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GENERAL DIMENSIONAL LIMITS, FITS & TOLERANCES AS PER HY0230261

COMPUTER FILE NAME
REF. DRG. NO.
DATE

Signature with Date
Name of Reviewer
Transmittal No.

LEGEND :-

DRAYOUT TYPE

ACB

DRAYOUT TYPE

SFU

DRAYOUT

MODULE

CONTACTOR

MCB(WITH OC+SC+EF RELEASES)

POTENTIAL TRANSFORMER

CURRENT TRANSFORMER

AMMETER SELECTOR SWITCH

VOLTAGE SELECTOR SWITCH

AMMETER

VOLTMETER (96 SQMM TAUT BAND)

KILO WATT HOUR METER

ACB AIR CIRCUIT BREAKER

SFC SWITCHFUSE CONTACTOR

A/M C/O AUTO/MANUAL CHANGEOVER

PF POWER FACTOR METER

2 TIMER

25 CHECK SYNCH. RELAY

27C VOLTAGE HEALTH CHECK RELAY

U/V RELAY (SETTING RANGE 40-80%)

RESIDUAL U/V RELAY (SETTING 40%)

U/V RELAY FOR TRIPPING MOTORS (SETTING RANGE 40-80%)

INSTANTANEOUS O/C RELAY

INSTANTANEOUS E/F RELAY

IDMT O/C RELAY

IDMT E/F RELAY

DC SUPPLY SUPERVISION RELAY

86 MASTER TRIP RELAY

95 TRIP CIRCUIT SUPERVISION RELAY

51G STANDBY E/F RELAY

64R RESTRICTED E/F RELAY

ELR EARTH LEAKAGE RELAY (SETTING RANGE 1-16%) WITH BUILTIN TIMER

MPR MOTOR PROTECTION RELAY (46,49,50,50N,27,50L/R)

AT CURRENT TRANSUCER (4-20mA, DUEL OUTPUT)

NR NUMERICAL RELAY

F FREQUENCY METER

SFU SWITCHFUSE UNIT

ECS ELECTRICAL CONTROL SYSTEM

CORE BALANCE CURRENT TRANSFORMER

TTB TEST TERMINAL BLOCK

T/F TRANSFORMER

NON SEGREGATED PHASE BUSDUCT (NSPBD)

TABLE-1: 415V PMCC-1 OUTGOING FEEDER DETAILS.

SL NO.	FEEDER DESCRIPTION	FEEDER RATING	FEEDER TYPE	BREAKER RATING	FEEDERS QUANTITY			CT DETAILS			TERMINATION
					TOTAL	BUS-A	BUS-B	CT-1	CT-2	CBCT	
1	415V BOP MCC	450kVA	ACB FEEDER	800A	2	1	1	700/1A, 5P10, 10VA	700/1A, CL-1.0, 10VA	NA	
2	415V ASB	142kVA	ACB FEEDER	800A	2	1	1	700/1A, 5P10, 10VA	700/1A, CL-1.0, 10VA	NA	
3	CONDENSATE TRANSFER PUMPS	75kW	MOTOR FEEDER	630A	2	1	1	200/1A, 5P10, 10VA	200/1A, CL-1.0, 10VA	NA	
4	DM GT ACC PUMP	90kW	MOTOR FEEDER	630A	2	1	1	200/1A, 5P10, 10VA	200/1A, CL-1.0, 10VA	NA	
5	ELECTRIC HEATER	400kW	ACB FEEDER	800A	2	1	1	700/1A, 5P10, 10VA	700/1A, CL-1.0, 10VA	NA	
7	SPARE BREAKER O/G FEEDER	-	ACB FEEDER	1000A	1	1	-	700/1A, 5P10, 10VA	700/1A, CL-1.0, 10VA	NA	
8	SPARE MOTOR O/G FEEDER (55-160kW)	-	MOTOR FEEDER	630A	1	-	1	200/1A, 5P10, 10VA	200/1A, CL-1.0, 10VA	NA	

NOTES:

