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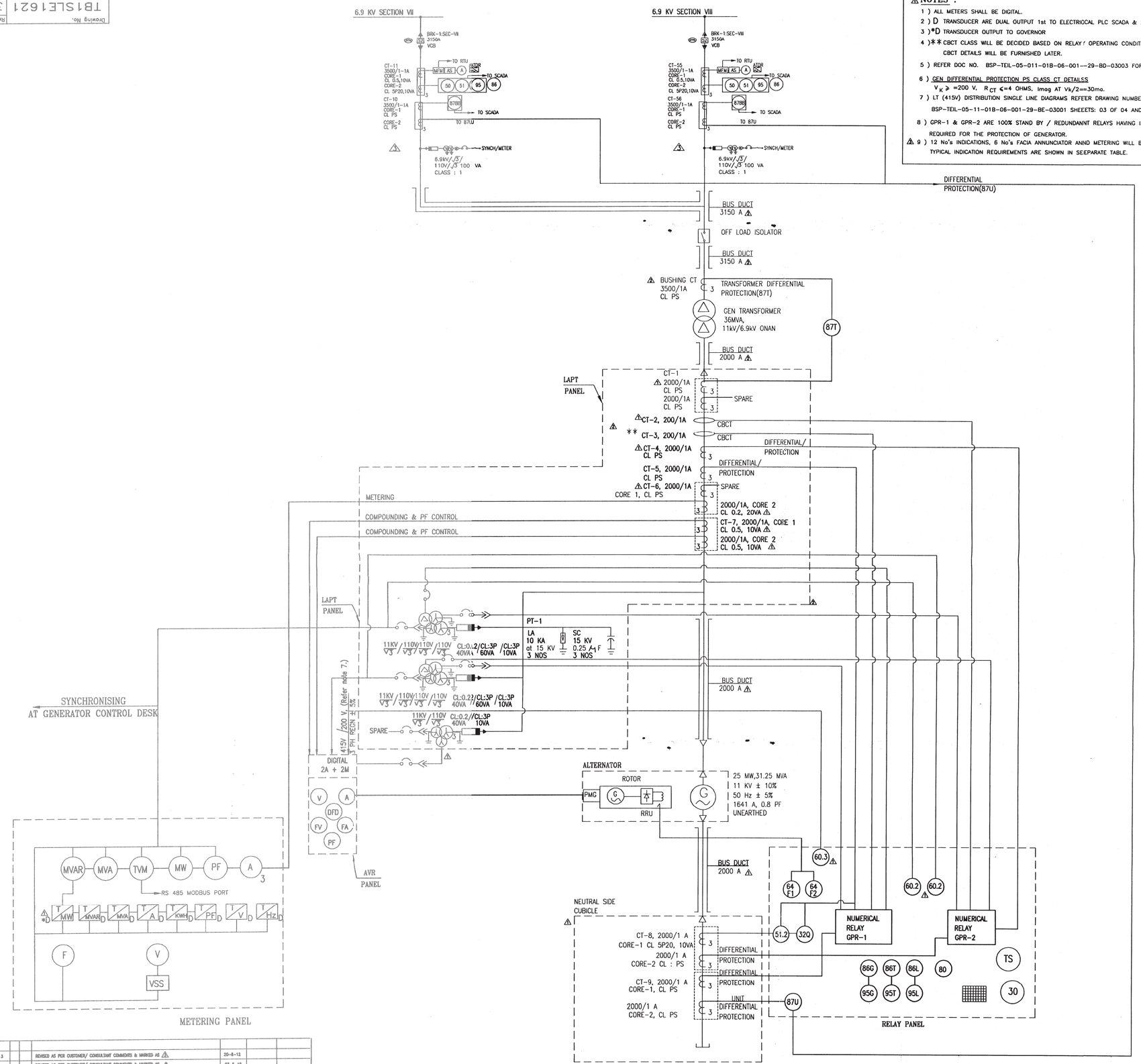
Drawing No. TB1SLE1621 Rev 3

Adopted from:

Machining tolerance applicable if not specified (mm)							
Above	0.5	3	6	30	120	315	1000
To	3	6	30	120	315	1000	2000
Tolerance	±0.05	±0.05	±0.1	±0.15	±0.2	±0.3	±0.5

SURFACE FINISH						
ROUGH M/C	FINISH M/C	GRIND	HONE / LAP	2000	4000	6000
6.3 m	3.2 m	1.6 m	0.8 m	0.4 m	0.2 m	



NOTES :

1) ALL METERS SHALL BE DIGITAL.

