T E N D E R S P E C I F I C A T I O N

NO: BHE/PW/PUR/TENDHE-TPT/OJ-176

PORT CLEARANCE AT DJIBOUTI AND CROSS COUNTRY TRANSPORTATION OF CARGO TO TENDAHO SUGAR FACTORY , 2X20 MW STG SET AT TENDAHO NEW SUGAR FACTORY , AFAR REGIONAL STATE, ETHIOPIA.

AT

TENDAHO NEW SUGAR FACTORY PROJECT

AFAR REGIONAL STATE

ETHIOPIA

VOLUME – I

CONSISTING OF:

- **Notice Inviting Tender,**
- **Volume-IA : Technical Conditions of Contract-,**
- **Volume-IB : Special conditions of Contract,**
- **Volume-IC : General conditions of Contract**
- **Volume-ID : Forms & Procedures**

Bharat Heavy Electricals Limited
(*A Government of India Undertaking*)
Power Sector - Western Region
345-Kingsway, Nagpur-440001

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Tender Specification Issue Details

Tender Specification No: BHE/PW/PUR/TENDHE-TPT/OJ-176

PORT CLEARANCE AT DJIBOUTI AND CROSS COUNTRY TRANSPORTATION OF CARGO TO TENDAHO SUGAR FACTORY OF **2X20 MW STG SET AT TENDAHO NEW SUGAR FACTORY , AFAR REGIONAL STATE, ETHIOPIA**

AT

TENDAHO NEW SUGAR FACTORY PROJECT

AFAR REGIONAL STATE

ETHIOPIA

EARNEST MONEY DEPOSIT: Refer Notice Inviting Tender

LAST DATE FOR TENDER SUBMISSION . Refer Notice Inviting Tender

THESE TENDER SPECIFICATION DOCUMENTS CONTAINING VOLUME-I AND VOLUME- II ARE ISSUED TO:

M/s. ……

…….

PLEASE NOTE:
THESE TENDER SPECS DOCUMENTS ARE NOT TRANSFERABLE.

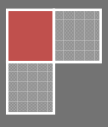
For Bharat Heavy Electricals Limited

AGM (Purchase)
Place: Nagpur
Date :

OJ-176

NOTICE INVITING TENDER

Bharat Heavy Electricals Limited



Ref: BHE/PW/PUR/TENDHE-TPT/OJ-176 Date: 28/07/2010

NOTICE INVITING TENDER (NIT)

NOTE: BIDDER MAY DOWNLOAD FROM WEB SITES OR PURCHASE TENDERS FROM THIS OFFICE ALSO

==========

To

Dear Sir/Madam

Sub : NOTICE INVITING TENDER

Sealed offers in two part bid system are invited from reputed & experienced **Indian/Ethiopian/Djiboutian** bidders (meeting PRE QUALIFICATION CRITERIA as mentioned in Annexure-I) for the subject job by the undersigned on the behalf of BHARAT HEAVY ELECTRICALS LIMITED as per the tender document. Following points relevant to the tender may please be noted and complied with.

1.0 Salient Features of NIT

SL NO	ISSUE	DESCRIPTION	
i	**TENDER NUMBER**	**BHE/PW/PUR/TENDHE-TPT/OJ-176**	
ii	**Broad Scope of job**	PORT CLEARANCE AT DJIBOUTI AND CROSS COUNTRY TRANSPORTATION OF CARGO TO TENDAHO SUGAR FACTORY OF **2X20 MW STG SET AT TENDAHO NEW SUGAR FACTORY , AFAR REGIONAL STATE, ETHIOPIA AT TENDAHO NEW SUGAR FACTORY PROJECT AFAR REGIONAL STATE ETHIOPIA**	
iii	**DETAILS OF TENDER DOCUMENT**		
a	Volume-IA	*Technical Conditions of Contract (TCC) consisting of Scope of work, Technical Specification, Drawings, Procedures, Bill of Quantities, Terms of payment, etc*	*Applicable*
b	Volume-IB	*Special Conditions of Contract (SCC)*	*Applicable*
c	Volume-IC	*General Conditions of Contract (GCC)*	*Applicable*
d	Volume-ID	*Forms and Procedures*	*Applicable*
e	Volume-II	*Price Schedule (Absolute value).*	*Applicable*
iv	**Issue of Tender Documents**	***1. Sale from BHEL PS Regional office at :Nagpur*** ***Start : 28 /07/ 2010*** ***Closes: 16/08/2010 , Time :16.00 Hrs*** **2. From BHEL website (www.bhel.com)** Tender documents can however be downloaded from website till due date of submission	*Applicable*

v	**DUE DATE & TIME OF OFFER SUBMISSION**	***Date : 17/08/ 2010 , Time :15.00Hrs*** ***Place : BHEL PS Regional office at :Nagpur*** *Tenders being submitted through representative shall be handed over to any of the following BHEL officials after making entry/registration at the reception:* *SM Borkar/ Sr Manager (Purchase)* *RK Ranade/ Manager (Purchase)* *Vivek Kamal/ Engineer(Purchase)* *Pratish Gee Varghese/Engineer(Purchase)*	*Applicable*
vi	**OPENING OF TENDER**	***1 hour after the latest due date and time of Offer submission*** *Notes:* *(1) In case the due date of opening of tender becomes a non-working day, tenders shall be opened on next working day at the same time.* *(2) Bidder may depute representative to witness the opening of tender*	*Applicable*
vii	**EMD AMOUNT**	**Rs.1,50,000/- (Rupees One lakhs Fifty Thousand only) OR 43200 ETHIOPIAN BIRR** *Ethiopian and Djiboutian bidders can submit their EMD/Cost of documents of requisite amount at BHEL TBG Ethiopia office at the following address:* *House No 2109 (Near Embassy of Somalia) Kabile: 02, Bole Sub City, Addis Ababa, Ethiopia*	*Applicable*
viii	**COST OF TENDER**	***Rs 2000/-. OR 575 ETHIOPIAN BIRR***	*Applicable*
ix	**LAST DATE FOR SEEKING CLARIFICATION**	*Date: Atleast 3 days before the due date of offer submission* *Along with soft version also, addressing to undersigned & to others as per contact address given below*	*Applicable*
x	**SCHEDULE OF Pre Bid Discussion (PBD)**	*Date : Not applicable.*	*Not applicable.*
xi	**INTEGRITY PACT & DETAILS OF INDEPENDENT EXTERNAL MONITOR (IEM)**	*Not Applicable*	*Not Applicable*
xii	**Latest updates**	Latest updates on the important dates, Amendments, Correspondences, Corrigenda, Clarifications, Changes, Errata, Modifications, Revisions, etc to Tender Specifications will be hosted in BHEL webpage (www.bhel.com -->Tender Notifications →View Corrigendums) **and not in the newspapers**. Bidders to keep themselves updated with all such information	

2.0 The offer shall be submitted as per the instructions of tender document and as detailed in this NIT. Bidders to note specifically that all pages of tender document, including these NIT pages of this particular tender together with subsequent correspondences shall be submitted by them, duly signed & stamped on each page, as part of offer. **Rates/Price including discounts/rebates, if any, mentioned anywhere/in any form in the techno-commercial offer other than the Price Bid, shall not be entertained.**

3.0 Unless specifically stated otherwise, bidder shall remit cost of tender and courier charges if applicable, in the form of Demand Draft drawn in favour of Bharat Heavy Electricals Ltd, payable at Power Sector Regional HQ at Nagpur issuing the Tender, along with techno-commercial offer. Bidder may also choose to deposit the Tender document cost by cash at the Cash Office as stated above against sl no iv of 1, on any working day; and in such case copy of Cash receipt is to be enclosed with the Techno Commercial offer. Sale of tender Documents shall not take place on National Holidays, holidays declared by Central or State Governments and BHEL PS HQ at NAgpur, Sundays and second/ last Saturdays

4.0 Unless specifically stated otherwise, bidder shall deposit EMD through Demand Draft/Pay Order in favour of Bharat Heavy Electricals Ltd, payable at Nagpur. For other details and for 'One Time EMD' please refer General Conditions of Contract.

