

*NTPC Limited*

(A Government of India Enterprise)



## **LOT 1B PROJECTS**

**(PART –B)**

### **SUB-SECTION-VI**

**(PRE-COMMISSIONING ACTIVITIES, COMMISSIONING OF  
FACILITIES AND INITIAL OPERATIONS)**

## **SECTION – VI**

**TECHNICAL SPECIFICATION**

**FOR**


**FLUE GAS DESULPHURISATION (FGD)**


**SYSTEM PACKAGE**


**BIDDING DOCUMENT NO. : CS-0011-109(1B)-9**


## SUB-SECTION- VI


(PRE-COMMISSIONING ACTIVITIES, COMMISSIONING  
OF FACILITIES AND INITIAL OPERATIONS)


CLAUSE NO.	PRE-COMMISSIONING ACTIVITIES, COMMISSIONING OF FACILITIES AND INITIAL OPERATIONS 		
	<p><b>PRE-COMMISSIONING ACTIVITIES, COMMISSIONING OF FACILITIES AND INITIAL OPERATIONS</b></p> <p><b>1.00.00 GENERAL</b></p> <p>1.01.00 The pre-commissioning and commissioning activities including Guarantee tests, checks and initial operations of the equipment furnished and installed by the Contractor shall be the responsibility of the Contractor as detailed in relevant clauses in Technical Specification. The Contractor shall provide, in addition, test instruments, calibrating devices, etc. and labour required for successful performance of these operations. If it is anticipated that the above test may prolong for a long time, the Contractor's workmen required for the above test shall always be present at Site during such operations.</p> <p>1.02.00 It shall be the responsibility of the Contractor to provide all necessary temporary instrumentation and other measuring devices required during start-up and initial operation of the equipment systems which are installed by him. The Contractor shall also be responsible for flushing &amp; initial filling of all oils &amp; lubricants required for the equipment furnished and installed by him so as to make such equipment ready for operation. The Contractor shall be responsible for supplying such flushing oil and other lubricants unless otherwise specified elsewhere in these specifications &amp; documents.</p> <p>1.03.00 The Contractor upon completion of installation of equipments and systems, shall conduct pre-commissioning and commissioning activities, to make the facilities ready for sustained safe, reliable and efficient operation. All pre-commissioning/ commissioning activities considered essential for such readiness of the facilities including those mutually agreed and included in the Contractors quality assurance program as well as those indicated in clauses elsewhere in the technical specifications shall be performed by the Contractor.</p> <p><b>2.00.00 TESTING / COMMISSIONING PROCEDURES</b></p> <p>The contractor shall submit his testing / commissioning check lists and procedures for various equipments / systems covered under the contract at least 10 months before the actual commissioning of the equipments / systems for review and approval of employer.</p> <p>The testing / commissioning procedures are to be of a standard format in order to maintain consistency of presentation, content and reporting. The list of commissioning check lists and procedures to be submitted and their content details shall be agreed upon during preaward discussions.</p> <p>An indicative list of Testing / Commissioning procedures and Standard Checklists and the details regarding the contents are enclosed as annexure at the end of this</p>		
LOT-1B PROJECTS FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE	TECHNICAL SPECIFICATION SECTION-VI BID DOCUMENT NO.: CS-0011-109(1B)-9	PART-B SUB-SECTION-VI PRE-COMMISSIONING	PAGE 1 OF 5

