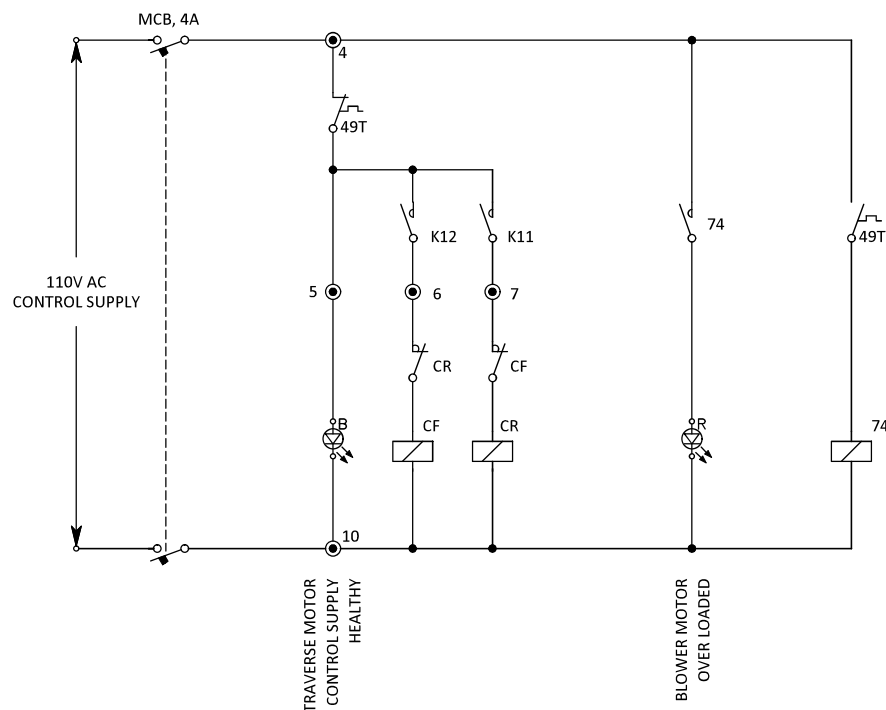


LIMIT SWITCH CONTACT DEVELOPMENT				
CONTACT	POSITION	HOME	INTER MEDIATE	FORWARD END
LS-1	1-2	X	X	-
	4-5	-	X	X
LS-2	4-6	X	-	-
X CONTACT CLOSED, - CONTACT OPEN				

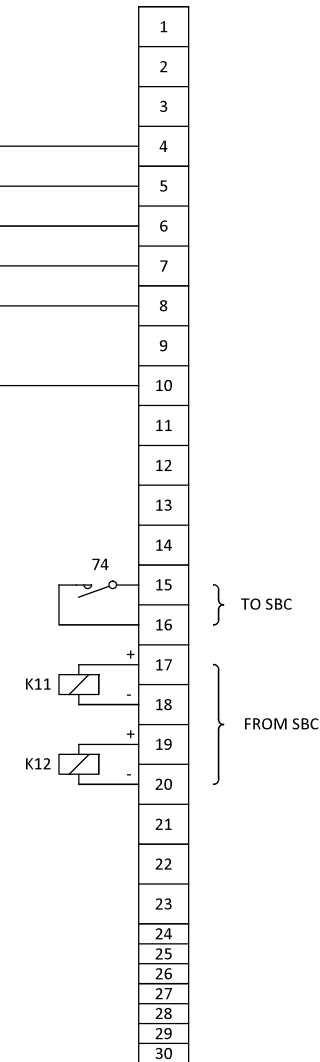
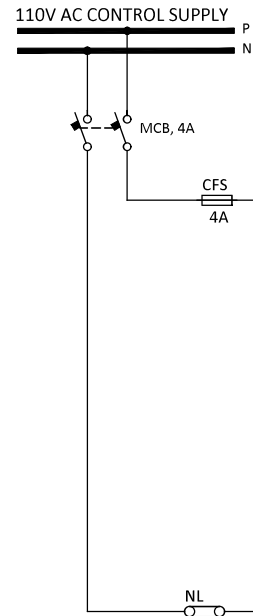
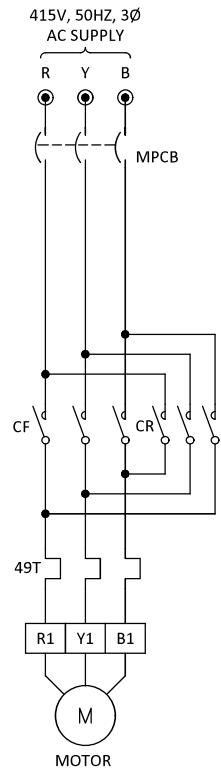
ALL LIMIT SWITCHES ARE WIRED TO DCS.

WRITE UP ON OPERATION OF AIR HEATER BLOWERS

There are 2 limit switches (LS-1 & LS-2) and one motor. When an impulse is given for the blower start, the forward motion starts. When the blower moves from home position limit switch LS-2 (Contact 4,5) contact makes and associated solenoid valve shall be given open command from DDCMIS. Opening the solenoid valve will admit the steam through AH blower. When the blower reaches forward end position limit switch LS-1 opens. This issues retract command to the blower. During retract cycle there will be no steam blowing. When the blower completes its retract motion, limit switch LS-2 (Contact 4,5) opens and blower stops.

NOTE

K11 & K12 ARE ENERGISED BY 24V DC COMMANDS FROM SBC.
K11 - RETRACT COMMAND
K12 - ADVANCE COMMAND



WIRING SHOWN FOR BLOWER-1 & SIMILAR FOR OTHER BLOWERS.

	TECHNICAL SPECIFICATION LT SWITCHGEAR KODERMA THERMAL POWER STATION PHASE-II (2X800MW)	PE-TS-519-506-E002
		Issue No: 00
		Rev. No. 00
		02 September 2026

QUALITY PLAN

		MANUFACTURE'S NAME & ADDRESS		MANUFACTURING QUALITY PLAN				PROJECT : CUSTOMER : END USER :							
SR. NO	COMPONENT & OPERATION	CHARACTERISTICS	CLASSIFICATION	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY 10				REMARKS	
1	2	3	4	5	M	C/N	7	8	9	D*	M**	C	N	11	
1	RAW MATERIAL														
1.1	Angles, Channels & Sheet Steel for Fabrication (CR/HR)	i) Thickness	Major	Meas.	1 sample of each type & size/lot	-	Approved Drawing/IS-513, IS-1079, IS-2062	Approved Drawing/IS-513, IS-1079, IS-2062	QC records/ MTC		P	-	-		
		ii) Surface finish & check for waviness / flatness	Major	Visual	-do-	-	Approved Drawing/IS-513, IS-1079, IS-2062	Approved Drawing/IS-513, IS-1079, IS-2062	QC records/ MTC		P	-	-		
		iii) Bending Test	Major	Mech.	Sample	-	Approved Drawing/IS-513-1994	Approved Drawing/IS-513-1994	MTC		V	-	-		
1.2	Bus Bar – Copper / Aluminum 	i) Dimension	Major	Meas.	1 sample of each type & size/lot	-	As per IS- 5082 / IS-1897/ Approved Drg.	As per IS- 5082 / IS-1897/Approved Drg.	QC records/ MTC		P	V 	V 		
		ii) Physical and Chemical Test	Major	Meas.	-do-	-	As per IS- 5082 / IS-1897/ Approved Drg.	As per IS- 5082 / IS-1897/Approved Drg.	QC records/ MTC		P	V 	V 		
		iii) Surface Finish	Major	Visual	-do-	-	As per IS- 5082 / IS-1897	As per IS- 5082 / IS-1897	QC Records		P	V 	V 		
		iv) Conductivity	Major	Ele.	10% Sample	-	As per IS- 5082 / IS-1897	As per IS- 5082 / IS-1897	MTC		P	V 	V 		
2	BROUGHT OUT ITEMS														
2.1	Air Circuit Breaker	i) Make, Type, Rating	Major	Visual	100%	-	Approved Drg. /Data sheet/IEC 60947-2	Approved Drg. /Data sheet/ IEC 60947-2	QC Records		P	V 	V 		
		ii) All Routine test	Critical	Tests	-do-	-	Approved Drg. /Data sheet/IEC 60947-2	Approved Drg. /Data sheet/ IEC 60947-2	MTC	✓	V	V	V		
Suman Nakwal  HARISH KUMAR  Digitally signed by Suman Nakwal DN: cn=Suman Nakwal, o=IEC, ou=IEC, email=s.nakwal@iec.gov.in, c=IN, serial=2023.03.14.16551-10957 Digitally signed by Harish Kumar DN: cn=Harish Kumar, o=IEC, ou=IEC, email=h.kumar@iec.gov.in, c=IN, serial=2023.03.14.16551-10957 * Records, identified with "TICK"(✓) shall be included by contractor in documentation. **M: Manufacturer/Sub-Contractor, C: Contractor / Nominated Inspection Agency, N: End User . Indicated "P" PERFORM, "W" WITNESS & "V" VERIFICATION "W" Indicated in column N shall be "CHP" of NTPC. (FS - Factory Standard) Note: COC - Wherever mention shall be COC by Pyrotech. FOR END USER DOC NO : REV NO : CAT :															
Manufacturer / Sub Supplier		Main Supplier													
SIGNATURE										REVIEWED BY		APPROVED BY		APPROVAL SEAL	

		MANUFACTURE'S NAME & ADDRESS		MANUFACTURING QUALITY PLAN				PROJECT : CUSTOMER : END USER :						
				PACKAGE :										
				ITEM : LT SWITCHGEAR PANELS (DRAW OUT TYPE AND FIXED TYPE)		QAP NO : REV. : DATE : PAGE :								
SR. NO	COMPONENT & OPERATION	CHARACTERISTICS	CLASSIFICATION	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY 10				REMARKS	
1	2	3	4	5	M	C/N	7	8	9	D*	M**	C	N	11
2.2	CT's	i) Overall dimensions & mounting arrangement	Major	Meas.	10% of each type & rating per lot	-	Approved Drg. /Data sheet	Approved Drg. /Data sheet	QC Records / MTC		P	-	-	
		ii) Make, Type, Rating, Accuracy class	Major	Visual	-do-	-	Approved Drg. /Data sheet	Approved Drg. /Data sheet	QC Records/ MTC		P	V	V	
		iii) All routine tests	Critical	Ele.	100%	10%	IS-2705	IS-2705	MTC	✓	V	V	V	
2.3	PT's	i) Overall dimensions & mounting arrangement	Major	Meas.	10% of each type & rating per lot	-	Approved Drg. /Data sheet	Approved Drg. /Data sheet	QC Records / MTC		P	-	-	
		ii) Make, Type, Rating, Accuracy class	Major	Visual	-do-	-	Approved Drg. /Data sheet	Approved Drg. /Data sheet	QC Records / MTC		P	V	V	
		iii) All routine tests	Critical	Ele.	100%	10%	IS-3156	IS-3156	MTC	✓	V	V	V	
2.4	Air Break Switch, Fuse, MCCB, MPCB, Push Button, MCB, Control & Selector Switches AC/DC Power & aux. Contactor, Timers, OLR, Coupling relay, Indicating lamp	i) Make, Type, Rating	Major	Visual	10% of each type & rating per lot	-	Approved Drg. /Data sheet	Approved Drg. /Data sheet	COC/ QC Records		P	V	V	
2.5	Indicating Instruments	i) Make, Type, Rating, Accuracy class	Major	Visual	10% of each type & rating/lot	-	Approved Drg. /Data sheet	Approved Drg. /Data sheet	MTC		P	V	-	

Suman Nakwal Digitally signed by Suman Nakwal DN: cn=Suman Nakwal, o=Pyrotech, email=snakwal@pyrotech.in, c=IN, serial=30165209, date=2025.03.30 16:02:09 +05'30' HARISH KUMAR		* Records, identified with "TICK"(✓) shall be included by contractor in documentation. **M: Manufacturer/Sub-Contractor, C: Contractor / Nominated Inspection Agency, N: End User . Indicated "P" PERFORM, "W" WITNESS & "V" VERIFICATION "W" Indicated in column N shall be "CHP" of NTPC. (FS - Factory Standard) Note: COC - Wherever mention shall be COC by Pyrotech.		FOR END USER DOC NO : REV NO : CAT :	
Manufacturer / Sub Supplier	Main Supplier				
SIGNATURE				REVIEWED BY	APPROVED BY
				APPROVAL SEAL	

		MANUFACTURE'S NAME & ADDRESS		MANUFACTURING QUALITY PLAN					PROJECT : CUSTOMER : END USER :					
				PACKAGE : ITEM : LT SWITCHGEAR PANELS (DRAW OUT TYPE AND FIXED TYPE)		QAP NO : REV. : DATE : PAGE :								
SR. NO	COMPONENT & OPERATION	CHARACTERISTICS	CLASSIFICATION	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY 10				REMARKS
1	2	3	4	5	M	C/N	7	8	9	D*	M**	C	N	11
		ii) Routine tests	Major	Ele.	100%	100%	IS-1248	IS-1248	MTC	✓	V	V	V	
2.6	Transducer, MFM, IMC, Energy Meter. 	i) Make, Type, Rating, Accuracy class	Major	Visual	10% of each type & rating/lot	-	Approved Drg. /Data sheet	Approved Drg. /Data sheet	QC RECORD/ MTC		P	V 	-	
		ii) Routine tests	Major	Ele.	100%	10%	Approved Drg. /Data sheet/ IEC-60688/ IEC62052/ IEC60947	Approved Drg. /Data sheet/ IEC-60688/IEC62052/IEC60947	MTC	✓	V	V	V	
2.7	Control Transformer	i) Make, Type, Rating	Major	Visual	10% of each type & rating/lot		Approved Drg. /Data sheet	Approved Drg. /Data sheet	QC RECORD		P	V 	V 	
		ii) Routine tests including Voltage Ratio	Major	Ele.	100%	10%	Approved Drg. /Data sheet/ IS-12021	Approved Drg. /Data sheet/ IS-12021	MTC	✓	V	V	V	
2.8	PVC Wires / Cables (Multi strand FRLS)	i) Make, Type, Rating	Major	Visual	10% of each type & rating/lot		IS-694	IS-694	QC RECORD		P	-	- 	BIS CERTIFIED WIRE (ISI MARK)
		ii) Routine tests including FRLS test	Major	Ele.	100%	10%	IS-694	IS-694	MTC		V	V	V	
2.9	Insulating Barriers, Shrouds and Bus-bar Insulators	i) Visual	Major	Visual	1 Sample per lot	1 Sample per lot	As per approved Drg.	As per approved Drg.	QC Record		P			

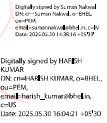
Suman Nakwal  HARISH KUMAR Digitally signed by HARISH KUMAR DN: cn=HARISH KUMAR, o=DELTA, email=harish_kumar@delat.in, c=IN Date: 2025.05.30 16:02:33 +05'30'		* Records, identified with "TICK"(✓) shall be included by contractor in documentation. **M: Manufacturer/Sub-Contractor, C: Contractor / Nominated Inspection Agency, N: End User . Indicated "P" PERFORM, "W" WITNESS & "V" VERIFICATION "W" Indicated in column N shall be "CHP" of NTPC. (FS - Factory Standard) Note: COC - Wherever mention shall be COC by Pyrotech.		FOR END USER DOC NO : REV NO : CAT :	
Manufacturer / Sub Supplier	Main Supplier				
SIGNATURE				REVIEWED BY	APPROVED BY
					APPROVAL SEAL

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1	2	3	4	5	M	C/N	7	8	9	D*	M**	C	N	11
		ii) Flame Resistance Test	Major	Elec.	1 Sample per lot	1 Sample per lot	As per approved Data Sheet	As per approved Data Sheet	MTC / COC / QC Record		V	V	V	UL 94 V0 MATERIAL TO BE USED. ▲
2.10	ACB handling Trolley	i) Dimensional & Functional Check	Major	Test	10% of each type & rating of first lot	--	Approved Drg.	Approved Drg.	QC Records		P	V		Subsequent lot will be cleared based on COC
2.11	Space heater, Thermostat, 3-pin socket, Hooter, Terminal Block	i) Make, Type, Rating	Major	Visual	1 Sample of each type/lot	-	Approved Drg. /Data sheet	Approved Drg. /Data sheet	QC Records		V	-	-	
2.12	Numerical Relay	i) Make, Type, Rating	Major	Meas.	100%	-	Approved Drg. /Data sheet	Approved Drg. /Data sheet	QC Records		V	-	-	
		ii) Routine test report	Major	Ele.	100%	100 %	Approved Drg. /Data sheet/ IEC 60255/ IEC 61850	Approved Drg. /Data sheet/ IEC 60255/IEC 61850	MTC	✓	V	V	V	CHP OF NUMERICAL RELAY TO BE SHOWN AT THE TIME OF FINAL INSPECTION.
		iii) Numerical Relay Testing	Major	Ele	10% of each type, & rating/lot	10% of each type, & Rating /lot	Approved FAT Procedure	Approved FAT Procedure		✓	P	W	W	SEPARATE FAT PROCEDURE IS TO BE FURNISHED FOR NTPC REVIEW AND APPROVAL.

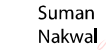
Suman Nakwal HARISH KUMAR Digitally signed by Suman Nakwal DN: cn=Suman Nakwal, o=Pyrotech, email=Suman.Nakwal@pyrotech.com, c=IN, Date: 2023.03.17 16:03:23 +05'30'		* Records, identified with "TICK"(✓) shall be included by contractor in documentation. **M: Manufacturer/Sub-Contractor, C: Contractor / Nominated Inspection Agency, N: End User . Indicated "P" PERFORM, "W" WITNESS & "V" VERIFICATION "W" Indicated in column N shall be "CHP" of NTPC. (FS - Factory Standard) Note: COC - Wherever mention shall be COC by Pyrotech.	FOR END USER DOC NO : REV NO : CAT :
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SIGNATURE			REVIEWED BY APPROVED BY APPROVAL SEAL

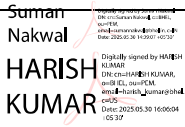
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SR. NO	COMPONENT & OPERATION	CHARACTERISTICS	CLASSIFICATION	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY 10				REMARKS
1	2	3	4	5	M	C/N	7	8	9	D*	M**	C	N	11
2.13	Synthetic rubber Gasket/ Neoprene rubber gasket	i) Visual & Dimension, Profile, shore hardness, Elongation at break & ageing & compression Test, Ozone Resistance Test	Major	Review of Documents	100%	-	Approved Drg. /Data sheet	Approved Drg. /Data sheet	QC Records/ COC	✓	P	V	V	Gaskets as per type tested design 
2.14	High Tensile Bolt 	i) Appearance and Dimension	Major	Visual	Sample	-	Approved Drawing	Approved Drawing	QC Records/ COC		V	-	-	
		ii) Mechanical Properties	Major	Mech.	Sample	-	Approved Drawing/IS 1367	Approved Drawing/IS 1367	QC Records/ COC/ MTC		V	-	-	
2.15	PVC Sleeve 	i) Visual	Major	Visual	Sample	-	Approved Drawing	Approved Drawing	QC Records/ COC /MTC		V	-	-	UL224 Sleeve to be used
3	IN PROCESS INSPECTION													
3.1	Panel Fabrication	i) Cutting, punching, shearing & bending	Major	Meas.	Mfr. Practice	-	Manufacturer's Standard	Manufacturer's Standard	QC Records		P	-	-	
		ii) panel front door cut-outs punching	Major	Meas.	-do-	-	Approved Drg.	Approved Drg.	QC Records		P	-	-	
3.2	Paint Check	i) Pre- Treatment of sheet	Major	Processes	Mfr. Practice	-	Manufacturer's Standard/IS-6005	Manufacturer's Standard/IS-6005	QC Records		P	-	-	
Digitally signed by Suman Nakwal DN: cn=Suman Nakwal, o=NTPC, email=surnakwal@ntpc.co.in, c=IN Date: 2025.03.20 13:27:56 +05'30' HARISH KUMAR Digitally signed by HARISH KUMAR DN: cn=HARISH KUMAR, o=NTPC, email=harish_kumar@ntpc.co.in, c=IN Date: 2025.03.20 14:03:59 +05'30' * Records, identified with "TICK"(✓) shall be included by contractor in documentation. **M: Manufacturer/Sub-Contractor, C: Contractor / Nominated Inspection Agency, N: End User . Indicated "P" PERFORM, "W" WITNESS & "V" VERIFICATION "W" Indicated in column N shall be "CHP" of NTPC. (FS - Factory Standard) Note: COC - Wherever mention shall be COC by Pyrotech. FOR END USER														
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		MANUFACTURE'S NAME & ADDRESS		MANUFACTURING QUALITY PLAN					PROJECT : CUSTOMER : END USER :					
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				ITEM : LT SWITCHGEAR PANELS (DRAW OUT TYPE AND FIXED TYPE)		QAP NO : REV. : DATE : PAGE :								
SR. NO	COMPONENT & OPERATION	CHARACTERISTICS	CLASSIFICATION	TYPE OF CHECK	QUANTUM OF CHECK	REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY 10				REMARKS	
1	2	3	4	5	M	C/N	7	8	9	D*	M**	C	N	11
		ii) Paint Shade, Thickness & Adhesion	Major	Processes	1 sample per lot	-	Approved Drg. / Annexure-II	Approved Drg. / Annexure-II	QC Records		P	-	-	Cross Hatch method using Adhesive tape
3.3	Panel Assembly	i) Panel shell assembly, Top & back cover assembly, Panel door assembly, hinge fitting & door knob fitting etc.	Major	Processes	100%	-	Mfr Internal Drgs made to meet Appd. GA Drgs.	Mfr Internal Drgs made to meet Appd. GA Drgs.	QC Records		P	-	-	
		ii) Size of busbar & busbar finish	Major	Processes	100%	-	-do-	-do-	QC Records		P	-	-	
		iii) Colour coding of busbar	Major	Visual	100%	-	-do-	-do-	QC Records		P	-	-	
		iv) Insulator type & mounting	Major	Processes	100%	-	-do-	-do-	QC Records		P	-	-	
		v) Busbar support distance & tightness of bolts for Main bus bars and bus bar joints	Major	Processes	100%	-	Manufacturer's Standard	Manufacturer's Standard	QC Records		P	-	-	
		vi) Main , Control & Auxiliary Busbar Clearances	Major	Processes	100%	-	Mfr Internal Drgs made to meet Appd. GA Drgs.	Mfr Internal Drgs made to meet Appd. GA Drgs.	QC Records		P	-	-	
		vii) CT / PT mounting arrangement & tightness	Major	Processes	100%	-	-do-	-do-	QC Records		P	-	-	

Suman Nakwal  HARISH KUMAR		* Records, identified with "TICK"(✓) shall be included by contractor in documentation. **M: Manufacturer/Sub-Contractor, C: Contractor / Nominated Inspection Agency, N: End User . Indicated "P" PERFORM, "W" WITNESS & "V" VERIFICATION "W" Indicated in column N shall be "CHP" of NTPC. (FS - Factory Standard) Note: COC - Wherever mention shall be COC by Pyrotech.				FOR END USER DOC NO : REV NO : CAT :	
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		MANUFACTURE'S NAME & ADDRESS		MANUFACTURING QUALITY PLAN					PROJECT : CUSTOMER : END USER :					
				PACKAGE :										
				ITEM : LT SWITCHGEAR PANELS (DRAW OUT TYPE AND FIXED TYPE)		QAP NO : REV. : DATE : PAGE :								
SR. NO	COMPONENT & OPERATION	CHARACTERISTICS	CLASSIFICATION	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY 10				REMARKS
1	2	3	4	5	M	C/N	7	8	9	D*	M**	C	N	11
		viii) Termination for power & control circuits	Major	Processes	100%	-	-do-	-do-	QC Records		P	-	-	
		ix) Lug size & crimping quality	Major	Processes	100%	-	-do-	-do-	QC Records		P	-	-	
		x) Earthing busbar size & continuity; earth-ing of panel & doors	Major	Processes	100%	-	-do-	-do-	QC Records		P	-	-	
		xi) Breaker safety shutter operation	Major	Processes	100%	-	-do-	-do-	QC Records		P	-	-	
		xii) Spring loaded power and control contact alignment	Major	Processes	100%	-	-do-	-do-	QC Records		P	-	-	
		xiii) Tin/Silver plating/ bimetallic strip between Cu. & Al. joint	Major	Processes	100%	-	-do-	-do-	QC Records		P	-	-	
3.4	Module assembly	i) Component identification	Major	Processes	100%	-	-do-	-do-	QC Records		P	-	-	
		ii) Component layout, mounting & dimensions	Major	Processes	100%	-	-do-	-do-	QC Records		P	-	-	
		iii) Incoming & outgoing power & control contacts assembly & alignment	Major	Processes	100%	-	-do-	-do-	QC Records		P	-	-	

