











LEGENDS

DEVICE NO.	FUNCTION
21L1	DIST. PROTECTION MAIN-I
21L2	DIST. PROTECTION MAIN-II
79	AUTO-RECLOSE FUNCTION
25	CHECK SYNCHRONISING FUNCTION
DFL	DISTURBANCE/FAULT LOCATOR
98	CVT FUSE FAIL RELAY
59	TWO STAGE OVER VOLTAGE RELAY
67/67N	DIRECTIONAL IDMT PHASE O/C / E/F PROTECTION WITH HIGH SET FUNCTION
50 STUB	STUB PROTECTION
68	POWER SWING BLOCKING FUNCTION
46 BC	BROKEN CONDUCTOR PROTECTION
85	CARRIER-AIDED INER-TRIPPING FUNCTION
SER	SEQUENCE OF EVENT RECORDER
50/27	SOTF PROTECTION
27	UNDER VOLTAGE PROTECTION
DR	DISTURBANCE RECORDER
PMU	PHASOR MEASUREMENT UNIT
TWFL	TRAVELLING WAVE FAULT LOCATOR
51/51N	NON DIRECTIONAL IDMT PHASE O/C / E/F PROTECTION WITH HIGH SET FUNCTION
63 AX/TX	BUCHHOLZ RELAY, ALARM/TRIP
PRD TX	PRESSURE RELIEF DEVICE, TRIP
490 AX/TX	OIL TEMPERATURE HIGH, ALARM/TRIP
49W AX/TX	WINDING TEMPERATURE HIGH, ALARM/TRIP
OLAX	OIL LEVEL LOW, ALARM
63 OLTX	OLTC OIL SURGE, TRIP
FP TX	FIRE PROTECTION, TRIP
87T/87R	TRANSFORMER/REACTOR DIFFERENTIAL PROTECTION WITH BUILT-IN DR
64T/64R	TRANSFORMER/REACTOR RESTRICTED EARTH FAULT PROTECTION
99	OVER FLUXING PROTECTION
59N	NEUTRAL VOLTAGE DISPLACEMENT PROTECTION
50/50N	NON DIRECTIONAL INSTANTANEOUS PHASE O/C / E/F PROTECTION WITH HIGH SET FUNCTION
87B1/B2	BUSBAR DIFFERENTIAL PROTECTION MAIN-1/2
50 LBB	LOCAL BREAKER BACKUP PROTECTION
BCU	BAY CONTROL UNIT
EM	ENERGY METER
CSD	CONTROLLED SWITCHING DEVICE

	CURRENT TRANSFORMER
	BUSHING CURRENT TRANSFORMER
	VOLTAGE TRANSFORMER
	LIGHTNING ARRESTER
	CIRCUIT BREAKER WITHOUT CSD
	CIRCUIT BREAKER WITH CSD
	DISCONNECTOR
	MAINTENANCE EARTH SWITCH
	HIGH SPEED EARTH SWITCH
	SF6-TO-AIR BUSHING

NOTES:

- 1) ALL PROTECTION FEATURES SHOWN IN THIS DRAWING SHALL BE PROVIDED IN THE OFFERED SYSTEM. HOWEVER, CLUBBING OF PROTECTION FUNCTIONS IN NUMERICAL RELAYS SHALL BE DECIDED AFTER FINALISATION OF CRP SUPPLIER.
- 2) REFERENCE DRAWING: SINGLE LINE DIAGRAM FOR 400/220KV GIS S/S AT ERSAMA DWG NO. TB-3-420-510-001, REV 00
- 3) DISTURBANCE RECORDER SHALL BE IN-BUILT FEATURE OF ONE NO. RESPECTIVE BAY PROTECTION NUMERICAL RELAY.
- 4) LBB PROTECTION SHALL BE BUILT-IN FUNCTION OF BUSBAR PROTECTION RELAY EXCEPT FOR THE TIE BAYS & FUTURE REACTOR BAY WHEREIN A STAND ALONE LBB PROTECTION RELAY SHALL BE PROVIDED.
- 5) BUSHING CT DETAILS OF REACTOR & ICT MAY CHANGE AS PER THE OEM (BHEL BHOPAL) RECOMMENDATION.

