

## **IMPORTANT NOTE**

BID DOCUMENT HAS BEEN DISPLAYED BELOW TO UNDERSTAND THE REQUIREMENT ONLY. PARTIES INTERESTED TO PARTICIPATE AGAINST SUCH REQUIREMENTS MAY APPROACH WITH COMPLETE CREDENTIALS TO THE FOLLOWING OFFICE:

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ISSUE OF ENQUIRY TO THE PARTY MAY BE CONSIDERED AGAINST PRESENT/ FUTURE TENDER BASED ON THE CREDENTIALS.

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**ANNEXURE-I****Tender No. : KID0583L09/07****Tender Date : 25.09.2008**

Item No./ Mat. Code	Material Description	Quantity	UOM
<b>10</b> OC000404	<p><b>1.0 SPECIFICATION FOR LT PANEL OF FLOATING EPS</b></p> <p>The Panel shall have the following features:</p> <ul style="list-style-type: none"> <li># Panel shall be indoor, industrial, semi cubicle type with provision of extension of panels in future.</li> <li># Panel shall be built on Self supporting, floor mounting, rigid framework.</li> <li># Panel shall be sheet steel clad made of 14 SWG MS CRCA sheets and built upon suitably sized MS angle iron frame work.</li> <li># Panel shall be Dust / vermin proof and weatherproof with IP54 degree of protection.</li> <li># Bottom detachable gland plates made from 3 mm thick MSCR sheet shall be provided for all cable entries. Height of bottom detachable gland plate shall be 450 mm from floor level.</li> <li># The entire metal work shall be treated with seven tank antirust treatment as per IS and then powder coated in DA Grey color.</li> <li># Special non-deteriorating Neoprene rubber gaskets shall be provided between all joints.</li> <li># Panel shall be designed for Ambient of 45°C (Max)/ 5°C (Min) and Humidity-95% (Max).</li> <li># All feeders and motor control centres shall be suitable for operation from front side and shall have provision of inspection from backside.</li> <li># All panel doors shall be provided with single turn latches for opening / closing.</li> <li># Internal barriers shall be provided between cubicles to provide Form-2 separation as per IEC to prevent transmission of flashover from one panel to other panels.</li> <li># Danger plates shall be fitted on front and back of the panel.</li> <li># Legend plates of the feeders and starters shall be provided in the front as well as at back of each feeder.</li> <li># Adequate nos. of lifting lugs shall be provided on top.</li> <li># Ventilation louvers shall be guarded with wire mesh.</li> <li># Internal earthing shall be provided for all equipment having earthing terminal and panel doors with suitably rated, PVC insulated, flexible copper earth wires or copper braids of suitable rating as per IS.</li> <li># Earthing bus shall be provided at bottom of the panel. Earthing Bus shall be made of 50x5 mm GI straps with 80 micron galvanisation thickness. Brought out studs shall be provided on two sides complete with suitably sized zinc passivated double nuts and spring washers. Earth bus shall have holes drilled for connection with main earth electrodes and earth cable/ strap of outgoing feeders.</li> <li># BIS ref.: Confirming to IS-8623, IS 13947</li> <li># Legend #LT POWER AND MOTOR CONTROL CENTRE# shall be provided at the top centre.</li> </ul> <p><b>2.0 PANEL COMPARTMENTS / SECTIONS</b></p> <p>The panel shall broadly have the following compartments / sections.</p> <ul style="list-style-type: none"> <li>A) Incomer section</li> <li>B) Change Over Switch</li> </ul>	1	NO

**ANNEXURE-I****Tender No. : KID0583L09/07****Tender Date : 25.09.2008**

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	<p>c) Bus chamber D) Outgoing section</p> <p>A) INCOMER SECTION:</p> <p>2 nos. 250 Amps, 4P, MCCB comprising of overload and short circuit protection of microprocessor based(electronic) for distribution system. Each incomer to terminate on Change Over Switch.</p> <p>Legend: 1. INCOMER 1 2. INCOMER 2</p> <p>The incomer units shall be complete with brought out terminals of suitable rating and single compression cable gland suitable for cable provided on the bottom detachable gland plate. Suitably rated tinned copper lugs for all incoming cable connections shall be supplied with the brought out terminals.</p> <p>Protections in Incomer Panels:</p> <p>Each Incomer panels shall have :</p> <p># Earth-leakage protection through separate CBCT &amp; ELR . EL current Range: 0-3A, adjustable in preferred steps of 50/100mA Trip Time Range: 0-5s, adjustable in preferred steps of 50/100ms. The relay shall have indication LEDs, test push button and reset push button.</p> <p>Incoming Feeder Instruments</p> <p>The incoming feeder shall comprise the following instruments in an instruments panel complete with all necessary interconnections, fine wiring and duly tested:</p> <p>1. Digital Voltmeter, 0-500V, auxiliary power supply 230 V, class of accuracy 0.5 Qty: 1 no.</p> <p>2. Digital Ammeter, 0-500A, with individual CTs of 200/5 (15VA, 0.6kV, Class1) in each phase,auxiliary power supply 230 V ,class of accuracy 0.5</p> <p>3. HRC Instrument Fuse Holders fused 4 Amps Qty: As per ckt</p> <p>4. LED type Indication Lamps for 'Phase Healthy' indication in Red, Yellow and Blue in colour. Qty:3 Nos</p> <p>B) CHANGE OVER SWITCH</p> <p>Change Over Switch: 250A, 4P, On load, front handle operated. Qty:1 No.</p> <p>C) BUS CHAMBER</p> <p>The bus chamber shall be sheet steel clad having front and rear bolted covers and shall consist of 1 set TP &amp; N electrolytic grade, high conductivity electrolytic E 91 E grade aluminium Bus Bars, conforming to IS: 5082.</p>		