CLAUSE NO.	PRE-COMMISSIONING ACTIVITIES, COMMISSIONING OF FACILITIES AND INITIAL OPERATIONS 		
	<p>sub-section of section-VI, Part B. The actual list of such equipments / systems shall depend on the equipments / systems being supplied by the contractor.</p> <p>i) Annexure-I : Standard Checklist of items</p> <p>ii) Annexure-II : Testing / Commissioning Procedure</p> <p>iii) Annexure-III : Commissioning procedures requiring approval of Employer.</p> <p>iv) Annexure – IV : Brief write up on Contents of Testing / Commissioning Procedures</p>		
3.00.00	<b>PRECOMMISSIONING &amp; COMMISSIONING ACTIVITIES</b>		
3.01.00	<b>General</b> <p>The pre-commissioning activities including some of the important checks &amp; tests for certain major equipment/ systems (as a minimum) are described below, although it is the Contractor's responsibility to draw up a detailed sequential &amp; systematic list of checks / tests and various activities / procedures connected with pre-commissioning of the complete facilities with all systems, sub-systems and equipment supplied and installed by him and get the same approved by the Employer.</p>		
3.02.00	<b>PRE-COMMISSIONING ACTIVITIES/TESTS:</b>		
3.02.01	<b>Air and Gas Tightness Test</b> <p>After completion of installation of Booster fans, ducts, absorber and before commencement of application of thermal insulation a test shall be performed on the FGD system by the contractor to prove or to establish the tightness of the erected equipments within the Terminal points. The procedure adopted for such tests shall have the prior approval of the Employer. Normally physical leak detection method by pressurizing the section under test by running Temporary blower is adopted. The contractor may adopt any other better method of testing.</p> <p>All equipments including any temporary blanking, if required, for the above test shall be provided by the Contractor.</p> <p>The Contractor's air and gas tightness test procedure shall be such that it shall enable conductance of air/gas tightness test on the ducts in segmented manner (as and when these duct segments are ready), so that these duct segments can be immediately released for application of insulation after their gas tightness tests. Contractor shall made all necessary arrangement for conducting tests in this manner. Any blanking etc. on the duct side required for testing of duct segments</p>		
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<p>3.02.03</p> <p>3.03.00</p> <p>3.03.01</p>	<p>shall be provided by Contractor. Contractor shall bring fan / blower (s) of adequate size / capacity and other necessary instruments so that these tests can be conducted. The above equipment shall be brought to site by the Contractor on temporary basis and shall be taken back after successful completion of air / gas tightness test.</p> <p>All pre-commissioning tests &amp; activities as indicated in Annexure-I, II &amp; III and elsewhere in the technical specification shall be performed by the Contractor.</p> <p><b>COMMISSIONING OF FACILITIES</b></p> <p><b>General</b></p> <p>Upon completion of pre-commissioning activities/test the Contractor shall initiate commissioning of facilities. During commissioning the Contractor shall carryout system checking and reliability trials on various parts of the facilities.</p> <p>Contractor shall carry out these checks/tests at site to prove to the Employer that each equipment of the supply complies with requirements stipulated and is installed in accordance with requirements specified. Before the plant is put into initial operation the Contractor shall be required to conduct test to demonstrate to the Employer that each item of the plant is capable of correctly performing the functions for which it was specified and its performance, parameters etc. are as per the specified/approved values. These tests may be conducted concurrently with those required under commissioning sequence.</p> <p>The Contractor shall finalize the protocol of check lists, after erection of the system and equipment, as per International Codes/Standard with the Employer.</p> <p>The Contractor shall furnish requisite no. of copies of procedures and list of start up, pre-commissioning, commissioning and initial operation tests for Employer's approval.</p> <p>The Contractor shall also demonstrate the performance of all C&amp;I equipment, the tests on main equipment or prior to that as the case may be.</p> <p>Other tests shall be conducted, if required by the Employer, to establish that the plant equipments are in accordance with requirements of the specifications.</p> <p>The Commissioning tests/checks shall specifically include but will not be limited to following:</p> <p>(a) Checks on the operation of all controls of isolating gas and air dampers</p> <p>(b) Checks on operation of fans to ascertain level of noise and vibration</p>			
<p>LOT-1B PROJECTS FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE</p>		<p>TECHNICAL SPECIFICATION SECTION-VI BID DOCUMENT NO.: CS-0011-109(1B)-9</p>	<p>PART-B SUB-SECTION-VI PRE-COMMISSIONING</p>	<p>PAGE 3 OF 5</p>

