



हिन्दुस्तान पेपर कॉर्पोरेशन लिमिटेड
HINDUSTAN PAPER CORPORATION LTD
(A Government of India Enterprise)
75-C Park Street, Kolkata-700 016
Phone Nos. 91-33-2229 6901-02, 2249 6931/ 32/ 34/ 35
Fax No. 91-33-2249 7335/ 4996. Website: www.hindpaper.in
(An ISO-9001 : 2000 Certified Company)

To
M/s

Date:

Sir,

Please find enclosed Bid documents for supply of Design, engineering, manufacture, supply, erection, commissioning and performance testing of Integrated Caustic & Chlorine Plant , as per following details:

NOTICE INVITING BID NO.	ENQ/NC-09/000/08-09/57/MTUP/ESP/02 31.03.2009
ITEM DESCRIPTION	ESP for Power Boiler
LAST DATE OF SUBMISSION OF BIDS	07.05.2009 at 14.30 hours IST
DUE DATE OF OPENING TECHNO-COMMERCIAL PART	07.05.2009 at 15.00 hours IST
DOCUMENTS ENCLOSED	
➤ GLOBAL NOTICE INVITING BID	1 Page (Volume I - Part 1)
➤ GUIDE LINES FOR SUBMISSION OF BID	3 Pages (Volume I - Part 2)
➤ PRE-QUALIFICATION CRITERIA	1 Page (Volume I - Part 2)
➤ BIDDERS PROFILE	2 Pages (Volume I - Part 2)
➤ GENERAL TERMS AND CONDITIONS OF THE CONTRACT	Volume I - Part 3)
➤ TECHNICAL SPECIFICATION	Volume II - Part:4
➤ ABSTRACT OF PRICES	Volume II - Part:5
➤ OFFER LETTER BY BIDDER	Part: 6

Bidders in their own interest should quote most competitive price without being influenced by any other bidder.

Sealed bid may be dropped in the Tender / Bid Box placed in the Commercial Department or mailed /Courier/Hand Delivered to the following address so as to reach before the Bid opening time and date at the above address.

Yours faithfully
For Hindustan Paper Corporation Limited

Dy.General Manager(Commercial)

Encl: as above.



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VOLUME – I

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PART - 1	:	COPY OF PRESS GNIB
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हिन्दुस्तान पेपर

Sealed bids under two part system (Part I: Techno-Commercial Bid and Part II: Price Bid) are invited from reputed manufacturers/accredited agencies for the following plants for our Nagaon and Cachar Paper Mill, Assam, India.

Bid No., Date and brief description of material	Earnest Money Deposit	Sale of Bid documents	Pre-Bid Conference	Bid Closing date & time	Techno-Comm. Bid Opening date & time
GNIB NO.ENQ/NC-09/000/08-09/56/MTUP/C&C/01 – 31.03.2009 for Design, engineering, manufacture, supply, erection, commissioning and performance testing of Integrated Caustic & Chlorine Plant	INR 15,00,000/- Or USD 30000	06.04.2009 to 15.05.2009	12.05.2009 at 11.00 Hrs	19.05.2009 at 14:30 Hrs	19.05.2009 at 15:00 Hrs
NIB NO.ENQ/NC-09/000/08-09/57/MTUP/ESP/02 – 31.03.2009 for Design, engineering, manufacture, supply, erection, commissioning and performance testing of ESP for Power Boiler	INR 15,00,000/-	06.04.2009 to 05.05.2009	30.04.2009 at 11.00 Hrs	07.05.2009 at 14.30 Hrs	07.05.2009 at 15.00 Hrs
GNIB NO.ENQ/NC-09/000/08-09/58/MTUP/CD/03 – 31.03.2009 for Design, engineering, manufacture, supply, erection, commissioning and performance testing for Chlorine Dioxide Plant	INR 15,00,000/- Or USD 30000	06.04.2009 to 18.05.2009	14.05.2009 at 11.00 Hrs	21.05.2009 at 14.30 Hrs	21.05.2009 at 15.00 Hrs

Detailed Technical Specification is available in Bid Documents. Bid documents may be collected from Commercial Department at the above address on payment of Bid Fee of Rs.2,000/or USD 200 (non-refundable) for each document by DD drawn in favour of Hindustan Paper Corporation Ltd. payable at Kolkata. Bid documents may be down loaded from our web site or www.tendertimes.com, www.tenders.gov.in in such case Bid Fee will have to be deposited along with Techno-Commercial Bids.



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GUIDE LINES FOR SUBMISSION OF BID

1.0 SUBMISSION OF BID

Sealed bid, superscribed with NIB No & Date, Date of submission, Due Date of Opening and the name of the item, is to be submitted by intending bidders, within the due date as mentioned in the NIB.

- 1.1 Under TWO BID system, the Techno - Commercial Bid and the Price Bid are to be submitted in two separately sealed covers superscribing in block letters (a) TECHNO-COMMERCIAL BID (Part-I) including **unpriced bid** and (b) PRICE BID (Part-II). These two bids are to be put in a single sealed cover and the same may be dropped in the 'Tender Box' placed in the Commercial Department or sent by Post so as to reach before Bid closing time and date at the above address. The Company will not be responsible for any Postal delay in receipt of bid(s).

1.1.2 TECHNO-COMMERCIAL BID (PART-I) must contain the following:

- (a) Bid Fee for those who downloaded the document from website.
- (b) Earnest Money Deposit.
- (c) List of Commercial deviation, if any.
- (d) Copy of complete set of NIB Document duly signed, stamped and dated by bidder.
- (e) Document requested with respect to pre-qualification criteria and bidder's profile duly filled in

2.2 DOCUMENTS TO BE SUBMITTED WITH THE TECHNO-COMMERCIAL BID:

- 2.2.1 EMD of INR.15.00 Lakh [Rupees Fifteen Lakh] by Demand Draft from any Scheduled Commercial Bank drawn in favour of Hindustan Paper Corporation Ltd payable at Kolkata
- 2.2.2 Income Tax PAN No. and Sales Tax (CST/State VAT) Registration No.
- 2.2.3 Documentary evidence fulfilling pre-qualifying criteria as listed and all other terms and conditions of the bid. If extraneous details not called for, are entered in Part-I Bid, the same shall be treated as non-responsive and hence will be summarily rejected.

2.3 SUBMISSION OF PRICE BID:

Price bid to be submitted strictly in line with Price bid (Part- II) format as per Proforma enclosed in the NIB documents.

3.0 BID FEE (non-refundable):

Bidders, who download the bid documents from Website must remit the bid fee of INR . 2000/- by way of Demand Draft drawn in favour of Hindustan Paper Corporation Limited payable at Kolkata along with Techno Commercial Bid. Otherwise their bid will be rejected outright.

4.0 EARNEST MONEY DEPOSIT (EMD):

INR 15,00,000/- (Rupees Fifteen Lakhs only)by Demand Draft from any scheduled Commercial Bank drawn in favour of Hindustan Paper Corporation Limited payable at Kolkata must accompany Techno Commercial Bid (Part-I). Offer without EMD will be rejected. The cheque (s) will not be accepted towards EMD.

4.1 SECURITY DEPOSIT(SD):

EMD of the successful bidder(s) shall be converted to Security Deposit . HPCL also reserves the right to forfeit the Security Deposit if the successful Bidder/s fails to execute the supplies as per terms of the Contract. On due performance and completion of the Contract in all respect, the Security Deposit will be refunded to the Vendor .

5.0 ACCEPTANCE CRITERIA OF BID:

Any bid in absence of EMD and Tender Fee as stated above shall be rejected.

6.0 Each page of the tender document should be signed by a person competent to do so.

7.0 Any unsolicited offer after opening bid(s), unless and otherwise officially requested by the Purchaser in writing shall not be considered

8.0 Incomplete offer is liable to be rejected.

9.0 The offer submitted should be valid for 120 (one hundred twenty) days from the date of opening

10.0 Please ensure in your own interested that you bids in the required number of copies reaches us by the closing date and time mentioned above

11.0 Unwarranted correspondence, voluntary reduction in prices or canvassing in any form after opening of price bids may lead to rejection of offer.

12.0 We reserve the right to reject all or any of the bids without assigning any reason thereof. Please note that the price bids shall be opened only for the bidders who have been found techno-commercially acceptable.

13.0 Any bid(s) received after due date and time of opening will not be considered

14.0 Loading of Price Bid:

In case of deviation in commercial terms and conditions specially for liquidated damage, performance guarantee and terms of payment, the price bid shall be loaded to the extent as stated below:

Delays/Performance Guarantee:	Prices shall be loaded to the extent of differential percentage as incorporated in the NIB document
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Payment Terms:

The price shall be loaded @ 12% per annum for differential payment terms and time period.

15.0 DRAWINGS:

Relevant drawings are enclosed in the Bid Documents. Bidders while submitting the offer should take into consideration the said drawings

16.0 Pre-bid conference with the bidders shall take place on 30.04.2009 at 11.00 Hrs. Bidders interested to participate in Pre-Bid Conference should invariably intimate three days before the date about participation and any query may be mailed to the following officials:

a. Mr. N.K.Ghosh

Dy.General Manager(Engineering)
Hindustan Paper Corporation Ltd.
Fax No. 091 33 2229 3174
Email: nkghoshhpc@gmail.com

b. Mr. D.B.Majumder

Dy.General Manager(Commercial)
Hindustan Paper Corporation Ltd.
Fax No. 091 33 2249 7335
Email: dmajumder.hindpaper@gmail.com

Sub: Pre-qualification Criteria

(To be inserted suitably under PART-2 : INSTRUCTIONS TO THE TENDERER)

- a) Bidder shall have minimum five(5) years of experience for design, engineering, manufacture, supply, installation and commissioning of Electro-Static Precipitator (ESP).
- b) Bidder shall have past experience for design, engineering, manufacture, supply, installation and commissioning of ESP during last five (5) calendar years. Bidder shall have experience for such ESP of coal fired boiler having capacity not less than 3x80 tph boiler. This shall be supported by way of furnishing copies of Purchase Orders, performance certificate from their clients for successful operation of such plants:-.
- c) Bidder's should have annual turn over of Rs. 5 crore in the last three(3) years in the field of design, engineering, manufacture, supply, installation and commissioning of Electro-Static Precipitator (ESP)..Bidder to submit Annual Report (Balance Sheet and Profit & Loss Account) of last three years.

NOTE: The above shall be supported by documentary evidence.



BIDDER'S PROFILE

(TO BE SUBMITTED IN BIDDER'S OWN LETTER HEAD)

NIB NO.ENQ/NC-09/000/08-09/57/MTUP/ESP/02 – 31.03.2009 for Design, engineering, manufacture, supply, erection, commissioning and performance testing of ESP for Power Boiler

Sl. No.	Description	Bidder's Confirmation
1	Bid Fee (INR.2000/-)	Bank: DD No. Date:
2	EMD (INR 15,00,000)	Bank: DD No. Date:
3	Name and Address of the Firm with Phone No. / Fax No/ Email	
4	Status of Firm: (Proprietorship/Partnership/Company- documentary evidence to be furnished	
5	Full Name (s) & address (es) of proprietor / partner / directors	
6	Name (s) of person(s) authorized to sign documents on behalf of the bidder with specimen signature(s)	
7	Name of Bank & Address Alongwith RTGS details Note: RTGS details for overseas supplier is not required	
8	Factory License No (photocopy to be enclosed) Validity:	
9	Address of the factory with phone no. / fax no/ email and name(s) of contact person(s)	
10	PAN No (photocopy to be enclosed) Note: PAN Number for overseas supplier is not required	
11	CST Registration No. (photocopy to be enclosed) Note: CST Registration Number for overseas supplier is not required	
12	VAT Registration No (photocopy to be enclosed)	
13	Certified audited balance sheet as stated in Pre-qualification criteria	
14	List of major industrial customers in last 5 years (certified copies of purchase orders to be enclosed)	
15	Whether the bidder is agreeable to the General Terms and Conditions of Contract enclosed hereof in totality	
16	Bidder to confirm that they have submitted all documentary evidence for meeting pre-qualification criteria	
17	In case of an order, whether agreeable to keep the price valid till execution of the entire contract	
18	In case of overseas bidder having India agent, the name and address of the Company, contact person, fax no. / phone no / email details to be furnished with authorisation	
19	Declaration:	

	The bidder should submit their offer alongwith a declaration stating that the partners/directors of the company are not related to the employees of HPCL	
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I/We hereby declare that the particulars furnished above are true and correct to the best of my/our knowledge and agree to the terms and conditions of NIB No. ENQ/NC-09/000/08-09/57/MTUP/ESP/02 – 31.03.2009

In case of any misstatement or false information furnished, the bidder will be disqualified.

I/We accept all the terms and conditions contained in NIB No ENQ/NC-09/000/08-09/57/MTUP/ESP/02 – 31.03.2009

Date:

Address

Signature:



HINDUSTAN PAPER CORPORATION LIMITED

PART - 3

GENERAL TERMS AND CONDITIONS OF CONTRACT



HINDUSTAN PAPER CORPORATION LIMITED

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GENERAL TERMS AND CONDITIONS OF CONTRACT

Introduction

Works and phrases listed below as used in these General Terms and Conditions of Contract and in this Tender Document shall have the meaning specified against each word or phrase

Article-1 DEFINITION PURCHASER:

Hindustan Paper Corporation limited having its registered office at 4th Floor, South Tower, Scope Minar, Laximi Nagar District Centre, Delhi 110092, India. The term Purchaser includes successors and assigns of Hindustan Paper Corporation Limited

VENDOR:

Vendor means the person, firm or Corporation to which this Purchase Order/Contract/Work Order is addressed. The term Vendor includes its successors and assigns.

PROJECT CONSULTANT:

Development Consultants Ltd
24-B, Park Street, Kolkata 700 016, INDIA
Phone : (91) 33 226 7601/226 7602/
249 7603/249 7605
Fax : (91) 33 249 2340/249 3338/ 249 2897
E-Mail : dcpp@dclgroup.com

GOODS:

Goods means the articles, goods vendors, drawing, data and other property and all services including design, delivery, inspection, testing, supervision during erection, installation and commissioning specified or required to complete this Purchase Order/Contract/Work Order

1.1 PRICES FOR SUPPLY:

Overseas bidder should quote their price on FOB/C&F Kolkata Port basis

Indigenous bidder should quote their price on delivered basis at Mill Site with break-up of taxes and duties etc. as requested in abstract of prices. Any statutory variation during the tenure of the contract shall be applicable .

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PRICES FOR SERVICES:

(A) Supervision of Erection, Start up, Commissioning and Training of Purchaser's Operating Personnel

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Price payable to Vendor for personnel deputed for supervision of erection, start-up and commissioning of Equipment, training of Purchaser's operating personnel shall be on per diem rates.

Above-mentioned per diem rate is expressed per calendar day of presence of the supervisory person at site including intervening Sundays and holidays. No overtime payment shall be due and where overtime is required this shall be at the discretion of the senior supervisor at site at the time.

For this purpose, the number of supervisory personnel to be deputed by Vendor will be finalised between Purchaser and Vendor at the appropriate time. Should Purchaser find the supervisory personnel deputed by Vendor not acceptable for valid reasons vendor hereby undertakes to depute at Vendor's expense suitable replacement immediately.

Expense to be met and facilities to be provided by Purchaser in respect of personnel deputed by Vendor for supervision of erection, start-up and commissioning of Equipments, training of Purchaser's operating personnel :

Vendor shall carry out supervision of erection, start-up and commissioning of Equipment at site solely at his risk and responsibility and Purchaser shall be responsible only for the following facilities as would be required by supervisory personnel deputed by Vendor in this connection (Unless otherwise specified in this Contract document).

- a) Payment/Reimbursement of return air fare to site and back and
- b) Boarding and lodging facilities, shall be provided on chargeable basis subject to availability at site and
- c) Provision of requisite erection tools, tackles, equipment, consumable, labour and staff

(B) Contract Price for Complete Erection, Start-up and Commissioning:-

Contract Price for complete erection, start-up, commissioning of equipment/system supplied under this/separate Contract shall be on lump-sum basis and include cost of erection material, labour and consumables. Contract price shall also include cost of dismantling of any and all existing equipment if necessary. Contract price shall remain firm and fixed during the contractual period and will not be subject to any variation as a result of change in cost of material, labour etc. or for any reason whatsoever during the currency of this Contract.

NOTE: Contract price for Equipment, Special tools, commissioning and maintenance spares whether of Indian or foreign origin, shall remain firm and fixed during the currency of the Contract

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Any modification that may have to be carried out by Vendor for fulfilment of the guaranteed performance of any and all items of Equipment shall be solely to Vendor's account

Article- 2 COMPLETE AGREEMENT:

This Purchase Order/Contract/Work Order, including the terms and conditions, the specifications hereto and any additional terms and conditions incorporated into and attached hereto, constitutes the sole and entire agreement between the parties hereto. Vendor's quotation is incorporated in and made a part of this Purchase Order/Contract/Work Order only to extent of specifying the nature and description of the goods ordered, and then only to the extent that such items are consistent with the terms of Purchase Order/Contract/Work Order. No other terms or conditions shall be binding upon Purchaser unless accepted by them in writing

Article- 3 REVISIONS AND CHANGES:

The Purchaser may in writing make any revisions or changes in this Purchase Order/Contract/Work Order, including additions to or deletions from the quantities originally ordered, in the specification or drawings.

The Vendor shall carry out such revision/changes and be bound by the same terms and conditions to the extent applicable, as though the said revisions were incorporated in the initial order.

If any revisions/changes affect the contract price or delivery, the same shall be subject to adjustment of price/delivery, where required on a very reasonable basis by mutual agreement. Claims for adjustment of price must be made within fifteen (15) days from the date when the revision or change is ordered.

Article- 4 TAXES

All taxes, duties, levies and cess etc. payable in the country of origin and till despatch of the shipment will be payable by the Vendor. All other taxes, duties, cess or levies payable in India will be borne by the Purchaser.

Article- 5 DELAYS

Respect for Delivery Dates:

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Time is the essence of the agreement and the delivery dates are binding on the Vendor and no variation of scheduled delivery dates shall be permitted without prior written authorization from the Purchaser.

In the event of delay on the part of the Vendor to deliver these goods in full or part, the Purchaser shall be entitled at its option to recover from the Vendor as agreed liquidated damages, a sum of 0.5% of the price of the contract value for each completed week or part of a week by which the delivery has been delayed subject however to a limit of 5% of the contract value, without prejudice to Purchaser's other rights and remedies mentioned in the agreement

NOTE: THE MAXIMUM LIMIT OF LIQUIDATED DAMAGE ON ACCOUNT OF DELAY IN SUPPLY, ERECTION & COMMISSIONING AND LACKING IN PERFORMANCE GUARANTEE TEST SHALL NOT EXCEED TO 12.5% IN CASE OF COMPOSITE CONTRACT

CAUSES OF FORCE MAJEURE

Delivery dates will be extended to the Vendor without being subjected to liquidated damages, in the event of causes of force majeure within the contractual delivery periods, only the following will be considered causes of force majeure, acts of God (like earthquakes, floods, storms etc) acts of States including delays in the issuance of valid Import or Export Licences, the direct and indirect consequences of war (declared or undeclared), hostilities, national emergencies, civil commotions and strikes and lockouts (only those which exceed duration of ten continuous days) at Vendor's Works and if accepted by the Purchaser. The Vendor shall immediately inform the Purchaser by cable/telex/fax by detailed letter supported by documentary proof at the beginning and end of all such impediments. It is understood that delivery dates will be extended only for the duration of the above mentioned impediments.

POST DELIVERY OBLIGATIONS/RESPONSIBILITIES OF VENDOR:

Notwithstanding the delivery of Equipment, Special tools, commissioning and maintenance spares by Vendor to Purchaser on FOR site basis or FOB/Port of destination basis as referred to in Clauses 1.1 hereof and the passing of ownership and risk in all such Equipment to Purchaser at that point of time of delivery as referred to in Clause 2.06.01 hereof, vendor shall be wholly and exclusively responsible for rendition of timely services for

- ° Supervision of erection
- ° Supervision of start-up, commissioning

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- ° Training of Purchaser's operating personnel and for
- ° Fulfillment of the guaranteed performance of any and all items of Equipment to be supplied under the Contract to the satisfaction of Purchaser as may be specified in the Contract.

The scope of aforesaid services and the terms and conditions thereof are detailed in Part 4 of this Tender Document.

Vendor shall also be liable for fulfilment of his commitments under the Contract during the warranty period of twelve (12) months reckoned from the date of commissioning of any and all items of Equipment..

Article-6 NON-CONFORMANCE:

In the event of rejection or non-conforming goods, Vendor shall be allowed without any extension of delivery time, to correct the non conformities. Should, however, Vendor fail to do so within the stipulated time, the Purchaser may cancel the order as to the non-conforming goods and shall retain the right with respect to substitution at the cost of the vendor, for installing and removing the non-conforming goods. Alternatively, however, Purchaser may at its option have or cause the non-conformity to be corrected at Vendor's expense. Purchaser also reserves the right to claim damages for use of defective or sub-standard goods supplied by the Vendor irrespective of the fact whether goods were inspected prior to receipt at project site by the Purchaser or not

Article- 7 NON-WAIVER:

Failure of Purchaser to insist upon strict performance of any of terms and conditions hereof, or failure or delay to exercise any rights or remedies provided herein or by law or failure to properly notify Vendor in the event of breach or the acceptance of payment for any goods hereunder or approval of design, shall not release Vendor of any of the Warranties or obligations of this Purchase Order/Contract and shall not be deemed a waiver of any right to Purchaser to insist upon strict performance hereof or of any of its rights or remedies as to any such goods regardless when shipped, received or accepted, nor shall any perforated oral modification or recession of this Purchase Order/Contract by Purchaser shall operate as a waiver of the terms hereof.

Article- 8 INSPECTION:

Purchaser reserves the right to inspect or authorize any representative to

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inspect and expedite goods during manufacture at the Works of the Vendor or its sub-Vendor.

If inspection is not carried out as above, the Purchaser further reserves the right to inspect the goods, under the contract, on receipt of the same at its site. The defects and/or rejections will be intimated to the Vendor within 30 days from the date of receipt of goods at purchaser's site.

All the goods rejected by the Purchaser after inspection at our site shall be removed by the Vendor within 30 days from the date of intimation by the Purchaser at Vendor's expense and risk. It shall be option of the Purchaser to allow the Vendor to replace the rejected goods or to cancel the order for the rejected goods.

All the expenses relevant in the performance of the tests and connected with compilation of Test Reports, etc. at Vendor's Factory only ,will be borne by the Vendor. Purchaser shall bear their own travel and living expenses relating to the inspection.

OFFICIAL INSTITUTIONAL TESTING:

In addition to testing and inspection by inspectors mentioned above, Lloyds Register of Shipping or similar Institutional agencies like Boiler inspectorate may be assigned for official testing of all coded equipment. The Vendor shall ensure that all procedures for preparation and performance of test prescribed by such institution will be completed scrupulously

The Vendor is required to send to such institutions as may be designated by the Purchaser at least three sets of construction drawing for each equipment and calculations, All manufacturer's Mill's test certificates and analytical reports from material testing laboratories in respect of all raw materials and components employed have to be presented to such institutional Inspectors in the number of copies required. Vendor is responsible for eventual delay, if any, in the approval of testing schedule or for any delay, in submission of necessary certificates. The Vendor shall maintain close liaison with Institution's Inspectors to maintain schedule and delay, if any, in this process will not be taken into consideration as a case of Force Majeure.