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	<p>Current rating of bus bar sections shall be 600 Amps suitable for 415 V AC, 50 Hz system. Neutral bar shall be of same size as phase bus. The bus-bar shall be insulated with heat shrinkable PVC sleeves and shall be supported at required intervals with non- hygroscopic, non-deteriorating, and noninflammable SMC / FRP supports having adequate mechanical strength and a high tracking resistance, to withstand short circuit fault levels up to 50 kA for 1 sec. All risers and connections from bus bar shall be done with same material as the main bus bars of current rating as per rating of individual cubicle switch. To suit the stringent site conditions, the bus bar system shall be designed with generous clearance between phases than specified in the standards. Adequate non-hygroscopic insulating sheet barriers between the bus chambers and feeders shall be provided.</p> <p>The manufacturer of the panel must have CPRI test certificate and temperature rise certificate for bus bar fault level of 50kA. A copy of the CPRI test certificate and temperature rise certificate shall be enclosed with the offer.</p> <p>D) OUT GOING SECTION a) Feeders:</p> <p>1. 4 Nos. 125 A,4P, Fuse Switch Unit of CMM type with 80A HRC fuse. Legend: 1. FWD PUMP HOUSE FEEDER. 2. BOILER FEEDER 3. SPARE 4. SPARE</p> <p>2. 3 nos. 63A, 4P, switch disconnecter fuse unit with 63A HRC fuse. Legend: 1. HAZ AREA LIGHTING TRANSFORMER. 2. SPARE. 3. SPARE</p> <p>FWD and lighting transformer feeders shall have the following protection:</p> <p># Earth-leakage protection through separate CBCT &amp; ELR with suitable contactor for tripping mechanism.</p> <p>EL current Range: 0-3A, adjustable in preferred steps of 50/100mA Trip Time Range: 0-5s, adjustable in preferred steps of 50/100ms. The relay shall have indication LEDs, test push button and reset push button .</p> <p>Instruments in feeder panels:</p> <p>Each outgoing feeder shall comprise the following instruments in an instruments panel complete with all necessary interconnections, fine wiring and duly tested:</p> <p>1. Digital ammeter of suitable rating ,CT operated with suitably rated individual CTs (15VA, 0.6kV, Class1) in each phase,auxiliary power supply 230 V ,class of accuracy 0.5</p>		

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	<p>2. HRC Instrument Fuse Holders fused 4 Amps Qty: As per ckt</p> <p>3. LED type Indication Lamps for '#Feeder ON' indication in Red and '#Feeder OFF' indication in Green colour, Qty: 3 nos.</p> <p>b) Motor Starters:</p> <p>1.2 Nos. Star - Delta starter suitable for 20 HP motor with 125A FSU of CMM type and 40 A TP power contactor as incomer. 2.2 Nos. Star - Delta starter suitable for 15 HP motor with 125A FSU of CMM type and 40 A TP power contactor as incomer. 3.6 Nos DOL Starter suitable for 12.5 HP motor with 63A Switch Disconnecter Fuse and 32 A TP power contactor as incomer. 4.2 Nos. DOL starter suitable for 5 HP motor with 63A Switch Disconnecter Fuse and 16 A TP power contactor as incomer.</p> <p>General Notes on Starters:</p> <p>1. Power contactors or MPCBs, AC3 duty, with 4NC + 4NO auxiliary contacts shall be wired up as per drawing. AC3 rating of the contactors shall be 30% higher than the AC3 rating recommended in contactor selection chart of Siemens / L&amp;T / Schneider for the specified rating of motor. 2. The control panel shall include START / STOP push buttons with terminals for remote Start / Stop PB Station. One no PBS will be supplied with each starter. 3. Each motor starter shall have adequate no. of potential free contacts for instrument DCS. 4. Protections: The motor shall have the following minimum (but not limited to) protections in the Starter panel # Short Circuit # Overload (through Thermal bi-metallic over load relay) # Phase failure # Earth-leakage: EL protection shall be provided with separate CBCT &amp; ELR for 5 kW and above motor capacity. EL current Range: 0-5A, adjustable in preferred steps of 50/100mA Trip Time Range: 0-3s, adjustable in preferred steps of 50/100ms. The relay shall have indication LEDs, test push button, reset push button and shall be duly wired up to trip starter in case of earth leakage.</p> <p>6. Metering &amp; indication: The starter panels shall have meters and indication for the following information. HRC Instrument Fuse Holders with suitably rated HRC fuses shall be used for the circuitry: # Motor Current of Y phase through digital ammeter with CT of suitable rating. # Indications: LED type indicating lamps with complete fittings, with legend plate for #Motor ON #, #Motor Off#, #Motor Trip on Fault#.</p> <p>c) Distribution Boards:</p> <p>1. 1 no. TPN,4-way,63 A Fuse DB for general lighting, comprising of 63A, 4P</p>		

