PARAMETERS						
DESCRIPTION	765 kV	400 kV	220 kV	132 kV	66 kV	11 kV
1) HIGHEST SYSTEM VOLTAGE	800kV (r.m.s.)	420kV (r.m.s.)	245kV (r.m.s.)	145kV (r.m.s.)	72.5kV (r.m.s.)	12kV (r.m.s.)
2) SYSTEM OPERATING VOLTAGE	765kV	400kV	220kV	132kV	66kV	11kV
3) P.F. WITHSTAND VOLTAGE	850kV (r.m.s.)	630kV (r.m.s.)	460kV (r.m.s.) dry and wet	275kV (r.m.s.) dry and wet	140kV (r.m.s.) dry and wet	28kV (r.m.s.) dry and wet
4) LIGHTING IMPULSE WITHSTAND VOLTAGE	2100 kVP	1550 kVP	1050 kVP	650 kVP	325 kVP	75 kVP
5) SWITCHING IMPULSE WITHSTAND VOLTAGE	1550 kVP	1050 kVP	---	---	---	---
6) SYSTEM FAULT LEVEL	50KA FOR 1 Sec.	63KA FOR 1 Sec.	40KA FOR 1 Sec.	31.5KA FOR 1 Sec.	31.5KA FOR 1 Sec.	25KA FOR 1 Sec.
7) CREEPAGE	25MM/KV	25MM/KV	25MM/KV	25MM/KV	25MM/KV	25MM/KV
8) SYSTEM EARTHING	EFFECTIVELY	EFFECTIVELY	EFFECTIVELY	EFFECTIVELY	EFFECTIVELY	EFFECTIVELY

800KV, 3000A, CT

Core No.	Current Ratio	Accuracy Class	Output Burden VA	Min kVP (V)	Max RCT in Ohms	Max Im at kVP (mA)	Purpose
1	3000-2000-500 / 1	TPS	-	3000-2000-500	15-10-2.5	20mA on 3000/1 Tap 30mA on 2000/1 Tap 120mA on 500/1 Tap	BUS DIFF. CHECK
2	3000-2000-500 / 1	TPS	-	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
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	TPS	-	3000-2000-500	15-10-2.5	20mA on 3000/1 Tap 30mA on 2000/1 Tap 120mA on 500/1 Tap	TRANS. BACKUP/LINE BACKUP PROTN.
6	3000-2000-500 / 1	TPS	-	3000-2000-500	15-10-2.5	20mA on 3000/1 Tap 30mA on 2000/1 Tap 120mA on 500/1 Tap	LINE PROTN/LBB PROTN

All protection class shall be accuracy class TPS as per IEC 600446. Metering cores shall be accuracy class 0.2S as per IEC. 60044-1

800KV CVT:

Ratio	756KV / $\sqrt{3}$ / $\sqrt{3}$ / $\sqrt{3}$ / $\sqrt{3}$	110V / 110V / 110V / 110V
Sec-I	Class - 0.5/3P, 50VA	
Sec-II	Class - 0.5/3P, 50VA	
Sec-III	Class - 0.2, 50VA Capacitance - 8800 pF (+10%, -5%)	

Rated Voltage Factor: 1.2 Continuous
1.5 for 30 Seconds

NOA NO. : CC-CS/483-WR2/SS-2803/11/G8/NOA-1&2/5507 & 5508 DT. 01.09.15				
ADDITIONAL INFORMATION W.O.No.				
STATUS OF DRAWING				
DISTRIBUTION OF PRINTS				
NAME OF CUSTOMER/PROJECT POWER GRID CORPORATION OF INDIA LIMITED SUBSTATION PACKAGE-SS01 FOR CONSTRUCTION OF 765/400 /220KV BHUJ S/S & EXT. OF 765KV BANASKANTHA S/S UNDER GREEN ENERGY CORRIDOR ISTS PART- C (PART=1)				
BHEL BHARAT HEAVY ELECTRICALS LTD. TRANSMISSION PROJECTS DIVISION				
REV.	DATE	ALTERED	CHKD	DATE
ZONE		APPROVED		
SINGLE LINE DIAGRAM FOR 765 kV BANASKANTHA EXTENSION		APPROVED		
TB-385-510-021		0		