PROGRESS REPORTS:

Vendor shall submit to Purchaser periodic reports indicating the various

stages of execution of the Contract. However, if Purchaser requires any additional information, the same shall be provided as supplementary information in the reports by Vendor.

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Article-9 WARRANTIES-GUARANTEES:

Vendor shall warrant to Purchaser that the goods supplied shall give the required operational performance, shall be suitable for the service intended and be of the quality specified or of the best grade of their respective varieties if no quality is specified and shall conform to the specifications, drawings, samples and other descriptions contained in the Purchaser Order/Contract.

Vendor shall guarantee Purchaser and their authorized representatives against any and all defects in design workmanship, goods and performance for 12 months from the date of commissioning . Should any defect develop during guarantee period, it shall be remedied promptly free of charge by the Vendor and all expense for transportation of goods necessitated for such repairs or replacements shall be borne by the Vendor. The guarantee period for the replaced goods shall be twelve months. The goods, unless otherwise expressly stated herein are ordered by Purchaser in reliance on each and all of the warranties and guarantees specified herein and implied by law or usage of trade.

The said warranties and guarantees shall continue even if Vendor's quotation to Purchaser or acknowledgement or acceptance of this Purchase order attempts to disclaim the said warranties or guarantees or limits the Purchaser's remedies for breach. Acceptance of goods by Purchaser or their authorized representatives shall not release Vendor from responsibilities arising out of the above mentioned guarantees and warranties.

Article10 PERFORMANCE GUARANTEE:

The Vendor hereby undertakes to be responsible for defective goods supplied by him including shortcomings in the guaranteed qualities and performance as follows:

A. The Vendor guarantees that the material of construction and workmanship of all goods/materials covered by this Purchase Order/Contract shall be specified in our scope of supply hereto and where there is no specific mention in the same, the quality shall correspond to the best available grade.

B. The Vendor further guarantees that the goods covered by this Purchase Order/Contract shall be supplied conforming to the specifications, drawings and other description contained in this Purchase Order/Contract.

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Article11 INFRINGEMENT OF PATENTS:

The Vendor shall warrant that the sale or use of goods, supplied under this order, whether Designed or manufactured so as to comply with Purchaser's specifications or otherwise, shall be free of any claim, whether rightful or otherwise of any person by way of infringement of any patent, copyright, trademark or industrial design, or the like and shall hold the Purchaser harmless and indemnify Purchaser and their authorized representative at its own cost from any and all such claims and legal proceedings, Purchaser makes no guarantee that the production, sale or use of the goods designed and manufactured so as to comply with Purchaser specifications will not give rise to the claim, whether rightful or otherwise of any third person by way of infringement of any patent, copyright, trademark or industrial design, or the like and in no event shall Purchaser be liable to the Vendor or indemnification in the event of any action being brought against Vendor in connection with any claim.

Article12 COMPLIANCE OF REGULATIONS:

Vendor shall warrant that all goods and services covered by this conditions shall have been produced, sold supplied, despatched, delivered and furnished in strict compliance with all applicable laws, regulations, labour agreements, working conditions and technical codes and requirements as applicable from time to time. The Vendor shall execute and deliver such documents as may be required to effect or to evidence such compliance. All laws and regulations are hereby deemed to be incorporated by this reference. The Purchaser, and their authorized representatives disown any responsibility for any irregularity, contravention or infringement of any statutory regulations in the manufacture or supply of goods covered by this Order

NON-ASSIGNMENT:

Any assignment of this Purchase Order or of any rights hereunder in any manner or hypothecation of materials of construction supplied by the Purchaser in whole or in part by operation of law or otherwise, without the prior written consent of Purchaser shall be void. Any such consent shall not relieve the Vendor from its obligations under this order. Purchaser's

consent shall however not be unreasonably withheld.

Article13 GOVERNING LAW & JURISDICTION:

The Court of jurisdiction in case disputes, differences or claims arise

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between the parties shall be the Court within whose jurisdiction the Contract/Purchase Order/Work Order is signed

Article14 SALES CONDITIONS:

With the Vendor's acceptance of provision of this Purchase Order/Contract, Vendor waives and considers as void all of its sales conditions.

Article15 TRANSIT RISK:

Transit Insurance after delivery (FOB) shall be arranged and borne by the Purchaser against their Open General Policies. However, insurance coverage for indigenous bidder(s) shall be to vendor's account.

The Vendor shall furnish immediately after shipment of the equipment all relevant particulars required by the Purchaser and their Insurers to cover transit risk insurance. This shall in no way relieve the Vendor of his responsibility to provide proper packing and protections as stated elsewhere in this Purchase Order/Contract.

The Vendor shall assist the Purchaser, wherever necessary in settlement of claims which may arise in case of loss or damage to the equipment. Further, the Vendor shall ensure immediate replacement of any goods lost and/or damaged during transit.

Article16 PACKING & MARKING:

Vendor shall ensure proper packing to prevent any damages and breakages during transit as detailed in Appendix I hereof. .

Article17 SUBSTITUTION AND WRONG SUPPLIES:

Unauthorised substitution or goods delivered in error or the wrong description or quality or supplied in excess of the quantity ordered or rejected goods shall be returnable only at expenses of the Vendor after due notification to him. Vendor shall bear responsibility, and shall bear among other charges, transportation expenses both ways.

DEFERMENT OF DESPATCH DATE AND STORAGE:

The Purchaser shall have at his own discretion, the right to ask Vendor to defer despatch of goods by a period not exceeding 60 days. The care and storage of the goods during this period shall vest with the Vendor and all expenses in this regard shall be borne by the Vendor. For the extended

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period of storage, the Purchaser shall bear the cost of ware-housing and insurance at actual and shall also release payment.

STORAGE OF EQUIPMENT

Purchaser will endeavour to store each consignment of Equipment, Special tools, commissioning and maintenance spares in the manner recommended by Vendor as and when received at Site to protect it from damage, dust, corrosion etc

Article18 CONFIRMATION OF ORDER:

The Vendor will acknowledge the receipt of the Purchase Order/Contract within 15 days following the mailing of the order and shall thereby confirm his acceptance of the Purchase Order/Contract in its entirety without exceptions. This acknowledgement will bear on both Purchase Order/Contract and General Terms and Conditions. In case the same is not received within the date specified, it will be construed that the order/contract has been accepted in its entirety.

Article19 CONFLICT AMONG ORDER TERMS & CONDITIONS:

In case of any conflict between these general terms and conditions of the order and the special conditions agreed to for a particular order the later shall prevail to the extent applicable

Article20 VENDOR'S DRAWINGS AND DATA REQUIREMENTS:

All technical documents, catalogues, leaflets, flowsheet, sketches, testing certificates, drawings etc. shall be supplied by the Vendor in quadruplicate (four copies) alongwith an additional reproducible copy of drawings. All drawings, specifications and dimensional drawing, documents etc. to be furnished by Vendor will be established in accordance with the metric system of weights and measures.

The above drawings and data shall be submitted by the Vendor to the Purchaser in quadruplicate and in accordance with a time table to be mutually settled within two months from the time of this order between the Vendor and the Purchaser keeping in view the requirements that the designing and civil engineering work can commence at the earliest and

thereafter go on in an uninterrupted manner.

These time limits must be respected failing which the order will not be deemed to have been duly executed for all purposes.

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Article 21 RIGHT OF CANCELLATION:

The Purchaser reserves the right to cancel this Purchase order or any part thereof and shall be entitled to rescind the contract wholly or in part by a written notice to Vendor if:

(a) The Vendor non-adherence to any terms and conditions of the purchase order including general and special terms and conditions.

(b) The Vendor fails to deliver the goods in time and/or replace the rejected goods promptly. The provision of clause (a) and (b) would be subject to Purchaser giving reasonable opportunity to the Vendor to remedy the default.

(c) The Vendor becomes bankrupt or goes into liquidation

(d) The Vendor makes a general assignment for the benefit of creditor; and

(e) A receiver is appointed for any of the property owned by the Vendor.

Upon receipt of said cancellation notice, the Vendor shall discontinue all work on the purchase order and matters connected with it.

The Purchaser in that event will be entitled to procure the requirement in the open market and recover the excess payment over the Vendor's agreed price, if any, from the vendor. The vendor shall also refund all the advance payments made to him by the purchaser forthwith.

It is aware that the said goods are required by the Purchaser for the ultimate purpose of production and that non-delivery may cause loss of production and consequently loss of fixed expenses and profit to the Purchaser. In the event of the Purchaser exercising the option the option to claim damages, non-delivery by way of difference between the market price and the contract price the Vendor shall pay to the Purchaser the compensation to be agreed upon mutually between Purchaser and Vendor. The provision of this clause shall not prejudice the right of the Purchaser from invoking the provisions of other clauses of this agreement.

The Purchaser shall have the right to buy at his option from the Vendor the cancelled goods and components whether complete or incomplete after due inspection and verification of the same paying for them a reasonable

price arrived at by mutual agreement. In case no mutual agreement is reached within a reasonable time the matter shall be settled through Court of law.

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Article22 TERMS OF PAYMENT FOR SUPPLY:

For Indigenous supply:

(a) 10% of supply value as per contract shall be released as advance against submission of Bank Guarantee for equivalent amount as per our format (refer APPENDIX:IV) from any scheduled bank in India. The bank guarantee shall be valid till delivery period plus 3 months. Payment of advance will be subject to recovery of interest as per prevailing prime lending rate of Indian scheduled bank on the date of issuance of order/contract. Adjustment of advance shall be made on invoices against pro-rata delivery.

(b) 5% payment of supply value as per contract shall be released within 3 months from the date of order/contract against submission of deliverables i.e. GA drawing, Load data details etc. as defined in scope of supply.

(c) 70% payment of supply value as per contract shall be released against pro-rata dispatches immediately upon receipt of materials at site

(d) 5% of the supply value as per contract shall be released after commissioning of plant

(e) Balance 10% shall be released after fulfillment of warranty/guarantee period.

Note: The last 10% of the contract price as per Clause (e) shall be released after warranty/guarantee period, however, the 10% payment can be released upon commissioning and testing of plant subject to furnishing a Bank Guarantee as per proforma (refer APPENDIX V) for 10% of the order/contract value valid till warranty/guarantee period Bank Guarantee to be submitted from a scheduled bank of India as per Purchaser's format.

For Overseas supply:

(a) 10% of supply value as per contract shall be released as advance against submission of Bank Guarantee for equivalent amount as per our format (refer APPENDIX:IV) from any scheduled bank in India/foreign bank having branch in India. The bank guarantee shall be valid till delivery

period plus 3 months. Payment of advance will be subject to recovery of interest as per prevailing prime lending rate of Indian scheduled bank on the date of issuance of order/contract. Adjustment of advance shall be made on invoices against pro-rata delivery.

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(b) 5% payment of supply value as per contract shall be released within 3 months from the date of order/contract against submission of deliverables i.e. GA drawing, Load data details etc. as defined in scope of supply.

(c) 70% payment of supply value as per contract shall be released through irrevocable letter of credit against pro-rata dispatches on negotiation of documents through bank. All bank charges outside India shall be to beneficiary's account.

(d) 5% of the supply value as per contract shall be released after commissioning of plant

(e) Balance 10% shall be released after fulfillment of warranty/guarantee period.

Note: The last 10% of the contract price as per Clause (e) shall be released after warranty/guarantee period, however, the 10% payment can be released upon commissioning and testing of plant subject to furnishing a Bank Guarantee as per proforma (refer APPENDIX V) for 10% of the order/contract value valid till warranty/guarantee period. Bank Guarantee to be submitted from a scheduled bank of India/foreign bank having branch in India as per Purchaser's format.

TERMS OF PAYMENT FOR SUPERVISION OF ERECTION, START UP & COMMISSIONING OF EQUIPMENT AND TRAINING OF PURCHASER'S PERSONNEL:

100% payment shall be released upon completion of supervision of erection, start up and commissioning including training of Purchaser's personnel on receipt of invoice supported by completion certificate, attendance certificate issued by mill authority.

TERM OF PAYMENT FOR COMPLETE ERECTION, START UP AND COMMISSIONING OF EQUIPMENT:

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80% payment with full taxes and duties shall be paid against monthly progress bills, duly certified by the mill authority within 15 days on submission of documents.

10% after completion of entire erection

Balance 10% shall be released after successful commissioning and performance test run.

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APPENDIX: I

PACKING INSTRUCTIONS

All equipment shall be carefully and properly packed for ocean shipment/inland rail/road movement as the case may be and Vendor shall be responsible for its quality. Any repair or rework caused by inspection rejection shall be to Vendor's account.

All Packing shall be sufficient to prevent damage in transit and suitable to withstand rough handling.

All equipment subject to damage by moisture must be completely wrapped in waterproof plastic film or paper. If more than one (1) piece is contained in a box or crate, then each piece must be individually and completely wrapped in waterproof plastic film or paper.

Whenever items are completely or partially enclosed in boxes or crates, the box or crate must be steel strapped in at least two (2) directions. Vendor shall be fully responsible for suitable inner packing, bracing, floating etc. Hay, straw and like materials shall not be used in packing.

Items shipped on cradles, skids or pallets must be securely fastened to the cradle, skid pallet by means of bolting or steel strapping.

All bright and machined parts, such as flange facings, threads, moving parts, etc. shall be protected against corrosion by suitable rust preventive coating. Openings in vessels, equipment, pipes, etc., shall be suitably covered to prevent damage and entry of foreign matter. Wooden covers shall be used to protect unthreaded openings.

Threaded openings shall be covered by metal caps. All equipment shall be completely drained of water and cleaned of foreign matter before packing and shipment.

Items shipped in bundles must be tied together with steel strapping at several places. Bundles shall not exceed the approximate limit of two (2) tonnes.

All loose parts, such as fixtures, fittings and small parts, not rigidly secured to a major piece of equipment shall be packed separately and clearly marked for easy identification.

Fragile items shall be wrapped in crop-cellulose wadding or some equally efficient cushioning material and floated in a suitable impact absorbing material.

Electronic gear and other instrumentation shall be packed in an interior moisture-vapour-proof barrier with silica gel, or a comparable desiccant to absorb moisture within the package.

Paper bags may be used as packing only for those materials which the manufacturer normally ships in such containers . And, when used, such bags must, as a minimum, be of three (3) ply construction consisting of one (1) 60 lb (min) wall, one (1) 40 lb (min) wall and one (1) waterproof plastic wall . When such bags are used as shipping containers a quantity of empty bags equal to ten per cent (10%) of the total number of bags in each shipment must be supplied.

Special Instructions for Valves :

Process Valves :

Valves upto 80 mm diameter shall be shipped in boxes or barrels . Valves above 80 mm diameter but below 300 mm diameter shall be rested vertically in crates . Valves above 300 mm diameter but below 600 mm diameter shall be crated laying horizontal, two to the crate on the skew with stems besides each other. Valves, 600 mm and above shall be export packed individually . Machine surface shall be protected with covers securely fastened and protected against corrosion .

Control Valves :

Special care must be taken to pack control valves. They should be packed in wooden boxes with adequately designed interior support, with interior waterproof protection .

If drums are used in packing, they must be non-returnable steel export drums. Sealing of drum closure must be adequate to retain contents with the full load bearing on closure .

All boxes, crates, etc. must be constructed in such a way that no sling hoist will cause damage.

Two (2) copies of the packing list must accompany each box, crate etc. One (1) copy shall be placed in a waterproof envelope inside the box, crate, etc. The other copy shall also be placed in a waterproof envelope and securely attached to the outside of each box, crate etc. If no such packing is used, both copies must be enclosed in a waterproof envelope and securely attached to the unit.

PACKING LISTS (To be issued at the same Time as Vendor's Invoices)

Vendor shall furnish three (3) original and seven (7) copies of a packing list for each shipment . This packing list shall be prepared on Vendor's standard forms .

The packing list shall include a listing of only those items actually being shipped . Items which were previously shipped or which will be shipped in the future must not be listed .

Packing list must include the following :

- Issue Date
- Vendor's Reference Number
- Purchase Order Number
- Full name and address of the Vendor or Manufacturer
- Consignee (HPC)
- Import Licence Number, where applicable
- Itemized list of contents of each package, case, crate, etc., identified by the Purchase Order, Item Number and Equipment or Tag Number where applicable
- Quantity of each item actually being shipped
- Copy of all marking as shown on each package or piece
- Number and type of package and/or pieces in each shipment . Each package and/or piece shall be numbered consecutively to indicate individual and total packages : i.e. 1 of 2, 2 of 2 etc. (succeeding shipments against the same order number will carry progressive package numbers : i.e. 3 of 5, 4 of 5, 5 of 5 etc.)
- Shipment number – Packing list must indicate if shipment is partial or final shipment of order. Each partial shipment will be consecutively indicated as "Partial Shipment" No. 1 or 2 or 3 etc. as applicable. Final shipment shall be indicated as "Final Shipment" . A shipment of an entire order in one (1) shipment shall be indicated as "Complete Shipment" .
- Net and Gross Weight of each package and/ or piece, and the total weight of the shipment.
- Dimensions and volume of each package and/or piece and the total volume of the shipment .

The language of the description of the goods shall be English .

Vendor is cautioned that when a shipment is designated "FINAL" or "COMPLETE", it must be exactly as designated . The Import Licence expires automatically when a shipment is cleared through customs as "FINAL" or "COMPLETE" .

Should it be verified subsequently that a required piece, part, etc. has been omitted, then the entire process of documentation and import licencing must be done again in order to effect shipment and importation of the missing piece, part, etc. Should such event occur, all costs to Purchaser including all shipping costs, insurance charges, fees, fines, duties etc. incurred for effecting shipment and importation of the missing piece, part etc. shall be to Vendor's account .

Vendor shall be fully responsible for designating the shipment "FINAL" or "COMPLETE" and for the implications of such designations .
All packaging materials shall become the property of Purchaser.

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Notwithstanding anything stated in Clause 16.01 to 16.15 and 17.01 to 17.08 . Vendor shall be entirely responsible for loss, damage or depreciation to the material due to faulty protection or insecure packing .

MARKING INSTRUCTIONS

Each case, box, crate, piece etc., must be stenciled in waterproof ink or paint atleast on two (2) sides in clear legible characters. On bundles the marks are to be embossed on two (2) metal tags which shall be wired securely to the bundle at the end and in the middle. Waterproof paint shall be used on metal surfaces. Where packing material is clean and light coloured, a dark or black stencil ink or paint shall be used .

However, when the packing material is bright/ dark coloured, a coat of zinc white paint shall be applied to the marking area and allowed to dry before applying the shipping marks

Shipping marks shall be as follows: (in a frame of red point 5 cm wide)

- a) Shipment No. of
- b) Contract No.
- c) Item and Equipment No.
- d) Case No. of
- e) Gross Weight (kg)
- f) Net Weight (kg)
- g) Dimensions (Metres)
- h) Volume (cubic metres)
- i) Country of Origin

Shipment number shall be used only where partial shipments are made against single order. In such cases shipment shall be numbered consecutively from 1 and up. The last shipment must also be marked FINAL after the shipment number .

Case number must start with No.1 and go up. Subsequent partial shipment against the same Purchase Order will continue with the next numbers in sequence that follows the last number used on the previous shipment .

Example : If the first shipment against a Purchase Order consists of 4 cases, use case numbers 1 /4, 2/4, 3 /4 and 4/4. A subsequent shipment of 3 more cases against the same Purchase Order would be numbered 5/7, 6/7 and 7/7 with a reference to the previous date of shipment of cases 1 to 4. A final shipment of 4 cases would be numbered 8/11, 9/11, 10/11 and 11/11 and the word FINAL must be added .

Bags must show the above marks in ink, in large characters at least 15 cm high in such a way that marking will take up all the surface of the bag.

Special Markings :

In addition to the above markings, the following markings, where applicable, shall be shown separately from the above marks .

Fragile Items : On all sides

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“FRAGILE – HANDLE WITH CARE”

Items which must be kept in an upright position: On two sides .

“THIS SIDE UP”

Items that cannot be stored outdoors : On two sides.

“STORE UNDER COVER”

Vessels, tanks and similar equipment must be marked with stripes of paint to indicate where slings must be placed for hoisting .

“SLING”

“SLING”

Case containing spare parts must be so marked.

Other marks shall be applied in accordance with the International Maritime Dangerous Goods Code (IMCO) .

All the above markings must be distinct and separate from any Manufacturer's own markings, trade names, etc. Whenever the Manufacturer's or Fabricator's own markings, trade names etc., appear on containers or pieces, all of the above markings must be in characters at least as large as those of the Manufacturer.

All the markings must be shown correctly on each container .

APPENDIX:II

SUPERVISION OF ERECTION, START-UP AND COMMISSIONING

When this Contract requires Vendor to provide services for the supervision of erection, start-up and commissioning of equipment supplied under this Contract, the conditions, specified in this Clause will apply.

In case where erection, start-up and commissioning of equipment supplied under this Contract will be carried out by a separate agency to be appointed by Purchaser. Vendor shall however, be responsible for the supervision of the work from the commencement of erection upto the demonstration of the performance guarantees of equipment supplied under this Contract. The responsibilities of Vendor shall include but not be limited to the following:

Ensuring the correctness of materials and equipment despatched in the order in which they will be required for erection.

Advising on the safe handling of cargo at site and storage for all materials, equipment, special tools, commissioning spares and maintenance spares supplied under this Contract.

Ensuring correctness of erection of all equipment supplied by Vendor as well as those that may be procured from/fabricated by others based on Vendor's drawings or specifications or bills of quantities.

Ensuring that adequate quantities of the correct commissioning spares and supplies are at site for the purposes of start-up.

Handing over equipment to Purchaser on the issue of the Provisional Acceptance Certificate.

Advising on any matter pertaining to the erection, start-up and commissioning on request by Purchaser or Engineer.

In order to carry out his responsibilities under this Article Vendor shall send experienced personnel to take up residence at site as established in this Contract. Erection, start-up and commissioning schedule and the details of the strength and calibre of the resident staff, Vendor will be required to maintain at site, shall be finalised between the Purchaser and Vendor at the appropriate time. No resident staff shall be sent to site until permission to do so is received from Purchaser. Should Purchaser find the personnel deputed by Vendor not acceptable for valid reasons, Vendor undertakes to depute suitable replacement immediately at Vendor's expense.

At any time during the erection period Purchaser shall have the right to ask Vendor to temporarily withdraw his site staff or reduce/increase the strength of the staff in order to keep pace with the erection programme or for any reason whatsoever at his sole discretion. Purchaser will give Vendor two weeks' notice prior to requesting the temporary withdrawal of Vendor's personnel.

Vendor shall ensure that each individual of Vendor's personnel resident at site shall co-operate with the personnel of Purchaser and any and all other vendors/contractors engaged in work in or around site in order to avoid difficulties in carrying out the work. Failure to accomplish this co-operation shall be just cause for the removal of such individuals and their replacements by suitable other personnel by Vendor at his expense forthwith upon request by Purchaser. In case of disagreement as to the cause for such removal and replacement, the decision of Purchaser shall be final.

On completion of the erection work and connecting up of the electrical power supply, water and utilities, Vendor shall promptly notify Purchaser of the proposed date of the commencement of start-up operations. The duration of the start-up period shall be established in a schedule which shall be part of this Contract. Purchaser will provide requisite personnel, power, fuel, utilities and supplies for operating equipment during the start-up period and during this period equipment shall be operated under the supervision of Vendor.

Should the start-up period extend beyond the scheduled period due to either difficulties encountered with Vendor's equipment or inadequacy of Vendor's personnel, Purchaser shall have the right to recover the loss suffered during the extended period.