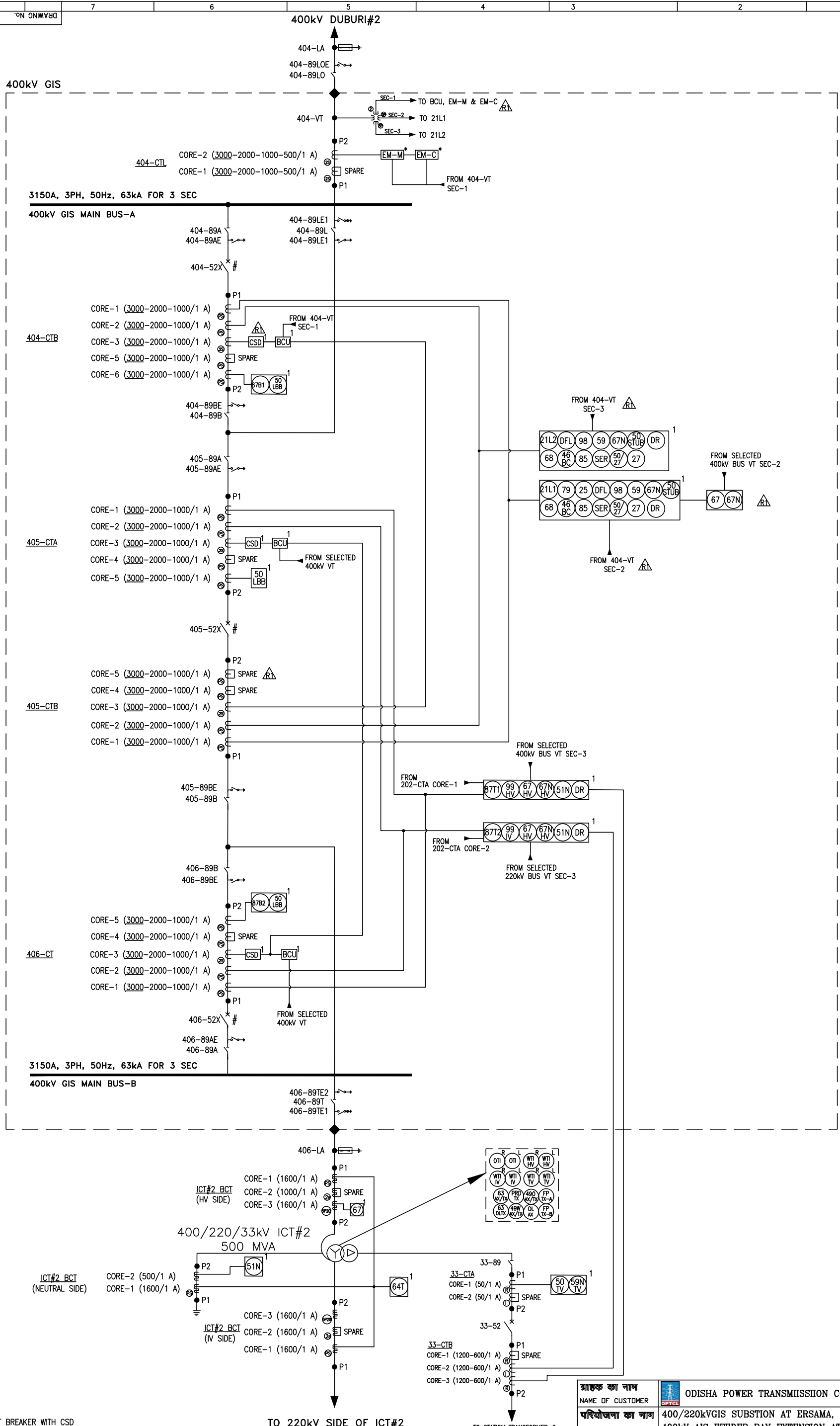
INVENTORY No. SIGN. & DATE REF. DRG. No. COMPUTER DRG. PATH NAME :