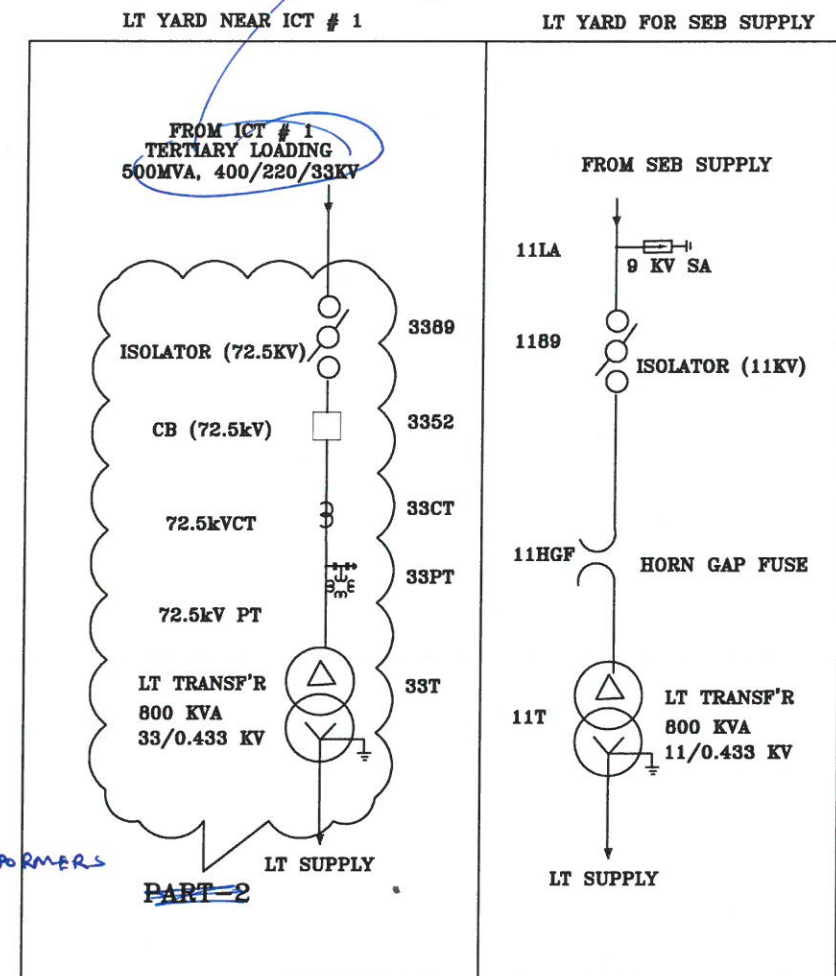
DRAWING No. TB-385-510-001

COMPUTER DRG. PATH NAME :

REF. DRG. No.

SIGN. & DATE

INVENTORY No.



2

Pls. refer NOK. No. 3 of Revised
SLD, & No. 800KVA LT Transformer
shall be loaded at 765/400KV
Transformer.

Approved/Released for Fabrication/
 construction
 II. Approved/Released for Fabrication/
 construction Subject to incorporation
 of comments. Modification as Noted.
 Plans/Drawings Required.
 To Be Submitted for Approval of
 Inspector and the Comments.
 Approved and Record.
 Not Approved.
 Civil Corporation or Inst
 1971-1976 1976 Group's Corporation.

ADDITIONAL INFORMATION
W.O.No. 85003

STATUS OF DRAWING	CONTRACT

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REV.	DATE	ALTERED
		CHECKED
		APPROVED

ZONE	
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ग्राहक/परियोजना का नाम POWER GRID CORPORATION OF INDIA LIMITED

NAME OF CUSTOMER/PROJECT	SUBSTATION PACKAGE-SS01 FOR CONSTRUCTION OF 765/400/220KV BHUJ S/S & EXT. OF 765KV BANASKANTHA S/S UNDER GREEN ENERGY CORRIDOR ISTS PART- C (PART-1)
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 भारत हेवी इलेक्ट्रिकल्स लिमिटेड
 ट्रांसमिशन परियोजना विभाग
 BHARAT HEAVY ELECTRICALS LTD.
 TRANSMISSION PROJECTS DIVISION

विभाग DEPT.	TBEM		अनुपात / SCALE	कार्ड कोड CARD CODE
कोड 422			NTS	

CODE			
शीर्षक/TITLE			
SINGLE LINE DIAGRAM FOR 765/400/220kV BHUJ S/S.			

खर्चा DRAWN	नाम /NAME	हस्ता./SIGN.	दि./DATE
	JS		06.04.1
जैचा CHECKED	SK/AA		
स्वीकृत	AS/RS		

डाईग.क./DRAWING NO.	पुनः/REV
TB-385-510-001	0

પૃષ્ઠ ક્ર./SHEET No. 01 અગાળા પૃષ્ઠ /NEXT SHEET 02

DRAWING No. TB-385-510-001

COMPUTER DRG. PATH NAME :

REF. DRG. No.

SIGN. & DATE

INVENTORY No.