5.0 **Procedure for Submission of Tenders**: The Tenderers must submit their Tenders to Officer inviting Tender, as detailed below:

- PART-I consisting of 'PART-I A (Techno Commercial Bid)' & 'PART-I B (EMD/COST of TENDER)' in two separate sealed and superscribed envelopes (ENVELOPE-I & ENVELOPE-II)
- PART-II (Price Bid) – in sealed and superscribed envelope (ENVELOPE-III)

6.0 The contents for ENVELOPES and the superscription for each sealed cover/Envelope are as given below. **(All pages to be signed and stamped)**

Sl no	Description	Remarks
	Part-I A	
	ENVELOPE – I superscribed as : PART-I (TECHNO COMMERCIAL BID) TENDER NO : NAME OF WORK : PROJECT: DUE DATE OF SUBMISSION: **CONTAINING THE FOLLOWING**:-	
i.	Covering letter/Offer forwarding letter of Tenderer.	
ii.	Duly filled-in `No Deviation Certificate' as per prescribed format to be placed after document under sl no (i) above. **Note:** a. In case of any deviation, the same should be submitted separately for technical & commercial parts, indicating respective clauses of tender against which deviation is taken by bidder. The list of such deviation shall be placed after document under sl no (i) above. It shall be specifically noted that deviation recorded elsewhere shall not be entertained. b. BHEL reserves the right to accept/reject the deviations without assigning any reasons, and BHEL decision is final and binding. i). In case of acceptance of the deviations, appropriate loading shall be done by BHEL ii). In case of unacceptable deviations, BHEL reserves the right to reject the tender	

iii.	Supporting documents/ annexure/ schedules/ drawing etc as required in line with Pre-Qualification criteria. It shall be specifically noted that all documents as per above shall be indexed properly and credential certificates issued by clients shall distinctly bear the name of organization, contact ph no, FAX no, etc.	
iv.	All Amendments/Correspondences/Corrigenda/Clarifications/Changes/ Errata etc pertinent to this NIT.	
v.	Integrity Pact Agreement (Duly signed by the authorized signatory)	If applicable
vi.	Duly filled-in annexures, formats etc as required under this Tender Specification/NIT	
vii.	Notice inviting Tender (NIT)	
viii.	Volume – I A : Technical Conditions of Contract (TCC) consisting of Scope of work, Technical Specification, Drawings, Procedures, Bill of Quantities, Terms of payment, etc	
ix.	Volume – I B : Special Conditions of Contract (SCC)	
x.	Volume – I C : General Conditions of Contract (GCC)	
xi.	Volume – I D : Forms & Procedures	
xii.	Volume – II (UNPRICED – without disclosing rates/price, but mentioning only 'QUOTED' or 'UNQUOTED' against each item	
xiii.	Any other details preferred by bidder with proper indexing.	

	PART-I B	
	ENVELOPE – II superscribed as: PART-I (EMD/COST of TENDER) TENDER NO : NAME OF WORK : PROJECT: DUE DATE OF SUBMISSION: **CONTAINING THE FOLLOWING**:-	
i.	1. Earnest Money Deposit (EMD) in the form as indicated in this Tender **OR** Documentary evidence for 'One Time EMD' with the Power Sector Region of BHEL floating the Tender 2. Cost of Tender (Demand Draft or copy of Cash Receipt as the case may be)	

	PART-II	
	PRICE BID consisting of the following shall be enclosed	
	ENVELOPE-III superscribed as: PART-II (PRICE BID) TENDER NO : NAME OF WORK : PROJECT: DUE DATE OF SUBMISSION: **CONTAINING THE FOLLOWING**	
i	Covering letter/Offer forwarding letter of Tenderer enclosed in Part-I	

ii	Volume II – PRICE BID (Duly Filled in Schedule of Rates – rate/price to be entered in words as well as figures)	

	OUTER COVER	
	ENVELOPE-IV (MAIN ENVELOPE / OUTER ENVELOPE) superscribed as: TECHNO-COMMERCIAL BID, PRICE BID & EMD TENDER NO: NAME OF WORK: PROJECT: DUE DATE OF SUBMISSION: **CONTAINING THE FOLLOWING:**	
i	o Envelopes I o Envelopes II o Envelopes III	

SPECIAL NOTE : All documents/ annexures submitted with the offer shall be properly annexed and placed in respective places of the offer as per enclosure list mentioned in the covering letter. BHEL shall not be responsible for any missing documents.

7.0 No Deviation with respect to tender clauses and no additional clauses/ suggestions/ in Techno-commercial bid/ Price bid shall normally be considered by BHEL. Bidders are requested to positively comply with the same.

8.0 BHEL reserves the right to accept or reject any or all Offers without assigning any reasons thereof. BHEL also reserves the right to cancel the Tender wholly or partly without assigning any reason thereof. Also BHEL shall not entertain any correspondence from bidders in this matter (except for the refund of EMD).

9.0 Assessment of Capacity of Bidders: (Shall be applicable for Bid Evaluation after 1st Jan 2011)
Bidders capacity for executing the job under tender shall be assessed as per the following:

I. **Assigning Weightages (A) for Similar Jobs Under-Execution**: Weightages shall be worked out and assigned based on the average number of Similar Works under execution including works yet to be commenced by the agency, in the following manner:

i). Number of Similar Jobs
- a) No. of jobs in BHEL, PSER : Say 'J'
- b) No. of jobs in BHEL, PSSR : Say 'K'
- c) No. of jobs in BHEL, PSWR : Say 'L'
- d) No. of jobs in BHEL, PSNR : Say 'M'
- e) No. of jobs with other customers* : Say 'N' (*: Other than BHEL PSER, PSSR, PSWR & PSNR)
- f) Average No. of Jobs is 'P'= (J+K+L+M+N) divided by 5

ii) Weightage "A" assigned to bidders based on Average Number of jobs "P";
- a) If 'P' = 0-1, "A" will be equal to '3'
- b) If 'P' = 2-3, "A" will be equal to '2'
- c) If 'P' = 4-5, "A" will be equal to '1'
- d) If 'P' is Above 5, "A" will be equal to '0'

II. **Weightage "B" for Quarterly Performance Reports of Vendors**: This shall be based on the averages of the net weighted score obtained by the bidder for the jobs under execution (excluding works not commenced) for the quarter previous to the last quarter reckoned from the date of latest due date of submission, in all four Regions i.e BHEL PSER, PSSR, PSWR & PSNR, in the following manner.

i). Ratings by Power Sector Region:

a) PS ER's Rating 'R**e**r' = ($X_1 + X_2 + .. + X_n$) divided by n
b) PS WR's Rating 'R**w**r' = ($X_1 + X_2 + .. + X_n$) divided by n
c) PS SR's Rating 'R**s**r' = ($X_1 + X_2 + .. + X_n$) divided by n
d) PS NR's Rating 'Rnr' = ($X_1 + X_2 + .. + X_n$) divided by n
e) **Over all Power Sector Region Rating 'R_{BHEL}'**= (R**e**r+ R**w**r+ R**s**r+ R**n**r) divided by 4

(where "X_1, X_2, X_3,…X_n" is the net weighted score obtained by the bidder as per the "Evaluation of Contractor Performance (Quarterly)" against the various contracts 'n' under execution in the respective Region).

ii) Weightage "B" assigned to bidders based on Overall Power Sector Rating **(R_{BHEL}):**

a) If R_{BHEL} is 80% and above, "B" will be equal to '6'
b) If R_{BHEL} is > 70% < 80%, "B" will be equal to '5'
c) If R_{BHEL} is > 60% < 70%, "B" will be equal to '4'
d) If R_{BHEL} is = < 60%, "B" will be equal to '0'

III. Evaluation of Bidders capacity to execute the job under tender: shall be based on the sum of scores obtained in 'A' and 'B', as below:

a) 6 or above : Considered 'Qualified' for the job under tender
b) Less than 6: Considered 'NOT Qualified' for the job under tender

IV. **Explanatory note**:

a) Similar work means Boiler or Turbine or Civil or Electrical or CI, etc irrespective of rating of Plant
b) Quarter shall be as per the quarter defined in the "Evaluation of Contractor performance (Quarterly)". For contracts where annexed Quarterly Evaluation performance was not part of the contract, 'Quarterly Performance Reports' previous to the last quarter reckoned from the date of latest due date of submission, given by the respective project site against the contract will be the basis for evaluation.

c) Vendors who are not executing any jobs presently in the Region and first timers to the Region, may be considered subject to satisfying all other tender conditions

d) 'Under execution' shall mean works in progress upto Boiler Steam Blowing (for Boiler and Auxilliaries) or Synchronisation (for all other jobs including Civil) shall be considered.

10.0 Since the job shall be executed at site**,** bidders must visit site/ work area and study the job content, facilities available, availability of materials, prevailing site conditions including law & order situation etc before quoting for this tender. They may also consult this office before submitting their offers, for any clarifications regarding scope of work, facilities available at sites or on terms and conditions. No additional claim shall be entertained by BHEL in future, on account of non-acquaintance of above.

11.0 For any clarification on the tender document, the bidder may seek the same in writing or through e-mail, as per specified format, within the scheduled date for seeking clarification, from the office of the undersigned. BHEL shall not be responsible for receipt of queries after due date of seeking clarification due to postal delay

or any other delays. Any clarification / query received after last date for seeking clarification may not be normally entertained by BHEL and no time extension will be given.

12.0 BHEL may decide holding pre-bid discussion [PBD] with all intending bidders as per date indicated in the NIT. The bidder shall ensure participation for the same at the appointed time, date and place as may be decided by BHEL. Bidders shall plan their visit accordingly. The outcome of pre-bid discussion (PBD) shall also form part of tender.