REV.	DATE	ALTERED BY	AK
01	18.07.23	CHECKED	DKS
		APPROVED	VK

ग्राहक का नाम NAME OF CUSTOMER ODISHA POWER TRANSMISSION CORPORATION LIMITED	
परियोजना का नाम NAME OF PROJECT 400/220kV GIS SUBSTATION AT ERSAMA, ODISHA & 400kV AIS FEEDER BAY EXTENSION AT DUBURI, ODISHA	
जारी / NAME AK	हस्ता./SIGN. -SGD-
दि./DATE 10.01.23	
जारी / NAME RD	हस्ता./SIGN. -SGD-
दि./DATE 10.01.23	
जारी / NAME VK	हस्ता./SIGN. -SGD-
दि./DATE 10.01.23	
ड्राइंग. नं./DRAWING NO. कुल/REV. 01	
BHEL DRG NO. TB-3-420-510-002 पृष्ठ नं./SHEET No. 01 अगला पृष्ठ/NEXT SHEET 02	

भारतीय भारत हेवी इलेक्ट्रिकल्स लिमिटेड
 भारतीय भारत हेवी इलेक्ट्रिकल्स लिमिटेड
 BHARAT HEAVY ELECTRICALS LTD.
 TRANSMISSION BUSINESS GROUP

ड्राइंग/TITLE
 KEY PROTECTION DIAGRAM OF 400/220kV GIS SUB STATION AT ERSAMA



INVENTORY No. _____
 SIGN. & DATE _____
 REF. DRG. No. _____
 COMPUTER DRG. PATH NAME : _____
 The information on this document is the property of BHARAT HEAVY ELECTRICALS LIMITED. It must not be used directly or indirectly in any way detrimental to the interest of the company.

- CIRCUIT BREAKER WITH CSD
 * - BUSHING CT DETAILS MAY CHANGE AS PER OEM RECOMMENDATION.

