

PROJECT : Taltcher-III (2X660MW) PACKAGE : EPC PACKAGES CONTRACTOR: CONTRACT NO :										LIST OF C&I ITEMS REQUIRING QUALITY PLAN AND SUB SUPPLIER APPROVAL				REVISION NO : 00 DATE : 04.02.2022	
Sr No	Item Description	QP Inspection Category	QP No	QP submission at SCH	QP approval at SCH	Proposed Sub Supplier	Country	SS Approval_Status (Note-1)	SS Detail Sub.SCH	SS Approval SCH	Remark				
		III				Rectuson Co. Ltd	S.Korea	A							
		III				Procon Engineering	UK	A							
		III				Acoustic Monitoring International Inc. (AMI)	USA	A							
7	CCTV System (IP Based)														
		III				Axis	Sweden	A			1-CCTV components will be of Axis communication AB.Sweden make & Video Management Software will be of Milestone Brand. 2.Other BOI items shall be from LOA approved sources & will be tied up during the finalization MQP.				
		III				Bosch	Bengaluru	A			1.CCTV components will be of M/S Bosch make, and supplied through M/s Bosch, Bengaluru. 2. Other BOI items shall be from LOA approved sources & will be tied up during the finalization MQP.				
		III				Pelco	USA	A			1.CCTV components will be of M/S Pelco, USA make 2. Other BOI items shall be from LOA approved sources & will be tied up during the finalization MQP.				
7A	CCTV System (IP Based) /System Integrators														
		I				Jonson Control India Pvt Ltd	Mumbai	A			M/S Pelco Make CCTV system				
		I				Toshniwal Industrial Pvt Ltd	Ajmer	A			M/S Axis Make CCTV system				
		I				L&T TECHNOLOGY SERVICES	Bengaluru	A			M/S Bosch Make CCTV system				
		I				Score Information Technologies Limited	Kolkata	A			M/S Bosch Make CCTV system				
8	Control Desk														
		I				Pyrotech Workspace Solutions Pvt Ltd	Udaipur	A			BOI items like Mosaic tiles /Console items shall be as per LOA approved sources				
		I				Cosmos Media Products Pvt Ltd	Greater Noida	A			1. BOI items like Mosaic tiles /Console items shall be as per LOA approved sources 2. H block should be from knurr Germany 3. Solid acrylic surface should be procured from Du Pont/NTPC approved sources 3. Extruded Al profile structure should be procured from Hindalco (With Knurr design)				
		I				Adarsha Control system Pvt Ltd	Bengaluru	A			1. BOI items like Mosaic tiles /Console items shall be as per LOA approved sources 2. Acrylic solid surface (ASS) should be procured from Du Pont /NTPC approved sources 3. wood works are to be done by M/S C K Furn. Bengaluru				
9	Control Valves														

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		I			Honeywell Automation India Ltd	Pune	A			
		I			GE	France	A			
		I			SIEMENS	Gungram	A			
		I			BHEL	Bengaluru	A			
		I			Yokogawa	Bengaluru	A			For MAX DNA System
		I			GE Power India Ltd	Noida	A			
		I			Toshiba	Japan	A			
		I			ABB	Bengaluru	A			
		I			Emerson Process Management Ltd	Pawane	A			
11	Dust Emission Monitor									
		III			Durag India Instrumentation Pvt Ltd	Bengaluru	A			1. For Durag Germany Make Extractive Type Dust density analyser 2. Other components shall be as per approval letter CQA/NTPC BARH-I /S-TPP-I /D-263 / Durag India Instrumentation Pvt Ltd Bengaluru Dated 28.08.2019
		III			Sick India Pvt Ltd	Mumbai	A			1.For SICK AG Make Extractive Type Dust density analyser 2. Other components shall be as per approval letter CQA/NTPC BARH-I /S-9077/M/S SICK India Pvt Ltd dated 28.08.2019
		III			Environment SA India Pvt Ltd	Navi Mumbai	A			1.For ENEVA UK Make Extractive Type Dust density analyser 2. Other components shall be as per approval letter No.: CQA/NTPC BARH-I /E-335 / M/S Environment SA India Pvt Ltd Dated 16.09.2019
		III			Land Instruments International	UK	A			For In Situ type /Optical Transceiver type
		III			Codel	UK	A			For In Situ type /Optical Transceiver type
		III			Durag Industrie Elektronik GmbH & Co KG	Germany	A			For In Situ type /Optical Transceiver type & Extractive Type
		III			Emerson Process Management	Ireland	A			For In Situ type /Optical Transceiver type
		III			SICK AG	Germany	A			For In Situ type /Optical Transceiver type & Extractive Type
		III			ENEVA	UK	A			For Extractive Type Dust density analyser
12	Electrical Actuators									
12-A	Electrical Actuator (With gear box if applicable)									
		II			Antrieb Technik Pvt Ltd	Chennai	A			For low torque applications only
		II			Auma	Bengaluru	A			
		II			Limitorque	Faridabad	A			Model no L120,SMB,LX series, Gear Box T. HBC Series
		II			Rotork	Bengaluru	A			For low torque app (Up to 1000 Nm)
		II			Rotork Controls (India) Private Ltd	Chennai	A			For low torque app (Up to 1000 Nm) & High torque 4000 to 7000 Nm With integral starter for non critical applications

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		III				Auma	Germany	A							
		III				Limitorque	USA	A							
		III				Rotork	UK	A			For low torque app (Up to 1000 Nm)				
		III				Nippon gear	Japan	A							
		III				Drehmo GMBH	Germany	A			C Matic Series (DMC/DMCR)				
12-B	Electrical Actuator- Non-Intrusive (With gear box if applicable)														
		I				Auma India Pvt Ltd	Bengaluru	A			Also acceptable for Field Bus based applicable				
		III				Flowsolve	USA	A			Also acceptable for Field Bus based applicable				
		III				Bernard Controls	France	A							
12-C	Electrical actuator for ID/FD/PA Blade pitch JGV &SCOOP														
		III				Harold Beck & Sons Inc	USA	A							
		III				SIPOS Aktronik GmbH	Germany	A							
13	Electronics Transmitter (Pressure , DP and DP based Flow/Level)														
13-A	Electronics Transmitter (Pressure , DP and DP based Flow/Level)														
		III				ABB Ltd	Bengaluru	A			2600T & critical item from ABB Italy/ Their approved source;				
		III				Emerson Process Management Ltd	Pawane	A							
		III				Siemens Ltd	Thane	A			Model:-SITRANS P				
		III				Honeywell Automation India Ltd	Pune	A							
		III				Baldota Control and Equipment Pvt Ltd	Navi Mumbai	A			PT & DPT of LD 301 Series (SMAR)				
		III				Yokogawa India Limited	Bengaluru	A			EJA-E 110,430,530 SERIES & all raw material and BOI under knocked down condition (sensor assembly as a single unit) shall be sourced from M/S Yokogawa Japan				
		III				M/s Endress + Hauser India Automation Instrument Pvt Ltd	Aurangabad	A							
		III				Emerson (Rosemount)	USA	A							
		III				Yokogawa	Japan	A							
		III				ABB	Germany / Italy	A			2600T & critical item from ABB Italy/ Their approved source;				
		III				Siemens	France	A			Sitrans P DSIII Series				
		III				Fuji Electric	France	A			FCX -AIII SERIES				
		III				Fuji	Japan	A							
13-B	Electronics Transmitter -Field Bus Based (Pressure , DP and DP based Flow/Level)														
		I				ABB India Ltd	Bengaluru	A			One no of Transmitter will be sent at DDCMIS supplier for function testing of field bus communication with DDCMIS during FAT				
14	EQMS														

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		III				Durag GmbH	Germany	A			D-VTA-201	
		III				Lenox	USA	A				
		III				Mirion	UK	A				
		III				Piper GmbH	Germany	A				
		III				Sabota GmbH	Germany	A				
25	H2 Gas Analyser											
		I				ABB India Ltd	Bengaluru	A			M/s ABB Germany/UK. Make analyser	
		I				Adage Automation Pvt. Ltd	Goa	A			1.M/s Siemens, Germany (Calomat 6) Make analyser 2. PI refer Note-07	
		I				Yokogawa India Ltd	Bengaluru	A			M/s Yokogawa Japan (Gas Densitybased) Make analyser	
		I				SIEMENS	Gunugram	A			M/s Siemens, Germany (Calomat 6) Make analyser	
		III				GE Sensing EMEA	Ireland	A			Conductivity based	
		III				ABB	UK	A				
		III				Emerson (Rosemount)	USA	A				
		III				Environment One Corporation	USA	A			Conductivity based	
26	HEA Ignitor											
		I				Durag India Instrumentation Pvt Ltd	Bengaluru	A			M/S Durag Germany make HEA Ignitor	
		I				Hindustan Thermometers	Ambala	A			Conditional as per approval ref no 01/CQA/0270-102 dated 17.09.2012.Spark tip of their own make is also acceptable	
		I				Fives combustion System Pvt Ltd	Vadodara	A				
		I				Boiler control Pvt Ltd	Puddukottai (Tamilnadu)	A			Approved for Aux Boiler package only	
		III				Unison Industries	USA	A				
		III				Durag GmbH	Germany	A				
		III				Ignition system INC	USA	A				
		III				Test SPA	Italy	A				
27	High Temp. cable (PTFE/FEP)											
		II				Thermocables	Hyderabad	A				
		II				Tempsons	Udaipur	A				
		II				Habia cables	Sweden	A				
		II				Thermo Electrica BV	Netherland	A				
		II				Lapp cables	Germany	A				
		II				Kerpen cables	Germany	A				
		II				TEW & C	USA	A				
28	Impulse Pipes/Tubes											
		II				Maharashtra Seamless	Raigarh	A			For CS Pipes only	
		II				Ratnamani Metals and Tubes	Gandhinagar	A			For SS only.	
		II				Heavy Metals and Tubes	Gandhinagar	A			For SS & CS only.	
		II				ISMT	Ahamadnagar	A			For CS/ AS upto Gr 22 Pipes only	
		II				Nippon Steel & Sumitomo Metals corporation	Japan	A				
		II				TPS Teintube	Germany	A				
		II				Veluric & Manessmann	Germany	A				
		II				Trouway and Cauvin	France	A				
		II				Sandvik	Sweden	A			For SS only	
29	Instrument Cables (F.G & T/C Cables)											


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		Note-2				Goyolene Fibers (India) Pvt Ltd	Silvassa	A			F&G Type Cable				
		Note-2				Tensens Instruments Ind Pvt Ltd	Udaipur	A							
		Note-2				Havells India	Alwar	A			F Type Cable				
		Note-2				Paramount Communication Ltd	Khushkhera	A							
		Note-2				Polycab	Daman	A							
		Note-2				Delton	Faridabad	A							
		Note-2				KEI	Bhiwadi (Raj)	A							
		Note-2				Elkey Telelinks	Faridabad	A							
		Note-2				CORDS	Kaharani	A							
		Note-2				CORDS	Bhiwadi	A							
		Note-2				Nicco	Kolkata	A							
		Note-2				Universal Cable	Satna	A							
		Note-2				Thermocables	Hyderabad /Mahboobnagar	A							
		Note-2				Gupta Power Infrastructure Ltd.	Khurda	A							
		Note-2				CMI	Faridabad	A							
		Note-2				Advance Cables Pvt Ltd	Bengaluru	A			F&G Type Cable				
		Note-2				Genscab Industries Ltd	Bhiwadi (Raj)	A			F&G Type Cable				
		Note-2				Apar Industries Limited	Valsad	A			F&G Type Cable				
		Note-2				Suyog Electricals Ltd	Halol (Gujrat)	A							
		Note-2				Special Cables Pvt Ltd	Rudrapur	A							
		Note-2				T C Communication	Ghaziabad	A							
		Note-2				TEW & C	USA	A							
		Note-2				Habia cables	Sweden	A							
		Note-2				Kerpen cables	Germany	A							
		Note-2				Lapp cables	Germany	A							
		Note-2				Thermo electra Bv	Netherland	A							
30	Intelligent Battery charger 24V DC / DCDB/BHMS														
		II				Chabbi Electricals	Jalgaon	A			Rectifier module, Controller module and Battery Health monitoring system shall be of M/s Vertiv make				
		II				Eitek SGS Pvt Ltd	Gurgaon	A							
31	Large Video Screen (LED Based)														
		I				Pyrotech Electronics Pvt Ltd	Udaipur	A							
		I				Delta India Electronics Pvt Ltd	Gurgaon	A							
		I				Barco Electronics system (P) Ltd	Noida	A							
		I				Planner System Inc	USA	A							
32	Level switch- Conductivity type														
		II				Raman Instruments (System integrator of Delta Morbey/ Emerson Mobrey /Solatron -Mobrey)	Delhi	A			1.M/S Emerson (Morbey) UK system 2.PI refer Note-07				
		II				HI Tech System & services Ltd (System Integrator of Levelstate systems Ltd ,UK)	Kolkata	A			1. M/S Levelstate UK System .Vessel from M/s Hi Tech 2.PI refer Note-07				
		II				BHEL	Trichurapalli	A							
		III				Emerson -Mobrey (Solatron mobrey)	UK	A							
		III				Levelstate Systems Ltd	UK	A							

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33	Local Instrument Enclosure/Rack	III				Yarway	USA	A							
		I				Pyrotech Electronics Pvt. Ltd	Udaipur	A			BOI from LOA approved sources				
		I				Sajas electrical	Trichurapalli (Tamilnadu)	A			BOI from LOA approved sources				
		I				Prammen	Puddukottai (Tamilnadu)	A			BOI from LOA approved sources				
		I				Chemin C&I Pvt Limited	Puducherry	A			1- BOI from LOA approved sources 2.Fabrication at M/s LUFFT tech India 3- Painting at M/s Supreme Coater & Fabricator				
34	Master Slave Clock System														
		I				Signals and Systems Pvt. Ltd. (SANDS)	Chennai	A							
		I				Masibus	Gandhinagar	A							
		I				Sertel Electronics Pvt. Ltd.	Chennai	A							
		II				Hopf Electronik GmbH	Germany	A							
		II				Hathway	USA	A							
		II				Mein Berg	Germany	A							
		II				Moser Baer AG	Switzerland	A							
35	Mercury Analyser														
		I				Analysier Instrument Co. Pvt Ltd (AIC)	Kota	A			1. Mercury Analyzer from PS Analytical UK 2.System integration & supply of components like, Enclosure with AC, calibration cylinders, PC will be done by M/s Analyser Instrument Co. Pvt Ltd (AIC) Kota . 3.PI refer Note-07				
		III				Environment SA India Pvt Ltd	Navi Mumbai	A			1-Mercury analyzer with accessories will be from Mercury instruments GmbH Germany . 2- Other components like, sample line between probe to mercury analyzer will be supplied by M/s Environment SA India Pvt Ltd .				
		III				Thermo Fisher Scientific India Pvt. Ltd	Pune	A			1. Mercury Analyser shall be from Thermofisher USA 2. Other approval conditions are as per approved letter ref no 01/CQA/9578-001/Thermofisher dated 09/12/2016				
		III				Durag India Instrumentation Pvt Ltd	Bengaluru	A			Analysier from M/s Verewa Umwelt Germany				
		III				Mercury Instruments GmbH	Germany	A							
		III				SICK AG	Germany	A							
		III				Thermofisher	USA	A							
36	PA System (IP Based)														
		III				BNA Technology Consulting Ltd.	Bengaluru	A			BOI shall be from LOA approved sources.				
		III				Armtel	Russia	A							
		III				Zenitel	Norway	A			1.PA system active component , Proprietary item will be Zenitel Norway make 2.Other components & BOI shall be from LOA approved sources				