- ALL BREAKER AND MCCB FEEDERS IN 415V PMCC ARE SINGLE FRONT AND DRAW OUT TYPE. CABLE ENTRY FROM BOTTOM.
- PAINT SHADE SHALL BE RAL 7032.
- CONTROL SUPPLY FOR BREAKERS, SPRING CHARGING MOTORS, NUMERICAL RELAYS,ELR,SHUNT TRIP, INDICATIONS SHALL BE 110V DC (REDUNDANT WITH AUTO CHANGEOVER FACILITY).
- MPR SHALL HAVE COMMUNICATION FACILITY.
- INCOMERS & BUS-COUPLER ARE PROVIDED WITH AUTO CHANGEOVER AND MOMENTARY PARALLING FACILITY.
- CABLE SIZES SHALL BE AS PER LT POWER CABLE SIZING CALCULATION WHICH SHALL BE SUBMITTED SEPARATELY.
- EQUIPMENT RATING/PARAMETERS/QUANTITY ARE SUBJECT TO APPROVAL OF RESPECTIVE EQUIPMENT SIZING CALCULATIONS.
- FOR PROCESS TRIPS ADDITIONAL SELF RESET TYPE LOCKOUT RELAY AND ITS INDICATION SHALL BE PROVIDED IN NR FOR MOTOR FEEDERS.
- ALL RELAYS EXCLUDING AUXILIARY RELAYS SHALL BE NUMERICAL MICROPROCESSOR BASED WITH IEC-61850 COMMUNICATIONS PROTOCOL.
- MCCB SHALL BE PROVIDED WITH 'SHUNT TRIP' COIL.
- EARTH LEAKAGE RELAY SHALL HAVE BUILTIN TIMER.
- # - 2 ACB FEEDERS OF 800A FOR OWNER'S USE (TOTAL 300kVA) IS CONSIDERED AS PER CONTRACT. INDIVIDUAL FEEDER RATING IS ASSUMED AS 150kVA.
- EQUIPMENT RATING/PARAMETER/QUANTITY MARKED WITH (*) ARE TENTATIVE.

PROJECT: CAPTIVE POWER PLANT (CPP) PACKAGE
VISAKH REFINERY MODERNIZATION PROJECT (VRMP)
JOB NO. B016

OWNER: HINDUSTAN PETROLEUM CORPORATION LIMITED

PMC: ENGINEERS INDIA LIMITED (EIL), NEW DELHI

BHARAT HEAVY ELECTRICALS LTD.
HYDERABAD

NAME	SIGN.	DATE	NO.OF ITEMS
DRN. GRM/AVS	-SD-	12.04.18	-N.A.-
CHD. P.SURESH	-SD-	12.04.18	-N.A.-
APPD. J.K.PATTANAIK	-SD-	12.04.18	-N.A.-

DEPT. PE&SD
CODE 450

UNTOT. DIMS. GR. G/M/F

SCALE

WEIGHT (KG)

REF. TO ASSY. DRG. -N.A.-

ITEM NO. -N.A.-

NO.OF ITEMS

TITLE
SINGLE LINE DIAGRAM OF
PMCC

CARD CODE
N.A.

BHEL DRG NO. PY-DL-1-M104-8809-01
CUST DRG NO.

REV. 00

SHT. No 01
No. OF SHT.02

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Refer attached file

	DOCUMENT REVIEW DETAILS
☐ 1	No Comments.
☒ 2	Proceed with manufacture / fabrication as per the commented document. Revised document required.
☐ 3	Document does not conform to basic requirements as marked. Resubmit for review.
☐ R	Retained for Records.
☐ V	Void.
Signature with Date 02-MAY-2018	
Name of Reviewer NAIK BHUKYA NAGARAJU (C254)	
Transmittal No. _____	

