

TD-201 Rev No. 00	Form No.	 	PRODUCT STANDARD PROJECT ENGINEERING & SYSTEMS DIVISION, HYDERABAD	ANNEXURE-03 to PY55223
				Rev No. 00
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PROJECT

40MW CDQ WASTE HEAT RECOVERY
CO-GENERATION POWER PLANT

CUSTOMER

M/S TATA STEEL LIMITED,
JAMSHEDPUR

CONSULTANT

TATA CONSULTING ENGINEERS,
KOLKATA

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COMPUTER FILE NAME
SIGN. AND DATE
INVENTORY NO.

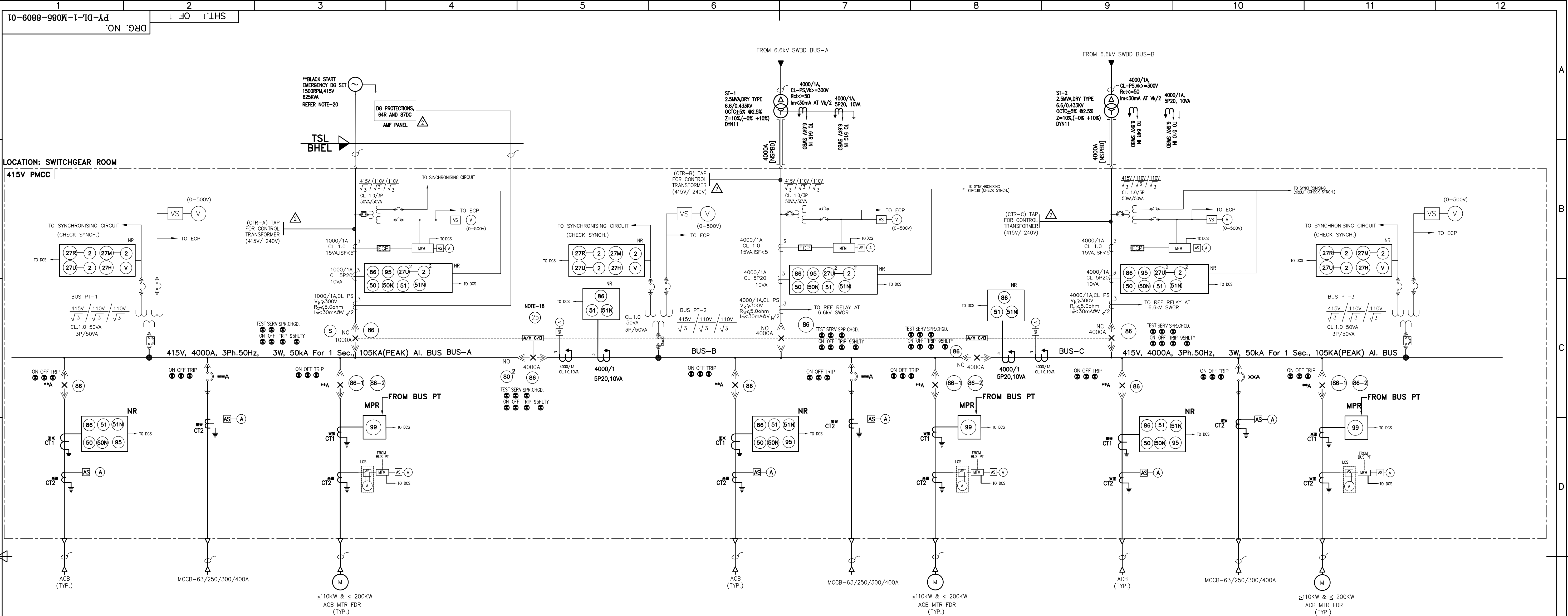
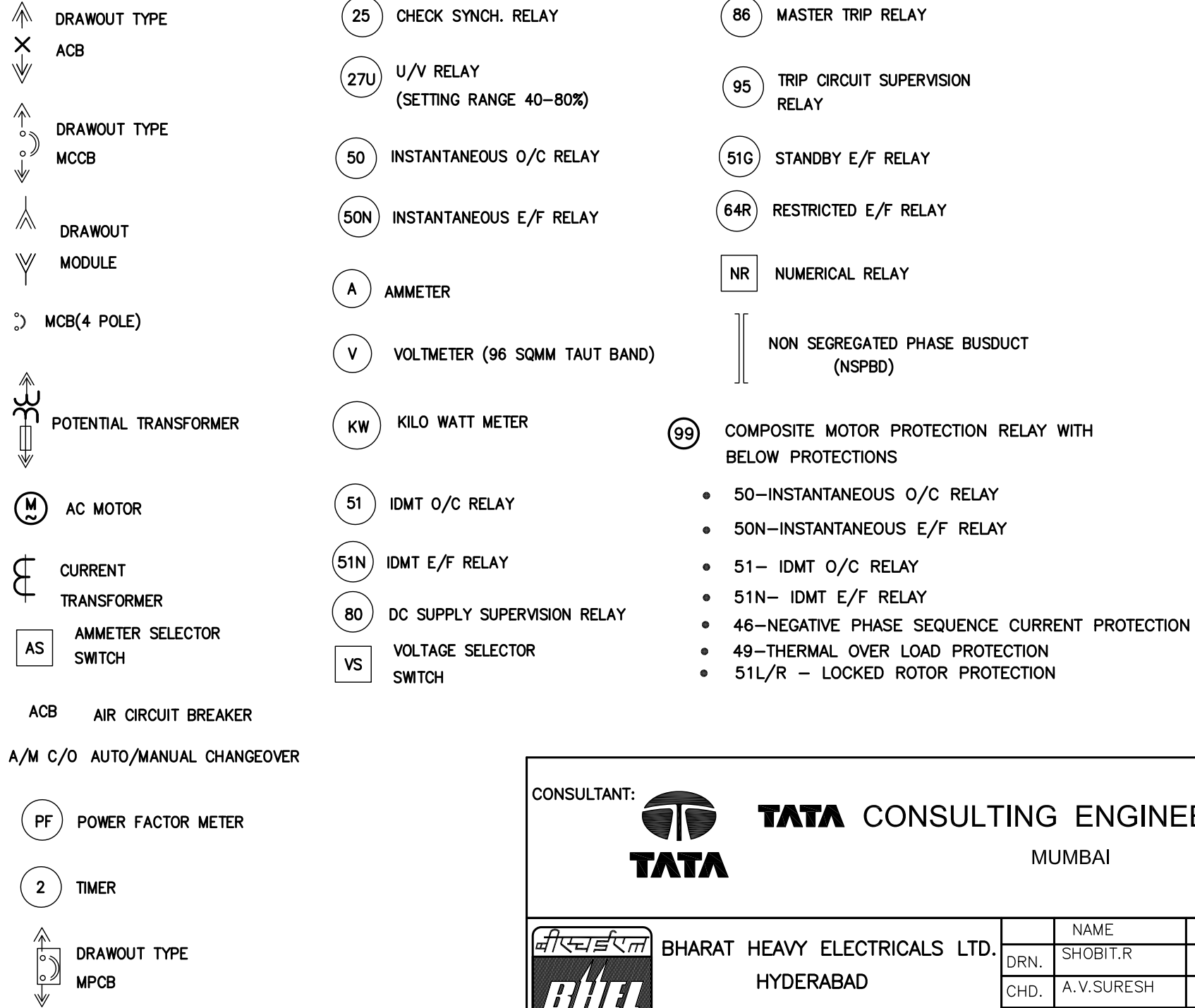