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36A	PA System (IP Based)/System Integrators	III				Commend International GMBH	Austria	A			note-7 For M/s Armtel Russia system		
		III				Willstrong Solutions Pvt. Ltd	Greater Noida	A			Approval conditions as per approval letter no Paratu-QA/9585-001-102/V/A-Willstrong Dated: 21.12.20		
		III				Toshniwal Industries Pvt ltd	Ajmer	A			For M/s Commend Austria make system		
		III				Aishan Technologies Pvt Ltd	Bengaluru	A			For M/s Zenitel Norway make system		
		III				Haritasa Checkmate Electronics Pvt Ltd	Bengaluru	A			For M/s Commend Austria make system		
		III				Netware Computer Pvt Ltd	New Delhi	A			For M/s Commend Austria make system		
37	PLC System												
		I				Emerson Automation solution Intelligent platforms Pvt Ltd	Bengaluru	A			PLC modules from M/s Emerson USA & BOI shall be from LOA approved sources		
		I				ABB India Ltd	Bengaluru	A					
		I				Schneider Electric system india Pvt Ltd	Chennai	A			PLC modules from M/s Schneider France & BOI shall be from LOA approved sources		
		I				Rockwell	Sahibabad	A					
		I				Siemens	Nasik	A					
		I				Honeywell	Pune	A			PLC modules from M/s Honeywell S.Korea & BOI shall be from LOA approved sources		
		I				Schneider Electric India Pvt Ltd	Bengaluru	A			PLC modules from M/s Schneider France & BOI shall be from LOA approved sources		
37-A	PLC System Integrators										Note-11 and note-7		
		I				Ladder Automation Solution Pvt Ltd	Gunugram	A			For M/s Honeywell make system		
		I				Virtual Automation	Ranga Reddy (Telangana)	A			For M/s Schneider make system		
		I				Commae Electronics Pvt Ltd	Pune	A			For M/s SIEMENS make system		
		I				Tech-Masters	Hyderabad	A			For M/s Emerson make system		
		I				Powertech Switchgear (I) Pvt Ltd	Sonepat	A			For M/s Schneider make system		
		I				Unity Industrial Automation Pvt Ltd	Delhi	A			For M/s Rockwell make system		
		I				EMCONS	Ranchi	A			For M/s Rockwell make system		
		I				Divya Engineers	Chennai	A			For M/s SIEMENS make system		
		I				M D Industries	Vadodara	A			For M/s Emerson make system		
		I				Velox automation	Surat	A			For M/s SIEMENS make system		
		I				Vision Comptel	Kolkata	A			For M/s Emerson make system		

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		I				Adaptive Engineering Private Limited	Ahmedabad	A			For M/s Schneider make system				
		I				Greenwave Solutions Private Limited	Kolkata	A			For M/s Rockwell make system				
		I				Dreamz Automation	Ghaziabad	A			For M/s SIEMENS make system				
		I				Creative Robotics	Ghaziabad	A			For M/s Honeywell make system				
		I				Kruti Techno Engineer Pvt Ltd	Chhapraula (GB Nagar	A			For M/s SIEMENS make system				
		I				EDS Instruments & Systems Pvt Ltd	Chennai	A			For M/s Honeywell make system				
		I				Delsys Automation Technologies Pvt Ltd	Chennai	A			For M/s Emerson make system				
		I				Hindustan Controls and Equipment Ltd	Kolkata	A			For M/s Emerson make system				
		I				Vollkraft Engineering And Consultant (P) Ltd	Kolkata	A			For M/s Emerson make system				
		I				SSM Infotech Solutions Pvt Ltd	Surat	A			For M/s Schneider make system				
		I				Sun Industrial Automation & Solutions	CHENNAI	A			For M/s Schneider make system				
38	Pneumatic Actuator Regulating (Power Cylinder HAD,CAD SADC & Burner Tilt)														
		I				Instrumentation Limited	Palakkad (Kerala)	A							
		I				Kelton	Cochin (Alleppy)	A							
		I				SMC Corporation India Private Ltd	Noida	A			Up to Bore size 12 inches				
		I				IMI Norgren Herion Pvt Ltd	Noida	A							
		II				Dong Woo Valve Control Co. Ltd	S.Korea	A							
		II				Shin Hwa Engineering Co. Ltd	S.Korea	A							
39	Radar type level transmitter														
		III				Linaco	Russia	A			High Frequency Type				
		III				Emerson Process Management Ltd	Pawane	A			For M/s Emerson Singapore make				
		III				Endress & Houser	Aurangabad	A							
		III				SIEMENS	Canada	A							
		III				B M Technology	Italy	A			For Non Contact type				
		III				Magnetrol	Belgium	A							
		III				ABB	USA	A			K-Tech Brand				
		III				Endress & Houser	Germany	A							
		III				Saab Rosemount	Sweden	A							
		III				Emerson Process Management	Singapore	A			Rosemount 3300 series for GW Radar & 5600 Series for Non-Contact type				
		III				Endress & Houser	Germany	A							
		III				Vega Grieshaber KG	Germany	A							
40	Short Term Fire Proof cable														
		III				nVent Solutions limited	UK	A							
		III				Wrexham Mineral	UK	A							
		III				KME	Italy	A							

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41	SWAS (Sampling Handling System and Dry Panel)															
		I				Emerson Process Management Ltd					Navi Mumbai				Analysers and Other BOI Components from LOA agreed source	
		I				Forbes Marshall					Pune				Analysers and Other BOI Components from LOA agreed source	
		I				SEPL					Pune				Analysers and Other BOI Components from LOA agreed source	
42	Water Analyser (Chloride, Conductivity, Dissolved Oxygen,pH, Hydrazine, Concentration , Phosphate, Silica, Sodium,Turbidity, Total Iron, Degassed Cation Conductivity)															
		III				Emerson Process Management Pvt Ltd					Pawane				For Conductivity,pH, Dissolved Oxygen, Turbidity	
		III				Mettlet Toledo India Pvt Ltd					Vasai				For pH Analyser (1. PH analyser from M/S Mettler Toledo GmbH Switzerland 2. Other components like, Housing, Panel mounting kit, Tubing's & easy clean mechanism will be supplied by M/s Mettler Toledo India Pvt Ltd)	
		III				Endress Hauser India Pvt. Limited					Mumbai				For pH Analyser (1. pH sensor with cable , analyser, retract & cleaning assembly , electrolyte reservoir (As applicable) will be supplied from Principals of M/S Endress Hauser India Pvt. Limited 2. Other components like, Flow through assembly shall be supplied from M/S Endress Hauser India Pvt. Limited approved sources.)	
		III				Thermo Fisher Scientific					USA				For Chloride,Dissolved Oxygen,Hydrazine	
		III				ABB					UK				For Chloride,Dissolved Oxygen,Hydrazine, Phosphate, Silica,Sodium,Turbidity	
		III				Hach					USA				For Conductivity, pH,Concentration, Phosphate, Silica,Turbidity	
		III				ABB					USA				For Conductivity, pH	
		III				Yokogawa					Japan				For Conductivity	
		III				Hach					Switzerland				For Dissolved oxygen, Hydrazine, Silica,Sodium	
		III				Yokogawa					Japan				For pH	
		III				Eutech Instrument PTE Ltd					Singapore				For Silica	
		III				Orion					USA				For Sodium	
43	Temp Transmitter															
43-A	Temp Transmitter															
		III				Endress & Houser					Aurangabad					
		III				Emerson Process Management Ltd					Pawane				For M/s Emerson Singapore make	
		III				Yokogawa					Bengaluru				Make Yokogawa japan and calibration at Yokogawa Bangalore	

PROJECT : Talcher-III (2X660MW) PACKAGE : EPC PACKAGES CONTRACTOR: CONTRACT NO :										LIST OF C&I ITEMS REQUIRING QUALITY PLAN AND SUB SUPPLIER APPROVAL				REVISION NO :00 DATE :04.02.2022	
Sr No	Item Description	QP Inspection Category	QP No	QP submission at SCH	QP approval at SCH	Proposed Sub Supplier	Country	SS Approval_Status (Note-1)	SS Detail Sub.SCH	SS Approval SCH	Remark				
		III				ABB	Bengaluru	A			For M/s ABB Germany make				
		III				WIKA Instruments India Pvt Ltd	Pune	A			For M/s WIKA Germany make Model no T-32				
		III				Honeywell Automation India Ltd	Pune	A							
		III				Yokogawa	Japan	A							
		III				Moore	USA	A							
		III				M System co Ltd	Japan	A							
		III				Emerson	U.S.A/Singapore/Germany	A			Model No-B3HU-U-0				
		III				ABB	Germany	A							
		III				Emerson Process Management	Germany	A							
43-B	Temp Transmitter -Field Bus based Single/Dual Input	I				ABB India Ltd	Bengaluru	A			One no of TT will be available at DCS supplier for function testing of field bus communication with DCS during FAT				
44	Turbine supervisory Instruments along with vibration analysis system.	I				GE	Pune	A			For GE Bently ,USA make system				
		I				Meggitt India Pvt ltd	Bengaluru	A			For Meggitt (Vibrometer) Switzerland make system				
		I				Forbes Marshall	Pune	A			For Shinkawa ,Japan make system				
		II				GE BENTLY	USA	A							
		II				SHINKAWA	JAPAN	A							
		II				MEGGITT	Switzerland	A							
45	Ultrasonic Type Flow Meter (for Stack)	III				Sick India Pvt ltd	Mumbai	A			For Sick AG Germany make				
		III				Sick AG	Germany	A							
		III				Durag	Germany	A							
		III				Teledyne	USA	A							
46	Ultrasonic type level Transmitter	III				EIP Enviro	Noida	A			1-Ultrasonic level Tx shall be BM Technology Italy make 2-Required mounting arrangement , Testing, Calibration shall be carried out at M/s EIP Works.				
		III				E & H	Aurangabad	A			Complete Intrument Transmitter & Probe to be procured from Mobrey UK , only intergration & configuration at Pawane works				
		III				Emerson Process Management Ltd	Pawane	A							
		III				BM Technology	Italy	A							
		III				Siemens Miltronics	Canada	A							
		III				Nivelco Process Control	Hungary	A							
		III				E & H	Germany	A							
		III				HAWK Measurement PTY Ltd	Australia	A							
47	UPS With ACDB	Note-5				Vertive Energy Pvt Ltd	Pune	A			Upto 125 KVA for 1 phase and 300 KVA for 3 Phase				
		Note-5				Vertive Energy Pvt Ltd	Mumbai	A			Upto 160 KVA				
		Note-5				Hitachi Hired Power Electronics Pvt Ltd	Gandhinagar	A			Upto 160 KVA,				

PROJECT : Talcher-III (2X660MW) PACKAGE : EPC PACKAGES CONTRACTOR: CONTRACT NO :											LIST OF C&I ITEMS REQUIRING QUALITY PLAN AND SUB SUPPLIER APPROVAL				REVISION NO : 00 DATE :04.02.2022	
Sr No	Item Description	QP Inspection Category	QP No	QP submission at SCH	QP approval at SCH	Proposed Sub Supplier	Country	SS Approval_Status (Note-1)	SS Detail Sub.SCH	SS Approval SCH	Remark					
		Note-5				Fuji Electric Consul Neowatt Private Limited	Pune	A			Up to 100 KVA single phase					
		Note-5				KELTRON	Trivendrum	A								
		Note-5				Merlin & Gerin	France	A								
		Note-5				Gutor	Switzerland	A								
		Note-5				AEG	Germany	A								
		Note-5				Fuji Electric	Japan	A								
48	Vibration Monitoring System					Sensorics Technology India	Kundli	A			For Sensoric UK system					
		II									1. Imported items like Vibration Monitors, Cross Connection Cables, Buffered Output Modules, and Piezoelectric Vibration Sensors, Eddy Current type Proximity Probe, Extension Cable and Signal Conditioner will be procured from Valmet Automation, Finland. 2.Indigenous items like Communication cables, networking components, blank panels, TB, OWS will be procured from NTPC approved sources.					
		II				BHEL	Bengaluru	A								
		II				IRD Mechanalysis Ltd	Thane	A			Vibration sensors will be sourced from M/s Hansford UK ,however brand name of IRD and its logo is acceptable with suitable traceability of M/s Hansford , UK.					
		II				Forbes Marshall Pvt Limited	Pune	A			VMS hardware , Sensors ,extension cables shall be shinkawa Japan make 2. All other BOI shall be from LOA agreed sources					
		II				GE	Pune	A			For GE Bentley , USA Make					
		II				Rockwell Automation	Sahibabad	A			For Rockwell USA make					
		II				SKF	Pune	A			For SKF USA make					
		II				Imageneous Engineering Pvt Ltd	Vadodara	A			1-For Meggitt Switzerland make 2- Refer note 7					
		II				Shinkawa	Japan	A								
		II				GE	USA	A			Bentley Niveda brand					
		II				Meggitt	Switzerland	A								
		II				Sensoric Limited	UK	A								
49	Wireless Solution (Microwave Tower Communication)															
		I				L&T Technology Services (LTTTS)	Bengaluru	A			1- Wireless Product (Access Point, Antenna) shall be M/s Cambium UK Make 2- Other Item like Switch, Cat-6 Cable can be supplied from M/s LTTTS approved sources meeting technical requirements.					
		I				Lotus wireless technologies India Pvt Ltd	Visakhapatnam	A								
		I				Sheetal Wireless Technologies Pvt Ltd	Pune	A								
		III				Proxim Wireless Corporation	USA	A			BOI shall be as per approval letter					