13.0 In the event of any conflict between requirement of any clause of this specification/ documents/drawings/data sheets etc or requirements of different codes/standards specified, the same to be brought to the knowledge of BHEL in writing for clarification before due date of seeking clarification (whichever is applicable), otherwise, interpretation by BHEL shall prevail. Any typing error/missing pages/ other clerical errors in the tender documents, noticed must be pointed out before pre-bid meeting/submission of offer, else BHEL's interpretation shall prevail.

14.0 Unless specifically mentioned otherwise, bidder's quoted price shall deemed to be in compliance with tender including PBD.

15.0 Bidders shall submit Integrity Pact Agreement (Duly signed by authorized signatory who signs in the offer), **if applicable**, along with techno-commercial bid. This pact shall be considered as a preliminary qualification for further participation. **The names and other details of Independent External Monitor (IEM) for the subject tender is as given at point (xi) of 1 above.**

16.0 The Bidder has to satisfy the Pre Qualifying Requirements stipulated for this Tender in order to be qualified. The Price Bids of only those bidders will be opened who will be qualified for the subject job on the basis of pre-qualification evaluation/ techno-commercial bids, approval/ acceptance of customer (as applicable), etc. and date of opening of price bids shall be intimated to only such bidders.

17.0 In case BHEL decides on a `Public Opening', the date & time of opening of the sealed PRICE BID shall be intimated to the qualified bidders and in such a case, bidder may depute one authorised representative to witness the price bid opening. BHEL reserves the right to open 'in-camera' the 'PRICE BID' of any or all Unsuccessful/Disqualified bidders under intimation to the respective bidders.

18.0 Validity of the offer shall be for **six months** from the latest due date of offer submission (including extension, if any) or specified otherwise in SCC of tender.

19.0 BHEL reserves the right to decide the successful bidder on the basis of Reverse Auction process. In such case all qualified bidders will be intimated regarding procedure/ modality for Reverse Auction process prior to Reverse Auction and price will be decided as per the rules for Reverse Auction. .

However, if reverse auction process is unsuccessful as defined in the RA rules/procedures, or for whatsoever reason, then the sealed 'PRICE BIDs' will be opened for deciding the successful bidder. BHEL's decision in this regard will be final and binding on bidder.

20.0 On submission of offer, further consideration will be subject to compliance to tender & qualifying requirement and customer's acceptance, as applicable.

21.0 In case the bidder is an "Indian Agent of Foreign Principals", 'Agency agreement has to be submitted along with Bid, detailing the role of the agent along with the terms of payment for agency commission in INR, along with supporting documents.

22.0 The bidders shall not enter into any undisclosed M.O.U. or any understanding amongst themselves with respect to tender.

23.0 In case Consortium Bidding is allowed as per Pre Qualifying Requirement, then Prime Bidder and Consortium Partner shall enter into Consortium Agreement. Validity period of Consortium Agreement shall be 6 months after which the same can be re validated.

'Stand alone' bidder cannot become a '**prime bidder' or a 'consortium bidder' in a consortium bidding**. Prime bidder shall neither be a consortium partner to other prime bidder nor take any other consortium partners. However, consortium partner may enter into consortium agreement with other prime bidders. In case of non compliance, consortium bids of such Prime bidders will be rejected. .

24.0 The bidder shall submit documents in support of possession of 'Qualifying Requirements" duly self certified and stamped by the authorized signatory, indexed and properly linked in the format for PQR. In case BHEL requires any other documents/proofs, these shall be submitted immediately.

25.0 The bidder may have to produce original document for verification if so decided by BHEL.

26.0 Order of Precedence
In the event of any ambiguity or conflict between the Tender Documents, the order of precedence shall be in the order below:

a. Amendments/Clarifications/Corrigenda/Errata etc issued in respect of the tender documents by BHEL
b. Notice Inviting Tender (NIT)
c. Price Bid
d. Technical Conditions of Contract (TCC)—Volume-1A
e. Special Conditions of Contract (SCC) —Volume-1B
f. General Conditions of Contract (GCC) —Volume-1C
g. Forms and Procedures —Volume-1D

for BHARAT HEAVY ELECTRICALS LTD

(SCT)

Enclosure

01. Annexure-1: Pre Qualifying criteria.
02. Annexure-2: Check List .
03 Other Tender documents as per this NIT.

ANNEXURE - 1

PRE QUALIFYING CRITERIA

JOB	**PORT CLEARANCE AT DJIBOUTI AND CROSS COUNTRY TRANSPORTATION OF CARGO TO TENDAHO SUGAR FACTORY , 2X20 MW STG SET AT TENDAHO NEW SUGAR FACTORY , AFAR REGIONAL STATE, ETHIOPIA**
TENDER NO	**BHE/PW/PUR/TENDHE-TPT/OJ-176**

SL NO	PRE QUALIFICATION CRITERIA	Bidders claim in respect of fulfilling the PQR Criteria	
		Name and Description of qualifying criteria	Page no of supporting document
A	Submission of Integrity Pact duly signed (if applicable)	**NOT APPLICABLE**	
B	Assessment of Capacity of Bidder to execute the work as per sl no 9 of NIT (if applicable)	**Shall be applicable for Bid Evaluation after 1st Jan 2011**	
C	**Technical** Bidder must have been in the business of 'Transportation of Consignments' in last seven years as on 30/06/2010		
D 1	**Financial** **TURNOVER** Bidders must have achieved an average annual financial turnover (Audited) of Rupees 2.3 Million or more over last three Financial Years (FY) i.e 2007-08, 2008-2009, 2009-2010 if Annual Accounts for FY 2009-10 are audited OR for 2006-2007, 2007-2008 and 2008-2009 if not audited**		
2	NETWORTH Net worth of bidder based on Audited Accounts of 2009-10 (**OR** 2008-09 incase accounts for FY 09-10 has not been audited) should be higher than 50% of paid up capital in case of companies.		
3	PROFIT Bidder must have earned cash profit in any one of the three Financial Years as applicable in the last three years defined in 'D1 above based on latest Audited Accounts.		
E	Approval of Customer Note: Names of bidders who stand qualified after compliance of criteria A to D shall be forwarded to customer for their approval. Price bid of only those bidders shall be opened who are approved by customer.	**NOT APPLICABLE**	

F	Consortium criteria	**NOT APPLICABLE**	
	Explanatory Notes for QR 'A' 1. Bidder to submit Audited Balance Sheet and Profit and Loss Account for the respective years as given above along with all annexures 2. For the purpose of evaluation of QR, Turn-over figures in Ethiopian Birr shall be converted into Indian Rupees @ Rs 3.47690 Per Ethiopian Birr and, Turn-over figures in Djiboutian Franc shall be converted into Indian Rupees @ Rs 0.27080 per Djiboutian Franc. 3. ** In case the closure of Financial Year of Ethiopian Companies/Djiboutian Franc is other than 31st March, then the turnover shall be considered with respect to preceding 12 months ending 31/03/2008, 31/03/2009 and 31/03/2010 OR 31/03/2007, 31/03/2008 and 31/03/2009 if Accounts for FY 09-10 has not been audited		

BIDDER SHALL SUBMIT ABOVE PRE-QUALIFICATION CRITERIA FORMAT, DULY FILLED-IN, SPECIFYING RESPECTIVE ANNEXURE NUMBER AGAINST EACH CRITERIA AND FURNISH RELEVANT DOCUMENT IN THE RESPECTIVE ANNEXURES IN THEIR OFFER.

ANNEXURE - 2

CHECK LIST

NOTE:- Tenderers are required to fill in the following details and no column should be left blank

1	Name and Address of the Tenderer		
2	Details about type of the Firm/Company		
3	Details of Contact person for this Tender	Name : Mr/Ms Designation: Telephone No: Mobile No: Fax No:	
4	EMD DETAILS	DD No: Date : Bank : Amount: Please tick (√) whichever applicable:- ONE TIME EMD / ONLY FOR THIS TENDER	
		APPLICABILITY	BIDDER REPLY
5	Whether the format for compliance with **PRE QUALIFICATION CRITERIA** (ANNEXURE-I) is understood and filled with proper supporting documents referenced in the specified format	Applicable	YES / NO
6	Whether Audited profit and Loss Account for the last three years submitted	Applicable	YES/NO
7	Whether Copy of PAN Card submitted	Applicable	YES/NO
8	Whether all pages of the Tender documents including annexures, appendices etc are read understood and signed	Applicable	YES/NO
9	Integrity Pact	Not Applicable	Not Applicable
10	Declaration by Authorised Signatory	Applicable	YES/NO
11	Whether No Deviation Certificate submitted	Applicable	YES/NO
12	Whether Declaration confirming knowledge about Site Conditions submitted	Applicable	YES/NO
13	Whether Declaration for relation in BHEL submitted	Applicable	YES/NO
14	Whether Non Disclosure Certificate submitted	Applicable	YES/NO
15	Whether Bank Account Details for E-Payment submitted	Applicable	YES/NO
16	Capacity Evaluation of Bidder for current Tender	Not Applicable	Not Applicable
17	Tie Ups/Consortium Agreement are submitted as per format	Not Applicable	Not Applicable
18	Whether Power of Attorney for Submission of Tender/Signing Contract Agreement submitted	Applicable	YES/NO
19	Whether Analysis of Unit rates submitted	Applicable	YES/NO