TABLE-1 : OUTGOING FEEDER DETAILS FOR 415V PMCC

				FEEDER DETAILS					CT DETAILS		
S.NO	FEEDER DESCRIPTION	RATING KW/KVA	TYPE	MCCB/ BREAKER RATING	TOTAL	BUS-A	BUS-B	BUS-C	CT-1	CT-2	TERMINATION
1	415V TG MCC	--	ACB	1000A	2	1	1	—	1000/1A, 5P20,10VA	1000/1A, CL-1.0,15VA	CABLE
2	CONDENSATE EXTRACT PUMP	132KW	ACB MTR	800A	2	—	1	1	300/1A, 5P20,10VA	300/1A, CL-1.0,15VA	CABLE
3	415V PDB	--	MCCB	250A	2	—	1	1	—	250/1A, CL-1.0,15VA	CABLE
4	220V DC CHARGER	--	MCCB	250A	2	1	—	1	—	250/1A, CL-1.0,15VA	CABLE
5	240V UPS SYSTEM	--	MCCB	250A	3	1	1	1	—	250/1A, CL-1.0,15VA	CABLE
6	415V MOV DB	--	MCCB	63A	2	—	1	1	—	250/1A, CL-1.0,15VA	CABLE
7	415V WATER SYSTEM MCC	--	MCCB	63A	2	—	1	1	—	250/1A, CL-1.0,15VA	CABLE
8	415V CTMCC (CUSTOMER)	--	ACB	1000A	2	—	1	1	1000/1A, 5P20,10VA	1000/1A, CL-1.0,15VA	CABLE
9	COMPRESSOR MOTOR(CUSTOMER)	110KW	ACB MTR	800A	2	—	1	1	250/1A, 5P20,10VA	250/1A, CL-1.0,15VA	CABLE
10	415V HVAC MCC(CUSTOMER)	--	MCCB	400A	2	—	1	—	—	400/1A, CL-1.0,15VA	CABLE
11	LIGHTING FEEDERS(CUSTOMER)	--	MCCB	63A	5	—	2	3	—	63/1A, CL-1.0,15VA	CABLE
12	EMERGENCY LIGHTING FEEDERS(CUSTOMER)	--	MCCB	63A	2	2	—	—	—	63/1A, CL-1.0,15VA	CABLE
13	EMERGENCY DG AUX.FEEDER(CUSTOMER)	--	MCCB	63A	1	1	—	—	—	63/1A, CL-1.0,15VA	CABLE
14	SPARE ACB	--	ACB	1000A	1	1	—	—	1000/1A, 5P20,10VA	1000/1A, CL-1.0,15VA	
15	SPARE MOTOR	--	ACB MTR	800A	1	1	—	—	250-300/1A, 5P20,10VA	250-300/1A, CL-1.0,15VA	
16	SPARE MCCB	--	MCCB	400A	1	—	1	—	—	400/1A, CL-1.0,15VA	
17	SPARE MCCB	--	MCCB	250A	1	—	—	1	—	250/1A, CL-1.0,15VA	
18	SPARE MCCB	--	MCCB	63A	2	—	1	1	—	63/1A, CL-1.0,15VA	

LEGEND :-



NOTES

- ** REFER TABLE-1 FOR DETAILS OF OUTGOING FEEDERS FROM 415V PMCC.
- ALL PMCC PANELS ARE SINGLE FRONT AND DRAW OUT TYPE. CABLE ENTRY FROM BOTTOM.
- PAINT SHADE SHALL BE 631 OF IS-5.
- BREAKER TRIPPING AND CLOSING CONTROL SUPPLY SHALL BE 220V DC. SPRING CHARGING MOTOR SUPPLY SHALL BE SUITABLE FOR 240V AC, TAPPED FROM ABOVE ACB INCOMER THROUGH 415V/ 240V TRANSFORMER WITH AUTO CHANGE OVER FACILITY BETWEEN CTR-B AND CTR-C.
- INCOMERS & BUS-COUPLER ARE PROVIDED WITH AUTO CHANGEOVER FACILITY.CLOSING ON DEADBUS AND MOMENTARY PARALLELING CLOSING WITH CHECK SYNCHRONISATION.
- PROTECTION RELAYS SHALL BE NUMERICAL TYPE AND OTHER RELAYS SHALL BE ELECTROMECHANICAL TYPE.
- CABLE SIZES SHALL BE AS PER LT POWER CABLE SIZING CALCULATION WHICH SHALL BE SUBMITTED SEPARATELY.
- SPARE OUTGOING FEEDERS IN PMCCs SHALL BE 10% OF EACH TYPE &RATING OF OUTGOING FEEDER
- MCCB SHALL BE SELECTED TO MEET TYPE-2 COORDINATION.
- FOR MOTOR FEEDERS ADDITIONAL LOCKOUT RELAY SHALL BE PROVIDED FOR PROCESS TRIP.
- EQUIPMENT RATING/PARAMETERS/QUANTITY ARE SUBJECT TO APPROVAL OF RESPECTIVE EQUIPMENT SIZING CALCULATIONS
- MOTOR SPACE HEATER CKT. TO BE PROVIDED FOR MOTOR 30KW AND ABOVE.
- PANEL SHALL CONFORM TO IP42 DEGREE OF PROTECTION.
- MCCBs IN OUTGOING POWER FEEDERS SHALL BE THERMAL MAGNETIC TYPE WITH INSTANTANEOUS STATIC SHORT CIRCUIT RELEASE, ADJUSTABLE THERMAL OVER LOAD AND EARTH FAULT RELEASE.
- ACCURACY CLASS OF AMMETERS AND VOLTMETERS SHALL BE 1.0.
- SUPPLY FOR PANEL SPACE HEATERS SHALL BE DERIVED FROM SPACE HEATING BUS, WHICH SHALL BE ENERGIZED FROM SINGLE PHASE SUPPLY PROVIDED FROM PDB.
- ANNUNCIATIONS FOR PMCC PANEL SHALL BE ENVISAGED IN THE ECP PANEL.
- SEPARATE CHECK SYNCHRONISATION RELAY (SKD TYPE) SHALL BE PROVIDED.
- CT RATIO FOR DG INCOMER IS TENTATIVE.IT WILL BE FINALIZED DURING DETAILED ENGINEERING BASED ON FINAL DG RATING.

CONSULTANT: **TATA CONSULTING ENGINEERS LIMITED** MUMBAI

BHARAT HEAVY ELECTRICALS LTD. HYDERABAD

NAME	SIGN.	DATE	NO.OF VAR.
SHOBIT.R	-sd-	30.05.16	N.A.
A.V.SURESH	-sd-	30.05.16	N.A.
J.K.PATANAIAK	-sd-	30.05.16	N.A.

DEPT. PE&SD CODE 450

UNTO. DIMS. GR. 2/M/F

SCALE NTS

WEIGHT (KG) REF. TO ASSY. DRG.

ITEM NO. NO.OF ITEMS

TITLE **415V PMCC SLD**

CARD CODE

BHEL DRAWING NO. **PY-DL-1-M085-8809-01**

REV. **02**

SHT. No 1 NO. OF SHT. 1

TATA STEEL LTD JAMSHEDPUR

DEPT	40MW CDQ WASTE HEAT RECOVERY CO-GENERATION POWER PLANT	CODE	
AREA	JAMSHEDPUR	CODE	
SUBJECT	415V PMCC SLD	CODE	
REV			

TATA DRG. NO.

