EPC PACKAGE FOR LARA SUPER THERMAL POWER PROJECT, STAGE-II (2x800 MW)
Amendment No. 02 to Technical Specifications Section-VI of Bidding Document No.: CS-9587-001R-2

SG1

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SG1-01	VI/ Part-B	A-02	8.07.00	63 OF 66	Acoustic 3D Level Scanner Based Level Monitoring System for each ESP Hopper in the First Field shall be provided complying with requirements indicated in Sub-Section-IIIC-03	Acoustic 3D Level Scanner Based Level Monitoring System for each ESP Hopper in the First **Three Fields** shall be provided complying with requirements indicated in Sub-Section-IIIC-03
SG1-02	Section-VI, Part A	SUB-SECTION-IIA-04 FGD SYSTEM	4.01.04	PAGE 3 OF 6	Motorized isolation gates at Absorber gas inlet, Absorber gas outlet and **FGD bypass in the main duct** to Chimney along with 2x100 seal air fans for each gate and 2x100 heaters for absorber outlet gate & bypass gate. A bi-plane bypass damper along with 2x100 seal air & 2x100 heaters shall also be provided in the bypass duct.	Motorized isolation gates at Absorber gas inlet, Absorber gas outlet ~~**and FGD bypass in the main duct to Chimney**~~ along with 2x100 seal air fans for each gate and 2x100 heaters for absorber outlet gate & bypass gate. A bi-plane bypass damper along with 2x100 seal air & 2x100 heaters shall also be provided in the bypass duct.
SG1-03	Section-VI, Part A	SUB-SECTION-IIA-04 FGD SYSTEM	2.04.01	PAGE 2 OF 6	.... For this purpose Contractor shall provide Motorized Guillotine type gates at (i) hot gas inlet to Absorber, (ii) cold gas outlet from Absorber. The Gates shall be provided with 2x100% seal air fans. Gates at outlet to Absorber **and in the bypass duct** shall also be provided with 2x100 electrical heaters. Further, Quick opening Biplane motorized/ pneumatic damper along with 2x100% seal air fans & 2x100 electrical heaters shall also be provided by the Contractor in the by-pass duct.	.... For this purpose Contractor shall provide Motorized Guillotine type gates at (i) hot gas inlet to Absorber, (ii) cold gas outlet from Absorber. The Gates shall be provided with 2x100% seal air fans. Gates at outlet to Absorber ~~**and in the bypass duct**~~ shall also be provided with 2x100 electrical heaters. Further, Quick opening Biplane motorized/ pneumatic damper along with 2x100% seal air fans & 2x100 electrical heaters shall also be provided by the Contractor in the by-pass duct.
SG1-04	VI / B	A-05	7.07.06	16 OF 26	The Waste water collection tank shall be of Steel construction with rubber lining.	The wastewater collection tank shall be of Steel construction **with rubber lining or Vinyl Ester based flake glass lining of minimum 3 mm thickness.**
SG1-05	VI / A	IIA-04	5.05.01	04 OF 06	The under flow from the secondary hydro-cyclone shall be taken to the filtrate water tank. The overflow from the secondary hydro-cyclone shall be taken …..	The under flow from the secondary hydro-cyclone shall be taken to the filtrate water tank. The overflow from the secondary hydro-cyclone shall be taken …. **or any other area with suitable treatment so as to suit/not to disturb the destination fluid quality.**
SG1-06	VI / B	A-05	7.08.03	17 OF 26	Agitation shall be provided to prevent settlement of slurry by sufficient no. of Top entry agitators with emergency flush start system.	Agitation shall be provided to prevent settlement of slurry by sufficient no. of Top entry agitators or **side entry agitators (as per proven practice of bidder)** with emergency flush start system.