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ADDITIONAL INFORMATION
W.O.No. 85003

STATUS OF DRAWING	CONTRACT
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DISTRIBUTION OF PRINTS

REV.	DATE	ALTERED
		CHECKED
		APPROVED

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ग्राहक/परियोजना का नाम POWER GRID CORPORATION OF INDIA LIMITED

NAME OF CUSTOMER/PROJECT	SUBSTATION PACKAGE-SS01 FOR CONSTRUCTION OF 765/400/220KV BHUJ S/S & EXT. OF 765KV BANASKANTHA S/S UNDER GREEN ENERGY CORRIDOR ISTS PART-C (PART-1)
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भारत हेवी इलेक्ट्रिकल्स लिमिटेड
द्रांसमिहान परियोजना विभाग
BHARAT HEAVY ELECTRICALS LTD.
TRANSMISSION PROJECTS DIVISION

विभाग	TBEM
DEPT.	
कोड	422

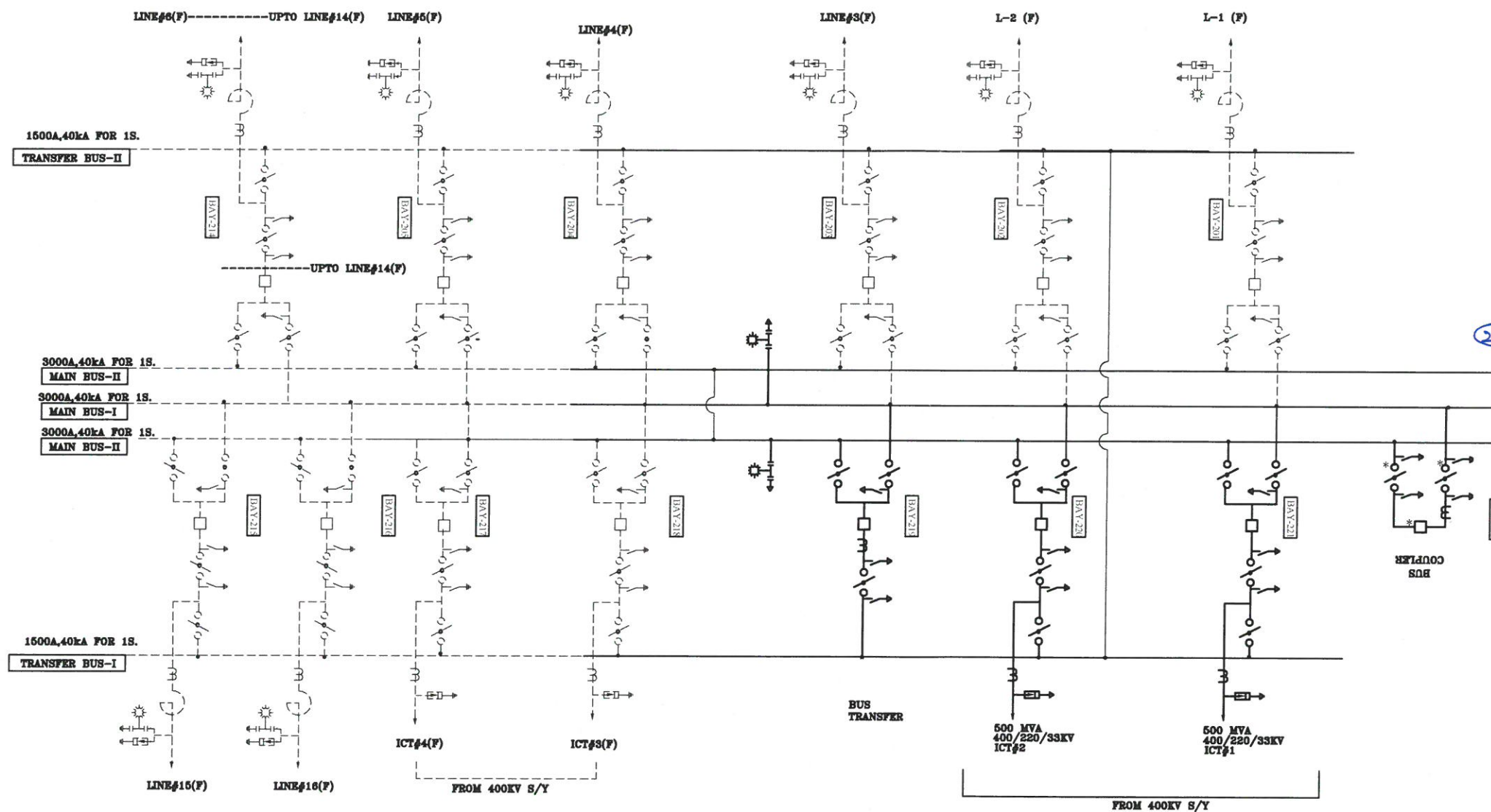
SINGLE LINE DIAGRAM
FOR 765/400/220kV BHUJ S/S.