400kV DUBURI LINE#2-TIE-ICT#2 DIA

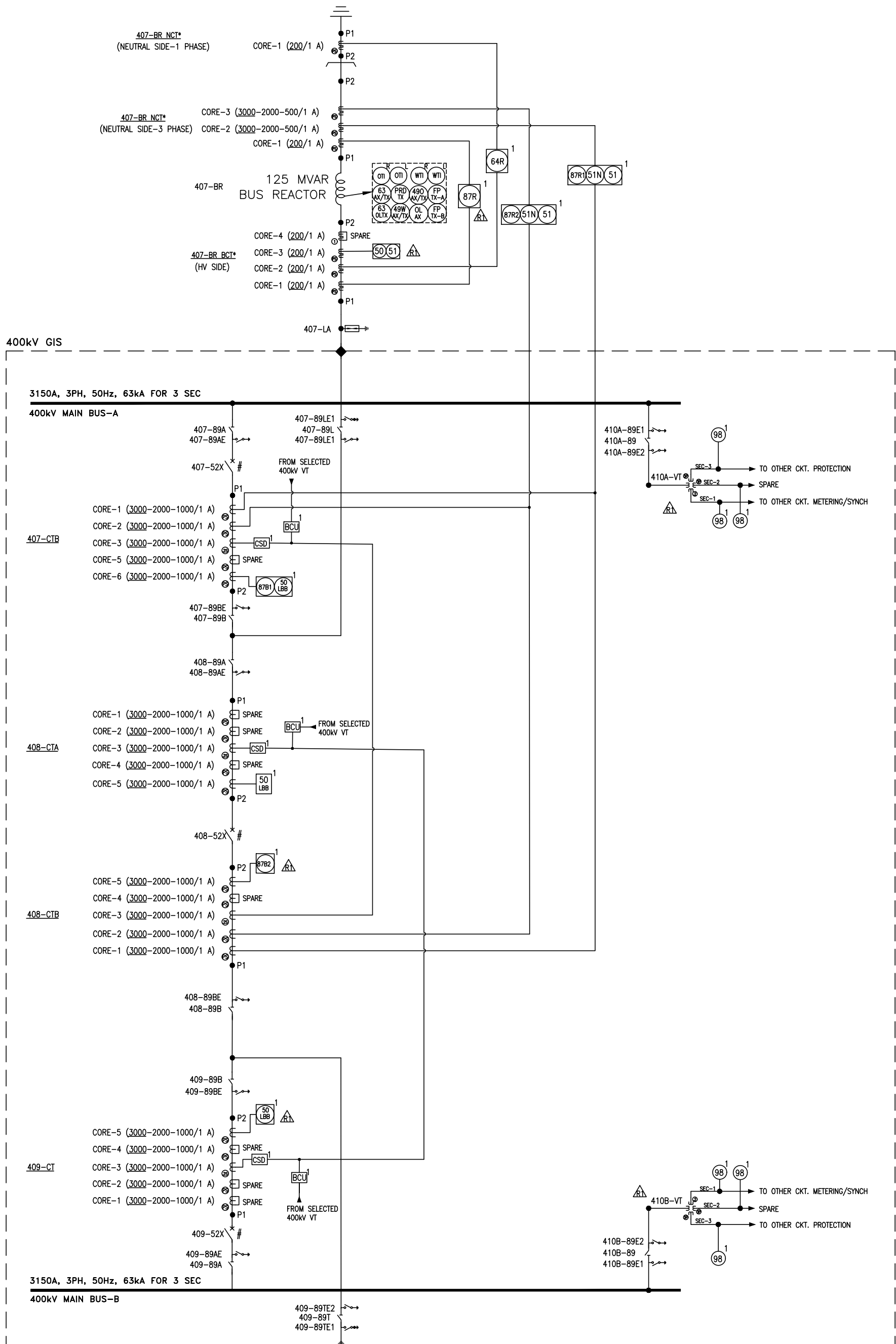
REV.	DATE	ALTERED BY	APPROVED BY
01	18.07.23	CHECKED DKS	APPROVED VK

ZONE: DRAWING REVISED IN LINE WITH OPTCL COMMENTS DATED 13.08.23 TO INCORPORATE:
 1. NUMERICAL BACKUP O/C & E/F RELAY
 2. CSD IN 400KV LINE BAYS

आह्वक का नाम NAME OF CUSTOMER: ODISHA POWER TRANSMISSION CORPORATION LIMITED	
परियोजना का नाम NAME OF PROJECT: 400/220kV GIS SUBSTATION AT ERSAMA, ODISHA & 400kV AIS FEEDER BAY EXTENSION AT DUBURI, ODISHA	
निर्देशक BHARAT HEAVY ELECTRICALS LTD. TRANSMISSION BUSINESS GROUP	वर्क ड्रॉन AK -SGD- 10.01.23 चेक RD -SGD- 10.01.23 स्वीकृत VK -SGD- 10.01.23
ड्राइंग नं. BHHEL DRG NO. TB-3-420-510-002	हस्ता./SIGN. दि./DATE पृष्ठ नं./SHEET No. 03 जगता पृष्ठ/NEXT SHEET 04

200-015-029-C-BL
DRAWING NO.

400kV BUS REACTOR#1



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COMPUTER DRG. PATH NAME :
SIGN. & DATE
REF. DRG. No.
INVENTORY No.