PROJECT : Talcher-III (2X660MW) PACKAGE : EPC PACKAGES CONTRACTOR: CONTRACT NO :										LIST OF C&I ITEMS REQUIRING QUALITY PLAN AND SUB SUPPLIER APPROVAL					REVISION NO : 00 DATE :04.02.2022	
Sr No	Item Description	QP Inspection Category	QP No	QP submission at SCH	QP approval at SCH	Proposed Sub Supplier	Country	SS Approval_Status (Note-1)	SS Detail Sub.SCH	SS Approval SCH	Remark					
50	Field Bus Cable/ Profibus Cable- PA & DP type	I				LAPP India Pvt Ltd	Bangalore	A								
51	Field bus components (Field bus modules ,segment protector ,surge protector & SS JB)	III				Phoenix Contact Inc	USA	A			Materiall will be allowed to dispatch from the vendor works as CAT-III item ,however all material except SS junction box will be available at DDCMIS supplier works for functional testing .					
		III				Pepperl + Fuchs Pte Ltd	Singapore	A			Materiall will be allowed to dispatch from the vendor works as CAT-III item ,however all material will be available at DDCMIS supplier works for functional testing .					
52	Stockyard Management System(Including 3D profiling scanner ,Thermal Imaging Camera, RTK GPS)	III				TSA	Brazil	A			For 3D profiling / Tripple-IN Germany make					
53	Perimeter Intrusion Detection System	III				Sensar	Canada	A			For 3D profiling / 1-Tripple-IN Germany make Laser Scanner and RPU along with software from TSA Brazil					
54	Radar based Perimeter Surveillance System	III				Magos System Ltd	Israel	A			2- Other item like ethernet cable, Ethernet Switch, Junction Box required for execution of 3D stockpile management system can be supplied by EIP Enviro					
55	Thermal Camera (PTZ)	III				FLIR Commercial Systems INC	USA	A			Third Party "Cyber Penetration report " shall be provided along with material TC/COC					

Main Contractor approved sources (Note-12)

MC-1	Amonia Analyser	III				Main Contractor Approved Sources			
MC-2	Amonia leak detector	III				Main Contractor Approved Sources			
MC-3	Air Filter Regulator	III				Main Contractor Approved Sources			
MC-4	Anemometer	III				Main Contractor Approved Sources			
MC-5	Annunciator	III				Main Contractor Approved Sources			
MC-6	Battery Health Monitoring System	III				Main Contractor Approved Sources			
MC-7	Biofouling/ Deposit Monitor	III				Main Contractor Approved Sources			
MC-8	Coal bunker Level monitor	III				Main Contractor Approved Sources			
MC-9	Compression Fittings(SS)	III				Main Contractor Approved Sources			
MC-10	Condensing Pots	III				Main Contractor Approved Sources			
MC-11	Conduits /Pipe (GI)	III				Main Contractor Approved Sources			
MC-12	Conduits lead coated (Flexible)	III				Main Contractor Approved Sources			

Main Contractor approved sources (Note-12)

MC-1	Amomia Analyser	III						Main Contractor Approved Sources											
MC-2	Amomia leak detector	III						Main Contractor Approved Sources											
MC-3	Air Filter Regulator	III						Main Contractor Approved Sources											
MC-4	Anemometer	III						Main Contractor Approved Sources											
MC-5	Annunciator	III						Main Contractor Approved Sources											
MC-6	Battery Health Monitoring System	III						Main Contractor Approved Sources											
MC-7	Biofouling/ Deposit Monitor	III						Main Contractor Approved Sources											
MC-8	Coal bunker Level monitor	III						Main Contractor Approved Sources											
MC-9	Compression Fittings(SS)	III						Main Contractor Approved Sources											
MC-10	Condensing Pots	III						Main Contractor Approved Sources											
MC-11	Conduits /Pipe (GI)	III						Main Contractor Approved Sources											
MC-12	Conduits lead coated (Flexible)	III						Main Contractor Approved Sources											

PROJECT : Taltcher-III (2X660MW) PACKAGE : EPC PACKAGES CONTRACTOR: CONTRACT NO :											LIST OF C&I ITEMS REQUIRING QUALITY PLAN AND SUB SUPPLIER APPROVAL				REVISION NO : 00 DATE :04.02.2022	
Sr No	Item Description	QP Inspection Category	QP No	QP submission at SCH	QP approval at SCH	Proposed Sub Supplier	Country	SS Approval_Status (Note-1)	SS Detail Sub.SCH	SS Approval SCH	Remark					
MC-13	Copper tubing/Brass connectors	III				Main Contractor Approved Sources										
MC-14	Coriolis Type Mass Flow meter	III				Main Contractor Approved Sources										
MC-15	Coupling /Interposing Relays	III				Main Contractor Approved Sources										
MC-16	Density Indicator	III				Main Contractor Approved Sources										
MC-17	Desk for OWS/EWS/Printer/Server	III				Main Contractor Approved Sources										
MC-18	Digital Indicators	III				Main Contractor Approved Sources										
MC-19	Dust Sensor	III				Main Contractor Approved Sources										
MC-20	Dew point sensor/meter (H2)	III				Main Contractor Approved Sources										
MC-21	Flow Gauge	III				Main Contractor Approved Sources										
MC-22	Flow Indicator cum Totaliser	III				Main Contractor Approved Sources										
MC-23	Flow Switch	III				Main Contractor Approved Sources										
MC-24	FRP Junction Box	III				Main Contractor Approved Sources										
MC-25	Furniture for control Room(Chair, Almira, Lock)	III				Main Contractor Approved Sources										
MC-26	Furnace exit gas temp probe	III				Main Contractor Approved Sources										
MC-27	Graphic Interface Unit	III				Main Contractor Approved Sources										
MC-28	Hand Held Calibrator	III				Main Contractor Approved Sources										
MC-29	Hart Management System	III				Main Contractor Approved Sources										
MC-30	Humidistat / Thermostat / Gyserstat / Airstat	III				Main Contractor Approved Sources										
MC-31	Instant Corrosion Rate Monitor & Portable Corrosion Meter	III				Main Contractor Approved Sources										
MC-32	Impact head type flow element	III				Main Contractor Approved Sources										
MC-33	Instrument Tube Fittings (Air)	III				Main Contractor Approved Sources										
MC-34	Instrument Valve	III				Main Contractor Approved Sources										
MC-35	IR Detector	III				Main Contractor Approved Sources										
MC-36	KVM Switch/Matrix KVM Switch	III				Main Contractor Approved Sources										
MC-37	Level gauge (Transparent & Reflex, Tubular type)	III				Main Contractor Approved Sources										
MC-38	Level Indicator (Float & Board type)	III				Main Contractor Approved Sources										
MC-39	Level switch - Float/Displacer Type	III				Main Contractor Approved Sources										
MC-40	Level Switch (RF Type)	III				Main Contractor Approved Sources										
MC-41	Level switch capacitance type	III				Main Contractor Approved Sources										
MC-42	Limit Switch	III				Main Contractor Approved Sources										
MC-43	Maintenance and Calibration Equipment	III				Main Contractor Approved Sources										
MC-44	Mini UPS-Type C configuration	III				Main Contractor Approved Sources										
MC-45	Orifice plate assembly	III				Main Contractor Approved Sources										
MC-46	On line carbon in Ash analyser	III				Main Contractor Approved Sources										
MC-47	Pilot Tube	III				Main Contractor Approved Sources										
MC-48	Pr/Vacuum/DP Gauges	III				Main Contractor Approved Sources										
MC-49	Press, DP, Vacuum Switch	III				Main Contractor Approved Sources										
MC-50	Printer (Dot Matrix/Inkjet / Laser)	III				Main Contractor Approved Sources										
MC-51	Psychrometer	III				Main Contractor Approved Sources										
MC-52	Pulse jet Controller	III				Main Contractor Approved Sources										
MC-53	Pulse Valve	III				Main Contractor Approved Sources										
MC-54	Residual Chlorine Analyser	III				Main Contractor Approved Sources										
MC-55	Rotameter	III				Main Contractor Approved Sources										
MC-56	Reverse Rotation Indicator	III				Main Contractor Approved Sources										
MC-57	Synchronising Relay	III				Main Contractor Approved Sources										
MC-58	Synchoscope	III				Main Contractor Approved Sources										
MC-59	Semaphore Indicators	III				Main Contractor Approved Sources										
MC-60	Sight Flow Indicator	III				Main Contractor Approved Sources										
MC-61	Smart Positioner	III				Main Contractor Approved Sources										
MC-62	Socket Weld Fittings	III				Main Contractor Approved Sources										
MC-63	Solenoid Valve	III				Main Contractor Approved Sources										

PROJECT : Tatcher-III (2X660MW) PACKAGE : EPC PACKAGES CONTRACTOR: CONTRACT NO :										LIST OF C&I ITEMS REQUIRING QUALITY PLAN AND SUB SUPPLIER APPROVAL				REVISION NO : 00 DATE :04.02.2022	
Sr No	Item Description	QP Inspection Category	QP No	QP submission at SCH	Proposed Sub Supplier	Country	SS Approval Status (Note-1)	SS Detail Sub.SCH	SS Approval SCH	Remark					
MC-64	Solid Mass Flow Meter	III			Main Contractor Approved Sources										
MC-65	Terminal Block (Cage and Clamp type)	III			Main Contractor Approved Sources										
MC-66	Temperature cum Humidity Indicator	III			Main Contractor Approved Sources										
MC-67	Temperature Element(Thermocouple , RTD & Thermowell)	III			Main Contractor Approved Sources										
MC-68	Temperature Gauge(With Thermowell)	III			Main Contractor Approved Sources										
MC-69	Temperature Switch	III			Main Contractor Approved Sources										
MC-70	Transducer	III			Main Contractor Approved Sources										
MC-71	Tube thickness Meter	III			Main Contractor Approved Sources										
MC-72	Voltmeter/ Waterhour Meter	III			Main Contractor Approved Sources										
MC-73	Valve manifolds	III			Main Contractor Approved Sources										
MC-74	Electric to Pneumatic Converter	III			Main Contractor Approved Sources										
MC-75	Network components	III			Main Contractor Approved Sources										
MC-76	Isolator	III			Main Contractor Approved Sources										
MC-77	ORP Monitor /Analyser	III			Main Contractor Approved Sources										
MC-78	Ultrasonic Type Flow Transmitter	III			Main Contractor Approved Sources										
MC-79	Chlorine Leak detector	III			Main Contractor Approved Sources										
MC-80	Density Meter	III			Main Contractor Approved Sources										
MC-81	Electro Magnetic Flow meter	III			Main Contractor Approved Sources										
MC-82	Positive displacement Type Flow Meter	III			Main Contractor Approved Sources										
MC-83	Level Scanner (3 D)for Solid Application	III			Main Contractor Approved Sources										
MC-84	Mosaic tiles /Console items	III			Main Contractor Approved Sources										
MC-85	Electrical Control Panel (UCP/Backup)	III			Main Contractor Approved Sources										
MC-86	Electrical Indicating Instruments (Mosaic Compatible)	III			Main Contractor Approved Sources										
MC-87	OVS/EWS/Server	III			Main Contractor Approved Sources										
MC-88	Bio Matrix Reader	III			Main Contractor Approved Sources										
MC-89	ANPR	III			Main Contractor Approved Sources										
MC-90	UVSS	III			Main Contractor Approved Sources										
MC-91	Comd & Control System	III			Main Contractor Approved Sources										
MC-92	Access & Controller Software	III			Main Contractor Approved Sources										
MC-93	IR LED based Illuminator	III			Main Contractor Approved Sources										
MC-94	ATB Bollard	III			Main Contractor Approved Sources										
MC-95	Boom Barrier	III			Main Contractor Approved Sources										
MC-96	Touchless biometric recorder	III			Main Contractor Approved Sources										
MC-97	GPS Sensor based Vehicle Monitoring system	III			Main Contractor Approved Sources										
MC-98	10mp digital camera with tripod for photo capture	III			Main Contractor Approved Sources										
MC-99	2D GIS map application	III			Main Contractor Approved Sources										
MC-100	Audible alarm device	III			Main Contractor Approved Sources										
MC-101	CameraPoles	III			Main Contractor Approved Sources										
MC-102	Card Reader	III			Main Contractor Approved Sources										
MC-103	Door Frame Metal Detector -DFMD	III			Main Contractor Approved Sources										
MC-104	Door sensor	III			Main Contractor Approved Sources										
MC-105	Egress Switch	III			Main Contractor Approved Sources										
MC-106	EM LOCK	III			Main Contractor Approved Sources										
MC-107	Emergency exit / door override switch	III			Main Contractor Approved Sources										
MC-108	Emergency Siren /Hooter	III			Main Contractor Approved Sources										
MC-109	Flap barrier	III			Main Contractor Approved Sources										
MC-110	Flash Lights for covering perimeter area for clear view from PTZ in night time	III			Main Contractor Approved Sources										
MC-111	Geo fencing	III			Main Contractor Approved Sources										
MC-112	Glass Break switch at Emergency Exit	III			Main Contractor Approved Sources										
MC-113	Guard tour	III			Main Contractor Approved Sources										