कला DRAWN	नाम /NAME	हस्ता./SIGN.	दि./DATE
	JS		06.04.16
पेचा CHECKED	SK/AA		
स्वीकृत AS/RS			

डाईग.क्र./DRAWING NO.	पुनः/REV
TB-385-510-001	0

पृष्ठ क्र./SHEET No. 02 अगला पृष्ठ /NEXT SHEET 03

DRAWING No. TB-385-510-001



220KV SINGLE LINE DIAGRAM

① Put the complete 220KV SLD in cloud and indicate the same under Part-2.

② Part-2 not under present scope of award.

NOA NO. : CC-CS/484-WR2/SS-2953/11/G8/NOA-1&2/5727 & 5728 DT. 31.03.16

ADDITIONAL INFORMATION
W.O.No. 85003

STATUS OF DRAWING CONTRACT

DISTRIBUTION OF PRINTS

POWER GRID CORPORATION OF INDIA LIMITED

NAME OF CUSTOMER/PROJECT SUBSTATION PACKAGE-SS01 FOR CONSTRUCTION OF 765/400/220KV BHUJ S/S & EXT. OF 765KV BANASKANTHA S/S UNDER GREEN ENERGY CORRIDOR ISTS PART- C (PART-1)

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
इंजीनियरिंग परियोजना विभाग
BHARAT HEAVY ELECTRICALS LTD.
TRANSMISSION PROJECTS DIVISION

क्रमांक DRAWN	नाम /NAME	हस्ता./SIGN.	दि./DATE
जेता CHECKED	JS		06.04.16
स्वीकृत APPROVED	SK/AA		
	AS/RS		

REV.	DATE	ALTERED CHECKED APPROVED

विभाग DEPT.	TBEM
कोड CODE	422

शीर्षक/TITLE

SINGLE LINE DIAGRAM
FOR 765/400/220KV BHUJ S/S.

अनुपात / SCALE	कार्ड कोड CARD CODE
NTS	

ड्राइंग.क्र./DRAWING NO.	पुनः/REV.
TB-385-510-001	0

पृष्ठ क्र./SHEET No.03	अगला पृष्ठ/NEXT SHEET 04

The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED
it must not be used directly or indirectly in anyway detrimental to the interest of the company.

COMPUTER DRG. PATH NAME :

REF. DRG. No.

SIGN. & DATE

INVENTORY No.

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पृष्ठ क्र./SHEET No. 04	अगला पृष्ठ /NEXT SHEET 05
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FIRST ANGLE PROJECTION (ALL DIMENSIONS ARE IN MM.)

TB-385-510-001

DRAWING No.

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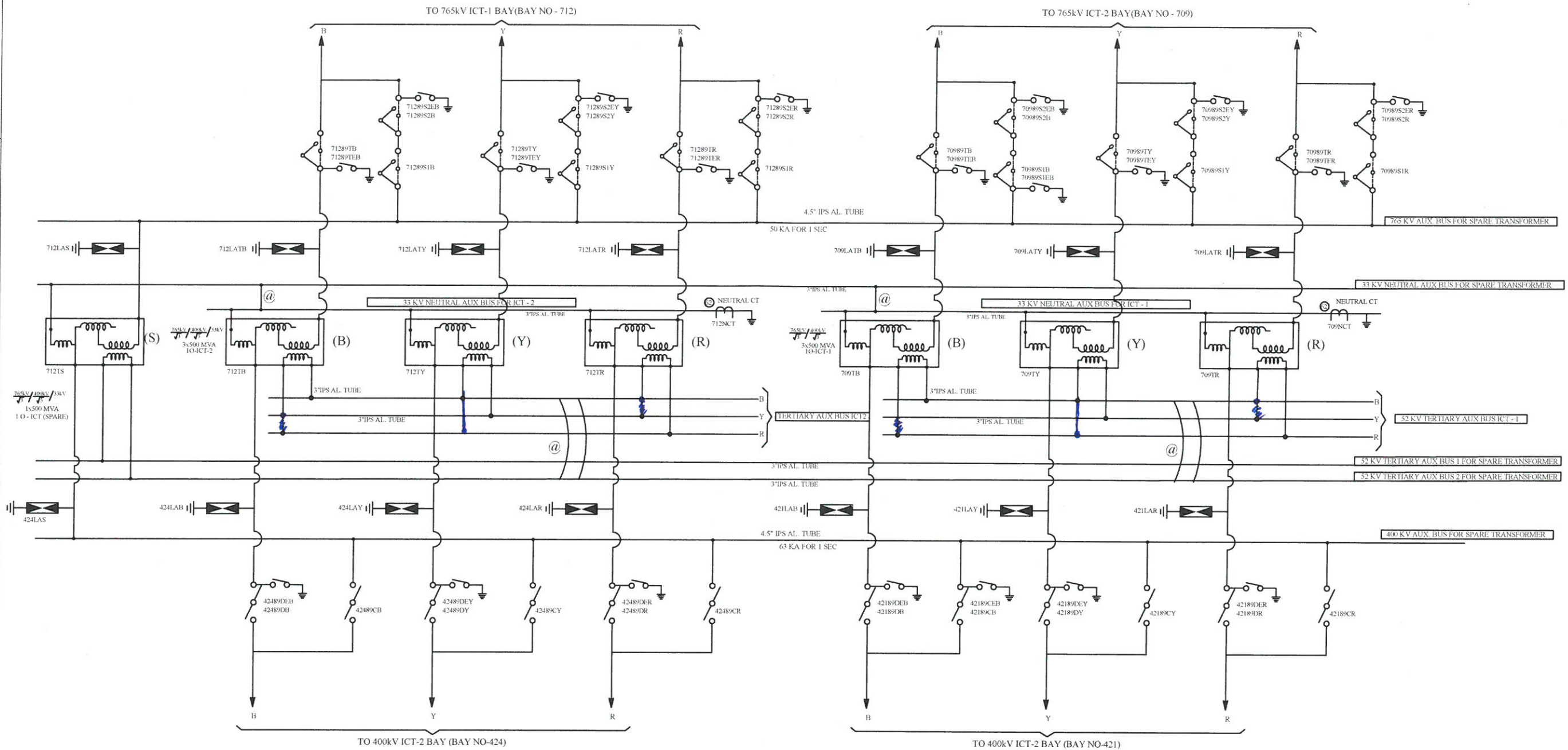
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DETAIL-C
(ARRANGEMENT OF 765/400kV ICT AND AUX. BUS.)