APPENDIX:III

COMPLETE ERECTION, START-UP AND COMMISSIONING

1 When this Contract requires Vendor to undertake complete erection, start-up and commissioning of equipment supplied under this/separate Contract, the conditions specified in this Clause will apply.

Vendor shall be solely responsible for satisfactory erection, start-up and commissioning of equipment supplied under this or a separate Contract, including demonstration of performance guarantees notwithstanding that Vendor may have been assisted by Purchaser or his authorised representative in doing so

2 The responsibilities of Vendor shall include but not be limited to the following:

2.01 Ensuring the correctness of materials and equipment in the order in which they will be required for erection

2.01 Taking delivery of materials and equipment from Purchaser's store/stock yard at site and moving it to Vendor's storage area and/or erection site unless otherwise provided in this Contract.

2.03 Opening of crates and packing cases, inspection and checking of equipment/materials

2.04 Repairing and replacement of equipment/ materials damaged or lost in transit or at site and assisting Purchaser in filling and processing of insurance claims for damaged/loss of equipment/materials.

2.05 Ensuring that adequate quantities of correct commissioning spares and supplies are available at site for the purpose of start-up of the equipment.

2.06 Making arrangement to draw electricity and water to the erection site from locations at site where electricity and power shall be provided by Purchaser, at such terms and conditions as stipulated in this Contract.

2.07 Checking foundations as constructed, including final adjustment of foundation levels by chipping and dressing, checking locations, elevations etc. for anchor bolts and base plates, connecting up electric power supply and water supply and carrying out all minor civil work as may be required in connection with the erection work

2.08 Complete erection of all materials and equipment supplied by equipment Vendor as well as those that may be procured from/fabricated by others based on equipment Vendor's drawings, specifications or bills of materials. This shall include the complete erection of equipment, piping, hangers, structures etc. supplied under this Contract, including aligning, lining and leveling and grouting of anchor bolts and base plates, connecting up electric power supply, water and utilities, applying including touching up of approved final painting to all equipment, piping hangers, structures etc. supplied under this Contract.

2.09 Starting up and operating equipment to meet specified performance guarantees and handing over equipment to Purchaser on the issue of the provisional acceptance certificate.

2.10 Providing all consumable materials and stores required for the work.

2.11 Providing all ladders, platforms, temporary supports and other necessary facilities required for the handling and erection of equipment supplied under the Contract as well as those that may be procured from/fabricated by others based on equipment Vendor's drawings, specifications or bills of materials.

2.12 Unless otherwise provided in this Contract, providing all construction/erection equipment, welding equipment, tools and tackle, instruments and appliances required for the erection, testing and commissioning of equipment.

2.13 Providing necessary supervisory personnel, staff, skilled and unskilled labour, to ensure that the whole of the erection work is completed in all respects within the period specified in this Contract. Vendor shall ensure, when local laws require, that the concerned employees obtain and hold certificates of competency for their work from the competent authority.

3. On completion of the erection work and connecting up of electric power supply, water and utilities, the Contractor shall promptly notify Purchaser and Engineer of the proposed date of the commencement of the start-up operations. The duration of the start-up period shall be established in a schedule which shall be part of this Contract. Purchaser will provide requisite facilities, such as fuel, power, water and utilities to Vendor as required for operating equipment during the start-up period, and during this period equipment shall be operated under the supervision of Vendor.

4 Should the start-up period extend beyond the scheduled period due to difficulties encountered due to inadequacy of Vendor's personnel or due to any incorrectness in erection work or due to any other reason for which Vendor is responsible, Purchaser will have the right to charge such amount from Vendor as may be reasonable by Purchaser for the facilities provided by Purchaser as specified above during the extended period. .

5. Supervision by Engineer

Erection work shall be carried out by Vendor under the general supervision and to the satisfaction of Engineer. Vendor shall receive instructions and directions from Engineer in connection with the work and shall strictly abide by the same. If Vendor perform any work in a manner contrary to this Contract without the written approval of Engineer, Vendor shall bear all the costs arising therefrom and shall be responsible for all the losses arising therefrom to Purchaser.

6. Facility to Purchaser's Engineers and Personnel

Vendor shall provide every facility and opportunity to Purchaser's Engineers and personnel as required by Purchaser to become familiar with erection, operation and maintenance of equipment to be erected under this Contract.

7. Program and particulars of Work and Progress Reports

7.01 Vendor shall submit to Purchaser for his approval before the commencement of erection work and subsequently, at such times as may be required by Purchaser, the programme and order in which Vendor proposes to carry out the work, with the dates and completion times for various parts and phases of the work, including particulars regarding Vendor's arrangement for carrying out the work and of the erection and transportation equipment and tools and categorywise staff and labour which Vendor shall engage on the work. Such programmes shall be within the overall time schedule of completion of erection of equipment as specified in this Contract. Submission to and approval by Purchaser of such programme of the furnishing of such particulars shall not relieve Vendor of any of his duties of responsibilities for satisfactory erection, start-up and commissioning under this Contract.

7.02 During the progress of the work, Vendor shall submit to Purchaser and engineer one copy each of fortnightly progress report and such other reports on the erection work and Vendor's field organisation as may be required by Engineer.

8. Vendor's Agent and Personnel

8.01 In order to carry out his responsibilities under this Clause, Vendor shall employ and post one competent agent, whose name shall be previously communicated in writing by Vendor to Purchaser and Engineer, to superintend the erection work.

8.02 Vendor on the request of Engineer shall remove forthwith from site any person employed thereon by him who may, in the option of Engineer, be incompetent or misconduct himself. In such case, Vendor shall provide immediately competent person in replacement.

9. Working Hours

A normal working day shall mean eight hours of work. There shall be six working days in a normal week. No work during holidays and other recognised holidays and during night shall be carried out by Vendor without written permission of Engineer.

10. Supply of Erection Equipment, Materials and Labours

Unless otherwise provided in this Contract, Vendor shall keep himself in touch with the day to day position regarding the supply of materials by Purchaser and shall so adjust the progress or the work that his labour may not remain idle nor there be any other claim due to, or arising from, delay in obtaining the materials. no claim whatsoever shall be admissible by Purchaser on account of delay in supplying materials, if any.

11. Purchaser's Erection and Transportation Equipment

Purchaser may at his discretion give on hire to Vendor erection and/or transportation equipment, if available, for the use of Vendor (but without prejudice to Vendor's obligations during the execution of the work on such terms as may be specified in this Contract or as may be decided by Engineer. Vendor shall take all reasonable care of all such equipment belonging to Purchaser but committed to his charge and shall be responsible for all damage or loss caused to such equipment while they are in his charge. On completion of this Contract or at its termination for any reason whatsoever or at any earlier occasion as required by Purchaser, Vendor shall return all such equipment to Purchaser in good order and repair, wear and tear accepted, and shall be entirely responsible for any failure to account for the same or any damage done thereto.

12. Return of Surplus Materials

Notwithstanding anything contained to the contrary anywhere in this Contract, wherever any materials for the execution of the work are procured with the assistance of Purchaser, either by issue from Purchaser's stocks or purchase made under orders or permits of licenses issued by Purchaser. Vendor shall use the said materials economically and solely for the purposes of the work and shall not dispose of them without the contrary anywhere in this Contract, wherever any written permission of Purchaser and shall return Purchaser all such surplus serviceable materials that may be left with Vendor after the completion of this Contract or at its termination for any reason whatsoever, on being paid for or credited such price as Purchaser shall determine, having due regard to the initial cost and the condition of the materials at the time of such return thereof. The price to be allowed to Vendor however, shall not exceed the amount charged to him, excluding the storage charge if any. The decision of Purchaser in this regard shall be final and conclusive. In the event of a breach of the aforesaid condition, Vendor shall (in addition to making himself liable for action for contravention o the terms of the license or permit and/or for criminal breach of trust) be liable to Purchaser for payment of double the cost of

materials not returned as determined by Purchaser plus all moneys, advantages of profits resulting or which in the usual course would have resulted to him by reason of such breach.

13. Accident or injury to Workman

13.01 Vendor shall be solely liable for any accident or injury that may happen to any of his personnel engaged in connection with the erection work according to this Contract. Purchaser shall not be liable for, or in respect of, any damage or compensation payable at all in respect of, or in consequence of, any accident or injury to any personnel in the employment of Vendor and Vendor shall indemnify and keep indemnified Purchaser against all such claims, damages, compensations and proceedings.

13.02 Vendor shall forthwith report to Engineer all cases of accidents to any of his personnel and shall make every arrangement to render all possible assistance and aid to the victims of the accident that may occur during erection work.

All the workmen employed by the Vendor should be covered under a comprehensive insurance policy.

14. Compliance with Statutory and other Regulations

14.01 Vendor shall, in all matters arising in the performance of this Contract, conform at his own expense with the provisions of all Central or State statutes, ordinances or laws and the rules, regulations, or bye-laws of any local or other duly constituted authority and shall keep Purchaser indemnified against all penalties and liabilities of every kind for breach of any such statute, ordinance, law, rule, regulation or bye law.

14.02 Vendor shall give all notices and pay all fees and taxes required to be given or paid under any Central or State Statutes, ordinances or other laws or any regulations or bye laws of any local or other duly constituted authority in relation to the erection work.

15. Traveling Expenses

When the Contract requires the Contractor to undertake the complete erection, start-up and commissioning of equipment supplied under a separate Contract, all travelling expenses for the Contractor's personnel engaged for Erection purpose only shall be borne by the Erection Contractor.

16. Compliance with Labour laws and Rules

16.01 In respect of all labour, directly or indirectly employed by Vendor for the erection work, Vendor shall comply with the provisions of the Contract Labour (Regulation and Abolition) Act prevailing in India and any amendment thereof and all

legislations and rules of the State and/or Central Government or other local authority framed from time to time governing the protection of health, sanitary arrangements, wages, welfare and safety of labour employed on the erection work. The rules and other statutory obligations with regard to fair wages, welfare and safety measures, maintenance of registers etc. will be deemed to be part of this Contract.

16.02 Provisions of Minimum Wages Act and Payment of Wages Act

(a) Vendor shall comply with the provisions of the Minimum Wages Act and Payment of Wages Act prevailing in India/state and any amendment thereof in respect of all personnel employed by him for the purpose of carrying out the erection work. Vendor shall supply to Purchaser any labour required to work wholly or partly under the direct order and control of Purchaser, whether in connection with any work being executed by Vendor or otherwise for the purpose of Purchaser, and such labour shall for the purpose of this Clause still be deemed to be persons employed by Vendor.

(b) If any moneys shall, as a result of any claim or application made under the said Acts, be directed to be paid by Purchaser, such moneys shall be deemed to be moneys payable to Purchaser by Vendor and, on failure by Vendor to repay Purchaser, any moneys paid by the Purchaser as aforesaid, within seven days after the same shall have been demanded from Vendor. Purchaser shall be entitled to recover the same from any moneys due or accruing to Vendor under this or any other contract with Purchaser.

©In the event of retrenchment of workers, by Vendor or sub-contractors employed by Vendor during or after the completion of the work, the retrenchment compensation and other benefits will be paid by Vendor to the workers as per the Industrial Disputes Act.

16.03 Provision of Workmen's Compensation Act

Vendor shall at all times indemnify and keep indemnified Purchaser against all claims for compensation under the provisions of the Workmen's Compensation Act or any other law for the time being in force by, or in respect of, any workmen employed by Vendor in carrying out this Contract and against all costs and expenses or penalties incurred by Purchaser in connection therewith. In every case in which, by virtue of the provisions of Workmen's Compensation Act, Purchaser is obliged to pay compensation to a workman employed by Vendor in executing the Contract. Purchaser shall recover from Vendor the amount of compensation so paid and, without prejudice to the rights of Purchaser under the said Act. Purchaser shall be at liberty to recover such amount or any part thereof deducting it from the security deposit or from any sum due by Purchaser to Vendor whether under this Contract or otherwise. Purchaser shall not be bound to content any claim made against him under the said Act, except on the written request of Vendor and upon his giving to

Purchaser full security for all costs for which Purchaser might become liable in consequence of contesting such claim.

16.04 Accommodation-for-Erection Contractor's Personnel

No quarters shall normally be provided by Purchaser for the accommodation of the Erection Contractor or any of his staff employed in connection with the erection work. In exceptional cases, where accommodation is provided to Vendor at Purchaser's discretion, recovery shall be made at such rates as may be fixed by Purchaser towards the rent of the buildings, furniture and fittings, if any therein, as well as charges for electric supply, water supply and conservancy.

16.05 Labor Camps

Vendor shall, at his own expenses, make adequate arrangements for housing, supply of drinking water and provisions of latrines and urinals for his staff and labour and disposal of sewage. Suitable sites on Purchaser's land, if available, may be allotted to Vendor for the erection of labour camps on such terms and conditions as may be prescribed by Purchaser. All camp-sites shall be maintained in clean and sanitary condition by Vendor at his own cost as directed by Purchaser.

16.06 Preservation of Peace

Vendor shall take requisite precautions and use his best endeavour to prevent any riotous or unlawful behaviour by, or amongst, his workman and/or others employed by him and for the preservation of peace and protection of the inhabitants and security of property in the neighbourhood of site. In the event of Purchaser requiring the maintenance of a special police force at, or in, the vicinity of site during the tenure of this Contract, in consequence of the riotous or unlawful behaviours by, or amongst, Vendor's workmen and/or others employed by him, all expenses thereof and costs of all damages due to such riotous or unlawful behaviour shall be borne by Vendor/recoverable from any moneys due or that may be due to Vendor by Purchaser.

16.07 Sanitary Arrangement

Vendor shall comply with all sanitary rules in force and carry out all sanitary measures and permit inspection of all sanitary arrangements at all reasonable times by Purchaser. Should Vendor fail to make adequate sanitary arrangements, these will be provided by Purchaser and the cost thereof shall be recovered from Vendor.

16.08 Infectious Diseases

Vendor shall remove from his labour camp such labour and their families who refuse protective inoculations and vaccinations when called upon to do so by any

competent authority. Should cholera, plague or any other infectious disease break out in his labour camp, Vendor shall forthwith burn the huts, beddings, clothes and other belongings of, or used by, the infected parties and promptly erect new huts on healthy sites as required by Purchaser.

16.09 Medical Facilities at Site

Vendor shall provide medical facilities at site as per rules in force in relation to the strength of Vendor's staff and workman.

16.10 Use of Intoxicants

The sale of ardent spirits or other intoxicating beverages upon site or in any of the buildings, encampments or tenements owned, occupied by or within the control of Vendor or any of his employees or sub-contractors is forbidden and Vendor shall secure strict compliance with this condition.

16.11 Age Limit of Labour

Vendor shall not employ persons below the age of 19 as labour for the erection work.

16.12 Observance by Sub-Contractors

Vendor shall be responsible for the observance of the provisions of Clauses 16 to 16.11 hereof by any sub-contractor employed by him in the execution of this Contract.

17. Time of Completion for Erection Work and Delays

17.01 The Date of Commencement of Erection Work

The date of commencement of erection work shall be reckoned from the day on which Vendor is given possession of site to commence erection, which will be indicated to him in writing by Purchaser.

17.02. Possession of Site

Save in so far as this Contract may prescribe the extent of portions of site of which Vendor is to be given possession from time to time and the order in which such portion shall be made available to him and subject to any requirement in this Contract as to the order in which the erection work shall be executed. Purchaser will give to Vendor possession of as much of site as may be required to enable Vendor to commence and proceed with the erection work in accordance with the programme referred in the PO/Contract hereof and otherwise in accordance with such

reasonable proposals of Vendor as he shall, by notice in writing to Engineer make, and will from time to time, as the work proceeds, give to Vendor possession of such further portions of site as may be required to enable to proceed with the erection work with due despatch, in accordance with the said programme or proposals as the case may be. If Vendor suffers delay from failure on the part of Purchaser to give possession in accordance with the terms of this Clause. Purchaser shall grant an extension of time for the completion of the work. No compensation will be payable by Purchaser for any such failure and delay.

17.03 Time of completion for Erection Work

This is an essence of this Contract, Subject to any requirement in this Contract as to the completion of any portion of the erection work before the completion of the whole of the erection work, the whole of the work, including conducting performance tests to demonstrate performance guarantees to the satisfaction of Purchaser, shall be completed within the time stipulated in this Contract, which shall be reckoned from the date of the commencement of the erection work in accordance with Clause 17.01 hereof.

17.04 Extension of Time of completion for Erection Work

Should the amount of extra or additional work of any kind or other circumstances of any kind whatsoever, which may occur, be such as fairly to entitle Vendor to an extension of time for the completion of the erection work, Purchaser shall determine the amount of such extension, provided that Purchaser is not bound to take into account any extra or additional work or other circumstances unless Vendor has, within twenty days after such work has been commenced or such circumstances have arisen or as soon thereafter as is practicable, delivered in writing to Purchaser full and detailed particulars of any claim to extension of time to which he may consider himself entitled, in order that such claim may be investigated at the time.

17.05 Rate of Progress

The whole of the materials, plant and labour to be provided by Vendor and the mode, manner and speed of execution of the erection work are to be of a kind and conducted in a manner, approved by Engineer. Should the rate of progress of the execution work be at any time, in the opinion of Engineer, too slow to ensure the completion of the work within the time prescribed by Clause 17.02 hereof or extended time in terms of Clause 17.04 hereof. Engineer shall so notify Vendor in writing and Vendor shall thereupon take such steps, as he may think necessary and engineer may approve to expedite the progress so as to complete the entire erection work within the prescribed time or extended time before completion. If Vendor shall request permission to work by night as well as by day, then, if Engineer shall grant permission to work also by night, then Vendor shall not be entitled to any additional

payment whatsoever for doing so, but if such permission is refused and there is no equivalent practicable method of expediting the progress of the work, the time for completion of the erection work may be extended by Purchaser by such period, if any, as is solely attributable to such refusal and deemed proper by Engineer.

17.06 Night Work Without Disturbance

If work at night is permitted as aforesaid it shall be carried out without unreasonable noise and disturbance. Vendor shall indemnify Purchaser from, and against, any liability for damage on account of noise or other disturbance created while, or in carrying out, the erection work, and from, and against, all claims, demands, proceedings, damages, costs, charges, and expenses whatsoever in regard to, or in relation to, such liability.

17.07 Liquidated damages for Delay in Erection Work

If Vendor shall fail to complete the whole of the erection work within the time prescribed by Clause 11.15.03 hereof or extended time in terms of Clause 17.04 hereof, Vendor shall be liable to pay to Purchaser as liquidated damages for such default, but not as a penalty, a sum calculated at the rate of one half of one per cent of the contract price for erection, start-up and commissioning of equipment for every week or part of a week's delay which shall elapse beyond the time prescribed by Clause 17.02 hereof or extended time in terms of Clause 17.04 hereof as the case may be, subject to a maximum of 5% (five percent) of the Contract price for Erection, start-up and commissioning of Equipment. Purchaser may at his option and without prejudice to any other method of recovery, deduct the amount of such damages from any moneys in his hands due to Vendor. Such damages shall not relieve Vendor from his obligations to complete the work or from any other of his obligations and liabilities under this Contract.

18. Subletting

Vendor shall not sublet the whole or any part of the erection work without the written consent of Purchaser, and such consent, if given, shall not establish any contractual relationship between the sub-contractor (s) and Purchaser and shall not relieve the Vendor of any responsibility of liability or obligation under this Contract. Vendor shall be entirely responsible for the acts, defaults and negligence of any sub-contractor or his agents or workmen as if they were the acts, defaults and negligence of Vendor or his agents or workmen. Provided always that execution or details of erection work by petty contractors under the direct and personal supervision of Vendor or his agent shall not be subletting within the meaning of this Clause.

19. Safety, Watch and Ward and Lighting

(a) Vendor shall be responsible for the provision of safety arrangements and protection clothing for all his workmen on site whether or not engaged in actual erection work or supervision thereof. He shall ensure that all his workmen in site use safety belts, gloves, helmets, masks etc. as are necessary for their safety. Vendor shall also be responsible for safety arrangements of all equipment used by him in connection with the erection and transportation equipment. Vendor shall use only tested equipment, tools wire, ropes etc. and shall periodically renew tests to the satisfaction of Engineer. All test certificates shall be made available to Engineer at site as and when required by him.

(b) Vendor shall, in connection with the erection work, provide and maintain at his own cost all lights, guards, fencing and watch and ward, when and where necessary or required by Engineer or by any duly constituted authority for the protection of the work and/or for the safety and convenience of the public or others Vendor shall provide at his own cost the necessary watch and ward to ensure security and safety of all equipment and materials placed under Vendor's custody.

20. Security Regulations

Vendor shall abide by all the security regulations at site promulgated by Purchaser from time to time. Vendor shall provide identity badges for all his personnel which must be properly displayed by them at site. In order to facilitate the issue of exit gate permits by Purchaser for materials and equipment after the completion of the work, Vendor shall submit Purchaser lists of erection equipment etc. and/or other materials that shall be taken by him inside site from time to time.

21. Care of Work

From the commencement to the completion of the work Vendor shall take full responsibility for the care of equipment and for all temporary works, and, in case any damage or loss shall happen to the equipment or to any temporary works from any cause whatsoever shall at his own cost replace or repair and make good the same.

22. Damage to Persons or Property

Vendor shall indemnify and keep indemnified Purchaser against all losses and claims for injuries or damages to any person or any property whatsoever which may arise out of or in the course of the work at site carried out by Vendor and against all claims, demands, proceedings, damages, costs, charges and expenses whatsoever in respect thereof or in relation thereto.

23. Third Party Insurance

Before the commencement of the erection work, Vendor shall insure (but without limiting his obligations and responsibilities under Clause 22 hereof) against any damage, loss or injury which may occur to any property (including that of the Purchaser) or to any person (including any employee of the Purchaser) by or arising out of this Contract. Such insurance shall be effected in the joint names of Purchaser and Vendor with an insurer and in terms approved by Purchaser at least for an amount of (Pl. indicate amount here) with a maximum indemnify of (Pl. indicate amount here) for any single accident, and Vendor shall whenever required by Purchaser, submit to Purchaser the policy or policies of insurance and the receipt for payment of the current premiums.

24. Co-operation with Other Agencies

The Contractor shall plan and execute his work in a phased manner as directed by Purchaser from time to time and shall fully co-operate with other agencies working at site simultaneously and afford all reasonable facilities to these agencies so as not to obstruct or retard the works simultaneously being executed by such agencies in any way.

25. Inspection of Other Vendor's/ Contractor's Works

If any part of the Vendor's work depends for proper execution on the work of another Vendor/contractor, Vendor shall inspect and promptly report to Engineer defects, if any, in such work that render it unsuitable for such proper execution and result. Vendor's failure to do so inspect and report shall constitute an acceptance of other Vendor's/contractor's work, as fit and proper for the reception of his work, except as to defects which may develop in the other Vendor's/ Contractor's work after the execution of the work.

26. Vesting of Constructional/ Erection Plant etc.

All constructional/erection plant, temporary works, materials owned by Vendor, or by any Company in which Vendor has a controlling interest, shall, when brought on to site, immediately be deemed to become the property of Purchaser.

26.01 Irremovability of Constructional/ Erection Plants, Materials etc.

No constructional/erection plant, temporary works or materials or any part thereof shall be removed from site by Vendor without the written consent of Purchaser, which consent shall not be unreasonably withheld where the same is no longer immediately required for the purpose of completion of the work, and Purchaser will permit Vendor the exclusive use of all such constructional/erection plant, temporary works and materials in and for the completion of the work until the occurrence of any

event which gives Purchaser the right to exclude Vendor from site and proceed with the completion of the work.