PROJECT : Tatcher-III (2X660MW)		LIST OF C&I ITEMS REQUIRING QUALITY PLAN AND SUB SUPPLIER APPROVAL						REVISION NO : 00			
PACKAGE : EPC PACKAGES								DATE :04.02.2022			
CONTRACTOR:											
CONTRACT NO :											
Sr No	Item Description	QP Inspection Category	QP No	QP submission at SCH	QP approval at SCH	Proposed Sub Supplier	Country	SS Approval_Status (Note-1)	SS Detail Sub.SCH	SS Approval SCH	Remark
MC-114	Half Height Turnstile	III				Main Contractor Approved Sources					
MC-115	Handheld Walkie - Talkie	III				Main Contractor Approved Sources					
MC-116	HHMD	III				Main Contractor Approved Sources					
MC-117	Long Range RFID Reader	III				Main Contractor Approved Sources					
MC-118	Monitors 24 Inch Full HD	III				Main Contractor Approved Sources					
MC-119	Network Panel	III				Main Contractor Approved Sources					
MC-120	Optical Time Domain Reflector-meter (OTDR) with all accessories	III				Main Contractor Approved Sources					
MC-121	Panic Button with Audible Alarm	III				Main Contractor Approved Sources					
MC-122	Panic button/SOS button support in SIP protocol	III				Main Contractor Approved Sources					
MC-123	RFID based Stickers	III				Main Contractor Approved Sources					
MC-124	Sliding Gate	III				Main Contractor Approved Sources					
MC-125	SMS gateway	III				Main Contractor Approved Sources					
MC-126	Storage Device (SAN/NAS/DAS) of 100 TB each	III				Main Contractor Approved Sources					
MC-127	Traffic Light	III				Main Contractor Approved Sources					
MC-128	Turnstile - half height	III				Main Contractor Approved Sources					
MC-129	SPIKE BARRIER	III				Main Contractor Approved Sources					
MC-130	CHAIN LINK FENCE	III				Main Contractor Approved Sources					
MC-131	X-ray Baggage Scanner	III				Main Contractor Approved Sources					
MC-132	Static Radio Set	III				Main Contractor Approved Sources					
LEGENDS :											
1.0 SYSTEM SUPPLIER / SUB SUPPLIER APPROVAL STATUS CATEGORY											
A - For those items proposed vendor is acceptable to Customer. To be indicated with letter "A" in the list alongwith the condition of approval, if any.											
2.0 QP INSPECTION CATEGORY :											
CAT - I : For those items the Quality Plans are approved by Customer and final acceptance will be on physical inspection witness by Customer											
CAT - II : For those items the Quality Plans are approved by Customer. However no physical inspection shall be done by Customer. The final acceptance by Customer shall be on the basis of review of documents.											
CAT - III : For these Items Quality control to be exercised as per Main contractor Quality Assurance System. The final acceptance by NTPC shall be on the basis of Certificate of Conformance (COC) by Main Contractor.											
UNITS/WORKS : Place of manufacturing- Place of main supplier of multi units/works.											
NOTE - 1 : A : Vendors to submit project specific documents as per Sub-QR requirements in case the Vendor is approved under collaboration agreement.											
B: In case approved sub vendor is offering product with latest model/series apart from earlier approved, vendors to submit project specific documents as per Sub-QR requirements.											
NOTE - 2 : For Instrument cable <= 1 KM inspection category CAT - III. For > 1 KM to <= 10 KM inspection category CAT - II COC & FOR> 10 KM inspection category CAT-I											
NOTE - 3 : For Fiber Optic cable <=10KM inspection category CAT - III & for > 10KM inspection category CAT-II											
NOTE-4 : Batteries for UPS <= 10 KVA and batteries for intelligent battery charger 24 V DC <= 40 Amp inspection category CAT-III & for Batteries for UPS> 10KVA and batteries for intelligent battery charger 24 V DC > 40 Amp rating											
NOTE-5 : UPS <= 10 KVA rating inspection category CAT-III & for > 10KVA rating inspection category CAT-I											
NOTE - 7 - EMPTY CABINETS, COMPUTERS, SIGNAL ISOLATOR/MULTIPLIER and TB SHALL ALSO BE ACCEPTABLE FROM OWNER ACCPETED IN QP. IF THE TOTAL INTEGRATED PANEL AND FAT IS CONDUCTED INDEGENEOUSLY											
NOTE-8 : For the C & I instrumnts mounted on the skid of the main item or supplied as a integral part of the main item, instrument to be supplied as per proven practice of the manufacturer meeting the Customer technical specification											
NOTE-9- This item is a bought out component of main equipments like DDCMIS, PLC, TSI, CCTV, PA system etc											
NOTE-10- For these controlled items, vendor shall be proposed for owner acceptance with-in the agreed contract schedule of the package											
NOTE-11 - Major Bought-Out-Items are to be procured from LOA approved sources & the same shall be finalized during the finalization of Manufacturing Quality Plan . MQP shall be duly vetted by OEM with their project specific authorisation letter .											
NOTE-12 : Main contractor approved sub vendors are acceptable those are evaluated / assessed as per Main contractor Quality Management System for vendor approval. Main contractor to inform the finally selected vendor to NTPC as soon as PO is placed for these items. In case of sub-QR Note-1 is also applicable.											

2 X 660MW TALCHER TPP**TECHNICAL SPECIFICATION
FOR
FUEL OIL UNLOADING & STORAGE SYSTEM****ANNEXURE - IV
(MDL WITH SUBMISSION SCHEDULE)**

**BHARAT HEAVY ELECTRICALS LTD
POWER SECTOR PROJECT ENGINEERING MANAGEMENT
PPEI, NOIDA-INDIA**

1500630/2023/PS-PEM-MAX

MDL FOR FUEL OIL HANDLING SYSTEM - 2X660 MW TALCHER TPP							
S.N	NTPC Drawing No.	BHEL Drawing nos	Drawing Title	Basic Engineering Doc/Drwg (Y/N)	Schedule Date of submission - Weeks from LOI	Category	RESUBMISSION AFTER INCORPORATING COMMENTS
1	4540-001-132-PVM-U-003	PE-DC-497-166-A002	DESIGN CALCULATION OF TANKS FOR FOHS (LDO TANK)	Y	4	I	WITHIN 1 WEEK
2	4540-001-132-PVM-U-007	PE-VO-497-166-A005	LDO Line Pressure Drop Calculation along with NPSH AND PUMP HEAD CALCULATION OF PUMPS FOR LDO	Y	6	A	WITHIN 1 WEEK
3	4540-001-132-PVM-U-006	PE-VO-497-166-A006	Design Calculation of Oil Water Separator	Y	8	A	WITHIN 1 WEEK
4	4540-001-132-PVM-U-010	PE-VO-497-166-A007	DESIGN CALCULATION & GAD OF MISCELLANEOUS TANKS FOR FOHS (DRAIN OIL)	Y	8	AA	WITHIN 1 WEEK
5	4540-001-132-PVM-Y-027	PE-VO-497-166-A008	DS of Pipes, Fittings, Flanges, Gasket etc for FO System	N	8	AA	WITHIN 1 WEEK
6	4540-001-132-PVM-B-023	PE-VO-497-166-A009	STAIRCASE DRAWING FOR LDO STORAGE TANK	N	14	AA	WITHIN 1 WEEK
7	4540-001-132-PVM-Y-026	PE-VO-497-166-A010	GAD and TDS of Screw Pumps of FOHS	Y	8	AA	WITHIN 1 WEEK
8	4540-001-132-PVM-Y-029	PE-VO-497-166-A011	TDS & GA for Ball / Plug Valves - FO System	N	10	AA	WITHIN 1 WEEK
9	4540-001-132-PVM-Y-028	PE-VO-497-166-A012	TDS & GA for CS Gate / Globe / Check Valves - FO System	N	10	AA	WITHIN 1 WEEK
10	4540-001-132-PVM-Y-031	PE-VO-497-166-A014	Data Sheet for painting on pipes and valves (Painting procedure at site) for FO System	N	4	AA	WITHIN 1 WEEK
11	4540-001-132-PVM-P-020	PE-VO-497-166-A015	PIPING LAYOUT IN AND AROUND TRUCK UNLOADING PLATFORM	Y	10	A	WITHIN 1 WEEK
12	4540-001-132-PVM-P-034	PE-VO-497-166-A016	Piping Layout in & around Storage Tank Farm Area	Y	8	A	WITHIN 1 WEEK
13	4540-001-132-PVM-P-033	PE-VO-497-166-A017	PIPING LAYOUT IN & AROUND PUMP HOUSE (UNLOADING PORTION)	Y	10	A	WITHIN 1 WEEK
14	4540-001-132-PVM-P-035	PE-VO-497-166-A018	Composite Layout of Fuel Oil Area	Y	10	A	WITHIN 1 WEEK
15	4540-001-132-PVM-B-021	PE-VO-497-166-A019	GA of Oil Hose for LDO	N	10	AA	WITHIN 1 WEEK
16	4540-001-132-PVM-B-025	PE-VO-497-166-A020	GAD OF FOHS FOR CCOE APPROVAL	Y	10	AA	WITHIN 1 WEEK
17	4540-001-132-PVM-B-022	PE-VO-497-166-A021	GA of roof Structure for LDO Storage Tanks	N	14	AA	WITHIN 1 WEEK
18	4540-001-132-PVM-B-040	PE-VO-497-166-A022	Fabrication Details of LDO Storage Tanks	N	14	AA	WITHIN 1 WEEK
19	4540-001-132-PVM-B-020	PE-VO-497-166-A023	GA of Strainer for LDO unloading Pumps	N	10	AA	WITHIN 1 WEEK
20	4540-001-132-QVM-Q-258	PE-VO-497-166-A024	MQP PIPE-CS/SS seamless	N	10	A	WITHIN 1 WEEK
21	4540-001-132-QVM-Q-256	PE-VO-497-166-A025	MQP Drain Oil Tank/ Misc Shop fabricated Tank	N	12	A	WITHIN 1 WEEK
22	4540-001-132-QVM-Q-261	PE-VO-497-166-A026	MQP Screw Pump (Single & twin)	N	8	A	WITHIN 1 WEEK
23	4540-001-132-QVM-Q-253	PE-VO-497-166-A027	MQP Ball valve/Plug valve- Endorsement	N	10	A	WITHIN 1 WEEK
24	4540-001-132-QVM-Q-262	PE-VO-497-166-A028	MQP Submersible/Sump Pump	N	8	A	WITHIN 1 WEEK
25	4540-001-132-QVM-Q-254	PE-VO-497-166-A029	MQP Conventional Gate/Globe Valve/ Check Valve (Size >600 NB or Rating Pr Class > 300)	N	10	A	WITHIN 1 WEEK
26	4540-001-132-PVM-B-024	PE-VO-497-166-A030	GA of Oil Water Separator	Y	8	AA	WITHIN 1 WEEK
27	4540-001-132-PVM-H-039	PE-VO-497-166-A031	PIPE SCHEDULE OF FOHS	N	12	AA	WITHIN 1 WEEK
28	4540-001-132-PVM-X-058	PE-VO-497-166-A032	O&M Manual for Fuel Oil System	N	16	A	WITHIN 1 WEEK
29	4540-001-132-PVM-W-057	PE-VO-497-166-A033	PG Test Procedure for FOHS	N	16	A	WITHIN 1 WEEK
30	4540-001-132-PVI-H-037	PE-VO-497-166-A034	Instrument Schedule of FOHS	N	14	AA	WITHIN 1 WEEK
31	4540-001-132-QVM-Q-263	PE-VO-497-166-A035	MQP WRAPPING & COATING MATERIALS	N	12	A	WITHIN 1 WEEK
32	4540-001-132-PVI-L-036	PE-VO-497-166-A036	Instrument Hookup Diagram for FOHS	N	14	AA	WITHIN 1 WEEK
33	4540-001-132-PVI-Y-012	PE-VO-497-166-A037	Data Sheet- Electrical Actuator for FOHS	N	10	AA	WITHIN 1 WEEK
34	4540-001-132-PVM-H-038	PE-VO-497-166-A038	Valve Schedule of FOHS	N	12	AA	WITHIN 1 WEEK
35	4540-001-132-PVI-Y-013	PE-VO-497-166-A039	Data Sheet- Level Transmitter for FOHS	N	10	AA	WITHIN 1 WEEK
36	4540-001-132-PVI-Y-014	PE-VO-497-166-A040	Data Sheet- Pressure / Differential Pressure Gauge	N	10	AA	WITHIN 1 WEEK
37	4540-001-132-PVI-Y-015	PE-VO-497-166-A041	Data Sheet- Pressure Transmitter / Differential Pressure transmitter	N	10	AA	WITHIN 1 WEEK
38	4540-001-132-PVI-Y-016	PE-VO-497-166-A042	Data Sheet- Level Indicator for FOHS	N	10	AA	WITHIN 1 WEEK
39	4540-001-132-PVI-Y-017	PE-VO-497-166-A043	Data Sheet - Flow Meter & Strainer for FOHS	N	10	AA	WITHIN 1 WEEK
40	4540-001-132-PVI-Y-018	PE-VO-497-166-A044	Data Sheet - Temp/ Indicator for FOHS	N	10	AA	WITHIN 1 WEEK
41	4540-001-132-PVI-Y-019	PE-VO-497-166-A045	GA & Data Sheet- Junction Box for FOHS	N	10	AA	WITHIN 1 WEEK
42	-	PE-VO-497-166-A046	INTERCONNECTION SCHEDULE FOR FOHS BASED ON CABLE LIST	N	14	I	WITHIN 1 WEEK
43	-	PE-VO-497-166-A047	CABLE SCHEDULE OF FOHS	N	14	I	WITHIN 1 WEEK
44	-	PE-VO-497-166-A048	ELECTRICAL LOAD DATA OF FOHS	N	12	I	WITHIN 1 WEEK
45	-	PE-VO-497-166-A049	CONTROL SCHEME/ LOGIC DIAGRAM FOR FOHS (TO BE IMPLEMENTED IN DCS)	N	12	I	WITHIN 1 WEEK
46	-	PE-VO-497-166-A050	ANALOG & BINARY I/O LIST FOR FOHS (DCS BASED)	N	12	I	WITHIN 1 WEEK
47	-	PE-VO-497-166-A051	HMI PICTURES/ PLANT SCHEMATICS FOR FOHS (DCS BASED)	N	12	I	WITHIN 1 WEEK

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48	-	PE-V0-497-166-A052	SUGGESTIVE ELECTRICAL LAYOUT DRAWING OF FOHS	N	10	I	WITHIN 1 WEEK
49	-	PE-V0-497-166-A053	CIVIL INPUT DRAWING IN UNLOADING PUMP HOUSE OF FOHS	Y	12	I	WITHIN 1 WEEK
50	-	PE-V0-497-166-A054	CIVIL INPUT DRAWING IN UNLOADING AREA OF FOHS	Y	12	I	WITHIN 1 WEEK
51	-	PE-V0-497-166-A055	CIVIL INPUT DRAWING IN TANK FARM AREA FOR FOHS	Y	12	I	WITHIN 1 WEEK
52	-	PE-V0-497-166-A056	QAP OF HOSE FOR FOHS	N	14	A	WITHIN 1 WEEK
53	-	PE-V0-497-166-A057	QAP OF PLATES AND STRUCTURE FOR FOHS	N	14	A	WITHIN 1 WEEK
54	-	PE-V0-497-166-A058	QAP OF STRAINER FOR FOHS	N	12	A	WITHIN 1 WEEK
55	-	PE-V0-497-166-A059	QAP OF FLOWMETER FOR FOHS	N	10	A	WITHIN 1 WEEK
56	-	PE-V0-497-166-A060	QAP OF ELECTRIC ACTUATORS FOR VALVES OF FOHS	N	10	A	WITHIN 1 WEEK
57	-	PE-V0-497-166-A061	QAP OF FOHS INSTRUMENTS and IBs	N	10	A	WITHIN 1 WEEK
58	-	PE-V0-497-166-A062	DESIGN CALCULATION (STADD) OF ROOF STRUCTURE FOR LDO TANKS FOR FOHS	Y	8	I	WITHIN 1 WEEK
59	-	PE-V0-497-166-A063	GAD & TDS of Sump pumps(Centrifugal) & Motors in FOHS	Y	8	A	WITHIN 1 WEEK
60	-	PE-V0-497-166-A064	GAD & TDS of Oil Recovery pumps and Drain Oil pumps with Motors in FOHS (Single Screw type pumps)	Y	8	A	WITHIN 1 WEEK
61	-	PE-V0-497-166-A065	Sub Vendor list for FOHS	Y	4	A	WITHIN 1 WEEK
62	-	PE-V0-497-166-A066	E Learning Module for FOHS	N	16	A	WITHIN 1 WEEK
63	4540-001-132-QVM-Q-255	PE-V0-497-166-A067	MQP FOR BUTTERLY VALVES	N	10	A	WITHIN 1 WEEK

NOTES

1. Finally approved documents / drawings to be provided in editable format(MS office/Autocad format) for onward submission to end customer.
2. Bidder to note that during detailed engineering, drwg/doc will be submitted through web based document management system in addition to hard copies to be submitted as per drawing/document distribution schedule. Procedure for the same shall be informed after award of contract.
3. 'I' category- 'For information', 'A' Category - ' For Approval', 'AA' Category - ' Auto Archive'.