NOTE : STRIKE OFF 'YES' OR 'NO', AS APPLICABLE

DATE :

AUTHORISED SIGNATORY
(With Name, Designation and Company seal)

OJ-176

TECHNICAL CONDITIONS OF CONTRACT (TCC)

BHARAT HEAVY ELECTRICALS LIMITED

TECHNICAL CONDITIONS OF CONTRACT (TCC)
CONTENTS

1.0	**Project Information**
1.1	**INTROUCTION** Tendaho Sugar Factory, Ethiopia on behalf of Government of Federal Democratic Republic of Ethiopia having its principal place of business at P. O Box 2574 , Salfaz Building (in front of Atlas Hotel), Cape Verde Road, Addis Ababa, Ethiopia, intended to install new Sugar Factory with designed cane crushing capacity of 26,000 tons per hour at Tendaho. M/s Tendaho Sugar Factory have engaged M/s Overseas Infrastructure Alliance (India) Pvt Ltd having its principal place of Business at 1205, Surya Kiran Building, 19, Kasturba Gandhi Marg, New Delhi – 110001 as their EPC contractor. M/s Overseas Infrastructure Alliance (India) Pvt Ltd have awarded job of Design, Manufacture, Supply to Port Djibouti, transport to the site (Tendaho Sugar Factory), Store, Erection of mechanical and electrical equipment, train employers personnel, commissioning, testing and handover Power Generation Plant of capacity 2x20 MW STG to Bharat Heavy Electrical Limited having its Head Office at BHEL House, Siri Fort, New Delhi – 110049 (India) **LOCATION & APPROACH** i). Project Name: Tendaho Sugar Factory Project , 2x20 MW ii). Project Location: Tendaho Sugar Factory, Afar Regional State, Ethiopia. iii). Transport facilities: i. Road : Project site is located in the lower Awash valley of Afar administration region, about 600 km North East to Addis Ababa. ii. Airport : Nearest Airport is Addis Ababa. iii. Sea Port : Port of entry for imported goods by marine transport is 'Port of Djibouti'., which is around 350 km from site. The transportation from Port Djibouti to Tendaho site is by Addis Djibouti tarmac highway. **GEOGRAPHICAL CONDITIONS:** i). Height above Mean Sea level : 350 m ii). Seismic zone : Zone - II

1.2	**CLIMATIC CONDITIONS** i). Maximum ambient Temperature . : $+45^{o}$ Centigrade ii). Minimum ambient Temperature. : $+17^{o}$ Centigrade iii). Relative Humidity range : 96 % Max & 37 % Min. iv). Rainy season : July to October v). Average rainfall : 235 mm

2.0 SCOPE OF WORK

The work to be carried out under the scope of these specifications is broadly as under:

AA Port clearance and Local Transportation

2.0.0.1 DETAIL SCOPE OF WORK

AA Port clearance at Djibouti and cross country Transportation of Cargo to Tendaho Sugar Factory

1. a Arranging all permits at Djibouti Port for cross country transportation of cargo.
   b Unloading of cargo from the ship
   c Lashing / securing & reloading on trailer,
   d Transportation from Port to Tendaho Sugar Factory
   e Placement of cargo/ Truck / trailer at the designated place if required ,
   f Transportation of empty container to the Shipping Company if required.

2. Contractor shall have their liaison office at Addis Ababa for coordination with various agencies

3. The containers / Break Bulk cargo shall be custom cleared at Djibouti or any other suitable place in Ethiopia as desired by customs department of Ethiopia and transported to designated sites at Ethiopia. All expenses for custom clearance (except any custom duty) & Container Security Deposits shall be borne by the Transporters.

4. The empty containers shall be returned to the Djibouti port by Contractor after unloading of Cargo at site by BHEL(if required)

5. Use of Shore cranes is permitted without any financial liability to BHEL. The contractor shall be responsible for safe unloading and loading of Heavy Packages. Any damages during these operations if adopted, it will be the sole responsibility of the contractor to make good the losses to the product and any other incidental damages.

6. Contractor should ensure port handling; transportation and delivery of goods at site with utmost care and in a professional manner. Contractor should follow manufacturer's lifting & handling instructions on packages. Contractor

will be responsible for any damage due to negligence to follow manufacturer's instructions or due to use of wrong lifting and handling equipments.

7. The shipment is expected to commence **from Aug-2010 and may last up to June- 2011.**
8. Endorsements on the relevant documents from relevant authorities are to be obtained by the Contractor. BHEL / BHEL'S Site representatives shall issue receipt at site for material delivered and the same shall be obtained by the Contractor. BHEL Addis Ababa office shall extend all necessary support for the required paper works.

9. Under the contract the custom duty is not payable for the T&P taken on returnable basis .Contractor shall declare list of T&P along with it's value for getting custom clearance at Ethiopia.

10. Payment to Ethiopian Shipping lines / Ethiopian Airlines against the items shipped by BHEL and its suppliers. These payments would be done in Ethiopian Birr by Contractor's Addis Ababa office.

11. This will be the responsibility of Contractor to collect all papers from BHEL Addis Ababa office .BHEL will arrange duty free letter, Bank permit, original or copy B/L with letter from Shipper. Contractor shall be intimated over phone / e-mail about the readiness of papers. After receipt of papers contractor will arrange custom clearance & discharge letter from Ethiopian shipping lines / Ethiopian Airlines. Contractor will make payments for freight, container security, demurrage (if any). BHEL will reimburse for freight & Demurrage .As return of container safely is Contractor's responsibility hence container security amount will not be reimbursed.

2.0.0.2 DETAIL SCOPE OF WORK

2.0.1

The work shall be executed under the usual conditions affecting major power plant construction and in conjunction with numerous other operations at site. The bidder and his personnel shall co-operate with the personnel of other agencies, co-ordinate his work with others and proceed in a manner that shall not delay or hinder the progress of work as a whole.

2.0.2

All the necessary certificates and licenses required to carryout this work are to be arranged by the contractor expeditiously at his cost.

2.0.3

The work to be carried out under the scope of these specifications covers the complete work of -

AA Port clearance at Djibouti and cross country Transportation of Cargo to Tendaho Sugar Factory

2.0.4
The indicative schedule of weight of major equipments given at Relevant Annexure is meant for providing a general idea to the contractor about the magnitude of the work involved.

2.0.5
All tools and tackles, fixtures, equipments, materials, manpower, supervisors/ engineers, consumables etc. required for this scope of work shall be provided by the contractor. All expenditure including applicable taxes if any and incidentals in this connection will have to be borne by him unless otherwise specified in the relevant clause.

2.0.6
All equipments shall be handled very carefully to prevent any damage or loss.

2.0.7

All necessary certificates and licenses, permits & clearances required to carry out this work are to be arranged by the contractor expeditiously at his cost.

2.08

Materials shall be transported by The truck/Trailer upto Tendaho site. In case of detention at Tendaho site beyond three days shall be @ 4000 ETB per day . However the detention other than Tendaho site shall not be payable .

2.09

The quantity of CBM indicated of 1100 CBM in price Bid as well as weights of 1200MT as per Annexure –III is indicative.

2.10

The works inclusive of all activities of co-ordination for Customs clearance, taking delivery, storage at port (if required), safe transit/transportation, permissions and road survey , Unloading & Reloading with required crane/ Forklift etc

2.11 IMPORTANT INFORMATION

i. **Indian bidders, Ethiopian local bidders & Djiboutian local bidders shall be eligible to participate in this tender.**

ii. **The tender document shall be hosted in BHEL web page (www.bhel.com) and bidders are requested to download the complete tender specification. In case bidders are unable to download the tender specifications from BHEL web page, on specific request from vendors, BHEL will send the total tender specification by e-mail.**

iii. **Bidder should ensure that their complete offer in hard copy should reach to BHEL- Nagpur office on or before due date & time mentioned in NIT. Late tender shall not be accepted in any circumstances.**

iv. **The bidder who is submitting the offer should necessarily fulfill the QR (Qualifying Requirement) and other tender conditions. The Indian Bidder will be permitted to have a tie up for execution of limited portions of work with the agencies locally available in Ethiopia or Djibouti, on prior approval of BHEL. However back to back tie up is NOT permitted.**

v. **Offer shall be submitted by bidders in ENGLISH Language only. Also any correspondence shall be in English Language.**

vi. **All the bidders shall quote the price in Ethiopian Birrs(ETB) only in Price Bid**

vii. **Evaluation of prices shall be done in Ethiopian Birr.**

viii. **Work order shall also be placed in Ethiopian Birr only.**

ix. **Slab for the rates of Security Deposit as given in Clause 1.10.1 of 'General Conditions of Contract' may suitably be converted into ETB @ Rs 3.47690 per ETB**

x. **Ethiopian and Djiboutian bidders can submit their EMD/Cost of documents of requisite amount at BHEL TBG Ethiopia office at the following address:**

xi. **House No 2109 (Near Embassy of Somalia) Kabile: 02, Bole Sub City, Addis Ababa, Ethiopia**

xii. **Wherever the BG (Bank Guarantee) is required to be submitted as per tender specifications , the following procedure is to be adopted by bidder**

- **For Indian Bidders- The BG should be issued through the Member Bank listed Vendors are advised to obtain BG from any of the BHEL consortium banks**

- **For Ethiopian and Djiboutian Bidders- The BG may be accepted from Foreign Bank at the sole discretion of BHEL, provided the BG is duly endorsed by any Bank listed above**

- **The BG through any other Indian Nationalized Bank (Not covered in the above list), the discretion of its acceptance shall lie solely with BHEL**

NOT APPLICABLE

NOT APPLICABLE

NOT APPLICABLE

6.1 MOBILIZATION, TIME SCHEDULE, CONTRACT PERIOD AND GRACE PERIOD

6.1.1 Contractor shall mobilize necessary resources within shortest possible time of issue of fax letter of intent to commence the work. Such resources shall be progressively augmented to match the schedule of milestones and commissioning.