26.03 Removal of Constructional/ Erection Plant

Upon the removal of any such constructional/erection plant, temporary works and materials as have been deemed to have become the property of Purchaser under Clause 26 hereof with consent as aforesaid, the property therein shall be deemed to revert in Vendor and, upon the completion of the work, the property in the remainder of such constructional/erection plant, temporary works and materials as aforesaid shall be deemed to revert in Vendor. If Vendor fails to remove any constructional/erection plant, temporary works and materials as aforesaid, within such reasonable time after completion of the work as may be allowed by Purchaser, then Purchaser may sell any such constructional/erection plant, temporary works and materials as aforesaid and, after deduction from any proceeds of sales, the costs, charges and expenses of, and in connection with, such sale, shall pay the balance (if any) to Vendor but to the extent that the proceeds of any sale are insufficient to meet all such costs, charges and expenses the excess shall be a debt due from Vendor to Purchaser and shall be recoverable by Purchaser accordingly as aforesaid.

26.04 Purchaser not liable for Loss or Injury to Constructional/Erection Plant

Purchaser shall not any time be liable for the loss of, or injury to, any of the constructional/ erection plant, temporary works and materials which have been deemed to become the property of Purchaser under Clause 26 hereof.

27. Work in or around Operating Plant

When the work is being carried out in or around an operating plant, where the plant must run uninterrupted, Vendor shall only work at specified places and times as mutually arranged between Vendor and Purchaser. Vendor shall take sufficient care in moving his construction/ erection plant and equipment from one place to another in an operating plant so that they may not cause any damage to the property of Purchaser, like roads, overhead and underground cables, pipes and/or any other service or equipment or building, and, in the event of Vendor's failure to do so, the cost of such damages, including eventual loss of working hours as estimated by Purchaser, is to be borne by Vendor/ recoverable from any moneys due or that may be due to Vendor by Purchaser.

28. Site to be cleared on Completion of Work

During erection, Vendor shall at all times keep the working and storage area used by him free from accumulation of waste materials and/or rubbish, immediately after the completion of erection. Vendor shall remove or dispose of all temporary structures,

waste, debris, rubbish etc. and leave the site in a clean condition to the satisfaction of Purchaser.

29. Possession Prior to Completion

Purchaser shall have the right to take possession of or use any completed or partially completed part of the work. Such possession or use shall not be deemed to be in acceptance of any work done not in accordance with this Contract

30. Suspension of Erection Work

Vendor shall, on the written order of Purchaser suspend the progress of the whole of the erection or any part thereof, for such time or times and in such manner as Purchaser may consider necessary and shall during such suspension properly protect and secure the work so far as is necessary in the opinion of Purchaser, if such suspension is :

- a) provided for in this Contract; or
- b) necessary for the proper execution of the erection work or on account of some default on the part of Vendor; or
- c) necessary for the safety of the work or any part thereof.

Vendor shall not be entitled to the extra costs (if any) incurred by him during the period of suspension of the erection work, but, in the event of any suspension ordered by Purchaser for reasons other than aforementioned and when each such period of suspension exceeds fourteen days, Vendor shall be entitled to such extension of time for the completion of the erection work as Purchaser may consider proper having regard to the period of such suspension.

31 Termination of Contract for Equipment Erection

If the Vendor shall :

- a) become bankrupt or insolvent; or
- b) make an arrangement with, or assignment in favour of, his creditors or agree to carry out the erection work under a committee of inspection of his creditors; or
- c) being a company or corporation go into liquidation (other than a voluntary liquidation for the purpose of amalgamation or reconstruction); or
- d) have an execution levied on his goods or property; or
- e) assign or sublet this Contract or any part thereof otherwise than as provided in Clause 18 hereof; or
- f) abandon this Contract; or

g) without reasonable excuse fail to commence the erection work within the stipulated period or suspend the progress of the erection work for fourteen days after receiving from Purchaser written notice to proceed; or
 h) fail to proceed with the erection work with due diligence according to the programme of work; or
 i) fail to remove materials from site or to pull down and replace work after receiving from Purchaser written notice to the effect that the said materials or works have been condemned or rejected; or
 j) fail to employ competent staff and labour, or
 k) disregard the instructions of Purchaser in relation to the execution of the erection work; or

l) fail to execute the erection work in accordance with this Contract or neglect to carry out his responsibilities and obligations under this Contract; or
 m) promise, offer or give any bribe, commission gift or advantage either by himself or through his partner or agent or servant, to any officer or employee of Purchaser or to any person on their behalf in relation to the execution of this Contract or any other contract with Purchaser then, in any of the aforesaid cases, Purchaser may serve Vendor with a notice in writing to that effect, and if Vendor does not, within seven days after the delivery to him of such notice, proceed to make good his default, in so far as the same is capable of being made good, and carry on the erection work in compliance with such directions as stated in the aforesaid notice to the entire satisfaction of Purchaser, Purchaser shall be entitled after giving forty-eight hours notice in writing, to expel Vendor from site, without thereby avoiding this Contract or releasing Vendor from any of his obligations or liabilities under this Contract or affecting the rights and powers conferred on Purchaser by this Contract. The expiry of forty-eight hours from the time of serving such notice in writing to the Vendor by Purchaser shall be conclusive evidence of the expulsion of Vendor from site notwithstanding any physical presence of Vendor or his workmen at site after such expiry. Upon such expulsion Purchaser may himself complete the erection work or may employ any other Contractor to complete the erection work and Purchaser or such other Contractor may use for such completion so much of the construction/ erection plant, temporary works and materials which have been deemed to become the property of the Purchaser under Clause 26 hereof as he or they may think proper and Purchaser is entitled at any time to sell any of the said constructional/ erection plant, temporary works and unused materials and apply the proceeds of sale in, or towards, the satisfaction of any sums due or which may become due to him from Vendor or under this Contract. Provided always that Purchaser at any time after expelling Vendor from site have the right to rescind this Contract and claim damages from Vendor. Provided further that the exercise of any of the rights aforesaid shall not prejudice Purchaser's other rights and remedies under the law.

32. LIABILITY FOR ACCIDENTS AND DAMAGES

32.01 Vendor shall indemnify Purchaser against any loss, damage and injury to pay person or to any property and against any other liability or obligation and against all the actions, suits, claims, demands, costs, charges and expenses arising in connection with such damages, injury, liability or obligation resulting from:

the negligence of Vendor and his employees, agents and sub-Vendors and/or
the lack of or inadequacy of safety devices on Equipment supplied under the Contract:
and/or
non-compliance of safety regulations

32.02 In the event of any claim being made against Purchaser by reason of any matter referred to in Clause 32 hereof and in respect of which Purchaser shall promptly notify Vendor, who may at his own expenses conduct all negotiations for the settlement of the same and any litigation that may arise therefrom. Purchaser shall, at the request of Vendor, extend all available assistance for the above purpose at the cost and expense of Vendor.

33. FORCE MAJEURE

33.01 Should force majeure circumstances intervene after the date of the Contract and impede, prevent or delay the execution thereof, then the proper time for performance under the Contract of any obligation of the parties shall be automatically extended by the actual delay in performance of such obligation caused by such circumstances.

33.02 For purpose of this clause. Force Majeure means an event beyond the control of either Vendor or Purchaser and not involving either Vendor's or Purchaser's fault or negligence and not foreseeable either Vendor or Purchaser, as the case may be such events may include, but are not restricted to Act of god, wars or revolutions, fires, floods, earthquake, epidemics, quarantine restrictions and freight embargoes.

33.03 The party wishing to claim relief by reason of such circumstances shall notify the other party in writing without delay and, in any case, within fifteen days of the intervention and within fifteen days of the cessation of such circumstances.

33.04 Without prejudice to Clauses 33.01 and 33.02 hereof, both parties should make every reasonable effort to minimise, as far as possible, the effects of such circumstances upon the Contract, including consideration of the use of the manufacturing facilities of Vendors' associate companies, if any, and of the opportunities which will be available for changing Vendors of sub-contracted Equipment and Spare Parts part thereof.

PROFORMA FOR ADVANCE BANK GUARANTEE

HINDUSTAN PAPER CORPORATION LIMITED

BANK GUARANTEE FOR ADVANCE PAYMENT

NAME OF THE BANK

ADDRESS

GUARANTEE NO.

DATE OF EXPIRY

LIMIT OF LIABILITY RS

REF: PURCHASE ORDER / CONTRACT NO.

DATED

FOR (NAME OF WORK & PROJECT)

M/S. Hindustan Paper Corporation Limited
75C, Park Street
Kolkata – 700 016

Dear Sirs,

In consideration of your agreeing to pay to Messrs -----

(Hereinafter referred to as “the Contractor”) as sum of Rs.....
(Rupees..... only) as and by way of advance payment representing.....% of
the contract value of rupee element of..... In terms of their contract with you for
supply of (hereinafter referred to as “the contract”) on our agreeing
to furnish you with our guarantee in the manner hereinafter contained,
we.....do hereby covenant and agree with you as follows :

We..... Bank Ltd., (hereinafter referred to as “the bank”) do hereby undertake
to pay to Hindustan Paper Corporation Ltd. an amount not exceeding
Rs..... against any loss or damage that may be caused to or suffered by
you by reason of any breach by the said contractor (s) of any of the terms or conditions
contained in the said contract.

We..... Bank Ltd. do hereby undertake to pay the amounts due and payable under this guarantee without any demur, merely on a demand from you stating that the amount claimed is due by way of loss or damage caused to or would be caused to or suffered by you by reason of any breach by the said Contractor (s) of any of the terms or conditions contained in the said contract or by reason of the Contractor's failure to perform the said contract. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under the guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs..... Your right to recover the said sum of Rs.....(Rupees.....) from us in the manner aforesaid will not be affected or suspended by reason of the fact that any dispute or disputes have been raised by the said contractor/ vendor and/ or that any disputes are pending before any officer, Tribunal or Court.

We,Bank Ltd, further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said contract and it shall continue to be enforceable till all the dues of the Hindustan Paper Corporation Ltd, under or by virtue of the said contract have been fully paid and its claims satisfied or discharged or till you certify that the terms and conditions of the said contract have been fully and properly carried out by the said Contractor (s) and accordingly discharges the guarantee. Unless a demand or claimed under this guarantee is made on us in writing on or before the..... We shall be discharged from all liability under this guarantee thereafter.

We,.....Bank Ltd, further agree with you that you shall have the fullest liberty without our consent and without affecting in any manner our obligations hereunder to vary any of the terms and conditions of the said contract or to extend time of performance by the said Contractor (s) from time to time or to postpone for any time or from time any of the powers exercisable by you against the said Contractor (s) and to forbear or enforce any of the terms and conditions relating to the said contract and we shall not be relieved from our liability by reason of any such variation, or extension being granted to the said Contractor (s) or for any forbearance, act or omission on your part or any indulgence by the Hindustan Paper Corporation Ltd. to the said Contractor(s) or by any such matter or thing whatsoever which under the law relating to the sureties would but for this provision have effect of so relieving us.

This guarantee shall come into force simultaneously with your making the said advance payment to the Contractor and shall not be revoked by us whether before its coming into force or any time during its currency without your previous consent in writing.

This guarantee shall not in any way be affected by your taking or varying or giving up any securities from the Contractor or any other person, firm or company on its behalf or by the winding up dissolution, insolvency or death as the case may be, of the Contractor.

Notwithstanding anything contained herein :

1. Our liability under this Guarantee shall not exceed Rs.....(Rupeesonly).
2. This guarantee is valid upto..... (until this day of 200)
3. We are liable to pay the Guaranteed amount or any part thereof under this Bank Guarantee only and only if you serve upon us written claim or demand on or before.....day of.....200.....

We have power to issue this guarantee under our Memorandum and Articles of Association and the undersigned has full power to sign this guarantee on our behalf under Power of Attorney dated..... granted to him.

Signature :

Full Name :

Designation :

Official Address :

Bank Stamp :

Attorney as per Power of Attorney No :

Dated.....

WITNESS NO.1

.....
(Signature)

Full name and official address
(in legible letters)

WITNESS NO.2

.....

(Signature)

Full name and official address (in legible letters)

PROFORMA OF BANK GUARANTEE-AGAINST PERFORMANCE OF PLANT/EQUIPMENT

NAME OF THE BANK.....

ADDRESS.....

GUARANTEE NO:.....A/C.....

DATE OF EXPIRY.....

LIMIT OF LIABILITY RS.....

REF :PURCHASE ORDER/CONTRACT NO :

DATED.....FOR (NAME OF WORKS & PROJECT).....

.....

To
M/s.....

.....

.....

In consideration of your agreeing to pay to
M/s.....

.....of.....

.....(hereinafter referred to as "the Vendor/Contractor")
a sum of
Rs.....(Rupees.....
.....

.....only) in terms of Purchase Order/Contract
No.....

.....dated.....concluded with you by the
Vendor/Contractor for the supply
of.....

.....
.....
subject to additions and alternations mutually agreed upon and set forth (hereinafter referred to as("The said Purchase Order/Contract") on our agreeing to furnish you with our guarantee in the manner hereinafter contained, we,.....(Bank) do hereby covenant and agree with you as follows :

1. We undertake to indemnify you and keep you indemnified to the extent to the sum of Rs.....(Rupees.....only) from and against all losses and damages that may be caused to or suffered by you or in relation to the payment to be made by you to the Vendor/Contractor as aforesaid by reason of any default on the part of the Vendor/Contractor in the fulfillment of satisfactory performance guarantees or carrying out any works under the said Purchase Order/Contract in respect of which such payment as aforesaid is to be made by you to the Vendor/Contractor or otherwise in the observance and performance of any of the terms and conditions relating thereto in accordance with the true intent and meaning thereof and in the event of any default or defaults on the part of the Vendor/Contractor as aforesaid we shall forthwith on demand pay to you any sum or sums not exceeding in the total, the said sum of Rs.....(Rupees.....only) as may be claimed by you to be due from the Vendor/Contractor by way of refund of such payment or any portion or portions thereof or otherwise as your losses and/or damages by reason of such default or defaults on the part of the Vendor/Contractor as aforesaid.

2. Notwithstanding anything to the contrary your decision as to whether the Vendor/Contractor has made any such default or defaults and the amount or amounts to which you are entitled by reason thereof will be binding on us and we shall not be entitled to ask you to establish your claim or claims under this guarantee but will pay the same forthwith without any objection. Your right to recover the said sum of Rs.only) from us in the manner aforesaid will not be affected or suspended by reason of the fact that any dispute or disputes have been raised by the said Vendor/Contractor and/or that any dispute or disputes are pending before any Officer Tribunal or Court.
3. The guarantee shall come into force simultaneously with your making the said payment to the Vendor/Contractor and shall not be revoked by us whether before its coming into force or any time during its currency without your previous consent in writing.
4. The guarantee shall expire on.....day of.....Two Thousand.....() at the latest without prejudice to your claim or claims arisen and demanded from or otherwise notified to us in writing on or before the said date.
5. You will have fullest liberty without affecting this guarantee to postpone for any time or from time to time any of your rights or powers against the Vendor/Contractor and either to enforce or forbear to enforce any of the terms or conditions of the said Purchase Order/Contract and we shall not be released from our liability under this guarantee by the exercise of your liberty with reference to the matters aforesaid or by reason of any time being given to the Vendor/Contractor or any other forbearance, act or omission on your part or any indulgence by you to the Vendor/Contractor or by any variation or modifications of the said Purchase Order/Contract or any other act matter or thing whatsoever which under the law relating to sureties would but for the provisions hereof have the effect of so releasing us from our liability hereunder PROVIDED ALWAYS nothing herein contained will enlarge our liability hereunder beyond the limit of Rs.(Rupees.....only) as

aforesaid or extend the period of this guarantee beyond the said.....of.....unless expressly agreed to by us in writing.

6. All composition and payments that may be received by you from the Vendor/Contractor or any person firm or Company whomsoever for or on account of the Vendor/Contractor in any way in respect of the said Purchase Order/Contract shall be regarded as payments in gross and you will be entitled to prove against the assets of the Vendor/Contractor be wound up, dissolved or declared insolvent in respect of the whole of the Vendor/Contractor's indebtedness to you without any right on our part to stand in your place in respect of or to claim the benefit of such composition or payments or any security that may be held by you until you shall have received the full amount of your claims against the Vendor/Contractor and this guarantee shall not in any way be affected by your taking or varying or giving up any securities from the Vendor/Contractor or any other person firm or company on its behalf or by the winding up dissolution insolvency or death as the case may be of the Vendor/Contractor.
7. In order to give full effect to this guarantee herein contained you shall be entitled to act as if we were your principal debtors in respect of all your claims against the Vendor/Contractor hereby guaranteed by us aforesaid and we hereby expressly waive all our surety ship and other rights if any which are in any way inconsistent with the above or any other provisions of this guarantee.
8. Subject to the maximum limit of our liability as aforesaid this guarantee will cover all your claim or claims against the Vendor/Contractor from time to time arising out of or in relation to your such advance payment to the Vendor/Contractor as aforesaid and in respect of which your demand or notice in writing be issued on us before the date of expiry of this guarantee mentioned above.
9. This guarantee and the powers and provisions herein contained are in addition to and not by way of limitation of or substitution for any other guarantee heretofore given to

you by us (whether jointly with other or alone and now existing uncanceled) and that this guarantee is not intended to and shall not revoke or limit such guarantee or guarantees.

10. This guarantee shall not be affected by any change in the constitution of the Vendor/Contractor or ourselves nor shall it be affected by change in your constitution or by any amalgamation or absorption thereof or therewith but will ensure for and be available to and enforceable by the absorbing or amalgamated company or concern.
11. We have power to issue this guarantee under our Memorandum and Article of Association and the undersigned has full power to sign this guarantee on our behalf under power of Attorney dated.....granted to him **OR** the resolution dated.....passed by our Board of Directors in accordance with our constitution.

Yours faithfully,

NAGAON / CACHAR PAPER MILLS
ASSAM INDIA

**MODERNISATION & TECHNOLOGICAL
UPGRADATION PROJECT**

**BID DOCUMENT
ELECTROSTATIC PRECIPITATOR
SUPPLY, ERECTION & COMMISSIONING**

SPECIFICATION NO. : K8P01-SPC-M-281-56.01

VOLUME-II : TECHNICAL SPECIFICATION



DEVELOPMENT CONSULTANTS PVT. LTD.

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VOLUME-II : TECHNICAL SPECIFICATION

C O N T E N T S

- PART - 4 : TECHNICAL SPECIFICATION
PART - 5 : ABSTRACT OF PRICES
PART - 6 : OFFER LETTER BY BIDDER

PART - 4

I N D E X

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1.00.00 INTENT OF SPECIFICATION

This specification is intended to cover design, engineering, manufacture, assembly/pre-assembly, tests at manufacturer's works, delivery properly packed for transport F.O.R.(free on rail) Works/F.O.B.(free on board) port of export, road transport from Works to Project site and erection, erection supervision, final check-up, commissioning and conducting performance and acceptance tests at site of the Electrostatic Precipitators (ESP) on Lumpsum Turnkey (LSTK) basis excluding Civil & Structural works for the existing Coal Fired Boilers, complete with all accessories (as per the layout shown in Dwg. Nos. K8P01(N)-DWG-M-281-270.01Rev.b & K8P01(N)-DWG-M-281-280.01, Rev.b for NPM and K8P01(C)-DWG-M-281-270.01Rev.b & K8P01(C)-DWG-M-281-280.01Rev.b for CPM attached herewith) and as specified hereinafter for the Modernisation & Technological Upgradation Project of Hindustan Paper Corporation Ltd's existing Paper Mills at Nagaon and Cachar in the State of Assam in India.

2.00.00 GENERAL INFORMATION TO BIDDER

2.01.00 Hindustan Paper Corporation Ltd. (A Government of India Enterprise) intends to modernise and upgrade their existing writing & printing paper mills, Nagaon Paper Mill (NPM) and Cachar Paper Mill (CPM) in the state of Assam, India. The target average paper production at Nagaon Paper Mill is 140,000 TPA while production at Cachar Paper Mill would be maintained at 110,000 TPA on sustained basis.

2.02.00 The sites for the Paper Mills are as below :

2.02.01 Nagaon Paper Mill is located on south of National Highway No. NH37 around 60 KM from Guwahati and 4 KM towards east from Jagi Road Railway Station on Guwahati–Tinsukia route of North East Frontier Railway.

2.02.02 Cachar Paper Mill is located at Panchgram on Silchar–Karimgang Highway and approximately 25 KM from Silchar. The nearest Railway Station is Panchgram on North East Frontier Railway and Badarpur Railway Junction is nearly 6 KM from site.

3.00.00 SCOPE OF WORK OF THE BIDDER

3.01.00 Scope of supply :

3.01.01 The scope of supply of the Bidder covered under this specification shall include the following for each of Nagaon Paper Mill and Cachar Paper Mill :

3.01.02 Three (3) nos. Electrostatic Precipitators, one(1) for each of the existing Coal Fired Boilers complete with the following accessories for each ESP :

- Precipitator main Casing, Gas distribution screen with special perforated plates for proper distribution of gas (3 no. at inlet and 1 no. at outlet).
- Rigid frame emitting system configuration that maintains perfect alignment during operation.

- Panel form of collecting electrode plates - Aerodynamically shaped to reduce pressure drop.
- Steel Support structure , Staircase, Platforms as required.
- Structural bearings.
- Hoppers, inlet and outlet funnels in MS, with access doors.
- Canopy for TR Sets proper.
- RALs & Slide Gates at Hopper Outlets and Main Collecting Conveyor.
- MCC with one (1) no. incomer, Line P.T and adequate no. of outgoing feeders.
- TR sets lifting and handling arrangement with manually operated chain-pulley arrangement.
- Plate & Electrode (Collecting & Discharge) rapping mechanism system.
- Motors.
- Compression insulator house that envelopes all support insulators.
- Air purging arrangement.
- Painting of ESP (However, TR sets and rappers shall be with original equipment painting provided by manufacturer).
- Insulation and cladding of ESP.
- All ducting and ductwork, duct supports, duct insulation and cladding.
- Fly ash hoppers with heating arrangement and provision for attaching fluidising arrangement.
- Hook up with the existing ash handling and disposal system for disposal of ash from the ESP fly ash hoppers. All auxiliary equipment required for the hook up with the existing system shall be included in the scope of the Bidder

- 3.01.03 Transformer -Rectifier sets with individual microprocessor based field control panels.
- 3.01.04 Auxiliary Control Panel (ACP).
- 3.01.05 Power , Control instrumentation & Special Cables, Cable Glands, Cable Trays and other accessories.
- 3.01.06 Local Push button Stations, Lock out switches for transformers.
- 3.01.07 Junction boxes.
- 3.01.08 All necessary instrumentation and controls with safety interlocks.
- 3.01.09 Earthing (above ground) & Lightning Protection system.
- 3.02.00 Services
- 3.02.01 The Bidder under this specification shall also be responsible for complete erection, supervision, final check-up, commissioning and acceptance testing at site of the equipment supplied by him including dismantling of the existing Mechanical Dust Collector.
- 3.02.02 The work shall generally comprise supply of supervisory personnel, special erection tools and tackle as may be required for efficient and expeditious

erection of the equipment and material covered by the scope of supply mentioned under Clause No. 3.01.00.