CLAUSE NO.	PRE-COMMISSIONING ACTIVITIES, COMMISSIONING OF FACILITIES AND INITIAL OPERATIONS		
	<div><div><div>(c) Test running of all pumps, blowers &amp; compressors</div><div>(d) Checks on operation of Fire Fighting System</div><div>(e) Checks on operation of all ZLD system (wherever provided).</div><div>(f) Checks on operation of all rotating equipments to ascertain level of noise and vibration</div><div>(g) Standard commissioning tests and procedures as per Contractor's practice for FGD plant</div><div>(h) Checks on operation of all individual control loops in the FGD control loops in the FGD control system.</div><div>(i) Checks on inter-relation between each control loop in the FGD control system.</div><div>(j) Calibration tests of orifice, flow nozzles, instruments and control equipment to the extent included in these specifications.</div><div>(k) Checks on operation of all static equipments to ascertain level of noise and vibration</div><div>(l) Tests on Control &amp; Instrumentation (C&amp;I) Equipments</div></div><div>The Contractor shall finalise the protocol of check lists, after erection of the system and equipment, as per International Codes/Standard with the Employer.</div><div>The Contractor shall furnish requisite no. of copies of procedures and list of start up, precommissioning, commissioning and initial operation tests for Employer's approval.</div><div>The Contractor shall also demonstrate the performance of all C&amp;I equipment, the tests on main equipment or prior to that as the case may be.</div><div>Other tests shall be conducted, if required by the Employer, to establish that the plant equipments are in accordance with requirements of the specifications.</div></div>		
3.03.02	Balance equipment & systems		
LOT-1B PROJECTS FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE		TECHNICAL SPECIFICATION SECTION-VI BID DOCUMENT NO.: CS-0011-109(1B)-9	PART-B SUB-SECTION-VI PRE-COMMISSIONING
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CLAUSE NO.	PRE-COMMISSIONING ACTIVITIES, COMMISSIONING OF FACILITIES AND INITIAL OPERATIONS			
<p><b>4.00.00</b></p> <p><b>5.00.00</b></p> <p><b>6.00.00</b></p> <p><b>7.00.00</b></p> <p>7.01.00</p> <p>7.02.00</p>	<p>All pre-commissioning tests &amp; activities as required for successful running of the equipment or as mentioned in the technical specification elsewhere shall be performed by the contractor.</p> <p><b>INITIAL OPERATION</b></p> <p>Upon completion of system checking/tests and as a part of commissioning of facilities, complete FGD plant/facilities shall be put on initial operation for a period of thirty (30) days or 720 hours as stipulated in General Technical Requirements.</p> <p>The Contractor shall conduct all the commissioning tests and undertake commissioning activities pertaining to all other auxiliaries and equipments including all Electrical &amp; C&amp;I equipment/systems not specifically brought out above but are within the scope of work and facilities being supplied &amp; installed by the Contractor and follow the guidelines indicated above or elsewhere in these technical specifications (Section-VI).</p> <p>The Contractor shall conduct all the commissioning tests and undertake commissioning activities pertaining to all other auxiliaries and equipments including all Electrical &amp; C&amp;I equipment/systems not specifically brought out above but are within the scope of work and facilities being supplied &amp; installed by the Contractor and follow the guidelines indicated above or elsewhere in these technical specifications (Section-VI).</p> <p><b>COMMISSIONING SPARES</b></p> <p>It will be the responsibility of the Contractor to provide all commissioning spares including consumable spares required for initial operation till the Completion of Facilities. The Contractor shall furnish a list of all commissioning spares within 60 days from the date of Notification of Award and such list shall be reviewed by the Employer and mutually agreed to. However, such review and agreement will not absolve the Contractor of his responsibilities to supply all commissioning spares so that initial operation do not suffer for want of commissioning spares. All commissioning spares shall be deemed to be included in the scope of the Contract at no extra cost to the Employer.</p> <p>These spare will be received and stored by the Contractor at least 3 months prior to the schedule date of commencement of initial operation of the respective equipment and utilized as and when required. The unutilized spares and replaced parts, if any, at the end of successful completion of guarantee tests shall be the property of the Contractor and he will be allowed to take these parts back at his own cost with the permission of Employer.</p>			
<p>LOT-1B PROJECTS FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE</p>	<p>TECHNICAL SPECIFICATION SECTION-VI BID DOCUMENT NO.: CS-0011-109(1B)-9</p>	<p>PART-B SUB-SECTION-VI PRE-COMMISSIONING</p>	<p>PAGE 5 OF 5</p>	