NOA NO. : CC-CS/484-WR2/SS-2953/11/G8/NOA-1&2/5727 & 5728 DT. 31.03.16

ADDITIONAL INFORMATION
W.O.No. 85003

STATUS OF DRAWING CONTRACT
DISTRIBUTION OF PRINTS

आवक/परियोजना का नाम POWER GRID CORPORATION OF INDIA LIMITED

NAME OF CUSTOMER/PROJECT SUBSTATION PACKAGE-SS01 FOR CONSTRUCTION OF 765/400/220KV BHUJ S/S & EXT. OF 765KV BANASKANTHA S/S UNDER GREEN ENERGY CORRIDOR ISTS PART- C (PART-1)

भारत हेवी इलेक्ट्रिकल्स लिमिटेड
इंजीनियरिंग परियोजना विभाग
BHARAT HEAVY ELECTRICALS LTD.
TRANSMISSION PROJECTS DIVISION

क्रमांक DRAWN	नाम /NAME	हस्ता./SIGN.	दि./DATE
जेका CHECKED	JS		23.11.15
स्वीकृत APPROVED	SK/AA		
	AS/RS		

REV.	DATE	ALTERED CHECKED APPROVED

विभाग
DEPT. TBEM
कोड
CODE 422
शीर्षक/TITLE

अनुपात / SCALE
NTS
कार्ड कोड
CARD CODE

SINGLE LINE DIAGRAM
FOR 765/400/220KV BHUJ S/S.

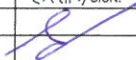
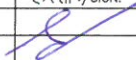
ड्राइंग.क./DRAWING NO.
TB-385-510-001
पृष्ठ नं./SHEET No.05 अगला पृष्ठ/NEXT SHEET 06

पुनः/REV.
0

BILL OF QTY. FOR 400kV MAIN EQUIPMENTS: (63KA for 1sec)

SL.NO	DESCRIPTION	RATING	QTY. (PART-1) (NO.)	QTY. (PART-2) (NO.)	SYMBOL	SCOPE OF SUPPLY	LEGEND
20	500MVA, (3-PH) AUTOTRANSFORMER.	400/220/33KV	0	1		BHEL	T
21	125MVAR BUS REACTOR (3-PH)	420 kV	1	0		BHEL	BR
22	SF6 CIRCUIT BREAKER WITH CR, WITH CSD (3-PH)	3150A	4	7		BHEL	52
23	SF6 CIRCUIT BREAKER WITHOUT CR, WITH CSD (3-PH)	3150A	3	7		BHEL	52
24	SF6 CIRCUIT BREAKER WITHOUT CR, WITHOUT CSD (3-PH)	3150A	0	7		BHEL	52
25	ISOLATOR WITH ONE E/SW (3 PH) DOUBLE BREAK TYPE	3150A	17	6		BHEL	89/89E
26	ISOLATOR WITH TWO E/SW (3 PH) DOUBLE BREAK TYPE	3150A	2	7		BHEL	89/89E /89E2
27	ISOLATOR WITH ONE E/SW (3 PH) DOUBLE BREAK TYPE	2000A	1	7		BHEL	89/89E
28	ISOLATOR WITH ONE E/SW (1 PH) DOUBLE BREAK TYPE	3150A	7	7		BHEL	89/89E
29	ISOLATOR WITHOUT E/SW (1 PH) DOUBLE BREAK TYPE	3150A	5	7		BHEL	89
30	CURRENT TRANSFORMER (1 PH.) WITH 120% EXTENDED CURRENT RATING.	3000A	21	7		BHEL	CT
31	CVT (1 PH.)	4400pF	6	7		BHEL	CVT
32	SURGE ARRESTER (1 PH.)	336 kV	10	7		BHEL	LA
33	WAVE TRAP (1 PH.) PEDESTAL TYPE.	0.5mH, 2000A	7	7		BHEL	WT