3.02.03 The Bidder is required to indicate separate price for the services.

4.00.00 EXCLUSIONS

4.01.00 The following items of work are excluded from the Bidder's scope of work.

4.01.01 All civil works including ESP foundation, cable trenches, earth pits, earthing grid at ESP etc.

4.01.02 Control room construction, plant lighting, aviation lighting and air conditioning.

4.01.03 All statutory approvals such as from factory inspector, electrical inspector etc.

4.01.04 Supply & laying of incoming cables to each ESP MCC.

4.01.06 Inter communication system including Public Address System & Telephone.

4.01.07 Supply & installation of cable trays for incoming power cables.

4.01.08 Underground mat.

5.00.00 TECHNICAL REQUIREMENT

5.01.00 OPERATING DATA

The Electrostatic Precipitators shall be designed based on the operating data as given below:

<u>Sl. No.</u>	<u>Description</u>	<u>Unit</u>	<u>Quantity</u>
1.	Type of Boiler	-	Stoker Fired
2.	Gas flow at ESP inlet	Cu.m/hr	171,000
3.	Gas temp. at ESP inlet	°C	182 for NPM 240 for CPM*
4.	Gas pressure at ESP inlet	mbar	(-) 15 to 5
5.	Dust content at ESP inlet	gm/cu.m	6
6.	ESP inlet gas dew point	°C	130-140
7.	CO concentration in Flue Gas	% (V/V)	< 3
8.	CO ₂ concentration in Flue Gas	% (V/V)	8.5 Avg.
9.	Dust content at ESP outlet	mg/N.Cu.m	100
10.	Collector electrode spacing (Recommended)	mm	400
11.	Max. migration velocity	cm/s	11.0
12.	Gas velocity in ESP	M/s	0.75-0.90
13.	Number of fields	-	As per Manufacturer's Design

Sl. No.	Description	Unit	Quantity
14.	Minimum number of series fields	-	As per Manufacturer's design
15.	Output Voltage	kV	120
16.	Output Current	mA	As per Manufacturer's design
17.	Max. length of discharge electrode individual section	-	As per Manufacturer's design
18.	Min. trough angle of dust hoppers	Deg.	60
19.	ESP mechanical design for a) Pressure b) Temperature	mbar °C	(+/-) 50 300
20.	ESP duty conditions	-	24 hrs per day (7 days/ week)

*No Air-Preheater after economizer in CPM.

The above parameters are based on the gas flow from the existing C.F. Boilers.

5.02.00 FUEL & ASH ANALYSIS

5.02.01 The analysis of coal being presently used as fuel for C.F.Boilers in NPM and CPM are given below for selection of ESP.

Coal Fines (<6mm)

1. Proximate Analysis :

Fixed Carbon	42.2%
Volatile Matter	37.6%
Ash	19.1%
Moisture	1.1%
2. Ultimate Analysis :

Carbon	62.24%
Hydrogen	4.57%
Nitrogen	0.92%
Sulphur	6.37%
Oxygen	3.59%
3. Gross Calorific Value on Dry basis 6000 Kcal/Kg
4. As fired Moisture 7%
5. Fuel Size 100% less than 6mm Max.
 30% less than 1 mm

5.02.02 The analysis of ash from the C.F.Boilers are as below :

Fly Ash

1. Proximate Analysis :	
Fixed Carbon	30.12%
Volatile Matter	4.14%
Ash	64.40%
Moisture	1.34%
2. Ultimate Analysis :	
Carbon	31.06%
Hydrogen	0.77%
Nitrogen & Oxygen	0.90%
Sulphur	1.53%
Mineral matter	64.40%
Moisture	1.34%

5.03.00 DESIGN & CONSTRUCTION

5.03.01 Electrostatic Precipitators :

The electrostatic precipitator shall be of two or four sections, each capable of independent operation. A minimum spacing of 1000 mm must be kept between two adjacent system sections to assure maintainability during shut down of any one of the sections. Guillotine type gas-tight dampers shall be provided on inlet & outlet so that one bank can be maintained while the other is in service. For this purpose, double isolation with intermediate venting may be used, if required as an alternative.

The Purchaser have plans to convert the existing stoker fire boilers to FBC boilers at a later date. The Bidder, should therefore keep provisions in their design for retrofitting of the same ESP suitable for handling flue gas from the FBC boilers where the dust concentration will be on much higher side.

5.03.02 Dust Hoppers

The capacity of the hopper shall be adequate to hold the maximum ash collection for a minimum period of 8 hours. The design shall take into consideration the possible variation in the ash collection at different points and each hopper shall be designed for maximum possible loading considering one(1) field out of operation. The ash density shall be taken to 800 Kg/Cu.m. for calculating storage capacity. A margin of at least 10% shall be provided in the hopper capacity over calculated values. For structural design, however, the ash density shall be considered as 1600 Kg/Cu.m.

Hoppers shall be welded from steel plates, suitably stiffened and not less than 5 mm thick. The hoppers shall be of inverted pyramidal type with flanged outlet connection of approved size. The outlet flanges shall be of standard dimensions and shall be located at a sufficient height above the ground floor

level for attaching to the fly ash removal system. The ash handling system valves and piping shall be supported from the hopper flange and hopper wall through suitable hanger connection. Attention shall be given to the design and construction of the hopper to ensure free discharge of dust under all conditions. Valley angle between hopper sides and horizontal shall not be less than 60 Deg. The internal surface of the hopper shall have a smooth finish. The hopper shall be electrically heated to prevent bridge formation inside the hoppers. The thermostatically controlled heating elements shall be designed adequately to maintain ash temperature near hopper outlet above dew point between 130 to 140 Deg.C. The ESP supply shall be complete with supply of panels, switches, fuses, etc. required for the heating elements complete with all cabling, cable trays etc. between the panel and the heating elements. External surface of hoppers shall be properly insulated. The Bidder shall provide necessary arrangements for fixing fluidisers in hopper. All hoppers shall be fitted with gas baffles preventing entry of gas into hoppers and consequent ash re-pick up. Each hopper shall be provided with two (2) numbers hundred (100) mm dia. poke holes with screwed caps. The poke holes shall be so oriented that the probes cannot be rammed into sources of high voltage. The height of the hopper outlet above the floor shall be to suit the requirements of ash handling system. Water ingress in rainy season shall be guarded properly.

5.03.03 Structural Steel Work:

The precipitator casings, internals and inlet and outlet flanges and the dust hoppers and support structures are to be fabricated from mild steel designed and erected in accordance with the relevant National Standard.

5.03.04 Stairway and Hand railing :

These are to be designed and supplied integral with the precipitators as specified elsewhere.

5.03.05 Gas Distributors:

Gas distributors are to be incorporated to ensure even distribution in each field.

5.03.06 Discharge Electrode Frame Work:

The discharge electrode frame work shall be designed to obtain a stable configuration. The entire frame work shall be thoroughly braced to form a rigid structure. No parts of frame work shall extend beyond the top and bottom edges of collecting plates. All sharp edges and the ends of the frame parts shall be rounded to avoid excessive flash overs. The discharge system assembly shall ensure highly accurate spacings. Anti sway devices shall be provided to prevent shifting and swinging of the frames. Frame work shall be so designed that the clearance between electrodes is not disturbed during rapping.

5.03.07 Discharge Electrodes:

The high tension discharge electrodes shall be made of durable, corrosion and erosion resistant material such as stainless steel. They shall be accurately

centered between successive collecting electrodes. The supporting framework shall be robust and maintain the alignments perfectly within the allowable limits even after long periods of continuous operation. The type of cross-section shall also ensure an even distribution of corona discharge over the entire length of the discharge electrodes.

5.03.08 Discharge Electrodes Rappers:

Suitable rapping devices complete with drive units shall be furnished for rapping of the discharge electrodes at regular intervals. The rapping mechanism shall be of proven design. The rapper shaft shall be properly insulated and the insulators shall be provided with electric heating to prevent condensation and flash overs. All parts requiring frequent attention shall be easily accessible for inspection when the unit is in operation.

5.03.09 Collecting Electrodes:

The collecting electrodes shall be designed to maintain good dimensional stability and the collecting efficiency at desired level. Adequate collecting area should be provided to achieve the specified collection efficiency under the worst conditions of operation. The collecting plate material shall have good forming properties. The profile of the collecting plates shall be such as to limit the re-entrainment of the collected dust at the time of rapping. Each plate shall be shaped by roll using deep-drawing quality steel sheets and shall be stiff enough to withstand the rapping impact. The collecting plates shall permit maximum corona power to be applied for operation at peak efficiency under all conditions.

5.03.10 Collecting Electrode Rappers:

- a) The rapping mechanism for collecting electrodes shall ensure proper uniform rapping of each plate at regular intervals. The direction of plate rapping shall be so selected as to achieve greatest effectiveness of fly ash shedding. Clearance between electrodes shall not be disturbed by rapping.
- b) Care shall be taken in the design and construction of the plate rapping mechanism to limit re-entrainment of collected dust into the gas stream during rapping operation. The system shall be designed for continuous sequential rapping to eliminate puffing at the stack. Frequency of rapping shall be kept to a minimum in order to limit dust losses due to re-entrainment. The rapping mechanism shall be of such design so as to offer flexibility of control within wide limits. Separate rapping equipment shall be provided for each field so that intensity of rapping can be adjusted suitably in that area in accordance with the dust build-up, inlet loadings and changing gas volumes. Remote manual operation of rapping shall also be provided.
- c) All internal parts of rapping mechanism shall be accessible for inspection and they shall be placed on wide access passages. Necessary lubrication system shall be provided for the rapping mechanism.

5.03.11 Access:

Sufficient space is to be provided between the top of the electrode assemblies and the underside of the roof of the precipitator to enable access to be gained to the electrode suspension points, internal rapping gear parts etc. and the doors giving access to this space are to be located in the floor of the top house.

At the bottom of the precipitator casing, access doors are to be provided at the ends of, and between, each separate electrode system preferably with walkway facilities for example, by suitably positioned structural members. Each department of the dust hoppers is to be provided with an access door also.

Every access door is to be fitted with an efficient quick release latch and must provide an effective seal against in leaking air. The number and disposition of the doors must be such as to enable the discharge and collector electrodes and the gas distributors to be and cleaned and to facilitate the removal and replacement of the discharge electrodes.

All access doors are to be adequately sized to permit easy entry and exit of personnel and those access doors fitted to vertical, or near vertical, faces are to be hinged on a vertical side to provide sideways openings.

Access doors fitted to dust hoppers are to have two position latches to allow controlled opening to the cracked position, in order to prevent any pressure exerted by dust build-ups bursting the doors open on initial latch release.

5.03.12 Thermal Insulation:

The precipitator casings, inlet and outlet flares and dust hoppers are to be so constructed and/ or thermally insulated as to prevent excessive heat loss and to maintain the temperature of the interior surfaces, under normal operating conditions, above the water dew points of the gases. The insulation is to be non-combustible, is to be applied in accordance with the relevant National Standard, if available, pertaining to the particular type of insulation and is to be applied in accordance with best current practice, particularly with regard to protection and weatherproofing. The thickness of the thermal insulation must not be less than 100 mm.

5.03.13 External Cladding:

The thermal insulation is to be protected and weather-proofed by an outer cladding of profiled aluminum sheeting applied with lap joints arranged so as to shed water and sealed with a metal sealing compound.

5.03.14 Transformer Rectifier Unit:

- a) The high voltage D.C. supply to the electrostatic precipitator shall be from adequate number of transformer-rectifier (TR) units. The transformer rectifier shall be suitably mounted on the top of precipitator. Each leg of the transformer rectifier shall not be connected to more than one bus section. The transformer-rectifier units shall be provided with protection against surge, excess temperature rise and under voltage. The transformer rectifier

units shall be suitable for operation at 50 Deg.C ambient temperature (design) having mineral insulated oil filled type class ONAN cooling. The transformer and its associated equipment shall conform to IS or other approved international standards (like BS/DIN/JIS etc.). Each field of each section will be provided with one TR set.

- b) In HV side of Transformer clear indication should be provided whether it is ON or OFF, otherwise dedicated key should be provided in each Rectifier panel and corresponding Transformer for maintenance purpose so that in no case running Transformer can be taken for maintenance. Remote "OFF" from control room for each TR set shall be provided.
- c) The rectifiers shall be silicon diode type having proven service over five years and shall conform to relevant IS, or other approved international standards. The rectifier units shall be suitably arranged to give satisfactory operation at all loads with arrangement to take any one unit off the system without affecting operation of the precipitator.
- d) Each TR set shall be placed on a metal tray to collect leakage/spillage oil. All such trays will be connected to common drain pipe which shall be extended up to ground level with necessary valves.
- e) The TR set shall be of reputed make, having adequate proven experience of use and subject to the approval of the Purchaser.
- f) The HV Rectifier set shall preferably be located in a separate chamber, other than the transformer tank, in order to facilitate replacement/maintenance of the diodes.
- g) Over current protection shall be provided in case of failure of diodes.
- h) Each TR panel shall have a provision of interfacing with ESP control room PC for ON/OFF, data logging, alarm & display etc. During running of TR panel if power fails, the system can be restarted from PC after revival of power.
- i) HV positive terminal, HV negative terminal & HV resistor terminal of each TR shall be separate. LV input terminals, LV input measurement terminals & shunt terminals shall be housed in separate box for each TR. Adequate numbers of earthing terminals shall be provided for each TR. Creepage provided for all insulators shall be 31mm/KV minimum.
- j) Bi-directional flat roller with stopper shall be provided for each TR.

5.03.15 Control Panels:

The system shall be semi pulse control and microprocessor based. Rectifier control cubicles shall be housed in a control room adjacent to each precipitator.

5.03.16 Auxiliary Control Panel:

Each auxiliary control panel shall regulate the operation of rapping motors and heating elements pertaining to one pass of the system. Separate control panel shall be provided for each horizontal pass of the precipitator. Each auxiliary control panel shall consist of necessary relays, master-controllers, timers, switches, indicating lamps etc. necessary for the efficient operation and control of individual/group rapping mechanism and heating elements.

Master controller and timer shall be designed to control the sequence and frequency of the operation of rapping mechanism of the collecting and discharge system of the different fields of the precipitators. Signal lamps shall indicate over-load tripping of the rapping motors.

5.03.17 Field Rectifier Control Cubicle:

The control cubicles for the transformer rectifier unit shall incorporate protections for abnormal condition. It shall include devices like arc suppression unit, under-voltage protection and protection for excessive temperature rise and

internal short circuit of the transformer winding. The panel shall be complete in all respects with DC and AC ammeters, voltmeters, circuit breaking devices, pulse rate controller, L.T. busbar, control/ switches, indicators, visual and audio alarm overload and earth fault protection, current limiting relays, polarity switch (if applicable) and all necessary relays. The panel shall also provide all necessary interlocks, automatic regulator and other protective devices for safe and efficient operation of the precipitator and safety for operating personnel. DC voltage and current measurement must be directly from DC side.

5.03.18 Annunciation Provision:

Annunciation in the power house control room shall also include the following in addition to providing the same in ESP control room.

- a) ESP rectifier faulty
- b) Electric supply to ESP fails
- c) Rapping mechanism trip
- d) Outlet dust emission level high
- e) Under voltage

5.03.19 415 V Motor Control Centre:

- a) 415 V Motor Control Centre (MCC) with one (1) no. Switch Fuse incomer, required number of active and spare outgoing feeders for control of various ESP drives and loads (TR sets) shall be provided for each unit.

Each ESP MCC will be fed from Upstream 415 V PMCC/MCC through cable.

The MCC s shall be indoor, metal clad, floor mounted suitable for location in a clean but hot humid and tropical atmosphere. Sheet steel used for the construction shall be minimum 2mm thick for structural load bearing members, doors, covers and partitions. MCC shall be single front fully draw-out type. The design and construction shall be such as to allow extension at either end. The MCC shall be rated for 50kA for one (1)

second. Degree of protection for MCC shall be IP-54. MCC assembly shall comprise a continuous line up of dead front, freestanding vertical sections, housing the control modules in multi-tier formation. The design shall be fully compartmentalized with metal / insulating partitions between compartments. The working height shall be limited within 400 mm to 1800 mm from floor level. Each control module of MCC shall be housed in a separate compartment, complete with an individual front access door. Each vertical section shall have a removable back cover. All doors and covers shall be provided with neoprene gaskets. The door shall have self-tightening handle / knob so as to prevent ingress of dust. All lamps, switches, push buttons, indicating instruments, relays shall be flush / semi-flush mounted on respective module compartment. MCC shall have start and stop facility for all the drives. 10% spare feeders, minimum one of each type and rating shall be provided.

b) Bus and Bus Taps

- i. The continuous current rating for incomer and bus bar shall be based on total continuous running load plus 20% overall margin.
- ii. The main buses and connections shall be of high conductivity Aluminum / Aluminum alloy, sized for specified current ratings with maximum temperature limited to 90°C (i.e., 40°C rise over 50 °C ambient) for normal operating condition. Vertical bus bars shall be provided for each vertical panel.
- iii. All bus connections shall be silver-plated. Adequate contact pressure shall be ensured by means of two-bolt connection with plain and spring washers and locknuts.
- iv. Bimetallic connector shall be furnished for connection between dissimilar metals.
- v. Busbars and connections shall be fully insulated for working voltage with adequate phase/ground clearances. Insulating sleeves for busbars and shrouds for joints shall be provided.
- vi. Bus insulators shall be flame retardant, track-resistant type with high creepage surface.
- vii. Busbars & connections shall be supported and braced to withstand the stresses due to maximum short circuit current and also to take care of any thermal expansion.
- viii. Busbars shall be colour coded for easy identification and so located that the sequence R-Y-B shall be from left to right, top to bottom or front to rear when viewed from the front of the assembly.
- ix. Vertical neutral bus-bars shall be brought for each panel.
- x. Main bus bar shall run horizontally at the top for easy accessibility.

- xi. "CAUTION LIVE BUS BARS" inscribed label shall be provided on barriers/ covers.
 - xii. Adequately rated copper auxiliary bus bars shall be provided for:
 - Panel & motor space heater
 - AC control supply
 - xiii. Heat shrinkable PVC sleeves having flame retardant property shall be provided on each bus bar.
- c) Control Modules
- i. Control module shall have self-aligning power/control disconnects. All disconnects shall be silver-plated to ensure good contacts.
 - ii. The design shall be such as to permit easy withdrawal/reinsertion of the unit with guide rails to ensure correct alignment.
 - iii. Control Module shall house the control components for a circuit such as switch, fuse, lamps etc.
 - iv. The equipment layout shall provide sufficient working space in between the components and subject to Employer's approval.
 - v. Various module/compartments sizes shall be multiple of one basic unit to facilitate modification at site. Suitable provision for this purpose should also be incorporated in the vertical bus bars.
 - vi. Control modules of same size and type shall be electrically and physically interchangeable.
 - vii. Selection and sizing of starter module shall comply with the requirement of IS 8554 Part- I.
- d) Switches
- i. Switches shall be three pole, air break, AC22A heavy duty for power feeders and AC23A heavy duty for motor feeders. Motor duty switches shall be capable of safely making and breaking the locked rotor current of the motor circuit.
 - ii. The switch shall have a quick-make, quick-break mechanism operated by a suitable external handle, complete with position indicator.
 - iii. This handle shall have provision for padlocking in ON and OFF position.
 - iv. Barriers shall be provided to prevent inter-phase arcing and live terminals shall be shrouded to avoid accidental contact.
 - v. The compartment door shall be interlocked mechanically with the switch such that the door cannot be opened unless the switch is in OFF position. Means shall be provided for releasing this interlock at any time.

- vi. Switches shall be capable of withstanding the let-through fault current of back-up fuses or circuit breakers.
- vii. Outgoing feeders shall be provided with bolted disconnect link for isolation of neutral, if necessary.

e) Fuses

- i. Fuses shall be HRC, preferably link type, with a minimum interrupting capacity equal to the listed Short Circuit Current.
- ii. Fuses shall be furnished complete with fuse bases and fittings of such design as to permit easy and safe replacement of fuse element.
- iii. Visible indication shall be provided on blowing of the fuse.
- iv. Motor fuse characteristics and ratings shall be chosen to ride over starting period without blowing / tripping. The fuse on incoming feeder, if specified, shall be chosen to provide discrimination with motor/feeder fuses.

All fuses shall be per IS/IEC standards

f) A.C. Starter

Contactors

- i. The contactors shall be three pole, air break type designed for duty class III -Category AC3 with non-bouncing silver / silver alloy contacts.
- ii. Each contactor shall be provided with two (2) normally open and two (2) normally closed auxiliary contacts rated 5 A at 240 V A.C.
- iii. Reversing contacts shall be electrically and mechanically interlocked.
- iv. Contactors with delayed dropout feature shall be provided for essential auxiliaries. These contactors shall not dropout on power failure if the voltage is restored within 3 seconds.
- v. 415V motors of rating upto 90 kW shall be contactor operated. Higher ratings shall be ACB operated.

Thermal overload

- i. Thermal overload relay shall be three elements, positive acting, ambient temperature compensated with adjustable settings.
- ii. Single phase preventor shall be provided as an in-built feature of overload relays.

- iii. Relay shall be manual reset type with 1 NO + 1 NC Potential free contact. Resetting of relays shall be possible with compartment door closed.
- iv. Relays may be direct acting or C.T. operated depending upon current rating C.T.s shall be included in the scope of supply.
- v. Thermal bypass contactor or saturable core C.T. shall be provided with overload relays for motors with longer starting time.
- vi. Motor starters shall have type '2' co-ordination according to IEC 947-4.

g) Control and Indication

- i. Push button shall be heavy duty, oil tight, push to actuate type with integral escutcheon plate marked with its function.
- ii. Each push button shall have two (2) normally open and two (2) normally closed contacts rated 5A at 240V A.C.
- iii. One (1) no. stop (Stay Put) push button and one (1) no. test button shall be provided for each motor feeder.
- iv. Lamps shall be LED type with coloured lens. Lens and lamps shall be replaceable from the front.
- v. For control supply bidder shall provide 415/240V control transformer with 100% standby arrangement.

h) Meters & Transducers

- i. Meters shall be provided for all incomers and outgoing feeders. The metering shall cover current, voltage for all the phases.
- ii. Discrete meters (96 x 96 mm) shall be switchboard type, with 240o scale, anti-glare glass and accuracy class of $\pm 2\%$ full scale. Each meter shall have zero adjuster on the front. Motor feeder rated above 30kW shall be provided with ammeter in module door and transducer for remote metering.
- iii. Transducers, with +0.5% accuracy, 4-20mA DC linear output & 750 ohm load shall be provided.

i) Current Transformer

Current Transformer shall be cast resin type rated 15 VA, accuracy class 1.0 for metering and 5P20 for relaying.

j) Voltage Transformer

- i. Voltage transformer shall be cast-resin, draw-out type and shall have an accuracy class of 1.0 and 3P. Voltage transformer mounted on breaker carriage is not acceptable.

