






NOTES:—

- 01) SYSTEM: 400KV 40kA FOR 1 SEC. SOLIDLY GROUNDED.
02) CREEPAGE: 25mm/kV.

BILL OF QUANTITY (MAIN EQUIPMENT)

S.L.	ITEM DESCRIPTION	kV	QTY.	SYMBOL
1.	2500A,3-PH ,40KA FOR 1 SEC, SF6 CB SUITABLE FOR 1 ϕ & 3 ϕ OPERATION WITHOUT CLOSING RESISTOR.	420	09	
2.	2500A,3-PH ,HCB ISOLATOR(MECHANICALLY GANGED MOTOR & MANUAL OPERATED) WITH 1E/S (MECHANICALLY GANGED MANUAL OPERATED)..	420	26	
3.	2000 A, 5 CORE CURRENT TRANSFORMER,1 PH.	420	36	
4.	4400+10%,-5% pF,3 WINDING CVT 1PH.	420	06	
5.	SURGE ARRESTER(METAL OXIDE GAPLESS TYPE) 1-PH. 10ka CLASS-3	360	12	

CT DETAILS

CORE No.	APPLICATION	RATIO	BURDEN	KVP (MIN)	I _E AT VK (MAX)	R _{CT} (MAX AT 75 °C)	ACCURACY CLASS
CORE 1	BUS DIFFERENTIAL MAIN	2000/1A 1000/1A 500/1A	—	2000 V 1000 V 500 V	30mA ON 2000/1 tap 60mA ON 1000/1 tap 120mA ON 500/1 tap	10 Ω 5 Ω 2.5 Ω	PS
CORE 2	BUS DIFFERENTIAL CHECK	2000/1A 1000/1A 500/1A	—	2000 V 1000 V 500 V	30mA ON 2000/1 tap 60mA ON 1000/1 tap 120mA ON 500/1 tap	10 Ω 5 Ω 2.5 Ω	PS
CORE 3	METERING (BCU & EM)	2000/1A 1000/1A 500/1A	40VA 40VA 40VA	— — —	— — —	— — —	0.2S
CORE 4	TRANSF. BACKUP/LINE BACKUP PROTECTION	2000/1A 1000/1A 500/1A	—	4000 V 2000 V 1000 V	30mA ON 2000/1 tap 60mA ON 1000/1 tap 120mA ON 500/1 tap	10 Ω 5 Ω 2.5 Ω	PS
CORE 5	TRANSF. DIFF./LINE PROTECTION	2000/1A 1000/1A 500/1A	—	4000 V 2000 V 1000 V	30mA ON 2000/1 tap 60mA ON 1000/1 tap 120mA ON 500/1 tap	10 Ω 5 Ω 2.5 Ω	PS

BUS CVT DETAILS

	PARTICULARS	SEC 1	SEC 2	SEC 3
400kV CVT	RATIO	$\frac{400kV}{\sqrt{3}} \cdot \frac{110V}{\sqrt{3}}$	$\frac{400kV}{\sqrt{3}} \cdot \frac{110V}{\sqrt{3}}$	$\frac{400kV}{\sqrt{3}} \cdot \frac{110V}{\sqrt{3}}$
4400pF	APPLICATION	PROTECTION	PROTECTION	METERING
	BURDEN	100 VA	100 VA	100 VA
	ACCURACY CLASS	3P	3P	0.2

NOTE:—SIMULTANEOUS BURDEN 100VA

REFERENCE

400kV OVERALL SINGLE LINE DIAGRAM
DRG. IPPL-ELE-1002-SAG-2001

KEY SINGLE LINE DIAGRAM FOR 400 kV SAGARDIGHI SUBSTATION
DRG. K8A07-DWG-E-0101

  DEVELOPMENT CONSULTANTS PVT. LIMITED.	
Reviewed only for general conformance with contract drawings and specifications. Contractor to be responsible for any errors and for fulfillment of detailed requirements of contract documents	
ACTION	2
DATE	16.08.2012
DISTRIBUTED BY. S.M.	
1	Distributed
2	Approved
3	Approved except as noted. Forward final drawings ---
4	Approved except as noted. Resubmission required
5	Disapproved see accompanying letter
6	For information only
PRESENT BILL SCOPE FUTURE BIDDING SCOPE	
SEE COVERING LETTER	
LETTER REF NO.	0857
DATE.	16.08.2012