 Suman Nakwal Digitally signed by Suman Nakwal DN: cn=Suman Nakwal, o=Pyrotech, ou=Pyrotech, email=s.nakwal@pyrotech.in, c=IN, date=2023.05.01 14:58:18 +05'30'		* Records, identified with "TICK"(✓) shall be included by contractor in documentation. **M: Manufacturer/Sub-Contractor, C: Contractor / Nominated Inspection Agency, N: End User . Indicated " P " PERFORM, " W " WITNESS & " V " VERIFICATION "W" Indicated in column N shall be " CHP " of NTPC. (FS - Factory Standard) Note: COC - Wherever mention shall be COC by Pyrotech.	FOR END USER	DOC NO : REV NO : CAT :		
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		MANUFACTURE'S NAME & ADDRESS		MANUFACTURING QUALITY PLAN				PROJECT : CUSTOMER : END USER :						
				PACKAGE : ITEM : LT SWITCHGEAR PANELS (DRAW OUT TYPE AND FIXED TYPE)		QAP NO : REV. : DATE : PAGE :		FORMAT OF RECORD	AGENCY 10				REMARKS	
SR. NO	COMPONENT & OPERATION	CHARACTERISTICS	CLASSIFICAT ION	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY 10				REMARKS
1	2	3	4	5	M	C/N	7	8	9	D*	M**	C	N	11
		iv) Power circuit wire / strip termination & clearances	Major	Processes	100%	-	Mfr Internal Drgs made to meet Appd. GA Drgs.	Mfr Internal Drgs made to meet Appd. GA Drgs.	QC Records		P	-	-	
		v) Bus bar joints	Major	Processes	100%	-	-do-	-do-	QC Records		P	-	-	
		vi) Functional Checks	Major	Processes	100%	-	-do-	-do-	QC Records		P	-	-	
3.5	Control Wiring	i) Wire Size & lug size. Color of wire	Minor	Visual	100%	-	As Per apprd. Wiring diagram	As Per apprd. Wiring diagram	QC Records		P	-	-	
		ii) Proper wire Clamping & Ferruling	Minor	Visual	100%	-	Mfr std	Mfr std	QC Records		P	-	-	
		iii) Continuity as per wiring drg.	Critical	Test	Sample	-	As Per Apprd. Drg.	As Per Apprd. Drg.	QC Records		P	-	-	
		iv) Tightness of termination & crimping check	Major	Test	100%	-	Mfr std	Mfr std	QC Records		P	-	-	
4	FINAL INSPECTION & TESTING													
4.1	Visual & Dimension Check	i) Overall visual check for aesthetics, verticality of panels and alignment between two transport sections	Major	Visual	100%	10%	Approved GA Drgs	Approved GA Drgs	QC Records	✓	P	W	W	
 Suman Nakwal HARISH KUMAR Digitally signed by HARISH KUMAR DN: cn=HARISH KUMAR, o=Pyrotech, ou=Pyrotech, email=hkumar@pyrotech.in, c=IN, Date: 2023.05.30 16:05:04 +0530 Manufacturer / Sub Supplier Main Supplier		* Records, identified with "TICK"(✓) shall be included by contractor in documentation. **M: Manufacturer/Sub-Contractor, C: Contractor / Nominated Inspection Agency, N: End User . Indicated "P" PERFORM, "W" WITNESS & "V" VERIFICATION "W" Indicated in column N shall be "CHP" of NTPC. (FS - Factory Standard) Note: COC - Wherever mention shall be COC by Pyrotech.						FOR END USER		DOC NO : REV NO : CAT :				
SIGNATURE										REVIEWED BY	APPROVED BY	APPROVAL SEAL		

		MANUFACTURE'S NAME & ADDRESS		MANUFACTURING QUALITY PLAN				PROJECT : CUSTOMER : END USER :						
				PACKAGE :		QAP NO :								
				ITEM : LT		REV. :								
				SWITCHGEAR PANELS		DATE :								
				(DRAW OUT TYPE AND		PAGE :								
				FIXED TYPE)										
SR. NO	COMPONENT & OPERATION	CHARACTERISTICS	CLASSIFICATION	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY 10				REMARKS
1	2	3	4	5	M	C/N	7	8	9	D*	M**	C	N	11
		ii) Verification of overall dimensions Including sheet steel thickness	Major	Meas.	100%	1 sample of each type of panel / lot	Approved GA Drgs	Approved GA Drgs	QC Records	✓	P	W	W	
		iii) Bus duct interface, phase sequence, flange dimensions & clearances	Major	Visual	100%	100%	Approved GA Drgs	Approved GA Drgs	QC Records	✓	P	W	W	
		iv) Bus bar (Main – horizontal) – clearances, color coding, phase sequence identification for each Transport unit including sleeve insulation checking	Critical	Meas. & Visual	100%	10%	As Per Approved Drgs	As Per Approved Drgs	QC Records	✓	P	W	W	
		v) Verification of tightness of bus bar joints by torque wrench	Critical	Mech.	100%	10%	As Per Approved Drgs / Technical Specification	As Per Approved Drgs / Technical Specification	QC Records	✓	P	W	W	Torque marking on bolt head will be done.

Suman Nakwal Digitally signed by Suman Nakwal DN: cn=Suman Nakwal, o=Pyrotech, email=Suman.Nakwal@pyrotech.in, c=IN, date=2025.05.10 14:26:54 +05'30'		* Records, identified with "TICK"(✓) shall be included by contractor in documentation. **M: Manufacturer/Sub-Contractor, C: Contractor / Nominated Inspection Agency, N: End User . Indicated "P" PERFORM, "W" WITNESS & "V" VERIFICATION "W" Indicated in column N shall be "CHP" of NTPC. (FS – Factory Standard) Note: COC – Wherever mention shall be COC by Pyrotech.		FOR END USER DOC NO : REV NO : CAT :	
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SIGNATURE				REVIEWED BY	APPROVED BY
					APPROVAL SEAL

		MANUFACTURE'S NAME & ADDRESS		MANUFACTURING QUALITY PLAN					PROJECT : CUSTOMER : END USER :					
				PACKAGE : ITEM : LT SWITCHGEAR PANELS (DRAW OUT TYPE AND FIXED TYPE)		QAP NO : REV. : DATE : PAGE :								
SR. NO	COMPONENT & OPERATION	CHARACTERISTICS	CLASSIFICATION	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY 10				REMARKS
1	2	3	4	5	M	C/N	7	8	9	D*	M**	C	N	11
		vi) CT/PT fixing & mounting arrangement	Major	Visual	100%	10%	Mfr. Std.	Mfr. Std.	QC Records	✓	P	W	W	Clearance between CT and busbar to be ensured.
		vii) Check shrouding of accessible live parts, Cable supports and tool falling shroud in cable alley and application of PVC sleeves on bus bars.	Major	Visual	100%	10%	Technical Specification	Technical Specification	QC Records	✓	P	W	W	Form-4B as per IEC-61439
		viii) Verification of Components for make, type, rating & layout	Major	Visual	100%	10% of each type of module/lot	As per approved scheme drg/ Make List	As per approved scheme drg/ Make List	QC Records	✓	P	W	W	
		ix) Check control wiring / terminal arrangement & ferruling	Major	Visual	100%	Same as above	NTPC approved drg.	NTPC approved drg.	QC Records	✓	P	W	W	
		x) Safety Shutters operation check	Critical	Ele.	100%	Same as above	Technical Specification	Technical Specification	QC Records	✓	P	W	W	
		xi) Check door interlock & defeat interlock feature	Major	Ele.	100%	Same as above	Technical Specification	Technical Specification	QC Records	✓	P	W	W	

Suman Nakwal HARISH KUMAR		* Records, identified with "TICK"(✓) shall be included by contractor in documentation. **M: Manufacturer/Sub-Contractor, C: Contractor / Nominated Inspection Agency, N: End User . Indicated "P" PERFORM, "W" WITNESS & "V" VERIFICATION "W" Indicated in column N shall be "CHP" of NTPC. (FS - Factory Standard) Note: COC - Wherever mention shall be COC by Pyrotech.		FOR END USER		DOC NO : REV NO : CAT :	
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1	2	3	4	5	M	C/N	7	8	9	D*	M**	C	N	11
		xii) Mech operation test for ACB as per IS	Critical	Ele.	100%	Same as above	IS 13947/IEC 60947	IS 13947/IEC 60947	QC Records	✓	P	W	W	
		xiii) Breaker operation at service, test & isolate position	Critical	Ele.	100%	100 %	IS 13947/IEC 60947; As per app. Drg	IS 13947/IEC 60947; As per app. Drg	QC Records	✓	P	W	W	
		xiv) Power & control draw-out contacts alignment check	Major	Ele.	100%	10% of each type of module/lot	Technical Specification	Technical Specification	QC Records	✓	P	W	W	
		xv) Check for Breaker Anti-pumping & trip free feature	Major	Ele.	100%	100 %	Technical Specification	Technical Specification	QC Records	✓	P	W	W	
		xvi) Earthing of ACB Cradle	Major	Visual	100%	100 %	Technical Specification	Technical Specification	QC Records	✓	P	W	W	
		xvii) Interlocks & operation check: elect. / mech open, close: under test, service & isolation position	Critical	Ele.	100%	10% of each type of module/lot	As per Approved drgs.	As per Approved drgs.	QC Records	✓	P	W	W	

Suman Nakwal HARISH KUMAR Digitally signed by Suman Nakwal DN: cn=Suman Nakwal, o=PYROTECH, ou=INDIA, email=Suman.Nakwal@pyrotech.in, c=IN Date: 2023.05.30 14:40:17 +05'30' Digitally signed by HARISH KUMAR DN: cn=HARISH KUMAR, o=PYROTECH, ou=INDIA, email=harish.kumar@pyrotech.in, c=IN Date: 2023.05.30 16:08:01 +05'30'		* Records, identified with "TICK"(✓) shall be included by contractor in documentation. **M: Manufacturer/Sub-Contractor, C: Contractor / Nominated Inspection Agency, N: End User . Indicated "P" PERFORM, "W" WITNESS & "V" VERIFICATION "W" Indicated in column N shall be "CHP" of NTPC. (FS - Factory Standard) Note: COC - Wherever mention shall be COC by Pyrotech.	FOR END USER DOC NO : REV NO : CAT :			
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1	2	3	4	5	M	C/N	7	8	9	D*	M**	C	N	11																		
		xviii) interchangeability check for draw-out modules	Major	Mech.	100%	10%	Technical Specification	Technical Specification	QC Records	✓	P	W	W																			
		xix) Earth bus dimensions, earthing of draw-out modules, door etc.	Major	Ele.	100%	10% of each type of module/lot	As per Approved drgs.	As per Approved drgs.	QC Records	✓	P	W	W	SEPARATE COPPER EARTH BUS FOR IMC 																		
		xx) Check Point shade, thickness, Adhesion & finish	Major	Visual/ Test	100% for shade & finish; 2-3 samples / lot for thickness & adhesion check	2- 3 samples / board	As per approved drg. /Data Sheet	Approved drg./ Data Sheet	QC Records	✓	P	W	W																			
		xxi) Bus-bar support arrangement, center to center distance between supports	Major	Mech.	100%	10%	As per Approved drgs.	As per Approved drgs.	QC Records	✓	P	W	W																			
		xxii) Overlapping of Bus bar joints	Major	Mech.	100%	10%	As per Approved drgs.	As per Approved drgs.	QC Records	✓	P	W	W																			
Suman Nakwal HARISH KUMAR Digitally signed by Suman Nakwal DN: cn=Suman Nakwal, o=Pyrotech, email=s.nakwal@pyrotech.com, c=IN Date: 2023.03.31 14:11:46 +05'30' Digitally signed by HARISH KUMAR DN: cn=HARISH KUMAR, o=Pyrotech, email=h.kumar@pyrotech.com, c=IN Date: 2023.03.31 14:09:23 +05'30' * Records, identified with "TICK"(✓) shall be included by contractor in documentation. **M: Manufacturer/Sub-Contractor, C: Contractor / Nominated Inspection Agency, N: End User . Indicated "P" PERFORM, "W" WITNESS & "V" VERIFICATION "W" Indicated in column N shall be "CHP" of NTPC. (FS - Factory Standard) Note: COC - Wherever mention shall be COC by Pyrotech. <table border="1"> <tr> <td>Manufacturer / Sub Supplier</td> <td>Main Supplier</td> <td>FOR END USER</td> <td>DOC NO :</td> <td>REV NO :</td> <td>CAT :</td> </tr> <tr> <td colspan="2"></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td colspan="2">SIGNATURE</td> <td></td> <td>REVIEWED BY</td> <td>APPROVED BY</td> <td>APPROVAL SEAL</td> </tr> </table>															Manufacturer / Sub Supplier	Main Supplier	FOR END USER	DOC NO :	REV NO :	CAT :							SIGNATURE			REVIEWED BY	APPROVED BY	APPROVAL SEAL
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1	2	3	4	5	M	C/N	7	8	9	D*	M**	C	N	11																																	
		xxiii) Draw in- draw out- draw- in of modules at random and check damages of contacts including module/breaker interchangeability check.		Visual	Random			No Damages		Q C R e c o r d s	P	W	W																																		
		xxiv) Degree of protection check, check profile & fixing of gaskets	Major	Visual	2-5 samples at gasketed joints/ board	2-5 samples at gasketed joints/ board	As per approved drgs / Technical Specification	No insertion possible from openings & gasketed joints	QC Records	✓	P	W	W	Paper insertion method for IP 5X compartments & 1 mm wire insertion method for IP 4X Compartments.																																	
		xxv) Degree of Protection Check for IMC	Major	Visual	2-5 sample	2-5 sample	As per approved drgs / Technical Specification	As per approved drgs / Technical Specification	QC Records	✓	P	W	W																																		
		xxvi) Functional test on each type of draw out module	Major	Ele.	100%	10% of each type of module	As per Approved drgs.	As per Approved drgs.	QC Records	✓	P	W	W																																		
		xxvii) Close door operation check	Major	Mech.	100%	10% of each type of module	As per Approved drgs.	As per Approved drgs.	QC Records	✓	P	W	W																																		
<table border="1"> <tr> <td colspan="2"> Suman Nakwal HARISH KUMAR Digitally signed by Suman Nakwal DN: cn=Suman Nakwal, o=NTPC, ou=NTPC, email=s.nakwal@ntpc.co.in, c=IN, Date: 2023.09.20 19:00:09 +05'30' </td> <td colspan="4"> * Records, identified with "TICK"(✓) shall be included by contractor in documentation. **M: Manufacturer/Sub-Contractor, C: Contractor / Nominated Inspection Agency, N: End User . Indicated "P" PERFORM, "W" WITNESS & "V" VERIFICATION "W" Indicated in column N shall be "CHP" of NTPC. (FS - Factory Standard) Note: COC - Wherever mention shall be COC by Pyrotech. </td> <td colspan="2"> FOR END USER </td> <td colspan="3"> DOC NO : REV NO : CAT : </td> </tr> <tr> <td>Manufacturer / Sub Supplier</td> <td>Main Supplier</td> <td colspan="4"></td> <td colspan="2"></td> <td colspan="3"></td> </tr> <tr> <td colspan="2">SIGNATURE</td> <td colspan="4"></td> <td colspan="2"></td> <td>REVIEWED BY</td> <td>APPROVED BY</td> <td>APPROVAL SEAL</td> </tr> </table>															Suman Nakwal HARISH KUMAR Digitally signed by Suman Nakwal DN: cn=Suman Nakwal, o=NTPC, ou=NTPC, email=s.nakwal@ntpc.co.in, c=IN, Date: 2023.09.20 19:00:09 +05'30'		* Records, identified with "TICK"(✓) shall be included by contractor in documentation. **M: Manufacturer/Sub-Contractor, C: Contractor / Nominated Inspection Agency, N: End User . Indicated " P " PERFORM, " W " WITNESS & " V " VERIFICATION "W" Indicated in column N shall be " CHP " of NTPC. (FS - Factory Standard) Note: COC - Wherever mention shall be COC by Pyrotech.				FOR END USER		DOC NO : REV NO : CAT :			Manufacturer / Sub Supplier	Main Supplier										SIGNATURE								REVIEWED BY	APPROVED BY	APPROVAL SEAL
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SR. NO	COMPONENT & OPERATION	CHARACTERISTICS	CLASSIFICATION	TYPE OF CHECK	QUANTUM OF CHECK		REFERENCE DOCUMENT	ACCEPTANCE NORMS	FORMAT OF RECORD	AGENCY 10				REMARKS	
					M	C/N				D*	M**	C	N		
1	2	3	4	5	M	C/N	7	8	9	D*	M**	C	N	11	
		xxviii) Provision of symmetric guide	Major	Mech.	100%	10% of each type of module	As per Approved drgs/ As per Approved General Notes	As per Approved drgs/ As per Approved General Notes	QC Records	✓	P	W	W	For module size >300 mm will use 4 nos. guide rails	
		xxix) Gap checking of busbar and module contact at test position	Major	Mech.	100%	10% of each type of module	As per Approved drgs/ As per Approved General Notes	As per Approved drgs/ As per Approved General Notes	QC Records	✓	P	W	W		
		xxx) Functional test on IMC Module with input/output checking	Major	Ele.	100%	10% of each type of module	As per Approved drgs.	As per Approved drgs.	QC Records	✓	P	W	W		
		xxxi) IR Test before & after the HV Test	Major	Ele.	100%	100%	IS-8623/IEC 61439	IS-8623/IEC 61439	QC Records	✓	P	W	W		
		xxxii) HV test on Power circuit.	Critical	Ele.	100%	100%	IS-8623/IEC 61439	IS-8623/IEC 61439	QC Records	✓	P	W	W		
		xxxiii) Prototype Panel with offered panel	Critical	Visual	100%	100%	Technical Specifications, Approved Design & Data Sheet	Technical Specifications, Approved Design & Data Sheet	QC Records	✓	P	W	W	To be retained with proper identification if required as per contract	
5	Packing	i) Soundness of packing, Loading etc.	Major	Verification	100%	100%	Packing shall be as per Annexure-III	Packing shall be as per Annexure-III			P	V	-		
NOTE: Prototype Inspection shall be offered for joint inspection with PE-Electrical, CQA & RIO before start of manufacturing of LT Switchgear.															
Suman Nakwal HARISH KUMAR Digitally signed by Suman Nakwal DN: cn=Suman Nakwal, o=Pyrotech, ou=Pyrotech, email=s.nakwal@pyrotech.com, c=IN, Date: 2023.05.30 14:43:58 +05'30' Digitally signed by Harish Kumar DN: cn=Harish Kumar, o=Pyrotech, ou=Pyrotech, email=h.kumar@pyrotech.com, c=IN, Date: 2023.05.30 14:11:01 +05'30'		* Records, identified with "TICK"(✓) shall be included by contractor in documentation. **M: Manufacturer/Sub-Contractor, C: Contractor / Nominated Inspection Agency, N: End User . Indicated "P" PERFORM, "W" WITNESS & "V" VERIFICATION "W" Indicated in column N shall be "CHP" of NTPC. (FS - Factory Standard) Note: COC - Wherever mention shall be COC by Pyrotech.							FOR END USER		DOC NO : REV NO : CAT :				
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SIGNATURE											REVIEWED BY		APPROVED BY		APPROVAL SEAL

	TECHNICAL SPECIFICATION LT SWITCHGEAR KODERMA THERMAL POWER STATION PHASE- II (2X800MW)	PE-TS-519-506-E002
		Issue No: 00
		Rev. No. 00
		27 August 2026

SUB VENDOR LIST

	TECHNICAL SPECIFICATION LT SWITCHGEAR KODERMA THERMAL POWER STATION PHASE-II (2X800MW)	PE-TS-519-506-E002
		Issue No: 00
		Rev. No. 00
		27 August 2026

S. No.	Item Description	Proposed Vendors
1	MOULDED CASE CIRCUIT BREAKER (MCCB)	
2	MOTOR PROTECTION CIRCUIT BREAKER (MPCB)	
3	MINIATURE CIRCUIT BREAKER (MCB)	
4	AC POWER CONTACTOR	
5	AC AUXILIARY CONTACTOR	
6	DC POWER CONTACTOR	
7	DC AUXILIARY CONTACTOR	
8	INTELLIGENT MOTOR CONTROLLER	
9	AMMETER (ANALOG)	
10	AMMETER (DIGITAL)	
11	VOLTMETER (ANALOG)	
12	VOLTMETER (DIGITAL)	
13	ENERGY METER (ANALOG)	
14	ENERGY METER (DIGITAL)	
15	MULTIFUNCTION METER (MFM)	
16	TRANSDUCER	
17	ELECTRONIC MOTOR PROTECTION RELAY (EMPR)	
18	AUXILIARY RELAY	
19	INTERPOSING/COUPLING RELAY	
20	TIMER/TIME DELAY RELAY	
21	INDICATION LAMP	
22	INDUSTRIAL SOCKET	
23	CONTROL SWITCHES/ SELECTOR SWITCH	
24	DC SWITCH	
25	DIODES	
26	PUSH BUTTON	
27	CABLE GLANDS	
28	CABLE LUGS	
29	TERMINAL BLOCK (FIXED/DRAWOUT)	
30	LT SWITCH GEAR (FIXED/DRAWOUT) PANELS	
31	DATA CONCENTRATOR	
32	ETHERNET SWITCHES	
33	Y-LINK	
34	DP CABLE	
35	OPTICAL FIBRE CABLE	
36	THERMAL OVERLOAD RELAY	
Note:	Bidder may include items alongwith subvendors that are not listed above.	
	Make of all the equipment/instrument under this specification shall be subjected to DVC/BHEL approval in the event of order.DVC/BHEL reserves the right to accept/reject any make or sub-vendor and to add new sub-vendors for the project after award of contract. Approval, rejection or addition of makes shall not have any price implication to BHEL after award of contract.	

DVC APPROVED SUB-VENDOR LIST

12.1	Numerical Relays	CAT I							
					SEL	Pullman, USA	A		
					GE T&D	Stafford, UK	A	P14X, P34X, P44X, P64X, P74X models	
					GE T&D	Chennai	A	P14X, P24X, P34X, P44X, P64X, P74X models	
					ABB	Finland	A		
					ABB	Baroda	A	For 6XX Series	
					GE Multilin	Zamudio, Vizcaya, Spain/ Markham, Ontario, Canada	A	F-650 only	
					Schneider	Stone- UK, Vassa- Finland	A	PX30, PX40, VAMP 5X and VAMP 2XX models	
					Siemens	Germany	A	75X Series only	
					Siemens	Goa	A		
12.2	LV Air Circuit Breaker	CAT II							
					C&S Electric	Noida	A		
					L&T	Mumbai	A		
					GE	Bangalore	A		
					Siemens	Germany	A		
					Schneider	France	A		
12.3	LT CT/PT/CBCT/ Control Transformer	CAT III							
					Kappa	Bangalore	A		
					Southern Electric	Chennai	A		
					Precise	Mumbai	A		
					G&M	Baroda	A	CBCT Only	
					Silkaans	Mumbai	A		
					Ind Coil	Mumbai	A		
					Pragati	Thane	A		
					Prayog	Pune	A		
					AE	Mumbai	A		
					Logicstat	Delhi	A	For control transformer only	
					C&S Electric	Noida	A	For CT only	
					Newtek	Aurangabad	A	For CT/PT/Control transformer	

Note:

Make of all the equipment/instrument under this specification shall be subjected to DVC/BHEL approval in the event of order. The bidder may propose name of additional sub-vendors make, which will be subject to DVC/BHEL approval. DVC/BHEL reserves the right to accept/reject any make or sub-vendor and to add new sub-vendors for the project after award of contract. Approval, rejection or addition of makes shall not have any price implication to the Purchaser after award of contract.

	TECHNICAL SPECIFICATION LT SWITCHGEAR KODERMA THERMAL POWER STATION PHASE-II (2X800MW)	PE-TS-519-506-E002
		Issue No: 00
		Rev. No. 00
		02 September 2026

PAINTING REQUIREMENT

Package	Condition	Surface Preparation	Primer Coat	No. of Coats	DFT (in Microns)	Intermediate Coat (in Microns)	No. of Coats	DFT (in Microns)	Final Coat	No. of Coats	DFT (in Microns)	Total DFT
LT SWITCHGEAR	Plain Area	As per Manufacturer Std.	As per Manufacturer Std.	As per Manufacturer Std.	As per Manufacturer Std.	As per Manufacturer Std.	As per Manufacturer Std.	As per Manufacturer Std.	As per Manufacturer Std.	As per Manufacturer Std.	50	100

Painting shade on exterior shall be RAL 9002 for complete panel except RAL 5012 for extreme ends and RAL 9002 for Mounting Plate & Trolley. Paint finish coat shall be minimum 50 microns (minimum total DFT shall be 100 microns). However, in case electrostatic process of painting is offered, minimum paint thickness of 50 microns shall be acceptable for finish coat.



GENERAL PAINTING SPECIFICATION FOR LOW VOLTAGE SWITCHGEAR

1. General Specification:

All 415V switchgears, MCC's, AC & DC distribution boards etc. shall be painted by powder coating process.

2. Pre-Treatment or Surface Preparation:

Minimum 7 tank process or better shall be used for pre-treatment or surface preparation of sheet steel used for enclosures. The sequence of pre-treatment process shall include but not be limited to the following steps:

TANK-1: DEGREASING

Sheet Metal Surface shall be cleaned of grease, oils, soils, lubricants, oxide films, Heat Treatment / welding Scales etc. by using ALKALINE DEGREASER at Room Temperature for a Duration of 30-40 Minutes

TANK-2: WATER RINSE-I

Sheet Metal Surface shall be rinsed with water

TANK-3: DERUSTING

Sheet Metal Surface shall be cleaned of Rust by using Mixed HYDROCHLORIC ACID at Room Temperature for a Duration of 20 Minutes.

TANK-4: WATER RINSE-II

Sheet Metal Surface shall be rinsed with water

TANK-5: SURFACE ACTIVATION

Sheet Metal Surface shall be activated for Zn & Mn phosphate Coating by using ACTIVATION CHEMICALS ACID at Room Temperature for a Duration of 20 Minutes.

TANK-6: PHOSPHATING

Sheet Metal Surface shall be smoothly & uniformly coated with Zn Phosphate by using ZINC PHOSPHATE SOLUTION at Room Temperature for a Duration of 5 - 20 Minutes

TANK-7: WATER RINSE-III

Sheet Metal Surface shall be rinsed with water

TANK-8: PASSIVATION

For Sealing Pores of Sheet Metal Surface for obtaining Maximum Corrosion Resistance over Phosphate Coating by DECXYLITE SOLUTION at Room Temperature for a Duration of 15 - 20 Minutes



GENERAL PAINTING SPECIFICATION FOR LOW VOLTAGE SWITCHGEAR

3. Powder Coating:

The following steps shall be followed to complete the powder coating process -

- **OVEN DRYING**

Sheet Metal Parts shall be dried by HOT AIR at 150 Deg C Process, Duration-10-20 Minutes.