- ii. Primary winding of voltage transformer shall be protected by current limiting fuses. The voltage transformer and fuses shall be completely disconnected and visibly grounded in fully draw-out position.
- iii. Secondary winding fuses, sized to prevent overload, shall be installed in all ungrounded secondary leads. Fuses shall be suitably located to permit easy replacement while the PMCC is energized.

k) Secondary Wiring

- i. Panel shall be fully wired at the factory to ensure proper functioning of control, protection, transfer and interlocking schemes.
- ii. Fuse shall be provided to permit individual circuit isolation from bus wires without disturbing other devices shall be wired up to terminal blocks.
- iii. Wiring shall be done with flexible, 1100V grade, PVC insulated switchboard wires with stranded copper conductors of 2.5 mm² for control & current circuits and 1.5 mm² for voltage circuits.
- iv. Each wire shall be identified, at both ends, with permanent marker bearing wire numbers.
- v. Wire terminations shall be made with crimping type connectors with insulating sleeves. Wire shall not be spliced between terminals.

l) Terminal Blocks

- i. Terminal blocks shall be 660V grade box-clamp type with marking strips, similar to ELMEX 10 mm² or equal. Terminals for C.T. secondary leads shall have provision for shorting.
- ii. Not more than two wires shall be connected to any terminal. Spare terminals equal in number to 20% active terminals shall be furnished.
- iii. Terminal blocks shall be located to allow easy access. Wiring shall be so arranged that individual wires of an external cable can be connected to consecutive terminals.

m) Ground Bus

- i. A ground bus, rated to carry maximum fault current, shall be extended full length of the panel.
- ii. The ground bus shall be provided with two-bolt drilling with Cadmium coated bolts and nuts at each end to receive 50 x 6 mm GS flat.
- iii. Each stationary unit shall be connected directly to the ground bus. The frame of each circuit breaker and draw out modules shall be grounded through heavy multiple contacts at all times except when the primary disconnecting devices are separated by a safe distance.

- iv. Wherever the schematic diagrams indicate a definite ground at the switchgear, a single wire for each circuit thus grounded shall be run independently to the ground bus and connected thereto.
 - v. C.T. & V.T. secondary neutrals shall be earthed through removable links so that earth of one circuit may be removed without disturbing others.
- n) Space Heaters
- i. Each vertical section shall be provided with thermostat-controlled space heater.
 - ii. Cubicle heater & Motor heater circuit shall have individual switch fuse units.
- o) Painting
- i. All surfaces shall be sand blasted, pickled and grounded as required to produce a smooth, clean surface free of scale, grease and rust.
 - ii. After cleaning, the surfaces shall be given a phosphate coating followed by two coats of high quality primer and stoved after each coat.
 - iii. The switchgear shall be finished in Siemens gray (RAL 7032) with two coats of Epoxy Paint. However, Owner reserves the right to change the color shade at the time of approval of vendor drawings.
 - iv. Sufficient quantity of touch-up paint shall be furnished for application at site.
- p) Tests
- i. The MCC shall be completely assembled, wired, adjusted and tested at the factory as per the relevant standards of IS/IEC.
 - ii. The following Routine test shall be performed for each MCC panel.
- Routine Test
- The tests shall include but not necessarily be limited to the following:
- Operation under simulated service condition to ensure accuracy of wiring, correctness of control scheme & proper functioning of the equipment.
 - All wiring and current carrying part shall be given appropriate High Voltage Test.

- Primary current & voltage shall be applied to all instrument transformers.
- Routine test shall be carried out on all equipment such as circuit breakers, instrument transformers, relays, meters etc.

MODULE SELECTION

MOTOR FEEDER

Motor Rating	Switch Rating	Contactor	Cable size
0 - 5.5 KW	32A	16A	3/c – 2.5 Sq.mm - Cu
5.6 - 11 KW	63A	32A	3/c - 16 Sq.mm - Al
11.1 - 22 KW	63A	63A	3/c - 35 Sq.mm - Al
22.1 - 50 KW	100A	100A	3/c - 95 Sq.mm - Al
50.1 - 75 KW	200A	160A	3/c - 185 Sq.mm - Al
75.1 - 90 KW	400A	300A	2 x 3/c - 185 Sq.mm - Al

Cable sizes indicated above are minimum. Actual cable sizes shall be decided during detail engineering.

OUTGOING FEEDER

Switch Rating	Cable Size
32A	4/c – 16 Sq.mm - Cu
63A	4/c – 35 Sq.mm - Al
100A	3.1/2 – 95 Sq.mm - Al
200A	3.1/2 – 300 Sq.mm - Al
400A	4 x 1/c – 630 Sq.mm - Al
630A	7 x 1/c – 630 Sq.mm - Al

Cable sizes indicated above are minimum. Actual cable sizes shall be decided during detail engineering.

MODULE SELECTION

Switch Rating	Fuse Rating	Cable Size
16A	16A	2/C-2.5 Sq.mm. cu.
32A	32A	2/C-2.5 Sq.mm. cu.
63A	63A	2 x 2/C-16 Sq.mm - Al
100A	100A	4/C-35 Sq.mm - Al
200A	200A	2 x 4/C-35 Sq.mm - Al
400A	400A	2 x 1/C-630 Sq.mm - Al

Cable sizes indicated above are minimum. Actual cable sizes shall be decided during detail engineering.

5.03.20

Cables:

All Power and Control cables including special cables as required for inter connection of L.T. MCC, control cubicles, auxiliary control panel, Transformer and Rectifier units, heaters and rapping mechanism motors, remote signaling devices, instrumentation cables (screened), etc. of EP system shall be supplied.

a) L.V. Power Cables

1100V grade, 90 Deg.C rating heavy duty, XLPE FRLSH power cable conforming to following requirement and in line with IS-7098, IS: 5831 & IS-8130, IS: 3975.

- | | | |
|-----|----------------|--|
| 1.0 | Conductor | Stranded and compacted plain aluminium conductor of grade H2 and class 2 for cable sizes above 2.5 Sq.mm. and stranded, high conductivity annealed plain copper for cable sizes up to 2.5 Sq.mm. generally conforming to IS: 8130. |
| 2.0 | Insulation | Extruded cross-linked polyethylene (XLPE) conforming to IS: 7098 (Part-1). |
| 3.0 | Inner sheath | Extruded PVC compound conforming to type ST2 of IS: 5831 for multicore cable. Single core cables shall have no inner sheath. |
| 4.0 | Armour | Galvanized single round steel wire/strip armour for twin and multicore cables.

Non-magnetic hard drawn aluminium single round wire conforming to H4 grade of IS: 8130 for single core cables. |
| 5.0 | Overall sheath | Extruded FRLSH PVC compound conforming to type ST2 of IS: 5831 |
| 6.0 | Drum | Conforming to IS: 10418 |

b) Control Cables

1100V grade, 70 Deg.C rating, PVC FRLSH control cable conforming to following requirement and in line with IS: 1554, IS: 8130, IS: 5831 and IS: 3975.

1.0 Conductor	Stranded, non-compacted & circular, high conductivity annealed plain copper, generally conforming to IS: 8130.
2.0 Insulation	Extruded PVC compound conforming to type A of IS: 5831.
3.0 Inner sheath	Extruded PVC compound conforming to type ST1 of IS: 5831 for three core cables. Single core cables shall also have inner sheath with FRLSH properties.
4.0 Armour	Galvanized single round steel wire/strip armour for twin and multi-core cables.
5.0 Overall sheath	Extruded FRLSH PVC compound conforming to type ST1 of IS: 5831
6.0 Drum	Conforming to IS: 10418

- c) LV power cables shall be selected on the basis of current carrying capacity with due consideration to following derating factors, short circuit rating and permissible voltage drop as applicable.
- d) Minimum cable size for LV power cable shall be 16 sq.mm aluminium or 2.5 mm² copper and the same shall be 2.5 sq.mm copper for control cable.

While sizing power cables following aspects shall be reckoned:

- i) Ground / Ambient Air Temperature
- ii) Depth of Laying
- iii) Cables touching each other

Cables for circuit breaker controlled feeders shall withstand the short circuit current for the following fault clearing time:

Incomer & Motor Feeder : 0.2 Secs.

- e) Voltage drop in cables between MCC and individual motor terminal during running shall be limited to 3% at motor full load current while the same during starting shall be limited to 15%.

For load feed from local panels, the total running voltage drop in cable from 415V MCC to local panel and from local panel to individual motor shall be limited to 3% at full load motor current while the same during starting shall be limited to 15%.

Control Cable

Multi-core control cable will generally have spare conductor(s) in accordance with the following chart:

Conductors required	Cables
1 or 2	1-3/C
3 or 4	1-5/C
5 or 6	1-7/C
7 or 8	1-9/C
9 or 10	1-12/C
Above 12	Two or more of above cables.

All control cables shall be of 2.5 mm² copper.

f) Cable identification

Cable identification shall be provided by embossing on every meter on the outer sheath the following:

- i) Manufacturer's name or trademark
- ii) Voltage grade
- iii) Year of manufacture
- iv) Type of insulation and sheath, e.g. HR85 for HR PVC/ FRLS, XLPE/ FRLSH as applicable.
- v) No. of core and size of cables.
- vi) Sequential length marking at an interval of 1m through out the length of the cable.

5.03.22 Earthing:

An adequate earthing system is to be provided with all collecting electrodes and non-current carrying metalwork bonded together and joined to a common earthing conductor from which the connections to the tanks of the transformer rectifiers shall be made. The earthing conductor is to be extended on the outside of the precipitator casing to support level where a suitable terminal point shall be provided to facilitate connection to an earth electrode. The earthing bus bar shall be of aluminum conductor of size 30 X 5 mm and shall run throughout the length of Auxiliary Control Panel. The incoming and outgoing cable entries shall be from the bottom , unless otherwise specified.

Each rectifier equipment is to be provided with an earthing switch, connected to the earthing system, to facilitate the discharge and earthing of all associated high voltage conductors and components. Additionally, portable earthing facilities are to be provided at each and every point where access may be gained to charged metalwork.

Each rectifier equipment is to be provided with an automatic earthing switch, with intermediate position, connected to the earthing system, to facilitate the rapid discharge of the electrode system. The switch is to be of the motorized operated type, with the fail-safe feature that the switch will move to the earth position through emergency power supply, in the event of an electricity supply failure. For all three positions limit switch feed back to be provided. Limit switches supplied would be of heavy duty with IP 67 protection having 2 NO + 2 NC contacts each.

All electrical equipment shall be properly protected and two independent distinct terminals shall be provided for earthing of each equipment. Earthing of electrical equipment shall be done. Electronic type earthing shall be provided for PLC/microprocessor system.

Bidder shall be responsible for supply, laying & connection of earthing conductor / riser with the equipments / items within their scope for efficient grounding from the nearest pre-laid grounding mat / system provided by Employer.

For the selection & provision of grounding conductor & earthing pads / terminals in the equipments / items, grounding conductor sizes shall be as follows:

- | | |
|--|---------------------|
| i) Trestle/Column/Steel Structure | : 50 x 6 mm GS Flat |
| ii) Riser | : 50 x 6 mm GS Flat |
| iii) Exposed Main Grid | : 50 x 6 mm GS Flat |
| iv) 415 V PMCC | : 50 x 6 mm GS Flat |
| v) Cable Tray | : 50 x 6 mm GS Flat |
| vi) 415 V Motors Rated upto 5.5 KW | : 8 SWG GS Wire |
| vii) Above 5.5 KW upto 30 KW | : 25 x 3 mm GS Flat |
| viii) Above 30 KW upto 90 KW | : 35 x 6 mm GS Flat |
| ix) 90 KW and above | : 50 x 6 mm GS Flat |
| x) Push Button Stations, Safety Switches, etc. | : 8 SWG GS Wire. |

5.03.23 Cabling

Supply and installation of cable trays and laying, termination and connection of all power and control cable is to be included. Cabling shall be complete with cable numbering (computerised) tags, core ferrules, indicating termination and destination at ends, cable glands, supports and accessories. Connection between the transformer rectifier units and the discharge system shall be provided by bus bar in ducting.

All material and accessories including cable trays, covers and its supports shall be hot dip galvanized.

Cables shall be laid in pre-fabricated trays of 2 mm thick sheet steel. Cable trays shall be of standard width such as 150mm, 300 mm, 450 mm and 600 mm.

Cable trays shall be laid out horizontally in indoor area whereas the same shall be installed vertically in boiler gallery being laden with coal-dust.

Separate trays shall be provided for L.V power, control and instrumentation cables. Power cables shall be laid touching each other in single layer formation while control and instrumentation cables shall be laid in maximum of two layers. In some cases L.V. power and control cables may run in the same cable tray with 150 mm gap.

5.03.24 Safety Interlocks, Safety sequential interlocks with mechanical key exchange boxes shall be provided to prevent access to interior of precipitator or hoppers unless all transformer rectifier sets are de-energised and grounded.

This should be achieved by key interlock between the rectifier feeder circuit breakers and the door lock of the precipitator hoppers and roof doors.

5.03.25 Local Push Button Stations (LPBS) & Lock out switch :

Local push button stations shall be either fabricated from 16 SWG MS CRCA sheet or FRP material. It shall be of IP – 55 class of protection, suitable for outdoor installation.

5.03.26 Junction boxes :

The junction boxes shall be either fabricated from 16 SWG sheet or FRP material, with suitable no. of elemex terminals. It shall be of IP – 55 class of protection suitable for outdoor installation.

5.03.27 Monorail and Hoist:

Suitable monorail with electrical hoist of adequate capacity for handling TR set and/or 250 litres/hr. oil filter machine from ground level to ESP top shall be provided by the Bidder.

5.03.28 The Bidder shall provide suitable instruments for on line monitoring and recording dust concentration at the outlet of each ESP along with all

accessories. Recorder will be located in ESP control room. Indigenous equipment with proven track record will be preferred.

6.00.00 TESTING & INSPECTION

6.01.00 Materials used shall be of tested quality. Certificates shall be furnished for material of construction of all critical parts. Non-destructive testing like ultrasonic test, radiography, magnetic particle inspection shall be employed wherever applicable as per relevant American or Indian codes.

6.02.00 Inspections will be made by the Purchaser or his authorized representative in stages as per the bar chart specified in clause no. 10.01.18. During each inspection all material test certificates shall be correlated and verified by the Purchaser with the actual material used for construction.

7.00.00 SPECIAL CLEANING, PROTECTION & PAINTING

7.01.00 Internal surfaces of all parts shall be cleaned to remove loose scale, dirt, weld rod stubs and other foreign objects prior to final assembly of the equipment. All openings shall be covered to guard against damage and entrance of foreign object during transportation.

7.02.00 Painting :

All steel surfaces shall have a near white blast cleaning in accordance with Steel Structure Painting Council Specification SP10-63T, and shall then be coated as follows:

7.02.01 Primer :

Two(2)coats to form a final dry film thickness of 2 mils. The primer shall be of reputed manufacturer, either red oxide zinc chromate or epoxy based and heat resistant type.

7.02.02 Finish Coats :

Two(2) or three(3) coats to achieve the desired dry film thickness of 3 mils. The finishing paint shall be of heat resistant type.

8.00.00 PERFORMANCE GUARANTEE CONDITION

The Successful Bidder shall guarantee that each equipment as specified in the scope of supply shall be suitable to meet the performance requirement as below :

- a) The dust concentration at the outlet of Electrostatic Precipitator shall not be more than 100 mg/Nm^3 of flue gas under all operating conditions with one field out in each gas stream. The collection efficiency of the Electrostatic Precipitator offered should hence be designed for the maximum dust concentration and flue gas flow expected by the Bidder for the existing

steam generators under different operating conditions. The Bidder will submit correction curves for changes in efficiency (plus or minus) with changes in flue gas volume (80% to 110% of the maximum flue gas flow expected by the Bidder, at the outlet of air heater), dust concentration (80% to 110% of the maximum dust concentration expected by the Bidder, at outlet of air heater) and any other relevant parameter considered by the Bidder. These figures will be binding during analysis of the performance test data and for final assessment.

- b) Minimum collection efficiency shall be 99.2%.
- b) Unless otherwise specifically agreed to by the Purchaser the design of the ESP shall be such that the velocity of the flue gases through the ESP shall not be more than 0.9 m/sec.

9.00.00 LIQUIDATED DAMAGE FOR NON-FULFILLMENT OF GUARANTEED TECHNICAL PERFORMANCE

9.01.00 In the event of non-fulfillment of the guaranteed technical performance the successful Bidder shall be liable to pay liquidated damages as per the following criteria.

9.01.01 For shortfall of guaranteed dust concentration at the outlet of ESP by 1% or part thereof, the liquidated damage shall be applicable @ 1% (one percent) of the total Contract Price subject to maximum of 5% (five percent) of the Contract Price.

9.01.02 For shortfall of guaranteed collection efficiency by 0.1% or part thereof, the liquidated damage shall be applicable @ 1% (one percent) of the total Contract Price subject to maximum of 5% (five percent) of the Contract Price.

10.00.00 DRAWINGS, DATA & INFORMATION REQUIRED ALONGWITH PROPOSAL

10.01.00 The Bidder shall furnish the followings alongwith the proposal.

10.01.01 G.A. drawings of the Electrostatic Precipitator showing structural frame work, access platforms and stairs, re-routing of ducting between the Air pre-heater and I.D. Fan in Plan and Sections.

10.01.02 Flow diagram showing ash handling system and flue gas flow.

10.01.03 Rating of all motors under the Bidder's scope of supply.

10.01.04 Illustrative pamphlets and literatures of the equipment offered .

10.01.05 List showing the Bidder's experience in design, fabrication and supply of similar equipment .

10.01.06 Exclusion items shall be clearly spelt out.

- 10.01.07 List of data and information to be provided by the Purchaser, if any.
- 10.01.08 Power Requirement for each ESP.
- 11.00.00 DRAWINGS, DATA & INFORMATION REQUIRED FROM SUCCESSFUL BIDDER**
- 11.01.00 The following drawings, documents and data shall be furnished by the successful Bidder in requisite nos. of copies after finalisation of contract for review and approval by Purchaser/Consulting Engineers.
- 11.01.01 Equipment foundation drawing with dead load and operating load data.
- 11.01.02 Detail sectional drawings of equipment showing principal dimensions, material of construction.
- 11.01.03 Certified performance curves of the ESP .
- 11.01.04 Certified motor ratings.
- 11.01.05 Questionnaires duly filled up.
- 11.01.06 Electrical layout for MCC room.
- 11.01.07 Electrical cable tray layout for the entire ESP area including MCC room and the interconnecting trench between MCC room and ESP.
- 11.01.08 Electrical Lighting Layout in ESP area including Control Room, MCC room etc.
- 11.01.09 SLD showing rating of components, metering and protections.
- 11.01.10 Control Schematics.
- 11.01.11 Grounding layout drawing showing above ground connection to equipment, structure, cable tray Indicating risers to be provided by Purchaser at various locations.
- 11.01.12 Lightning protection layout.
- 11.01.13 Power & control cable schedule including interconnection.
- 11.01.14 Heat load for various panels/equipment installed inside the electrical & control room.
- 11.01.15 Material test certificates.
- 11.01.16 Other detail drawings as required.
- 11.01.17 Operation, erection and maintenance manual of the equipment offered .
- 11.01.18 Bar charts showing engineering, manufacturing and despatch of each equipment and material and monthly progress report.

11.01.19 Number of copies of drawings/documents to be submitted by the Successful Bidder are as follows :

- | | |
|---|--------------------------------|
| i) Approval drawings/documents | Four (4) copies. |
| ii) Approved drawings | Six (6) copies. |
| iii) Certified as Final | Six (6)copies + one (1) CD ROM |
| iv) Operation & Maintenance manuals | Six (6) copies. |
| v) Test Certificates/Misc. Documents
for reference | Six (6) copies. |

11.02.00 The drawings/data/documents specified under Cl. No. 9.00.00, shall be duly certified and submitted to the Purchaser/Consultants for approval.

11.03.00 The schedule of submission of the drawings/data/documents specified above shall be as below reckoned from the date of issue of Letter of Intent (LOI) or Purchase Order, whichever is earlier.

11.03.01 All drawings/data specified under Cl. No. 10.01.01 & 10.01.02 shall be furnished within four (4) weeks.

11.03.02 All drawings/data specified under Cl. Nos. 10.01.03 thru' 10.01.04 shall be furnished within six (6) weeks.

11.03.03 All other drawings/data/documents shall be furnished progressively within the period of manufacture and delivery.

12.00.00 COMPLETION SCHEDULE

Commissioning of all the three(3) Electrostatic Precipitators for each of NPM and CPM specified herein shall be sequentially completed within twelve(12) months from the date of issue of Letter of Intent (LOI) or Purchase Order, whichever is earlier as per the following commissioning schedule :

- 1 st Electrostatic Precipitator : By 8 th month
- 2 nd Electrostatic Precipitator : By 10 th month
- 3 rd Electrostatic Precipitator : By 12 th month

TABLE-1

SITE AND MILL SERVICES DATA

A. PHYSICAL & CLIMATOLOGICAL DATA

		<u>Nagaon Paper Mill</u>	<u>Cachar Paper Mill</u>
1.	Location (with Latitude/ Longitude)		
	- Nearest Airport	: Guwahati	Silchar
	- Nearest Railhead	: Jagi Road (NF Railway)	Panchgram (NF Railway)
	- Nearest Port	: Kolkata	Kolkata
2.	Altitude	: 58 M (Above mean sea level)	116 M (Above mean sea level)
3.	Latitude	: 26 °-7' N	24 °-52' N
4.	Longitude	: 92 °-14' E	92 °-36' E
5.	Ambient Air temp.		
	- Maximum	: 41° C	40° C
	- Minimum	: 5.1° C	5.1° C
	- Average	: 26° C	25° C
	- Mean Dry Bulb Temperature	: 27° C	26° C
	- Mean Wet Bulb Temperature	: 20° C	23° C
6.	Relative Humidity		
	- Maximum	: 95 %	90 %
	- Minimum	: 53%	54%
7.	Rainfall		
	- Average (per Year)	: 2770 mm	3000 mm
	- Maximum (per Year)	: 3800 mm	5000 mm
8.	Wind Velocity	Ref. IS 875 – 1987 Part-III	
9.	Earthquake zone (As per IS:1893-1970)	: V	V

* Electrical Equipment shall be designed considering 50°C ambient.

B. UTILITY SERVICES DATA

Nagaon Paper Mill

Cachar Paper Mill

1.	Mill water pressure at ground floor	:	1.5 Kg/cm2 (max.)	1.5 Kg/cm2 (max.)
2.	Mill air pressure	:	4.5 Kg/cm2 (max.)	4.5 Kg/cm2 (max.)
3.	Inst. Air pressure	:	4.5 Kg/cm2 (max.)	4.5 Kg/cm2 (max.)
4.	Process Steam Pressure & Temp.			
	- High Pressure	:	60.0 kg/cm ² g, 400±10°C	
	- Medium Pressure	:	8.0 kg/cm ² g, 220°C to 230°C	
	- Low Pressure	:	2.5 kg/cm ² g, 160°C to 165°C	
5.	Power Supply			
	• Distribution Voltage	:	11kV ±10%, 50 Hz ± 5%, 3 Phase	
	• For Motors			
	Below 0.18KW	:	240 V ±10%,50 Hz ± 5%, Single Phase	
	0.18 KW to 160 KW	:	440 V ±10%, 50 Hz ± 5%, 3 Phase	
	Above 160 KW up to 2500 KW	:	3.3 kV ±10%, 50 Hz ± 5%, 3 Phase	
	• Control Voltage	:	240 V ±10%, 50 Hz ± 5%, Single Phase or 110 V D.C in specific cases	
6.	Voltage variation	:	± 10%	
7.	Frequency variation	:	± 5%	
8.	Combined voltage & frequency variation	:	10%	
9.	Fault Level			
	a) 11 KV System	:	350 MVA Syn. (18.37 KA)	
	b) 3.3 KV System	:	150 MVA Syn. (26.243KA)	
	c) 415 V PCC	:	31 MVA Syn. (43.2KA)	
	d) 415 V MCC	:	26.2 MVA Syn. (37.0 KA)	
10.	No. of Phases & System of Neutral Grounding			
	a) 11 KV & 3.3 KV System	:	3 phase, 3 wire, non-effectively earthed system	
	b) 415V System	:	3 phase, 3 wire, effectively earthed system	
	c) 110V D.C.System	:	Ungrounded system	

PROPOSAL SHEET

1.00.00 The Bidder shall fill in the Technical information and the data sheets required in the following Annexures and submit the same along with his proposal.