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	<p>SDF with 63 A fuse as incomer.</p> <p>Legend: MLDB</p> <p>2. 1 no. Haz Area LDB [Hazardous Area Lighting Distribution Board] for lighting in hazardous areas, comprising of 63A, 4P MCCB as Incomer; one no. 4P-63A-230V coil Contactor; an Auto/Manual switch; one no. 24 hrs time switch; ON/OFF push buttons and 6 nos. DP-10A MCBs distributed evenly in Ph-Ph circuits. The contactor coil shall be powered from ph-ph circuit and shall be operated either in the auto mode through the timer or by the ON/OFF push buttons in the manual mode. Terminals shall be provided for a remote PBS.</p> <p>The DB shall be mounted on any one side of the panel and shall be isolated from the main bus. Incoming connection to the DB shall be left blank for separate independent onsite connection from a 230V Ph-Ph lighting transformer to be installed elsewhere.</p> <p>Legend: Haz Area LDB</p> <p>3. 1 No 20 A Industrial type Socket Outlet.</p>		
<p><b>20</b> OC000404</p>	<p>1.0 SPECIFICATION FOR LT PANEL AT BOILER SHED</p> <p>The Panel shall have the following features:</p> <ul style="list-style-type: none"> <li># Panel shall be indoor, industrial,semi cubicle type with provision of extension of panels in future.</li> <li># Panel shall be built on Self supporting, floor mounting, rigid framework.</li> <li># Panel shall be sheet steel clad made of 14 SWG MS CRCA sheets and built upon suitably sized MS angle iron frame work.</li> <li># Panel shall be Dust / vermin proof and weatherproof with IP54degree of protection.</li> <li># Bottom detachable gland plates made from 3 mm thick MSCR sheet shall be provided for all cable entries. Height of bottom detachable gland plate shall be 450 mm from floor level.</li> <li># The entire metal work shall be treated with seven tank antirust treatment as per IS and then powder coated in DA Grey color.</li> <li># Special non-deteriorating Neoprene rubber gaskets shall be provided between all joints.</li> <li># Panel shall be designed for Ambient of 45°C (Max)/ 5°C (Min) and Humidity-95% (Max).</li> <li># All feeders and motor control centres shall be suitable for operation from front side and shall have provision of inspection from backside.</li> <li># All panel doors shall be provided with single turn latches for opening / closing.</li> <li># Internal barriers shall be provided between cubicles to provide Form-2 separation as per IEC to prevent transmission of flashover from one panel to other panels.</li> <li># Danger plates shall be fitted on front and back of the panel.</li> <li># Legend plates of the feeders and starters shall be provided in the front as well as at back of each feeder.</li> <li># Adequate nos. of lifting lugs shall be provided on top.</li> <li># Ventilation louvers shall be guarded with wire mesh.</li> <li># Internal earthing shall be provided for all equipment having earthing terminal and panel doors with suitably rated, PVC insulated, flexible copper</li> </ul>	1	NO

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Item No./ Mat. Code	Material Description	Quantity	UOM
	<p>earth wires or copper braids of suitable rating as per IS.  # Earthing bus shall be provided at bottom of the panel. Earthing Bus shall be made of 50x5 mm GI straps with 80 micron galvanisation thickness. Brought out studs shall be provided on two sides complete with suitably sized zinc passivated double nuts and spring washers. Earth bus shall have holes drilled for connection with main earth electrodes and earth cable/ strap of outgoing feeders.  # BIS ref.: Confirming to IS-8623, IS 13947  # Legend #LT POWER AND MOTOR CONTROL CENTRE# shall be provided at the top centre.</p> <p><b>2.0 PANEL COMPARTMENTS / SECTIONS</b></p> <p>The panel shall broadly have the following compartments / sections.  A) Incomer section  B) Bus chamber  C) Outgoing section</p> <p><b>A) INCOMER SECTION:</b></p> <p>2 nos. 125 Amps, 4P, Fuse Switch Unit of CMM type with 40 A fuse  Legend: 1. INCOMER 1  2. INCOMER 2</p> <p>The incomer units shall be complete with brought out terminals of suitable rating and single compression cable gland suitable for cable provided on the bottom detachable gland plate. Suitably rated tinned copper lugs for all incoming cable connections shall be supplied with the brought out terminals.</p> <p>Protections in Incomer Panels:</p> <p>Each Incomer panels shall have :</p> <p># Earth-leakage protection through separate CBCT &amp; ELR with suitable contactor for tripping mechanism.  EL current Range: 0-3A, adjustable in preferred steps of 50/100mA  Trip Time Range: 0-5s, adjustable in preferred steps of 50/100ms.  The relay shall have indication LEDs, test push button and reset push button.</p> <p><b>Incoming Feeder Instruments</b>  The incoming feeder shall comprise the following instruments in an instruments panel complete with all necessary interconnections, fine wiring and duly tested:</p> <p>1. Digital Voltmeter, 0-500V, auxiliary power supply 230 V, class of accuracy 0.5  Qty: 1 no.</p> <p>2. Digital Ammeter, 0-100A, CT operated with suitably rated individual CTs (15VA, 0.6kV, Class1) in each phase, auxiliary power supply 230 V, class of accuracy 0.5</p> <p>3. HRC Instrument Fuse Holders fused 4 Amps  Qty: As per ckt</p> <p>4. LED type Indication Lamps for 'Phase Healthy' indication in Red, Yellow</p>		