SIGNATURE:

NAME:

DESIGNATION:

COMPANY:

DATE:

COMPANY SEAL

2 X 660MW TALCHER TPP**TECHNICAL SPECIFICATION
FOR
FUEL OIL UNLOADING & STORAGE SYSTEM****ANNEXURE - V****(INPUT DRAWINGS & DOCUMENTS OF TENDER)****BHARAT HEAVY ELECTRICALS LTD
POWER SECTOR PROJECT ENGINEERING MANAGEMENT
PPEI, NOIDA-INDIA**

S.N	DRWG NO	DWRG TITLE
1	PE-DG-497-100-M002	PLOT PLAN
2	PE-DG-435-166-A001	PROCESS & INSTRUMENTATION DIAGRAM FOR FOHS (LDO SYSTEM)
3	PE-DG-435-166-A004	GA AND NOZZLE ORIENTATION OF LDO STORAGE TANKS
4	PE-V0-497-166-A015	PIPING LAYOUT IN ROAD TANKER UNLOADING AREA
5	PE-V0-497-166-A016	PIPING LAYOUT IN & AROUND STORAGE TANK FARM AREA
6	PE-V0-497-166-A017	PIPING LAYOUT IN & AROUND PUMP HOUSE
7	PE-V0-497-166-A018	COMPOSITE LAYOUT OF FUEL OIL AREA



GENERAL LAYOUT OF PLANT

PROJECT: 2500MW VALCHER THERMAL POWER PROJECT STAGE-III
CLIENT: NTPC LIMITED
DESIGNER: NTPC LIMITED
DATE: 01.05.2023
SCALE: 1:1000
SHEET NO: 261 OF 263

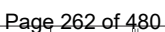
PILOT PLAN

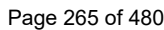
PROJECT: 2500MW VALCHER THERMAL POWER PROJECT STAGE-III
CLIENT: NTPC LIMITED
DESIGNER: NTPC LIMITED
DATE: 01.05.2023
SCALE: 1:1000
SHEET NO: 261 OF 263

LIST OF BUILDINGS/FACILITIES:-

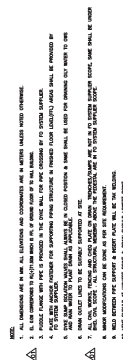
NO.	DESCRIPTION
1	BOILER HOUSE
2	CONDENSER HOUSE
3	COOLING WATER PUMP HOUSE
4	DEAERATOR HOUSE
5	DISTILLATE HOUSE
6	EXHAUST STEAM HEATER
7	EXHAUST STEAM HEATER
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- LEGEND:-**
- 1. ROAD (DOUBLE LANE)
 - 2. ROAD (SINGLE LANE)
 - 3. EXISTING BOUNDARY WALL
 - 4. 2.5 M FENCING (SINGLE ROW)
 - 5. RAILWAY LINE
 - 6. FACILITIES BUILDINGS (NTPC)
 - 7. WATCH TOWER
 - 8. FORMATION LEVEL
 - 9. NEW BOUNDARY WALL TO BE CONSTRUCTED
 - 10. BOUNDARY WALL TO BE DISMANTLED
 - 11. NEW CHAIN LINE FENCING TO BE CONSTRUCTED
 - 12. TEMPORARY FENCING LINE (NOT IN SPEC PAGE)
 - 13. ROAD
 - 14. PIPE RACK
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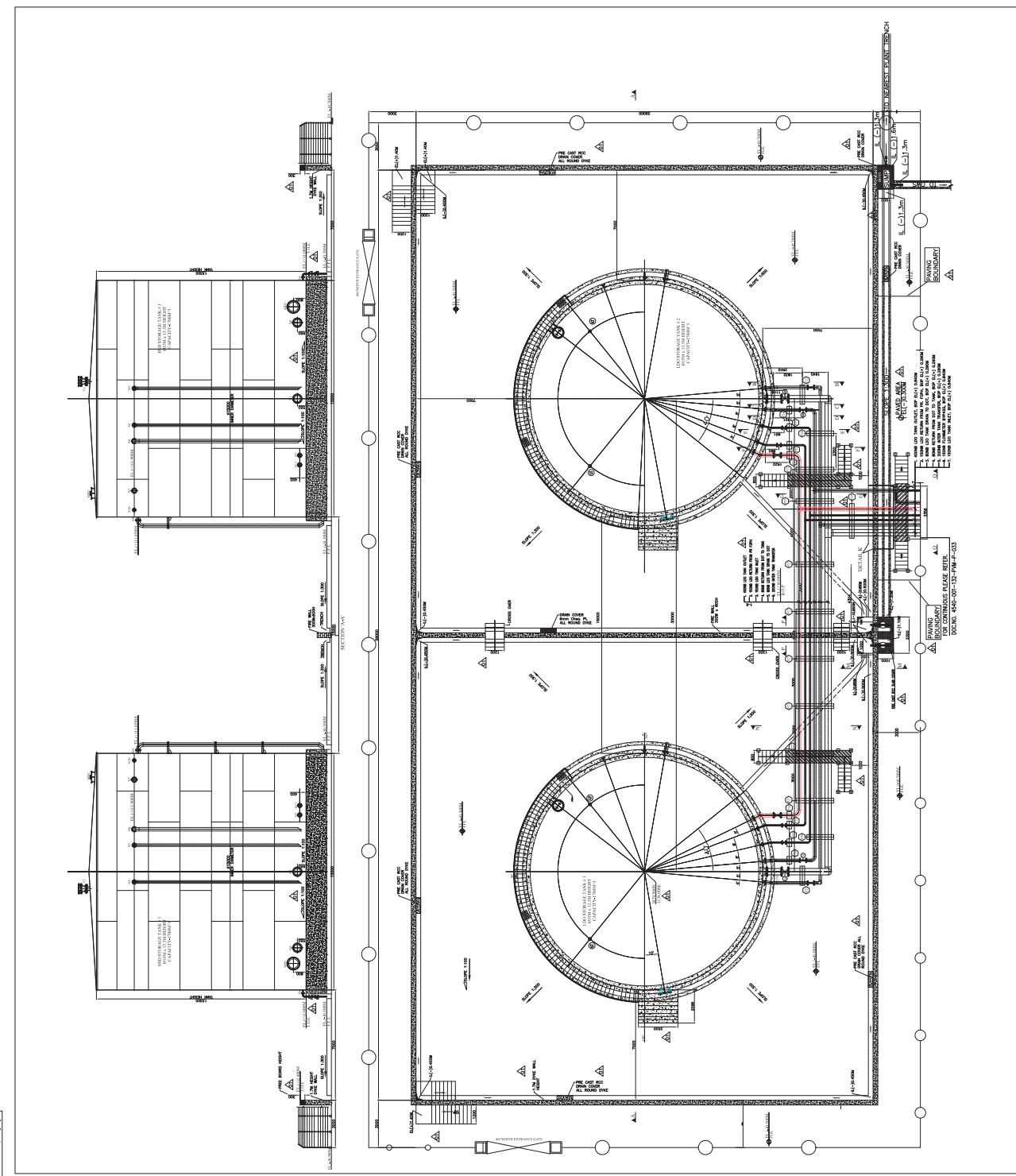


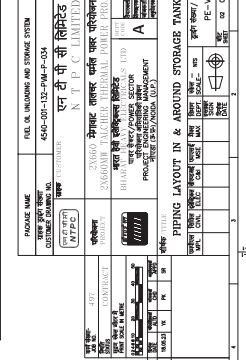
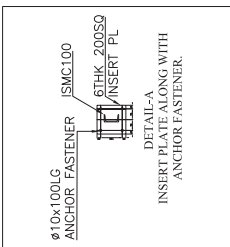
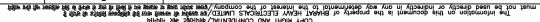


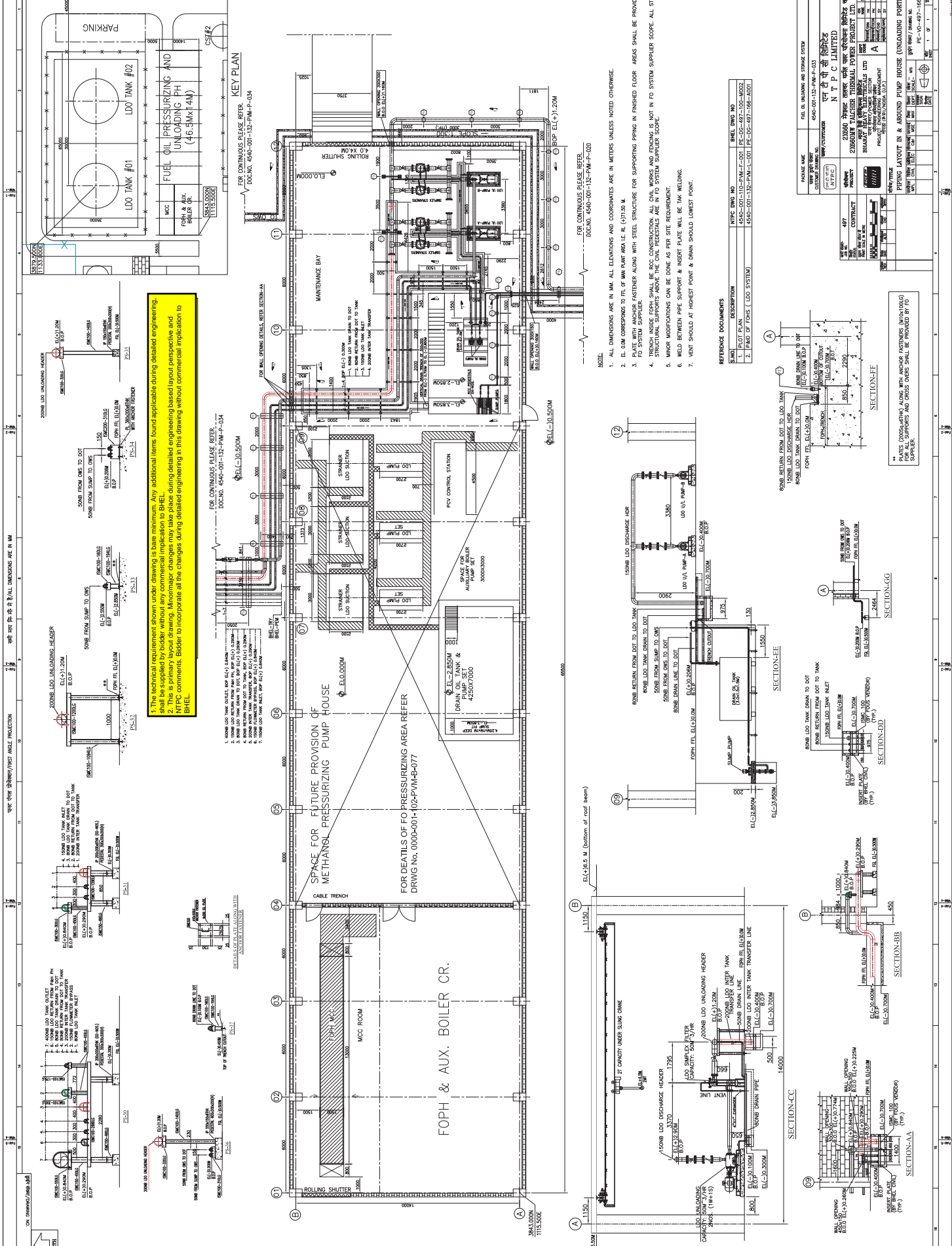
1. The technical requirement shown under drawing is bare minimum. Any additional items found applicable during detailed engineering, shall be supplied by bidder without any commercial implication to BHEL.
2. This is primary layout drawing. Minor/major changes may take place during detailed engineering based layout perspective and NTPC comments. Bidder to incorporate all the changes during detailed engineering in this drawing without commercial implication to BHEL.

[illegible]

1. The technical requirement shown under drawing is bare minimum. Any additional items found applicable during detailed engineering, shall be supplied by bidder without any commercial implication to BHEL.

[illegible]



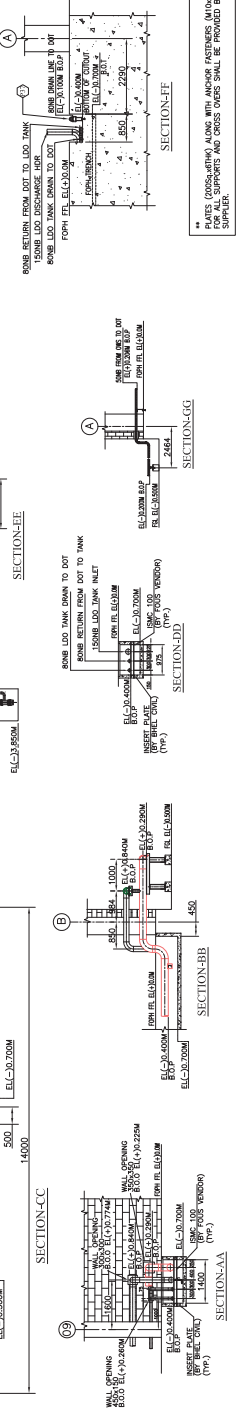


1. The technical requirement shown under drawing is bare minimum. Any additional items, based on applicable during detailed engineering, shall be supplied by bidder without any commercial implication to BHEL.
2. This is primary layout drawing. Minor changes may take place during detailed engineering based on perspective and BHEL comments. Bidder to incorporate all the changes during detailed engineering in this drawing without commercial implication to BHEL.