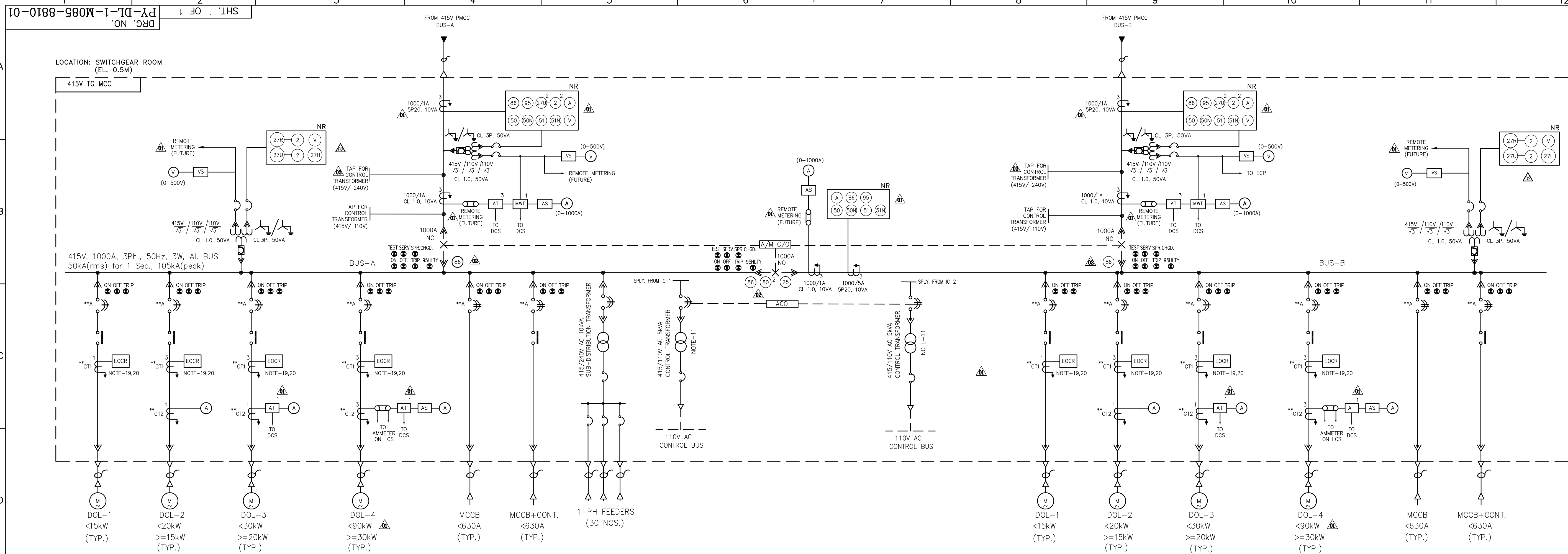


TABLE-1: OUTGOING FEEDER DETAILS FOR TG MCC

TABLE 1: OUTGOING FEEDER DETAILS FOR TG MCC										
SL. NO.	FEEDER DESCRIPTION	RATING IN kW	FEEDER DETAILS				CT-2 RATING	CT-1 RATING	TERMINATION	REMARKS
			TYPE	TOTAL	BUS-A	BUS-B				
1	Lube Oil Pump Drive Motor	75	DOL-4	1	1	1	200/1A, CL 1.0, 10VA	200/1A, CL 5P10, 10VA	CABLE	
2	Jacking Oil Pump Drive Motor	22	DOL-3	1	0	1	60/1A, CL 1.0, 10VA	60/1A, CL 5P10, 10VA	CABLE	
3	Oil Vapor Extraction Fan Motor	0.37	DOL-1	2	1	1		15/1A, CL 5P10, 10VA	CABLE	
4	Transfer Oil Pump Drive motor	1.5	DOL-1	1	0	1		15/1A, CL 5P10, 10VA	CABLE	
5	Oil Purification Unit (STG Integral) - Bulk Load	110	MCCB (250A)	1	1	0			CABLE	
6	Oil Purification Unit (Central Oil System) - Bulk Load	110	MCCB (250A)	1	0	1			CABLE	
7	Exhaust Fans & Illumination for Turbine Enclosure (Bulk Load)	5	MCCB (32A)	1	0	1			CABLE	
8	Motor Operated Valves [Drain Valves] (Non Inching Type)	0.18	MCCB (32A)	8	4	4			CABLE	
9	Motor Operated Valves [Vacuum Breaker] (Non Inching Type)	0.2	MCCB (32A)	1	0	1			CABLE	
10	Motor Operated Valves [Hydraulic Barring] (Inching Type)	1.2	MCCB (32A)	1	0	1			CABLE	
11	AVR Control (for Testing)	5	MCCB (32A)	1	0	1			CABLE	
12	Generator space heater	7	MCCB (32A)	1	1	0			CABLE	
13	DMCW Pump	75	DOL-4	2	1	1	200/1A, CL 1.0, 10VA	200/1A, CL 5P10, 10VA	CABLE	
14	ETP Disposal & Collection pumps	5.5	DOL-1	2	1	1		15/1A, CL 5P10, 10VA	CABLE	
15	Dirty Oil Transfer Pump	3.7	DOL-1	1	1	0		15/1A, CL 5P10, 10VA	CABLE	
16	Clean Oil Transfer Pump	5.5	DOL-1	1	0	1		15/1A, CL 5P10, 10VA	CABLE	
17	Portable water Pump	3.7	DOL-1	2	1	1		15/1A, CL 5P10, 10VA	CABLE	
18	Air Blower for SSF	18.5	DOL-2	2	1	1	60/1A, CL 1.0, 10VA	60/1A, CL 5P10, 10VA	CABLE	
19	Vacuum Pumps	80	DOL-4	2	1	1	200/1A, CL 1.0, 10VA	200/1A, CL 5P10, 10VA	CABLE	
20	Recirculation Pumps	0.67	DOL-1	2	1	1		15/1A, CL 5P10, 10VA	CABLE	
21	GSC Fan & Motor	3.7	DOL-1	2	1	1		15/1A, CL 5P10, 10VA	CABLE	
22	Misc. Pumps (Customer Load)	30	DOL-4	2	1	1	100/1A, CL 1.0, 10VA	100/1A, CL 5P10, 10VA	CABLE	
23	OLTC DM & Cooling Fans - Gen Transformer	5	MCCB (63A)	2	1	1			CABLE	
24	OLTC DM & Cooling Fans - UAT	5	MCCB (63A)	2	1	1			CABLE	
25	Contractual Spare	0.37	DOL-1	1	0	1		15/1A, CL 5P10, 10VA	CABLE	
26	Contractual Spare	0.67	DOL-1	1	1	0		15/1A, CL 5P10, 10VA	CABLE	
27	Contractual Spare	1.5	DOL-1	1	1	0		15/1A, CL 5P10, 10VA	CABLE	
28	Contractual Spare	3.7	DOL-1	1	0	1		15/1A, CL 5P10, 10VA	CABLE	
29	Contractual Spare	5.5	DOL-1	1	1	0		15/1A, CL 5P10, 10VA	CABLE	
30	Contractual Spare	18.5	DOL-2	1	1	0	60/1A, CL 1.0, 10VA	60/1A, CL 5P10, 10VA	CABLE	
31	Contractual Spare	22	DOL-3	1	0	1	60/1A, CL 1.0, 10VA	60/1A, CL 5P10, 10VA	CABLE	
32	Contractual Spare	30	DOL-4	1	1	0	100/1A, CL 1.0, 10VA	100/1A, CL 5P10, 10VA	CABLE	
33	Contractual Spare	75	DOL-4	1	1	0	200/1A, CL 1.0, 10VA	200/1A, CL 5P10, 10VA	CABLE	
34	Contractual Spare	80	DOL-4	1	0	1	200/1A, CL 1.0, 10VA	200/1A, CL 5P10, 10VA	CABLE	
35	Contractual Spare		MCCB (250A)	1	0	1			CABLE	
36	Contractual Spare		MCCB (63A)	1	1	0			CABLE	
37	Contractual Spare		MCCB (32A)	2	1	1			CABLE	