- **POWDER COATING**

Within 24 Hours of Oven Drying, Sheet Metal parts shall be coated with Powder of shade desired by client through Spraying in Spray Booths, and then Epoxy-Powder Coated/Sprayed Sheet Metal parts are BAKED in an electrically fired oven at 140-150 Deg C for 10-15 Minutes.

4. Paint Thickness:

To be followed as per Customer Specifications or Project-wise Technical Specification documents.

5. Paint Shade:

To be followed as per Customer Specifications or Project-wise Technical Specification documents.

6. Testing and Verification of Painting Process:

To be followed as per Customer Approved or Project-wise approved Quality Plan.

Routine tests:

- a. Test for Paint shade with reference to shade card
- b. Paint thickness measurement
- c. Adhesion test

Special Tests:

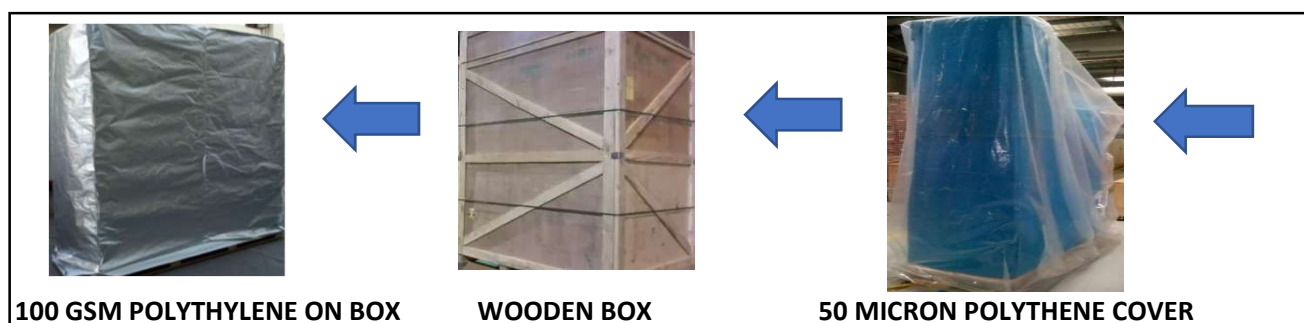
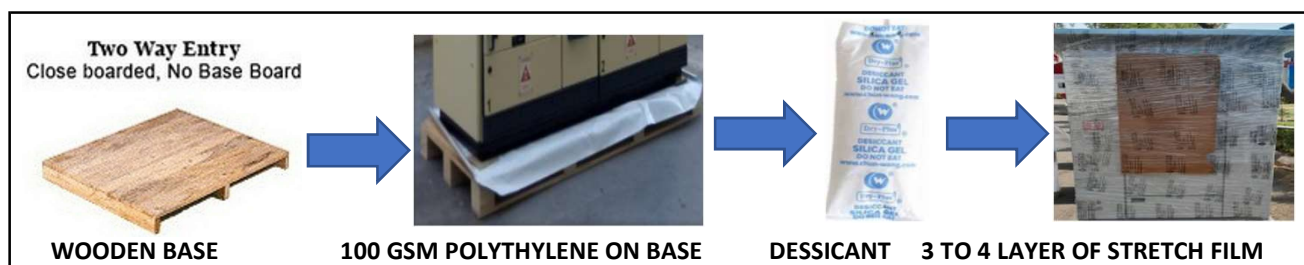
If any special tests are specified, the same shall be carried out as per approved Quality Plan

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PACKING REQUIREMENT

Sl.no	DESCRIPTION
1	TYPE OF PACKING :
1.1	Each switchboard/Item must be thoroughly cleaned inside and outside before packing. Remove all foreign particles, dust, oil, grease, and weld spatter. Ensure no extra hardware or tools remain inside the panel.
1.2	Item shall be fully covered with 3 to 4 layer of stretch film sheet (at least 25 micron) and shall be packed inside wooden box, fixed on wooden base depending upon the size.
1.3	Item shall be fixed on wooden base only & height of the bottom support/ wooden base shall be 18cm minimum. 100GSM (Colourless) Multi Layered Cross Laminated Polyethylene to be placed on the bottom of panels. As mentioned above 3 to 4 layer of stretch film with protective cushion on critical component with minimum 30% overlap shall be done. After which panel shall be covered with minimum 50 micron polythene.
1.4	All Items shall be firmly fixed to the bottom of the packing box i.e. wooden base with the help of supports/blocks to arrest the movement from all sides. All opening shall be protected with polyethylene blind end caps.
1.5	Ply Wood Case/Box shall be used to pack the panels after fixing of supports on the wooden base. Plywood must be of appropriate thickness used for making packing box. Construction of plywood box must give strength, stability, and durability during transportation & unloading of material to site.
1.6	Finally 100GSM (Colourless) Multi Layered Cross Laminated Polyethylene are used to make covers to the Wooden box individually. The cross lamination shall have qualities of extra toughness, together with flexibility and lightness coupled with good weather resistance to ultra violet rays. It is preferable to have a single piece of the above Multi-layered cross laminated polyethylene sheet fixed on the four sides. In case jointing is unavoidable, it should be done by overlapping of approximately 100mm.
1.7	Loose items/Spares/ accessories shall be separately packed with stretch film & then polyethylene sheet of at least 100 GSM inside the packing box.
1.8	Planks for Wooden Box support
a	Horizontal, vertical, diagonal planks shall be given for binding of Wooden Box.
b	Thickness of planks for Front, rear, top and bottom sides and binding, jointing battens shall be 25/20mm +2/-3 mm.
c	Suitable Width of binding planks & Suitable distance between any 2 binding planks shall be provided.
d	Diagonal planks shall be used in between vertical binding planks when distance between inner to inner of vertical planks is more than 750mm.
e	Diagonal planks are not required for top planks and width side, if the width of pallet is less than 750mm.
f	Single length planks shall be used for cubicles whose overall length is less than 2400mm.

2	QUALITY OF WOODS:
2.1	Wood used for packing box shall be Pinewood, Rubber wood, Mango wood, Fir wood, Silver Oak wood or other as per availability with moisture content not exceeding 30%.
3	CUSHONING MATERIAL & MOISTURE ABSORBER :
3.1	Suitable cushioning shall be provided by rubberized coir/ thermocol / expanded soft polyethylene foam. Provide extra protections on cores, edges or critical components i.e. HMI, Numerical Relay etc.
3.2	Adequate quantity of packed silica gel, VCI Powder/Tablets, packed in thin muslin cloth cotton bags shall be suitably placed inside the packing box.
4	NAILS
4.1	Adequate diameter and length of nails shall be provided.
5	HOOP IRON STRIPS
5.1	These are used for strapping the boxes. The material shall be free from rust. If sufficient nailing is done for bigger boxes thickness, strapping need not be done. Clips shall be used for strapping the hoop iron strips on the boxes.
6	BRACKETS
6.1	These brackets are used for nailing to the corners of cubicle boxes. The brackets shall be of mild steel of suitable. The brackets shall be of "L" shape. Two holes shall be provided towards the end of each side for screwing /nailing.
7	FASTENERS
7.1	Bolts, double nuts, spring washers will have to be used to hold the job that there shall be no jerk.
8	PACKING SLIP & HOLDER :
8.1	Packing slip kept in polyethylene bag shall be placed inside the wooden box at appropriate place.
8.2	One copy of packing slip wrapped in polyethylene bag covered in galvanized iron tin sheet/ aluminium packing slip holder shall be fixed on the external surface the packing box.
9	Refer below illustration for typical packing stages. Images are shown for representation only and it is manufacturer responsibility to ensure proper packing.



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DOCUMENTATION REQUIREMENT					
a)	DRAWINGS & DOCUMENTS TO BE SUBMITTED ALONG WITH THE BID				
Sl. No.	DOCUMENT				
1	PQR Credentials				
2	Compliance Sheet				
3	Un-priced Schedule alongwith Annexure- E, F , G & H duly stamped and signed by the bidder.				
4	Sub QR Data				
5	Complete dimensions of all the boards including no of panels (PCC as well as MCC panels)				
6	Dimensions of each type of panel				
7	Module size of each type of feeder				
b)	DRAWINGS & DOCUMENTS TO BE SUBMITTED BY SUCCESSFUL BIDDER AFTER AWARD OF CONTRACT ALONG WITH SUBMISSION SCHEDULE				
Sl. No.	BHEL Drawing No.	Drawing Title	Vendor Sub (Days)*	Vendor Sub (Days)#	Remarks
Primary Documents					
1	PE-V0-519-506-E101	COMPONENT SELECTION CHART & GENERAL NOTES AND LEGENDS	35	7	Refer Remark-1
2	PE-V0-519-506-E102	DATA SHEETS FOR LT SWITCHGEAR	35	7	Refer Remark-1
3	PE-V0-519-506-E103	BUSBAR SIZING CALCULATION FOR LT SWITCHGEAR	35	7	Refer Remark-1
4	PE-V0-519-506-E104	TYPE-2 COORDINATION CHART	35	7	Refer Remark-1
5	PE-V0-519-506-E105	MODULE SIZE SELECTION CHART	35	7	Refer Remark-1
6	PE-V0-519-506-E902	MQP FOR LT SWITCHGEAR PANEL ALONGWITH MAKE OF COMPONENTS & EQUIPMENTS AND FAT PROCEDURE OF NUMERICAL RELAYS	35	7	Refer Remark-1
7	PE-V0-519-506-E2XX	CONTROL SCHEMES	35	7	Refer Remark-1
8	PE-V0-519-506-E3XX	GA & SLD FOR LV SWITCHBOARDS	10	5	Refer Remark-2a & 2b
Secondary Documents					
1	PE-V0-519-506-E5XX	BILL OF MATERIAL FOR MODULES	10	5	After Approval of Scheme
2	PE-V0-519-506-E106	TYPE TEST REPORT FOR - LT SWITCHGEAR	35	7	
3	PE-V0-519-506-E107	TOOLS & TACKLES FOR LT SWITCHGEAR	35	7	
4	PE-V0-519-506-E108	E&C SPARE FOR LT SWITCHGEAR	35	7	
5	PE-V0-519-506-E109	MANDATORY SPARE FOR LT SWITCHGEAR	35	7	

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<u>DOCUMENTATION REQUIREMENT</u>		

Remark-1:

Documents for which inputs are not required from BHEL shall be given by vendor (Schemes, General Notes, Datasheet, QP, Type Test Report, Type-2 coordination Chart etc.) as stipulated in specification.

Remark-2:

- a) GA & SLD for LT Switchboards to be submitted within 10 days from release of Load Data for respective board.
- b) Every LT switchboard to be considered independently for drawing submission/re-submission & additional 1 day to be added in submission/re-submission days for each additional switchboard in case load data of more than 1 switchboard has been given on same day.
- c) LT Switchboards shall be cleared for manufacturing in various Lots. Every Lot shall be cleared after approval of related drawings/ documents including QP.
- d) Lot shall be released along with Cat-1 approved drawings/ documents applicable for the lot. Delivery time of the first lot shall be 150 days from date of release of lot or date of issue of applicable Cat-1 approved drawings/ documents whichever is later. Further, delivery time of each subsequent lot shall be 120 days from date of release of lot or date of issue of applicable Cat-1 approved drawings/ documents whichever is later. Delay by vendor in submission/re-submission of applicable drawing/documents shall be reduced from the given delivery period of respective Lot. However, delay in submission/re-submission of common drawing/documents shall not be considered for reduction of delivery period of subsequent lots.
- e) In one lot, maximum 10 nos. LT Switchboards shall be cleared for manufacturing.
- f) There shall be minimum 10 days gap between two consecutive lots.
- g) PO validity shall be as per NIT.

NOTES:

- a) * 1st submission within indicated days from date of purchase order.
- b) # Re-submission (within indicated days) after incorporating all BHEL comments.
- c) Primary documents shall be considered for Delay analysis.
- d) Refer Annexure-7 (part of Documentation Requirement) for Tentative documents list to be submitted by Bidder. Final list shall be decided after ordering.

c)	DRAWINGS & DOCUMENTS TO BE SUBMITTED AS FINAL/AS-BUILT DOCUMENT
Sl. No.	DOCUMENT
1	Approved Documents. All final drawings shall be submitted in both PDF and Autocad (.dwg 2016 or lower version) format. Final SLD FOR LV SWITCHBOARDS to be submitted in Excel format incorporating module Nos.
2	O&M Manual
3	All Test Certificates

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ANNEXURE-7 DOCUMENTS TO BE SUBMITTED				
S.No.	DVC Drawing No.	BHEL Drawing No.	Drawing Title	Remarks
1	-	PE-V0-519-506-E101	COMPONENT SELECTION CHART & GENERAL NOTES AND LEGENDS	
2	-	PE-V0-519-506-E102	DATA SHEETS FOR LT SWITCHGEAR	
3	-	PE-V0-519-506-E103	BUSBAR SIZING CALCULATION FOR LT SWITCHGEAR	
4	-	PE-V0-519-506-E104	TYPE-2 COORDINATION CHART	
5	-	PE-V0-519-506-E105	MODULE SIZE SELECTION CHART	
6	-	PE-V0-519-506-E106	TYPE TEST REPORT FOR - LT SWITCHGEAR	
7	-	PE-V0-519-506-E107	TOOLS & TACKLES FOR LT SWITCHGEAR	
8	-	PE-V0-519-506-E108	E&C SPARE FOR LT SWITCHGEAR	
9	-	PE-V0-519-506-E109	MANDATORY SPARE FOR LT SWITCHGEAR	
10	-	PE-V0-519-506-E110	TYPE TEST REPORT OF ETHERNET SWITCHES	
11	-	PE-V0-519-506-E111	CROSS SECTIONAL DRWG OF PROTOTYPE PANELS	
12	-	PE-V0-519-506-E112	DATA SHEET FOR DATA CABLE, FO CABLE	
13	-	PE-V0-519-506-E113	OVERALL SYSTEM ARCHITECTURE FOR LT SWITCHGEAR NETWORK	
14	-	PE-V0-519-506-E114	DATA LIST	
15	-	PE-V0-519-506-E115	FUNCTIONAL DESIGN SPECIFICATION	
16	-	PE-V0-519-506-E201	CONTROL SCHEME FOR 2 INCOMER +1 BUS COUPLER (2 DAET+1 DAE)	
17	-	PE-V0-519-506-E202	CONTROL SCHEME FOR 2 INCOMER (2 DAET)	
18	-	PE-V0-519-506-E203	CONTROL SCHEME FOR 2 INCOMER +1 BUS COUPLER (2 DAE+1 DAE)	
19	-	PE-V0-519-506-E204	CONTROL SCHEME FOR EMERGENCY SWITCH BOARD (2 DG IC+2 TIE IC+1 BC)	
20	-	PE-V0-519-506-E205	CONTROL SCHEME FOR PCC OUTGOING BREAKER FEEDER TYPE DAE	
21	-	PE-V0-519-506-E206	CONTROL SCHEME FOR OUTGOING TIE (DAE) FROM TURBINE PMCC TO UES	
22	-	PE-V0-519-506-E207	CONTROL SCHEME FOR ACB CONTROLLED MOTOR FEEDER (90KW & ABOVE) - TYPE DM	
23	-	PE-V0-519-506-E208	CONTROL SCHEME FOR BUS PT MODULE FOR PCC/PMCC (MODULE - G1)	
24	-	PE-V0-519-506-E209	CONTROL SCHEME FOR BUS PT MODULE FOR DG SWGR (MODULE - G2)	
25	-	PE-V0-519-506-E210	CONTROL SCHEME FOR METERING MODULE FOR MCC (MODULE - VM) DO/FIXED	
26	-	PE-V0-519-506-E211	CONTROL SCHEME FOR CONTROL TRAFSORMER MODULE TYPE CS	
27	-	PE-V0-519-506-E212	CONTROL SCHEME FOR 220V DCDB I/C & B/C (TYPE DC + DB + CH + HD)	
28	-	PE-V0-519-506-E213	CONTROL SCHEME FOR 48V DCDB I/C & B/C (TYPE DC + DB + CH + HD)	
29	-	PE-V0-519-506-E214	CONTROL SCHEME FOR DC METERING & PROTECTION MODULE TYPE S	
30	-	PE-V0-519-506-E215	220V/ 48V DC OUTGOING FEEDER TYPE X	
31	-	PE-V0-519-506-E216	CONTROL SCHEME FOR CONTACTOR CHANGEOVER BETWEEN TWO INCOMER MODULE TYPE CC (DO/FIXED)	
32	-	PE-V0-519-506-E217	CONTROL SCHEME FOR INCOMING MCCB (DO+FIXED) (MCCB) E3(I/C)	
33	-	PE-V0-519-506-E218	CONTROL SCHEME FOR BUSCOUPLER MODULE TYPE MCCB (DRAWOUT/FIXED) E3 (B/C)	
34	-	PE-V0-519-506-E219	CONTROL SCHEME FOR 3 PHASE NEUTRAL MCCB OUTGOING FEEDER (DRAWOUT/FIXED) E3 (O/G)	
35		PE-V0-519-506-E220	CONTROL SCHEME FOR 3 PHASE MCCB OUTGOING FEEDER (DRAWOUT/FIXED) E3-TP (O/G)	
36	-	PE-V0-519-506-E221	CONTROL SCHEME FOR 2 PHASE MCCB OUTGOING FEEDER TYPE E2 (DRAWOUT/FIXED)	
37	-	PE-V0-519-506-E222	CONTROL SCHEME FOR 1 PHASE MCCB OUTGOING FEEDER TYPE E1 (DRAWOUT/FIXED)	
38	-	PE-V0-519-506-E223	CONTROL SCHEME FOR TPN AC OUTGOING FOR SOLAR, MCCB OPERATED FEEDER FOR RATING UP TO 400A ES3	
39	-	PE-V0-519-506-E224	CONTROL SCHEME FOR MOTORS TYPE DK2 (BELOW 30KW)	

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ANNEXURE-7 DOCUMENTS TO BE SUBMITTED				
S.No.	DVC Drawing No.	BHEL Drawing No.	Drawing Title	Remarks
40	-	PE-V0-519-506-E225	CONTROL SCHEME FOR MOTORS TYPE DK21 (30KW & BELOW 90KW)	
41	-	PE-V0-519-506-E226	CONTROL SCHEME FOR RE-ACCELARATION MOTORS MODULE TYPE DK2E (UPTO 30KW)	
42	-	PE-V0-519-506-E227	CONTROL SCHEME FOR RE-ACCELARATION MOTORS MODULE TYPE DK21E (ABOVE 30KW & BELOW 90KW)	
43	-	PE-V0-519-506-E228	CONTROL SCHEME FOR MOTORS TYPE K2 (UPTO 30KW)	
44	-	PE-V0-519-506-E229	CONTROL SCHEME FOR MOTORS TYPE K21 (ABOVE 30KW & BELOW 90KW)	
45	-	PE-V0-519-506-E230	CONTROL SCHEME FOR MOTORS TYPE K3 (UPTO 30KW)	
46	-	PE-V0-519-506-E231	CONTROL SCHEME FOR MOTORS TYPE K31 (ABOVE 30KW & BELOW 90KW)	
47	-	PE-V0-519-506-E232	CONTROL SCHEME FOR REVERSIBLE MOTOR TYPE DN1 (BELOW 30KW)	
48	-	PE-V0-519-506-E233	CONTROL SCHEME FOR REVERSIBLE MOTOR TYPE DN11 (30KW AND ABOVE)	
49	-	PE-V0-519-506-E234	CONTROL SCHEME FOR HEATERS TYPE EA3 (BELOW 30KW)	
50	-	PE-V0-519-506-E235	CONTROL SCHEME FOR HEATERS TYPE EA1	
51	-	PE-V0-519-506-E236	CONTROL SCHEME FOR SPACE HEATER SUPPLY SHS	
52	-	PE-V0-519-506-E237	CONTROL SCHEME FOR PANEL SPACE HEATER AND PLUGS & SOCKETS PNL SP HTR	
53	-	PE-V0-519-506-E238	CONTROL SCHEME FOR RAPPING MOTOR (RM)	
54	-	PE-V0-519-506-E239	CONTROL SCHEME FOR DUST DENSITY MONITOR (DDM)	
55	-	PE-V0-519-506-E240	CONTROL SCHEME FOR HOPPER HEATER (HH)	
56	-	PE-V0-519-506-E241	CONTROL SCHEME FOR SHAFT INSULATOR HEATER (HS)	
57	-	PE-V0-519-506-E242	CONTROL SCHEME FOR SUPPORT INSULATOR HEATER (HI)	
58	-	PE-V0-519-506-E243	CONTROL SCHEME FOR ASH LEVEL INDICATOR HIGH (ALI(H))	
59	-	PE-V0-519-506-E244	CONTROL SCHEME FOR ASH LEVEL INDICATOR LOW (ALI(L))	
60	-	PE-V0-519-506-E245	CONTROL SCHEME FOR ARECA MARSHALING MODULE (ARECA)	
61	-	PE-V0-519-506-E246	CONTROL SCHEME FOR WAVE LEVEL TRANSMITTER (WLT)	
62	-	PE-V0-519-506-E247	CONTROL SCHEME FOR MARSHALING MODULE (MM)	
63	-	PE-V0-519-506-E248	CONTROL SCHEME FOR WALL BLOWER	
64	-	PE-V0-519-506-E249	CONTROL SCHEME FOR LR BLOWER	
65	-	PE-V0-519-506-E250	CONTROL SCHEME FOR AH BLOWER	
66		PE-V0-519-506-E251	CONTROL SCHEME FOR ALARM MODULE	
67		PE-V0-519-506-E252	CONTROL SCHEME FOR TP MCCB CONTACTOR CONTROLLED FEEDER WITHOUT IMC (CONTROLLED FROM DDCMIS) ET3	
68		PE-V0-519-506-E253	CONTROL SCHEME FOR HEATERS TYPE EA3-H (BELOW 30KW)	
69		PE-V0-519-506-E254	CONTROL SCHEME FOR MOTORS TYPE DK2-H (BELOW 30KW)	
70		PE-V0-519-506-E255	CONTROL SCHEME FOR MOTORS TYPE DK21-H (30KW & BELOW 90KW)	
71		PE-V0-519-506-E256	CONTROL SCHEME FOR RE-ACCELARATION MOTORS MODULE TYPE DK2E-H (UPTO 30KW)	
72		PE-V0-519-506-E257	CONTROL SCHEME FOR RE-ACCELARATION MOTORS MODULE TYPE DK21E-H (ABOVE 30KW & BELOW 90KW)	
73	-	PE-V0-519-506-E301	GA & SLD DRAWING FOR U#3 EMERGENCY MCC	
74	-	PE-V0-519-506-E302	GA & SLD DRAWING FOR U#3 220V MAIN DCDB	
75	-	PE-V0-519-506-E303	GA & SLD DRAWING FOR U#3 BOILER SERVICE PMCC	
76	-	PE-V0-519-506-E304	GA & SLD DRAWING FOR U#3 BOILER VALVE & DAMPER ACDB	
77	-	PE-V0-519-506-E305	GA & SLD DRAWING FOR U#3 BOILER ACDB	

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ANNEXURE-7				
DOCUMENTS TO BE SUBMITTED				
S.No.	DVC Drawing No.	BHEL Drawing No.	Drawing Title	Remarks
78	-	PE-V0-519-506-E306	GA & SLD DRAWING FOR U#3 SOOT BLOWER	
79	-	PE-V0-519-506-E307	GA & SLD DRAWING FOR U#3 TURBINE SERVICE PMCC	
80	-	PE-V0-519-506-E308	GA & SLD DRAWING FOR U#3 UNIT SERVICE ACDB	
81	-	PE-V0-519-506-E309	GA & SLD DRAWING FOR U#3 TURBINE VALVE DB	
82	-	PE-V0-519-506-E310	GA & SLD DRAWING FOR U#4 EMERGENCY MCC	
83	-	PE-V0-519-506-E311	GA & SLD DRAWING FOR U#4 220V MAIN DCDB	
84	-	PE-V0-519-506-E312	GA & SLD DRAWING FOR U#4 BOILER SERVICE PMCC	
85	-	PE-V0-519-506-E313	GA & SLD DRAWING FOR U#4 BOILER VALVE & DAMPER ACDB	
86	-	PE-V0-519-506-E314	GA & SLD DRAWING FOR U#4 BOILER ACDB	
87	-	PE-V0-519-506-E315	GA & SLD DRAWING FOR U#4 SOOT BLOWER MCC	
88	-	PE-V0-519-506-E316	GA & SLD DRAWING FOR U#4 TURBINE SERVICE PMCC	
89	-	PE-V0-519-506-E317	GA & SLD DRAWING FOR U#4 UNIT SERVICE ACDB	
90	-	PE-V0-519-506-E318	GA & SLD DRAWING FOR U#4 TURBINE VALVE DB	
91	-	PE-V0-519-506-E319	GA & SLD DRAWING FOR U#3 & U#4 ESP PMCCs	
92	-	PE-V0-519-506-E320	GA & SLD DRAWING FOR U#3 ESP STANDBY PMCC-1	
93	-	PE-V0-519-506-E321	GA & SLD DRAWING FOR U#3 ESP STANDBY PMCC-2	
94	-	PE-V0-519-506-E322	GA & SLD DRAWING FOR U#4 ESP STANDBY PMCC-1	
95	-	PE-V0-519-506-E323	GA & SLD DRAWING FOR U#4 ESP STANDBY PMCC-2	
96	-	PE-V0-519-506-E324	GA & SLD DRAWING FOR U#3 ESP HVAC MCC	
97	-	PE-V0-519-506-E325	GA & SLD DRAWING FOR U#3 ESP & ID FAN AREA MCC	
98	-	PE-V0-519-506-E326	GA & SLD DRAWING FOR U#4 ESP HVAC MCC	
99	-	PE-V0-519-506-E327	GA & SLD DRAWING FOR U#4 ESP & ID FAN AREA MCC	
100	-	PE-V0-519-506-E328	GA & SLD DRAWING FOR U#3 STATION SERVICE PMCC	
101	-	PE-V0-519-506-E329	GA & SLD DRAWING FOR U#3 & 4 AIR CONDITIONING MCC	
102	-	PE-V0-519-506-E330	GA & SLD DRAWING FOR U#3 VENTILATION MCC	
103	-	PE-V0-519-506-E331	GA & SLD DRAWING FOR U#3 MISC. SERVICES MCC	
104	-	PE-V0-519-506-E332	GA & SLD DRAWING FOR U#3 AIR WASHER MCC	
105	-	PE-V0-519-506-E333	GA & SLD DRAWING FOR U#3 TRF AREA OUTDOOR SWGR	
106	-	PE-V0-519-506-E334	GA & SLD DRAWING FOR U#4 STATION SERVICE PMCC	
107	-	PE-V0-519-506-E335	GA & SLD DRAWING FOR U#4 VENTILATION MCC	
108	-	PE-V0-519-506-E336	GA & SLD DRAWING FOR U#4 MISC. SERVICES MCC	
109	-	PE-V0-519-506-E337	GA & SLD DRAWING FOR U#4 AIR WASHER MCC	
110	-	PE-V0-519-506-E338	GA & SLD DRAWING FOR U#4 TRF AREA OUTDOOR SWGR	
111	-	PE-V0-519-506-E339	GA & SLD DRAWING FOR U#3 IDCT PMCC	
112	-	PE-V0-519-506-E340	GA & SLD DRAWING FOR U#4 IDCT PMCC	
113	-	PE-V0-519-506-E341	GA & SLD DRAWING FOR SERVICE BUILDING MCC	
114	-	PE-V0-519-506-E342	GA & SLD DRAWING FOR RWPH PMCC	
115	-	PE-V0-519-506-E343	GA & SLD DRAWING FOR O&M STORE ACDB	
116	-	PE-V0-519-506-E344	GA & SLD DRAWING FOR 220V RAW WATER AREA DCDB	
117	-	PE-V0-519-506-E345	GA & SLD DRAWING FOR FOPH PMCC	
118	-	PE-V0-519-506-E346	GA & SLD DRAWING FOR SWITCHYARD PMCC	
119	-	PE-V0-519-506-E347	GA & SLD DRAWING FOR 220V SWYD DCDB	