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	<p>and Blue in colour. Qty:3 Nos</p> <p><b>B) BUS CHAMBER</b></p> <p>The bus chamber shall be sheet steel clad having front and rear bolted covers and shall consist of 1 set TP &amp; N electrolytic grade, high conductivity electrolytic E 91 E grade aluminium Bus Bars, conforming to IS: 5082. Current rating of bus bar sections shall be 200 Amps suitable for 415 V AC, 50 Hz system. Neutral bar shall be of same size as phase bus. The bus-bar shall be insulated with heat shrinkable PVC sleeves and shall be supported at required intervals with non- hygroscopic, non-deteriorating, and noninflammable SMC / FRP supports having adequate mechanical strength and a high tracking resistance, to withstand short circuit fault levels up to 50 kA for 1 sec. All risers and connections from bus bar shall be done with same material as the main bus bars of current rating as per rating of individual cubicle switch. To suit the stringent site conditions, the bus bar system shall be designed with generous clearance between phases than specified in the standards. Adequate non-hygroscopic insulating sheet barriers between the bus chambers and feeders shall be provided.</p> <p>The manufacturer of the panel must have CPRI test certificate and temperature rise certificate for bus bar fault level of 50kA. A copy of the CPRI test certificate and temperature rise certificate shall be enclosed with the offer.</p> <p><b>C) OUT GOING SECTION</b></p> <p>a) Feeders:</p> <p>1. 1 No.32 A,4P,switch disconnecter fuse unit with 16 A HRC fuse.</p> <p>Legend: 1.SPARE</p> <p>All feeders shall have the following protection:</p> <p># Earth-leakage protection through separate CBCT &amp; ELR with suitable contactor for tripping mechanism.</p> <p>EL current Range: 0-3A, adjustable in preferred steps of 50/100mA Trip Time Range: 0-5s, adjustable in preferred steps of 50/100ms. The relay shall have indication LEDs, test push button and reset push button .</p> <p>Instruments in feeder panels:</p> <p>Each outgoing feeder shall comprise the following instruments in an instruments panel complete with all necessary interconnections, fine wiring and duly tested:</p> <p>1. Digital Ammeter of suitable range CT operated with suitably rated individual CTs (15VA, 0.6kV, Class1) in each phase,auxiliary power supply 230 V ,class</p>		

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	<p>of accuracy 0.5</p> <p>2. HRC Instrument Fuse Holders fused 4 Amps Qty: As per ckt</p> <p>3. LED type Indication Lamps for #Feeder ON' indication in Red and #Feeder OFF' indication in Green colour, Qty: 3 nos.</p> <p>b)Motor Starters: 1.2 Nos. DOL starter suitable for 5 HP motor with 32 A SDF with 16 A fuse as incomer.</p> <p>c) Distribution Boards: 1. 1 no. TPN, 4-way, 32A-Fuse DB comprising of 32A, 4P SDF with 32A fuse as Incomer. Legend: 32A, 4Way, FUSE DB</p> <p>2. 1 No 20 A Industrial type Socket Outlet.</p>		
<p><b>30</b> OC000404</p>	<p>1.0 SPECIFICATION FOR LT PANEL OF FLOATING EPS</p> <p>The Panel shall have the following features:</p> <ul style="list-style-type: none"> <li># Panel shall be indoor, industrial,semi cubicle type with provision of extension of panels in future.</li> <li># Panel shall be built on Self supporting, floor mounting, rigid framework.</li> <li># Panel shall be sheet steel clad made of 14 SWG MS CRCA sheets and built upon suitably sized MS angle iron frame work.</li> <li># Panel shall be Dust / vermin proof and weatherproof with IP54degree of protection.</li> <li># Bottom detachable gland plates made from 3 mm thick MSCR sheet shall be provided for all cable entries. Height of bottom detachable gland plate shall be 450 mm from floor level.</li> <li># The entire metal work shall be treated with seven tank antirust treatment as per IS and then powder coated in DA Grey color.</li> <li># Special non-deteriorating Neoprene rubber gaskets shall be provided between all joints.</li> <li># Panel shall be designed for Ambient of 45°C (Max)/ 5°C (Min) and Humidity-95% (Max).</li> <li># All feeders and motor control centres shall be suitable for operation from front side and shall have provision of inspection from backside.</li> <li># All panel doors shall be provided with single turn latches for opening / closing.</li> <li># Internal barriers shall be provided between cubicles to provide Form-2 separation as per IEC to prevent transmission of flashover from one panel to other panels.</li> <li># Danger plates shall be fitted on front and back of the panel.</li> <li># Legend plates of the feeders and starters shall be provided in the front as well as at back of each feeder.</li> <li># Adequate nos. of lifting lugs shall be provided on top.</li> <li># Ventilation louvers shall be guarded with wire mesh.</li> <li># Internal earthing shall be provided for all equipment having earthing terminal and panel doors with suitably rated, PVC insulated, flexible copper earth wires or copper braids of suitable rating as per IS.</li> <li># Earthing bus shall be provided at bottom of the panel. Earthing Bus shall be</li> </ul>	1	NO

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	<p>made of 50x5 mm GI straps with 80 micron galvanisation thickness. Brought out studs shall be provided on two sides complete with suitably sized zinc passivated double nuts and spring washers. Earth bus shall have holes drilled for connection with main earth electrodes and earth cable/ strap of outgoing feeders.</p> <p># BIS ref.: Confirming to IS-8623, IS 13947 # Legend #LT POWER AND MOTOR CONTROL CENTRE# shall be provided at the top centre.</p> <p><b>2.0 PANEL COMPARTMENTS / SECTIONS</b></p> <p>The panel shall broadly have the following compartments / sections.</p> <p>A) Incomer section B) Change Over Switch c) Bus chamber D) Outgoing section</p> <p><b>A) INCOMER SECTION:</b></p> <p>2 nos. 250 Amps, 4P, MCCB comprising of overload and short circuit protection of microprocessor based (electronic)for distribution systems. Each incomer to terminate on Change Over Switch.</p> <p>Legend: 1. INCOMER 1 2. INCOMER 2</p> <p>The incomer units shall be complete with brought out terminals of suitable rating and single compression cable gland suitable for cable provided on the bottom detachable gland plate. Suitably rated tinned copper lugs for all incoming cable connections shall be supplied with the brought out terminals.</p> <p>Protections in Incomer Panels:</p> <p>Each Incomer panels shall have :</p> <p># Earth-leakage protection through separate CBCT &amp; ELR . EL current Range: 0-3A, adjustable in preferred steps of 50/100mA Trip Time Range: 0-5s, adjustable in preferred steps of 50/100ms. The relay shall have indication LEDs, test push button and reset push button.</p> <p><b>Incoming Feeder Instruments</b></p> <p>The incoming feeder shall comprise the following instruments in an instruments panel complete with all necessary interconnections, fine wiring and duly tested:</p> <p>1. Digital Voltmeter, 0-500V, auxiliary power supply 230 V ,class of accuracy 0.5 Qty: 1 no.</p> <p>2. Digital Ammeter, 0-500A, with individual CTs of 200/5 (15VA, 0.6kV, Class1) in each phase,auxiliary power supply 230 V ,class of accuracy 0.5</p> <p>3. HRC Instrument Fuse Holders fused 4 Amps Qty: As per ckt</p>		