CLAUSE NO.	PRE-COMMISSIONING ACTIVITIES, COMMISSIONING OF FACILITIES AND INITIAL OPERATIONS			
	<p style="text-align: right;"><b>ANNEXURE-I</b></p> <p style="text-align: center;"><b><u>STANDARD CHECKLIST</u></b></p> <p>This is an indicative list of items. The actual list shall depend on the Equipment / System being supplied by the contractor.</p> <p style="text-align: center;"><b><u>MECHANICAL</u></b></p> <p><b><u>VALVES</u></b></p> <ol style="list-style-type: none"> <li>1. Manually Operated Valve</li> <li>2. Electrically Operated Valve</li> <li>3. Pneumatically Actuated Valve</li> <li>4. Hydraulically Actuated Valve</li> <li>5. Safety Valve</li> <li>6. Electromatic Relief Valve</li> <li>7. Steam Trap</li> <li>8. Non Return Valve (including Hydraulic/ Pneumatic QCNRVS)</li> <li>9. Control Valve</li> <li>10. Relief Valve</li> <li>11. Differential Pressure Regulating Valve</li> <li>12. Pinch valve</li> </ol> <p><b><u>TANKS &amp; PRESSURE VESSELS</u></b></p> <ol style="list-style-type: none"> <li>1. Limestone silos</li> <li>2. Gypsum storage silos</li> <li>3. Limestone slurry tanks</li> <li>4. Filtrate tank</li> <li>5. Waste water tank</li> <li>6. Secondary hydrocyclone feed tank</li> <li>7. Lime dosing tank</li> <li>8. Process water tank</li> <li>9. Absorber</li> <li>10. Auxiliary absorbent tank</li> <li>11. Mill circuit tank</li> </ol>			
<p style="text-align: center;">LOT-IB PROJECTS FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE</p>	<p style="text-align: center;">TECHNICAL SPECIFICATION SECTION-VI, PART-B BID DOC. NO.: CS-0011-109(1B)-9</p>	<p style="text-align: center;">PART-B ANNEXURE-I SUB-SECTION-VI PRE-COMMISSIONING</p>	<p style="text-align: center;">PAGE 1 OF 6</p>	




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	<p>12. Any other tank not covered above</p> <p>13. Vacuum tanks</p> <p>14. Air Receiver(if any)</p> <p><b><u>PUMPS</u></b></p> <p>1. Slurry recirculation pumps</p> <p>2. Gypsum bleed pumps</p> <p>3. Limestone slurry pumps</p> <p>4. Process water pumps</p> <p>5. All other slurry pumps</p> <p>6. Vacuum pumps</p> <p>7. Sump pumps</p> <p><b><u>PIPE WORK SYSTEM</u></b></p> <p>1. Steam services</p> <p>2. Water services</p> <p>3. Slurry services</p> <p>4. Air services</p> <p>5. Constant load support</p> <p>6. Spring supports</p> <p>7. Hangers and other Supports</p> <p><b><u>STRAINER AND FILTER</u></b></p> <p>1. Strainer / Filter Basket Type</p> <p>2. Strainer Rotary (Low Pressure)</p> <p>3. Filter &amp; Strainers Centrifugal Separators</p> <p>4. Filter &amp; Strainer Y-Type</p> <p>5. Filter &amp; Strainer (Plate Type)</p> <p>6. Purifier</p> <p>7. Filter – Compressed Air Line</p> <p><b><u>FANS &amp; COMPRESSORS</u></b></p> <p>1. Booster Fans– Axial Flow pressure Lubricated</p>			
<p>LOT-IB PROJECTS</p> <p>FLUE GAS DESULPHURISATION (FGD)</p> <p>SYSTEM PACKAGE</p>	<p>TECHNICAL SPECIFICATION</p> <p>SECTION-VI, PART-B</p> <p>BID DOC. NO.: CS-0011-109(1B)-9</p>	<p>PART-B</p> <p>ANNEXURE-I</p> <p>SUB-SECTION-VI</p> <p>PRE-COMMISSIONING</p>	<p>PAGE 2 OF 6</p>	