6.1.2 Mobilization for Local Transportation from Port to Site etc.

First consignment is expected to be **dispatched from MID AUG-10**. Contractor to mobilise its resources to coordinate the formalities to be completed for fulfilling statutory requirements and unloading the consignment at Port of landing and arrange for onward transportation to Site. All necessary lifting equipments and trailer / trucks etc are to be arranged by the contractor.

6.1.3 COMMENCEMENT OF CONTRACT PERIOD AND TENTATIVE SCHEDULE

Unloading of first consignment from the first shipment shall be recognised as "start of Contract period"

6.1.4 START OF CONTRACT PERIOD AND DURATION

The total contract period for completion of entire work **shall be 10 (Ten) months from the date of start of Contract period.**

The contractor shall complete all the work in the scope of this contract within the contract period.

6.1.5 GRACE PERIOD

NOT applicable

6.3 CONTRACT EXTENSION

6.3.1 If the completion of work as detailed in these specification gets delayed beyond the end of contract period then depending on the balance work left out, BHEL at its discretion may extend the contract.

6.4 OVERRUN COMPENSATION

NOT Applicable

6.5 PRICE VARIATION

6.5.1 For Local Transportation

If there is more than 10% variation in the price of Fuel (HSD), as notified by Ethiopian Government, the contract prices for transportation shall be revised by 6% for every 10% changes in the price of fuel, in the same direction as variation in the fuel prices. The base price shall be taken as the date of submission of offer from contractor.

6.6 CONTRACT VARIATIONS

6.6.1 VARIATION IN WEIGHT /QUANTITY

Quantity & weight of various equipments and items of work covered under the tender specification are likely to vary. For any upward or downward variation in quantities as well as weight in respect of TG & auxiliaries under item Sl. no.1 of rate schedule in Price Bid, the accepted price shall remain firm.

6.7 Mobilization Advance

No mobilization advance is payable under this tender specifications.

6.8 INTEREST BEARING RECOVERABLE ADVANCE

NOT Applicable

6.9 DEFINITION OF WORK COMPLETION

The contractor's scope of work under these specifications will be deemed to have been completed in all respect, only when all the activities are completed satisfactorily and so certified by BHEL site in charge. The decision of BHEL in this regard shall be final and binding on the contractor.

7.1 Stages Of Progressive Pro-Rata Payments

Progressive payment for Local Transportation from Djibouti Port to Tendaho site Bill of Quantity given at Appendix – IIB is 1200MT approximately. It is expected to be despatched in consignments by way of Containers / CBM. The modality of payment can be decided at site with mutual agreement. The payment can be either consignment wise or tonnage wise or any other option.

7.2 Currency of Payment : In ETB(Ethiopian Birrs)

The payments shall be made in ETB (Ethiopian Birrs) for Indian/Ethiopian/Djiboutian contractors as per terms of payment given above.

TAXES & OTHER DUTIES

8.1. **The rate quoted by bidders should be inclusive of all Taxes & Duties and BHEL will not reimburse any amount on account of Taxes & Duties. Wherever tax exemptions/concessions are allowed to the bidder, the same may be availed by the bidder without attracting any financial implication on BHEL. However, if as per the Ethiopian/ Indian laws, BHEL can avail set off against any tax or duty paid by the bidder, the bidder shall provide necessary documents to BHEL to avail such set off.**

8.2 All the taxes, duties applicable in Ethiopia (Except for personnel Income tax) shall be reimbursed by BHEL on submission of relevant documents.

8.3 All payments to the bidders shall be subject to recovery of all applicable Withholding Tax and / or Tax Deduction at source as per the Ethiopian Laws and /or Indian Law

TECHNICAL CONDITIONS OF CONTRACT (TCC)
Annexure-I:
Tentative Scope of Equipment/Systems Covered Under This Specification

(A) Steam Turbine & Auxiliaries:

1. Steam turbine
2. Emergency Trip Cum Stop valve
3. Blanket plate for steam blowing.
4. Turbine steam governing valves(HP and LP).
5. Steam Strainer Built into Stop valve.
6. Reduction Gear box between Turbine & Generator.
7. Coupling and coupling guard between Turbine and Gear Box.
8. Coupling and coupling Guard between Guard between Gear box & Generator.
9. Manual Barring Device.
10. Turning Device –Electric.
11. Solenoid Valve for Remote Tripping.
12. Turbine Sole Plates.
13. Foundation Bolts.
14. Shafts Grounding Device.
15. Mating Flanges for Turbine Inlet, Exhaust and Extraction Flanges.
16. Gland Steam Leak off Piping.
17. Exhaust Hood spray system.
18. Prime coat of paint.
19. Vacuum Breaker Valve.
20. Turbine Drain Water Piping within TG Block.
21. Turbine insulation mineral wool mattress
22. Insulation of integral piping
23. QCNRVs in Uncontrolled Extraction line & Controlled Extraction Line.
24. Turbine Enclosure.

(B) Oil Supply System:

1. Main Oil Tank (Carbon Steel) Including Drain & Maintenance Openings ,Level Indicator ,Level Signalisation High/Low, Connection for Purifier
2. Main Oil Pump with AC Motor.
3. Auxiliary Oil Pump with AC Motor.
4. Emergency Oil Pump with DC Motor.
5. Jacking oil pump with AC motor, if required.
6. Duplex filter with lube
7. Trans- flow valves for Duplex oil filters.
8. Oil –Mist fan with Ac Motor (2x100%)
9. Pressure throttles for bearings.
10. Complete lube oil piping (CS material up to LO filter)

11.
12. Complete lube oil piping (SS material from LO Filter to Bearing).
13. Complete Return Lube oil piping (CS material).
14. Complete control oil piping (stainless steel material)
15. Complete jacking oil piping including throttle valves, Relief valves etc.
16. Overhead lube oil tank with complete piping (Stainless steel material)
17. Control oil accumulators (as required)
18. Oil purifying system (1000 LPH capacity)
19. Governing console consisting of Duplex filter for control oil, main trip solenoid valves, Electric -Hydraulic converters, Solenoid valves for opening and closing emergency stop valves , solenoid valve for resetting the turbine , local Gauge board with governing oil system instruments, other hydraulic components.

(C) Surface Condenser:

1. Two pass divided water box cylindrical condenser.
2. Carbon steel dome, shell, hot well, water box etc and admiralty Brass tubes.
3. Stand pipes for mounting instruments.
4. Sacrificial anodes inside water box for cathodic protection.
5. SS Expansion Bellow.
6. Primer coating on outer surfaces and epoxy coating on water box internals
7. Accessories like rupture disc, water expansion relief valve, vent and drain valves etc.

(D) Steam Jet Air Ejector:

1. 2x100% running ejector with inter and after condensers and one starting ejector with silencer.
2. Nozzle and diffusers for ejectors.
3. Inter and after condensers with carbon steel shell, tube sheet, water box & stainless steel SA 249 TP304 tubes.
4. Steam and air pipes.
5. Accessories like water expansion relief valve vent and drain valves etc.

(E) Gland steam Condenser:

1. GSC with 2x 100% fan & motor.
2. Carbon steel shell, water box and stainless steel SA249 TP 304 tubes.
3. Accessories like tube side relief valves vent and drain valves etc.
4. Primer coating on outer surfaces

(F) ST Oil Cooler :

1. Vertical 2x100% capacity ST Oil cooler.
2. Coolers with carbon steel shell, water box etc and Admiralty Brass tubes.
3. Manually operated 3 – way change over valve.
4. Primer coating on outer surfaces
5. Accessories like vent and drain valves etc.