- NOTE.
1. ALL DIMENSIONS ARE IN MM. ALL ELEVATIONS AND COORDINATES ARE IN METERS UNLESS NOTED OTHERWISE.
 2. EL. DIM. CORRESPONDS TO FTL OF MAIN RAIL AREA L.R. (471.50) M.
 3. PLATE WITH ANCHOR FASTENER ALONG WITH STEEL STRUCTURE FOR SUPPORTING PIPING IN FINISHED FLOOR AREAS SHALL BE PROVIDED BY FO SYSTEM SUPPLIER.
 4. ALL COIL CONNECTIONS, ALL COIL WORKS AND PIPINGS ARE NOT IN FO SYSTEM SUPPLIER SCOPE. ALL STEEL STRUCTURAL SUPPORTS ABOVE THE COIL FEEDSTOCKS ARE IN TO SYSTEM SUPPLIER SCOPE.
 5. MAJOR MODIFICATIONS CAN BE DONE AS PER SITE REQUIREMENT.
 6. WELD BETWEEN PIPE SUPPORT & INSERT PLATE WILL BE TAP WELDING.
 7. VENT SHOULD AT HIGHEST POINT & DRAIN SHOULD LOWEST POINT.

REFERENCE DOCUMENTS

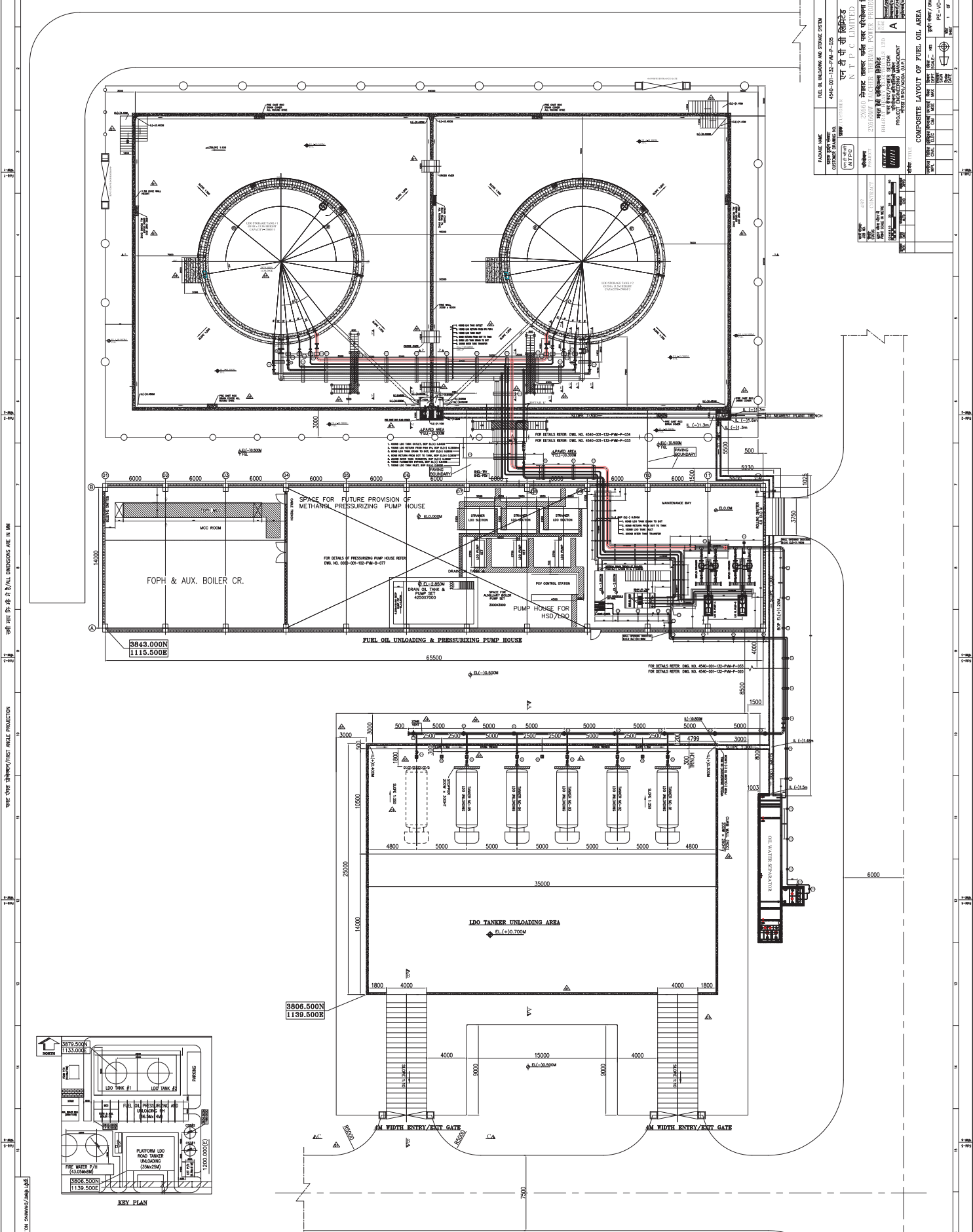
S.NO.	DOC NO.	DESCRIPTION	REVISION NO.
1.	6440-001-10-PM-F-001	FO SYSTEM SUPPLIER	PE-00-497-100-0002
2.	6440-001-12-PM-L-001	FO SYSTEM SUPPLIER	PE-00-497-100-0001



PROJECT INFORMATION

ITEM	DESCRIPTION	REVISION NO.
1.	PROJECT NAME	202306 FOPH & AUX. BOILER CR. PROJECT
2.	PROJECT NO.	202306 FOPH & AUX. BOILER CR. PROJECT
3.	PROJECT LOCATION	202306 FOPH & AUX. BOILER CR. PROJECT
4.	PROJECT DATE	202306 FOPH & AUX. BOILER CR. PROJECT
5.	PROJECT STATUS	202306 FOPH & AUX. BOILER CR. PROJECT
6.	PROJECT TYPE	202306 FOPH & AUX. BOILER CR. PROJECT
7.	PROJECT SCOPE	202306 FOPH & AUX. BOILER CR. PROJECT
8.	PROJECT BUDGET	202306 FOPH & AUX. BOILER CR. PROJECT
9.	PROJECT RISK	202306 FOPH & AUX. BOILER CR. PROJECT
10.	PROJECT TEAM	202306 FOPH & AUX. BOILER CR. PROJECT

FOR ALL SUPPORTS AND CROSS OVERS SHALL BE PROVIDED BY FO SUPPLIER.



PACKAGE NAME	FUEL OIL UNLOADING AND STORAGE SYSTEM
ESTIMATE NO.	4540-001-132-PHM-P-025
DATE	15/05/2023
PROJECT	250000 TALLER THERMAL POWER PROJECT (TD-STAGE-II)
PROJECT NO.	250000 TALLER THERMAL POWER PROJECT (TD-STAGE-II)
PROJECT TITLE	COMPOSITE LAYOUT OF FUEL OIL AREA
PROJECT LOCATION	INDIA
PROJECT OWNER	STATE POWER CORP. LTD.
PROJECT MANAGER	STATE POWER CORP. LTD.
PROJECT ENGINEER	STATE POWER CORP. LTD.
PROJECT ARCHITECT	STATE POWER CORP. LTD.
PROJECT ELECTRICAL	STATE POWER CORP. LTD.
PROJECT MECHANICAL	STATE POWER CORP. LTD.
PROJECT CIVIL	STATE POWER CORP. LTD.
PROJECT SAFETY	STATE POWER CORP. LTD.
PROJECT ENVIRONMENT	STATE POWER CORP. LTD.
PROJECT HEALTH	STATE POWER CORP. LTD.
PROJECT SOCIAL	STATE POWER CORP. LTD.
PROJECT ECONOMIC	STATE POWER CORP. LTD.
PROJECT LEGAL	STATE POWER CORP. LTD.
PROJECT POLITICAL	STATE POWER CORP. LTD.
PROJECT CULTURAL	STATE POWER CORP. LTD.
PROJECT HISTORICAL	STATE POWER CORP. LTD.
PROJECT SCIENTIFIC	STATE POWER CORP. LTD.
PROJECT TECHNICAL	STATE POWER CORP. LTD.
PROJECT MANAGEMENT	STATE POWER CORP. LTD.
PROJECT FINANCIAL	STATE POWER CORP. LTD.
PROJECT LEGAL	STATE POWER CORP. LTD.
PROJECT POLITICAL	STATE POWER CORP. LTD.
PROJECT CULTURAL	STATE POWER CORP. LTD.
PROJECT HISTORICAL	STATE POWER CORP. LTD.
PROJECT SCIENTIFIC	STATE POWER CORP. LTD.
PROJECT TECHNICAL	STATE POWER CORP. LTD.
PROJECT MANAGEMENT	STATE POWER CORP. LTD.
PROJECT FINANCIAL	STATE POWER CORP. LTD.


2 X 660MW TALCHER TPP**TECHNICAL SPECIFICATION
FOR
FUEL OIL UNLOADING & STORAGE SYSTEM****ANNEXURE - VI
(MANDATORY SPARES LIST)**

**BHARAT HEAVY ELECTRICALS LTD
POWER SECTOR PROJECT ENGINEERING MANAGEMENT
PPEI, NOIDA-INDIA**

CLAUSE NO.	MANDATORY SPARES FOR FO UNLOADING SYSTEM	एनटीपीसी NTPC		
	<div>ITEM</div> <div>QUANTITY</div>			
1.00.00	MECHANICAL ITEMS			
1.01.00	Strainer elements			
	a. F.O. Drain pumps	1 no.		
	b. LDO unloading pumps	1 no. of each type		
1.02.00	Relief valve complete assembly			
	a. LDO unloading pumps	1 no. of each type		
1.03.00	Bearings of:			
	a. LDO unloading pumps	1 set of each type		
	b. F. O. Drain pumps	1 set		
1.04.00	Rotor Assembly (Complete cartridge assembly)			
	a. LDO unloading pumps	1 no. of each type		
	b. F. O. Drain pumps	1 no.		
1.05.00	Coupling Bolts with nuts, washer and bushes for LDO unloading pumps	1 set for each size of coupling		
1.06.00	Wearing Rings	1 set for each type of pump		
1.07.00	Gland Packing (if applicable)	1 set for each type of pump		
1.08.00	Mechanical seal Assembly (if applicable)	2 sets for each type		
1.09.00	Shaft Sleeve	1 set for each type of pump		
1.10.00	Valves (Each type and size)	a) 1 number, where the total quantity of a particular type and size of valve is less than or equal to 10.		
		b) 2 numbers, where the total quantity of a particular type and size of valve is less than 40 but more than 10.		
		c) 10% of total quantity (to nearest whole number) of a particular type and size of		
TALCHER THERMAL POWER PROJECT STAGE-III (2X660 MW) EPC PACKAGE	TECHNICAL SPECIFICATION SECTION-VI, PART-A BID DOC. NO.:CS-4540-001-2	SUB-SECTION-VI CHAPTER - 10 FO Unloading System	PAGE 1 OF 3	

CLAUSE NO.		MANDATORY SPARES FOR FO UNLOADING SYSTEM		<div>एनटीपीसी NTPC</div>	
1.11.00		Neoprene rubber unloading hoses (For LDO) with end connections complete hose)		valve, where the total quantity of a particular type and size of valve is more than 40 Ten (10) Nos.	
1.12.00		Dirty Oil Pump complete assembly with motor		01 set.	
		<p>Note:</p> <p>1) Mandatory spares listed above is bare minimum requirement. In case any additional mandatory spares requirement is covered elsewhere in the tender specification apart from specified above, same shall be deemed to have been covered in bidders scope of supply.</p> <p>2) These spares shall be considered as per the applicable items in main supply.</p> <p>3) One set means total numbers as required for one complete replacement for one equipment..</p> <p>4) Quantity mentioned in percentage (%) is the % of total installed. If percentage comes as fraction next higher integer should be considered for the purpose of quantity required.</p>			
TALCHER THERMAL POWER PROJECT STAGE-III (2X660 MW) EPC PACKAGE		TECHNICAL SPECIFICATION SECTION-VI, PART-A BID DOC. NO.:CS-4540-001-2		SUB-SECTION-VI CHAPTER - 10 FO Unloading System	
				PAGE 2 OF 3	

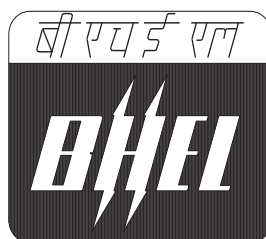
CLAUSE NO.		MANDATORY SPARES FOR FO UNLOADING SYSTEM		<div>एनटीपीसी NTPC</div>	
		<div><div>-----</div><div>ITEM</div><div>-----</div><div>QUANTITY</div><div>-----</div></div>			
2.00.00		CONTROL AND INSTRUMENTATION ITEMS			
2.01.00		MEASURING INSTRUMENTS			
		1	Electronic Transmitters		
			Transmitters of all types and model no. (for the measurement of Pressure, differential pressure flow, level, etc.)	1 no. of each type and model whichever is more.	
		2	Temperature elements		
		(i)	RTD's*, Thermocouples	1 no. of each type, make and model	
		(ii)	Thermowell	1 no. of each type, make and model	
			* (With head assembly, terminal block and nipple)		
		3	Local Indicators like temperature gauges, pressure gauges, differential pressure gauges, flow gauges level gauge etc.	1 no. of each type, make and model	
		4	Process Actuated Switch Devices Includes all types of Pressure, differential pressure, flow, temperature, level switch Devices	1 no. of each type, make and model	
2.02.00		PROCESS CONNECTION PIPING (FOR IMPULSE PIPING/TUBING, SAMPLING PIPING/TUBING AND AIR SUPPLY PIPING AS APPLICABLE)			
		1	Valves	1 no. of each type, make and model	
		2	2 way, 3way, 5way valve manifolds	1 no. of each type, make and model	
		3	Fittings	1 no. of each type, make and model	
2.03.00		ELECTRICAL ACTUATORS			
		1	Actuators	10% (or) 1 no. of each type, model and rating, whichever is more	
		Note :			
		One (1) set means total numbers as required for one complete replacement for one equipment.			
TALCHER THERMAL POWER PROJECT STAGE-III (2X660 MW) EPC PACKAGE		TECHNICAL SPECIFICATION SECTION-VI, PART-A BID DOC. NO.:CS-4540-001-2		SUB-SECTION-VI CHAPTER - 10 FO Unloading System	
				PAGE 3 OF 3	