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<table>
<tr><th rowspan="2">S. No.</th><th colspan="4">SPECIFICATION REFERENCE</th><th rowspan="2">Instead of</th><th rowspan="2">Read as</th></tr>
<tr><th>Section / Part</th><th>Sub-Section</th><th>Clause No.</th><th>Page No.</th></tr>
<tr><td>SG1-07</td><td>VI / A</td><td>IV</td><td>1.01.01</td><td>04 OF 76</td><td>Limestone Consumption rate:
Bids with lime-stone consumption higher than 9440 kg/hr shall not be accepted and no evaluation credit shall be given for lower consumption rate.</td><td>Limestone Consumption rate:
Bids with lime-stone consumption higher than ~~9440~~ 8700 kg/hr shall not be accepted and no evaluation credit shall be given for lower consumption rate.</td></tr>
<tr><td>SG1-08</td><td>VI / A</td><td>IB</td><td>-</td><td>18 OF 22</td><td>ANNEXURE-IV-1
HIGH SPEED DIESEL OIL CHARACTERISTICS
[AS PER IS 1460-2005 (BS-II)]
6. CONTAMINANTS
a. Ash — ppm (wt.) — 100 (max)
b. Sediments — % wt — 0.05 (max)
c. Total Sulphur — % wt — 0.05 (max)
d. Water Content — % volume — 0.05 (max)
e. Trace Metals</td><td>ANNEXURE-IV-3
HIGH SPEED DIESEL OIL CHARACTERISTICS
[AS PER IS 1460-2005 (BS-II)]
6. CONTAMINANTS
CONTAMINANTS
a. Ash — ppm (wt.) — 100 (max)
b. Sediments — % wt — 0.05 (max)
c. Total Sulphur — % wt — 0.05 (max)
d. Water Content — % volume — 0.05 (max)
e. Trace Metals
- Na + K — ppm (wt) — 0.30 (max)
- Vanadium — ppm (wt) — 0.50 (max)
- Lead — ppm (wt) — 0.50 (max)
- Calcium — ppm (wt) — 2.0
- Ni + Zn — ppm (wt) — Nil</td></tr>
<tr><td>SG1-09</td><td>VI / A</td><td>IV</td><td>1.03.02 (VI)</td><td>30 OF 76</td><td>Water wall corrosion/erosion rate:
The contractor shall demonstrate that the average thinning in the water wall tubes in the furnace due to corrosion, erosion etc. does not exceed the specified value as per Sub section-A-02, Part-B (Mechanical), of Technical specifications. The same shall be demonstrated by calculating the average thinning in the water wall tubes in the furnace by measuring the tube thicknesses between two overhauls at about 1500 locations arranged in a grid around the furnace. The areas to be covered under the grid shall include burner zone extended upto the OFA Nozzle location.</td><td>Water wall corrosion/erosion rate:
The contractor shall demonstrate that the average thinning in the water wall tubes in the furnace due to corrosion, erosion etc. does not exceed the specified value as per Sub section-A-03, Part-B (Mechanical), of Technical specifications. The same shall be demonstrated by calculating the average thinning in the water wall tubes in the furnace by measuring the tube thicknesses prior/during commissioning and next overhauling unit shutdown or 8000 hours whichever is later at about 1500 locations arranged in a grid around the furnace.
The areas to be covered under the grid shall include burner zone extended upto the Separated over fire air nozzle location. Soot bower operation impacted zone shall be excluded. The measured value of average thinning ~~measured~~ shall be divided by a time factor. The time factor shall be calculated ~~arrived~~ at by dividing the number of unit operation hours between the two measurements by 8000. For accurately locating the measurements points, the Bidder may mark the measurement points with the</td></tr>
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						help of punch marks on the membrane wall fins or any other method considered suitable by the Bidder.
SG1-10	VI/B	A-02	17.01.18	54 OF 66	…Bidder shall include in his proposal platform area of 19,000 m2 (clear of all intervening pipes, columns, actuators, instrument enclosures, racks etc. and excluding area covered by stairways)	…Bidder shall include in his proposal platform area of **20,000 m2** (clear of all intervening pipes, columns, actuators, instrument enclosures, racks etc. and excluding area covered by stairways **& landings and excluding platforms required for ESP & FGD**)
SG1-11	VI/A	II A-01	2.16.05	16 OF 28	Flue gas duct from economizer outlet to each SCR reactor inlet, from each SCR reactor outlet to each RAPH (Bi-sector or Trisector, as applicable) inlet ducts, SCR bypass ducts and from RAPHs (Bi-sector or Trisector, as applicable) outlet to ESP inlets…..	Flue gas duct from economizer outlet ~~to each SCR reactor inlet~~ **up to Economiser Bypass Gate including blanking plate, blanking plate with connecting projected duct at APH inlet (SCR Outlet side). Refer Typical SCR Sketch at Annex-I (Annexure-SG-04, Sub-section-IIA-02A, part-A) for scope details.** ~~from each SCR reactor outlet to each RAPH (Bi-sector or Trisector, as applicable) inlet ducts, SCR bypass ducts~~ and from RAPHs (Bi-sector or Trisector, as applicable) outlet to ESP inlets…..