LEGEND

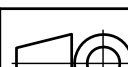
- | | | | | | | | |
|---|-------------------------------------|---|--------------------------------------|---|---------|---|-------------------------------------|
|  | DRAWOUT TYPE
ACB |  | CHECK SYNCH. RELAY |  | A/M C/O |  | AUTO/MANUAL CHANGEOVER |
|  | |  | U/V RELAY
(SETTING RANGE 40--80%) |  | Δ |  | TERMINATION |
|  | MPCB |  | RESIDUAL U/V RELAY
(SETTING 40%) |  | ACB |  | DISTRIBUTED CONTROL SYSTEM |
|  | DRAWOUT
MODULE |  | VOLTAGE HEALTH
CHECK RELAY |  | MPCB |  | MOTOR PROTECTION
CIRCUIT BREAKER |
|  | |  | TIMER |  | MCCB |  | MOLDED CASE
CIRCUIT BREAKER |
|  | CONTACTOR |  | DC SUPPLY
SUPERVISION RELAY |  | MCB |  | MINIATURE
CIRCUIT BREAKER |
|  | MCB |  | MASTER TRIP RELAY |  | NR |  | NUMERICAL RELAY |
|  | POTENTIAL
TRANSFORMER |  | TRIP CIRCUIT
SUPERVISION RELAY |  | AT |  | DUAL OUTPUT
CURRENT TRANSDUCER |
|  | CURRENT
TRANSFORMER |  | ANALOG AMMETER |  | MWI |  | DUAL OUTPUT
POWER TRANSDUCER |
|  | AS |  | ANALOG VOLTMETER |  | M |  | AC MOTOR |
|  | VS |  | |  | | | CONTROL/ SUB-DIST.
TRANSFORMER |
|  | MCCB |  | |  | | | INDICATION LAMP |
|  | CABLE |  | EOCR |  | S1 |  | IDMT OVER
CURRENT RELAY |
|  | INSTANTANEOUS OVER
CURRENT RELAY |  | INSTANTANEOUS EARTH
FAULT RELAY |  | S1N |  | IDMT EARTH
FAULT RELAY |
| | | | |  | ACO |  | AUTO CHANGE OVER |

NOTES:

1. ** REFER TABLE-1 FOR DETAILS OF OUTGOING FEEDERS FROM TG MCC. FINAL LOADS, AS PER FINAL LOAD LIST. WILL BE REFLECTED IN THE SWITCHBOARD VENDOR DRAWINGS.
2. MCC SHALL BE SINGLE FRONT, DRAW OUT TYPE.
3. CABLE ENTRY SHALL BE FROM BOTTOM.
4. EXTERNAL PAINT SHADE SHALL BE LIGHT GREY SEMI GLOSSY SHADE 631 OF IS-5.
5. DEGREE OF PROTECTION SHALL BE IP-52.
6. BREAKER TRIPPING AND CLOSING CONTROL SUPPLY SHALL BE 220V DC AND CONTROL SUPPLY FOR CONTACTOR FEEDERS SHALL BE 110V AC.
7. SPRING CHARGING MOTOR SUPPLY SHALL BE SUITABLE FOR 240V AC, TAPPED FROM ABOVE ACB INCOMER THROUGH 415V/ 240V TRANSFORMER WITH AUTO CHANGE OVER FACILITY.
8. INCOMERS & BUS COUPLER SHALL BE PROVIDED WITH AUTO CHANGEOVER, MANUAL MOMENTARY PARALLELING AND INDEPENDENT CLOSING ON DEAD BUS. AUTO CHANGEOVER HAPPENS AT BUS COUPLER IN CASE OF ANY LINE UNDER-VOLTAGE.
9. PROTECTION RELAYS SHALL BE NUMERICAL TYPE. OTHER RELAYS SHALL BE ELECTROMECHANICAL TYPE.
10. MCCB, CONTACTOR RATINGS AND O/L RELAY RANGE SHALL BE SELECTED TO MEET TYPE-2 COORDINATION AS PER IS-60947-4-1.
11. 2 x 100%, 415/110V, 5kVA CONTROL TRANSFORMERS (1 NUMBER ON EACH BUS) SHALL BE PROVIDED WITH TAPPING $\pm 5\%$ IN STEP OF $\pm 2.5\%$ WITH AUTO CHANGE OVER FACILITY.
12. CONTRACTUAL SPARE FEEDERS SHALL BE PROVIDED AS 10% OF EACH TYPE & RATING WITH MINIMUM 1 NO.. SUPPLY FOR PANEL SPACE HEATERS SHALL BE DERIVED FROM SPACE HEATING BUS, WHICH SHALL BE ENERGISED FROM SINGLE PHASE SUPPLY PROVIDED FROM 415V PDB.
13. ACCURACY CLASS OF AMMETERS & VOLTMETERS 1.0.
14. DELETED.
15. MCCBs IN OUTGOING MOTOR FEEDERS SHALL BE MAGNETIC TYPE WITH INSTANTANEOUS STATIC SHORT CIRCUIT RELEASE. MCCBs IN OUTGOING POWER FEEDERS SHALL BE THERMAL MAGNETIC TYPE WITH INSTANTANEOUS STATIC SHORT CIRCUIT RELEASE, ADJUSTABLE THERMAL OVERLOAD & EARTH FAULT RELEASE.
16. AMMETER FOR MOTOR FEEDERS SHALL BE PROVIDED WITH SUPPRESSED END SCALE OF 600% OF FULL LOAD CURRENT.
17. REFER LT POWER CABLE SIZING DOCUMENT FOR CABLE SIZES.
18. ALL EOCR SHALL BE CURRENT DISPLAY TYPE.
19. EOCR SHALL HAVE BELOW PROTECTIONS AS PER THE FEEDER RATING:
 <15kW : OVERLOAD
 >=15kW & <30kW : OVERLOAD & EARTH FAULT
 >=30kW & <90kW : OVERLOAD, EARTH FAULT, UNBALANCE & LOCKED ROTOR
20. ALL TRANSDCUSERS SHALL HAVE DUAL OUTPUT. CONTROL SUPPLY OF TRANSDCUSERS SHALL BE 220V DC SUPPLY.
21. 240V AC MOTOR SPACE HEATER SUPPLY FOR MOTORS RATED 30kW AND ABOVE SHALL BE DERIVED USING CONTACTOR FROM PANEL SPACE HEATING BUS AND SHALL BE ON WHEN MOTOR IS OFF.
22. ANNUNCIATIONS OF TG MCC SHALL BE ENVISAGED IN ECP.