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	<ol style="list-style-type: none"> <li>2. Oxidation Blowers</li> <li>3. Compressors</li> </ol> <p><b><u>DAMPERS &amp; GATES</u></b></p> <ol style="list-style-type: none"> <li>1. Manually Operated Damper</li> <li>2. Pneumatically Operated Damper</li> <li>3. Electrically Operated Damper</li> <li>4. Manually Operated Gates</li> <li>5. Pneumatically Operated Gate</li> <li>6. Electrically Operated Gate</li> </ol> <p><b><u>DUCT WORK</u></b></p> <ol style="list-style-type: none"> <li>1. Flue Gas Ducting</li> <li>2. Expansion Joints</li> <li>3. Observation &amp; Access Door</li> </ol> <p><b><u>CRANES AND ELEVATORS</u></b></p> <ol style="list-style-type: none"> <li>1. Crane</li> <li>2. Hoists</li> <li>3. Passenger cum goods elevator</li> </ol> <p><b><u>POWER TRANSMISSION</u></b></p> <ol style="list-style-type: none"> <li>1. Power Transmission Gear Box</li> <li>2. Bearings</li> <li>3. Couplings</li> </ol> <p><b><u>FGD &amp; AUX.SYSTEM</u></b></p> <ol style="list-style-type: none"> <li>1. Agitators</li> <li>2. Air Motor</li> <li>3. Process trestle</li> <li>4. Limestone feeder</li> <li>5. Vacuum belt filter</li> </ol>			
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CLAUSE NO.	PRE-COMMISSIONING ACTIVITIES, COMMISSIONING OF FACILITIES AND INITIAL OPERATIONS	एनटीपीसी NTPC		
	<p>6. Limestone ball mill</p> <p>7. Limestone Hydrocyclones</p> <p>8. Primary Hydrocyclones</p> <p>9. Secondary Hydrocyclones</p> <p>10. Absorber internals</p> <p>11. Absorber Auxiliaries</p> <p><b><u>ELELCTRICAL</u></b></p> <p>1. D.C. Motor</p> <p>2. HV Squirrel Cage Induction Motor</p> <p>3. 415 V Squirrel Cage Induction Motor</p> <p>4. Motor Operated Actuators</p> <p>5. Transformers</p> <p>6. Aux. Control and Relay Panel Desk</p> <p>7. HT &amp; LT SWITCHGEARS/MCC</p> <p>(I.) STANDARD CHECLISTS FOR ALL TYPES OF RELAYS USED IN SWITCHGEARS PROTECTION SYSTEM</p> <p>(II.) PT CARRIAGE AND CUBICLES</p> <p>(III.) CABLE/BUS DUCT/BUS BARS</p> <p>(IV.) CONTRACTOR MODULE</p> <p>(V.) SWITCH FUSE MODULE</p> <p>(VI.) MASTER PANEL OF LUBE OIL PANEL</p> <p>(VII.) FEEDER PANEL OF LUBE OIL PANEL</p> <p>(VIII.) SPACE HEATER AND CABLE MODULE</p> <p>(IX.) HT CIRCUIT BREAKER</p> <p>(X.) 415 V CIRCUIT BREAKER</p> <p>8. POWER CABLE</p> <p>9. AUXILIARY CABLE</p> <p>10. D.C. CABLE</p> <p>11. EXPLOSION PROOF ELECTRICAL EQUIPMENT</p> <p>12. JUNCTION BOX</p> <p>13. CONTROL TRANSFORMER MODULE</p>			
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	<p>14. BRUSH GEAR ASSEMBLY</p> <p>15. AUX. CONTROL AND RELAY PANEL DESK</p> <p>16. INDICATING INSTRUMENT</p> <p>17. RECORDING INSTRUMENT</p> <p>18. INTEGRATING INSTRUMENT</p> <p>19. D.G SET</p> <p>20. STATION LIGHTING</p> <p><b><u>CONTROL &amp; INSTRUMENTATION</u></b></p> <ol style="list-style-type: none"> <li>1. Conductivity Measuring Equipment Including Test Procedures</li> <li>2. pH Analyser Including Test procedure</li> <li>3. Silica Analyser</li> <li>4. Level Switch (Float Actuated)</li> <li>5. Level Switch (Electrode Type)</li> <li>6. Level Switch (Displacer Actuated)</li> <li>7. Transmitter (Float Operated Pneumatic Output including Testing procedures</li> <li>8. Level indicator (Float/Pulley Type)</li> <li>9. Local Temperature Indicator Including Test Procedure</li> <li>10. Resistance Thermometer Element Including Test procedure</li> <li>11. Thermocouple Element and Connecting Cable</li> <li>12. Thermocouple and Resistance Thermometer Convertor/Transmitter Including Test Procedures</li> <li>13. Temperature Switch Including Test Procedure</li> <li>14. Cold Junction Boxes</li> <li>15. O<sub>2</sub>Analyser</li> <li>16. SO<sub>2</sub> analyzer</li> <li>17. O<sub>2</sub> in Hydrogen including Test procedures</li> <li>18. Pressure and Vacuum Gauge</li> <li>19. Pressure and Vacuum Switch Including Test procedures</li> <li>20. Differential Pressure Transmitter including Test Procedures</li> <li>21. Differential pressure switch including Test procedures</li> <li>22. Flow indicator (Variable Area)</li> </ol>			
<p>LOT-IB PROJECTS</p> <p>FLUE GAS DESULPHURISATION (FGD)</p> <p>SYSTEM PACKAGE</p>	<p>TECHNICAL SPECIFICATION</p> <p>SECTION-VI, PART-B</p> <p>BID DOC. NO.: CS-0011-109(1B)-9</p>	<p>PART-B</p> <p>ANNEXURE-I</p> <p>SUB-SECTION-VI</p> <p>PRE-COMMISSIONING</p>	<p>PAGE 5 OF 6</p>	