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ANNEXURE-7				
DOCUMENTS TO BE SUBMITTED				
S.No.	DVC Drawing No.	BHEL Drawing No.	Drawing Title	Remarks
120	-	PE-V0-519-506-E348	GA & SLD DRAWING FOR SWITCHYARD EMERGENCY POWER DB	
121	-	PE-V0-519-506-E349	GA & SLD DRAWING FOR SWITCHYARD OIL FILTRATION BOARD	
122	-	PE-V0-519-506-E501	BILL OF MATERIAL FOR MODULE DAET (I/C)	
123	-	PE-V0-519-506-E502	BILL OF MATERIAL FOR MODULE DAE (I/C)	
124	-	PE-V0-519-506-E503	BILL OF MATERIAL FOR MODULE DAET/DAE (B/C)	
125	-	PE-V0-519-506-E504	BILL OF MATERIAL FOR MODULE DG (I/C)	
126	-	PE-V0-519-506-E505	BILL OF MATERIAL FOR MODULE DAE(O/G)/DAE-TIE	
127	-	PE-V0-519-506-E506	BILL OF MATERIAL FOR MODULE DM/PM/AM	
128	-	PE-V0-519-506-E507	BILL OF MATERIAL FOR MODULE G1	
129	-	PE-V0-519-506-E119	BILL OF MATERIAL FOR MODULE G2	
130	-	PE-V0-519-506-E509	BILL OF MATERIAL FOR MODULE VM	
131	-	PE-V0-519-506-E510	BILL OF MATERIAL FOR MODULE CS	
132	-	PE-V0-519-506-E511	BILL OF MATERIAL FOR MODULE DB/DC/CH/HD	
133	-	PE-V0-519-506-E119	BILL OF MATERIAL FOR MODULE S	
134	-	PE-V0-519-506-E513	BILL OF MATERIAL FOR MODULE X	
135	-	PE-V0-519-506-E514	BILL OF MATERIAL FOR MODULE CC	
136	-	PE-V0-519-506-E515	BILL OF MATERIAL FOR MODULE E3 (I/C)	
137	-	PE-V0-519-506-E516	BILL OF MATERIAL FOR MODULE E3 (B/C)	
138	-	PE-V0-519-506-E517	BILL OF MATERIAL FOR MODULE E3 & E3-TP	
139	-	PE-V0-519-506-E518	BILL OF MATERIAL FOR MODULE E2	
140	-	PE-V0-519-506-E519	BILL OF MATERIAL FOR MODULE E1	
141	-	PE-V0-519-506-E520	BILL OF MATERIAL FOR MODULE ES3	
142	-	PE-V0-519-506-E521	BILL OF MATERIAL FOR MODULE DK2/PK2/AK2	
143	-	PE-V0-519-506-E522	BILL OF MATERIAL FOR MODULE DK21/PK21/ AK21	
144	-	PE-V0-519-506-E523	BILL OF MATERIAL FOR MODULE DK2E/PK2E/AK2E	
145	-	PE-V0-519-506-E524	BILL OF MATERIAL FOR MODULE DK21E/PK21E/ AK21E	
146	-	PE-V0-519-506-E525	BILL OF MATERIAL FOR MODULE K2	
147	-	PE-V0-519-506-E526	BILL OF MATERIAL FOR MODULE K21	
148	-	PE-V0-519-506-E527	BILL OF MATERIAL FOR MODULE K3	
149	-	PE-V0-519-506-E528	BILL OF MATERIAL FOR MODULE K31	
150	-	PE-V0-519-506-E529	BILL OF MATERIAL FOR MODULE DN1	
151		PE-V0-519-506-E530	BILL OF MATERIAL FOR MODULE DN11	
152	-	PE-V0-519-506-E531	BILL OF MATERIAL FOR MODULE EA3	
153	-	PE-V0-519-506-E532	BILL OF MATERIAL FOR MODULE EA1	
154	-	PE-V0-519-506-E533	BILL OF MATERIAL FOR MODULE SHS	
155	-	PE-V0-519-506-E534	BILL OF MATERIAL FOR MODULE PNL SP HTR	
156	-	PE-V0-519-506-E535	BILL OF MATERIAL FOR MODULE RM1	
157	-	PE-V0-519-506-E536	BILL OF MATERIAL FOR MODULE RM2	
158	-	PE-V0-519-506-E537	BILL OF MATERIAL FOR MODULE DDM	
159	-	PE-V0-519-506-E538	BILL OF MATERIAL FOR MODULE HH	
160	-	PE-V0-519-506-E539	BILL OF MATERIAL FOR MODULE HS	
161	-	PE-V0-519-506-E540	BILL OF MATERIAL FOR MODULE HI	

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ANNEXURE-7 DOCUMENTS TO BE SUBMITTED				
S.No.	DVC Drawing No.	BHEL Drawing No.	Drawing Title	Remarks
162	-	PE-V0-519-506-E541	BILL OF MATERIAL FOR MODULE ALI (H)	
163	-	PE-V0-519-506-E542	BILL OF MATERIAL FOR MODULE ALI (L)	
164	-	PE-V0-519-506-E543	BILL OF MATERIAL FOR MODULE ARECA	
165	-	PE-V0-519-506-E544	BILL OF MATERIAL FOR MODULE WLT	
166	-	PE-V0-519-506-E545	BILL OF MATERIAL FOR MODULE MM	
167	-	PE-V0-519-506-E546	BILL OF MATERIAL FOR MODULE WB	
168	-	PE-V0-519-506-E547	BILL OF MATERIAL FOR MODULE LR	
169	-	PE-V0-519-506-E548	BILL OF MATERIAL FOR MODULE AH	
170	-	PE-V0-519-506-E549	BILL OF MATERIAL FOR MODULE WT1, WT2 & WT3	
171	-	PE-V0-519-506-E550	BILL OF MATERIAL FOR MODULE ALARM MODULE	
172	-	PE-V0-519-506-E551	BILL OF MATERIAL FOR MODULE ET3	
173	-	PE-V0-519-506-E902	MQP FOR LT SWITCHGEAR PANEL ALONGWITH MAKE OF COMPONENTS & EQUIPMENTS AND FAT PROCEDURE OF NUMERICAL RELAYS	

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COMPLIANCE CERTIFICATE	
1	It is hereby confirm that the technical specification (sheet 1 to 190) has been read and we confirm compliance to the tender specification including any clarification and amendments without any deviation.
2	It is hereby declared that any technical submittals which was not specifically asked for in NIT shall stand withdrawn.

Signature of Authorized Representative

Name and Designation :

Name & Address of the Bidder

Date

	TECHNICAL SPECIFICATION LT SWITCHGEAR KODERMA THERMAL POWER STATION PHASE-II (2X800MW)	PE-TS-519-506-E002
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UNPRICED SCHEDULE

		TECHNICAL SPECIFICATION LT SWITCHGEAR KODERMA THERMAL POWER STATION PHASE-II (2X800MW) EPC PACKAGE								PE-TS-519-506-E002	
										Issue No: 00	
										Rev. No. 00	
										Date : 02.09.2026	
BOQ-CUM-PRICE SCHEDULE FOR LT SWITCHGEAR											
S.No.	ITEM NO.	ITEM NAME	UOM	TOTAL QTY.	RATING (A)	BOARD NO.	UNIT PRICE (Ex-WORKS) Rs.	TOTAL PRICE (Ex-WORKS) Rs.	NO. OF PCC / ACB PANEL	NO. OF MCC / ACDB / DCDB PANEL	BOARD NAME PLATE, DESCRIPTION & RATING
A	SWITCHBOARD										
1	506-0110316-00-A	UNIT EMERGENCY SWBD-1	NOS.	1	3000	3DG					415 V UNIT-3 EMERGENCY PMCC 3DG, 3000A
2	506-0110040-00-A	220V MAIN DCDB-1	NOS.	1	1600	3FA					220 V UNIT-3 MAIN DCDB 3FA, 1600A
3	506-0110382-00-A	Unit Boiler PMCC-1	NOS.	1	4000	3DA					415 V UNIT-3 BOILER SERVICE PMCC 3DA, 4000A
4	506-0110107-00-A	BOILER V&D ACDB-1	NOS.	1	250	3HA					415 V UNIT-3 BLR. VALVE & DAMPER ACDB 3HA, 250A
5	506-0110092-00-A	BOILER ACDB-1	NOS.	1	630	3HB					415 V UNIT-3 BOILER ACDB 3HB, 630A
6	506-0110419-00-A	SOOT BLOWER MCC-1	NOS.	1	63						415 V UNIT-3 SOOT BLOWER MCC, 63A
7	506-0110387-00-A	Unit Turbine PMCC-1	NOS.	1	4000	3DB					415 V UNIT-3 TURBINE SERVICE PMCC 3DB, 4000A
8	506-0110321-00-A	UNIT SERVICE ACDB-1	NOS.	1	630	3QA					415 V UNIT-3 SERVICE ACDB 3QA, 630A
9	506-0110300-00-A	TURBINE VALVE ACDB-1	NOS.	1	250	3KA					415 V UNIT-3 TURBINE VALVE DB 3KA, 250A
10	506-0110317-00-A	UNIT EMERGENCY SWBD-2	NOS.	1	3000	4DG					415 V UNIT-4 EMERGENCY PMCC 4DG, 3000A
11	506-0110041-00-A	220V MAIN DCDB-2	NOS.	1	1600	4FA					220 V UNIT-4 MAIN DCDB 4FA, 1600A
12	506-0110383-00-A	Unit Boiler PMCC-2	NOS.	1	4000	4DA					415 V UNIT-4 BOILER SERVICE PMCC 4DA, 4000A
13	506-0110108-00-A	BOILER V&D ACDB-2	NOS.	1	250	4HA					415 V UNIT-4 BLR. VALVE & DAMPER ACDB 4HA, 250A
14	506-0110093-00-A	BOILER ACDB-2	NOS.	1	630	4HB					415 V UNIT-4 BOILER ACDB 4HB, 630A
15	506-0110420-00-A	SOOT BLOWER MCC-2	NOS.	1	63						415 V UNIT-4 SOOT BLOWER MCC, 63A
16	506-0110388-00-A	Unit Turbine PMCC-2	NOS.	1	4000	4DB					415 V UNIT-4 TURBINE SERVICE PMCC 4DB, 4000A
17	506-0110322-00-A	UNIT SERVICE ACDB-2	NOS.	1	630	4QA					415 V UNIT-4 SERVICE ACDB 4QA, 630A
18	506-0110301-00-A	TURBINE VALVE ACDB-2	NOS.	1	250	4KA					415 V UNIT-4 TURBINE VALVE DB 4KA, 250A
19	506-0110179-00-A	ESP SWBD	NOS.	12	3000	3DC, 3DD, 3DE, 3DF,3DH, 3DJ 4DC, 4DD, 4DE, 4DF,4DH,4DJ					UNIT-3 & UNIT-4 ESP PMCCs, 3000A
20	506-0110180-00-A	ESP SWBD-1	NOS.	1	4000	3DK					415 V UNIT-3 ESP STANDBY PMCC 3DK, 4000A
21	506-0110181-00-A	ESP SWBD-2	NOS.	1	4000	3DL					415 V UNIT-3 ESP STANDBY PMCC 3DL, 4000A
22	506-0110182-00-A	ESP SWBD-3	NOS.	1	4000	4DK					415 V UNIT-4 ESP STANDBY PMCC 4DK, 4000A
23	506-0110183-00-A	ESP SWBD-4	NOS.	1	4000	4DL					415 V UNIT-4 ESP STANDBY PMCC 4DL, 4000A
24	506-0110170-00-A	ESP A/C & VENT MCC-1	NOS.	1	400	3TB					415 V UNIT-3 ESP HVAC MCC 3TB, 400A
25	506-0110165-00-A	ESP & ID FAN AREA MCC-1	NOS.	1	400	3HC					415 V UNIT-3 ESP & ID FAN AREA MCC 3HC, 400A
26	506-0110171-00-A	ESP A/C & VENT MCC-2	NOS.	1	400	4TB					415 V UNIT-4 ESP HVAC MCC 4TB, 400A
27	506-0110166-00-A	ESP & ID FAN AREA MCC-2	NOS.	1	400	4HC					415 V UNIT-4 ESP & ID FAN AREA MCC 4HC, 400A
28	506-0110264-00-A	STATION SERVICE SWBD.-1	NOS.	1	4000	0DA					415 V UNIT-3 STATION SERVICE PMCC 0DA, 4000A
29	506-0110077-00-A	AIR CONDITIONING MCC	NOS.	1	1600	0TA					415V CCR AIR CONDITIONING MCC 0TA, 1600A
30	506-0110331-00-A	VENTILATION MCC-1	NOS.	1	630	3TA					415 V UNIT-3 VENTILATION MCC 3TA, 630A

31	506-0110241-00-A	MISC. SERVICE MCC-1	NOS.	1	630	0QA					415 V UNIT -4 MISC. SERVICE MCC 0QA, 630A
32	506-0110079-00-A	AIR WASHER MCC-1	NOS.	1	800	0SA					415 V UNIT -4 AIR WASHER MCC 0SA, 800A
33	506-0110265-00-A	STATION SERVICE SWBD.-2	NOS.	1	4000	0DB					415 UNIT-4 V STATION SERVICE PMCC 0DB, 4000A
34	506-0110332-00-A	VENTILATION MCC-2	NOS.	1	630	4TA					415 V UNIT-4 VENTILATION MCC 4TA, 630A
35	506-0110242-00-A	MISC. SERVICE MCC-2	NOS.	1	630	0QB					415 V UNIT-4 MISC. SERVICE MCC 0QB, 630A
36	506-0110080-00-A	AIR WASHER MCC-2	NOS.	1	800	0SB					415 V UNIT -4 AIR WASHER MCC 0SB, 800A
37	506-0110259-00-A	SERVICE BLDG. MCC	NOS.	1	1000	0SC					415 V SERVICE BUILDING AC MCC 0SC, 1000A
38	506-0110254-00-A	RAW WATER SWBD.	NOS.	1	1600	0DF					415 V RAW WATER PMCC 0DF, 1600A
39	506-0111019-00-A	O&M STORE SWBD	NOS.	1	400	0WB					415 V O & M STORE ACDB 0WB, 400A
40	506-0110044-00-A	220V OFFSITE DCDB	NOS.	1	125	0FA					220 V RAW WATER AREA DCDB 0FA, 125A
41	506-0110190-00-A	FUEL OIL P/H SWBD.	NOS.	1	1600	0DE					415 V FOPH PMCC 0DE, 1600A
42	506-0110138-00-A	COOLING TOWER SWBD.-1	NOS.	2	3000	3DQ, 4DQ					415 V IDCT UNIT-3/ 4 PMCC # 3DQ/ 4DQ, 3000A
43	506-0110139-00-A	COOLING TOWER SWBD.-2	NOS.	2	3000	3DR, 4DR					415 V IDCT UNIT-3/ 4 PMCC # 3DR/ 4DR, 3000A
44	506-0110140-00-A	COOLING TOWER SWBD.-3	NOS.	2	3000	3DT, 4DT					415 V IDCT UNIT-3/ 4 PMCC # 3DT/ 4DT, 3000A
45	506-0110141-00-A	COOLING TOWER SWBD.-4	NOS.	2	3000	3DU, 4DU					415 V IDCT UNIT-3/ 4 PMCC # 3DU/ 4DU, 3000A
46	506-0111034-00-A	SWITCHYARD SERVICE SWBD	NOS.	1	1600						415V SWYD MAIN SWBD, 1600A
47	506-0110977-00-A	220V SWITCHYARD DCDB 1	NOS.	1	125						220 V SWITCHYARD DCDB, 125A
48	506-0110411-00-A	SWITCHYARD EMERGENCY POWER DB	NOS.	1	250						415V SWITCHYARD EMERGENCY POWER DB, 250A
49	506-0110983-00-A	OUTDOOR SWGR # 1	NOS.	1	400						415 V UNIT-3 TRF AREA OUTDOOR SWGR, 400A
50	506-0110984-00-A	OUTDOOR SWGR # 2	NOS.	1	400						415 V UNIT-4TRF AREA OUTDOOR SWGR, 400A
51	506-0110412-00-A	SWITCHYARD OIL FILTRATION SWBD	NOS.	1	400						SWITCHYARD OIL FILTRATION BOARD, 400A
52	506-0110985-00-A	AC MCCB BOX	NOS.	80	63						
53	506-0110986-00-A	DC MCCB BOX	NOS.	20	63						
54	506-0111084-00-A	24V DC PDB - 16 WAYS	NOS.	4							
55	506-0111085-00-A	24V DC PDB - 32 WAYS	NOS.	12							
56	506-0111086-00-A	24V DC PDB - 64 WAYS	NOS.	24							
B HMI SYSTEM											
1	506-0110417-00-A	HMI (EWS)	NOS.	4							
2	506-0111038-00-A	CONSOLE FOR HMI	NOS.	4							REFER NOTE- B.2 & B.3
3	506-0111039-00-A	LASER PRINTER (A4 SIZE)	NOS.	4							
4	506-0111040-00-A	TABLE FOR PRINTER	NOS.	4							REFER NOTE- B.3
B1 NUMERICAL RELAY, IMC, ENERGY METERS AND WIRELESS TEMP MONITORING SYSTEM-NETWORKING HARDWARE											
1		ETHERNET SWITCH WITH IEC-61850 PROTOCOL									IT SHALL BE PART OF SWITCHBOARD
2	506-0111041-00-A	NETWORK LEVEL ETHERNET SWITCH (OF ADEQUATE PORTS)	NOS.	4							NEAR DDCMIS END, INCLUDING COMPLETE DESIGN, ENGINEERING, SUPPLY, TESTING AND ERECTION & COMMISSIONING. EACH NO. (COMPLETE SET) SHALL BE SUITABLE FOR RECEIVING SIGNALS FROM EACH SWITCHGEAR LEVEL NETWORK/RING OF ETHERNET SWITCH's. BOTH SET OF NETWORK LEVEL ETHERNET SWITCH SHALL BE MOUNTED IN ETHERNET SWITCH BOX.
3	506-0111042-00-A	CAT5e/CAT6 or Better Ethernet CABLE	METERS	6000							

4	506-0111043-00-A	SIMPLEX FIBER OPTICAL CABLE FOR COMMUNICATION BETWEEN SWGR LEVEL ETHERNET SWITCH's (& THEIR RINGS) & NETWORK LEVEL ETHERNET SWITCH	METERS	45000							
5	506-0111044-00-A	SIMPLEX FIBER OPTICAL CABLE PATCH CORD WITH CONNECTORS AT BOTH ENDS OF MINIMUM LENGTH 10 METERS	NOS.	70							
6	506-0111045-00-A	HDPE CONDUIT (RODENT FREE)	METERS	45000							USED FOR FIBER OPTICAL CABLE AT S.NO B1 (4)
7	506-0111046-00-A	FO TERMINATION ACCESSORIES AT BIDDER'S SUPPLIED EQUIPMENT END UNDER THIS PACKAGE	NOS.	1							ANNEXURE-1_TYPICAL SWITCHGEAR RELAY / ENERGY METER NETWORK ARCHITECTURE FOR SCOPE AND TERMINAL POINT
8	506-0111047-00-A	LAPTOP PC WITH LICENCED VERSION SOFTWARE, HARDWARE FOR RELAY, IMC & ENERGY METERS PARAMETERISATION	NOS.	5							
9	506-0111048-00-A	INTERFACE CABLE WITH SUITABLE CONNECTING PORT AT BOTH END FOR CONNECTION OF NUMERICAL RELAY/ ENERGY METERS FRONT PORT TO THE LAPTOP	NOS.	55							EACH CABLE OF LENGTH ATLEAST 5M
10	506-0111049-00-A	INTERFACE CABLE WITH SUITABLE CONNECTING PORT AT BOTH END FOR CONNECTION OF IMCC FRONT PORT TO THE LAPTOP	NOS.	20							EACH CABLE OF LENGTH ATLEAST 5M
B3 NETWORKING HARDWARE FOR WIRELESS TEMPERATURE MONITORING SENSOR											
1	506-0111053-00-A	COMPLETE NETWORKING HARDWARE (EXCEPT CABLE & TERMINATION ACCESSORIES) NEAR SWITCHGEAR END FOR COMMUNICATION BETWEEN WIRELESS TEMPERATURE RECEIVER END & DDCMIS/HMI FOR TEMPERATURE MONITORING SYSTEM :- FOR TWO SET OF SWITCHBOARDS- a. FIRST SET- 3DA, 3DB & 3DG b. SECOND SET- 4DA, 4DB & 4DG	NOS.	2							INCLUDING COMPLETE DESIGN, ENGINEERING AND SUPPLY. 1 NO. = 1 COMPLETE SET IS FOR EACH UNIT (CONSISTS OF 3 SWITCHBOARDS)
2	506-0111054-00-A	SPECIAL CABLE(TWISTED PAIR/ CAT/ OPTICAL FIBRE CABLE OR AS APPLICABLE) INCLUDING TERMINATION ACCESSORIES FOR COMMUNICATION BETWEEN SWITCHGEAR & DDCMIS/HMI FOR TEMPERATURE MONITORING SYSTEM :- FOR TWO SET OF SWITCHBOARDS- a. FIRST SET- 3DA, 3DB & 3DG b. SECOND SET- 4DA, 4DB & 4DG	NOS.	2							INCLUDING COMPLETE DESIGN, ENGINEERING AND SUPPLY. 1 NO. = 1 COMPLETE SET IS FOR EACH UNIT (CONSISTS OF 3 SWITCHBOARDS)

C	TOOLS & TACKLE										
1	506-0111055-00-A	ACB RACKING HANDLE	NOS.	30							
2	506-01110283-00-A	TELESCOPIC TROLLEY (TROLLEY FOR ACB HANDLING)	NOS.	20							
3	506-0111056-00-A	DOOR KEY	NOS.	100							
4	506-0111057-00-A	RELAY TEST EQUIPMENT	NOS.	2							
5	506-0111058-00-A	MODULE RACKING HANDLE	NOS.	30							
D	SITE MODIFICATION										
1	506-0111059-00-A	LUMP SUM ALL INCLUSIVE CHARGES PER VISIT FOR SKILLED TECHNICIAN (EXCEPT DAILY CHARGES)	VISITS	15							REFER NOTE D.1 TO D.4
2	506-0111060-00-A	LUMP SUM ALL INCLUSIVE DAILY CHARGES FOR SKILLED TECHNICIAN	DAYS	60							REFER NOTE D.1 TO D.4
3	506-0111061-00-A	LUMP SUM ALL INCLUSIVE CHARGES PER VISIT FOR SERVICE ENGINEER (EXCEPT DAILY CHARGES)	VISITS	15							REFER NOTE D.1 TO D.4
4	506-0111062-00-A	LUMP SUM ALL INCLUSIVE DAILY CHARGES FOR SERVICE ENGINEER	DAYS	60							REFER NOTE D.1 TO D.4
5	506-0111063-00-A	SITE MODIFICATION MATERIAL @ 1% OF TOTAL BOARD COST (i.e. SUMMATION OF S.NO. 1 TO S.NO. 48 OF BOQ CUM PRICE SCHEDULE)	SET	1							REFER NOTE D.3
E	NUMERICAL RELAY, IMC, ENERGY METERS AND WIRELESS TEMP MONITORING SYSTEM-COMMISSIONING										AS PER ANNEXURE-E
F	E&C SPARES										AS PER ANNEXURE-F
G	MANDATORY SPARES										AS PER ANNEXURE-G

NOTES:

A.1	TO CALCULATE THE SWITCHBOARD PRICES, REFER DETAILED BOARD WISE BOM AND MODULE WISE BOM, ANNEXURE-A.1 AND ANNEXURE-A.2 OF TECHNICAL DATA PART-A OF TECHNICAL SPECIFICATION (PE-TS-519-506-E002) RESPECTIVELY.
A.2	BIDDER HAS TO QUOTE FOR THE FOLLOWING ALONG WITH THE BID:
i	HMI SYSTEM: AS PER SR. NO. B ABOVE.
ii	NETWORKING HARDWARE FOR NUMERICAL RELAYS, IMC AS PER SR. NO.-B(1) & FOR WIRELESS TEMPERATURE MONITORING SYSTEM AS PER SR. NO.B (3) ABOVE
iii	NUMERICAL RELAY, IMCC, WIRELESS TEMPERATURE MONITORING & HMI SYSTEM COMMISSIONING: AS PER ANNEXURE-E
iv	TOOLS & TACKLES: AS PER SR. NO. C ABOVE.
v	SITE MODIFICATION CHARGES: AS PER SR. NO. D (1 TO 5) ABOVE.
vi	E & C SPARES: AS PER ANNEXURE-F
vii	MANDATORY SPARE: AS PER LIST IN ANNEXURE-G
viii	BIDDER TO PROVIDE A SCHEDULE OF UNIT PRICES IN ACCORDANCE WITH THE LIST PROVIDED IN ANNEXURE-H
A.3	BIDDER TO ENSURE THAT SUMMATION OF PRICES (AS PER ANNEXURE-H) OF APPLICABLE MODULES (AS PER ANNEXURE A.1-BOARDWISE BOM) AND APPLICABLE PANELS (MENTIONED ABOVE BY THE BIDDER) OF A BOARD SHALL BE EQUIVALENT TO BOARD PRICE QUOTED ABOVE FOR THAT BOARD. VARIATION OF +/- 5% IS ACCEPTABLE IN THE DERIVED PRICE FROM THE BOARD PRICE QUOTED ABOVE.