CLAUSE NO.	<div style="text-align: center;">MANDATORY SPARES FOR C&I</div> 		
8.00.00		L2 switch	2 Nos.
		L3 switch	1 No
	(ix)	I/O module for Fire Alarm interfacing (if applicable)	2 nos. of each type
	(vi)	Camera mounting arrangement.	2 nos. of each type
	Wireless Instruments & System (if applicable)		
9.00.00	Sl. No.	ITEM	QUANTITY
	(i)	Transmitters	10% of specified quantity or minimum 2 nos. of each model
	(ii)	Repeaters / Routers	10% subject to minimum 2 nos. of each type
	(iii)	Gateway along with antenna / access point	1 no.
	In addition to the mandatory spares of electric actuators indicated in all the chapters of sub section VI, Part-A of technical specification the below clause is also applicable.		
	Sl. No.	ITEM	QAUNTITY
	(i)	Electronic PCB of all types	10% of each type & model
	(ii)	Absolute Encoder (replaceable part)	5% of each type & model
	(iii)	Electronic Torque sensor	5% of each type & model
	Note: 1. Refer Part-A Sub-Section-VI (Mandatory Spares) for general requirements and interpretation of various terms and conditions. 2. In case the main population of any item is only one no., then the spare quantity shall also be one no., overriding requirements indicated in clause 1.00.00 to 11.00.00 above. 3. Wherever the quantity is given only in percentage, the spare quantity shall be distributed into various ranges/size/rating/type (as the case may be) in the same proportion of the main population. For the quantities coming less than 1, shall be treated as 1 only. 4. C&I mandatory spares if covered under other chapters of sub section VI, Part A of technical specification are not required to be repeated.		
TALCHER THERMAL POWER PROJECT STAGE-III (2X660 MW) EPC PACKAGE		TECHNICAL SPECIFICATION SECTION-VI, PART-A BID DOC NO.: CS-4540-001A-2	SUB-SECTION-VI CHAPTER-12 CONTROL & INSTRUMENTATION PAGE 9 OF 9

2 X 660MW TALCHER TPP, STAGE III (EPC)

FUEL OIL SYSTEM

TECHNICAL SPECIFICATION (ELECTRICAL PORTION)



**BHARAT HEAVY ELECTRICALS LIMITED
POWER SECTOR
PROJECT ENGINEERING MANAGEMENT
NOIDA, UP [INDIA]**

SPECIFIC TECHNICAL REQUIREMENTS:**1.0 EQUIPMENT & SERVICES TO BE PROVIDED BY BIDDER:**

The equipment and services to be provided by bidder under this specification shall be as detailed here below but shall not be limited to the following:

- a) Services and Equipment as per "Electrical Scope between BHEL and Vendor".
- b) Any item/work either supply of equipment or erection material which have not been specifically mentioned but are necessary to complete the work for trouble free and efficient operation of the plant shall be deemed to be included within the scope of this specification. The bidder without any extra charge shall provide the same.
- c) Supply of mandatory spares as specified in the specifications of mechanical equipments.
- d) Electrical load requirement for FUEL OIL SYSTEM package.
- e) All equipment shall be suitable for the power supply fault levels and other climatic conditions mentioned in the enclosed project information.
- f) Bidder to furnish list of makes for each equipment at contract stage, which shall be subject to customer / BHEL approval without any commercial and delivery implications to BHEL.
- g) Various drawings including GA drg, data sheet as per required format, quality plans, calculations, test reports, test certificates, operation and maintenance manuals, characteristic curves, wiring diagrams/schemes etc. shall be furnished as specified at contract stage. All documents shall be subject to customer / BHEL approval without any commercial implications to BHEL.
- h) The sub-vendor list for various electrical items is subject to BHEL/Customer approval without any commercial implications.
- i) Motors shall meet minimum requirement of Electric motor specification.
- j) Purchaser will furnish data sheets to the vendor after award of contract. Vendor shall furnish filled in data sheets meeting the specification requirements.
- k) Vendor to clearly indicate equipment locations and local routing lengths in their cable listing furnished to BHEL.
- l) Cable BOQ worked out based on routing of cable listing provided by the vendor for "both end equipment in vendor's scope" shall be binding to the vendor with +10 % margin to take care of slight variation in routing length & wastages.
- m) All Structural steel required for electrical equipment supplied by Vendor- as per scope split, shall be in Vendor's scope.

2.0 EQUIPMENT & SERVICES TO BE PROVIDED BY PURCHASER FOR ELECTRICAL & TERMINAL POINTS:

Refer "Electrical Scope between BHEL and Vendor".

3.0 DOCUMENTS TO BE SUBMITTED ALONG WITH BID

- 3.1 Bidder shall confirm total compliance to the electrical specification without any deviation from the technical/ quality assurance requirements stipulated. In line with this, the bidder as technical offer shall furnish two signed and stamped copies of the following:
- a) A copy of this sheet "Electrical Equipment Specification for FUEL OIL SYSTEM package and sheet "Electrical Scope between BHEL and Vendor" with bidder's signature and company stamp.
 - b) Electrical load requirement.
- 3.2 No technical submittal such as copies of data sheets, drawings, write-up, quality plans, type test certificates, technical literature, etc, is required during tender stage. Any such submission even if made, shall not be considered as part of offer.
- 4.0 **LIST OF ENCLOSURES**
- 4.1 Electrical scope between BHEL & vendor
 - 4.2 Customer (NTPC) specification for Motors & Cabling (for vendor scope as per scope split)
 - 4.3 Quality plan for motors & NTPC quality assurance
 - 4.4 Datasheet A & C (ANNEX-I)
 - 4.5 Electrical Load data format (ANNEX-II)
 - 4.6 BHEL cable listing format (ANNEX-III)

S.NO	DETAILS	SCOPE SUPPLY	SCOPE E&C	REMARKS
1	415V MCC	BHEL	BHEL	240 V AC (supply feeder)/415 V AC (3 PHASE 4 WIRE) supply shall be provided by BHEL based on load data provided by vendor at contract stage for all equipment supplied by vendor as part of contract. Any other voltage level (AC/DC) required will be derived by the vendor.
2	Local Push Button Station (for motors)	BHEL	BHEL	Located near the motor.
3	Power cables, control cables and screened control cables for a) both end equipment in BHEL's scope b) both end equipment in vendor's scope c) one end equipment in vendor's scope	BHEL BHEL BHEL	BHEL Vendor BHEL	1. For 3.b) & c): Sizes of cables required shall be informed by vendor at contract stage (based on inputs provided by BHEL) in the form of cable listing. Finalisation of cable sizes shall be done by BHEL. Vendor shall provide lugs & glands accordingly. 2. Termination at BHEL equipment terminals by BHEL. 3. Termination at Vendor equipment terminals by Vendor.
4	Junction box for control & instrumentation cable	Vendor	Vendor	Number of Junction Boxes shall be sufficient and positioned in the field to minimize local cabling (max 10-12 mtrs) and trunk cable.
5	Any special type of cable like compensating, co-axial, prefab, MICC, optical fibre etc.	Vendor	Vendor	Refer C&I portion of specification for scope of fibre Optical cables if used between PLC/ microprocessor & DCS.
6	Cable trays, accessories & cable trays supporting system	BHEL	BHEL	Local cabling from nearby main route cable tray (BHEL scope) to equipment terminal (vendor's scope) shall be through 100/ 50 mm. cable trays/ conduits/ Galvanised steel cable troughs, as per approved layout drawing during contract stage.
7	100/ 50 mm cable trays/ Conduits/ Galvanised steel cable troughs for local cabling Cable glands, lugs and bimetallic strip for equipment supplied by Vendor	Vendor	Vendor	1. Double compression Ni-Cr plated brass cable glands 2. Solder less crimping type heavy duty tinned copper lugs for power and control cables.
8	Conduit and conduit accessories for cabling between equipment supplied by vendor	Vendor	Vendor	Conduits shall be medium duty, hot dip galvanised cold rolled mild steel rigid conduit as per IS: 9537.
9	Lighting	BHEL	BHEL	
10	Equipment grounding (including electronic earthing) & lightning protection	BHEL	BHEL	Refer note no. 4 for electronic earthing

S.NO	DETAILS	SCOPE SUPPLY	SCOPE E&C	REMARKS
11	Below grade grounding	BHEL	BHEL	
12	LT Motors with base plate and foundation hardware	Vendor	Vendor	Makes shall be subject to customer/ BHEL approval at contract stage.
13	Mandatory spares	Vendor	-	Vendor to quote as per specification.
14	Recommended O & M spares	Vendor	-	As specified elsewhere in specification
15	Any other equipment/ material/ service required for completeness of system based on system offered by the vendor (to ensure trouble free and efficient operation of the system).	Vendor	Vendor	
16	a) Input cable schedules (Control & Screened Control Cables) b) Cable interconnection details for above c) Cable block diagram	Vendor Vendor Vendor	- - -	Cable listing for Control and Instrumentation Cable and electronic earthing cable in enclosed excel format shall be submitted by vendor during detailed engineering stage.
17	Electrical Equipment & cable tray layout drawings	Vendor	-	<p>a. In case, vendor's Fuel oil pump house building is located as combined with Heating & Pumping building (BHEL-TRICHY), cable tray/trench layout inside combined building shall be prepared by BHEL-PEM. Vendor to furnish drawing (both in print form as well as in AUTOCAD) of Fuel oil pump house layout clearly indicating all pumps, panels, JB's etc. which require cabling along with their terminal box/location/ Foundation etc.</p> <p>b. In case, vendor's Fuel oil pump house building is separate from Heating & Pumping building (BHEL-TRICHY), vendor shall prepare & submit cable tray/trench & equipment layout (both in print form as well as in AUTOCAD) of the complete Fuel oil pump house building indicating location and identification of all equipment requiring cabling for BHEL review & approval. Vendor to ensure the cable tray lay out shall confirm to NFPA (National fire prevention act)/TAC (Tariff advisory committee) applicable for hazardous area classification.</p>

S.NO	DETAILS	SCOPE SUPPLY	SCOPE E&C	REMARKS
18	Electrical Equipment GA drawing	Vendor	-	For necessary interface review..

NOTES:

1. Make of all electrical equipment/ items supplied shall be reputed make & shall be subject to approval of BHEL/customer after award of contract.
2. All QPs shall be subject to approval of BHEL/customer after award of contract without any commercial implication.
3. In case the requirement of Junction Box arises on account of Power Cable size mis-match due to vendor engineering at later stage, vendor shall supply the Junction Box for suitable termination.
4. Vendor shall indicate location of Electronic Earth pit in their Civil assignment drawing.



SUB-SECTION-B – 02

MOTORS

<p>TALCHER THERMAL POWER PROJECT STAGE-III (2X660 MW) EPC PACKAGE BID DOC NO.: CS-4540-001A-2</p>	<p>TECHNICAL SPECIFICATION SECTION - VI PART-B</p>
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07/2023/PS-PEM-MAX			
CLAUSE NO.		TECHNICAL REQUIREMENTS	
		MOTORS	
1.00.00	GENERAL REQUIREMENTS		
1.01.00	This chapter has to be read in conjunction with sub-section B-0 "General electrical specification" of Technical specification Section- VI, Part-B and Sub-Section-IIB Electrical system/Equipment of Technical Specifications Section-VI, Part-A"		
	Degree of Protection		
	Degree of protection for various enclosures as per IEC60034-05 shall be as follows :-		
	i)	Indoor motors	- IP 55
	ii)	Outdoor motors	- IP 55 (Additional Canopy to be provided)
	iii)	Cable box-indoor area	- IP 55
	iv)	Cable box-Outdoor area	- IP 55
2.00.00	CODES AND STANDARDS		
	1)	Three phase induction motors	: IS15999/IEC:60034
	2)	Single phase AC motors	: IS 996/ IEC:60034
	3)	Crane duty motors	: IS:3177, IEC:60034
	4)	DC motors/generators	: IS:4722, IEC:60034
	5)	Energy Efficient motors	: IS 12615, IEC:60034-30
3.00.00	TYPE		
3.01.00	AC Motors:		
	a)	Squirrel cage induction motor suitable for direct-on-line starting.	
	b)	Continuous duty LT motors upto 200 KW Output rating (at 50 deg.C ambient temperature), shall be Premium Efficiency class-IE3 , conforming to IS 12615, or IEC:60034-30. HT motors shall have minimum design efficiency of 95 %. However, tolerance on this efficiency value shall be applicable as per IEC 60034	
	c)	Motor operating through variable frequency drives shall be suitable for inverter duty with VPI insulation. Also these motors shall comply the requirements stipulated in IEC: 60034-18-41 and IEC: 60034-18-42 as applicable.	
3.02.00	DC Motors: Shunt wound.		
4.00.00	RATING		
	(a)	Continuously rated (S1). However, crane motors shall be rated for S4 duty, 40% cyclic duration factor.	
	(b)	Whenever the basis for motor or driven equipment ratings are not specified in the corresponding mechanical specification sub-sections, maximum continuous motor ratings shall be at least 10% above the maximum load demand of the driven equipment under entire operating range including voltage and frequency variations.	
5.00.00	TEMPERATURE RISE		
	Air cooled motors		
	70 deg. C by resistance method for both thermal class 130(B) & 155(F) insulation.		
	Water cooled		
	80 deg. C over inlet cooling water temperature mentioned elsewhere, by resistance method for both thermal class 130(B) & 155(F) insulation.		
TALCHER THERMAL POWER PROJECT STAGE-III (2X660 MW) EPC PACKAGE		TECHNICAL SPECIFICATION SECTION – VI, PART-B BID DOC NO : CS-4540-001A-2 Page 282 of 480	SUB SECTION-II-B-02 MOTORS
			PAGE 1 OF 4
			Page No. 282 of 479