SL.NO.	DESCRIPTION	RATING	QTY. (NO.)	SYMBOL	SCOPE OF SUPPLY	LEGEN
60	SF6 CIRCUIT BREAKER FOR NGR BYPASS (1-PH)	132 KV, 1250A 145 KV	2		BHEL	S2
61	SURGE ARRESTER (1 PH.)	120 kV, 10 KA 5 KJ/KV	2		PGCIL	LA
62	NEUTRAL CT. (1 PH.) WITH 120% EXTENDED CURRENT RATING.	33KV	5		PGCIL	CT

NOA NO. : CC-CS/484-WR2/SS-2953/11/G8/NOA-1&2/5727 & 5728 DT. 31.03.16										
ADDITIONAL INFORMATION W.O.No. 85003			ग्राहक/परियोजना का नाम POWER GRID CORPORATION OF INDIA LIMITED NAME OF CUSTOMER/PROJECT SUBSTATION PACKAGE-SS01 FOR CONSTRUCTION OF 765/400/220KV BHUJ S/S & EXT. OF 765KV BANASKANTHA S/S UNDER GREEN ENERGY CORRIDOR ISTS PART-C (PART-1)							
			STATUS OF DRAWING DISTRIBUTION OF PRINTS							
			भारत हेवी इलेक्ट्रिकल्स लिमिटेड द्वारा निम्नलिखित परियोजना विभाग BHARAT HEAVY ELECTRICALS LTD. TRANSMISSION PROJECTS DIVISION				कक्षा/ड्राउन JS	नाम /NAME JS	हस्ता./SIGN. 	दि./DATE 23.11.15
							चेक/स्वीकृत AS/RS	नाम /NAME SK/AA	हस्ता./SIGN. 	दि./DATE 23.11.15
REV.	DATE	ALTERED CHECKED APPROVED	विभाग DEPT.	TBEM		अनुपात / SCALE	कॉर्ड कार्ड CODE	ड्राईंग.कं./DRAWING NO. TB-385-510-001 पृष्ठ कं./SHEET No.06		पुनः/REV. 0
ZONE			कोड CODE	422		NTS				
			शीर्षक/TITLE SINGLE LINE DIAGRAM FOR 765/400/220KV BHUJ S/S.					ड्राईंग.कं./DRAWING NO. TB-385-510-001		पुनः/REV. 0
								पृष्ठ कं./SHEET No.06		अगला पृष्ठ/NEXT SHEET 07

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COMPUTER DRG. PATH NAME :

REF. DRG. No.

SIGN. & DATE

INVENTORY No.

DRAWING No. TB-385-510-001

SYSTEM PARAMETERS

DESCRIPTION	765 kV	400 kV	220 kV	132 kV	66 kV	11 kV
1) HIGHEST SYSTEM VOLTAGE	800kV (r.m.s.)	420kV (r.m.s.)	245kV (r.m.s.)	145kV (r.m.s.)	72.5kV (r.m.s.)	12kV (r.m.s.)
2) SYSTEM OPERATING VOLTAGE	765kV	400kV	220kV	132kV	66kV	11kV
3) P.F. WITHSTAND VOLTAGE	830kV (r.m.s.)	630kV (r.m.s.)	460kV (r.m.s.) dry and wet	275kV (r.m.s.) dry and wet	140kV (r.m.s.) dry and wet	28kV (r.m.s.) dry and wet
4) LIGHTING IMPULSE WITHSTAND VOLTAGE	2100 kVP	1550 kVP	1050 kVP	650 kVP	325 kVP	75 kVP
5) SWITCHING IMPULSE WITHSTAND VOLTAGE	1550 kVP	1050 kVP	---	---	---	---
6) SYSTEM FAULT LEVEL	50KA FOR 1 Sec.	63KA FOR 1 Sec.	40KA FOR 1 Sec.	31.5KA FOR 1 Sec.	31.5KA FOR 1 Sec.	25KA FOR 1 Sec.
7) CREEPAGE	31 MM/KV	31 MM/KV	31 MM/KV	31 MM/KV	31 MM/KV	31 MM/KV
8) SYSTEM EARTHING	EFFECTIVELY	EFFECTIVELY	EFFECTIVELY	EFFECTIVELY	EFFECTIVELY	EFFECTIVELY