Annexure - I	:	Key Information
Annexure - II	:	Guaranteed Data
Annexure - III	:	Technical Particulars
Annexure - IV	:	Progress Schedule
Annexure - V	:	Drawing of Documents Submission Schedule
Annexure - VI	:	List of Recommended Spare Parts
Annexure - VII	:	List of Special Tools & Tackles
Annexure - VIII	:	Deviation from Specification
Annexure - IX	:	Experience List
Annexure - X	:	Questionnaire for Motors
Annexure – XI	:	Questionnaire for 415V MCC
Annexure – XII	:	Questionnaire for Cables
Annexure – XIII	:	Declaration Sheet

The information sought in data sheets enclosed hereinafter in this Section, shall be furnished by the Bidder in the format specified by typing out answers to the questionnaire at the appropriate spaces allotted. These must be properly signed by the authorised representative of the Bidder as verification of the data submitted. These signed pages, in their entirety, shall be returned with and shall be a part of the Bidder's original Proposal. Other copies of the proposal shall contain prints of these sheets duly filled in. Failure to comply with the above requirement may result in rejection of the Proposal.

ANNEXURE-I

KEY INFORMATION

1.00.00	Name of Bidder	
2.00.00	Nationality	
3.00.00	Responsible officer of Bidder, designation, e-mail I.D., telefax and telephone number, postal address.	
4.00.00	Bidder's Proposal Number	
5.00.00	Bidder's Proposal Date	
6.00.00	Validity of offer, counted from the date of opening of Bid	
7.00.00	Price firm ?	
8.00.00	Terms of Payment	
9.00.00	Whether agreeable to liquidated damage (LD) due to deficient performance	Yes / No
	If yes, any ceiling limit of L.D. ?	
10.00.00	Whether agreeable to liquidated damage due to late delivery ?	Yes / No
	If yes, any ceiling limit on L.D. ?	
11.00.00	Furnished base offer strictly as per specification requirement ?	Yes / No
12.00.00	Equipment guarantee period	
13.00.00	Bid guarantee furnished ?	
	If yes, in what form ?	
14.00.00	Guaranteed commissioning period	
15.00.00	Quotation for Recommended Spares Submitted	
16.00.00	Bidder has filled in the data as follows :	
	Annexure - II Guaranteed Data	Yes / No
	Annexure - III Technical Particulars	Yes / No
	Annexure - IV Progress Schedule	Yes / No
	Annexure - V Drawings/Documents Submission	Yes / No

	Schedule	
Annexure - VI	List of Recommended Spare Parts	Yes / No
Annexure - VII	List of Special Tools & Tackle	Yes / No
Annexure -VIII	Deviation from Spec.	Yes / No
Annexure - IX	Experience List	Yes / No
Annexure - X	Questionnaire for Motors	Yes / No
Annexure - XI	Questionnaire for 415V PMCC	Yes / No
Annexure - XII	Questionnaire for Cables	Yes / No
Annexure - XIII	Declaration Sheet	Yes / No
Signature of Bidder's authorised representative		

Date : _____

ANNEXURE-III

TECHNICAL PARTICULARS

<u>Clause No.</u>	<u>Description</u>	<u>Unit</u>	
1.00.00	INLET CONDITIONS :		
1.01.00	Gas Flow Rate	Am ³ /hr.	
1.02.00	Gas temperature	Deg C	
1.03.00	Gas pressure at ESP inlet	mbar	
1.04.00	Gas dew point	Deg C.	
1.05.00	Dust concentration inlet to pre-collector	gm/Am ³	
1.06.00	Dust concentration inlet to ESP	gm/Am ³	
1.07.00	Barometric Pressure	mm Hg	
2.00.00	OUTLET CONDITIONS :		
2.01.00	Dust concentration	mg/Nm ³	
3.00.00	GENERAL :		
3.01.00	Type of ESP		
3.02.00	Model offered		
3.03.00	No. of fields	Nos.	
3.04.00	No. of gas passages	Nos.	
3.05.00	Electrode spacing	mm	
3.06.00	Total projected collection area	M ²	
3.07.00	Specific collection area	M ² /m ³ /sec	
3.08.00	Migration Velocity	cm/sec	
3.09.00	Face area	M ²	
3.10.00	Face velocity	m/sec	
3.11.00	Retention time	Sec	
4.00.00	DIMENSIONS :		
4.01.00	Field width (Total)	m	
4.02.00	Field height	m	
4.03.00	Field length (each)	m	
4.04.00	Aspect Ratio		
5.00.00	PRECIPITATOR CASING :		
5.01.00	Material of construction		
5.02.00	Plate thickness	mm	
5.03.00	Maximum tolerated pressure	mbar	
5.04.00	Maximum tolerated temp. on & duration	°C / min.	
5.05.00	Maximum permissible pressure drop	mbar	

ANNEXURE-III

TECHNICAL PARTICULARS (Cont'd.)

<u>Clause No.</u>	<u>Description</u>	<u>Unit</u>	
5.06.00	No. of access doors		
5.07.00	Dimensions of Access doors	mm x mm	
6.00.00	GAS DISTRIBUTION SCREEN :		
6.01.00	Type		
6.02.00	No.		
7.00.00	DISCHARGE ELECTRODE		
7.01.00	Type		
7.02.00	Material of the electrode		
7.03.00	Height of Electrode (eff.)	mm	
7.04.00	Total no. of Electrodes	No.	
8.00.00	COLLECTING ELECTRODE :		
8.01.00	Material		
8.02.00	Size		
	a) Width	mm	
	b) Thickness	mm	
	c) Height	mm	
	d) No.		
8.03.00	Spacing of collecting electrodes	mm	
9.00.00	RAPPING ARRANGEMENT		
9.01.00	Type		
9.02.00	No. of CE Hammer		
9.03.00	No. of DE Hammer		
9.04.00	No. of GD Hammer		
9.05.00	Rapper Controller – Type		
9.06.00	Rapper Controller – Method of frequency control		
9.07.00	Normal time interval :	min	
	For GD :		
	Between raps (adjustable)		
	For EMITTING :		
	(Repetition time)		
9.08.00	Type		
9.09.00	Material		
	T.R. Sets :		
9.10.00	Type		
	Transformer		
9.11.00	Manufacturer		

ANNEXURE-III

TECHNICAL PARTICULARS (Cont'd.)

<u>Clause No.</u>	<u>Description</u>	<u>Unit</u>	
9.12.00	No. offered per electrical field		
9.13.00	Mounting type		
9.14.00	Input voltage	V	
9.15.00	Output voltage (peak)	kV	
9.16.00	Output current	mA	
9.17.00	Rectification (wave form of output voltage)		
9.18.00	T/R controller per electrical field		
10.00.00	DUST HOPPERS :		
10.01.00	Type		
10.02.00	No. per ESP		
10.03.00	Plate thickness	mm	
10.04.00	Valley Angle (approx.)	Deg	
10.05.00	No. of access doors per ESP		
10.06.00	Access door dimension	mm	
10.07.00	Hopper volume (total)		
11.00.00	DUST CONVEYING SYSTEM :		
11.01.00	No. of Conveyor		
11.02.00	Capacity of Conveyor	M3/hr.	
11.03.00	Type		
11.04.00	No. of Rotary Airlock Valve		
11.05.00	Capacity of Rotary Airlock Valve	M3/hr	
11.06.00	Drive		
11.07.00	Motor Rating of Conveyor	kW/rpm	
11.08.00	Motor Rating of Rotary Airlock Valve	kW/rpm	
11.09.00	Size & length of Conveyor	mm x mm	
11.04.00	Size of RAL		
12.00.00	MISCELLANEOUS		
12.01.00	Total weight of equipment without dust (approx.)	M1	
12.02.00	Total area of equipment to be heat insulated (approx.)	M2	
12.03.00	Power Consumption (continuous)	kW	
12.04.00	Proposal Standard for conducting the performance tests		

ANNEXURE-IV

PROGRESS SCHEDULE

The Bidder shall indicate the time required for different phases of work in the fashion below. Time shall be mentioned in weeks taking the date of issue of Letter of Intent as datum.

<u>Sl.No.</u>	<u>Description</u>	<u>Time in weeks from the date of issue of L.O.I.</u>
1.	Start submission of dwg. / data as specified for approval	
2.	Complete submission of dwgs./ data as specified for approval	
3.	Start manufacture	
4.	Start issuing purchase orders for bought out items	
5.	Complete issuing purchase orders for bought out items	
6.	Complete manufacture	
7.	Start testing at manufacturer's works	
8.	Complete testing at manufacturer's works	
9.	Start shipment	
10.	Complete shipment	
11.	Start Erection	
12.	Complete Erection	
13.	Start final check up testing & commissioning	
14.	Complete final check up testing & commissioning	

ANNEXURE-V

DRAWINGS / DOCUMENTS SUBMISSION SCHEDULE

<u>Sl.No.</u>	<u>Drawing / Document</u>	Submission for Approval, <u>days after issue of LOI</u>
----------------------	----------------------------------	--

ANNEXURE-VI

LIST OF RECOMMENDED SPARE PARTS

The Bidder shall tabulate in the proforma below list of spare parts recommended by him for two (2) years operation, itemised price of which has been indicated separately in the Price Schedule. Additional sheets may be used, if necessary :

Sl.No.	Description	Qty. Offered
--------	-------------	--------------

Note : The Bidder must indicate the guaranteed life of each spare offered.

ANNEXURE-VII

LIST OF SPECIAL TOOLS AND TACKLE

The Bidder shall tabulate below itemised list of all special tools and tackle for operation, maintenance and replacement of equipment and component supplied under the specification, and whose total cost has been indicated separately in the Price Schedule. All tools and tackle supplied shall be complete with required container and boxes. Additional sheets may be used.

ANNEXURE-VIII

DEVIATION FROM SPECIFICATION

If the proposal submitted has got any technical deviation from the stipulation in the Bid Documents, the Bidder shall tabulate below the full particulars of these deviations and shall sign below. Additional sheets may be added as necessary. Without filled up deviation sheet(s), the offer may not be considered.

ANNEXURE-IX

EXPERIENCE LIST

The Bidder shall tabulate below a list of his experience for manufacture, supply, erection, testing and commissioning of similar plant and equipment mentioning the names of the customers and their addresses. The list shall also include the capacity and sizes of the equipment supplied. Additional sheets may be used, if required.

ANNEXURE-X

QUESTIONNAIRE FOR MOTORS

(Individual Sheet shall be filled up for each Frame Size)

1.0 GENERAL

1.1 Application

1.2 Quantity

1.3 Make

1.4 Frame Size

1.5 Applicable Standard

2.0 TYPE AND RATING

2.1 Type of Motor

2.2 Service

2.3 Duty Cycle/Designation / Mounting

2.4 Rated Continuous Output

At 45°C ambient kW

At 45°C design ambient temp. kW

2.5 Rated Speed r.p.m.

2.6 Rated Voltage & % Variation 415 ± 10%

2.7 Rated Frequency & % Variation 50Hz ± 5%
For Pump design 48

2.8 Full load current Amps.

2.9 No load current Amps.

2.10 Rated Power Factor at

- a) Full load
- b) 3/4 load
- c) 1/2 load
- d) During Starting

ANNEXURE-X

QUESTIONNAIRE FOR MOTORS (Cont'd.)

2.11 Efficiency at rated voltage and frequency

- a) Full load %
- b) 3/4 load %
- c) 1/2 load %

3.0 PERFORMANCE

3.1 Method of Starting Direct On Line
through vacuum
contactors

3.2 Starting Current at rated voltage % f.l.c.

3.3 Starting Torque at rated voltage % f.l.c.

3.4 Duty Cycle/Designation / Mounting **80% Voltage** **100% Voltage**

- a) With load sec.
- b) Without load (driven equipment coupled) sec.

3.5 Safe stall time at 110% rated voltage

- a) Hot condition sec.
- b) Cold condition sec.

4.0 CONSTRUCTION

4.1 Degree of Protection of Enclosure

4.2 Method of Cooling

4.3 Insulation Class

4.4 Temperature Rise Over 50°C design ambient temperature (by resistance)

4.5 Tropicalised Yes / No

4.6 Winding Connection

ANNEXURE-X

QUESTIONNAIRE FOR MOTORS (Cont'd.)

4.7	Bearings	<u>D.F.</u>	<u>N.D.F.</u>
	a) Make		
	b) Type		
	c) Recommended lubricant		
4.8	Motor Terminal Box		
	a) Type		
	b) Fault withstand		
	i) Current	KA	
	ii) Time	sec.	
	c) Cable lugs & glands furnished	Yes/No	
5.0	ACCESSORIES		
5.1	Space Heaters		
	a) No. x Watt		
	b) Volt / phase / frequency		
5.2	Bearing temperature detectors(BTDs)		
	a) Nos.		
5.3	Accessory Terminal Box		
	a) No. provided		
	b) Cable glands furnished		
	Yes/No		
6.0	GROUNDING		
6.1	No. of grounding pads provided		
	a) On motor body		
	b) On terminal box		

ANNEXURE-X

QUESTIONNAIRE FOR MOTORS (Cont'd.)

7.0 MISCELLANEOUS

7.1 Type of mounting

7.2 Overall dimension
(L x B x H) mm x mm x mm

7.3 Moment of Inertia (GD^2)
a) Rotor Kg.m²

7.4 Weight
a) Stator Kg.
b) Rotor Kg.
c) Total Kg.

**NOTE : BIDDER IS ADVISED TO TAKE COPIES OF THIS SHEET
TO FILL UP AGAINST EACH FRAME SIZE.**

ANNEXURE-XI

QUESTIONNAIRE FOR 415 V MCC

	415V MCC ASSEMBLY :	
1.1	Make	
1.2	Type	
1.3	Reference Standard	
1.4	Voltage (Nom./Max.)	KV
1.5	Phase, Frequency	No., Hz
1.6	Short Circuit Rating :	
	a) Interrupting Symmetrical	MVA
	b) Short-time for 3 Sec.	KA rms
1.7	Insulation Level :	
	a) Impulse Withstand	KV _p
	b) 1-min. 50 Hz. Voltage	
	Withstand	
1.8	Metal-clad construction?	Yes / No
1.9	Degree of Protection	
1.10	Minimum thickness of sheet metal used	mm
1.11	Switchgear completely assembled, wired and tested at factory	Yes/No
2.0	CONSTRUCTION :	
2.1	Draw-out feature provided for :	
	a) Voltage Transformer	Yes/No
2.2	All meters, switch & relays flush mounted type.	Yes/No
2.3	Typical vertical section :	
	a) Overall dimension and weight:	
	i) Incomer	
	ii) Transformer feeder	
3.0	BUS BAR :	
3.1	Make	
3.2	Material & Grade	
3.3	Reference, Standard	
3.4	Cross sectional Area	mm ²
	Size	mm x mm
3.5	Continuous Current (at site condition, 50°C ambient and within cubicle)	°C

ANNEXURE-XI

QUESTIONNAIRE FOR 415 V MCC (Cont'd.)

3.6	Maximum temperature rise over 50°C	°C
3.7	Short-time current for 3 Sec.	KA rms
3.8	DC resistance at 90°C	Ohm/m/ph
3.9	Skin-effect ratio	
3.10	Reactance	Ohm/m/ph
3.11	Losses-middle Phase:	W/m/ph
3.12	Minimum clearance of bare bus bar and connection :	
	a) Phase to phase	mm
	b) Phase to ground	mm
3.13	Bus bar provided with :	
	a) Insulating sleeve	
	b) Phase barriers	
	c) Cast resin shrouds for joint	
3.14	Bus connections :	
	a) Silver Plated	
	b) Made with antioxidant grease	
3.15	Bus bar support spacing	mm
3.16	Bus support insulator :	
	a) Make	
	b) Type	
	c) Reference Standard	
	d) Voltage Class	kV
	e) Minimum creepage distance	mm
	f) Cantilever strength	Kg/cm ²
	g) Net weight	Kg.
4	CONTROL & INDICATIONS	
4.1	Push Buttons	
	a) Make	
	b) Type & Cat. No.	
	c) Contact rating at :	
	i) Make & Continuous	Amp
	ii) Break (Inductive)	Amp
	PF for A.C. & L/R for D.C.	

ANNEXURE-XI

QUESTIONNAIRE FOR 415 V MCC (Cont'd.)

4.2	Lamps :	
	a) Make	
	b) Type & Cat. No.	
	c) Watts / Voltage	
	d) Series resistance	
	e) Lamp & Lens replaceable from front.	
4.3	Selector Switch :	
	a) Make	
	b) Type & Cat. No.	
	c) Contact rating at :	
	i) Make & continuous	Amps
	ii) Break (Inductive)	Amps
	d) Key interlock furnished ?	
5	CURRENT TRANSFORMER :	
5.1	Make	
5.2	Type	
5.3	Reference Standard	
5.4	CT ratios as per drawings ?	
5.5	Rated frequency	
5.6	Short Circuit Withstand	
	a) Short-time current for 3 sec.	KA rms
	b) Dynamic current	KA peak
5.7	Class of Insulation	
5.8	Temp. rise over 50°C ambient	°C

ANNEXURE-XI

QUESTIONNAIRE FOR 415 V MCC (Cont'd.)

5.9	Basic Insulation level	KV peak
5.10	CT magnetisation curve furnished	
5.11	Metering C.T. :	
	a) Incomer	
	b) Transformer feeder	
6	VOLTAGE TRANSFORMER :	
6.1	Make	
6.2	Type	
6.3	Reference Standard	
6.4	Voltage ratio	
6.5	Rated frequency	
6.6	Accuracy Class	
6.7	VA burden	
6.8	Over voltage factor :	
	a) Continuous	
	b) 30 seconds	
6.9	Class of Insulation	
6.10	Temp. rise over 50°C ambient	°C
6.11	Basic Impulse level	KVP peak
6.12	Winding Connection :	
	a) Primary	
	b) Secondary	
6.13	Fuses :	
	a) Continuous ratings - H.V / L.V.	Amps
	b) Symmetrical fault rating - H.V/ L.V.	KA rms
	1 - Pole	
	f) Auxiliary relay 110V D.C.	%
	self reset with	
	4 pair of contact	
	8 pair of contact	

ANNEXURE-XI

QUESTIONNAIRE FOR 415 V MCC (Cont'd.)

	g) Locked out relay 110V D.C. with	
	electrical reset :	
	4 NO + 4 NC Contact	
	8 NO + 8 NC Contact	
7	METERS :	
7.1	Make	
7.2	Type	
7.3	Reference Standard	
7.4	Size	
7.5	Scale	
7.6	Accuracy class	
7.7	Meter Switch :	
	a) Make	
	b) Type	
	c) Cat. No.	
8	SECONDARY WIRING :	
8.1	Type and Insulation	
8.2	Voltage grade	
8.3	Conductor material	
8.4	Conductor size (minimum) :	
	a) Potential circuit	
	b) Control & current circuit	
8.5	Wires identified at both ends with markets	
9	TERMINAL BLOCK :	
9.1	Make	
9.2	Type	
9.3	Cat. No.	
9.4	20% spare terminals furnished	
10	CABLE TERMINATION :	
10.1	Cable termination & connection arrangement furnished as specified	
10.2	Cable termination Kit furnish :	
	a) Make	
	b) Type	
	c) Complete with all accessories	

ANNEXURE-XI

QUESTIONNAIRE FOR 415 V MCC (Cont'd.)

10.3	Cable Lugs :	
	a) Type	
	b) Material	
10.4	Cable Gland :	
	a) Type	
	b) Material	
	c) With tapered washer	
	d) With armour clamp	
10.5	Removable Gland Plate :	
	a) Material for multi-core cable	
	b) Material for single-core cable	
11	GROUND BUS :	
11.1	Ground bus furnished	
11.2	Material	
11.3	Size	
12	NAME PLATE :	
12.1	Material	
12.2	Thickness	
12.3	Size for	mm
	a) Panel	
	b) Equipment / devices	
13	SPACE HEATER/PLUG SOCKET :	
13.1	Cubicle Heater :	
	a) Thermostat controlled ?	
	b) Wattage	
	c) Voltage	
13.2	Plug Socket :	
	a) Type	
	b) Rating	
13.3	Cubicle heater, motor heater & plug socket circuit provided with individual switch fuse unit ?	
14	A.C. / D. C. SUPPLY :	
14.1	Isolating switches fuse unit for incoming supply :-	
	a) A.C. - type & rating	
	b) D.C. - type & rating	

ANNEXURE-XI

QUESTIONNAIRE FOR 415 V MCC (Cont'd.)

15	TROPICAL PROTECTION :	
15.1	a) Any special treatment for tropical protection ?	
	b) Screens are of corrosion resistant materials ?	
16	PAINTING :	
16.1	Finish of switchgear :	
	a) Inside	
	b) Outside	Matt/Glossy
17	NO. OF ACCESSORIES FURNISHED :	
	a) Slow closing device for maintenance	
	b) Test cabinet	
18	TEST :	
18.1	Routine tests to be performed on MCC	
	a)	
	b)	
	c)	
	d)	

ANNEXURE-XII

QUESTIONNAIRE FOR CABLES

Bidder shall fill up sheets of this format for each type of cable, i.e, H. V., L.V. Cable, Control Cable, instrumentation Cable, flexible trailing, optical fibre cable etc. Bidder shall also fill in the technical particulars separately for each type and size of cables.

- | | | |
|-----|--|-------------------|
| 1.0 | Make | : |
| 2.0 | Type | : |
| 3.0 | Applicable Standard | : |
| 4.0 | Voltage Grade | : |
| 5.0 | Suitable for System with | |
| | a) Service Voltage | : |
| | b) Neutral | : |
| 6.0 | Maximum Conductor Temperature | |
| | a) Continuous | °C : |
| | b) Short Time | °C : |
| 7.0 | Conductor : | |
| | a) Material, grade & class | : |
| | b) Size | mm ² : |
| | c) No. & diameter of wire
in each conductor | No./mm : |
| 8.0 | Shielding on Conductor : | |
| | a) Material | : |
| | b) Type | : |
| | c) Thickness | mm : |
| 9.0 | Insulation | |
| | a) Material | : |

ANNEXURE-XII

QUESTIONNAIRE FOR CABLES (Cont'd.)

- | | | | |
|------|-------------------------|--|-------------|
| | b) | Type | : |
| | c) | Thickness | mm |
| 10.0 | Shielding on Insulation | | |
| | a) | Material | : |
| | b) | Type | : |
| | c) | Thickness | mm : |
| 11.0 | Inner Sheath | | |
| | a) | Material | : |
| | b) | Type | : |
| | c) | Thickness | mm : |
| | d) | Extruded ? | Yes/No : |
| | e) | Calculated dia. over laid up core | mm : |
| | f) | Approx. Outside dia over sheath | mm : |
| 12.0 | Armouring | | |
| | a) | Material | : |
| | b) | Type & applicable standard | : |
| | c) | Calculated dia. over inner sheath (under armour) | mm : |
| | d) | Size | No x dia. : |
| | e) | D.C. Resistance at 20 Dec.C. | Ohm/Km : |
| 13.0 | Overall Sheath | | |
| | a) | Material | : |
| | b) | Type | : |

ANNEXURE-XIII

DECLARATION SHEET

I,
certify that all the above typed in data and
information pertaining to this specification
are correct and is a true representation of
the equipment and services covered by
our formal proposal No.
.....
dated

I hereby certify that I am duly authorised
representative of the Bidder whose name
appears above my signature.