REFERENCES:

- | | | |
|----------------------------|---|----------------------|
| 1. KEY SINGLE LINE DIAGRAM | : | PY-DL-1-M085-0000-01 |
| 2. PMCC SLD | : | PY-DL-1-M085-8809-01 |

CONSULTANT:  TATA CONSULTING ENGINEERS LIMITED MUMBAI										 TATA STEEL LTD JAMSHEDPUR																									
 BHARAT HEAVY ELECTRICALS LTD. HYDERABAD										NAME		SIGN.		DATE		NO. OF VAR.		DEPT		40MW CDQ WASTE HEAT RECOVERY CO-GENERATION POWER PLANT										CODE					
										DRN.		K.RANGAMANI		-sd-		30.05.16		N.A.		AREA		JAMSHEDPUR										CODE			
										CHD.		K.RANGAMANI		-sd-		30.05.16				SUBJECT		415V TG MCC SLD										CODE			
										APPD.		J.K.PATTANAIK		-sd-		30.05.16																			
DEPT. PE&SD CODE 450		UNTO. DIMS. GR 9/4/9				SCALE NTS		WEIGHT (KG) -N.A.-		REF. TO ASSY. DRG. -N.A.-				ITEM NO. -N.A.-		NO. OF ITEMS -N.A.-												REV							
TITLE 415V TG MCC SLD								CARD CODE		BHEL DRAWING NO. PY-DL-1-M085-8810-01						REV. 03		TATA DRG. NO.										03							
										SHT. No 1						NO. OF SHT. 1																			

SHT. 1 OF 1



SL. NO.	FEEDER DESCRIPTION	RATING IN kW	FEEDER DETAILS			CT-2 RATING	CT-1 RATING	TERMINATION	REMARKS
			TYPE	TOTAL	BUS-A				
1	Biocide Dosing pumps	0.37	DOL-1	2	1	1	15/1A, CL 5P10, 10VA	CABLE	
2	Acid dosing pumps	0.37	DOL-1	2	1	1	15/1A, CL 5P10, 10VA	CABLE	
3	Acid unloading pump	3.7	DOL-1	2	1	1	15/1A, CL 5P10, 10VA	CABLE	
4	Corrosion Inhibitor Dosing pumps	0.37	DOL-1	2	1	1	15/1A, CL 5P10, 10VA	CABLE	
5	NaOCl Dosing pumps	0.37	DOL-1	2	1	1	15/1A, CL 5P10, 10VA	CABLE	
6	Scale Inhibitor Dosing pumps	0.37	DOL-1	2	1	1	15/1A, CL 5P10, 10VA	CABLE	
7	Motor For Ball Recirculating Pump	7.5	DOL-1	1	0	1	30/1A, CL 5P10, 10VA	CABLE	
8	Motor For Dosing Pump	0.37	DOL-1	2	1	1	15/1A, CL 5P10, 10VA	CABLE	
9	Motor For Agitator	0.75	DOL-1	1	1	0	15/1A, CL 5P10, 10VA	CABLE	
10	Actuator For Ball separator Screens	0.74	MCCB (32A)	2	1	1		CABLE	
11	Actuator for Ball Vessel for 3-way Valve	0.12	MCCB (32A)	1	1	0		CABLE	
12	Actuator for Ball Vessel Inlet Valve	0.12	MCCB (32A)	1	0	1		CABLE	
13	Biocide Dosing tank agitator	0.19	DOL-1	1	1	0	15/1A, CL 5P10, 10VA	CABLE	
14	Corrosion Inhibitor Dosing tank agitator	0.19	DOL-1	1	0	1	15/1A, CL 5P10, 10VA	CABLE	
15	Scale Inhibitor Dosing tank agitator	0.19	DOL-1	1	1	0	15/1A, CL 5P10, 10VA	CABLE	
16	Scale Inhibitor Dosing tank agitator	0.19	DOL-1	1	0	1	15/1A, CL 5P10, 10VA	CABLE	
17	Contractual Spare	0.19	DOL-1	1	0	1	15/1A, CL 5P10, 10VA	CABLE	
18	Contractual Spare	0.75	DOL-1	1	0	1	15/1A, CL 5P10, 10VA	CABLE	
19	Contractual Spare	7.5	DOL-1	1	1	0	30/1A, CL 5P10, 10VA	CABLE	
20	Contractual Spare	0.37	DOL-1	1	0	1	15/1A, CL 5P10, 10VA	CABLE	
21	Contractual Spare	3.7	MCCB (32A)	1	1	0		CABLE	

	MPCB		ANALOG AMMETER		TERMINATION
	MCB		ANALOG VOLTMETER	MPCB	MOTOR PROTECTION CIRCUIT BREAKER
	CURRENT TRANSFORMER		MCCB	MCCB	MOULDED CASE CIRCUIT BREAKER
	AMMETER SELECTOR SWITCH		CABLE	MCB	MINIATURE CIRCUIT BREAKER
	VOLTAGE SELECTOR SWITCH		CONTROL/ SUB-DIST. TRANSFORMER		ELECTRONIC OVER CURRENT RELAY
	INDICATION LAMP		AC MOTOR		CONTACTOR
					AUTO CHANGE OVER

1. KEY SINGLE LINE DIAGRAM	:	PY-DL-1-M085-0000-01
2. PMCC SLD	:	PY-DL-1-M085-8809-01

02. ** REFER TABLE-1 FOR DETAILS OF OUTGOING FEEDERS FROM WATER SYSTEM MCC. FINAL LOADS WILL BE REFLECTED IN THE SWITCHBOARD VENDOR DRAWINGS.
02. WATER SYSTEM MCC SHALL BE SINGLE FRONT DRAW OUT TYPE.
2. CABLE ENTRY SHALL BE FROM BOTTOM.
4. EXTERNAL PAINT SHADE SHALL BE LIGHT GREY SEMI GLOSSY SHADE 631 OF IS-5.
5. DEGREE OF PROTECTION SHALL BE IP-52.
6. CONTROL SUPPLY FOR CONTACTOR FEEDERS SHALL BE 110V AC.
6. INCOMERS & BUS COUPLER SHALL BE PROVIDED WITH MECHANICAL INTERLOCK.
7. MCCB, CONTACTOR AND OVER LOAD RELAY RANGE SHALL BE SELECTED TO MEET TYPE-II CO-ORDINATION AS PER IS-60947-4-1.
8. 2x100% 415/110V, 3kVA CONTROL TRANSFORMERS (1 NO. ON EACH BUS) SHALL BE PROVIDED WITH TAPPING $\pm 5\%$ IN STEPS OF $\pm 2.5\%$.
9. CONTRACTUAL SPARE FEEDERS SHALL BE PROVIDED AS 10% OF EACH TYPE & RATING WITH MINIMUM 1 NO..
10. SUPPLY FOR PANEL SPACE HEATERS SHALL BE DERIVED FROM SPACE HEATING BUS, WHICH SHALL BE ENERGISSED FROM SINGLE PHASE SUPPLY PROVIDED FROM 415V PDB.

11. ACCURACY CLASS OF AMMETERS & VOLTMETERS 1.0.
12. MCCBs IN OUTGOING MOTOR FEEDERS SHALL BE MAGNETIC TYPE WITH INSTANTANEOUS STATIC SHORT CIRCUIT RELEASE. MCCBs IN OUTGOING POWER FEEDERS SHALL BE THERMAL MAGNETIC TYPE WITH INSTANTANEOUS STATIC SHORT CIRCUIT RELEASE, ADJUSTABLE THERMAL OVERLOAD & EARTH FAULT RELEASE.
13. AMMETER FOR MOTOR FEEDERS SHALL BE PROVIDED WITH SUPPRESSED END SCALE OF 600% OF FULL LOAD CURRENT.
14. REFER LT POWER CABLE SIZING DOCUMENT FOR CABLE SIZES.
15. ALL EOCR SHALL BE CURRENT DISPLAY TYPE.
16. EOCR SHALL HAVE BELOW PROTECTIONS AS PER THE FEEDER RATING:

$<15\text{kW}$: OVERLOAD
17. 240V AC MOTOR SPACE HEATER SUPPLY FOR MOTORS RATED 30kW AND ABOVE SHALL BE DERIVED USING CONTACTOR FROM PANEL SPACE HEATING BUS AND SHALL BE ON WHEN MOTOR IS OFF.

CONSULTANT:



TATA CONSULTING ENGINEERS LIMITED

MUMBAI



BHARAT HEAVY ELECTRICALS LTD.