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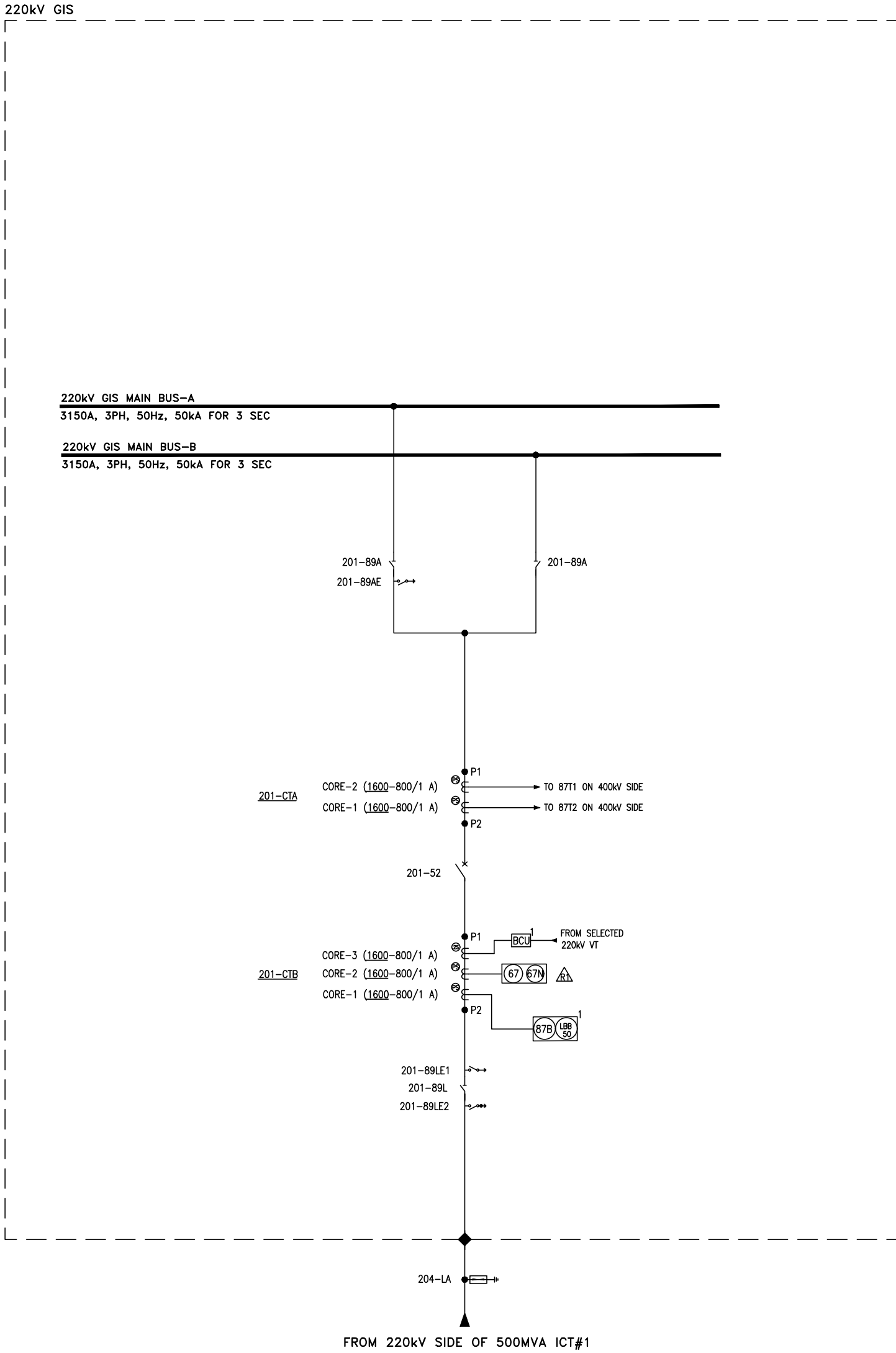
BUS REACTOR#2
(FUTURE)

400kV BUS REACTOR#1-TIE-FUTURE REACTOR#2 DIA

REV.	DATE	ALTERED BY	AK
01	18.07.23	CHECKED	DKS
		APPROVED	VK

ZONE: DRAWING REVISED IN LINE WITH OPTCL COMMENTS DATED 13.08.23 TO INCORPORATE:
1. NUMERICAL BACKUP O/C & E/F RELAY
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ग्राहक का नाम NAME OF CUSTOMER	ODISHA POWER TRANSMISSION CORPORATION LIMITED		
परियोजना का नाम NAME OF PROJECT	400/220kV GIS SUBSTATION AT ERSAMA, ODISHA & 400kV AIS FEEDER BAY EXTENSION AT DUBURI, ODISHA		
निर्माता का नाम NAME OF PROJECT	भारत हेवी इलेक्ट्रिकल्स लिमिटेड Bharat Heavy Electricals Ltd.	वर्क / NAME	हस्ता / SIGN.
	TRANSMISSION BUSINESS GROUP	ड्रॉ / CHECKED	दि./DATE
		स्वीकृत / APPROVED	10.01.23
			10.01.23
			10.01.23
शीट/क/TITLE	KEY PROTECTION DIAGRAM OF 400/220kV GIS SUB STATION AT ERSAMA		पृष्ठ/REV.
	BHEL DRG NO. TB-3-420-510-002		01
	पृष्ठ क्र./SHEET No. 04		अगला पृष्ठ/NEXT SHEET 05



220kV ICT BAYS
(APPLICABLE FOR BAYS 201 & 202)