(G) Generator and Auxiliaries:

1. Closed circuit air cooled generator consisting of stator with output leads (3 phase + 3 neutral)taken out from the sides of the m/c, Rotor suitable for overhang BLE, Bearings , base frame, built in RTDs ,space heaters, Bottom mounted air to water coolers (CACW) with n+1)cooler elements.

Over hang brush- less exciter with PMG

2. Phase segregated busduct (25M on phase side and 6 M on neutral side) housing CT's PT''s, LA & SP. Extra charge for busduct requirement above the specified length on per meter basis.
3. Neutral Grounding Resistor to limit the fault current to 100A for 30 sec with motorised isolator.
4. Generator conventional control, metering & synchronising panel with auto-synchroniser and multifunctional micro processor based numerical relay panel with protections for generator.
5. Interconnecting control cables for connection between Generator and generator control and relay panels (length considered is 100m. unit length applicable beyond this length).

(H) STG Air Coolers :

1. Bottom mounted STG Air Cooler.
2. High fin Admiralty Brass tubes Copper fins, Carbon steel frames.
3. Accessories like CW inlet/ outlet valves vent and drains valves etc.
4. Primer coating on outer surface

(I) Control & Instrumentation for STG & Integral portion :

1. Scope :-
   - 1.1 Electronic Governor for control of Turbine speed, Load, inlet stem pressure, extraction pressure.
   - 1.2 Dual Channel Turbine Shaft Vibration and Axial Displacement Monitoring system (TSI rack) which includes proximity type probes, proximeters and extension cables for the following
     a) Shaft vibration at turbine front bearing.
     b) Shaft vibrations at turbine rear bearing.
     c) Shaft vibrations at Generator front bearing.
     d) Shaft vibration at Generator rear bearing.
     e) Shaft vibration at Gear box high speed shaft.

f) Shaft vibration at Gearbox low speed shaft.
g) Turbine Axial displacement Key phasor for turbine shaft.

2. Primary instruments to realise the turbine auxiliaries interlock and protections for the following drives in DCS.
   a) Main oil pump.
   b) Auxiliary oil pump.
   c) Emergency lube oil pump.
   d) Jacking oil pump.
   e) Oil Vapour Extraction fan.
   f) Turning gear.
3. Field Instruments (for STG Integral Portion):

3.1 Bearing thermo-elements for monitoring Bearing Metal Temperature for following (monitoring in DCS)

a) Turbine front journal Bearing Temperatures.
b) Turbine rear journal bearing temperatures.
c) Turbine Thrust Bearing Temperatures (Active & Non active).
d) All Gear box Bearings temperatures.
e) Generator front journal Bearing Temperatures
f) Generator rear journal Bearing Temperatures

3.2 Local pressure Gauges within Battery limits.
3.3 Local Temperature Gauges within battery limits.
3.4 Level gauges for main oil tanks and over head oil tanks.
3.5 Instruments mounted on local gauges board.
3.6 Instruments mounted on Governing console board
-Control oil pressure
- start up oil to ESV Pressure
-Trip oil to ESV Pressure
- HP Secondary oil to HP Governing valve pressure
- LP Secondary oil to LP Governing valves pressure.
- Trip oil Header pressure.
3.7 Primary instruments required for alarms trips and interlocks for STG integral portion (Realised in DCS)
3.8 Transmitters / Temperature elements for Remote Indication and Control for STG integral portion (Realised in DCS)

4. Safety Relief valves for controlled extraction line.

5. Control valves for Turbine Gland sealing steam supply, turbine gland steam dump, Wander Extraction Pressure (2 nos).
6. I/P Converters for all pneumatic control valves.
7. Calibration kit for transmitters.
8. GI instruments air supply lines.
9. Impulse lines along with fittings for instruments in pressure parts.

(J) TG Package Control:

Distributed Digital control system: STG and its auxiliaries including regulating controls, interlocks, operator interface units, interconnection cabling and requisite terminations encompassing the following systems:

1. Turbine controls (for STG and Auxiliaries) comprising of :
    a) Electronic system cabinets: 1 set of 3 panels – per TG
        (Catering to TG integral)
        - Electro hydraulic turbine control catering to speed control, load/frequency control, inlet pressure control, extraction pressure control, wanders extraction pressure control.
        - Turbine protection, including separate over speed trip (2 of 3).
        - Steam turbine integral interlock and protection.
    b) Electronic system cabinets : one suite of panels – per TG
        (Control catering to STG-BOP / regenerative cycle as below)
        - Main steam – flow , pressure, temp monitoring
        - Condenser–Level control, min. recirculation, level alarm
        - CEP Control– 2 nos.CEP Header pressure, temp indications.
        - MP Extraction line & header – flow , pressure ,temp monitoring.
        - LP Extraction line & header – flow, pressure, temp monitoring.
        - MP De-superheater + spray control – 2 nos.
        - LP De-superheater + spry control – 2 nos.
        - Aux steam PRDS – 1 No.
        - Aux steam to GCS , Dearator, Steam, steam ejector, gland steam
    c) Common system for both turbines : one suite of 2 panels
        (Catering to common control system for 2 turbines as below)
        1. Cooling tower consisting of
            - Level control, level alarms

- CW Pump control – 4 nos.
- ACW pump controls – 4 nos.
- CW makes up pump control – 2 nos.
- De-superheaters spray water booster pump control- 2 nos.
- Inst air compressor monitoring (control in local panel) – 2 nos.

2. Electrical controls
(Approximate I/O Count: DI = 150 Nos DO = 60 Nos.
AI = 20 NOS.)

d) Vertical panel for mounting TSI Rack : 1 set.

1. Man Machine Interface : 1 set
(Common for all 2 TG and its auxiliaries)
   - Operator stations: 2 nos.
   - Engineering station; 1 no.
   - Historian: 1 no.
   - Max LINK Station: 1 no.
   - Colour LaserJet printer (a4) :1 no.
   - Laser printer A3/A4 (B&W):1 no.
   - Dot matrix printer (132) col):2 no.
   - Turbine emergency trip PB: 2 nos.
   - Ethernet switches :1set
   - TCP / IP cables :1 set
2. Instrumentation / cable for TG package comprising of : 2set.
   - ST on base instrument to Field JBs.
   - Instrument of ST auxiliaries to field JBs.
   - Field JBs of TG to Electronic system cubicles.
3. Digital Automatic Voltage Regulator for: 2 nos.
   (Brush less excitation of generator (1 auto 1 manual configuration)

(k) Balance of plant piping & Equipment. :

1. Turbine Exhaust hood spray piping from terminal point to turbine.
2. Thermal insulation required for the piping in scope

(L) Balance of plant Equipment – Mechanical.

1. COOLING WATER SYSTEM

a. Main cooling water pumps with drive motor for condenser.
b. Auxiliary cooling water pumps.
c. CT make –up water pumps .
d. RCC cooling tower with 3 cells.

2. CONDENSATE SYSTEM

a. CEPs – 2 nos for each unit.

3. COMPRESSED AIR SYSTEM

a. Reciprocating Air compressors (2W +1S)
b. Air drlers.
c. Air receiver.

4. MAINTENANCE EQUIPMENT

a. EOT crane 70/20T
b. Hoist for CW Pumps
c. Hoist for reciprocating compressors.

5. PIPING

a. Piping,valves and fittings, insulation and supports for BOP + integral piping

(M) Balance of plant Equipment –Electrical

S.no.	Description	Qty
1.	HT(11kV) VCB switchgear consisting of Generator breaker panels ,copper bus bars ; breaker ratings 3000Amps, fault rating 26.24 kA for 1 sec.	2 nos
2	LV (400V) switchgear : STG MCC 400V, 50Hz,50kA for 1 sec cu bus bars with microprocessor based protection relays for incomers in single front modular panels execution	2 set
3	LV (400V) switchgear : BOP MCC 400V, 1250A, 50Hz,50kA for 1 sec cu bus bars with microprocessor based protection relays for incomers in single front modular panels execution for CWP's, compressors, etc BOP load	1 set

4	110V DC System : 110V DC battery system consisting of 110V, 55cells, 400Ah lead acid tubular battery bank and FC + FCBC thyristorised battery charger and other standard maintenance accessories.	1 set
5	110V DC distribution board with Cu bus bars, 25kA for 1 sec, with MCCB incomers & MCB outgoing feeders in non-draw out fixed type execution, and DC starters for DC ELOP	1 set
6	HT(11kV) Cu conductor XLPE armoured cable with cable kits (Maximum cable distance between Generator & HT swgr considered 50 mtrs)	1 set
7	Weather Proof sheet steel Local control push button stations with/without ammeters	1 lot
8	LT power 1.1kV, PVC/XLPE insulation, Cu conductor armoured cable & cable accessories	1 set
9	LT control 1.1kV, PVC/FRLS insulation, Cu conductor armoured cables & accessories	1 set
10	Above ground earthing material for equipment grounding (GI strip min 120sqmm)	1 set