SG1-12	VI/B	A-02	13.02.01, (H)	42 OF 66	DAMPERS (h) At each SCR inlet duct, each SCR outlet duct & each SCR bypass duct.	DAMPERS (h) NA ~~At each SCR inlet duct, each SCR outlet duct & each SCR bypass duct.~~
SG1-13	VI/A	IV FUNCTIONAL GUARANTEES & LIQUIDATED DAMAGES	1.01.05.01	16 OF 76	The performance test on electrostatic precipitator will commence after a minimum period of three thousand (3000) hours of cumulative operation after completion of initial operation.	The performance test on electrostatic precipitator will ~~commence after a minimum period of three thousand (3000) hours of cumulative operation after completion of initial operation.~~ be conducted soon after completion of trial operation or along with Boiler PG test whichever is earlier.
SG1-14	VI/B	A-01	1.05.22.01	39 OF 101	CHIMNEY …..For Titanium/C-276 lining, the top flue liner above the roof slab shall be made of solid C276 (ASTM B575, UNS N10276) / Titanium (Grade 2 as per ASME SB265) of minimum 10 mm thickness. For Borosilicate lining, the top flue	CHIMNEY …. For Titanium/C-276 lining, the top flue liner above the roof slab shall be made of solid C276 (ASTM B575, UNS N10276) / Titanium (Grade 2 as per ASME SB265) of minimum 10 mm thickness. ~~For Borosilicate lining, the top flue liner above the roof slab shall be made of C276 (ASTM B575, UNS N10276) / Titanium (Grade 2 as per ASME~~

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					liner above the roof slab shall be made of C276 (ASTM B575, UNS N10276) / Titanium (Grade 2 as per ASME SB265) of minimum 8 mm thickness with Borosilicate Glass Block Lining of minimum 38 mm thickness. The minimum length of flue liner projecting over the chimney roof shall be atleast equal to diameter of flue liner. For Titanium/C-276 lining, external surface of chimney flue liner projecting over the chimney roof shall be wrapped with 2 mm thick Titanium / C-276 sheet over insulation. For Borosilicate lining, top portion of the flue can shall be fitted with stop bar of 8 mm thick capping of Titanium / C-276 sheet to avoid any damage in between flue can and borosilicate lining. The minimum length of the capping inside the chimney shall be atleast equal to 1/4th diameter of flue liner. The stack shall be designed as per the latest guidelines of EPRI Wet Stack Design Guide……..	~~SB265) of minimum 8 mm thickness with Borosilicate Glass Block Lining of minimum 38 mm thickness~~. **For Borosilicate lining, top portion of the flue can shall be fitted with stop bar of 8 mm thick capping of Titanium / C-276 sheet to avoid any damage in between flue can and borosilicate lining. The minimum length of the capping inside the chimney shall be atleast equal to 150mm diameter of flue liner.** The minimum length of flue liner projecting over the chimney roof shall be atleast equal to diameter of flue liner~~. For Titanium/C-276 lining,~~ **and** external surface of chimney flue liner projecting over the chimney roof shall be wrapped with 2 mm thick Titanium / C-276 sheet over insulation. ~~For Borosilicate lining, top portion of the flue can shall be fitted with stop bar of 8 mm thick capping of Titanium / C-276 sheet to avoid any damage in between flue can and borosilicate lining. The minimum length of the capping inside the chimney shall be atleast equal to 1/4th diameter of flue liner~~. The stack shall be designed as per the latest guidelines of EPRI Wet Stack Design Guide……
SG1-15	SECTION–VI, PART-B	SUB-SECTION G-07 MDL			MDL List	MDL List Documents related to auxiliary boiler stands deleted
SG1-16	SECTION–VI, PART-B	A-02		7.01.01 (c)	**Heating surfaces arrangements** (a) Completely…….. (b) ----seamless tubes. (c)Ensure even temperature distribution at gas and steam side by criss - crossing the steam paths between LHS and RHS.	**Heating surfaces arrangements** (a) Completely…….. (b) ----seamless tubes. (c) Ensure even temperature distribution at gas and steam side by criss - crossing the steam paths between LHS and RHS. **In case the contractor is able to limit the steam temperature imbalance between LHS and RHS to within 10°C by employing suitable furnace/ burner configuration like twin furnace, the**