HYDERABAD

NAME	SIGN.	DATE	NO.OF VAR.
DRN. C.R.REDDY	-sd-	04.08.16	N.A.
CHD. K.RANGAMANI	-sd-	05.08.16	
APPD. J.K.PATTANAIK	-sd-	05.08.16	

DEPT. PE&SD	UNTOL. DIMS. GR.		SCALE	WEIGHT (KG)	REF. TO ASSY. DRG.	ITEM NO.	NO.OF ITEMS
CODE 450	Ø/M/ℓ		NTS	-N.A.-	-N.A.-	-N.A.-	-N.A.-

TITLE

415V WATER SYSTEM MCC SLD



CARD CODE

BHEL DRAWING NO.

PY-DL-3-M085-8820-01

REV.

02





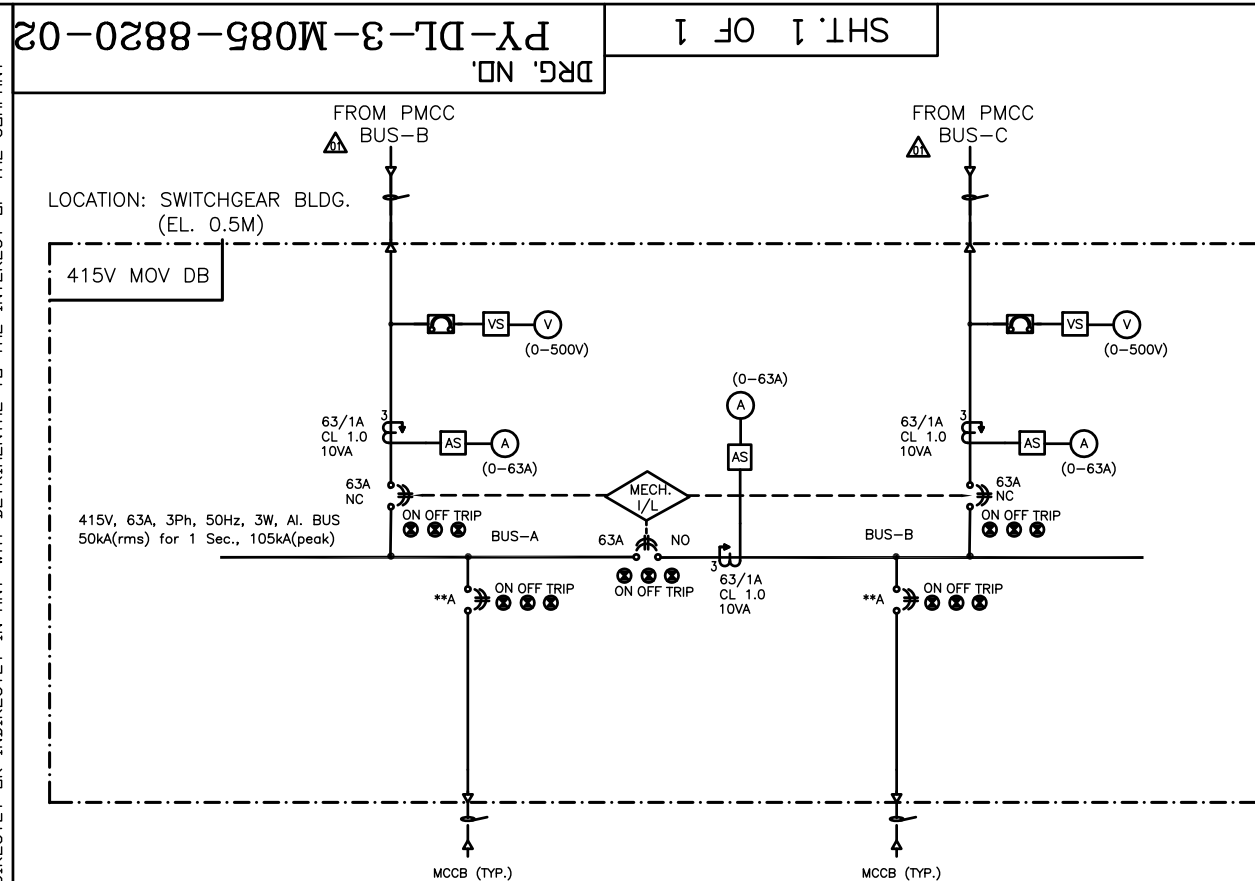
TATA STEEL LTD
JAMSHEDPUR

DEPT	40MW CDQ WASTE HEAT RECOVERY CO-GENERATION POWER PLANT	CODE	
AREA	JAMSHEDPUR	CODE	
SUBJECT	415V WATER SYSTEM MCC SLD ⚠	CODE	
TATA DRG. NO.			REV
			02

IT MUST BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY

COMPUTER FILE NAME

SIGN. AND DATE REF. DRG. NO.



NOTES:

- ** REFER TABLE-1 FOR DETAILS OF OUTGOING FEEDERS FROM MOV DB. FINAL LOADS WILL BE REFLECTED IN THE SWITCHBOARD VENDOR DRAWINGS.
- MOV DB SHALL BE SINGLE FRONT FIXED TYPE.
- CABLE ENTRY SHALL BE FROM BOTTOM.
- EXTERNAL PAINT SHADE SHALL BE LIGHT GREY SEMI GLOSSY SHADE 631 OF IS-5.
- DEGREE OF PROTECTION SHALL BE IP-52.
- INCOMERS & BUS COUPLER SHALL BE PROVIDED WITH MECHANICAL INTERLOCK.
- CONTRACTUAL SPARE FEEDERS SHALL BE PROVIDED AS 10% OF EACH TYPE & RATING WITH MINIMUM 1 NO.
- SUPPLY FOR PANEL SPACE HEATERS SHALL BE DERIVED FROM SPACE HEATING BUS, WHICH SHALL BE ENERGISED FROM SINGLE PHASE SUPPLY PROVIDED FROM 415V PDB.
- ACCURACY CLASS OF AMMETERS & VOLTMETERS 1.0.
- MCCBs SHALL BE THERMAL MAGNETIC TYPE WITH INSTANTANEOUS STATIC SHORT CIRCUIT RELEASE, ADJUSTABLE THERMAL OVERLOAD & EARTH FAULT RELEASE.
- REFER LT POWER CABLE SIZING DOCUMENT FOR CABLE SIZES.

LEGEND:

	MPCB		ANALOG AMMETER		MPCB	MOTOR PROTECTION CIRCUIT BREAKER
	MCB		ANALOG VOLTMETER		MCCB	MOULDED CASE CIRCUIT BREAKER
	CURRENT TRANSFORMER		MCCB		MCB	MINIATURE CIRCUIT BREAKER
	AMMETER SELECTOR SWITCH		CABLE			
	VOLTAGE SELECTOR SWITCH		CONTROL/ SUB-DIST. TRANSFORMER			
	INDICATION LAMP		TERMINATION			