A.4	ADDITION/ DELETION OF QUANTITIES SHALL BE APPLICABLE AT THE QUOTED PRICES. ALLOWABLE VARIATION IN QUANTITY AND PRICE SHALL BE AS PER NIT.
A.5	ALL LT PCC/ PMCC/MCC/ DBs SHALL BE SUPPLIED ALONGWITH THE INTEGRAL BASE FRAMES, FOUNDATION BOLTS, CABLE GLANDS & LUGS. PRICES FOR THE SAME SHALL BE BUILT IN THE SWITCHBOARD PRICE.
A.6	BIDDER IS REQUIRED TO PROVIDE THE QUANTITY OF PANELS CORRESPONDING TO EACH BOARD IN THE TABLE ABOVE WHEN SUBMITTING THEIR TECHNO-COMMERCIAL PROPOSAL.
A.7	IN CASE MODULE DOORS ARE PART OF MODULES, 2 NOS OF DUMMY MODULES OF EACH SIZE TO FILL IN MODULE BEING TAKEN OUT FOR MAINTENANCE PURPOSE SHALL BE PROVIDED IN EACH SWITCHGEAR ROOM (REFER ANNEXURE-3. TENTATIVE SWITCHGEAR LOCATION OF TECHNICAL SPECIFICATION PE-TS-519-506-E002), THESE DUMMY MODULES SHALL BE FITTED IN SWITCHBOARD AS VACANT MODULES HAVING NO CUT OUT ON BACK SIDE AND CABLE ALLEY SIDE. IN CASE DOOR IS HINGED TO THE PANEL, 2 NOS OF BLANKING PLATES OF EACH SIZE NEED TO BE PROVIDED. PRICES FOR THE SAME SHALL BE BUILT IN THE SWITCHBOARD PRICE.
A.8	NO ADDITIONAL PRICES SHALL BE PAID FOR PROTOTYPE PANELS, PRICES QUOTED ABOVE INCLUDES COST OF PROTOTYPE PANELS ALSO.
A.9	PVC SHALL BE APPLICABLE FOR THIS ENQUIRY FOR PMCC / PCC / MCC / ACBD / DCDB ONLY AS PER IEEMA CIRCULAR (https://ieema.org/wp-content/uploads/2020/07/lvswgr-jan-2019.pdf). PRICE VARIATION IS NOT APPLICABLE FOR THE FOLLOWING: i) AC MCCB BOX, DC MCCB BOX, 24V PDB, HMI SYSTEM, NUMERICAL RELAY, IMCC, ENERGY METERS AND WIRELESS TEMP MONITORING SYSTEM ii) NETWORKING HARDWARE FOR 24V PDB, HMI SYSTEM, NUMERICAL RELAY, IMCC, ENERGY METERS AND WIRELESS TEMP MONITORING SYSTEM. iii) NUMERICAL RELAY, IMCC, 24V PDB, ENERGY METERS, WIRELESS TEMP MONITORING AND HMI SYSTEM- COMMISSIONING iv) TOOLS & TACKLE, SITE MODIFICATION, E&C SPARES & MANDATORY SPARES.
A.10	IN UNIT ADDITION-DELETION PRICES (ANNEXURE-H), PRICES QUOTED FOR COMPONENTS SHALL BE REASONABLE AND AS PER LIST PRICE OF CONCERNED MANUFACTURERS.
B.1	REFER ANNEXURE-1_TYPICAL SWITCHGEAR RELAY & ENERGY METERS NETWORK ARCHITECTURE.
B.2	INDUSTRIAL MODULAR DESIGN CONSOLE (FURNITURE I.E. TABLE WITH DRAWER & SWIVEL COMPUTER CHAIR) SHALL BE PROVIDED. EACH CONSOLE SHALL HAVE SPACE FOR KEEPING AN ADDITIONAL PC.
B.3	MAKE AND COLOR SHADE OF FURNITURE SHALL BE DECIDED DURING DETAIL ENGINEERING. FURNITURE COLOR SHADE SHOULD MATCH WITH CONTROL ROOM FURNITURE.
B.4	BHEL WILL PROVIDE UPS REDUNDANT FEEDER AT ONE LOCATION NEAR TO EWS LOCATION. FURTHER DISTRIBUTION OF UPS SUPPLY (FOR HMI, NETWORK SWITCH ETC.) ALONG WITH UPS DB SHALL BE IN THE SCOPE OF BIDDER.
B.5	FOR TESTING AND ERECTION & COMMISSIONING CHARGES FOR HMI- ITEMS, KINDLY REFER S.No.5 OF ANNEXURE-E
B1.1	REFER ANNEXURE- 3_TENTATIVE SWITCHBOARD LOCATION DETAIL FOR DISTANCE BETWEEN SWITCHGEAR AND NETWORK LEVEL ETHERNET SWITCH IN MAIN CONTROL ROOM.
B1.2	REFER ANNEXURE- 1_TYPICAL SWITCHGEAR RELAY NETWORK ARCHITECTURE FOR HMI REQUIREMENT.
B1.3	BIDDER TO PROVIDE ONE NO. OF EACH TYPE OF IMCC MODULE ALONG WITH Y-LINK TO BHEL ON RETURNABLE BASIS & COORDINATE WITH BHEL FOR CONDUCTING FAT FOR IMCC AS PER CUSTOMER SATISFACTION.
B3.1	REFER ANNEXURE- 3_TENTATIVE SWITCHBOARD LOCATION DETAIL FOR DISTANCE BETWEEN SWITCHGEAR AND MAIN CONTROL ROOM.
C.1	BIDDER HAS TO QUOTE FOR TOOLS AND TACKLES MENTIONED ABOVE. HOWEVER, BIDDER HAS TO INDICATE ANY SPECIAL TOOLS (IF REQUIRED).
D.1	AMOUNT PAYABLE FOR SKILLED TECHNICIAN PER VISIT TO SITE = VISIT CHARGES AS PER SL. NO. D(1) ABOVE + [DAILY CHARGES AS PER SL. NO. D(2) ABOVE X NO. OF DAYS AT SITE] (TO BE CERTIFIED BY BHEL SITE)
D.2	AMOUNT PAYABLE FOR SERVICE ENGINEER PER VISIT TO SITE = VISIT CHARGES AS PER SL. NO. D(3) ABOVE + [DAILY CHARGES AS PER SL. NO. D (4) ABOVE X NO. OF DAYS AT SITE] (TO BE CERTIFIED BY BHEL SITE)
D.3	AMOUNT PAYABLE FOR SITE MODIFICATION MATERIAL SHALL BE BASED ON THE ACTUAL COST OF THE MATERIALS UTILIZED. (TO BE CERTIFIED BY BHEL SITE). THE COST OF THE ACTUAL MATERIALS USED WILL BE DETERMINED USING THE UNIT RATE PROVIDED BY THE BIDDER IN THE ANNEXURE-H.
D.4	FOR LINE ITEMS D (1 TO 5), BIDDER TO DEPUTE ITS MANPOWER WITHIN 15 DAYS FROM THE DATE OF INTIMATION BY BHEL.

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ANNEXURE-E

NUMERICAL RELAY, IMCC, ENERGY METERS, WIRELESS TEMPERATURE MONITORING & HMI SYSTEMS - COMMISSIONING CHARGES

S. No.	ITEM NO.	Item Description	Quantity	Unit	Unit Price (Ex- Works) Rs.	Total Price (Ex- Works) Rs.	Remarks
1	506-0110403-00-C	LUMP SUM ALL INCLUSIVE CHARGES PER NUMERICAL RELAY COMMISSIONING (INCLUDING CONVEYANCE TO SITE, BOARDING AND LODGING)	350	NOS.			
2	506-0110404-00-C	LUMP SUM ALL INCLUSIVE CHARGES PER IMC COMMISSIONING (INCLUDING CONVEYANCE TO SITE, BOARDING AND LODGING)	2500	NOS.			
3	506-0110405-00-C	LUMP SUM ALL INCLUSIVE CHARGES FOR WIRELESS TEMPERATURE MONITORING SYSTEM COMMISSIONING. FOR TWO LOT OF SWITCHBOARDS- a. FIRST LOT- 3DA, 3DB & 3DG SWITCHBOARDS b. SECOND LOT- 4DA, 4DB & 4DG SWITCHBOARDS	2	NOS.			1 NO. CONSISTS OF 3 SWITCHBOARD
4	506-0111083-00-C	LUMP SUM ALL INCLUSIVE CHARGES PER ENERGY METER COMMISSIONING (INCLUDING CONVEYANCE TO SITE, BOARDING AND LODGING)	350	NOS.			
5	506-0110407-00-C	TESTING AND ERECTION & COMMISSIONING CHARGES FOR HMI ITEMS AT SL. NO. B1 TO B4 (HMI SYSTEM)	4	NOS.			1 NO. SHALL CONSIST OF TESTING AND ERECTION & COMMISSIONING OF ONE ITEM EACH OF SL. NO. B1 TO B4 (HMI SYSTEM)
					TOTAL =		

NOTES:

1	AMOUNT PAYABLE FOR NUMERICAL RELAY COMMISSIONING = UNIT PRICE FOR COMMISSIONING CHARGES AS PER SL.NO.1 ABOVE x NO. OF RELAYS COMMISSIONED (SAME TO BE CERTIFIED BY BHEL SITE).
2	AMOUNT PAYABLE FOR IMCC COMMISSIONING = UNIT PRICE FOR COMMISSIONING CHARGES AS PER SL.NO.2 ABOVE x NO. OF IMCC COMMISSIONED (SAME TO BE CERTIFIED BY BHEL SITE).
3	AMOUNT PAYABLE FOR WIRELESS TEMPERATURE MONITORING SYSTEM COMMISSIONING FOR EACH UNIT (BMCC, TMCC and EMCC) = UNIT PRICE FOR COMMISSIONING CHARGES AS PER SL.NO.3 ABOVE (SAME TO BE CERTIFIED BY BHEL SITE).
4	FOR LINE ITEM 3, TESTING AND COMMISSIONING OF WIRELESS TEMPERATURE MONITORING SYSTEM FOR BMCC(3DA), TMCC (3DB) and EMCC(3DG) IS CONSIDERED AS 1 NO.SIMILARLY 3 BOARDS OF ANOTHER UNIT CONSIDERED AS 2ND NO.
5	AMOUNT PAYABLE FOR ENERGY METER COMMISSIONING = UNIT PRICE FOR COMMISSIONING CHARGES AS PER SL.NO.4 ABOVE x NO. OF ENERGY METERS COMMISSIONED (SAME TO BE CERTIFIED BY BHEL SITE).
6	APPROXIMATELY 15 NOS. OF NUMERICAL RELAYS, 15 NOS. OF ENERGY METERS AND/OR 50 NOS. OF IMCS CAN BE CONSIDERED BY BIDDER FOR COMMISSIONING IN EACH VISIT.
7	FOR LINE ITEM 1, 2, 3,4 BIDDER TO NOTE THAT TESTING, CONFIGURATION AND NETWORKING SETUP OF RELAY, IMC, ENERGY METERING SYSTEM, & TEMPERATURE MONITORING SYSTEM SHALL BE THE BIDDER'S RESPONSIBILITY COMPLETELY.
8	FOR LINE ITEM 5, BIDDER TO NOTE THAT ERECTION & COMMISSIONING, TESTING, CONFIGURATION AND NETWORKING SETUP OF HMI SYSTEM SHALL BE THE BIDDER'S RESPONSIBILITY COMPLETELY.
9	BIDDER TO COORDINATE WITH DCS SUPPLIER (BHEL EDN) TO ENSURE SMOOTH AND EFFECTIVE COMMUNICATION BETWEEN NUMERICAL RELAY/ Y-LINK, ENERGY METERS AND DCS, AS WELL AS BETWEEN TEMPERATURE MONITORING SYSTEM AND DCS/HMI.
10	FOR LINE ITEMS 1 TO 5, BIDDER TO DEPUTE ITS MANPOWER WITHIN 15 DAYS FROM THE DATE OF INTIMATION BY BHEL.

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ANNEXURE-F

E&C SPARES

S. No.	ITEM NO.	Item / Component	Unit	Quantity	Unit Price (Ex-Works) Rs.	Total Price (Ex- Works) Rs.
1		FACTORY BUILT ASSEMBLIES (PCC/MCC/DB)				
1.1	506-0110990-00-G	Busbar supports (Horizontal)(1 set of 3)	Nos.	1		
1.2	506-0110991-00-G	Primary isolating contacts (Bus side) of each rating(1 set of 3)	Nos.	1		
1.3	506-0110992-00-G	Primary isolating contacts (Load side) of each rating (1 set of 3)	Nos.	1		
1.4	506-0110993-00-G	Secondary isolating contacts of each rating (1 set of 3)	Nos.	1		
1.5	506-0110994-00-G	Gaskets (each size)	Meter	10		
1.6	506-0110995-00-G	Fixed Terminal (1way)	Nos.	20		
1.7	506-0110996-00-G	Shrouds (for outgoing modules)	Nos.	one for each physical size of module		
1.8		Wire (for secondary wiring)				
a.	506-0110997-00-G	2.5 mm ²	Metres	100		
b.	506-0110998-00-G	1.5mm ²	Metres	100		
1.9	506-0111021-00-G	Lugs (for 2.5 mm ² secondary wiring)	Nos.	100		
1.10	506-0110999-00-G	Lugs (for 1.5 mm ² secondary wiring)	Nos.	100		
2		AIR CIRCUIT BREAKER (FOR EACH RATING)				
2.1	506-0111000-00-G	Shunt trip coil	Nos.	5		
2.2	506-0111001-00-G	spring charging motor	Nos.	1 motor of each rating		
2.3	506-0111002-00-G	closing coil	Nos.	5		
2.4	506-0111003-00-G	Auxiliary contact/ switch	Nos.	1		
3		ISOLATING SWITCH				
3.1	506-0111004-00-G	Main contact kit for each rating (1 set of 3)	Nos.	1		
4		POWER CONTACTORS				
4.1	506-0111005-00-G	Contactor coil of each rating	Nos.	1		
4.2	506-0111006-00-G	Contacts kit (main) for each rating (1 set of 3)	Nos.	1		

5		AUXILIARY CONTACTORS				
5.1	506-0111007-00-G	Complete unit with 2NO + 2NC contacts	Nos.	1 no. of each rating/type		
5.2		Contactor coils				
a.	506-0111008-00-G	AC for each Aux. contactor rating	Nos.	1		
b.	506-0111009-00-G	DC for each Aux. contactor rating	Nos.	1		
6	506-0111010-00-G	MCCB	Nos.	1 no. of each rating/type		
7	506-0111011-00-G	MPCB	Nos.	1 no. of each rating/type		
8	506-0111012-00-G	MCB	Nos.	1 no. of each rating/type		
7		PUSH BUTTONS				
6.1	506-0111013-00-G	Actuator contacts	Nos.	5		
6.2	506-0111014-00-G	Element	Nos.	5		
8		INDICATING LAMPS				
8.1	506-0111015-00-G	Complete unit	Nos.	10		
8.2	506-0111016-00-G	Lens (assorted)	Nos.	10		
9		OTHERS				
9.1	506-0111017-00-G	Selector & control switch (each type)	Nos.	1		
9.2	506-0111018-00-G	Connecting cable between CT and IMCC of appropriate length	Nos.	50		
9.3	506-0111019-00-G	Connecting cable between VT and IMCC of appropriate length	Nos.	50		
9.4	506-0111020-00-G	IMC Display HMI cable of Appropriate length	Nos.	50		
					TOTAL =	

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ANNEXURE-G
MANDATORY SPARES

S.no.	ITEM NO.	Item Description	Unit	Quantity	Unit Price Rs.	Total Price Rs.
1	506-0111064-00-B	Complete breaker of each rating	Nos.	10		
2	506-0111065-00-B	Numerical Relays of each type	Nos.	5		
3	506-0111066-00-B	Auxiliary Relays of each type	Nos.	10		
4	506-0111067-00-B	Horizontal busbar support Insulators of each type	Nos.	12		
5	506-0111068-00-B	Vertical busbar dropper support insulators of each type	Nos.	12		
6	506-0111069-00-B	Current transformer of each type & ratio	Nos.	3		
7	506-0111070-00-B	Voltage transformer of each type & ratio	Nos.	3		
8	506-0111071-00-B	Control supply transformer of each type & rating	Nos.	3		
9	506-0111072-00-B	Power Contactor of each type and rating	Nos.	10		
10	506-0111073-00-B	Coil for above contactor for each type and rating	Nos.	10		
11	506-0111074-00-B	MCCBs (equally divided for all ratings)	Nos.	40		
12	506-0111075-00-B	MPCBs (equally divided for all ratings)	Nos.	40		
13	506-0111076-00-B	Closing coil of each type of each rating	Nos.	10		
14	506-0111077-00-B	Trip coil of each type of each rating	Nos.	10		
15	506-0111078-00-B	Aux contact set of each type and Rating	Sets.	6		
16	506-0111079-00-B	Fixed contact set of each type & rating	Sets.	3		
17	506-0111080-00-B	Moving contact set of each type & rating	Sets.	3		
18	506-0111081-00-B	Maintenance tools and accessories for maintenance of LT MCC	Nos.	2		
					TOTAL =	

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ANNEXURE-H
MODULE UNIT PRICE

S.No.	Item Description	Quantity	Unit Price (INR)	Remarks
1	INCOMING FEEDER UNIT			
a)	ACB Incomer to PCC/PMCC from Trafo. - Module Type DAET (I/C)			
	1000A	1		
	1600A	1		
	2000A	1		
	2500A	1		
	3000A	1		
	4000A	1		
b)	ACB Incomer to MCC - Module Type DAE (I/C)			
	630A	1		
	800A	1		
	1000A	1		
	1250A	1		
	1600A	1		
	2000A	1		
	2500A	1		
	3000A	1		
	4000A	1		
c)	ACB Incomer to Emergency Board - Module Type DG(I/C)			
	800A	1		
	1000A	1		
	1250A	1		
	1600A	1		
	2000A	1		
	2500A	1		
	3000A	1		
	4000A	1		
d)	MCCB Incomer for MCC / ACDB – Module Type E3 (I/C)			
	63A – Fixed Type	1		
	125A – Fixed Type	1		
	160A – Fixed Type	1		
	200A – Fixed Type	1		
	250A – Fixed Type	1		
	300A – Fixed Type	1		
	400A – Fixed Type	1		
	63A – Drawout Type	1		
	125A – Drawout Type	1		
	160A – Drawout Type	1		
	200A – Drawout Type	1		
	250A – Drawout Type	1		
	300A – Drawout Type	1		
	400A – Drawout Type	1		
e)	MCCB Incomer with contactor changeover – Module Type CC			
	16A – Fixed Type	1		
	32A – Fixed Type	1		
	63A – Fixed Type	1		
	125A – Fixed Type	1		
	200A – Fixed Type	1		
	250A – Fixed Type	1		
	300A – Fixed Type	1		
	400A – Fixed Type	1		
	16A – Drawout Type	1		
	32A – Drawout Type	1		
	63A – Drawout Type	1		
	125A – Drawout Type	1		
	200A – Drawout Type	1		
	250A – Drawout Type	1		
	300A – Drawout Type	1		
	400A – Drawout Type	1		

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ANNEXURE-H
MODULE UNIT PRICE

f)	220V DCDB Incomer from charger - Module type CH (I/C)			
	50A – CH Fixed Type	1		
	100A – CH Fixed Type	1		
	125A – CH Fixed Type	1		
	150A – CH Fixed Type	1		
	200A – CH Fixed Type	1		
	300A – CH Fixed Type	1		
	400A – CH Fixed Type	1		
	450A – CH Fixed Type	1		
	500A – CH Fixed Type	1		
	630A – CH Fixed Type	1		
	800A – CH Fixed Type	1		
	1000A – CH Fixed Type	1		
	1250A – CH Fixed Type	1		
	1600A – CH Fixed Type	1		
	50A – CH Drawout Type	1		
	100A – CH Drawout Type	1		
	125A – CH Drawout Type	1		
	150A – CH Drawout Type	1		
	200A – CH Drawout Type	1		
	300A – CH Drawout Type	1		
	400A – CH Drawout Type	1		
	450A – CH Drawout Type	1		
	500A – CH Drawout Type	1		
	630A – CH Drawout Type	1		
	800A – CH Drawout Type	1		
	1000A – CH Drawout Type	1		
	1250A – CH Drawout Type	1		
	1600A – CH Drawout Type	1		
g)	220V DCDB Incomer from battery - Module type DB (I/C)			
	50A – DB Fixed Type	1		
	100A – DB Fixed Type	1		
	125A – DB Fixed Type	1		
	150A – DB Fixed Type	1		
	200A – DB Fixed Type	1		
	300A – DB Fixed Type	1		
	400A – DB Fixed Type	1		
	450A – DB Fixed Type	1		
	500A – DB Fixed Type	1		
	630A – DB Fixed Type	1		
	800A – DB Fixed Type	1		
	1000A – DB Fixed Type	1		
	1250A – DB Fixed Type	1		
	1600A – DB Fixed Type	1		
	50A – DB Drawout Type	1		
	100A – DB Drawout Type	1		
	125A – DB Drawout Type	1		
	150A – DB Drawout Type	1		
	200A – DB Drawout Type	1		
	300A – DB Drawout Type	1		
	400A – DB Drawout Type	1		
	450A – DB Drawout Type	1		
	500A – DB Drawout Type	1		
	630A – DB Drawout Type	1		
	800A – DB Drawout Type	1		
	1000A – DB Drawout Type	1		
	1250A – DB Drawout Type	1		
	1600A – DB Drawout Type	1		
2	BUSCOUPLER UNIT			

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ANNEXURE-H
MODULE UNIT PRICE

a)	ACB Buscoupler to PCC/PMCC/MCC - Module Type DAET/ DAE (B/C)			
	630A	1		
	800A	1		
	1000A	1		
	1250A	1		
	1600A	1		
	2000A	1		
	2500A	1		
	3000A	1		
	4000A	1		
b)	MCCB Buscoupler for MCC / ACDB – Module Type E3 (B/C)			
	63A – Fixed Type	1		
	125A – Fixed Type	1		
	160A – Fixed Type	1		
	200A – Fixed Type	1		
	250A – Fixed Type	1		
	300A – Fixed Type	1		
	400A – Fixed Type	1		
	63A – Drawout Type	1		
	125A – Drawout Type	1		
	160A – Drawout Type	1		
	200A – Drawout Type	1		
	250A – Drawout Type	1		
	300A – Drawout Type	1		
	400A – Drawout Type	1		
c)	220V DCDB buscoupler - Module Type - DC			
	50A – DC Fixed Type	1		
	100A – DC Fixed Type	1		
	125A – DC Fixed Type	1		
	150A – DC Fixed Type	1		
	200A – DC Fixed Type	1		
	300A – DC Fixed Type	1		
	400A – DC Fixed Type	1		
	450A – DC Fixed Type	1		
	500A – DC Fixed Type	1		
	630A – DC Fixed Type	1		
	800A – DC Fixed Type	1		
	1000A – DC Fixed Type	1		
	1250A – DC Fixed Type	1		
	1600A – DC Fixed Type	1		
	50A – DC Drawout Type	1		
	100A – DC Drawout Type	1		
	125A – DC Drawout Type	1		
	150A – DC Drawout Type	1		
	200A – DC Drawout Type	1		
	300A – DC Drawout Type	1		
	400A – DC Drawout Type	1		
	450A – DC Drawout Type	1		
	500A – DC Drawout Type	1		
	630A – DC Drawout Type	1		
	800A – DC Drawout Type	1		
	1000A – DC Drawout Type	1		
	1250A – DC Drawout Type	1		
	1600A – DC Drawout Type	1		
d)	220V DCDB TIE - Module Type - HD			
	50A – HD Fixed Type	1		
	100A – HD Fixed Type	1		
	125A – HD Fixed Type	1		
	150A – HD Fixed Type	1		
	200A – HD Fixed Type	1		

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ANNEXURE-H
MODULE UNIT PRICE