(N) Balance of Plant Equipment – Control & instrumentation

S.no	Description	Qty
1.	Pressure, temp, level & flow for monitoring -MS Steam line -Condenser level -CEP discharge header upto Dearator Hot well inlet -Desuperheater spray water booster line upto desuprheaters -Cooling water line from cooling tower to condenser & return	1 lot

	-IP (8 BAR) & LP (2.8 BAR) Extraction line -pressure, temp, flow monitoring	
2.	Signal ,RTD & Thermocouple cable up to field JB for BOP Scope	1 sets
3	Instrument hook up material for BOP Instruments	1 sets

4	Desuperheaters: - Desuperheater to IP steam extraction (8 bar) – 3 nos - Desuperheater to LP steam process (2.3 bar) – 3 nos - Aux steam PRDS – 1 no	1 lot
5	Control valve for with pnematic positioner & I/P converter : 1.Condenser level control- 1 no 2.condenser min. recirculation – 1 no 3.Pressure , contol for aux steam for steam ejector,GSC, D'rator. – 1 no 4.Desuperheater spray control valve – As required	1 sets

TECHNICAL CONDITIONS OF CONTRACT (TCC)
Annexure-II:
Tentative Weight Details and Dimensions of Major Equipments For Each Unit

SL	DESCRIPTION	PKG.SIZE(MM)	GR.WT IN MT	REMARK
A	**Steam Turbine & Auxiliaries**:			
1	Steam turbine	L5500 x B4000 x H4000	47	
2	Gear Box	L2000 x B2100 x H2200	11	
B	**Oil Supply System Aux,Pumps and other Auxiliaries :**			
1	Lube oil tank	L3450 x B2500 x H2500	4.65	
2	Over head tank	2625(Diameter) x H2100	2	
3	L.O.P	L2200 x B920 x H800	1.2	
4	E.O.P	L2000 x B750 x H700	0.7	
5	J.O.P	L1000 x B800 x H700	0.2	
6	Filter	L1700 x B800 x H1700	0.41	
7	Centrifuge	L1500 x B1250 xH1100	1.4	
8	Accumulator	L1000 x B500 x H2275	0.585	
C	**Surface Condenser**:	L7300 x B3000 x H3500	38	
D	**Steam Jet Air Ejector:**	L6000 x B1900 x H2300	7.1(EACH)	2 nos.
E	**Gland steam Condenser:**	Dia 406 x L 2500	1.4	1 No
F	**ST Oil Cooler :**	Dia 750 x L 3500	4.1(each)	2 nos.
G	**Generator and Auxiliaries:**			
1	Generator package	L6500 x B3100 x H3150	50.6	
2	Air cooler duct	L6000 x B1700 x H2400	6.1	
3	Air cooler elements (6 nos)	L3000 x B670 x H630	5.1	
4	Foundation items	loose items	7	
5	Generator control panel	L1000 x B1000 x H2355	1	
6	Generator Relay panel	L1000 x B1000 x H2355	1.5	
7	Bus duct	L35000 x B1400 x H400	7	
8	NGE Cubicle	L1500 x B2500 x H1500	2	
9	PT . SP Cubicle	L2500 x B2000 x H2800	3	

H	**ST Generator Air Cooler**	L4200 x W620 x H 440	0.96 (each)	6 nos

TECHNICAL CONDITIONS OF CONTRACT (TCC)
Annexure-II:
Tentative Weight Details and Dimensions of Major Equipments For Each Unit

(I) Control & Instrumentation for STG & Integral portion :

EXHIBIT – I (DETAILED SCOPE) : The scope of supply consists of erection , Calibration, testing, loop checking & commissioning.

AA. LOCAL / FIELD MOUNTED INSTRUMENTS AND DEVICES:.

Sl.No.	ITEM DESCRIPTION	ERECTION QTY (Nos)	CALIBRATION QTY (Nos)	REMARKS
1.	Pressure gauges.	26	40	Refer documents: TD900223 TD900984 TD901093 TD801296 IN901019
2.	Pressure switches	22	31	
3.	Differential pressure indicator	1	1	
4.	Differential pressure switches	1	1	
5.	Temperature Gauges	14	19	
6.	Thermocouple(K-type)	6	6	
7.	Bearing thermo elements(RTD 3 WIRE PT-100)	14	14	
8.	RTD	2	2	
9.	Thermo wells	35	35	
10.	Level gauges	3	3	
11.	Smart pressure Transmitter	13	13	
12.	Diffl pressure Transmitter	4	4	
13.	Level switches	3	3	
14.	Vibration, Axial displacement and speed probes	22	22	
15.	proximitors	16	16	
16.	Safety relief valve	1	1	
17.	Control valves(with I/P converter, position transmitter and limit switches)	4	4	
19.	Solenoid valves	1	6	

Sl.No.	ITEM DESCRIPTION	ERECTION QTY (Nos)	CALIBRATION QTY (Nos)	REMARKS
20.	***Panel mounted instruments***			
	TURBOVISORY MONITORING RACK	1	1	Bently Nevada 3500 series

BB. PANELS AND CUBICLES:

Sl.No.	ITEM DESCRIPTION	DIMENSION	QTY.	REMARKS
1.	LOCAL GAUGE BOARD	1425 x 1600(mm) w x h	1	
2.	GOVERNING CONSOLE BOARD	1300 x 1600(mm) w x h	1	

CC .FABRICATION,ERECTION OF STRUCTURE STEEL:

Sl.No.	ITEM DESCRIPTION	LENGTH (meters)	QTY.	REMARKS
a.	CHANNEL100x50mm, 1700mm	10		REF DOC: TD501614
b.	ANGLE50x50x 6mm, 1550mm	30		
c.	SHEET 4mm THICK (400 x120mm)	60		
d.	PLATE 10mm thick (375 x 770mm)	10		

DD. PROCESS IMPULSE TUBING AND PNEUMATIC TUBING FITTINGS

Sl.No.	ITEM DESCRIPTION	QTY(MTS)	REMARKS
1.	CS PIPE 21.3 x 3.73	400	REFER DOCUMENT: TD501614 & TD301058
2.	Cr-Mo PIPE 21.3 x 3.73	550	
3.	SS TUBE 12.7 x 2.1.	400	
4.	SS PIPE 60.3 x 2.8	100	
5.	SS PIPE 6.35 x 0.9	60	
6.	SS PIPE 21.3 x 2.8	30	

EE. LOOP CHECKING:

Sl.No.	ITEM DESCRIPTION	NO. 0F LOOPS	REMARKS
1.	PNEUMATIC.	4	.
2 .	ELECTRICAL	100	

FF. SCOPE OF WORK OF C&I ERECTION COTRACTOR

NOTES:

1. Clamping material ,identification ferrules, tags,U clamps, bolts, nuts required for laying Pneumatic Tubing & Process impulse piping are not supplied by BHEL. The same are to be supplied by erection contractor.
2. Erection, calibration, testing and commissioning for all C&I items are enumerated under scope of supply in this document. (which are in the scope of supply of T&C engg of BHEL-Hyderabad).
3. Erection of instruments shall include fabrication of instrument stands and hardware like nuts & bolts for mounting instruments on to stands.
4. Cable laying shall include drilling of gland holes, fixing of cables, glands, tagging, ferruling, termination & continuity checking. Consumables like aluminium tags, lugs and ferrules shall be supplied by the erection contractor.
5. Rack erection & testing shall include chipping, levelling, grouting and small modifications, if any, and removal of instruments for calibration and refixing.
6. TSI proximator and probes erection shall include proximator housing erection, support tube erection and protective flexible conduit erection.
7. Impulse Tubes & Piping erection shall include hydraulic test.
8. The necessary tools and accessories like clamping, material identification tags, ferrules, supports, U clamps, bolts, nuts etc. required for laying pneumatic tubing process Impulse piping and cables are not supplied by BHEL. The same are to be supplied by erection contractor.