TABLE-1: OUTGOING FEEDER DETAILS FOR MOV DB

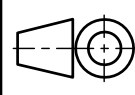
SL. NO.	FEEDER DESCRIPTION	RATING IN KW	FEEDER DETAILS			TERMINATION	REMARKS
			TYPE	TOTAL	BUS-A	BUS-B	
1	MAIN STEAM ISOLATION VALVE-14"-900# GV-MOV-3101-350	1.1	MCCB (32A)	1	1	0	CABLE
2	BYPASS VALVE FOR MAIN STEAM ISOLATION VALVE 1"-1500# RGL-MOV-3101A-25	0.102	MCCB (32A)	1	0	1	CABLE
3	MOV IN MAIN STEAM LINE DRAIN-1.5"-1500# RGL-3103B-40	1.1	MCCB (32A)	1	1	0	CABLE
4	MOV IN VENT SILENCER INPUT LINE-2"-900# GV-MOV-3104-50	1.1	MCCB (32A)	1	0	1	CABLE
5	MOV IN VENT SILENCER INPUT LINE-2"-900# RGL-MOV-3106-50	1.1	MCCB (32A)	1	1	0	CABLE
6	MOV IN AUXILIARY STEAM TO TURBINE GLAND SEALING LINE-1"-1500# RGL-MOV-3111-25	0.102	MCCB (32A)	1	0	1	CABLE
7	MOV IN MAIN STEAM TO PRDS LINE-8"-900# GV-MOV-3120-200	0.55	MCCB (32A)	1	1	0	CABLE
8	MOTOR OPERATED BYPASS VALVE IN MAIN STEAM TO PRDS LINE-1"-1500# RGL-MOV-3120A-25	0.102	MCCB (32A)	1	0	1	CABLE
9	SPRAY WATER CEP DISCHARGE TO DSH-1"-800# RGL-MOV-3117-25	0.102	MCCB (32A)	1	1	0	CABLE
10	MOV IN SPRAY WATER TO CONDENSER WATER INLET-1.5"-800# RGL-MOV-3130-40	0.102	MCCB (32A)	1	0	1	CABLE
11	MOV IN SPRAY WATER TO PRDS-1.5"-800# RGL-MOV-3125-40	0.102	MCCB (32A)	1	1	0	CABLE
12	MOV IN CEP DISCHARGE HEADER-8"-150# GV-MOV-3194-200	0.55	MCCB (32A)	1	0	1	CABLE
13	MOV IN INLET 1 TO GSC-8"-150# GV-MOV-3195-200	0.55	MCCB (32A)	1	1	0	CABLE
14	MOV IN INLET 2 TO GSC-8"-150# GV-MOV-3196-200	0.55	MCCB (32A)	1	0	1	CABLE
15	MOV IN CEP A DISCHARGE LINE-8"-150# GV-MOV-3178A-200	0.55	MCCB (32A)	1	1	0	CABLE
16	MOTOR OPERATED BY PASS VALVE IN CEP A DISCHARGE LINE -1"-800# GL-MOV-3179A-25	0.102	MCCB (32A)	1	0	1	CABLE
17	MOV IN CEP B DISCHARGE LINE-8"-150# GV-MOV-3178B-200	0.55	MCCB (32A)	1	1	0	CABLE
18	MOTOR OPERATED BY PASS VALVE IN CEP B DISCHARGE LINE-1"-800# GL-MOV-3179B-25	0.102	MCCB (32A)	1	0	1	CABLE

19	MOV IN LINE TO NEARBY LOCAL DRAIN-4"-150# RGL-3203-100	1.1	MCCB (32A)	1	1	0	CABLE	
20	MOVE IN COND MINIMUM CIRCULATION LINE TO CONDENSER -3"-150# RGL-3208-80	0.55	MCCB (32A)	1	0	1	CABLE	
21	MOTOR OPERATED BYPASSVALVE FOR CV IN MAKE UP TO HOTWELL-3"-150# RGL-3234-80	0.55	MCCB (32A)	1	1	0	CABLE	
22	MOV IN SERVICE WATER LINE TO SW OVERHEAD TANK -1"-800# RGLV-3272-25	0.102	MCCB (32A)	1	0	1	CABLE	
23	MOV IN POTABLE WATER LINE TO PW OVERHEAD TANK -1"-800# RGLV-3278-25	0.102	MCCB (32A)	1	1	0	CABLE	
24	MOTOR OPERATED BUTTERFLY VALVE IN CW PUMP-A DISCHARGE-34"-150# BV-3256-850	1.5	MCCB (32A)	1	0	1	CABLE	
25	MOTOR OPERATED BUTTERFLY VALVE IN CW PUMP-B DISCHARGE-34"-150# BV-3257-850	1.5	MCCB (32A)	1	1	0	CABLE	
26	MOTOR OPERATED BUTTERFLY VALVE IN CW PUMP-C DISCHARGE-34"-150# BV-3258-850	1.5	MCCB (32A)	1	0	1	CABLE	
27	MOTOR OPERATED BUTTERFLY VALVE IN CONDENSER INLET-1- 34"-150# BV-3259-850	1.5	MCCB (32A)	1	1	0	CABLE	
28	MOTOR OPERATED BUTTERFLY VALVE IN CONDENSER INLET-2- 34"-150# BV-3260-850	1.5	MCCB (32A)	1	0	1	CABLE	
29	MOTOR OPERATED BUTTERFLY VALVE IN CONDENSER OUTLET-1- 34"-150# BV-3265-850	1.5	MCCB (32A)	1	1	0	CABLE	
30	MOTOR OPERATED BUTTERFLY VALVE IN CONDENSER OUTLET-2- 34"-150# BV-3266-850	1.5	MCCB (32A)	1	0	1	CABLE	
31	MOTOR OPERATED BUTTERFLY VALVE IN COOLING WATER MAKE UP LINE TO CW PUMP SUMP - 8"-150# BV-3274-200	0.55	MCCB (32A)	1	1	0	CABLE	
32	MOTOR OPERATED BUTTERFLY VALVE IN DRAIN LINE TO UPPER COOLING POND -3"-150# BV-3268-80	0.55	MCCB (32A)	1	1	0	CABLE	
33	Contractual Spare		MCCB (32A)	4	2	2	CABLE	

REFERENCES:

- KEY SINGLE LINE DIAGRAM : PY-DL-1-M085-0000-01
- PMCC SLD : PY-DL-1-M085-8809-01

CONSULTANT:

**TATA CONSULTING ENGINEERS LIMITED**
MUMBAI**BHARAT HEAVY ELECTRICALS LTD.**
HYDERABADDEPT. PE&SD
CODE 450UNTOL. DIMS.
GR.
Ø/M/FSCALE
NTSWEIGHT (KG)
-N.A.-REF. TO ASSY. DRG.
-N.A.-ITEM NO.
-N.A.-NO.OF ITEMS
-N.A.-