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	<p>4. LED type Indication Lamps for 'Phase Healthy' indication in Red, Yellow and Blue in colour. Qty:3 Nos</p> <p>B) CHANGE OVER SWITCH</p> <p>Change Over Switch: 250A, 4P, On load, front handle operated. Qty:1 No.</p> <p>C) BUS CHAMBER</p> <p>The bus chamber shall be sheet steel clad having front and rear bolted covers and shall consist of 1 set TP &amp; N electrolytic grade, high conductivity electrolytic E 91 E grade aluminium Bus Bars, conforming to IS: 5082. Current rating of bus bar sections shall be 600 Amps suitable for 415 V AC, 50 Hz system. Neutral bar shall be of same size as phase bus. The bus-bar shall be insulated with heat shrinkable PVC sleeves and shall be supported at required intervals with non- hygroscopic, non-deteriorating, and noninflammable SMC / FRP supports having adequate mechanical strength and a high tracking resistance, to withstand short circuit fault levels up to 50 kA for 1 sec. All risers and connections from bus bar shall be done with same material as the main bus bars of current rating as per rating of individual cubicle switch. To suit the stringent site conditions, the bus bar system shall be designed with generous clearance between phases than specified in the standards. Adequate non-hygroscopic insulating sheet barriers between the bus chambers and feeders shall be provided.</p> <p>The manufacturer of the panel must have CPRI test certificate and temperature rise certificate for bus bar fault level of 50kA. A copy of the CPRI test certificate and temperature rise certificate shall be enclosed with the offer.</p> <p>D) OUT GOING SECTION</p> <p>a) Feeders:</p> <p>1. 4 Nos. 125 A,4P, Fuse Switch Unit of CMM type with 80A HRC fuse. Legend: 1. FWD PUMP HOUSE FEEDER. 2. BOILER FEEDER 3. SPARE 4. SPARE</p> <p>2. 3 nos. 63A, 4P, switch disconnecter fuse unit with 63A HRC fuse.</p> <p>Legend: 1. HAZ AREA LIGHTING TRANSFORMER. 2. SPARE. 3. SPARE</p> <p>FWD and lighting transformer feeders shall have the following protection:</p> <p># Earth-leakage protection through separate CBCT &amp; ELR with suitable contactor for tripping mechanism.</p>		

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	<p>EL current Range: 0-3A, adjustable in preferred steps of 50/100mA            Trip Time Range: 0-5s, adjustable in preferred steps of 50/100ms.            The relay shall have indication LEDs, test push button and reset push button .</p> <p>Instruments in feeder panels:</p> <p>Each outgoing feeder shall comprise the following instruments in an instruments panel complete with all necessary interconnections, fine wiring and duly tested:</p> <ol style="list-style-type: none"> <li>1. Digital ammeter of suitable rating ,CT operated with suitably rated individual CTs (15VA, 0.6kV, Class1) in each phase,auxiliary power supply 230 V ,class of accuracy 0.5</li> <li>2. HRC Instrument Fuse Holders fused 4 Amps Qty: As per ckt</li> <li>3. LED type Indication Lamps for '#Feeder ON' indication in Red and '#Feeder OFF' indication in Green colour, Qty: 3 nos.</li> </ol> <p>b) Motor Starters:</p> <ol style="list-style-type: none"> <li>1.2 Nos. Star - Delta starter suitable for 20 HP motor with 125A FSU of CMM type and 40 A TP power contactor as incomer.</li> <li>2.2 Nos. Star - Delta starter suitable for 15 HP motor with 125A FSU of CMM type and 40 A TP power contactor as incomer.</li> <li>3.6 Nos DOL Starter suitable for 12.5 HP motor with 63A Switch Disconnecter Fuse and 32 A TP power contactor as incomer.</li> <li>4.2 Nos. DOL starter suitable for 5 HP motor with 63A Switch Disconnecter Fuse and 16 A TP power contactor as incomer.</li> </ol> <p>General Notes on Starters:</p> <ol style="list-style-type: none"> <li>1. Power contactors or MPCBs, AC3 duty, with 4NC + 4NO auxiliary contacts shall be wired up as per drawing. AC3 rating of the contactors shall be 30% higher than the AC3 rating recommended in contactor selection chart of Siemens / L&amp;T / Schneider for the specified rating of motor.</li> <li>2. The control panel shall include START / STOP push buttons with terminals for remote Start / Stop PB Station. One no PBS will be supplied with each starter.</li> <li>3. Each motor starter shall have adequate no. of potential free contacts for instrument DCS.</li> <li>4. Protections: The motor shall have the following minimum (but not limited to) protections in the Starter panel               <ul style="list-style-type: none"> <li># Short Circuit</li> <li># Overload (through Thermal bi-metallic over load relay)</li> <li># Phase failure</li> <li># Earth-leakage: EL protection shall be provided with separate CBCT &amp; ELR for 5 kW and above motor capacity.</li> </ul> </li> </ol> <p>EL current Range: 0-5A, adjustable in preferred steps of 50/100mA            Trip Time Range: 0-3s, adjustable in preferred steps of 50/100ms.            The relay shall have indication LEDs, test push button, reset push button and</p>		