	300A – HD Fixed Type	1		
	400A – HD Fixed Type	1		
	450A – HD Fixed Type	1		
	500A – HD Fixed Type	1		
	630A – HD Fixed Type	1		
	800A – HD Fixed Type	1		
	1000A – HD Fixed Type	1		
	1250A – HD Fixed Type	1		
	1600A – HD Fixed Type	1		
	50A – HD Drawout Type	1		
	100A – HD Drawout Type	1		
	125A – HD Drawout Type	1		
	150A – HD Drawout Type	1		
	200A – HD Drawout Type	1		
	300A – HD Drawout Type	1		
	400A – HD Drawout Type	1		
	450A – HD Drawout Type	1		
	500A – HD Drawout Type	1		
	630A – HD Drawout Type	1		
	800A – HD Drawout Type	1		
	1000A – HD Drawout Type	1		
	1250A – HD Drawout Type	1		
	1600A – HD Drawout Type	1		
3	ACB outgoing supply feeder - Module Type DAE (O/G)/DAE-TIE			
	630A	1		
	800A	1		
	1000A	1		
	1250A	1		
	1600A	1		
	2000A	1		
	2500A	1		
	3000A	1		
	4000A	1		
4	ACB outgoing motor feeder - Module Type DM/PM/AM (controlled from DDCMIS/PLC/ATRS)			
	90- 200KW	1		
5	MCCB outgoing supply feeders			
a)	Module Type E3(O/G)			
	16A - Fixed type	1		
	32A - Fixed type	1		
	63A - Fixed type	1		
	100A - Fixed type	1		
	125A - Fixed type	1		
	160A - Fixed type	1		
	200A - Fixed type	1		
	250A - Fixed type	1		
	300A - Fixed type	1		
	400A - Fixed type	1		
	16A - Drawout Type	1		
	32A - Drawout Type	1		
	63A - Drawout Type	1		
	100A - Drawout Type	1		
	125A - Drawout Type	1		
	160A - Drawout Type	1		
	200A - Drawout Type	1		
	250A - Drawout Type	1		
	300A - Drawout Type	1		
	400A - Drawout Type	1		
b)	Module Type E3-TP (O/G)			
	16A - Fixed type	1		
	32A - Fixed type	1		
	63A - Fixed type	1		

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ANNEXURE-H
MODULE UNIT PRICE

	100A - Fixed type	1		
	125A - Fixed type	1		
	160A - Fixed type	1		
	200A - Fixed type	1		
	250A - Fixed type	1		
	300A - Fixed type	1		
	400A - Fixed type	1		
	16A - Drawout Type	1		
	32A - Drawout Type	1		
	63A - Drawout Type	1		
	100A - Drawout Type	1		
	125A - Drawout Type	1		
	160A - Drawout Type	1		
	200A - Drawout Type	1		
	250A - Drawout Type	1		
	300A - Drawout Type	1		
	400A - Drawout Type	1		
c)	Module Type ES3 (O/G)			
	63A - Fixed type	1		
	100A - Fixed type	1		
	125A - Fixed type	1		
	160A - Fixed type	1		
	200A - Fixed type	1		
	250A - Fixed type	1		
	400A - Fixed type	1		
	63A - Drawout Type	1		
	100A - Drawout Type	1		
	125A - Drawout Type	1		
	160A - Drawout Type	1		
	200A - Drawout Type	1		
	250A - Drawout Type	1		
	400A - Drawout Type	1		
d)	2-ph feeder Module Type E2(O/G)			
	100A - Fixed type	1		
	160A - Fixed type	1		
	200A - Fixed type	1		
	250A - Fixed type	1		
	300A - Fixed type	1		
	400A - Fixed type	1		
	100A - Drawout Type	1		
	160A - Drawout Type	1		
	200A - Drawout Type	1		
	250A - Drawout Type	1		
	300A - Drawout Type	1		
	400A - Drawout Type	1		
e)	Double pole 1-ph feeder Module Type E1(O/G)			
	16A - Fixed type	1		
	32A - Fixed type	1		
	63A - Fixed type	1		
	100A - Fixed type	1		
	125A - Fixed type	1		
	16A - Drawout Type	1		
	32A - Drawout Type	1		
	63A - Drawout Type	1		
	100A - Drawout Type	1		
	125A - Drawout Type	1		
f)	3-Ph MCCB controlled outgoing contactor feeder with IMC Module Type EA3(O/G)			
	16A - Fixed type	1		
	32A - Fixed type	1		
	63A - Fixed type	1		
	100A - Fixed type	1		
	125A - Fixed type	1		
	200A - Fixed type	1		
	250A - Fixed type	1		

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MODULE UNIT PRICE

	400A - Fixed type	1		
	16A - Drawout Type	1		
	32A - Drawout Type	1		
	63A - Drawout Type	1		
	100A - Drawout Type	1		
	125A - Drawout Type	1		
	200A - Drawout Type	1		
	250A - Drawout Type	1		
	400A - Drawout Type	1		
g)	3-Ph MCCB controlled outgoing contactor feeder with IMC Module Type EA3-H (O/G)			
	16A - Fixed type	1		
	32A - Fixed type	1		
	63A - Fixed type	1		
	100A - Fixed type	1		
	125A - Fixed type	1		
	200A - Fixed type	1		
	250A - Fixed type	1		
	400A - Fixed type	1		
	16A - Drawout Type	1		
	32A - Drawout Type	1		
	63A - Drawout Type	1		
	100A - Drawout Type	1		
	125A - Drawout Type	1		
	200A - Drawout Type	1		
	250A - Drawout Type	1		
	400A - Drawout Type	1		
h)	3-Ph MCCB controlled outgoing contactor feeder without IMC Module Type ET3(O/G)			
	16A - Fixed type	1		
	32A - Fixed type	1		
	63A - Fixed type	1		
	100A - Fixed type	1		
	125A - Fixed type	1		
	200A - Fixed type	1		
	250A - Fixed type	1		
	400A - Fixed type	1		
	16A - Drawout Type	1		
	32A - Drawout Type	1		
	63A - Drawout Type	1		
	100A - Drawout Type	1		
	125A - Drawout Type	1		
	200A - Drawout Type	1		
	250A - Drawout Type	1		
	400A - Drawout Type	1		
i)	1-Ph MCCB controlled outgoing contactor feeder Module Type EA1(O/G)			
	16A - Fixed type	1		
	32A - Fixed type	1		
	63A - Fixed type	1		
	16A - Drawout Type	1		
	32A - Drawout Type	1		
	63A - Drawout Type	1		
j)	220V DC Outgoing MCCB Type (X) Feeder			
	16A - Fixed type	1		
	32A - Fixed type	1		
	63A - Fixed type	1		
	100A - Fixed type	1		
	125A - Fixed type	1		
	200A - Fixed type	1		
	250A - Fixed type	1		
	300A - Fixed type	1		
	400A - Fixed type	1		
	600A - Fixed type	1		
	800A - Fixed type	1		

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ANNEXURE-H
MODULE UNIT PRICE

	16A - Drawout Type	1		
	32A - Drawout Type	1		
	63A - Drawout Type	1		
	100A - Drawout Type	1		
	125A - Drawout Type	1		
	200A - Drawout Type	1		
	250A - Drawout Type	1		
	300A - Drawout Type	1		
	400A - Drawout Type	1		
	600A - Drawout Type	1		
	800A - Drawout Type	1		
6	DOL Motor Starter - Unidirectional Drive - Drawout Type			
a)	Module Type DK2 / PK2 / AK2 (controlled from DDCMIS/PLC/ATRS)			
	Upto 5.5KW	1		
	5.6 - 7.0KW	1		
	7.1 - 13KW	1		
	13.1 - 24KW	1		
	24.1 - 29.9KW	1		
b)	Module Type DK2-H / PK2-H / AK2-H (Hardwired- controlled from DDCMIS/PLC/ATRS)			
	Upto 5.5KW	1		
	5.6 - 7.0KW	1		
	7.1 - 13KW	1		
	13.1 - 24KW	1		
	24.1 - 29.9KW	1		
c)	Module Type DK21 / PK21 / AK21 (controlled from DDCMIS/PLC/ATRS)			
	30.0 - 37.0KW	1		
	37.1 - 55KW	1		
	55.1 - 80.0KW	1		
	80.1 - 89.9KW	1		
d)	Module Type DK21-H / PK21-H / AK21-H (Hardwired-controlled from DDCMIS/PLC/ATRS)			
	30.0 - 37.0KW	1		
	37.1 - 55KW	1		
	55.1 - 80.0KW	1		
	80.1 - 89.9KW	1		
e)	Module Type DK2E/PK2E/AK2E (Reacceleration) (controlled from DDCMIS/PLC/ATRS)			
	Upto 5.5KW	1		
	5.6 - 7.0KW	1		
	7.1 - 13KW	1		
	13.1 - 24KW	1		
	24.1 - 29.9KW	1		
f)	Module Type DK2E-H/PK2E-H/AK2E-H (Reacceleration) (Hardwired-controlled from DDCMIS/PLC/ATRS)			
	Upto 5.5KW	1		
	5.6 - 7.0KW	1		
	7.1 - 13KW	1		
	13.1 - 24KW	1		
	24.1 - 29.9KW	1		
g)	Module Type DK21E/PK21E/AK21E (Reacceleration) (controlled from DDCMIS/PLC/ATRS)			
	30.0 - 37.0KW	1		
	37.1 - 55KW	1		
	55.1 - 80.0KW	1		
	80.1 - 89.9KW	1		
h)	Module Type DK21E-H/PK21E-H/AK21E-H (Reacceleration) (Hardwired-controlled from DDCMIS/PLC/ATRS)			
	30.0 - 37.0KW	1		
	37.1 - 55KW	1		

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MODULE UNIT PRICE

	55.1 - 80.0KW	1		
	80.1 - 89.9KW	1		
i)	Module Type K2 (Controlled from LCP)			
	Upto 5.5KW	1		
	5.6 - 7.0KW	1		
	7.1 - 13KW	1		
	13.1 - 24KW	1		
	24.1 - 29.9KW	1		
j)	Module Type K21 (Controlled from LCP)			
	30.0 - 37.0KW	1		
	37.1 - 55KW	1		
	55.1 - 80.0KW	1		
	80.1 - 89.9KW	1		
k)	Module Type K3 (Controlled from LPBS)			
	Upto 5.5KW	1		
	5.6 - 7.0KW	1		
	7.1 - 13KW	1		
	13.1 - 24KW	1		
	24.1 - 29.9KW	1		
l)	Module Type K31 (Controlled from LPBS)			
	30.0 - 37.0KW	1		
	37.1 - 55KW	1		
	55.1 - 80.0KW	1		
	80.1 - 89.9KW	1		
7	RDOL Motor Starter - Bidirectional Drive - Drawout Type			
a)	Module Type DN1/ PN1/ AN1 (controlled from DDCMS/PLC/ATRS)			
	Upto 5.5KW	1		
	5.6 - 7.0KW	1		
	7.1 - 13KW	1		
	13.1 - 24KW	1		
	24.1 - 29.9KW	1		
	30.0 - 37.0KW	1		
	37.1 - 55KW	1		
	55.1 - 80.0KW	1		
	80.1 - 89.9KW	1		
8.1	Rapping Motor (RM1) Module with IMC	1		
8.2	Rapping Motor (RM2) Module with OLR	1		
9	DUST DENSITY MONITOR (DDM) Module	1		
10	HOPPER HEATER (HH) Module	1		
11	SUPPORT INSULATOR HEATER (HI) Module	1		
12	SHAFT INSULATOR HEATER (HS) Module	1		
13	Ash Level Indicator (ALI) Module	1		
14	ARECA MARSHALING (ARECA) Module	1		
15	WAVE LEVEL TRANSMITTER (WLT) Module	1		
16	MARSHALING MODULE FOR SSPB OF RAPPING MOTOR AND HOPPER HEATER FEEDBACK (MM)	1		
17	WALL BLOWER Module	1		
18	LR BLOWER Module	1		
19	AH BLOWER Module	1		
20	JAMMING RELAY Module	1		
21	Wireless Temperature Sensor (WTS1) Module (In one ACB/PCC panel with single ACB)	1		
22	Wireless Temperature Sensor (WTS2) Module (In one ACB panel with double ACB)	1		
23	Wireless Temperature Sensor (WTS3) Module (In one Double front MCC panel)	1		
24	Common Auxiliary Module			

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ANNEXURE-H
MODULE UNIT PRICE

a)	PT module			
i)	Bus PT module for PCC/PMCC - G1 Type	1		
ii)	Bus PT module for Emergency MCC - G2 Type	1		
iii)	Bus PT module for MCC/ACDB - VM Type	1		
iv)	Bus PT DCDB - S Type	1		
b.1)	110V AC control supply module – Type CS (consisting of 415/110V control Trafo.)			
	1KVA	1		
	2KVA	1		
	2.5KVA	1		
	3KVA	1		
	5KVA	1		
	7.5KVA	1		
	10KVA	1		
b.2)	240 V AC control supply module – type CS (consisting of 415/240V control Trafo.)			
	1KVA	1		
	2KVA	1		
	2.5KVA	1		
	3KVA	1		
	5KVA	1		
	7.5KVA	1		
	10KVA	1		
b.3)	24V AC control supply module – Type CS (consisting of 415/24V control Trafo.)			
	250VA	1		
	500VA	1		
	1KVA	1		
	2KVA	1		
	2.5KVA	1		
	3KVA	1		
	5KVA	1		
	7.5KVA	1		
	10KVA	1		
c)	240V AC motor space heater module	1		
d)	220V DC supply module (for receiving 220V DC supply)	1		
e)	24V DC supply module	1		
f)	Alarm module	1		
g)	240 V AC Panel Space heating supply module – type SH (consisting of 415/240V control Trafo.)			
	1KVA	1		
	2KVA	1		
	2.5KVA	1		
	3KVA	1		
	5KVA	1		
	7.5KVA	1		
	10KVA	1		
h)	240V AC SPACE HEATER SUPPLY MODULE- SHS	1		
25	Empty Panel with Horizontal & Vertical Busbar, Support & Auxiliary Busbar (4 Wire System)			
a)	PCC Panel (Single Front Drawout Type) Without Temperature Sensor			
	630 / 630A	1		
	1000 / 1000A	1		
	1250 / 1250A	1		
	1600 / 1600A	1		
	2000 / 2000A	1		
	2500 / 2500A	1		
	3000 / 3000A	1		
	4000 / 4000A	1		
b)	MCC Panel (Single Front Fixed Type)			
	63 / 63A	1		
	250 / 250A	1		
	400 / 400A	1		
	630 / 630A	1		

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ANNEXURE-H
MODULE UNIT PRICE

	800 / 630A	1		
	1000 / 630A	1		
	1250 / 630A	1		
	1600 / 630A	1		
	2000 / 630A	1		
	2500 / 630A	1		
	3000 / 630A	1		
	4000 / 630A	1		
c)	MCC Panel (Single Front Drawout Type)			
	63 / 63A	1		
	250 / 250A	1		
	400 / 400A	1		
	630 / 630A	1		
	800 / 630A	1		
	1000 / 630A	1		
	1250 / 630A	1		
	1600 / 630A	1		
	2000 / 630A	1		
	2500 / 630A	1		
	3000 / 630A	1		
	4000 / 630A	1		
d)	MCC Panel (Double Front Drawout Type)			
	63 / 63A	1		
	250 / 250A	1		
	400 / 400A	1		
	630 / 630A	1		
	800 / 630A	1		
	1000 / 630A	1		
	1250 / 630A	1		
	1600 / 630A	1		
	2000 / 630A	1		
	2500 / 630A	1		
	3000 / 630A	1		
	4000 / 630A	1		
e)	ACDB Panel (Double Front Fixed Type)			
	250 / 250A	1		
	400 / 400A	1		
	630 / 250A	1		
	630 / 630A	1		
f)	220V DCDB Panel (Single Front Fixed type) with 20kA, 1 second fault Level			
	UPTO 125A (with 125A VBB)	1		
	UPTO 630A (with 630A VBB)	1		
	1000A (with 630A VBB)	1		
	1600A (with 630A VBB)	1		
g)	220V DCDB Panel (Single Front Fixed type) with 40kA, 1 second fault Level			
	UPTO 125A (with 125A VBB)	1		
	UPTO 630A (with 630A VBB)	1		
	1000A (with 630A VBB)	1		
	1600A (with 630A VBB)	1		
h)	220V DCDB Panel (Double Front Fixed type) with 20kA, 1 second fault Level			
	UPTO 125A (with 125A VBB)	1		
	UPTO 630A (with 630A VBB)	1		
	1000A (with 630A VBB)	1		
	1250A (with 630A VBB)	1		
	1600A (with 630A VBB)	1		
i)	220V DCDB Panel (Double Front Fixed type) with 40kA, 1 second fault Level			
	UPTO 125A (with 125A VBB)	1		
	UPTO 630A (with 630A VBB)	1		
	1000A (with 630A VBB)	1		
	1250A (with 630A VBB)	1		
	1600A (with 630A VBB)	1		

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MODULE UNIT PRICE

j)	48V DCDB Panel (Single Front Fixed type)			
	UPTO 125A (with 125A VBB)	1		
	UPTO 200A (with 200A VBB)	1		
	UPTO 630A (with 630A VBB)	1		
k)	48V DCDB Panel (Double Front Fixed type)			
	UPTO 125A (with 125A VBB)	1		
	UPTO 200A (with 200A VBB)	1		
	UPTO 630A (with 630A VBB)	1		
l)	Empty ACB Panel with Horizontal & Vertical Busbar, Support & Auxiliary Busbar			
	630 / 630A	1		
	800 / 630A	1		
	800 / 800A	1		
	1000 / 630A	1		
	1000 / 800A	1		
	1000 / 1000A	1		
	1250 / 630A	1		
	1250 / 800A	1		
	1250 / 1000A	1		
	1250 / 1250A	1		
	1600 / 630A	1		
	1600 / 800A	1		
	1600 / 1000A	1		
	1600 / 1250A	1		
	1600 / 1600A	1		
	2000 / 630A	1		
	2000 / 800A	1		
	2000 / 1000A	1		
	2000 / 1250A	1		
	2000 / 1600A	1		
	2000 / 2000A	1		
	2500 / 630A	1		
	2500 / 800A	1		
	2500 / 1000A	1		
	2500 / 1250A	1		
	2500 / 1600A	1		
	2500 / 2000A	1		
	2500 / 2500A	1		
	3000 / 630A	1		
	3000 / 800A	1		
	3000 / 1000A	1		
	3000 / 1250A	1		
	3000 / 1600A	1		
	3000 / 2000A	1		
	3000 / 2500A	1		
	3000 / 3000A	1		
	4000 / 630A	1		
	4000 / 800A	1		
	4000 / 1000A	1		
	4000 / 1250A	1		
	4000 / 1600A	1		
	4000 / 2000A	1		
	4000 / 2500A	1		
	4000 / 3000A	1		
	4000 / 4000A	1		
26	Empty Panel with Horizontal & Vertical Busbar, Support & Auxiliary Busbar (3 Wire System)			
a)	PCC Panel (Single Front Drawout Type) Without Temperature Sensor			
	2000 / 2000A	1		
	3000 / 3000A	1		
b)	MCC Panel (Double Front Drawout Type)			

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ANNEXURE-H
MODULE UNIT PRICE

	2000 / 630A	1		
	3000 / 630A	1		
c)	ACDB Panel (Double Front Fixed Type)			
	250 / 250A	1		
	400 / 400A	1		
d)	Empty ACB Panel with Horizontal & Vertical Busbar, Support & Auxiliary Busbar			
	2000 / 630A	1		
	2000 / 800A	1		
	2000 / 1000A	1		
	2000 / 1250A	1		
	2000 / 1600A	1		
	2000 / 2000A	1		
	3000 / 630A	1		
	3000 / 800A	1		
	3000 / 1000A	1		
	3000 / 1250A	1		
	3000 / 1600A	1		
	3000 / 2000A	1		
	3000 / 2500A	1		
	3000 / 3000A	1		
27	Dummy Panel			
	UPTO 630A	1		
	800A	1		
	1000A	1		
	1250A	1		
	1600A	1		
	2000A	1		
	2500A	1		
	3000A	1		
	4000A	1		
28	Unit Prices For Circuit Components			
a)	Air Circuit Breaker without releases			
	630A ACB, 4P, EDO, AC	1		
	800A ACB, 4P, EDO, AC	1		
	1000A ACB, 4P, EDO, AC	1		
	1250A ACB, 4P, EDO, AC	1		
	1600A ACB, 4P, EDO, AC	1		
	2000A ACB, 4P, EDO, AC	1		
	2500A ACB, 4P, EDO, AC	1		
	3000A ACB, 4P, EDO, AC	1		
	4000A ACB, 4P, EDO, AC	1		
	630A ACB, 3P, EDO, AC	1		
	800A ACB, 3P, EDO, AC	1		
	1000A ACB, 3P, EDO, AC	1		
	1250A ACB, 3P, EDO, AC	1		
	1600A ACB, 3P, EDO, AC	1		
	2000A ACB, 3P, EDO, AC	1		
	2500A ACB, 3P, EDO, AC	1		
	3000A ACB, 3P, EDO, AC	1		
	4000A ACB, 3P, EDO, AC	1		
	800A ACB, 2P, MDO, DC	1		
	1000A ACB, 2P, MDO, DC	1		
	1250A ACB, 2P, MDO, DC	1		
	1600A ACB, 2P, MDO, DC	1		
b)	MPCB, Short-Circuit Release			
	16A	1		
	25A	1		
	32A	1		
	63A	1		
	80A	1		

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MODULE UNIT PRICE

	115A	1		
c)	TP MCCB, 2NO+2NC AUX, FSC & O/L RELEASE			
	16A	1		
	25A	1		
	32A	1		
	63A	1		
	100A	1		
	125A	1		
	160A	1		
	200A	1		
	250A	1		
	315A	1		
	400A	1		
d)	TP MCCB, 2NO+2NC AUX, ADJ S/C & O/L RELEASE			
	16A	1		
	25A	1		
	32A	1		
	63A	1		
	100A	1		
	125A	1		
	160A	1		
	200A	1		
	250A	1		
	315A	1		
	400A	1		
e)	TP MCCB with LSIG release			
	200A	1		
	250A	1		
	300A	1		
	350A	1		
	400A	1		
f)	TP MCCB - Motorized with LSIG release			
	200A	1		
	250A	1		
	300A	1		
	350A	1		
	400A	1		
g)	Power contactor (AC) (With 2NO & 2NC Minimum)			
	16A	1		
	25A	1		
	32A	1		
	63A	1		
	80A	1		
	115A	1		
	150A	1		
	185A	1		
	265A	1		
	315A	1		
	400A	1		
i)	AC Aux. contactor With			
	2NO + 2NC	1		
	4NO + 4NC	1		
j)	DC Aux. contactor With			
	2NO + 2NC	1		
	4NO + 4NC	1		
k)	Protection Relay			
	VAGM 23	1		
	VTT 11	1		
	VAG 11	1		
	VAA 11	1		

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MODULE UNIT PRICE

	VAJHM 13	1		
	VAJHM 23	1		
	CAG 12	1		
	VDG 14	1		
	CAG 14	1		
	VAX 31	1		
	CAG 37	1		
	CAEM-21	1		
	VAG-21	1		
	VAJC-11	1		
	VAA21	1		
	VTT12	1		
	Numerical Relay for PHASE OVER CURRENT PROTECTION (50/51), EARTH FAULT PROTECTION (50N/51N), STAND BY EARTH FAULT PROTECTION (51NS), RESTRICTED EARTH FAULT PROTECTION (64R), BUS NO VOLT, FAULT LOCKOUT FUNCTION (86), UNDER VOLTAGE WITH TIMER (27M), SYNCHRONISING CHECK FUNCTION (25, CIRCUIT BREAKER FAILURE (50BF), RELAY SELF SUPERVISION, CIRCUIT BREAKER CONDITION MONITORING, TRIP CIRCUIT SUPERVISION (95), CURRENT TRANSFORMER SUPERVISION, VOLTAGE TRANSFORMER SUPERVISION, BREAKER CONTROL with I/L, DISTURBANCE RECORDING, FAULT RECORDING, EVENT RECORDING, MEASUREMENT FUNCTIONS (3I, Io, 3U, Uo, Hz, P, Q, E, PF)	1		
	Numerical Relay for PHASE OVER CURRENT PROTECTION (50/51), EARTH FAULT PROTECTION (50N/51N), STAND BY EARTH FAULT PROTECTION (51NS), RESTRICTED EARTH FAULT PROTECTION (64R), BUS NO VOLT, FAULT LOCKOUT FUNCTION (86), UNDER VOLTAGE WITH TIMER (27M), SYNCHRONISING CHECK FUNCTION (25, CIRCUIT BREAKER FAILURE (50BF), RELAY SELF SUPERVISION, CIRCUIT BREAKER CONDITION MONITORING, TRIP CIRCUIT SUPERVISION (95), CURRENT TRANSFORMER SUPERVISION, VOLTAGE TRANSFORMER SUPERVISION, BREAKER CONTROL with I/L, DISTURBANCE RECORDING, FAULT RECORDING, EVENT RECORDING, MEASUREMENT FUNCTIONS (3I, Io, 3U, Uo, Hz, P, Q, E, PF), MEASUREMENT AND DISPLAY OF HARMONIC CONTENT OF VOLTAGE & CURRENT	1		
	Numerical Relay for PHASE OVER CURRENT PROTECTION (50/51), EARTH FAULT PROTECTION (50N/51N), BUS NO VOLT, FAULT LOCKOUT FUNCTION (86), UNDER VOLTAGE WITH TIMER (27M), SYNCHRONISING CHECK FUNCTION (25, CIRCUIT BREAKER FAILURE (50BF), RELAY SELF SUPERVISION, CIRCUIT BREAKER CONDITION MONITORING, TRIP CIRCUIT SUPERVISION (95), CURRENT TRANSFORMER SUPERVISION, VOLTAGE TRANSFORMER SUPERVISION, BREAKER CONTROL with I/L, DISTURBANCE RECORDING, FAULT RECORDING, EVENT RECORDING, MEASUREMENT FUNCTIONS (3I, Io, 3U, Uo, Hz, P, Q, E, PF)	1		
	Numerical Relay for PHASE OVER CURRENT PROTECTION (50/51), EARTH FAULT PROTECTION (50N/51N), RESTRICTED EARTH FAULT PROTECTION (64R), BUS NO VOLT, FAULT LOCKOUT FUNCTION (86), UNDER VOLTAGE WITH TIMER (27M), SYNCHRONISING CHECK FUNCTION (25, CIRCUIT BREAKER FAILURE (50BF), DIFFERENTIAL PROTECTION (87) (HIGH IMPEDANCE), REVERSE POWER PROTECTION, DG NEUTRAL DISPLACEMENT (59), DG MONITORING, RELAY SELF SUPERVISION, CIRCUIT BREAKER CONDITION MONITORING, TRIP CIRCUIT SUPERVISION (95), CURRENT TRANSFORMER SUPERVISION, VOLTAGE TRANSFORMER SUPERVISION, BREAKER CONTROL with I/L, DISTURBANCE RECORDING, FAULT RECORDING, EVENT RECORDING, MEASUREMENT FUNCTIONS (3I, Io, 3U, Uo, Hz, P, Q, E, PF)	1		