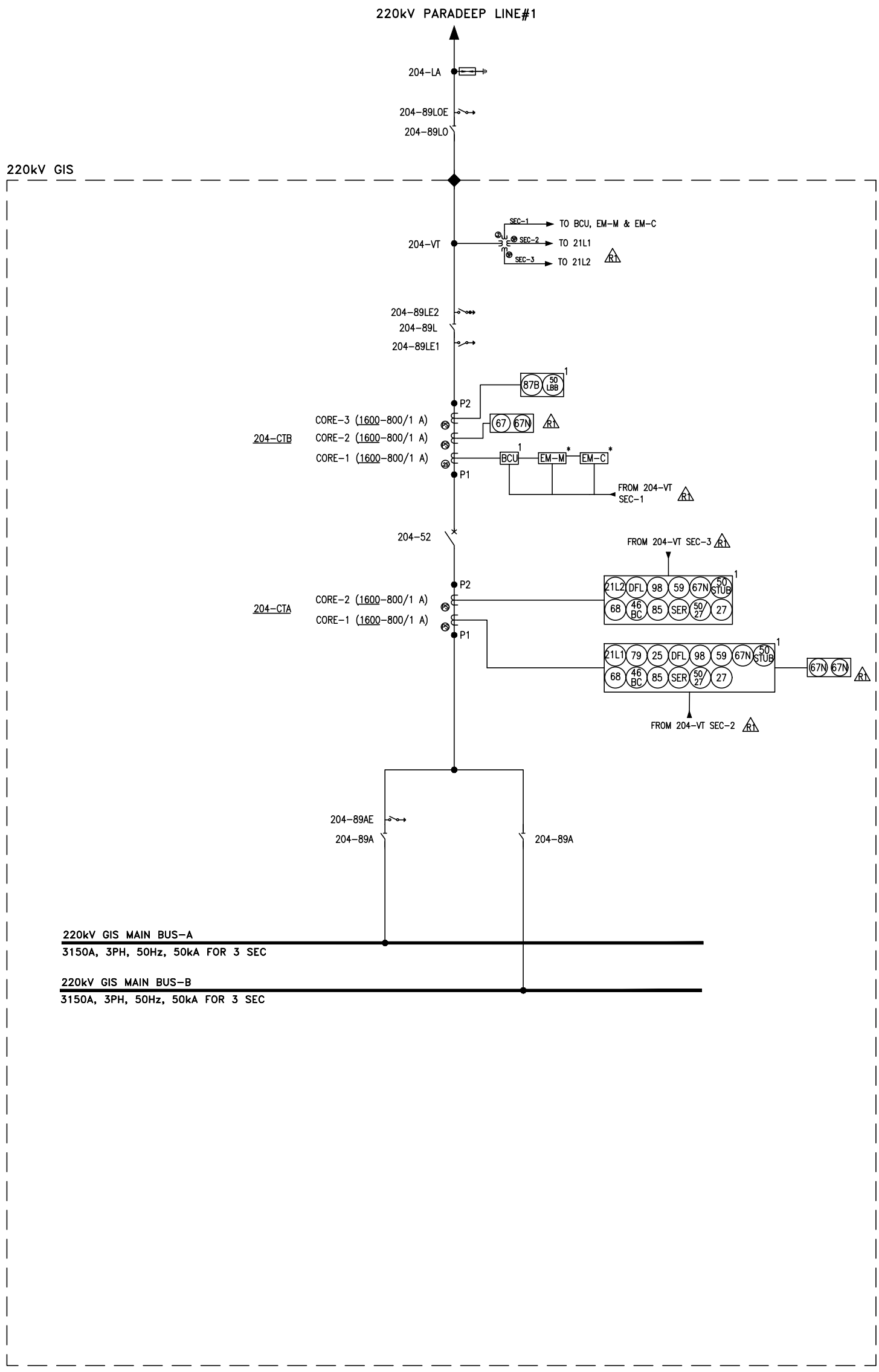
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INVENTORY No. SIGN. & DATE REF. DRG. No. COMPUTER DRG. PATH NAME :