**ANNEXURE-I****Tender No. : KID0583L09/07****Tender Date : 25.09.2008**

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	<p>shall be duly wired up to trip starter in case of earth leakage.</p> <p>6. Metering &amp; indication: The starter panels shall have meters and indication for the following information. HRC Instrument Fuse Holders with suitably rated HRC fuses shall be used for the circuitry:  # Motor Current of Y phase through digital ammeter with CT of suitable rating.  # Indications: LED type indicating lamps with complete fittings, with legend plate for #Motor ON #, #Motor Off#, #Motor Trip on Fault#.</p> <p>c) Distribution Boards:</p> <p>1. 1 no. TPN,4-way,63 A Fuse DB for general lighting, comprising of 63A, 4P SDF with 63 A fuse as Incomer .  Legend: MLDB</p> <p>2. 1 no. Haz Area LDB [Hazardous Area Lighting Distribution Board] for lighting in hazardous areas, comprising of 63A, 4P SDF with 63 A fuse as Incomer; one no. 4P-63A-230V coil Contactor; an Auto/Manual switch; one no. 24 hrs time switch; ON/OFF push buttons and 6 nos. DP-10A MCBs distributed evenly in Ph-Ph circuits. The contactor coil shall be powered from ph-ph circuit and shall be operated either in the auto mode through the timer or by the ON/OFF push buttons in the manual mode. Terminals shall be provided for a remote PBS.</p> <p>The DB shall be mounted on any one side of the panel and shall be isolated from the main bus. Incoming connection to the DB shall be left blank for separate independent onsite connection from a 230V Ph-Ph lighting transformer to be installed elsewhere.  Legend: Haz Area LDB</p> <p>3. 1 No 20 A Industrial type Socket Outlet.</p>		
<p><b>40</b> OC000404</p>	<p>1.0 SPECIFICATION FOR LT PANEL AT BOILER SHED</p> <p>The Panel shall have the following features:  # Panel shall be indoor, industrial,semi cubicle type with provision of extension of panels in future.  # Panel shall be built on Self supporting, floor mounting, rigid framework.  # Panel shall be sheet steel clad made of 14 SWG MS CRCA sheets and built upon suitably sized MS angle iron frame work.  # Panel shall be Dust / vermin proof and weatherproof with IP54degree of protection.  # Bottom detachable gland plates made from 3 mm thick MSCR sheet shall be provided for all cable entries. Height of bottom detachable gland plate shall be 450 mm from floor level.  # The entire metal work shall be treated with seven tank antirust treatment as per IS and then powder coated in DA Grey color.  # Special non-deteriorating Neoprene rubber gaskets shall be provided between all joints.  # Panel shall be designed for Ambient of 45°C (Max)/ 5°C (Min) and Humidity-95% (Max).  # All feeders and motor control centres shall be suitable for operation from front side and shall have provision of inspection from backside.  # All panel doors shall be provided with single turn latches for opening /</p>	1	NO

**ANNEXURE-I****Tender No. : KID0583L09/07****Tender Date : 25.09.2008**

Item No./ Mat. Code	Material Description	Quantity	UOM
	<p>closing.</p> <p># Internal barriers shall be provided between cubicles to provide Form-2 separation as per IEC to prevent transmission of flashover from one panel to other panels.</p> <p># Danger plates shall be fitted on front and back of the panel.</p> <p># Legend plates of the feeders and starters shall be provided in the front as well as at back of each feeder.</p> <p># Adequate nos. of lifting lugs shall be provided on top.</p> <p># Ventilation louvers shall be guarded with wire mesh.</p> <p># Internal earthing shall be provided for all equipment having earthing terminal and panel doors with suitably rated, PVC insulated, flexible copper earth wires or copper braids of suitable rating as per IS.</p> <p># Earthing bus shall be provided at bottom of the panel. Earthing Bus shall be made of 50x5 mm GI straps with 80 micron galvanisation thickness. Brought out studs shall be provided on two sides complete with suitably sized zinc passivated double nuts and spring washers. Earth bus shall have holes drilled for connection with main earth electrodes and earth cable/ strap of outgoing feeders.</p> <p># BIS ref.: Confirming to IS-8623, IS 13947</p> <p># Legend #LT POWER AND MOTOR CONTROL CENTRE# shall be provided at the top centre.</p> <p><b>2.0 PANEL COMPARTMENTS / SECTIONS</b></p> <p>The panel shall broadly have the following compartments / sections.</p> <p>A) Incomer section B) Bus chamber C) Outgoing section</p> <p><b>A) INCOMER SECTION:</b></p> <p>2 nos. 125 Amps, 4P, Fuse Switch Unit of CMM type with 40 A fuse Legend: 1. INCOMER 1 2. INCOMER 2</p> <p>The incomer units shall be complete with brought out terminals of suitable rating and single compression cable gland suitable for cable provided on the bottom detachable gland plate. Suitably rated tinned copper lugs for all incoming cable connections shall be supplied with the brought out terminals.</p> <p><b>Protections in Incomer Panels:</b></p> <p>Each Incomer panels shall have :</p> <p># Earth-leakage protection through separate CBCT &amp; ELR with suitable contactor for tripping mechanism. EL current Range: 0-3A, adjustable in preferred steps of 50/100mA Trip Time Range: 0-5s, adjustable in preferred steps of 50/100ms. The relay shall have indication LEDs, test push button and reset push button.</p> <p><b>Incoming Feeder Instruments</b></p> <p>The incoming feeder shall comprise the following instruments in an instruments panel complete with all necessary interconnections, fine wiring and duly tested:</p>		