2) D TRANSDUCER ARE DUAL OUTPUT 1st TO ELECTRIOCAL PLC SCADA & 2nd TO DCS FOR INDICATION.

3)*D TRANSDUCER OUTPUT TO GOVERNOR

4)** CBCT CLASS WILL BE DECIDED BASED ON RELAY / OPERATING CONDITIONS.
CBCT DETAILS WILL BE FURNISHED LATER.

5) REFER DOC NO. BSP-TEIL-05-011-01B-06-001--29-BD-03003 FOR CALCULATION OF CT & PT.

6) GEN DIFFERENTIAL PROTECTION PS CLASS CT DETAILSS
$V_K \geq$ =200 V, $R_{CT} \leq$=4 OHMS, Imag AT Vk/2==30ma.

7) LT (415V) DISTRIBUTION SINGLE LINE DIAGRAMS REFEER DRAWING NUMBER
BSP-TEIL-05-11-01B-06-001-29-BE-03001 SHEEETS: 03 OF 04 AND 04 OF 04

8) GPR-1 & GPR-2 ARE 100% STAND BY / REDUNDANNT RELAYS HAVING INDEPENDENT CONNECTIONS CT'S & PT'S REQUIRED FOR THE PROTECTION OF GENERATOR.

9) 12 No's INDICATIONS, 6 No's FACIA ANNUNCIATOR ANND METERING WILL BE PROVIDED FOR ALL HT BREAKERS. TYPICAL INDICATION REQUIREMENTS ARE SHOWN IN SEEPARATE TABLE.

RELAYS

DEVICE NO	DESCRIPTION
80	DC SUPERVISION RELAY
86G	GENERATOR LAOCKOUT RELAY
86T	TURBINE LOCKOUT RELAY
86L	GRID LOCKOUT RELAY
95	TRIP RELAY COIL SUPERVISION RELAY
32Q	REV REACTIVE POWER RELAY
60.2	PT FUSE FAIL RELAY FOR METERING PT (2 NOS)
64 F1	FIRST ROTOR EARTH FAULT RELAY
64 F2	SECOND ROTOR EARTH FAULT RELAY
60.3	PT FUSE FAIL RELAY FOR EXCITATION TR
51.2	VOLTAGE RESTRAINED O/C RELAY

GPR CONSISTING OF THE FOLLOWING RELAYS

60.1	PT FUSE FAILURE SENSING RELAYS
81.1Q 81.2Q	UNDER FREQUENCY WITH DF/DT
81.1	OVER FREQUENCY RELAY
27Q	UNDER VOLTAGE RELAY
59.1Q 59.2Q	OVER VOLTAGE RELAY
46Q	NEGATIVE PHASE SEQUENCE CURRENT RELAY
51.1 51.2	DEFINITE TIME OVER CURRENT RELAY
64S1	CURRENT OPERATED SENSITIVE DIRECTIONAL EARTH FAULT
64S2	VOLTAGE DISPLACEMENT E/F RELAY
87Q	DIFFERENTIAL RELAY
40Q	LOSS OF EXCITATION RELAY
32P	REVERSE ACTIVE POWER RELAY
37Q	LOW FORWARD POWER RELAY
50 LBB	LOCAL BREAKER BACK UP
21	BACK UP IMPEDANCE RELAY
99	DEAD MACHINE PROTECTION
99	OVER FLUXING RELAY