REV.	DATE	ALTERED BY	APPROVED BY
01	18.07.23	CHECKED DKS	APPROVED VK

ZONE: DRAWING REVISED IN LINE WITH OPTCL COMMENTS DATED 13.08.23 TO INCORPORATE:
1. NUMERICAL BACKUP O/C & E/F RELAY
2. CSD IN 400KV LINE BAYS

<p>भारत हेवी इलेक्ट्रिकल्स लिमिटेड द्वारा तैयार किया गया परियोजना विभाग BHARAT HEAVY ELECTRICALS LTD. TRANSMISSION BUSINESS GROUP</p>	<p>आह्वयक का नाम NAME OF CUSTOMER: ODISHA POWER TRANSMISSION CORPORATION LIMITED</p> <p>परियोजना का नाम NAME OF PROJECT: 400/220kV GIS SUBSTATION AT ERSAMA, ODISHA & 400kV AIS FEEDER BAY EXTENSION AT DUBURI, ODISHA</p>																
<table border="1"> <thead> <tr> <th>वर्क/DRWN</th> <th>नाम /NAME</th> <th>हस्ता./SIGN.</th> <th>दि./DATE</th> </tr> </thead> <tbody> <tr> <td>डिजाइन</td> <td>AK</td> <td>-SGD-</td> <td>10.01.23</td> </tr> <tr> <td>चेक</td> <td>RD</td> <td>-SGD-</td> <td>10.01.23</td> </tr> <tr> <td>स्वीकृत/अनुमोदित</td> <td>VK</td> <td>-SGD-</td> <td>10.01.23</td> </tr> </tbody> </table>	वर्क/DRWN	नाम /NAME	हस्ता./SIGN.	दि./DATE	डिजाइन	AK	-SGD-	10.01.23	चेक	RD	-SGD-	10.01.23	स्वीकृत/अनुमोदित	VK	-SGD-	10.01.23	<p>शीट/REV. 01</p> <p>कुल/REV. 01</p> <p>पृष्ठ क्र./SHEET No. 05 कुल/पृष्ठ/NEXT SHEET 06</p>
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220kV LINE BAYS
(APPLICABLE FOR BAYS 204, 205, 206 & 207)

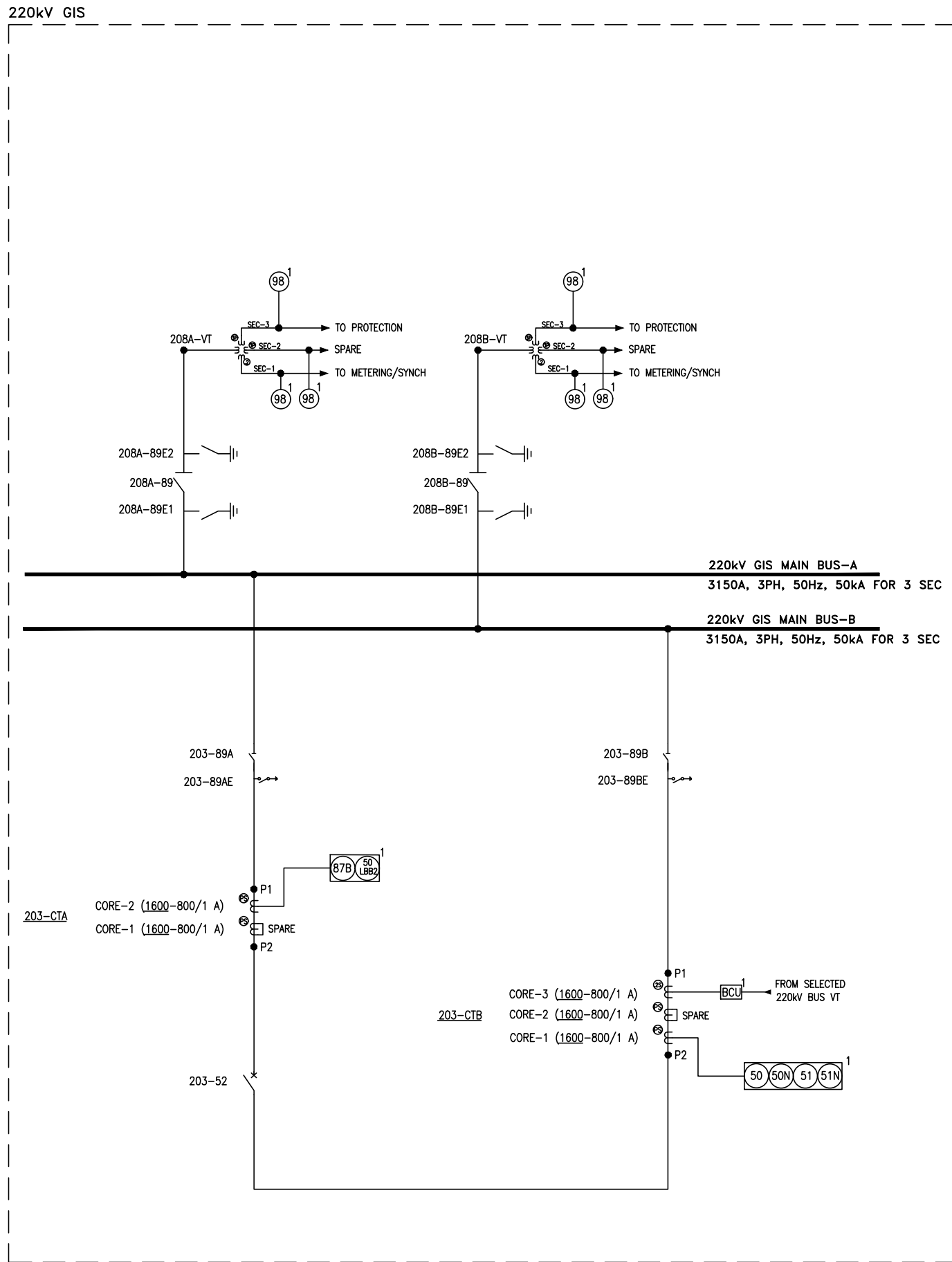
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INVENTORY No. SIGN. & DATE REF. DRG. No. COMPUTER DRG. PATH NAME :