**ANNEXURE-I****Tender No. : KID0583L09/07****Tender Date : 25.09.2008**

Item No./ Mat. Code	Material Description	Quantity	UOM
	<p>1. Digital Voltmeter, 0-500V, auxiliary power supply 230 V, class of accuracy 0.5 Qty: 1 no.</p> <p>2. Digital Ammeter, 0-100A, CT operated with suitably rated individual CTs (15VA, 0.6kV, Class1) in each phase,auxiliary power supply 230 V ,class of accuracy 0.5</p> <p>3. HRC Instrument Fuse Holders fused 4 Amps Qty: As per ckt</p> <p>4. LED type Indication Lamps for 'Phase Healthy' indication in Red, Yellow and Blue in colour. Qty:3 Nos</p> <p><b>B) BUS CHAMBER</b></p> <p>The bus chamber shall be sheet steel clad having front and rear bolted covers and shall consist of 1 set TP &amp; N electrolytic grade, high conductivity electrolytic E 91 E grade aluminium Bus Bars, conforming to IS: 5082. Current rating of bus bar sections shall be 200 Amps suitable for 415 V AC, 50 Hz system. Neutral bar shall be of same size as phase bus. The bus-bar shall be insulated with heat shrinkable PVC sleeves and shall be supported at required intervals with non- hygroscopic, non-deteriorating, and noninflammable SMC / FRP supports having adequate mechanical strength and a high tracking resistance, to withstand short circuit fault levels up to 50 kA for 1 sec. All risers and connections from bus bar shall be done with same material as the main bus bars of current rating as per rating of individual cubicle switch. To suit the stringent site conditions, the bus bar system shall be designed with generous clearance between phases than specified in the standards. Adequate non-hygroscopic insulating sheet barriers between the bus chambers and feeders shall be provided.</p> <p>The manufacturer of the panel must have CPRI test certificate and temperature rise certificate for bus bar fault level of 50kA. A copy of the CPRI test certificate and temperature rise certificate shall be enclosed with the offer.</p> <p><b>C) OUT GOING SECTION</b></p> <p>a) Feeders:</p> <p>1. 1 No.32 A,4P,switch disconnecter fuse unit with 16 A HRC fuse.</p> <p>Legend: 1.SPARE</p> <p>All feeders shall have the following protection:</p> <p># Earth-leakage protection through separate CBCT &amp; ELR with suitable contactor for tripping mechanism.</p> <p>EL current Range: 0-3A, adjustable in preferred steps of 50/100mA Trip Time Range: 0-5s, adjustable in preferred steps of 50/100ms. The relay shall have indication LEDs, test push button and reset push button .</p>		

**ANNEXURE-I****Tender No. : KID0583L09/07****Tender Date : 25.09.2008**

Item No./ Mat. Code	Material Description	Quantity	UOM
	<p>Instruments in feeder panels:</p> <p>Each outgoing feeder shall comprise the following instruments in an instruments panel complete with all necessary interconnections, fine wiring and duly tested:</p> <p>1. Digital Ammeter of suitable range CT operated with suitably rated individual CTs (15VA, 0.6kV, Class1) in each phase, auxiliary power supply 230 V ,class of accuracy 0.5</p> <p>2. HRC Instrument Fuse Holders fused 4 Amps Qty: As per ckt</p> <p>3. LED type Indication Lamps for '#Feeder ON' indication in Red and '#Feeder OFF' indication in Green colour, Qty: 3 nos.</p> <p>b) Motor Starters:</p> <p>1.2 Nos. DOL starter suitable for 5 HP motor with 32 A SDF with 16 A fuse as incomer.</p> <p>c) Distribution Boards:</p> <p>1. 1 no. TPN, 4-way, 32A-Fuse DB comprising of 32A, 4P SDF with 32A fuse as Incomer. Legend: 32A, 4Way, FUSE DB</p> <p>2. 1 No 20 A Industrial type Socket Outlet.</p>		

**Special Notes : 1.0 DOCUMENTS:**

1. The following documents shall be submitted with the offer
  - # GA drawing of the panel showing all details
  - # Single line Power circuit diagrams
  - # Technical specification of all equipment as per tender specs
  - # Copy of CPRI test certificate for 50kA fault level of bus bar of the panel
  - # Deviation of offer from tender specifications with justification and backup documents from principal wherever required. All deviations subject to acceptance by OIL in writing
  
2. The successful bidder shall obtain approval for the following drawings, documents. All electrical details shall be submitted within 45 days of placement of order. OIL shall require minimum 30 days time for approval of drawings. The approval time may increase depending upon clarifications required from the bidders.
  - # GA drawing showing all details, including constructional detail and component layout for panels
  - # Single line Power and control circuit diagrams
  - # Technical specification of all equipment
  - # Bill of materials with catalogues of various components.
  - # Copy of CPRI test certificate for 50kA fault level of bus bar of the panel
  
3. Four sets of the following documents shall be submitted with the supply

**ANNEXURE-I****Tender No. : KID0583L09/07****Tender Date : 25.09.2008**

- # Approved GA drawing showing all details, including constructional detail and component layout for panels
- # Approved Single line Power and control circuit diagrams
- # Technical specification of all equipment
- # Bill of materials with catalogues of various components.
- # Copy of CPRI test certificate for 50kA fault level of bus bar of the panel
- # Guarantee Certificate
- # List of recommended spares with part nos. for two years