Bidder's Name

.....

Authorised Representative's
Name (Typed)

.....

Manufacturer's Intent

The manufacturer hereby agrees to fully
comply with the requirements and intent
of this specification for the price indicated.

Authorised Representative's
Signature

.....

PART - 5

ABSTRACT OF PRICES

PART - 5
ABSTRACT OF PRICES
I N D E X

Section	<u>Description</u>	<u>No. of Sheets</u>
A1	Price Schedule for Supply of Equipment & Spare Parts and Services -Process & Mechanical (Indegenous Part)	2
A2	Price Schedule for Supply of Equipment & Spare Parts and Services -Electrical (Indegenous Part)	2
A3	Price Schedule for Supply of Equipment & Spare Parts and Services -Instrumentation (Indegenous Part)	2
A4	Itemized Price Schedule for Supply of Spare Parts for two(2) years of operation (Indegenous Part) - Process & Mechanical - Electrical - Instrumentation	3
B1	Price Schedule for Supply of Equipment & Spare Parts and Services -Process & Mechanical (Imported Part)	1
B2	Price Schedule for Supply of Equipment & Spare Parts and Services -Electrical (Imported Part)	2
B3	Price Schedule for Supply of Equipment & Spare Parts and Services -Instrumentation (Imported Part)	3
B4	Itemized Price Schedule for Supply of Spare Parts for two(2) years of operation (Imported Part) - Process & Mechanical - Electrical - Instrumentation	3
C1	Lump sum Price for De-mobilising & Re-mobilising of Personnel (Indegeneous Part)	1
C2	Lump sum Price for De-mobilising & Re-mobilising of Personnel (Imported Part)	1

SPECIAL NOTE

BIDDER MUST FILL IN PROPERLY EACH OF THE REQUIRED DATA IN THE FOLLOWING SECTIONS AND SHALL ENCLOSE THESE FILLED IN SHEETS WITH HIS ORIGINAL PROPOSAL . OTHER COPIES OF THE PROPOSAL SHALL CONTAIN PRINTS OF THESE SHEETS DULY FILLED IN . FAILURE TO COMPLY WITH THE ABOVE REQUIREMENTS MAY RESULT IN REJECTION OF THE PROPOSAL.

PRICE SCHEDULE
Indigenous Part

SECTION – A1
Price Schedule for Supply of Equipment & Spare Parts and Services

(Process & Mechanical – Ref. Volume II)

HPC's Bid Inquiry Ref. No. ENQ/NC-09/000/08-09/57/MTUP/ESP/02
– 31.03.2009

Name of Bidder :

Offer No. & Date :

Plant/ Item :

Sl. No.	Description	Price , Indian Rs.	
		For NPM	For CPM
A. PLANT & EQUIPMENT			
1.	Quoted Price (F.O.R./ F.O.T Station of Dispatch)		
a)	Equipment/ System including commissioning spares, special tools & tackles (Price break-up is to be furnished as per Section A3)		
b)	Spare parts for two(2) years of operation (Itemized prices to be furnished separately as per Section A4)		
2.	Equipment/ System + Spare Parts (1a + 1b)		
3.	Incidence of Excise Duty : - Rate (%) - Amount		
4.	Incidence of Central Sales Tax against Form ‘C’ : - Rate (%) - Amount		
5.	Inland transportation charges from Station/ Centre of Dispatch up to Destination (Jagi Road, NF Railway for NPM, and Panchgram, NF Railway for CPM)		

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SECTION A1 (Cont'd)

Sl. No.	Description	Price , Indian Rs.	
		For NPM	For CPM
6.	Insurance Charges (transit up to site, and until storage at site till erection & commissioning)		
7.	Any other miscellaneous / Incidental costs/ charges (Please specify)		
8.	Total Price of Plant & Equipment and Spare Parts – Process & Mechanical (Sl. No. 2 + 3 + 4 + 5 + 6 + 7)		

Total Amount (as per A-8) for NPM & CPM (in Words) : Rupees.....

B. SERVICES		For NPM	For CPM
1.	Design & Engineering (incl. submission of all deliverables)		
2.	Erection, Testing, Start up & Commissioning, fulfillment of guaranteed performance obligation including training of operation and maintenance staff		
3.	Sub-total (1+2)		
4.	Taxes & Cess, as applicable on Sl. No. B3 above		
	i) Service Tax @%		
	ii) Any other Tax @.....%		
	iii) Cess @.....%		
5.	Sub-Total (4 - i + ii + iii)		
6.	Total Price (L.S) for the Services (3 + 5) - Process & Mechanical		

Total amount as per (B-6) for NPM & CPM (in Words) : Rupees.....

PRICE SCHEDULE
Indigenous Part

SECTION – A2
Price Schedule for Supply of Equipment & Spare Parts and Services
(Electrical – Ref. Volume II)

HPC's Bid Inquiry Ref.No. ENQ/NC-09/000/08-09/57/MTUP/ESP/02
– 31.03.2009

Name of Bidder :

Offer No. & Date :

Plant/ Item :

Sl. No.		Description	Price , Indian Rs.	
			For NPM	For CPM
A. PLANT & EQUIPMENT				
1.	Quoted Price (F.O.R./ F.O.T Station of Dispatch)			
a)	Electrical Equipment/ System including commissioning spares, special tools & tackles (Price Break up is to be furnished as per Section A3)			
b)	Spare parts for (for items as per 1a) for two(2) years of operation (Itemized prices to be furnished separately as per Section A4)			
c)	Sub-total - Electrical Equipment/ System + Spare Parts (1a + 1b)			
d)	Instrumentation & Control Systems including Commissioning Spares, Special Tools & Tackles (Price Break up is to be furnished as per Section A3)			
e)	Spare Parts (for items as per 1d) for two(2) years of operation (itemized prices to be furnished separately as per Section A4)			
f)	Sub-total - Instrumentation & Control system + Spare Parts (1d + 1e)			
2.	Total of Electrical equipment / system + Instrumentation & Control system + spare parts (1c + 1f)			

SECTION A2 (Cont'd)

Sl. No.	Description	Price , Indian Rs.	
		For NPM	For CPM
3.	Incidence of Excise Duty : - Rate (%) - Amount		
4.	Incidence of Sales Tax against Form 'C' : - Rate (%) - Amount		
5.	Inland transportation Charges from Station/ Centre of Dispatch up to Destination (Jagi Road, NF Railway for NPM, and Panchgram, NF Railway for CPM)		
6.	Insurance charges (transit up to site, storage at site and until erection & commissioning)		
7.	Any other miscellaneous / incidental costs/ charges (Please specify)		
8.	Total Price of Plant & Equipment and Spare Parts – Electrical & Instrumentation (Sl. No. 2 + 3 + 4 + 5 + 6 + 7)		
Total Amount (as per A-8) for NPM & CPM (in Words) :			
B. SERVICES		For NPM	For CPM
1.	Design & Engineering (incl. submission of all deliverables)		
2.	Erection, Testing, Start up & Commissioning, fulfillment of guaranteed performance obligation including training of operation and maintenance staff		
3.	Sub-total (1+2)		
4.	Taxes & Cess, as applicable on Sl. No. 3 above		
i)	Service Tax @%		
ii)	Any other Tax @.....%		
iii)	Cess @.....%		
5.	Sub-Total (4 - i + ii + iii)		
6.	Total Price (L.S) for the Services (3 + 5)		
Total amount (as per B-6) for NPM & CPM (in Words) : Rupees.....			

PRICE SCHEDULE
Indigenous Part
SECTION – A3
Price Break up Data
(Process & Mechanical – Ref. Volume II)

HPC's Bid Inquiry Ref.No. ENQ/NC-09/000/08-09/57/MTUP/ESP/02
– 31.03.2009

Name of Bidder :

Offer No. & Date :

Plant/ Item :

Sl. No.	Equipment/ Item Description	Price (F.O.R/ F.O.T), Indian Rs.	
		For NPM	For CPM
1.	Design Engineering Services (L.S.)		
2.	Electrostatic Precipitator complete with main casing, gas distributor screen, collecting electrodes, hoppers, structural steel support, staircase, platforms. etc.		
3.	RAIs & Slide Gates		
4.	Plate & Electrode rapping mechanism system		
5.	Insulation & Cladding		
6.	Ash disposal system including auxiliaries for hooking up with existing ash handling system		
7.	Painting		
8.	Any other items not included above but required for complete scope of work as per Volume II		
9.	Erection, Testing & Commissioning Services (L.S.)		

PRICE SCHEDULE
Indigenous Part

SECTION – A3 (Cont'd)
Price Break up Data
(Electrical – Ref. Volume II)

HPC's Bid Inquiry Ref.No ENQ/NC-09/000/08-09/57/MTUP/ESP/02
– 31.03.2009

Name of Bidder :

Offer No. & Date :

Plant/ Item :

Sl. No.	Equipment/ Item Description	Price (F.O.R/ F.O.T), Indian Rs.	
		For NPM	For CPM
1.	Design Engineering Services (L.S.)		
2.	Transformer-Rectifier Set complete with field control panels		
3.	Auxiliary Control Panel		
4.	MCC with incomer, Line P.T.,etc.		
5.	Local Push Button Stations, Switches, Lock out Switches for transformer, etc.		
6.	Power & Control Cables		
7.	Cable Raceway including Cable Tray System and materials for Grounding & Lightning Protection System		
8.	Materials for Illumination System		
9.	Any other items not included above but required for complete scope of work as per Volume II		
10.	Erection, Testing & Commissioning Services (L.S.)		

PRICE SCHEDULE

Indigenous Part

SECTION – A3 (Cont'd)

**Price Break up Data
(Instrumentation– Ref. Volume II)**

HPC's Bid Inquiry Ref.No. ENQ/NC-09/000/08-09/57/MTUP/ESP/02
– 31.03.2009

Name of Bidder :

Offer No. & Date :

Plant/ Item :

Sl. No.	Equipment/ Item Description	Price (F.O.R/ F.O.T), Indian Rs.	
		For NPM	For CPM
1.	Design Engineering Services (L.S.)		
2.	Field Instruments		
3.	Instrument Cables and Erection Hardwares		
4.	Any other items not included above but required for complete scope of work as per Volume II		
5.	Erection, Testing & Commissioning Services (L.S.)		

PRICE SCHEDULE
Indigenous Part

SECTION – A4
Itemized Price Schedule for Supply of
Spare Parts for two(2) years of operation
(Process & Mechanical – Ref. Volume II)

HPC's Bid Inquiry Ref. :No. ENQ/NC-09/000/08-09/57/MTUP/ESP/02
– 31.03.2009

Name of Bidder :

Offer No. & Date :

Plant/ Item :

Sl. No.	Eqpt./ Item Description	Qty, No. off		Unit Price, Indian Rs. (F.O.R./ F.O.T. Station of Dispatch)	
		For NPM	For CPM	For NPM	For CPM
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					

(Use additional sheets, if required)

PRICE SCHEDULE
Indigenous Part

SECTION – A4
Itemized Price Schedule for Supply of
Spare Parts for two(2) years of operation
(Electrical – Ref. Volume II)

HPC's Bid Inquiry Ref. No. ENQ/NC-09/000/08-09/57/MTUP/ESP/02
– 31.03.2009

Name of Bidder :

Offer No. & Date :

Plant/ Item :

Sl. No.	Eqpt./ Item Description	Qty, No. off		Unit Price, Indian Rs. (F.O.R./ F.O.T. Station of Dispatch)	
		For NPM	For CPM	For NPM	For CPM
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					

(Use additional sheets, if required)

PRICE SCHEDULE
Indigenous Part

SECTION – A4
Itemized Price Schedule for Supply of
Spare Parts for two(2) years of operation
(Instrumentation – Ref. Volume II)

HPC's Bid Inquiry Ref.No. ENQ/NC-09/000/08-09/57/MTUP/ESP/02
– 31.03.2009

Name of Bidder :

Offer No. & Date :

Plant/ Item :

Sl. No.	Eqpt./ Item Description	Qty, No. off		Unit Price, Indian Rs. (F.O.R./ F.O.T. Station of Dispatch)	
		For NPM	For CPM	For NPM	For CPM
1.					
2.					
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(Use additional sheets, if required)

PRICE SCHEDULE

Imported Part

SECTION – B1

**Price Schedule for Supply of Equipment & Spare Parts and Services
(Process & Mechanical – Ref. Volume II)**

HPC's Bid Inquiry Ref. No. ENQ/NC-09/000/08-09/57/MTUP/ESP/02
– 31.03.2009

Name of Bidder :

Offer No. & Date :

Plant/ Item :

Sl. No.	Description	Price (Currency to be specified)	
		For NPM	For CPM
A. PLANT & EQUIPMENT			
1.	Quoted Price (F.O.B./C&F Port of Kolkata)		
a)	Equipment/ System including commissioning spares, special tools & tackles.		
b)	Spare parts for two(2) years of operation (Itemized prices to be furnished separately as per Section B5)		
2.	Total Price of Equipment/ System + Spare Parts (1a + 1b)		
Total Amount (as per A-2) for NPM & CPM (in Words) :			
B. SERVICES		For NPM	For CPM
1.	Design & Engineering (incl. submission of all deliverables)		
2.	Erection, Testing, Start up & Commissioning, fulfillment of guaranteed performance obligation including training of operation and maintenance staff		
3.	Total Price of Services (1+2)		
Total amount (as per B-3) for NPM & CPM (in Words) :			

PRICE SCHEDULE

Imported Part

SECTION – B2

**Price Schedule for Supply of Equipment & Spare Parts and Services
(Electrical & Instrumentation – Ref. Volume II)**

HPC's Bid Inquiry Ref. No. ENQ/NC-09/000/08-09/57/MTUP/ESP/02
– 31.03.2009

Name of Bidder :

Offer No. & Date :

Plant/ Item :

Sl. No.		Description	Price (Currency to be specified)	
			For NPM	For CPM
A. PLANT & EQUIPMENT				
1.	Quoted Price (F.O.B./C&F Port of Kolkata)			
a)	Electrical Equipment/ System including commissioning spares, special tools & tackles (Price Break up is to be furnished as per Section B3).			
b)	Spare parts for (for items as per 1a) for two(2) years of operation (Itemized prices to be furnished separately as per Section B4)			
c)	Electrical Equipment/ System + Spare Parts (1a + 1b)			
d)	Instrumentation & Control Systems including Commissioning Spares, Special Tools & Tackles (Price Break up is to be furnished as per Section B3)			
e)	Spare Parts (for items as per 1d) for two(2) years of operation (itemized prices to be furnished separately as per Section B4)			
f)	Instrumentation & Control system + Spare Parts (1d + 1e)			
2.	Total Price of Plant & Equipment and Spare Parts – Electrical & Instrumentation (1c + 1f)			
Total Price (as per A-2) for NPM & CPM (in Words) :				

SECTION B2 (Cont'd)

B. SERVICES		For NPM	For CPM
1.	Design & Engineering (incl. submission of all deliverables)		
2.	Erection, Testing, Start up & Commissioning, fulfillment of guaranteed performance obligation including training of operation and maintenance staff		
3.	Total Price of Services (1+2)		
Total amount (as per B-3) for NPM & CPM (in Words)			

PRICE SCHEDULE
Imported Part
SECTION – B3
Price Break up Data
(Process & Mechanical – Ref. Volume II)

HPC's Bid Inquiry Ref. ENQ/NC-09/000/08-09/57/MTUP/ESP/02
– 31.03.2009

Name of Bidder :

Offer No. & Date :

Plant/ Item :

Sl. No.	Equipment/ Item Description	Price (F.O.B./C&F, Port of Kolkata) (Currency to be specified)	
		For NPM	For CPM
1.	Design Engineering Services (L.S.)		
2.	Electrostatic Precipitator complete with main casing, gas distributor screen, collecting electrodes, hoppers, structural steel support, staircase, platforms. etc.		
3.	RAIs & Slide Gates		
4.	Plate & Electrode rapping mechanism system		
5.	Insulation & Cladding		
6.	Ash disposal system including auxiliaries for hooking up with existing ash handling system		
7.	Painting		
8.	Any other items not included above but required for complete scope of work as per Volume II		
9.	Charges for supervision of Erection, Testing & Commissioning (Optional) - Categorywise estimated Man-days - Categorywise per diem Rates		

PRICE SCHEDULE
Imported Part
SECTION – B3 (Cont'd)
Price Break up Data
(Electrical – Ref. Volume II)

HPC's Bid Inquiry Ref. No. ENQ/NC-09/000/08-09/57/MTUP/ESP/02
– 31.03.2009

Name of Bidder :

Offer No. & Date :

Plant/ Item :

Sl. No.	Equipment/ Item Description	Price (F.O.B./C&F, Port of Kolkata) (Currency to be specified)	
		For NPM	For CPM
1.	Design Engineering Services (L.S.)		
2.	Transformer-Rectifier Set complete with field control panels		
3.	Auxiliary Control Panel		
4.	MCC with incomer, Line P.T.,etc.		
5.	Local Push Button Stations, Switches, Lock out Switches for transformer, etc.		
6.	Power & Control Cables		
7.	Cable Raceway including Cable Tray System and materials for Grounding & Lightning Protection System		
8.	Materials for Illumination System		
9.	Any other items not included above but required for complete scope of work as per Volume II		
10.	Charges for supervision of Erection, Testing & Commissioning (Optional) - Categorywise estimated Man-days - Categorywise per diem Rates		

PRICE SCHEDULE
Imported Part
SECTION – B3 (Cont'd)
Price Break up Data
(Instrumentation– Ref. Volume II)

HPC's Bid Inquiry Ref.No. ENQ/NC-09/000/08-09/57/MTUP/ESP/02
– 31.03.2009

Name of Bidder :

Offer No. & Date :

Plant/ Item :

Sl. No.	Equipment/ Item Description	Price (F.O.B./C&F, Port of Kolkata) (Currency to be specified)	
		For NPM	For CPM
1.	Design Engineering Services (L.S.)		
2.	Field Instruments		
3.	Instrument Cables and Erection Hardwares		
4.	Any other items not included above but required for complete scope of work as per Volume II		
5.	Charges for supervision of Erection, Testing & Commissioning (Optional) - Categorywise estimated Man-days - Categorywise per diem Rates		

PRICE SCHEDULE

Imported Part

SECTION – B4

**Itemized Price Schedule for Supply of
Spare Parts for two(2) years of operation**

(Process & Mechanical – Ref. Volume II)

HPC's Bid Inquiry Ref. No. ENQ/NC-09/000/08-09/57/MTUP/ESP/02
– 31.03.2009

Name of Bidder :

Offer No. & Date :

Plant/ Item :

Sl. No.	Eqpt./ Item Description	Qty, No. off		Unit Price (Currency to be specified) (F.O.B./C&F, Port of Kolkata)	
		For NPM	For CPM	For NPM	For CPM
1.					
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(Use additional sheets, if required)

PRICE SCHEDULE
Imported Part
SECTION – B4
Itemized Price Schedule for Supply of
Spare Parts for two(2) years of operation

(Electrical – Ref. Volume II)

HPC's Bid Inquiry Ref No. ENQ/NC-09/000/08-09/57/MTUP/ESP/02
– 31.03.2009

Name of Bidder :

Offer No. & Date :

Plant/ Item :

Sl. No.	Eqpt./ Item Description	Qty, No. off		Unit Price (Currency to be specified) (F.O.B./C&F, Port of Kolkata)	
		For NPM	For CPM	For NPM	For CPM
1.					
2.					
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(Use additional sheets, if required)

PRICE SCHEDULE
Imported Part
SECTION – B4
Itemized Price Schedule for Supply of
Spare Parts for two(2) years of operation

(Instrumentation – Ref. Volume II)

HPC's Bid Inquiry Ref. No. ENQ/NC-09/000/08-09/57/MTUP/ESP/02
– 31.03.2009

Name of Bidder :

Offer No. & Date :

Plant/ Item :

Sl. No.	Eqpt./ Item Description	Qty, No. off		Unit Price (Currency to be specified) (F.O.B./C&F, Port of Kolkata)	
		For NPM	For CPM	For NPM	For CPM
1.					
2.					
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(Use additional sheets, if required)

PRICE SCHEDULE
Indegenous Part

SECTION –C1
LUMP SUM PRICE FOR DEMOBILISING & REMOBILISING OF PERSONNEL

HPC's Bid Inquiry Ref. No. ENQ/NC-09/000/08-09/57/MTUP/ESP/02
– 31.03.2009

Name of the Bidder :

Offer No. & Date :

Plant/ Item :

Sl. No.	DESCRIPTION	AMOUNT IN RUPEES	
		In Figures	In Words
1.	Charges for demobilizing & re-mobilizing necessary engineers, administration staff, supervisors, skilled and unskilled manpower, tools, tackles and other appurtenances required for erection, commissioning and performance guarantee tests of (<i>name of the package</i>) including but not limited to transport of contractors staff, materials movement, all taxes, duties, levies etc.		

Note :

1. The above price for demobilizing and re-mobilizing of contractor's personnel shall not be included in the total quoted lump sum turnkey price for the LSTK-1 Contract.
2. The lump sum price as per FORM shall be payable if the Contractor's activities at site are delayed for more than three(3) months for reasons not attributable to him.
3. However, insurance and security shall be arranged by the Contractor during the period of demobilization.

PRICE SCHEDULE

Imported Part

SECTION –C2

LUMP SUM PRICE FOR DEMOBILISING & REMOBILISING OF PERSONNEL

HPC's Bid Inquiry Ref . NO. ENQ/NC-09/000/08-09/57/MTUP/ESP/02
– 31.03.2009

Name of the Bidder :

Offer No. & Date :

Plant/ Item :

Sl. No.	DESCRIPTION	AMOUNT (Currency to be specified)	
		In Figures	In Words
1.	Charges for demobilizing & re-mobilizing necessary engineers, administration staff, supervisors, skilled and unskilled manpower, tools, tackles and other appurtenances required for erection, commissioning and performance guarantee tests of (<i>name of the package</i>) including but not limited to transport of contractors staff, materials movement, all taxes, duties, levies etc.		

Note :

1. The above price for demobilizing and re-mobilizing of contractor's personnel shall not be included in the total quoted lump sum turnkey price for the LSTK-1 Contract.
2. The lump sum price as per FORM shall be payable if the Contractor's activities at site are delayed for more than three(3) months for reasons not attributable to him.
3. However, insurance and security shall be arranged by the Contractor during the period of demobilization.

PART - 6
OFFER LETTER BY BIDDER

OFFER LETTER BY BIDDER

NIB NO. ENQ/NC-09/000/08-09/57/MTUP/ESP/02 – 31.03.2009

From:

To:

**Dy.General Manager(Commercial)
Hindustan Paper Corporation Ltd.
75C, Park Street
Kolkata-700016
India**

Dear Sirs,

1. We have carefully examined and understood Parts 1 thru' 6 of the Bid Document No. K8P01-SPC-M-281-56.01, for Supply, Erection & Commissioning of Electrostatic Precipitator for C. F. Boilers on Lumpsum Turnkey basis (Except Civil & Structural works).
2. We confirm that our Bid adheres to the specifications as well as the terms and conditions specified above in the Bid document.
3. We have also furnished the statement of Abstract of Prices as required in Part 5 of the Bid document.
4. We have submitted the Bids one(1) in original and three(3) copies of the technical & commercial bid to you with detailed description and specifications of equipment offered, details of supervisory services for erection,start-up and commissioning of the said equipment together with the split up prices along with our Bid. We have also submitted one(1) copy of the technical bid directly to your consultants.

Signature of the Bidder