TITLE

415V MOV DB SLD

CARD CODE

BHEL DRAWING NO.
PY-DL-3-M085-8820-02REV.
01**TATA STEEL LTD**
JAMSHEDPUR

DEPT

**40MW CDQ WASTE HEAT RECOVERY
CO-GENERATION POWER PLANT**

CODE

AREA

JAMSHEDPUR

CODE

SUBJECT

415V MOV DB SLD

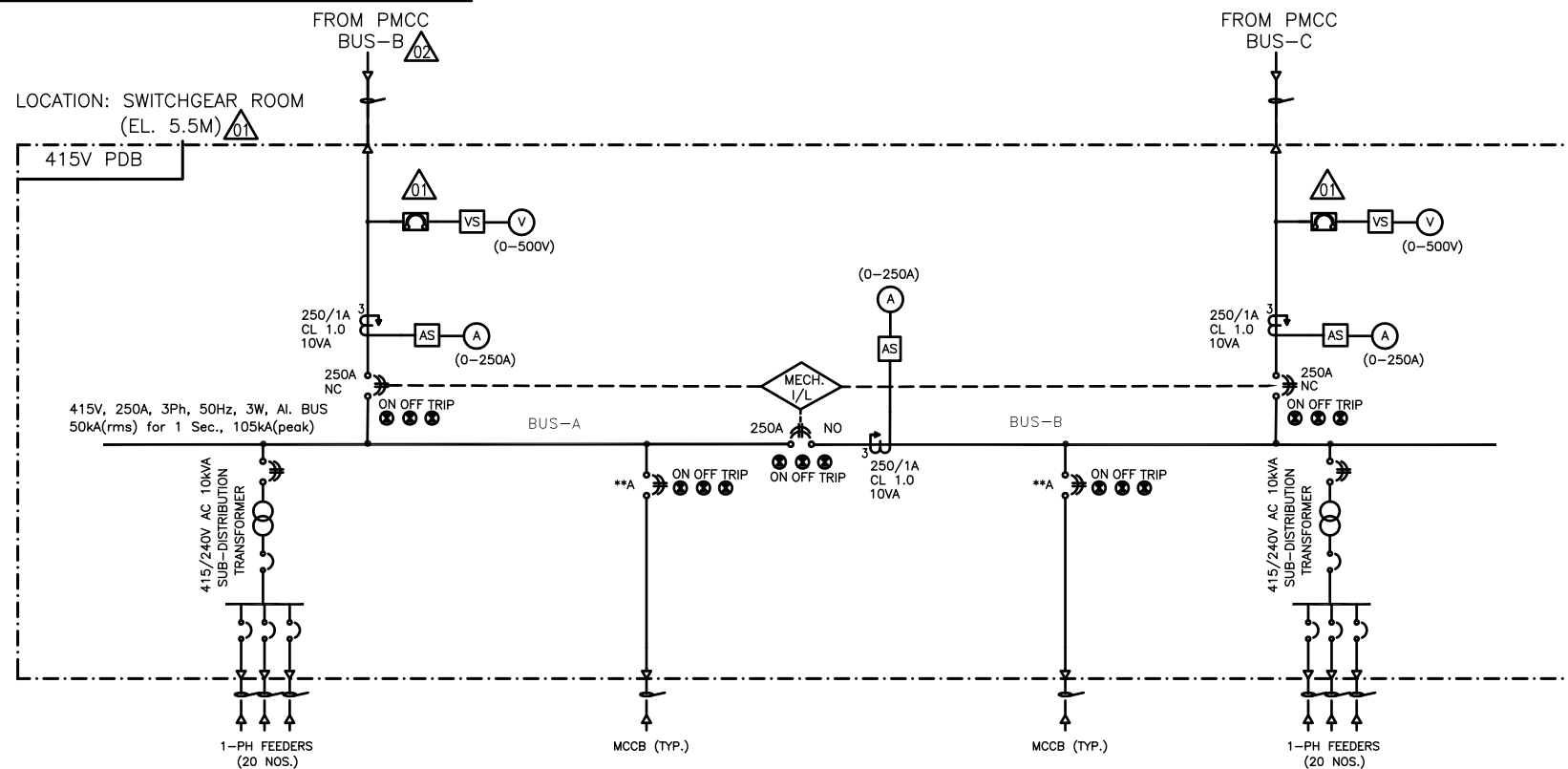
CODE

REV

01

DRG. NO. PY-DL-3-M085-8817-01

SHT. 1 OF 1



NOTES:

- ** REFER TABLE-1 FOR DETAILS OF OUTGOING FEEDERS FROM PDB. FINAL LOADS WILL BE REFLECTED IN THE SWITCHBOARD VENDOR DRAWINGS.
- PDB SHALL BE SINGLE FRONT FIXED TYPE.
- CABLE ENTRY SHALL BE FROM BOTTOM.
- EXTERNAL PAINT SHADE SHALL BE LIGHT GREY SEMI GLOSSY SHADE 631 OF IS-5.
- DEGREE OF PROTECTION SHALL BE IP-52.
- INCOMERS & BUS COUPLER SHALL BE PROVIDED WITH MECHANICAL INTERLOCK.
- SUPPLY FOR PANEL SPACE HEATERS SHALL BE DERIVED FROM SPACE HEATING BUS, WHICH SHALL BE ENERGISED FROM SINGLE PHASE SUPPLY TAPPED FROM LINE SIDE OF INCOMERS (BEFORE MCCBs) THROUGH SUITABLE TRANSFORMERS.
- ACCURACY CLASS OF AMMETERS & VOLTMETERS 1.0.
- MCCBs SHALL BE THERMAL MAGNETIC TYPE WITH INSTANTANEOUS STATIC SHORT CIRCUIT RELEASE, ADJUSTABLE THERMAL OVERLOAD & EARTH FAULT RELEASE.
- CONTRACTUAL SPARE FEEDERS SHALL BE PROVIDED AS 10% OF EACH TYPE & RATING WITH MINIMUM 1 NO..
- REFER LT POWER CABLE SIZING DOCUMENT FOR CABLE SIZES.

LEGEND:

	MPCB		ANALOG AMMETER		TERMINATION
	MCB		ANALOG VOLTMETER		MPCB
			MCCB		MCCB
	CURRENT TRANSFORMER		CABLE		MCB
	AMMETER SELECTOR SWITCH		CONTROL/ SUB-DIST. TRANSFORMER		MINIATURE CIRCUIT BREAKER
	VOLTAGE SELECTOR SWITCH		INDICATION LAMP		

REFERENCES:

- KEY SINGLE LINE DIAGRAM : PY-DL-1-M085-0000-01
- PMCC SLD : PY-DL-1-M085-8809-01



TABLE-1: OUTGOING FEEDER DETAILS FOR PDB

SL. NO.	FEEDER DESCRIPTION	RATING IN kW	FEEDER DETAILS				TERMINATION	REMARKS
			TYPE	TOTAL	BUS-A	BUS-B		
1	Misc. Power feeders (Customer Load)	30	MCCB (150A)	4	2	2	CABLE	
2	EOT Crane (Customer Load)	60	MCCB (150A)	1	1	0	CABLE	
3	Elevator (Customer Load)	10	MCCB (63A)	1	0	1	CABLE	
4	Contractual Spare		MCCB (150A)	1	1	0	CABLE	
5	Contractual Spare		MCCB (63A)	1	0	1	CABLE	

CONSULTANT:

**TATA CONSULTING ENGINEERS LIMITED**
MUMBAI**BHARAT HEAVY ELECTRICALS LTD.**
HYDERABAD

	NAME	SIGN.	DATE	NO.OF VAR.
DRN.	C.RAMANJANEYULU	-sd-	30.05.16	N.A.
CHD.	K.RANGAMANI	-sd-	30.05.16	
APPD.	J.K.PATTANAIK	-sd-	30.05.16	

REV. 01	DATE 26.08.2016	ALTERED APURVA SINGH CHD/APPD K. RANGAMANI/J.K.PATTANAIK	DEPT. PE&SD	UNTOL. DIMS. GR. Ø/M/F	SCALE NTS	WEIGHT (KG) -N.A.-	REF. TO ASSY. DRG. -N.A.-	ITEM NO. -N.A.-	NO.OF ITEMS -N.A.-
ZONE	REVISED IN LINE WITH TCE /TSL COMMENTS VIDE TRANSMITTAL TCE.7742B-EL-BHEL-032 AND GENERALLY REVISED. ALL REVISIONS MARKED WITH								

TITLE	415V PDB SLD	CARD CODE	BHEL DRAWING NO. PY-DL-3-M085-8817-01	REV. 02
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**TATA STEEL LTD**
JAMSHEDPUR

DEPT	40MW CDQ WASTE HEAT RECOVERY CO-GENERATION POWER PLANT	CODE	
AREA	JAMSHEDPUR	CODE	
SUBJECT	415V PDB SLD	CODE	
			REV
TATA DRG. NO.			02

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SIGN. AND DATE: REF. DRG. NO.

INVENTORY NO

Fri 16 15:31 2016

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