800kV, 3000A, CT

Core No.	Current Ratio	Accuracy Class	Output Burden VA	Min kPV (V)	Max RCT in Ohms	Max Im at kPV (mA)	Purpose
1	3000-2000-500 / 1	TPS	-	3000-2000-500	15-10-2.5	20mA on 3000/1 Tap 30mA on 2000/1 Tap 120mA on 500/1 Tap	BUS DIFF. CHECK
2	3000-2000-500 / 1	TPS	-	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
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	TPS	-	3000-2000-500	15-10-2.5	20mA on 3000/1 Tap 30mA on 2000/1 Tap 120mA on 500/1 Tap	TRANS. BACKUP/LINE BACKUP PROTIN.
6	3000-2000-500 / 1	TPS	-	3000-2000-500	15-10-2.5	20mA on 3000/1 Tap 30mA on 2000/1 Tap 120mA on 500/1 Tap	LINE PROTIN /LBB PROTIN

All protection class shall be accuracy class TPS as per IEC 60044-1. Metering cores shall be accuracy class 0.2S as per IEC: 60044-1

400kV, 3000A, CT

Core No.	Current Ratio	Accuracy Class	Output Burden VA	Min kPV (V)	Max RCT in Ohms	Max Im at kPV (mA)	Purpose
1	3000-2000-500 / 1	TPS	-	3000-2000-500	15-10-2.5	20mA on 3000/1 Tap 30mA on 2000/1 Tap 120mA on 500/1 Tap	BUS DIFF. CHECK
2	3000-2000-500 / 1	TPS	-	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
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	TPS	-	3000-2000-500	15-10-2.5	20mA on 3000/1 Tap 30mA on 2000/1 Tap 120mA on 500/1 Tap	TRANS. BACKUP/LINE BACKUP PROTIN.
6	3000-2000-500 / 1	TPS	-	3000-2000-500	15-10-2.5	20mA on 3000/1 Tap 30mA on 2000/1 Tap 120mA on 500/1 Tap	TRANS. DIFF./LINE PROTIN

All protection class shall be accuracy class TPS as per IEC 60044-1. Metering cores shall be accuracy class 0.2S as per IEC: 60044-1

800KV CVT:

Ratio	756KV / $\sqrt{3}$	110V / $\sqrt{3}$	110V / $\sqrt{3}$	110V / $\sqrt{3}$
Sec-I	Class - 0.5/3P, 50VA			
Sec-II	Class - 0.5/3P, 50VA			
Sec-III	Class - 0.2, 50VA			
	Capacitance - 8800 pF (+10%, -5%)			

Rated Voltage Factor: 1.2 Continuous
1.5 for 30 Seconds

400KV CVT:

Ratio	400KV / $\sqrt{3}$	110V / $\sqrt{3}$	110V / $\sqrt{3}$	110V / $\sqrt{3}$
Sec-I	Class - 0.5/3P, 50VA			
Sec-II	Class - 0.5/3P, 50VA			
Sec-III	Class - 0.2, 50VA			
	Capacitance - 4400 pF (+10%, -5%)			

Rated Voltage Factor: 1.2 Continuous
1.5 for 30 Seconds

NOA NO. : CC-CS/484-WR2/SS-2953/11/G8/NOA-1&2/5727 & 5728 DT. 31.03.16

ADDITIONAL INFORMATION
W.O.No.

STATUS OF DRAWING

DISTRIBUTION OF PRINTS

POWER GRID CORPORATION OF INDIA LIMITED

NAME OF CUSTOMER/PROJECT SUBSTATION PACKAGE-SS01 FOR CONSTRUCTION OF 765/400/220KV
BHUI S/S & EXT. OF 765KV BANASKANTHA S/S
UNDER GREEN ENERGY CORRIDOR ISTS PART-C (PART-1)Bharat Heavy Electricals Ltd.
TRANSMISSION PROJECTS DIVISION

क्रमांक DRAWN	नाम /NAME	हस्ता./SIGN.	दि./DATE
JS			23.11.15
ऑफ CHECKED	SK/AA		
स्वीकृत APPROVED	AS/RS		

REV. DATE ALTERED
CHECKED
APPROVEDDEPT. TBEM
कोड 422अनुपात / SCALE
NTSकॉड कोड
CARD CODE

ZONE

शीट/TITLE

SINGLE LINE DIAGRAM
FOR 765/400/220KV BHUI S/S.

ड्राइंग.क्र./DRAWING NO.