COMMENT SHEET

DOC. NO.	B016		--
	JOB NO.	TR. NO.	S.NO

PROJECT: VRMP PROJECT, VIZAG
NAME OF PACKAGE: CPP package

CLIENT: M/s HPCL-Vizag
CONTRACTOR: M/s BHEL

SL. NO.	COMMENT/ OBSERVATION	RESOLUTION / ACTION
1	DRAWING / DOCUMENT TITLE : 415V SWITCHBOARD PC-9431 / PC-9432 DOCUMENT NUMBER: PY-DL-1-M104-8809-01 R 00 CATEGORY/CODE: 2	
1	Please note that distribution transformer ratings & impedance values, motor ratings etc. mentioned are not reviewed at present. The same shall be as per final complete load data of the package, load analysis, Distribution Transformer Sizing calculations, Cable sizing calculations etc.	
2	Please note that CT ratios for incoming and outgoing feeders are not reviewed at present. These shall be checked / reviewed as per final transformer, motors, and capacitor ratings.	
3	All relays, meters, controls, timers, selector switches etc. as mentioned in bid package hardware data sheets and as required while developing the control schematic and felt necessary for safe operation shall be provided.	
4	Please note that 415V ACB for all incomers and buscouplers shall be four (4) pole circuit breakers. Indicate the same in SLD.	
5	Incomer for solar panel shall be provided with ACB, 4P of minimum rating 800A as per bid package and not MCCB as indicated. M/s BHEL to check and revise.	
6	For solar panel incomer numerical relay shall be provided.	
7	Numerical relays where ever provided for motor feeders shall use in built under voltage relay and timer for delayed tripping on bus under voltage in line with S. No. 14 of Cl. 5.4.3.3 of electrical design basis A758-999-16-50-EDB-1001 attached with tender.	
8	Indicate the Line PT in SLD immediately after the Busduct in the incomer feeders.	
9	MCB in the bus PT shall be 4 Pole. Include this point in Notes.	
10	All super critical application motors shall be provided with double contactors in DOL feeder as per note-3 of clause 5.6.5 of electrical design basis A758-999-16-50-EDB-1001 attached with tender. Indicate a note of the same in SLD.	
11	Break-up of protection components being considered in MPR shall be indicated in the note. U/V+ Timer, E/F protection functions etc. shall also be part of all MPR. MPR functionalities shall be indicated separately for breaker controlled motor feeder. Update drawing Accordingly.	
12	In the Legend, instead of MCB indicate it as MCCB.	
13	Spare feeders at least one number of each type of outgoing feeder or 10% of each type of outgoing feeder whichever is more shall be provided as per clause no. 5.3.4 of EIL specification 6-51-0099. Accordingly, quantity of spare feeders to be checked and indicate the same in revised SLD.	
14	Add note in the SLD "Stabilizing resistor shall be provided in residual earth fault connections for all motors and transformers even in case of numerical relays to prevent any spurious tripping during starting".	
15	metrosils shall be provided for numerical relays to prevent any spurious tripping. Add a note regarding the same.	
16	System architecture shall be IEC61850 HSR. Add this suitably in the notes.	
17	4 nos. Breaker controlled motor feeders required for owner's use over and above the requirement mentioned in clause 2.2 of B016-606-16-50-SOW-0001 Rev.B. M/s BHEL to note that Owner's each feeder (1 Working + 1 Standby) load shall be considered as 300kVA. Accordingly, revise the notes and also indicate these feeders in outgoing feeder table.	

DOCUMENT REVIEW DETAILS

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☐ R Retained for Records. ☒ V Void.

Signature with Date: 02 MAY 2018 (SIGN/ DATE): 02/05/18

Name of Reviewer: NAR BHUKA NAGARAJU (C254)

Name: Nagraju / Sai

Transmittal No. ENGINEERS INDIA LIMITED, NEW DELHI

COMMENT SHEET

DOC. NO.	B016		--
	JOB NO.	TR. NO.	S.NO

PROJECT: VRMP PROJECT, VIZAG
NAME OF PACKAGE: CPP package

CLIENT: M/s HPCL-Vizag
CONTRACTOR: M/s BHEL

SL. NO.	COMMENT/ OBSERVATION	RESOLUTION / ACTION
19	2 nos. 250A MCCB contactor feeders in MV switchboards for owner's use. (Owner's load – 150 KVA to be considered for equipment sizing). M/s BHEL to clarify from which switchboard the above owner loads will be fed.	
20	M/s BHEL to recheck the rating of transformer in line with complete load data of this package. In case the rating of Transformer is 2.5 MVA, Restricted earth fault relay 64R shall be provided and switchboard of short circuit rating of 65KA for 1 sec to be provided.	
21	Indicate cable sizes in the document.	
22	CLIENT COMMENTS	
	<i>Client comments if any shall be forwarded separately.</i>	

NOTE: CONTRACTOR IS OBLIGED TO FURNISH THIS SHEET (DULY FILLED UP WITH RESOLUTION TO ALL EIL COMMENTS) ALONGWITH REVISED DRAWINGS

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Signature with Date: 02 MAY 2018 (SIGN/ DATE): 02/05/18
 Name of Reviewer: NAIR BHUKYA NAGARAJU (C254)
 Transmittal No. _____

ENGINEERS INDIA LIMITED, NEW DELHI

Name: Nagraju / Sai