METERS

DEVICE NO	DESCRIPTION
A 3	AMMETER, 3 NOs
PF	POWER FACTOR METER
MM	MEGAWATT METER
TVM	TIRVECTOR METER
DV	DOUBLE VOLTMETER
MWh	KILO WATT HOUR METER
F	FREQUENCY METER
V	VOLTMETER
DF	DOUBLE FREQUENCY METER
SQ	ANNUNCIATION
KVAR	KILOVOLT AMPERE REACTIVE METER

LEGEND

	CIRCUIT BREAKER	86	HIGH SPEED TRIPPING RELAY
	TRANSFORMER	95	TRIP CIRCUIT SUPERVISION RELAY
	REACTOR	60G/51	COMPREHENSIVE O/C & E/F RELAY
	BUSDUCT	87BB	BUS BAR DIFFERENTIAL PROTECTION
MFM	MULTI FUNCTION METER	85	PILOT WIRE PROTECTION
AS	AMMETER SELECTOR SWITCH	59N	NEUTRAL DISPLACEMENT RELAY
A	AMMETER	2	TIMER RELAY
	FUSE	59	OVER VOLTAGE RELAY
	3 CORE POTENTIAL TRANSFORMER	27	UNDER VOLTAGE RELAY
V	VOLTMETER	60	FUSE FAILURE RELAY
VS	VOLTMETER SELECTOR SWITCH		MINIATURE CIRCUIT BREAKER
	ISOLATOR	RTU	REMOTE TERMINAL UNIT
	3 PHASE CURRENT TRANSFORMER	SCADA	SUPERVISORY CONTROL AND DATA AQUISATION
	'Y' PHASE CURRENT TRANSFORMER		
	2 CORE POTENTIAL TRANSFORMER		TRANSDUCER
MWT	MEGA WATT TRANSDUCER	AIR	AMMETER TRANSDUCER
TS	TEMPERATURE SCANNER	DFD	DIODE FAILURE DEVICE
FV	FIELD VOLTMETER	TVM	TRI VECTOR METER
FA	FIELD AMMETER	PF	POWER FACTOR
86	MASTER TRIP RELAY	25	CHECK SYNCHRONISING RELAY
95	TRIP CIRCUIT SUPERVISION RELAY	25G	SYN GUARD RELAY
30	ANNUNCIATOR	25X	SYN AUXILIARY RELAY

APPROVED WITHOUT PREJUDICE TO CONTRACTUAL OBLIGATION LIABILITIES
Sign. Name Sec - E & I (PP)
MECON LIMITED RANCHI
Date 27.11.12

SKID TERMINALS | TRIVENI | SAIL

CATEGORY OF DRG.	APPROVAL	INFORMATION	REFERENCE	RECORD	CONSTRUCTION

BHILAI STEEL PLANT, BHILAI, CHATTISGARH
7.0 MTPA EXPANSION

मेकॉन लिमिटेड
MECON LIMITED

VENDOR'S NAME : Triveni ENGINEERING & INDUSTRIES LTD.

PACKAGE DESCRIPTION : INSTALLATION OF STEAM TURBINE GENERATOR, BACK-PRESSURE TURBINE GENERATOR, COOLING WATER SYSTEM AND POWER EVACUATION SYSTEM (EXCLUDING ENABLING WORKS)

DESIGN
DRAWN S.MURALIKRISHNA
CHKD B.SUBRAMANIAN
APPROVED T.K.ROY/ SUBGUPTA
DATE 01-08-2012

TITLE OF DRG. : 25 MW STG SINGLE LINE DIAGRAM (PROTECTION & METERING)

SCALE :- NTS

VENDOR'S DRG. No. TB1SLE1621 | SHT : 01 OF 04 | REV 3

PROJECT DRG. No. : BSP-TEIL-05-11-01B-06-001-29-BE-03001

Rev.	Zone	REVISION DETAILS	Date	Altered by	Approved by
3		REVISED AS PER CUSTOMER/ CONSULTANT COMMENTS & MARKED AS △3	20-8-12		
2		REVISED AS PER CUSTOMER/ CONSULTANT COMMENTS & MARKED AS △2	07-5-12		
1		REVISED AS PER CUSTOMER/ CONSULTANT COMMENTS & MARKED AS △1	11-4-12		

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