CLAUSE NO.	PRE-COMMISSIONING ACTIVITIES, COMMISSIONING OF FACILITIES AND INITIAL OPERATIONS			
	<p>23. Orifice plate</p> <p>24. Flow Switch</p> <p>25. Nozzle</p> <p>26. Flow Integrator (pneumatic input) including test procedure</p> <p>27. Flow indicator (Float Operated) Including Test Procedure</p> <p>28. Venturi (Fluid)</p> <p>29. Flow Switch (Magnetic Type)</p> <p>30. Limit Switches</p> <p>31. Turbine Supervisory Measuring System</p> <p>32. Position Measurement &amp; Indication Including Test procedures</p> <p>33. Vibration Measurement</p> <p>34. Digital Indicator</p> <p>35. Moving Coil Indicator Including Test Procedures</p> <p>36. Recorder Including Test procedure</p> <p>37. Flame Scanner</p> <p>38. Electrical Auto Manual Control Station</p> <p>39. Push Button Module</p> <p>40. Test Procedure for Electronic Modules of DDCMIS</p> <p>41. Alarm Annunciator Equipment Including Test Procedure</p> <p>42. Test procedure for Adjustment of Modulating Controller-PID Term</p> <p>43. Test Procedure Indicating Controller-Electrical Input &amp; Pneumatic Output</p> <p>44. Density monitors</p> <p>45.</p> <p><b><u>AIR CONDITIONING &amp; VENTILATION SYSTEM</u></b></p> <p><b><u>FIRE FIGHTING SYSTEM</u></b></p> <p><b><u>ZERO LIQUID DISCHARGE SYSTEM (IF PROVIDED)</u></b></p>			
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	<div>ANNEXURE-III</div> <div>COMMISSIONING PROCEDURES REQUIRING APPROVAL OF EMPLOYER</div> <table><tr><th colspan="2">S.NO. DESCRIPTION</th></tr><tr><td>1.</td><td>AIR &amp; GAS TIGHTNESS TEST</td></tr><tr><td>2.</td><td>OIL FLUSHING OF LUB OIL SYSTEM OF ROTARY EQUIPMENTS</td></tr><tr><td>3.</td><td>LIMESTONE GRINDING SYSTEM</td></tr><tr><td>4.</td><td>GYPSUM DEWATERING SYSTEM</td></tr></table>				S.NO. DESCRIPTION		1.	AIR & GAS TIGHTNESS TEST	2.	OIL FLUSHING OF LUB OIL SYSTEM OF ROTARY EQUIPMENTS	3.	LIMESTONE GRINDING SYSTEM	4.	GYPSUM DEWATERING SYSTEM
S.NO. DESCRIPTION														
1.	AIR & GAS TIGHTNESS TEST													
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	<div>ANNEXURE-II</div> <div>TESTING / COMMISSIONING PROCEDURES</div> <p>Following is an indicative list of equipments / systems for which Testing / Commissioning procedures are to be submitted. The actual list will depend on the equipment / system being supplied by the Contractor.</p> <table><tr><th>S. No</th><th>DESCRIPTION</th></tr><tr><td colspan="2">FGD</td></tr><tr><td>1.</td><td>Booster Fan</td></tr><tr><td>2.</td><td>Absorber System</td></tr><tr><td>3.</td><td>Limestone grinding system</td></tr><tr><td>4.</td><td>Absorber system</td></tr><tr><td>5.</td><td>Gypsum dewatering system</td></tr><tr><td>6.</td><td>Zero Liquid Discharge System (if provided)</td></tr></table>				S. No	DESCRIPTION	FGD		1.	Booster Fan	2.	Absorber System	3.	Limestone grinding system	4.	Absorber system	5.	Gypsum dewatering system	6.	Zero Liquid Discharge System (if provided)
S. No	DESCRIPTION																			
FGD																				
1.	Booster Fan																			
2.	Absorber System																			
3.	Limestone grinding system																			
4.	Absorber system																			
5.	Gypsum dewatering system																			
6.	Zero Liquid Discharge System (if provided)																			
LOT-IB PROJECTS FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE		TECHNICAL SPECIFICATION SECTION-VI, PART-B BID DOC. NO.: CS-0011-109(1B)-9	PART-B ANNEXURE-II SUB-SECTION-VI PRE-COMMISSIONING	PAGE 1 OF 1																