[illegible]

LEGEND:-

- DRAW OUT TYPE AIR CIRCUIT BREAKER
- DRAW OUT TPN/SPN/2P MCCB
- TRANSDUCER, 4-20 mA DUAL OUTPUT
- 51NS

: OVER CURRENT STAND BY EARTH FAULT RELAY
- 51

: DOUBLE POLE INVERSE DEFINITE MINIMUM TIME OVER CURRENT RELAY
- 51N

: INVERSE DEFINITE MINIMUM TIME EARTH FAULT RELAY
- 2

: TIME DELAY PICKUP RELAY
- 27A, 27B

: TWO PHASE TWO WIRE INSTANTANEOUS UNDER VOLTAGE RELAY
- 27X

: AUXILIARY RELAY WITH 2 NO SELF RESET CONTACTS
- V

: VOLTMETER
- A

: AMMETER
- VSS

: VOLTAGE SELECTOR SWITCH
- ASS

: AMMETER SELECTOR SWITCH
- MK

: MARSHALLING KIOSK
- SAS

: SUBSTATION AUTOMATION SYSTEM
- SAP

: SUBSTATION AUXILIARY PANELS
- TMP

: TARIFF METERING PANEL
- REF

: RESTRICTED E/F RELAY
- 27

: DC UNDER VOLTAGE RELAY
- 59

: DC OVER VOLTAGE RELAY
- 96

: DC EARTH LEAKAGE RELAY

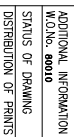
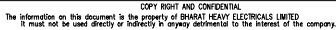
NOTES:-

- NO TWO AC SOURCE SHALL BE PARALLELED AT ANY STAGE.
- EACH BAY MK SHALL BE FED BY ATLEAST ONE SOURCE FROM 415V MAIN PMCC BOARD SECTION -1 SECOND SOURCE SHALL BE LOOPED FROM NEAREST BMK WHICH SHALL BE FED FROM ANOTHER SOURCE FROM 415V EMERGENCY LIGHTING DISTRIBUTION BOARD CUM LIGHTING TRANSFORMER (SEE DETAIL A FOR MK SUPPLY).
- EACH 400KV CIRCUIT BREAKER HAS INDIVIDUAL MK.
- THREE PHASE AC SUPPLY FOR AC (AIR CONDITIONED) BAY CONTROL ROOM, ISOLATOR & CIRCUIT BREAKER WILL BE FED FROM RESPECTIVE NEAREST BAY MK.
- SEE DETAIL B FOR DESCRIPTION OF POWER CABLE.
- IN NORMAL CONDITION WHEN TWO INCOMERS OF DC BOARD IS ON THEN BUS COUPLER AIR BREAK SWITCH SHALL BE OFF CONDITION.
- 220V MAIN DCDB SHALL BE WALL MOUNTED AND SAME SHALL BE LOCATED IN EXISTING CONTROL ROOM.
- 415V MAIN PMCC BOARD, 220V SUB DCDB, 415V MAIN LIGHTING DISTRIBUTION BOARD CUM LIGHTING TRANSFORMER, 415V EMERGENCY LIGHTING DISTRIBUTION BOARD CUM LIGHTING TRANSFORMER & 500KVA DRY TYPE TRANSFORMER SHALL BE LOCATED IN NEW LT SWITCHGEAR ROOM.
- SUBSTATION AUXILIARY 415V MAIN PMCC BOARD SHALL BE MONITOR & CONTROL FROM SAS.
- THE NECESSARY POTENTIAL FREE CONTACT SHALL BE PROVIDED.
- VT FUSE FAILURE & CIRCUIT BREAKER FAILURE PROTECTION SHALL BE PROVIDED IN 415V MAIN PMCC BOARD.
- REF & 51NS RELAY FOR PROTECTION OF 500kVA TRANSFORMER SHALL BE LOCATED IN 11kV MAIN PLANT SWITCHBOARD.
- NON SEGREGATED PHASE BUS DUCT BETWEEN 500kVA TRANSFORMER & 415V MAIN PMCC BOARD SHALL BE SUITABLE FOR TOP ENTRIES
- AIR CIRCUIT BREAKER SHALL BE PROVIDED WITH ANTI PUMPING (94). TRIP ANNUNCIATION (30), LOCKOUT (86) AND TRIP CIRCUIT SUPERVISION (74) RELAYS. LOCKOUT RELAY SHALL BE HAND RESET TYPE.
- SINGLE PHASE AC SUPPLY FOR HEATER AND ILLUMINATION OF ISOLATOR, CB, CT JB & CVT JB WILL BE FED FROM 415V MAIN LIGHTING DISTRIBUTION BOARD CUM LIGHTING TRANSFORMER.
- SINGLE PHASE AC SUPPLY FOR HEATER AND ILLUMINATION OF TMP, SAP, PRINTER & FIRE FIGHTING ANNUNCIATION PANEL LOCATED IN EXISTING CONTROL ROOM WILL BE FED FROM 415V EMERGENCY LIGHTING DISTRIBUTION BOARD CUM LIGHTING TRANSFORMER.
- ALL RELAY SHALL BE NUMERICAL RELAY WITH NECESSARY FEEDBACK SHALL BE PROVIDED TO SAS.
- ALL INCOMER, BUS COUPLER & OUTGOING FEEDERS SHALL BE DRAW OUT TYPE.
- ENERGY METER CONSIST OF FOLLOWING ELECTRICAL MEASURING PARAMETERS V, A, PF, MW, MWH, MVAR, F & HARMONICS.
- THE ENERGY METER OF INCOMING TRANSFORMER SHALL BE CONNECTED WITH ENERGY MANAGEMENT SYSTEM.
- ALL AC & DC MCCB OF PMCC, MLDB, ELDB DCDB & MK SHALL HAVE TRIP INDICATION & PROVISION OF GROUP ALARM.