1500630/2023/PS-PEM-MAX


02/2023/PS-PEM-MAX					
CLAUSE NO.	TECHNICAL REQUIREMENTS				
6.00.00	OPERATIONAL REQUIREMENTS				
6.01.00	Starting Time				
6.01.01	For motors with starting time upto 20 secs. at minimum permissible voltage during starting, the locked rotor withstand time under hot condition at highest voltage limit shall be at least 2.5 secs. more than starting time.				
6.01.02	For motors with starting time more than 20 secs. and upto 45 secs. at minimum permissible voltage during starting, the locked rotor withstand time under hot condition at highest voltage limit shall be at least 5 secs. more than starting time.				
6.01.03	For motors with starting time more than 45 secs. at minimum permissible voltage during starting, the locked rotor withstand time under hot condition at highest voltage limit shall be more than starting time by at least 10% of the starting time.				
6.01.04	Speed switches mounted on the motor shaft shall be provided in cases where above requirements are not met.				
6.02.00	Torque Requirements				
6.02.01	Accelerating torque at any speed with the lowest permissible starting voltage shall be at least 10% motor rated torque.				
6.02.02	Pull out torque at rated voltage shall not be less than 205% of rated torque. It shall be 275% for crane duty motors.				
6.03.00	NOT USED.				
7.00.00	DESIGN AND CONSTRUCTIONAL FEATURES				
7.01.00	Suitable single phase space heaters shall be provided on motors rated 30KW and above to maintain windings in dry condition when motor is standstill. Separate terminal box for space heaters & RTDs shall be provided. However for flame proof motors, space heater terminals inside the main terminal box may be acceptable.				
7.02.00	<p>All motors shall be either Totally enclosed fan cooled (TEFC) or totally enclosed tube ventilated (TETV) or Closed air circuit air cooled (CACA) type. However, motors rated 3000KW or above can be Closed air circuit water cooled (CACW). The method of movement of primary and secondary coolant shall be self-circulated by fan or pump directly mounted on the rotor of the main motor as per IEC 60034-6. However VFD driven motors can be offered with forced cooling type with machine mounted fan or pump driven by separate electric motor. Motors and EPB located in hazardous areas shall have flame proof enclosures conforming to IS:2148 as detailed below</p> <p>(a) Fuel oil area : Group – IIB</p> <p>(b) Hydrogen generation : Group - IIC or (Group-I, Div-II as per plant area NEC) or (Class-1, Group-B, Div-II as per NEMA /IEC60034)</p>				
7.03.00	<p>Winding and Insulation</p> <p>Type : Electrolytic grade Copper conductor, Non-hygroscopic, oil resistant, flame resistant Insulation.</p> <p>Starting duty : Two hot starts in succession, with motor initially at normal running temperature.</p> <p>However, conveyor motors shall be suitable for 3 consecutive hot starts</p> <p>11kV, 6.6 KV & 3.3 kV AC motors : Thermal class 155 (F) insulation. The winding insulation process shall be total Vacuum Presure Impregnated i.e resin poor method. The lightning Impulse & interturn insulation surge withstand level shall be as per IEC-60034 part-15.</p>				
<table><tr><td>TALCHER THERMAL POWER PROJECT STAGE-III (2X660 MW) EPC PACKAGE</td><td>TECHNICAL SPECIFICATION SECTION – VI, PART-B BID DOC NO : CS-4540-001A-2 Page 283 of 480</td><td>SUB SECTION-II-B-02 MOTORS</td><td>PAGE 2 OF 4 Page No. 283 of 479</td></tr></table>		TALCHER THERMAL POWER PROJECT STAGE-III (2X660 MW) EPC PACKAGE	TECHNICAL SPECIFICATION SECTION – VI, PART-B BID DOC NO : CS-4540-001A-2 Page 283 of 480	SUB SECTION-II-B-02 MOTORS	PAGE 2 OF 4 Page No. 283 of 479
TALCHER THERMAL POWER PROJECT STAGE-III (2X660 MW) EPC PACKAGE	TECHNICAL SPECIFICATION SECTION – VI, PART-B BID DOC NO : CS-4540-001A-2 Page 283 of 480	SUB SECTION-II-B-02 MOTORS	PAGE 2 OF 4 Page No. 283 of 479		

1500630/2023/PS-PEM-MAX

07/2023/PS-PEM-MAX		TECHNICAL REQUIREMENTS	
		240VAC, : Thermal Class (F) or better 415V AC & 220V DC motors	
7.04.00	Motors rated above 1000KW shall have insulated bearings/housing to prevent flow of shaft currents.		
7.05.00	Motors with heat exchangers shall have dial type thermometer with adjustable alarm contacts to indicate inlet and outlet primary air temperature.		
7.06.00	Noise level for all the motors shall be limited to 85 dB(A) except for BFP motor for which the maximum limit shall be 90dB(A). Vibration shall be limited within the limits prescribed in IS:12075 / IEC 60034-14 . Motors shall withstand vibrations produced by driven equipment. HT motor bearing housings shall have flat surfaces, in both X and Y directions, suitable for mounting vibration pads.		
7.07.00	In HT motors, at least four numbers simplex / two numbers duplex platinum resistance type temperature detectors shall be provided in each phase stator winding. Each bearing of HT motor shall be provided with three numbers duplex RTDs connected to three numbers dual input transmitters with display. However for air compressor, being high speed drive, each motor bearing shall be provided with minimum two numbers of duplex RTDs connected to two numbers dual input transmitters with display unit.		
7.08.00	Motor body shall have two earthing points on diagonally opposite sides.		
7.09.00	11 KV motors shall be offered with Separable Insulated Connector (SIC) as per IEEE 386. The offered SIC terminations shall be provided with protective cover and trifurcating sleeves. SIC termination kit shall be suitable for fault level of 25 KA for 0.17 seconds.		
7.10.00	3.3/6.6 KV motors shall be offered with dust tight phase segregated double walled (metallic as well as insulated barrier) Terminal box. Contractor shall provide termination kit for the offered Terminal box. The offered Terminal Box shall be suitable for fault level of 250 MVA for 0.12 sec. Removable gland plates of thickness 3 mm (hot/cold rolled sheet steel) or 4 mm (non magnetic material for single core cables) shall be provided.		
7.11.00	The spacing between gland plate & centre of bottom terminal stud shall be as per Table-I.		
7.12.00	All motors shall be so designed that maximum inrush currents and locked rotor and pullout torque developed by them at extreme voltage and frequency variations do not endanger the motor and driven equipment.		
7.13.00	The motors shall be suitable for bus transfer schemes provided on the 11kV, 6.6 KV, 3.3 kV /415V systems without any injurious effect on its life.		
7.14.00	For motors rated 2000 KW & above, neutral current transformers of PS class shall be provided on each phase in a separate neutral terminal box.		
7.15.00	NOT USED		
8.00.00	NOT USED		
10.00.00	TYPE TEST		
10.01.00	HT MOTORS		
	LIST OF TYPE TESTS TO BE CONDUCTED		
	The following type tests shall be conducted on each type and rating of HT motor		
	(a) No load saturation and loss curves upto approximately 115% of rated voltage		
	(b) Measurement of noise at no load.		
	(c) Momentary excess torque test (subject to test bed constraint).		
	(d) Full load test(subject to test bed constraint)		
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CLAUSE NO.	TECHNICAL REQUIREMENTS				
10.02.00	(e) Temperature rise test at rated conditions. During heat run test, bearing temp., winding temp.,coolant flow and its temp. shall also be measured. In case the temperature rise test is carried at load other than rated load, specific approval for the test method and procedure is required to be obtained. Wherever ETD's are provided, the temperature shall be measured by ETD's also for the record purpose.				
	LIST OF TESTS FOR WHICH REPORTS HAVE TO BE SUBMITTED				
	The following type test reports shall be submitted for each type and rating of HT motor				
	(a) Degree of protection test for the enclosure followed by IR, HV and no load run test. (b) Terminal box-fault level withstand test for each type of terminal box of HT motors only. (c) Lightning Impulse withstand test on the sample coil shall be as per clause no. 4.3 IEC-60034, part-15 (d) Surge-withstand test on inter-turn insulation shall be as per clause no. 4.2 of IEC 60034, part-15				
10.03.00	LT Motors				
	LIST OF TESTS FOR WHICH REPORTS HAVE TO BE SUBMITTED				
	The following type test reports shall be submitted for each type and rating of LT motor of above 100 KW only				
	1. Measurement of resistance of windings of stator and wound rotor. 2. No load test at rated voltage to determine input current power and speed 3. Open circuit voltage ratio of wound rotor motors (in case of Slip ring motors) 4. Full load test to determine efficiency power factor and slip 5. Temperature rise test 6. Momentary excess torque test. 7. High voltage test 8. Test for vibration severity of motor. 9. Test for noise levels of motor(Shall be limited as per clause no 7.06.00 of this section) 10. Test for degree of protection and 11. Overspeed test. 12. Type test reports for motors located in fuel oil area having flame proof enclosures as per IS 2148 / IEC 60079-1				
10.04.00	All acceptance and routine tests as per the specification and relevant standards shall be carried out. Charges for these shall be deemed to be included in the equipment price.				
	The type test reports once approved for any projects shall be treated as reference. For subsequent projects of NTPC, an endorsement sheet will be furnished by the manufacturer confirming similarity and "No design Change". Minor changes if any shall be highlighted on the endorsement sheet.				
<table><tr><td>TALCHER THERMAL POWER PROJECT STAGE-III (2X660 MW) EPC PACKAGE</td><td>TECHNICAL SPECIFICATION SECTION – VI, PART-B BID DOC NO : CS-4540-001A-2 Page 285 of 480</td><td>SUB SECTION-II-B-02 MOTORS</td><td>PAGE 4 OF 4 Page No. 285</td></tr></table>		TALCHER THERMAL POWER PROJECT STAGE-III (2X660 MW) EPC PACKAGE	TECHNICAL SPECIFICATION SECTION – VI, PART-B BID DOC NO : CS-4540-001A-2 Page 285 of 480	SUB SECTION-II-B-02 MOTORS	PAGE 4 OF 4 Page No. 285
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CLAUSE NO.	TECHNICAL REQUIREMENTS		
	v)	11 kV busduct	- 1 second
	vi)	Switchgears	- 1 second
	vii)	Cables to the feeders protected by breakers	Main protection fault clearing time with 0.12 second minimum
	viii)	Cables of all other feeders	As per MCCB operating time
	ix)	11KV & 3.3KV cable screen	- 2 seconds for the adopted ground fault current
			- 1 second for the adopted ground fault current, for cables connected to miscellaneous switchgear/transformer.
	x)	EHV systems	- 1 second
(** Note) Thermal withstand design time duration. The indicated values of time durations are used in transformer design for ensuring thermal stability of the transformers and are to be proven through calculations.			
10.00.00	MOTORS The ratio of locked rotor KVA at rated voltage to rated KW shall not exceed the following (without any further tolerance): (a) From 50KW & upto 110KW : 11.0 (b) From 110 KW & upto 200 KW : 9.0 (c) Above 200 KW & upto 1000KW : 10.0 (d) From 1001KW & upto 4000KW : 9.0 (e) Above 4000KW : 6 to 6.5 Starting voltage requirement :permissible starting voltage for motor shall be as follows: (a) Up to 85% of rated voltage for ratings below 110 KW (b) Up to 80% of rated voltage for ratings from 110 KW to 200 KW (c) Up to 85% of rated voltage for ratings from 201 KW to 1000 KW (d) Up to 80% of rated voltage for ratings from 1001 KW to 4000 KW (e) Up to 75 % of rated voltage for ratings above 4000KW		
11.00.00	All the plant and equipments/systems supplied under the contract shall be designed following "Fail Safe" concept in case of failure of Power Supply like Electric Power, Hydraulic pressure, Pneumatic pressure, Vacuum etc the system shall be designed in such a way that the equipment shall always move/remains (as applicable) to safest position as per system requirement to ensure safety of Man and Machinery.		
12.00.00	Latest Cybersecurity guidelines laid down by CEA/Government of India shall be followed.		
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SUB-SECTION-B – 10

CABLING EARTHING AND LIGHTNING PROTECTION

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CLAUSE NO.	TECHNICAL REQUIREMENTS	
<p>1.00.00</p> <p>1.01.00</p>	<p>CODES AND STANDARDS</p> <p>All standards, specifications and codes of practice referred to herein shall be the latest editions including all applicable official amendments and revisions as on date of opening of bid. In case of conflict between this specification and those (IS codes, standards, etc.) referred to herein, the former shall prevail. All work shall be carried out as per the following standards/ codes as applicable .</p> <p>IS:513 Cold rolled low carbon steel sheets and strips.</p> <p>IS:802 Code of practice for the use of Structural Steel in Overhead Transmission Line Towers.</p> <p>IS:1079 Hot Rolled carbon steel sheet & strips</p> <p>IS:1239 Mild steel tubes, tubulars and other wrought steel fittings</p> <p>IS:1255 Code of practice for installation and maintenance of power cables upto and including 33 KV rating</p> <p>IS:1367 Part-13 Technical supply conditions for threaded Steel fasteners. (Hot dip galvanized coatings on threaded fasteners).</p> <p>IS:2147 Degree of protection provided by enclosures for low voltage switchgear and control gear</p> <p>IS:2309 Code of Practice for the protection of building and allied structures against lightning.</p> <p>IS:2629 Recommended practice for hot dip galvanising of iron & steel</p> <p>IS:2633 Method for testing uniformity of coating on zinc coated articles.</p> <p>IS:3043 Code of practice for Earthing</p> <p>IS:3063 Fasteners single coil rectangular section spring washers.</p> <p>IS:6745 Methods for determination of mass of zinc coating on zinc coated iron & steel articles.</p> <p>IS:8308 Compression type tubular in- line connectors for aluminium conductors of insulated cables</p> <p>IS:8309 Compression type tubular terminal ends for aluminium conductors of insulated cables.</p> <p>IS:9537 Conduits for electrical installation.</p> <p>IS:9595 Metal - arc welding of carbon and carbon manganese steels - recommendations.</p> <p>IS:13573 Joints and terminations for polymeric cables.</p> <p>BS:476 Fire tests on building materials and structures</p> <p>IEEE:80 IEEE guide for safety in AC substation grounding</p> <p>IEEE:142 Grounding of Industrial & commercial power systems</p> <p>DIN 46267 (Part-II) Non tension proof compression joints for Aluminium conductors.</p> <p>DIN 46329 Cable lugs for compression connections, ring type ,for Aluminium conductors</p> <p>BS:6121 Specification for mechanical Cable glands for elastomers and plastic insulated cables.</p> <p>Indian Electricity Act.</p> <p>Indian Electricity Rules.</p> <p>1.02.00 Equipment complying with other internationally accepted standards such as IEC, BS, DIN, USA, VDE, NEMA etc. will also be considered if they ensure performance and constructional features equivalent or superior to standards listed above. In such a case, the Bidder shall clearly indicate the standard(s) adopted, furnish a copy in English of the latest revision of the standards alongwith copies of all official amendments and revisions in force as on date of opening of bid and shall clearly bring out the salient features for comparison.</p>	
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