TB-385-510-001

पृष्ठ क्र./SHEET No.07 अगला पृष्ठ/NEXT SHEET 08

DRAWING No. TB-385-510-001

220kV, 1600A, CT

- a) 120% Extended Rating applicable for ICT#1, #2 and Transfer Bus Bays
b) 150% Extended Rating applicable for Bus Coupler Bay

Core No.	Current Ratio	Accuracy Class	Output Burden VA	Min kPV (V)	Max RCT in Ohms	Max Im at kPV (mA)	Purpose
1	1600-800 / 1	PS	-	1600-800	8-4	25mA on 1600/1 Tap 50mA on 800/1 Tap	BUS DIFF. CHECK
2	1600-800 / 1	PS	-	1600-800	8-4	25mA on 1600/1 Tap 50mA on 800/1 Tap	BUS DIFF. MAIN
3	1600-800 / 1	0.2S	20	-	-	-	METERING
4	1600-800 / 1	PS	-	1600-800	8-4	25mA on 1600/1 Tap 50mA on 800/1 Tap	TRANS. BACKUP LINE BACKUP PROTIN.
5	1600-800 / 1	PS	-	1600-800	8-4	25mA on 1600/1 Tap 50mA on 800/1 Tap	TRANS. DIFF. LINE PROTIN

Accuracy class PS as per IS:2705

220KV CVT:

Ratio	220KV / $\sqrt{3}$	110KV / $\sqrt{3}$	110KV / $\sqrt{3}$	110KV / $\sqrt{3}$
Sec-I	Class - 3P, 50VA			
Sec-II	Class - 3P, 50VA			
Sec-III	Class - 0.2, 50VA			
	Capacitance - 4400 pF (+10%, -5%)			

Rated Voltage Factor: 1.2 Continuous
1.5 for 30 Seconds

72.5kV, 50A, CT

Core No.	Current Ratio	Accuracy Class	Output Burden VA	Min kPV (V)	Max RCT in Ohms	Max Im at kPV (mA)	Purpose
1	50 / 1	5P10	10	-	-	-	O/C & E/F
2	50 / 1	0.5	10	-	-	-	Metering

72.5KV VT:

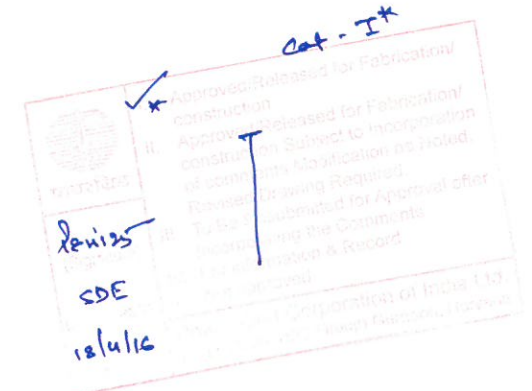
Ratio	33KV / $\sqrt{3}$	110KV / $\sqrt{3}$	110KV / $\sqrt{3}$	110KV / $\sqrt{3}$
Sec-I	Class - 3P, 10VA			
Sec-II	Class - 0.5, 10VA			

LEGENDS:-

————	PRESENT SCOPE
—— ———	FUTURE/EXISTING SCOPE

NOTES:

- (a) ELECTRICAL CONNECTION SHALL BE MADE MANUALLY DEPENDING UPON 765kV SIDE SWITCHING OF DIFFERENT FEEDERS OF AUTOTRANSFORMER/REACTOR.
- SUPPLY, ERECTION, TESTING & COMMISSIONING INCLUDING FORMATION OF HV, LV, NEUTRAL, TERTIARY & AUXILIARY BUSES OF 3x500MVA, (765kV / $\sqrt{3}$) / (400kV / $\sqrt{3}$) / 33kV IO AUTO TRANSFORMERS AND LINE/BUS REACTOR ARE NOT IN BHEL SCOPE.
- 765kV WAVE TRAP SHALL BE PROVIDED IN TWO PHASE ONLY.
- 400kV WAVE TRAP SHALL BE PROVIDED IN ONE PHASE ONLY.
- PART-2 EQUIPMENTS SHALL BE SUPPLIED BY BHEL AFTER ORDER RECEIVED FROM RGCN.



NOA NO. : CC-CS/484-WR2/SS-2953/11/G8/NOA-1&2/5727 & 5728 DT. 31.03.16

ADDITIONAL INFORMATION W.O.No. 85003		POWER GRID CORPORATION OF INDIA LIMITED NAME OF CUSTOMER/PROJECT SUBSTATION PACKAGE-SS01 FOR CONSTRUCTION OF 765/400/220KV BHUJ S/S & EXT. OF 765KV BANASKANTHA S/S UNDER GREEN ENERGY CORRIDOR ISTS PART-C (PART-1)	
STATUS OF DRAWING CONTRACT		DISTRIBUTION OF PRINTS	
REV. DATE ALTERED CHECKED APPROVED		विभाग TBEM कोड 422 शीर्षक/TITLE जनुपात / SCALE NTS कह कोड CARD CODE	
SINGLE LINE DIAGRAM FOR 765/400/220kV BHUJ S/S.		डाईग.क्र./DRAWING NO. TB-385-510-001 पृष्ठ क्र./SHEET No.08 अगला पृष्ठ/NEXT SHEET -	