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01	18.07.23	CHECKED	DKS
		APPROVED	VK

ZONE: DRAWING REVISED IN LINE WITH OPTCL COMMENTS DATED 13.08.23 TO INCORPORATE:
1. NUMERICAL BACKUP O/C & E/F RELAY
2. CSD IN 400KV LINE BAYS

आह्वक का नाम NAME OF CUSTOMER	ODISHA POWER TRANSMISSION CORPORATION LIMITED		
परियोजना का नाम NAME OF PROJECT	400/220kV GIS SUBSTION AT ERSAMA, ODISHA & 400kV AIS FEEDER BAY EXTENSION AT DUBURI, ODISHA		
ड्राफ्ट्समैन DRAWN	नाम /NAME	हस्ता./SIGN.	दि./DATE
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चेकर CHECKED	RD	-SGD-	10.01.23
स्वीकृत APPROVED	VK	-SGD-	10.01.23
शीट/टिटर SHEET/TITLE	ड्राफ्टिंग.क./DRAWING NO.		पृष्ठ/REV.
KEY PROTECTION DIAGRAM OF 400/220kV GIS SUB STATION AT ERSAMA	BHEL DRG NO. TB-3-420-510-002		01
	पृष्ठ क्र./SHEET No. 06	अगला पृष्ठ/NEXT SHEET	07



220kV BUS COUPLER (BAY-203)& BUS VT (BAY-208)

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COMPUTER DRG. PATH NAME :

SIGN. & DATE REF. DRG. No.

INVENTORY No.

REV.	DATE	ALTERED	AK
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		APPROVED	VK

ZONE DRAWING REVISED IN LINE WITH OPTCL COMMENTS DATED 13.08.23 TO INCORPORATE:
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RD	AK	-SGD-	10.01.23
चेकर CHECKED	RD	-SGD-	10.01.23
स्वीकृत APPROVED	VK	-SGD-	10.01.23
शीट/टिटा SHEET/TITLE	ड्राइंग. नं./DRAWING NO.		पृष्ठ/रेव. PAGE/REV.
KEY PROTECTION DIAGRAM OF 400/220kV GIS SUB STATION AT ERSAMA	BHEL DRG NO. TB-3-420-510-002		01
	पृष्ठ नं./SHEET No. 07	अगला पृष्ठ/NEXT SHEET 08	