**2.0 GENERAL NOTES:**

1. All main riser connections shall be done by suitably sized and rated aluminium links or copper cables as recommended by the switch manufacturer. In case of cables, terminations at both ends shall be done through suitably rated tinned copper lugs.
2. Brought out terminals of suitable rating (as per rating of the feeder) shall be provided for all cable terminations of incoming / outgoing feeder units.
3. Suitably rated tinned copper crimping lugs for each conductor of all outgoing cable connections shall be supplied with the brought out terminals including terminals for remote push buttons.
4. All cable entries shall be from bottom. Suitable cable entry arrangement with detachable gland plates shall be provided. Adequate nos. of single compression heavy duty nickel plated brass cable glands suitable for correspondingly rated PVCA, 4C, Copper cable shall be provided on the bottom detachable gland plate. Adequate nos. of glands shall also be provided for circuits to be fed from DBs.
5. Sufficient space shall be provided for cable termination, dressing and connecting cable leads to the brought out terminals.
6. Control wiring shall be done with 2.5 sq. mm PVC insulated and PVC sheathed FRLS Cables with copper conductor wires of 1100V grade. All power and Control wires shall have ferrule numbers. All joints in control & CT wiring shall be done with suitable TBs. All cables / wires shall have ferrule numbers for proper identification as per drawing. All terminations shall be done through lugs.
7. All feeders shall have Moulded fuse holders, suitably fused, for control & instrument circuits.
8. Legend plates for the indication lamps, meters, control switches / buttons and labels for the terminals shall be provided.
9. The board should be properly packed to avoid ingress of rain water/moisture and damage during the transit.
10. The panel shall be guaranteed for 1 (one) year from the date of supply or 18 months from the date of delivery. Guarantee cards shall be duly signed and stamped by the supplier and shall be provided along with the supply.
11. In their offer the bidder must mention their detailed comments point-wise against each point of tender specifications and general notes. Any deviation from the tender specification shall be specifically mentioned. Specific type and make of equipment shall be clearly mentioned. All the information required as per tender specifications must be submitted.

**ANNEXURE-I****Tender No. : KID0583L09/07****Tender Date : 25.09.2008**

12. In case of an order the complete tender specification shall be mentioned in the order. However, deviations from tender specifications, as mentioned by party in their offer and subject to acceptance by OIL shall be mentioned in the order.

13. The manufacture of the equipment is to be started only after written approval of the drawings/ documents by OIL.

14. In case the documents furnished by the bidder as per above do not comply with any of the points mentioned in the order then the order will be cancelled without any obligation on part of OIL. IN CASE OF SUCH CANCELLATION OIL WILL RECOVER FROM THE PARTY THE COST INCURRED BY OIL IN PROCESSING THE TENDER TILL THE TIME OF CANCELLATION.

15. The panel shall be inspected by Engineers of OIL before dispatch. Any alteration requirements pointed during the inspection shall be carried out by the manufacturer and confirmed before dispatch, without which dispatch clearance shall not be given.

**3.0 MAKES OF COMPONENTS:****Item Make**

CFS / SDF : GEPC / Havell's / Schneider / Legrand

MCCB : Merlin Gerin / Legrand / Siemens

HRC Fuses / Fuse Holders : GEPC

MPCB : Siemens / Merlin Gerin / GE

Contactors : Siemens / L&amp;T / Schneider

OLR : Siemens / L&amp;T / Schneider

(shall be same as that of contactor)

SPPR : Siemens / Schneider/ Minilac

Electronic Time Delay Relay : Siemens / L&amp;T / Schneider

PBS : Siemens / L&amp;T

Voltmeter : Automatic Electric / L&amp;T

Voltmeter Selector Switch : Kaycee / Salzer

Ammeter : Automatic Electric/ L&amp;T

Ammeter Selector Switch : Kaycee / Salzer

LED Type Indication Lamps : Vinay / Tecnik

CTs Kappa / AE

Earth Leakage Relay : Merlin Gerin / MDS-Legrand

A/M Switch : Siemens / L&amp;T

RCBOs / MCBs / RCCBs : Legrand / Merlin Gerin / Siemens

Metal Clad, Industrial Type Switch Socket : Legrand/Merlin Gerin

Terminal Blocks / DIN Channel : Connectwell / Tosha

Wiring Cables : Finolex / Havell's

Lugs : Dowell's

4. The bidder must submit technical literature / catalogue of the offered product in triplicate along with the offer, failing which offer may be liable for rejection.

5. PAYMENT TERM : 70% payment will be release against despatch document along with all relevant papers and balance 30% will be released after receipt and acceptance of material thereof.

Tender No. : KID0583L09/07  
Tender Date : 25.09.2008  
Bid Closing On : 07.11.2008 at 14:00 hrs.(IST)  
Bid Opening On : 07.11.2008 at 14:00 hrs.(IST)

**Tender issued to following parties only:**

Slno	V_Code	Vendor Name	City/Country
1	200309	KEY ELECTRICALS PVT.LTD.	KOLKATA
2	200310	ASSAM ELECTRICALS	TINSUKIA
3	200311	VENUS CONTROLS & SWITCHGEAR PVT. LT	KOLKATA
4	203969	LOTUS POWERGEAR PVT.LTD.	BANGALORE
5	204244	PCE PROJECTS PVT.LTD.	KOLKATA
6	208045	ALSTOM POWER INDIA LIMITED	KOLKATA