CLAUSE NO.	PRE-COMMISSIONING ACTIVITIES, COMMISSIONING OF FACILITIES AND INITIAL OPERATIONS 		
	<p style="text-align: right;"><b>ANNEXURE-IV</b></p> <p style="text-align: center;"><b>BRIEF WRITE UP ON THE CONTENTS OF TESTING / COMMISSIONING PROCEDURE</b></p> <p>Testing / Commissioning Procedure is required to be of a standard format in order to maintain consistency of presentation, content and reporting. These should contain the following sections to make the document a self contained one.</p> <ol style="list-style-type: none"> <li>1. Plant Details / Design data</li> <li>2. Objective</li> <li>3. Proposal</li> <li>4. Services Required</li> <li>5. Safety Precautions</li> <li>6. Emergency Procedures</li> <li>7. State of the Plant (Status in respect of erection completion of Mech, Elect and C&amp;I items)</li> <li>8. Method</li> <li>9. Completion / Acceptance Criteria</li> <li>10. Appendix               <ul style="list-style-type: none"> <li>• Result</li> <li>• Log sheet</li> <li>• Drawing etc.</li> </ul> </li> </ol>		
LOT-IB PROJECTS FLUE GAS DESULPHURISATION (FGD) SYSTEM PACKAGE	TECHNICAL SPECIFICATION SECTION-VI, PART-B BID DOC. NO.: CS-0011-109(1B)-9	PART-B ANNEXURE-IV SUB-SECTION-VI PRE-COMMISSIONING	PAGE 1 OF 1