DETAIL-B (FOR POWER SUPPLY CABLES)

SL. NO.	SIZE OF POWER CABLE	TYPE OF CABLE
1	1CX630SQ.MM	AL/XLPE
2	3.5CX185SQ.MM	AL/XLPE
3	4CX70SQ.MM	AL/XLPE
4	4CX35SQ.MM	AL/XLPE
5	4CX16SQ.MM	AL/XLPE
6	2CX25SQ.MM	CU/XLPE
7	2CX2.5SQ.MM	CU/PVC

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((2 x 500 MW) SAGARDIGHI THERMAL POWER
EXTENTION PROJECT (UNIT 3 & 4)

DEVELOPMENT CONSULTANTS PRIVATE LIMITED KOLKATA

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विभाग	परियोजना	संविधान
DRM	RANJEET	-SD-
02.02.12		

CHICAGO	LABOR / UNION	--
FEDERAL	LABOR / UNION	-60-

बनापान / SCMF	कॉड कोड	अनुमति	
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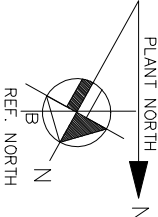
CARD CODE

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THE LINE DIAGRAM FOR
THE DISTRIBUTION SYSTEM AT
TB-3-348-316-004 03

पृष्ठ सं./SHEET No. 02 उत्तर पृष्ठ/NEXT SHEET 03

[illegible]






- | | |
|---------------|--|
| PMCC = | POWER CUM MOTOR CONTROL CENTER |
| MT = | 500kVA DRY TRANSFORMER |
| MLDB CUM LT = | MAIN LIGHTING DISTRIBUTION BOARD CUM LIGHTING TRANSFORMER |
| ELDB CUM LT = | EMERGENCY LIGHTING DISTRIBUTION BOARD CUM LIGHTING TRANSFORMER |
| LT = | 100kVA LIGHTING TRANSFORMER |
| DCDB = | DC DISTRIBUTION BOARD |
| FFL = | FINISHED FLOOR LEVEL |
| FGL = | FINISHED GROUND LEVEL |
| F = | FRONT |
| | BUS DUCT |

REFERENCE DWG.:—

FGL



ADDITIONAL INFORMATION W.O.No. 89010 STATUS OF DRAWING	THE WEST BENGAL POWER DEVELOPMENT CORPN. LTD. NAME OF CUSTOMER/PROJECT  (2 x 500 MW) SAGARDIGHI THERMAL POWER EXTENSION PROJECT (UNIT 3 & 4)
DISTRIBUTION OF PRINTS NAME OF CONSULTANT  DEVELOPMENT CONSULTANTS PRIVATE LIMITED KOLKATA	THE WEST BENGAL  BHARTI HEAVY ELECTRICALS LTD. TRANSMISSION PROJECTS DIVISION