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	Numerical Relay for PHASE OVER CURRENT PROTECTION (50/51), EARTH FAULT PROTECTION (50N/51N), STALLING/ LOCKED ROTOR PROTECTION (50L/R), THERMAL OVERLOAD PROTECTION (49), NEGATIVE PHASE SEQUENCE PROTECTION (46), BUS NO VOLT, REPETATIVE START PROTECTION (66), FAULT LOCKOUT FUNCTION (86), UNDER VOLTAGE WITH TIMER (27M), MOTOR DIFFERENTIAL PROTECTION (87M), CIRCUIT BREAKER FAILURE (50BF), PHASE REVERSAL PROTECTION (46R), CURRENT UNBALANCE PROTECTION, RELAY SELF SUPERVISION, CIRCUIT BREAKER CONDITION MONITORING, TRIP CIRCUIT SUPERVISION (95), CURRENT TRANSFORMER SUPERVISION, VOLTAGE TRANSFORMER SUPERVISION, BREAKER CONTROL with I/L, DISTURBANCE RECORDING, FAULT RECORDING, EVENT RECORDING, MEASUREMENT FUNCTIONS (3I, Io, 3U, Uo, Hz, P, Q, E, PF)	1		
	OVERLOAD RELAY, NOMINAL VOLTAGE-48V DC, O/V VLTAGE SETTING-110%, 1/4NV, 1NO+1NC S/R	1		
	ELECTRONIC TYPE JAMMING RELAY	1		
	l) IMC & its modules for Unidirectional Drive			
1.1	IMC Upto 5.5KW	1		
1.2	Current Sensing Module for above (if not Integral in IMC Module)	1		
2.1	IMC for 5.6 - 7.0KW	1		
2.2	Current Sensing Module for above (if not Integral in IMC Module)	1		
3.1	IMC for 7.1 - 13KW	1		
3.2	Current Sensing Module for above (if not Integral in IMC Module)	1		
4.1	IMC for 13.1 - 24KW	1		
4.2	Current Sensing Module for above (if not Integral in IMC Module)	1		
5.1	IMC for 24.1 - 29.9KW	1		
5.2	Current Sensing Module for above (if not Integral in IMC Module)	1		
6.1	IMC for 30.0 - 37.0KW	1		
6.2	Current Sensing Module for above (if not Integral in IMC Module)	1		
6.3	Voltage Sensing Module for above (if not Integral in IMC Module)	1		
7.1	IMC for 37.1 - 55KW	1		
7.2	Current Sensing Module for above (if not Integral in IMC Module)	1		
7.3	Voltage Sensing Module for above (if not Integral in IMC Module)	1		
8.1	IMC for 55.1 - 80.0KW	1		
8.2	Current Sensing Module for above (if not Integral in IMC Module)	1		
8.3	Voltage Sensing Module for above (if not Integral in IMC Module)	1		
9.1	IMC for 80.1 - 89.9KW	1		
9.2	Current Sensing Module for above (if not Integral in IMC Module)	1		
9.3	Voltage Sensing Module for above (if not Integral in IMC Module)	1		
10	Expansion Module for IMC	1		
	m) Timer (DC)			
	ON DELAY TIMER, 0.5-5SEC., 220V DC, 2NO+2NC	1		
	ON DELAY TIMER, 1.0-10SEC. 220V DC, 2NO+2NC	1		
	240VAC ON DELAY TIMER(1-10SECS)WITH 1NO	1		
	220VDC ON DELAY TIMER(.5-5SECS) WITH 1NO	1		
	220VDC ON DELAY TIMER(0.5-5SECS)WITH 3NO	1		
	220VDC ON DELAY TIMER(1-10SECS) WITH 3NO	1		
	n) Meter			
	AC ammeter (Digital)	1		
	AC ammeter (Analog) linear scale	1		
	AC ammeter (Analog) compressed scale	1		
	DC ammeter (Digital)	1		
	DC ammeter (Analog)	1		
	DC ammeter with shunt and center zero	1		
	AC voltmeter (Digital)	1		
	DC voltmeter (Analog)	1		
	Wattmeter (3 Phase)	1		
	Wattmeter (1 Phase)	1		
	TVM meter	1		
	DIGITAL ENERGY METER	1		

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	Frequency meter	1		
	Multifunction digital Energy meter with RS485 Port (0.2 Acc. Class)	1		
	Multifunction digital Energy meter with RS485 Port (0.5 Acc. Class)	1		
	Multifunction digital Energy meter with RS485 Port (1.0 Acc. Class)	1		
	ABT meter (0.2S Acc. Class)	1		
	o) Single Phase Preventor Relay	1		
	p) MCB			
	6A, 4P 415V AC	1		
	10A, 4P 415V AC	1		
	16A, 4P 415V AC	1		
	6A DP, 240V AC	1		
	10A DP, 240V AC	1		
	16A DP, 240V AC	1		
	32A DP, 240V AC	1		
	6A DP, 110V AC	1		
	10A DP, 110V AC	1		
	16A DP, 110V AC	1		
	32A DP, 110V AC	1		
	6A DP, 220V DC	1		
	10A DP, 220V DC	1		
	16A DP, 220V DC	1		
	6A SP, 240V AC	1		
	10A SP, 240V AC	1		
	16A SP, 240V AC	1		
	32A SP, 240V AC	1		
	6A SP, 110V AC	1		
	10A SP, 110V AC	1		
	16A SP, 110V AC	1		
	32A SP, 110V AC	1		
	6A SP, 220V DC	1		
	10A SP, 220V DC	1		
	16A SP, 220V DC	1		
	q) SWITCH & PUSH BUTTON			
	BREAKER CONTROL SWITCH, 16A,220V DC, 2CLOSE+2TRIP	1		
	DC ISOLATING SWITCH 16A,220V DC, DP, BASE MTG.	1		
	16A, 240V AC SELECTOR SWITCH 3WAY, 4POLE, FLUSH MTG	1		
	25A, 240V AC SELECTOR SWITCH 3WAY, 4POLE, FLUSH MTG	1		
	16A, 240V AC SELECTOR SWITCH 2WAY, 2POLE, FLUSH MTG	1		
	NORMAL/ TRIAL SEL. SWITCH, 2POLE , 2WAY, 10A 240V AC, FLUSH MTG,	1		
	MCC/ NORMAL/ TRIAL SEL. SWITCH, 2POLE ,3WAY, 10A 240V AC, FLUSH MTG	1		
	SWGR/ REMOTE SEL. SWITCH 3POLE 2WAY,16A 220V DC, FLUSH MTG	1		
	SWGR/ NORMAL/ TRIAL SEL. SWITCH, 3POLE, 3WAY, 16A 220V DC, FLUSH MTG.	1		
	NORMAL/ TRIAL SEL. SWITCH, 2POLE , 2WAY, 10A 240V AC, FLUSH MTG, LOCKABEL TYPE	1		
	MCC/ NORMAL/ TRIAL SEL. SWITCH, 2POLE ,3WAY, 10A 240V AC, FLUSH MTG, LOCKABEL TYPE	1		
	SWGR/ REMOTE SEL. SWITCH 3POLE 2WAY,16A 220V DC, FLUSH MTG.LOCKABLE TYPE	1		
	SWGR/ NORMAL/ TRIAL SEL. SWITCH, 3POLE, 3WAY, 16A 220V DC, FLUSH MTG., LOCKABLE TYPE	1		
	AMMETER SELECTOR SWITCH	1		
	VOLTMETER SELECTOR SWITCH	1		
	TOGGLE SWITCH 5A, 240V AC	1		
	AC SWITCH SPST-5A,240V AC	1		
	10A, 220V DC SWITCH	1		
	Door Limit switch	1		
	Ammeter selector switch	1		
	Voltmeter selector switch	1		

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	Trip selector switch	1		
	Push Button	1		
	2NO + 2NC Shrouded	1		
	1NO + 1NC Shrouded	1		
	2NO + 2NC Mushroom head stayput	1		
	2NO + 2NC Lockable type	1		
r)	Indicating Lamp Assembly (LED Type)			
	240V AC-GREEN	1		
	240V AC-RED	1		
	240V AC- AMBER	1		
	110V AC-GREEN	1		
	110V AC-RED	1		
	110V AC- AMBER	1		
	220V DC-WHITE	1		
	220V DC-RED	1		
	220V DC-GREEN	1		
	220V DC-BLUE	1		
	220V DC- AMBER	1		
	63.5V AC-RED	1		
	63.5V AC-YELLOW	1		
	63.5V AC-BLUE	1		
s)	CT			
i)	Metering CT			
	Upto 75/1A	1		
	100/1A	1		
	125/1A	1		
	150/1A	1		
	200/1A	1		
	250/1A	1		
	300/1A	1		
	400/1A	1		
	500/1A	1		
	630/1A	1		
	800/1A	1		
	1000/1A	1		
	1250/1A	1		
	1600/1A	1		
	2000/1A	1		
	2500/1A	1		
	3000/1A	1		
	4000/1A	1		
ii)	Protection CT (5P20)			
	Upto 75/1A	1		
	100/1A	1		
	125/1A	1		
	150/1A	1		
	200/1A	1		
	250/1A	1		
	300/1A	1		
	400/1A	1		
	500/1A	1		
	630/1A	1		
	800/1A	1		
	1000/1A	1		
	1250/1A	1		
	1600/1A	1		
	2000/1A	1		
	2500/1A	1		
	3000/1A	1		
	4000/1A	1		

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	630/5A	1		
	800/5A	1		
	1000/5A	1		
	1250/5A	1		
	1600/5A	1		
	2000/5A	1		
	2500/5A	1		
	3000/5A	1		
	4000/5A	1		
iii)	PS Class CT			
	1000/1A	1		
	1600/1A	1		
	2000/1A	1		
	2500/1A	1		
	3000/1A	1		
	4000/1A	1		
	1000/5A	1		
	1600/5A	1		
	2000/5A	1		
	2500/5A	1		
	3000/5A	1		
	4000/5A	1		
t)	Voltage Transformer			
	415/√3 : 110/√3 V, 50VA	1		
	415/√3 : 110/√3 V, 100VA	1		
	415/√3 : 240/√3 V, 50VA	1		
	415/√3 : 240/√3 V, 100VA	1		
	415 : 110V, 50VA	1		
	415 : 110V, 100VA	1		
	415 : 240V, 50VA	1		
	415 : 240V, 100VA	1		
u)	Toggle switch (16A)	1		
v)	Secondary Isolating Contact Block	1		
w)	Control Terminal (Fixed)	1		
x)	Control Terminal (Drawout)	1		
y)	Thermostat, Dial type	1		
z)	CONTROL TRANSFORMER			
	415/240V,CL-B, 1 KVA	1		
	415/240V,CL-B, 2KVA	1		
	415/240V,CL-B, 2.5KVA	1		
	415/240V,CL-B, 3KVA	1		
	415/240V,CL-B, 5KVA	1		
	415/240V,CL-B, 7.5KVA	1		
	415/240V,CL-B, 10KVA	1		
	415/110V,CL-B, 1 KVA	1		
	415/110V,CL-B, 2KVA	1		
	415/110V,CL-B, 2.5KVA	1		
	415/110V,CL-B, 3KVA	1		
	415/110V,CL-B, 5KVA	1		
	415/110V,CL-B, 7.5KVA	1		
	415/110V,CL-B, 10KVA	1		
aa)	415/110V,CL-B, 10KVA			
	4-20mA Dual o/p, Aux sup 220V DC, 1A, Current Transducer	1		
	4-20mA Dual o/p, Aux sup 240V AC, 1A, Current Transducer	1		
	4-20mA Dual o/p, Aux sup 110V AC, 1A, Current Transducer	1		
	4-20mA Dual o/p, Aux sup 220V DC, VoltageTransducer, PTR 415/110V	1		
	4-20mA Dual o/p, Aux sup 240V AC, VoltageTransducer, PTR 415/110V	1		

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	4-20mA Dual o/p, Aux sup 110V AC, Voltage Transducer, PTR 415/110V	1		
	4-20mA Dual o/p, Aux sup 220V DC, Frequency Transducer, PTR 415/110V	1		
	4-20mA Dual o/p, Aux sup 220V DC, Input 0-75mV DC, Current Transducer-DC	1		
	4-20mA Dual o/p, Aux sup 240V AC, Input Voltage 0-220V DC, Voltage Transducer-DC	1		
	4-20mA Dual Output kW transducer	1		
	4-20mA Dual Output kVA transducer	1		
	4-20mA Dual Output PF transducer	1		
	4-20mA Dual Output Frequency transducer	1		
ab)	Interposing relay RE 302 or Eqvt with freewheeling diode & LED	1		
ac)	3 PIN SOCKET - 5A, 110V AC, 3PIN	1		
ad)	SPACE HEATER	1		
ae)	NEUTRAL LINK WITH MOUNTING ASSEMBLY			
	20A FOR CONTROL CKT. & POWER CKT. UPTO 25A MCCB RATING	1		
	32A FOR 50A MCCB RATING	1		
	63A FOR 100A & 125A MCCB RATING	1		
	125A FOR 250A MCCB RATING	1		
	250A FOR 400A & 500A MCCB RATING	1		
af)	CASTLE KEY INTERLOCK FOR MCCB - 3LOCK+2KEY	1		
ag)	MECHANICAL INTERLOCK FOR POWER CONTACTOR			
	16A	1		
	25A	1		
	32A	1		
	63A	1		
	80A	1		
	115A	1		
	150A	1		
	185A	1		
	265A	1		
	315A	1		
	400A	1		
ah)	ADDON BLOCK FOR CONTACTOR			
	2NO+2NC	1		
	3NO+1NC	1		
	1NO + 1NC	1		
	1NO	1		
	1NC	1		
ai)	ISOLATOR WITH HANDLE			
	16A	1		
	32A	1		
29	Connection from PMCC/MCC panel to PMCC/MCC panel (per meter length)			
	250A	1		
	400A	1		
	630A	1		
	800A	1		
	1000A	1		
	1200A	1		
	1600A	1		
	2000A	1		
	2500A	1		
	3000A	1		
	4000A	1		
30	Cable Glands & Lugs:			
a)	Single Compression Cable Glands for cable sizes:			
	2C X 2.5 Sq. mm.	1		
	3C X 2.5 Sq. mm.	1		
	5C X 2.5 Sq. mm.	1		

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	7C X 2.5 Sq. mm.	1		
	10C X 2.5 Sq. mm.	1		
	14C X 2.5 Sq. mm.	1		
	2C X 10 Sq. mm.	1		
	2C X 16 Sq. mm.	1		
	2C X 25 Sq. mm.	1		
	2C X 35 Sq. mm.	1		
	2C X 50 Sq. mm.	1		
	2C X 70 Sq. mm.	1		
	2C X 95 Sq. mm.	1		
	3C X 2.5 Sq. mm.	1		
	3C X 10 Sq. mm.	1		
	3C X 16 Sq. mm.	1		
	3C X 25 Sq. mm.	1		
	3C X 35 Sq. mm.	1		
	3C X 50 Sq. mm.	1		
	3C X 70 Sq. mm.	1		
	3C X 95 Sq. mm.	1		
	3C X 150 Sq. mm.	1		
	3C X 240 Sq. mm.	1		
	3C X 300 Sq. mm.	1		
	3.5C X 25 Sq. mm.	1		
	3.5C X 50 Sq. mm.	1		
	3.5C X 70 Sq. mm.	1		
	3.5C X 95 Sq. mm.	1		
	3.5C X 240 Sq. mm.	1		
	3.5C X 300 Sq. mm.	1		
	4C X 16 Sq. mm.	1		
	4C X 35 Sq. mm.	1		
	1C X 300 Sq. mm.	1		
	1C X 630 Sq. mm.	1		
b)	Double Compression Cable Glands for cable sizes:			
	2C X 2.5 Sq. mm.	1		
	3C X 2.5 Sq. mm.	1		
	5C X 2.5 Sq. mm.	1		
	7C X 2.5 Sq. mm.	1		
	12C X 2.5 Sq. mm.	1		
	16C X 2.5 Sq. mm.	1		
	2C X 10 Sq. mm.	1		
	2C X 16 Sq. mm.	1		
	2C X 25 Sq. mm.	1		
	2C X 35 Sq. mm.	1		
	2C X 50 Sq. mm.	1		
	2C X 70 Sq. mm.	1		
	2C X 95 Sq. mm.	1		
	3C X 2.5 Sq. mm.	1		
	3C X 10 Sq. mm.	1		
	3C X 16 Sq. mm.	1		
	3C X 25 Sq. mm.	1		
	3C X 35 Sq. mm.	1		
	3C X 50 Sq. mm.	1		
	3C X 70 Sq. mm.	1		
	3C X 95 Sq. mm.	1		
	3C X 150 Sq. mm.	1		
	3C X 240 Sq. mm.	1		
	3C X 300 Sq. mm.	1		
	3.5C X 25 Sq. mm.	1		
	3.5C X 50 Sq. mm.	1		
	3.5C X 70 Sq. mm.	1		
	3.5C X 95 Sq. mm.	1		

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	3.5C X 240 Sq. mm.	1		
	3.5C X 300 Sq. mm.	1		
	4C X 16 Sq. mm.	1		
	4C X 35 Sq. mm.	1		
	1C X 300 Sq. mm.	1		
	1C X 630 Sq. mm.	1		
	c) Cable Lugs for sizes:			
	1.5 Sq. mm.	1		
	2.5 Sq. mm.	1		
	10 Sq. mm.	1		
	16 Sq. mm.	1		
	25 Sq. mm.	1		
	35 Sq. mm.	1		
	50 Sq. mm.	1		
	70 Sq. mm.	1		
	95 Sq. mm.	1		
	120 Sq. mm.	1		
	150 Sq. mm.	1		
	185 Sq. mm.	1		
	240 Sq. mm.	1		
	300 Sq. mm.	1		
	630 Sq. mm.	1		
31.1	Thermal O/L relay with SPP - OLR			
	Upto 5.5KW	1		
	5.6 to 7.0KW	1		
	7.1 to 13KW	1		
	13.1 to 24KW	1		
	24.1 to 29.9KW	1		
	30.0 to 37.0KW	1		
	37.1 to 55.0KW	1		
	55.1 to 80.0KW	1		
	80.1 to 89.9KW	1		
31.2	Heavy Duty Thermal O/L relay with SPP - OLR			
	Upto 5.5KW	1		
	5.6 to 7.0KW	1		
	7.1 to 13KW	1		
	13.1 to 24KW	1		
	24.1 to 29.9KW	1		
	30.0 to 37.0KW	1		
	37.1 to 55.0KW	1		
	55.1 to 80.0KW	1		
	80.1 to 89.9KW	1		
32	Daily 8 hour rate deployed at site:			
	Engineer : (per day)	1		
33	Module Name plate	1		
34	Wires for Secondary wiring:			
	a) 1.5 Sq. mm. per meter	1		
	b) 2.5 Sq. mm. per meter	1		
	c) 4.0 Sq. mm. per meter	1		
35	Control Terminal for Secondary wiring suitable for cable size:			
	1) 0.5 Sq. mm.	1		
	2) 1.5 Sq. mm.	1		
	3) 2.5 Sq. mm.	1		
36	Electrical Junction Boxes (for termination of 0.5 sqmm screened control cables)			
	a) 48 ways	1		
	b) 64 ways	1		
	c) 72 ways	1		
	a) 96 ways	1		

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37	Temperature Sensor for WIRELESS TEMPERATURE MONITORING SENSOR	1		
38	Wireless Transmitter for WIRELESS TEMPERATURE MONITORING SENSOR	1		
39	Wireless Receiver for WIRELESS TEMPERATURE MONITORING SENSOR	1		
40	Additional components (except networking hardware mentioned in Sr. No. B3 of BOQ) required for completeness of WIRELESS TEMPERATURE MONITORING SENSOR	1		
41	DP MCCB, ADJ. SC & O/L Release:			
	16A	1		
	25A	1		
	32A	1		
	63A	1		
	100A	1		
	125A	1		
	160A	1		
	200A	1		
42	TP MCCB motor duty type with S/C release:			
	16A	1		
	25A	1		
	32A	1		
	63A	1		
	100A	1		
	125A	1		
	160A	1		
	200A	1		
	250A	1		
	400A	1		
43	TP MCCB ADJ S/C , O/L, E/F release:			
	16A	1		
	25A	1		
	32A	1		
	63A	1		
	80A	1		
	100A	1		
	125A	1		
	160A	1		
	200A	1		
	250A	1		
	400A	1		
44	DC MCCB			
	16A	1		
	25A	1		
	32A	1		
	63A	1		
	80A	1		
	115A	1		
	150A	1		
	185A	1		
	265A	1		
	315A	1		
	400A	1		
45	SWITCH FUSE UNIT (DC) - DP along with fuse, link etc complete (suitable for 40kA fault current)			
	16A	1		
	32A	1		
	63A	1		
	100A	1		
	125A	1		
	200A	1		
	250A	1		
	300A	1		
	400A	1		
	600A	1		

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MODULE UNIT PRICE

	800A	1		
46	SWITCH FUSE UNIT (AC) - TP along with fuse, link etc complete			
	16A	1		
	32A	1		
	63A	1		
	100A	1		
	125A	1		
	200A	1		
	250A	1		
	300A	1		
	400A	1		
	600A	1		
	800A	1		
47	Y-Link	1		
48	OLM, Profibus DP connector along with accessories (at Y-link end) for interface of Y-Link with DDCMIS.	1		
49	SP ON/ OFF SWITCH FOR MOTOR SPACE HEATER OF BREAKER MOTOR FDR, 10A, 240V AC	1		
50	4 POLE, 2 POSI., SELECTOR SWITCH FOR CONTROL TRF., 110V AC	1		
51	EXTENDED ROTORY HANDLE	1		
52	AUXILIARY CONTACT FOR MCCB 1C/O	1		
53	TRIP CONTACT FOR MCCB 1C/O	1		
54	CONTROL TERMINALS (DRAWOUT)	1		
55	3 PIN INDUSTRIAL SOCKET & PLUG	1		
56	ROTARY ON/OFF SWITCH	1		
57	ELECTRONIC TIMER WITH 2C/O	1		
58	CONTROL TRANSFORMER, DRY TYPE, CAST RESIN, 415/24V, INS. CL-B OR BETTER	1		
59	RECTIFIER	1		
60	LIMIT SWITCH (BREAKER)	1		
61	Ethernet Switch with 16 Copper Ports & 4 FO ports	1		
62	Ethernet Switch with 08 Copper Ports & 4 FO ports	1		
63	Cat5e/ Cat6 Ethernet Cable	1		
64	Fibre Optic Patch Cord (minimum length - 10metres)	1		
65	9 WINDOWS ALARM ANNUNCIATION -1	1		
66	ELECTRONIC HOOTER (96SQMM)	1		
67	24V DC PDB - 16 WAYS	1		
68	24V DC PDB - 32 WAYS	1		
69	24V DC PDB - 64 WAYS	1		
NOTE:	The bidder should list the unit price for any additional modules, components, or items that are not mentioned in the above specifications but may be necessary to fulfill the customer's requirements.			

IEEMA/PVC/LVSWGR/2019 (R-2)**Effective from: 1st January 2019****PRICE VARIATION CLAUSE FOR LV SWITCHGEAR AND CONTROLGEAR (up to & including 1100 V)**

The price quoted/confirmed is based on the input cost of raw materials/components and labour cost as on the date of quotation and the same is deemed to be related to prices of raw materials and all India average consumer price index number for industrial workers as specified in the price variation clause given below. In case of any variation in these prices and index numbers, the price payable shall be subject to adjustment, up or down in accordance with the following formula:

$$P = \frac{P_0}{100} \left(21 + 19 \frac{IS}{IS_0} + 21 \frac{C}{C_0} + 12 \frac{AL}{AL_0} + 15 \frac{In}{In_0} + 12 \frac{W}{W_0} \right)$$

Wherein,

- P = Price payable as adjusted in accordance with the above formula.
- P₀ = Price quoted/confirmed. (Exclusive of all taxes & duties)
- IS₀ = Wholesale price index number for 'Manufacture of Basic Metals' (Base: 2011-12=100)(refer notes)
This index number is as applicable for the month, THREE month prior to the date of tendering.
- C₀ = Average LME settlement price of copper wire bars (refer notes)
This price is as applicable for the month, ONE month prior to the date of tendering.
- AL₀ = Price of busbar grade aluminium (refer notes).
This price is as applicable on the 1st working day of the month, ONE month prior to the date of tendering.
- In₀ = Price of phenolic moulding powder
This price is as applicable on the 1st working day of the month, ONE month prior to the date of tendering.
- W₀ = All India average consumer price index number for industrial workers, as published by the Labour Bureau, Ministry of Labour, Govt. of India (Base: 2001 = 100)
This index number is as applicable for the month, Four months prior to the date of tendering.