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						contractor may not provide the criss-crossing arrangement. **Bidder shall however submit the information relating to performance of reference steam generators to the Employer to substantiate such a decision.** **The contractor shall demonstrate steam temperature imbalance across two paths (LHS and RHS) to be within 10°C during commissioning. Incase temperature difference between the two paths of more than 10°C is observed beyond reasonable extent, the contractor shall provide criss-cross arrangement along with other suitable measures (as required) without any extra cost implication to NTPC.** **All necessary provisioning for installation of criss-crossing or any other measures (as required) including space/ hanger provision/ header tapping points etc. shall be made by the contractor so that same can be installed if the operational experience warrants the same.**
SG1-17	SECTION-VI, PART-B	SUB SECTION-A-02 STEAM GENERATOR & AUXILIARIES INCLUDING ESP	5.01.00 (b)	10 of 66	Steam Separator construction shall have: (b) Fusion welded construction with welded hemispherical dished ends.	Steam Separator construction shall have: (b) Fusion welded/ **forged** construction with welded hemispherical dished ends….
SG1-18	SECTION-VI, PART-B	SUB SECTION-A-02 STEAM GENERATOR & AUXILIARIES INCLUDING ESP	15.21.00	49 of 66	While deciding coverage of LRSBs the maximum coverage of LRSB shall not be considered more than 2m.	While deciding coverage of LRSBs the maximum coverage of LRSB shall not be considered more than 2m **of blowing radius.**

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SG1-19	SECTION-VI, PART-B	SUB-SECTION-A-05	5.03.02	565 of 1046	Margin on Head 10% margin on the higher value of above conditions.	Margin on Head 10% margin on the higher value of above ~~conditions.~~
SG1-20	SECTION-VI, PART-B	SUB SECTION-A-02 STEAM GENERATOR & AUXILIARIES INCLUDING ESP	1.01.02	2 of 66	(a) Description of Fuel Oil Unloading & Storage System The fuel oil requirements for steam generator shall be drawn from the LDO tanks to be provided by the contractor. The fuel oil pressurizing and firing system shall be in the scope of contractor. Bidder shall include all required piping, valves, fittings, instrumentation etc. unto the terminal point.	(a) Description of Fuel Oil Unloading & Storage System The fuel oil requirements for steam generator shall be drawn from the LDO tanks ~~to be provided by the contractor~~. The fuel oil pressurizing and firing system shall be in the scope of contractor. Bidder shall include all required piping, valves, fittings, instrumentation etc. unto the terminal point.
SG1-21	SECTION VI, PART-B	SUB SECTION-A-02 STEAM GENERATOR & AUXILIARIES INCLUDING ESP	9.02.02	20 of 66	Condensate from SCAPH shall lead to atmospheric flash tank in the boiler area.	Condensate from SCAPH**, through SCAPH tank,** shall lead to atmospheric flash tank in the boiler area.
SG1-22	SECTION-VI, PART-B	SUB-SECTION-A-02, STEAM GENERATOR & AUX. INCLUDING ESP	14.01.01	45 of 66	Safety valves and relief valves shall have minimum discharge capacities as under: ……	Safety valves and relief valves shall have minimum discharge capacities as under: … **Note:** Number of safety valves shown on the piping (refer corresponding tender drawing) is indicative only. This shall be as per specification/manufacturer's standard practice. However, at least two numbers of spring loaded and one ERV in each SH outlet and HRH outlet pipeline shall be provided.
SG1-23	VI/B	SUB SECTION-A-01	1.05.20	37 of 101	Nil	New clause added: (B) The Electrostatic Precipitator System shall also be designed to achieve ODB emission of less than 30 mg/Nm3 (6% O2 dry) for the range of loads at different operating conditions and for range of coals as specified with no electrical field out of operation.