For example, if date of tendering falls in April 2019, applicable prices of Copper (C₀), Aluminium Busbar (AL₀) and Insulating Material (In₀) should be as on 1st March 2019 and Wholesale price index number for 'Manufacture of Basic Metals' (IS₀) and all India average consumer price index no. (W₀) should be for the month of January 2019.

The above prices and indices are as published by IEEMA vide circular reference number IEEMA(PVC)/SWGR(R-1)/ _/_ ONE month prior to the date of tendering.

IEEMA/PVC/LVSWGR/2019 (R-2) page 1 of 3

IEEMA/PVC/LVSWGR/2019 (R-2)

Effective from: 1st January 2019

- IS = Wholesale price index number for 'Manufacture of Basic Metals' (Base: 2011-12=100) (refer notes)
This index number is as applicable for the month, FOUR month prior to the date of delivery.
- C = Average LME settlement price of copper wire bars (refer notes)
This price is as applicable for the month, TWO month prior to the date of delivery.
- Al = Price of busbar grade aluminium (refer notes).
This price is as applicable on the 1st working day of the month, TWO month prior to the date of delivery.
- In = Price of phenolic moulding powder
This price is as applicable on the 1st working day of the month, TWO month prior to the date of delivery.
- W = All India average consumer price index number for industrial workers, as published by the Labour Bureau, Ministry of Labour, Govt. of India (Base: 2001 = 100)
This index number is as applicable for the month, FIVE months prior to the date of delivery.

For example, if date of delivery in terms of clause given below falls in June 2019, applicable prices of Copper (C₀), Aluminium Busbar (Al₀) and Insulating Material (In₀) should be as on 1st April 2019 and Wholesale price index number for 'Manufacture of Basic Metals' (S₀) and all India average consumer price index no. (W₀) should be for the month of February 2019.

The date of delivery is the date on which the product is notified as being ready for inspection/despatch (in the absence of such notification, the date of manufacturer's despatch note is to be considered as the date of delivery) or the contracted delivery date (including any agreed extension thereto), whichever is earlier.

Notes

- a) All prices of raw materials are exclusive of modvatable GST/CV duty amount and exclusive of any other central, state or local taxes, octroi etc.
- b) The details of prices are as under:
 1. The wholesale price index number for 'Manufacture of Basic Metals' is as published by the Office of Economic Advisor, Ministry of commerce & Industry, Govt. of India, New Delhi with base 2011-12 = 100
 2. The LME price of Copper Wire Bars (in Rs./MT) is the LME average settlement price of Copper Wire Bars converted into Indian Rupees with applicable average exchange rate of SBI of the month. This price is the landed cost, inclusive of applicable customs duty only but exclusive of countervailing duty

IEEMA/PVC/LVSWGR/2019 (R-2)

Effective from: 1st January 2019

3. The price of busbar grade aluminium (in Rs/MT) is the average of ex-works price as quoted by the two primary producers for the busbar size 152.4 x 6.35 mm flat approximately, grade equivalent to E91 E as per IS 5082-1998 (or the latest).
4. The price of insulating material (in Rs/Kg) is the average price of phenolic moulding powder quoted by three manufacturers applicable for Switchgear and Controlgear of medium/lower voltage up to 1100 volts


Senior Director

IEEMA/PVC/LVSWGR/2019 (R-2) page 3 of 3

	TECHNICAL SPECIFICATION LT SWITCHGEAR KODERMA THERMAL POWER STATION PHASE-II (2X800MW)	PE-TS-519-506-E002
		Issue No: 00
		Rev. No. 00
		02 September 2026

PRE QUALIFICATION REQUIREMENT (TECHNICAL)

	PRE-QUALIFICATION REQUIRMENTS OF LT SWITCHGEAR FOR KODERMA THERMAL POWER STATION PHASE-II (2X800MW)	PE-PQ-519-506-E001
		REVISION NO. 0 DATE 03.09.2026
		SHEET NO. 1 of 2

SCOPE: Supply: YES; Erection & Commissioning: NO;

Route 1

- a) Bidder should have manufactured and supplied at least a total of four hundred & fifty (450) numbers of draw out type Air Circuit Breaker Panels and / or draw out type Motor Control Centre Panels with fault rating of at least 45kA for one (1) second and 105kA peak under a single order and these panels should have been in successful operation for at least two (2) years.

And

- b) Bidder should have manufactured and supplied at least one hundred & fifty (150) numbers of Air Circuit Breakers having fault rating of at least 45kA rms BREAKING, 105kA peak MAKING and 45kA withstand for one (1) second, and their associated draw out type Air circuit breaker panels having fault rating of at least 45kA for one (1) second and 105kA peak, which should have been in successful operation for at least two (2) years.

Route 2

- a) Bidder should have manufactured and supplied at least a total of two hundred & twenty-five (225) numbers of draw out type Air Circuit Breaker Panels and / or draw out type Motor Control Centre Panels with fault rating of at least 45kA for one (1) second and 105kA peak under a single order and these panels should have been in successful operation for at least two (2) years.

And

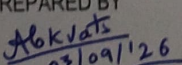
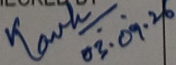
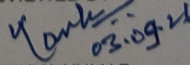
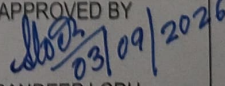
- b) Bidder should have manufactured and supplied at least seventy-five (75) numbers of draw out type Air Circuit Breaker panels having fault rating of at least 45kA for one (1) second and 105kA peak, which should have been in successful operation for at least two (2) years.

And

- c) Bidder shall be considered qualified provided its Associate or Collaborator or Technology Provider or Licensor meets the requirement stipulated in Route-1 for sourcing of Air Circuit Breakers. The Associate or Collaborator or Technology Provider or Licensor shall provide a letter of technical support for successful performance of the Air Circuit Breakers, as per the format, given in the bidding document. This letter of technical support should be submitted at the time of placement of order on the bidder.

And

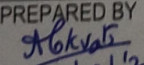
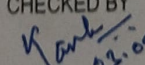
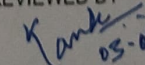
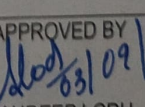
- d) Bidder should have established manufacturing facility for draw out type Air Circuit Breaker Panels and draw out type Motor Control Centre Panels in India. Further, all the panels for this project shall be manufactured and supplied from the Indian manufacturing facility.

PREPARED BY  ALOK VATS SR. ENGINEER (E)	CHECKED BY  KANHAIYA KUMAR DGM (E)	REVIEWED BY  KANHAIYA KUMAR DGM (E)	APPROVED BY  SANDEEP LODH AGM & DH (E)
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	PRE-QUALIFICATION REQUIREMENTS OF LT SWITCHGEAR FOR KODERMA THERMAL POWER STATION PHASE-II (2X800MW)	PE-PQ-519-506-E001
		REVISION NO. 0 DATE 03.09.2026
		SHEET NO. 2 of 2

NOTES:

1. Each Single Front Panel shall be counted as one (1) Panel, Double Front Panel as one (1) Panel and Air Circuit Breaker Panel as one (1) Panel.
2. For the purpose of qualification of Bidders, experience shall be reckoned as on 14.11.2024.
3. The above PQR points are as per customer specific requirements.
4. Consideration of Bidder's offer is subject to BHEL/ BHEL Customer's approval.
5. Bidder to submit all supporting documents in English. If documents submitted by Bidder are in language other than English, a self-attested English translated document should also be submitted.
6. Notwithstanding anything stated above, BHEL reserves the right to assess the capabilities and capacity of the Bidder/collaborators to perform the contract, should the circumstances warrant such assessment in the overall interest of BHEL.
7. After satisfactory fulfillment of all the above criterion requirement, offer shall be considered for further evaluation as per NIT and all the other terms of the tender.
8. Attached annexure (Annexure-I) to be filled by the bidder on quality & general terms. Requisite Documents (like factory registration certificate, R&D set-up details etc.) asked in Annexure-I, shall also be attached as Annexure F2.1 to F2.17 along with the filled response in the Annexure-I.

PREPARED BY  03/09/26 ALOK VATS SR. ENGINEER (E)	CHECKED BY  03.09.26 KANHAIYA KUMAR DGM (E)	REVIEWED BY  03.09.26 KANHAIYA KUMAR DGM (E)	APPROVED BY  03/09/2026 SANDEEP LODH AGM & DH (E)
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		QUALITY CONTROL & INSPECTION, DVC SUB-VENDOR QUESTIONNAIRE		
Ref No:			Date:	
Sl. No	Item	Description		
1.	Item/Scope of Sub-contracting:			
2.	Address of the registered office:	Details of Contact Person (Name, Designation, Mobile, Email)		
3.	Name and Address of the proposed Sub-vendor's works where item is being manufactured	Details of Contact Person: (Name, Designation, Mobile, Email)		
4.	Annual Production Capacity for proposed item/scope of sub-contracting			
5.	Annual Production Capacity for proposed item/scope of sub-contracting			
6.	Details of Proposed works			
(a)	Year of establishment of present works			
(b)	Year of commencement of manufacturing at above works			
(c)	Total Area			
(d)	Covered Area			
(e)	Factory Registration Certificate	Details attached at Annexure – F2.1		
(f)	Design/ Research & development set-up (No. of manpower, their qualification, machines & tools employed etc.)	Applicable / Not applicable if manufacturing is as per Main Contractor/purchaser design Details attached at Annexure – F2.2 (if applicable)		
(g)	Overall organization Chart with Manpower Details (Design/Manufacturing/Quality etc)	Details attached at Annexure – F2.3		
(h)	After sales service set up in India, in case of foreign sub-vendor (Location, Contact Person, Contact details etc.)	Applicable / Not applicable Details attached at Annexure – F2.4		
(i)	Manufacturing process execution plan with flow chart indicating various stages of manufacturing from raw material to finished product including outsourced process, if any	Details attached at Annexure – F2.5		
(j)	Sources of Raw Material/ Major Bought Out Item	Details attached at Annexure – F2.6		
(k)	Quality Control exercised during receipt of raw material/BOI, in-process, Final Testing, packing	Details attached at Annexure – F2.7		
(l)	Manufacturing facilities: (List of machines, special process facilities, material handling etc.)	Details attached at Annexure – F2.8		
(m)	Testing facilities (List of testing equipment)	Details attached at Annexure – F2.9		
(n)	If manufacturing process involves fabrication then-	Applicable / Not applicable Details attached at Annexure – F2.10		



QUALITY CONTROL & INSPECTION, DVC

SUB-VENDOR QUESTIONNAIRE

Ref No:				Date:			
Sl. No	Item			Description			
	(i) List of qualified Welders (ii) List of qualified NDT personnel with area of specialization			(if applicable)			
(o)	List of out-sourced manufacturing processes with Sub-Vendor's names & addresses			Applicable / Not applicable Details attached at Annexure. –F2.11 (if applicable)			
(p)	Supply reference list including recent supplies (as per format given below)			Details attached at Annexure – F2.12			
Project/ Package		Customer (s) Name	Supplied Item (Type/ Rating/ Model/Capacity/ Size etc)	Ref. PO No. & date	Supplied Quantity	Date of Supply	
(q)	Product satisfactory performance feedback letter/certificates/End User Feedback			Attached at annexure - F2.13			
(r)	Summary of Type Test Report (Type Test Details, Report No, Agency, Date of testing) for the proposed product (similar or higher rating) NOTE: Reports need not be submitted,			Applicable / Not applicable Details attached at Annexure – F2.14 (if applicable)			
(s)	Statutory / mandatory certification for the proposed product			Applicable / Not applicable Details attached at Annexure – F2.15 (if applicable)			
(t)	Copy of ISO certificates			Attached at Annexure – F2.16			
(u)	Product technical catalogues for proposed item (if available)			Details attached at Annexure – F2.17			
Name		Designation		Signature		Date	
Company's Seal/ Stamp							

Annexure-II (On Company Letter Head)

LETTER OF TECHNICAL SUPPORT FOR SATISFACTORY PERFORMANCE OF AIR CIRCUIT BREAKERS

TO

[EMPLOYER'S NAME & ADDRESS]

Sub: Letter of Support submitted from (name of the Associate*/Collaborator*/Technology provider*/Licensor*) undertaking the responsibility for satisfactory performance of (name of the equipment).

Dear Sirs,

1. In accordance with the Award of the Contract by (Name of the Contractor) to M/s. (Name of the sub-vendor), we, the aforesaid Associate*/Collaborator*/Technology provider*/Licensor*, (M/s) shall be fully responsible for the satisfactory performance of the (equipment name).
2. Further, the manner of achieving the objective set forth in point 1 above shall be as follows
For (Equipment name):
 - (a) We shall provide manufacturing and assembly drawings of..... (Equipment name). (Equipment name) shall be manufactured and supplied as per above drawings provided by us.
 - (b) We shall depute technical experts to Bidder's/sub-vendor's works for supervision during manufacturing, assembly, inspection, as and when required by Employer. We shall participate in site erection, commissioning and final testing (as and when necessary) of the..... (equipment name).
 - (c) We shall participate in Technical Co-ordination meetings (TCMs) from time to time, as and when required by Employer.
 - (d) We shall promptly carry out all the corrective measures and shall promptly provide corrected design and shall undertake replacements, rectifications or modifications to the equipment as and when required by Employer in case the equipment fails to demonstrate successful performance as per contract at site.
3. We, the Associate*/Collaborator*/Technology provider*/Licensor* do hereby undertake and confirm that this Letter of Support shall be valid till 90(ninety) days after the end of the defect liability period of the contract.

Signature of the Authorised Representative: ...

For M/s

(Associate*/Collaborator*/Technology provider*/Licensor*)

Name

Designation

Date: ...

Common Seal of the Company

***: Strike off whichever is not applicable.**

	TECHNICAL SPECIFICATION LT SWITCHGEAR KODERMA THERMAL POWER STATION PHASE- II (2X800MW)	PE-TS-519-506-E002
		Issue No: 00
		Rev. No. 00
		02 September 2026

SUB QUALIFICATION REQUIREMENT (TECHNICAL)

Sub: We / subvendor..... have designed, manufactured, supplied LT SWITCHGEAR and these panels should have been in successful operation for at least two (2) years. as per stipulated requirements mentioned at Clause No. 5.6.0 of Sub-Section A-1, Part-A, Section-VI of Bidding documents for LT Switchgear . The details of the same are given below:

Sl.no	Description	Details
1.1	No. of Air circuit breaker panels and/or draw out motor control centre panels manufactured and supplied, under a single order, with fault rating of	

Signature of authorized signatory.....

	at least 45kA for one (1) second and 105kA peak which are in successful operation for at least two (2) years.(under Route 1) .	
01	Name of the manufacturer and its address	
02	Name of the manufacturer Plant and its Location	
03	Name of the plant / project and its location for which the Air circuit breaker panels and/or draw out motor control centre panels / LT switchgear was supplied.	
04	Name and Designation of the responsible person in Client's Organisation.Client's name, his address Client's name, his address	
	Fax no & Tel. No	
	e-mail id :	
	website address	
05	Whether manufactured and supplied the referred Air Circuit breaker panels / MCC panels	Yes / No
06	Number of Units / Qty supplied	
07	Contract No & Date of Award of Contract	
08	Brief Scope of work	
09	Value of Order	
10	Draw out type Air Circuit Breaker panels and/or draw out motor control centre panels having fault rating (kA rms)	
	Time (Sec.)	
	KA (Peak)	
11	No. of draw out type MCC panels supplied	

Signature of authorized signatory.....

12	No. of draw out type Air Circuit breaker panels supplied	
13	Date of commissioning & no of years of service	
14	Whether the Air circuit breaker panels and/or draw out motor control centre panels are in Successful Operation for atleast Two (2) years as on the date of consideration for approval but not later than six months after award date of the package.	Yes / No.
15	Certificate from client in support of above , year and month of Commissioning, period of successful operation and that the above are installed by us have caused no serious problem in the past, is furnished this proposal at Annexure.....	

Sl.no	Description	Details
1.2	No. of Air circuit breakers having fault rating of at least 45kA rms BREAKING, 105kA peak MAKING and 45kA withstand for one (1) second, and their associated draw out type Air circuit breaker panels having fault rating of at least 45kA for one (1) second and 105kA peak , manufactured and supplied which are in successful operation for at least two (2) years. (under Route 1)	
01	Name of the manufacturer and its address	

Signature of authorized signatory.....

02	Name of the manufacturer Plant and its Location	
03	Name of the plant / project for which the Air Circuit Breakers was supplied and its location	
04	Name and Designation of the responsible person in Client's Organisation. Client's name, his address Client's name, his address	
	Fax no & Tel. No	
	e-mail id :	
	website address	
05	Whether manufactured and supplied the referred Air Circuit Breakers and their associated draw out type Air Circuit Breaker panels	Yes / No
06	Number of Units / Qty supplied	
07	Contract No & Date of Award of Contract	
08	Brief Scope of work	
09	Value of Order	
10	Air Circuit Breakers having fault rating	
	(i) Rated current (A)	
	ii) Breaking Capacity (KA rms)	
	iii) Making Capacity (KA peak	
11	Draw out type Air Circuit Breaker panels having fault rating (kA rms)	
	Time (Sec.)	
	KA (Peak)	

Signature of authorized signatory.....

12	No. of draw out type MCC panels supplied	
13	No. of draw out type Air Circuit breaker panels supplied	
14	Date of commissioning & no of years of service	
15	Whether the Air circuit breaker panels and/or draw out motor control centre panels are in Successful Operation for atleast Two (2) years as on the date of consideration for approval but not later than six months after award date of the package.	Yes / No.
16	Certificate from client in support of above , year and month of Commissioning, period of successful operation and that the above are installed by us have caused no serious problem in the past, is furnished this proposal at Annexure.....	

.Sl.no	Description	Details
1.3	No. of Air circuit breaker panels and/or draw out motor control centre panels manufactured and supplied, under a single order, with fault rating of at least 45kA for one(1) second and 105kA peak which are in successful operation for at least two (2) years.(under Route 2) .	
01	Name of the manufacturer and its address	
02	Name of the manufacturer Plant and its Location	

Signature of authorized signatory.....

03	Name of the plant / project for which the Air circuit breaker panels and/or draw out motor control centre panels manufactured and supplied & its location	
04	Name and Designation of the responsible person in Client's Organisation. Client's name, his address Client's name, his address	
	Fax no & Tel. No	
	e-mail id :	
	website address	
05	Whether manufactured and supplied the referred Air Circuit breaker panels / MCC panels	Yes / No
06	Number of Units / Qty supplied	
07	Contract No & Date of Award of Contract	
08	Brief Scope of work	
09	Value of Order	
10	Draw out type Air Circuit Breaker panels and/or draw out motor control centre panels having fault rating (kA rms)	
	Time (Sec.)	
	KA (Peak)	
11	No. of draw out type Air Circuit breaker panels supplied	
12	Date of commissioning & no of years of service	
13	Whether the Air circuit breaker panels and/or draw out motor control centre panels are in Successful Operation for	Yes / No.

Signature of authorized signatory.....

	atleast Two (2) years as on the date of consideration for approval but not later than six months after award date of the package.	
14	Certificate from client in support of above , year and month of Commissioning, period of successful operation and that the above are installed by us have caused no serious problem in the past, is furnished this proposal at Annexure.....	

.Sl.no	Description	Details
1.4	No. of Air circuit breakers having fault rating of at least 45kA rms BREAKING, 105kA peak MAKING and 45kA withstand for one (1) second, and their associated draw out type Air circuit breaker panels having fault rating of at least 45kA for one (1) second and 105kA peak , manufactured and supplied which are in successful operation for at least two (2) years.(under Route 2)	
01	Name of the manufacturer and its address	
02	Name of the manufacturer Plant and its Location	
03	Name of the plant / project for which the Air circuit breakers supplied & its location	
04	Name and Designation of the responsible person in Client's Organisation.Client's name, his address Client's name, his address	
	Fax no & Tel. No	
	e-mail id :	
	wedsite address	

Signature of authorized signatory.....

05	Whether manufactured and supplied the referred Air Circuit Breakers and their associated draw out type Air Circuit Breaker panels	Yes / No
06	Number of Units / Qty supplied	
07	Contract No & Date of Award of Contract	
08	Brief Scope of work	
09	Value of Order	
10	Air Circuit Breakers having fault rating	
	(ii) Rated current (A)	
	ii) Breaking Capacity (KA rms)	
	iii) Making Capacity (KA peak	
11	Draw out type Air Circuit Breaker panels having fault rating Falult rating (kA rms)	
	Time (Sec.)	
	KA (Peak)	
12	No. of draw out type Air Circuit breaker panels supplied	
13	Date of commissioning & no of years of service	
14	Whether the Air circuit breaker panels and/or draw out motor control centre panels are in Successful Operation for atleast Two (2) years as on the date of consideration for approval but not later than six months after award date of the package.	Yes / No.
15	Certificate from client in support of above , year and month of Commissioning, period of successful operation and that the above are installed by us have caused no serious problem in the past, is furnished this proposal at Annexure.....	

Signature of authorized signatory.....

Sl.no	Description	Details
1.5	Bidder's / Sub Vendor's Associate or Collaborator or Technology Provider or Licensor data to meet qualifying requirement stipulated in Route 1 for sourcing of Air Circuit Breakers. (under Route-2)	
1.5.1	No. of Air circuit breaker panels and/or draw out motor control centre panels manufactured and supplied, under a single order, with fault rating of at least 45kA for one (1) second and 105kA peak which are in successful operation for at least two (2) years. (under Route 2)	
01	Name of the manufacturer and its address (Associate or collaborator or Technology Provider of licensor)	
02	Name of the manufacturer Plant and its Location	
03	Name of the plant / project for which the manufacturer and its address (Associate or collaborator or Technology Provider of licensor Air circuit breakers supplied & its location.	
04	Name and Designation of the responsible person in Client's Organisation. Client's name, his address Client's name, his address	

Signature of authorized signatory.....

	Fax no & Tel. No	
	e-mail id :	
	wedsite address	
05	Whether manufactured and supplied the referred Air Circuit breaker panels / MCC panels	Yes / No
06	Number of Units / qty supplied	
07	Contract No & Date of Award of Contract	
08	Brief Scope of work	
09	Value of Order	
10	Draw out type Air Circuit Breaker panels and/or draw out motor control centre panels having fault rating (kA rms)Falult rating (kA rms)	
	Time (Sec.)	
	KA (Peak)	
11	No. of draw out type MCC panels supplied	
12	No. of draw out type Air Circuit breaker panels supplied	
13	Date of commissioning & no of years of service	
14	Whether the Air circuit breaker panels and/or draw out motor control centre panels are in Successful Operation for atleast Two (2) years as on the date of consideration for approval but not later than six months after award date of the package.	Yes / No.
15	Certificate from client in support of above , year and month of Commissioning, period of successful operation and that the above are installed by us have caused no serious problem in the past, is furnished this proposal at	

Signature of authorized signatory.....

	Annexure.....	
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.Sl.no	Description	Details
1.5.2	No. of Air circuit breakers having fault rating of at least 45kA rms BREAKING, 105kA peak MAKING and 45kA withstand for one (1) second, and their associated draw out type Air circuit breaker panels having fault rating of at least 45kA for one (1) second and 105kA peak , manufactured and supplied which are in successful operation for at least two (2) years. (under Route 2)	
01	Name & address of Manufacturer (Associate or Collaborator or Technology Provider or Licensor)	
02	Name of the Manufacturer (Associate or Collaborator or Technology Provider or Licensor) Plant and its Location	
03	Name of the plant / project for which the manufacturer and its address(Associate or collaborator or Technology Provider of licensor Air circuit breakers supplied & its location.	
04	Name and Designation of the responsible person in Client's Organisation.Client's name, his address Client's name, his address	
	Fax no & Tel. No	
	e-mail id :	

Signature of authorized signatory.....

	wedsite address	
05	Whether manufactured and supplied the referred Air Circuit Breakers and their associated draw out type Air Circuit Breaker panels	Yes / No
06	Number of Units / qty supplied	
07	Contract No & Date of Award of Contract	
08	Brief Scope of work	
09	Value of Order	
10	Air Circuit Breakers having fault rating	
	(iii) Rated current (A)	
	ii) Breaking Capacity (KA rms)	
	iii) Making Capacity (KA peak	
11	Draw out type Air Circuit Breaker panels having fault rating Falult rating (kA rms)	
	Time (Sec.)	
	KA (Peak)	
12	No. of draw out type MCC panels supplied	
13	No. of draw out type Air Circuit breaker panels supplied	
14	Date of commissioning & no of years of service	
15	Whether the Air circuit breaker panels and/or draw out motor control centre panels are in Successful Operation for atleast Two (2) years as on the date of consideration for approval but not later than six months after award date of the package.	Yes / No.

Signature of authorized signatory.....

16	Certificate from client in support of above , year and month of Commissioning, period of successful operation and that the above are installed by us have caused no serious problem in the past, is furnished this proposal at Annexure.....	
17	The letter of technical support by Associate/ Collaborator / Technology Provider / Licensor provided (under Route-2) .	Yes / No
1.6	Bidder/ Sub Vendor should have established manufacturing facility for draw out type Air Circuit Breaker Panels and draw out type Motor Control Centre Panels in India. Further, all the panels for this project shall be manufactured and supplied from the Indian manufacturing facility(Under Route-2)	Yes / No

Note : 1) Certificates from the client for the successful operation for each of the above shall be Submitted.

2) Supporting documents/ reference data as applicable shall be submitted.

Date : (Signature).....

Place : (Printed Name).....

(Designation).....

Signature of authorized signatory.....

(Common seal).....

Signature of authorized signatory.....