J) TG Package Control:

S.no	Equipment Description	Dimensions (W X H X D) in mm without packing. Add 10% for packing in MM	No of packages	Unit Wt in Kgs - Gross	Lot Wt in Kgs - Gross
1	TG Controls	2000 X 2345 X 400	10	1100	11000
2	DCS- BOP	2000 X 2345 X 400	4	1100	4400
3	Digital Automatic Voltage Regulator	1250 X 2295 x 1250	2	700	1400
4	HMI System	1000 X 2345 X 400	1	400.00	400
5	HMI Computers	2500 X 2000 X 1500	1	600.00	600

(K) PIPE QUANTITIES:

S.No	Description
a	66 bar (a) pressure steam line - complete piping with all valves from steam distribution header to turbine inlet.
b	8 bar (a) steam line - 50 meters of pipe outside power house from 2.6 bar(a) header including stop valves, desuperheater and 8 bar(a) header.
c	2.6 bar (a) steam - 50 meters of pipe outside power house from 2.6 bar (a) header including stop valve, desuperheater and 2.6 bar(a) header.
d	0.14 bar (a) pressure steam piping
e	Tappings fro H.P line to inlet of ejectors.
f	Tapping for H.P. line to gland sealing and from gland sealing to gland condenser outlet.
g	H.P pipe line from steam distribution header to inlet of turbine.
h	M.P pipeline from turbine uncontrolled extraction to M.P header
i	L.P pipiline from turbine controlled extraction to L.P header
j	M.P header
k	LP header
l	Condensate piping
m	De- superheating water piping.
n	Compressed air piping
o	Bearing cooling water piping

p	Turbo -alternator condenser cooling water piping.
q	General usage water
r	Drain water

(L) Balance of plant Equipment – Mechanical:

SL.No	Equipment Description	Qty	Dimension each	Unit Weight each	Total weight
		No	LxBxH (m)	Tons	Tons
1	**Cooling water system**				
a.	Main cooling water pumps with drive motor for Condenser	4	4.0 x 1.5 x 1.5	2	8
b.	Auxiliary ooling water pumps	2	2.0 x 1.0 x 1.0	2	4
c.	CT make - up water pumps	2	1.5 x 1.0 x 1.0	1.5	3
e.	RCC Cooling tower with 3 cells	1	45.0 x 20.0 x 14.0	1	
2	**Condensate system**				
a.	CEPs -2 nos for each Unit	4	0.6 x 0.6 x 4.5	2	8
3	**Compressed Air system**				
a.	Reciprocating Air compressors(2 W+1 S)	3	3.5 x 2.0 x 3.5	6	18
b.	Air driers	2	2.5 x 3.0 x 1.5	2	4
c.	Air receiver	1	Dia 1.5 x 4.0	0.5	0.5
4	**Maintenance Equipment**				
a.	EOT Crane 70/20 T	1	TG Hall span 27 m;Length of TG Hall 43 m(after assembly at site)		70
b	Hoist for CW pumps	1			5
c	Hoist for Reciprocating Compressors	1			5
5	**Piping**				
6	Piping, Valves and fittings,insulation and supports for BOP + integral piping				

Note:

1. All pipes shall be supplied in available commercial lengths. Bidder shall consider the edge preparation, cutting of pipes as per requirement and stub welding to pipes as per isometric drgs in their scope.

(M) Balance of Plant Equipment Electrical:

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Annexure-II:

Tentative Weight Details and Dimensions of Major Equipments For Each Unit

SNo	Description	Unit Weight in kg	Dimension (LxDxH) mm	Make	Qty	Remarks
1.	HT(11kV) switchgear consisting of two VCB type breaker panels (2 Generator incomers with PT), copper bus bars ; breaker ratings 1600Amps, bus rating 1600Amps, fault rating 31.5kA for 0.5 sec.	1200k.g. per Panel	2460wx2355dx 2700h; 3500kgs	**	1 set	Erection and Commissioning by PSR
	LV (400V) switchgear : Common MCC 400V(for two STG sets, BOP TG hall loads), 2000A, 50Hz,50kA for 1 sec cu bus bars with microprocessor based protection relays for incomers in single front modular panels execution	900k.g. per Panel	13710wX1350dX 2460h;	**	1 set	Erection and Commissioning by PSR Total wt: 13500 kg
	LV (380V) switchgear : BOP &CWMCC 400V(for BOP loads inclusive of CW system loads, MCC located at CT pump house), 2000A, 50Hz,50kA for 1 sec cu bus bars with microprocessor based protection relays for incomers in single front modular panels execution	900 k.g. per Panel	12240wx1710dx 2460h;	**	1 set	Erection and Commissioning by PSR Total wt:11700 kg
	LV (380V) switchgear : 110VDCDB (for DC loads), 2000A, 50Hz,50kA for 1 sec cu bus bars with microprocessor based protection relays for incomers in single front modular panels execution	900 k.g. per Panel	4050wx510dx 2460h;	**	1 set	Erection and Commissioning by PSR Total wt: 4500 kg
2.	110V DC System : 110V DC battery system consisting of 110V, 55cells, 2500Ah lead acid tubular battery bank with battery racks and other standard maintenance accessories.	.	4000lx800dx1750 h; 12500kgs	**	1 set	Each cell wt 200kgs approx.

3.	110V DC System : 110V DC battery charger system consisting of SCR type dual FCBC (off line boost charger) 600A charger , DC distribution board with Cu bus bars, 10kA for 1 sec, with MCCB incomers & 15nos. MCB outgoing feeders in non-draw out fixed type execution, and DC starters for DC ELOP	.	5600wx900dx 2400h; 4500kgs	**	1 set	
4.	Weather Proof sheet steel Local control push button stations with/without ammeters		180x300x125; 5.0kg per unit	**	1 lot	

LT POWER CABLE PACKAGE

Sl. No.	Cable Description	Cable Type	Length in Mtrs.	Make	Unit Weight
1.	1.1KV Armoured Cu. Conductor XLPE/PVC Insulated, FRLS outer sheathed.	3CX2.5 sq.mm	2000	**	525 kg/km
2.	1.1KV Armoured Cu. Conductor XLPE/PVC Insulated, FRLS outer sheathed.	3CX16 sq.mm	4000	**	1112 kg/km
3.	1.1KV Armoured Cu. Conductor XLPE XLPE/PVC Insulated, FRLS outer sheathed.	3CX50 sq.mm	2500	**	2272 kg/km
4.	1.1KV Armoured Cu. Conductor XLPE XLPE/PVC Insulated, FRLS outer sheathed.	3CX95 sq.mm	1000	**	4092 kg/km
5.	1.1KV Armoured Cu. Conductor XLPE XLPE/PVC Insulated, FRLS outer sheathed.	4CX2.5 sq.mm	3000	**	620 kg/km
6.	1.1KV Un-armoured Cu. Conductor XLPE/PVC Insulated, FRLS outer sheathed.	4CX4 sq.mm	3000	**	641 kg/km
7.	1.1KV Un-armoured Cu. Conductor XLPE/PVC Insulated, FRLS outer sheathed.	3CX185 sq.mm	4000	**	7713 kg/km

TECHNICAL CONDITIONS OF CONTRACT (TCC)
Annexure-II:
Tentative Weight Details and Dimensions of Major Equipments For Each Unit

CONTROL & SIGNAL CABLES PACKAGE

Sl. No.	Cable Description	Cable Type	Length in Mtrs.	Make	Unit Wt.
1.	1.1kV CU PVC Insulated FRLS Outer Sheathed.	3C x 2.5 Sq. mm	5000	**	500 kg/km
2.	1.1kV CU PVC Insulated FRLS Outer Sheathed.	7C x 1.5 / 2.5 Sq. mm	2000	**	800 kg/km
3.	1.1kV CU PVC Insulated FRLS Outer Sheathed.	12C x 1.5 / 2.5 Sq. mm	2000	**	1000 kg/km
4.	1.1kV CU PVC Insulated FRLS Outer Sheathed.	16C x 1.5 / 2.5 Sq.mm	2500	**	1200 kg/km
5.	1.1kV CU PVC Insulated FRLS Outer Sheathed.	10CX2.5 sq.mm cu	10000	**	900 kg/km

Note:

1. The Cable glands are double compression type made of Nickel plated brass.
2. Cable lugs are of tinned copper suitable for termination of different cross sections of HT/LT/ Control cables. Lugs for power cables shall be of compression type whereas control/signal cables shall be of crimping type.

PRE FABRICATED CABLE TRAYS AND ACCESSORIES

Sl. No.	Description	Quantity	Make	Unit Wt. (kg)
1.	Ladder type cable tray, W=600mm.	500	**	10
2.	Ladder type cable tray, W=300mm.	1500	**	10
3.	Horizontal TEE of 450mm bending radius with coupler plates for Ladder Type Cable tray, w=300mm	10	**	40
4.	Horizontal TEE of 900mm bending radius with coupler plates for Ladder Type Cable tray, w=600mm	5	**	40
5.	Horizontal Elbow of 600mm bending radius with coupler plates for Ladder Type Cable tray, w=300mm	5	**	20
6.	Vertical Elbow – Up of 600mm bending radius with coupler plates for Ladder Type Cable tray, w=300mm	10	**	25
7.	Vertical Elbow – Down of 600mm bending	5	**	

	radius with coupler plates for Ladder Type Cable tray, w=300mm			25
8.	Horizontal Cross of 600mm bending radius with coupler plates for Ladder Type Cable tray, w=300mm	3	**	55
9.	Perforated type cable tray, w=150mm.	750	**	10
10.	Perforated type cable tray, w=50mm.	500	**	5
11.	Cover for Perforated type Cable Tray, W=50mm	300	**	5
12.	Horizontal TEE of 600mm bending radius with coupler plates for Perforated Type Cable tray, w=300mm	5	**	10
13.	Horizontal TEE of 900mm bending radius with coupler plates for Perforated Type Cable tray, w=600mm	5	**	30
14.	Horizontal Elbow of 600mm bending radius with coupler plates for Perforated Type Cable tray, w=300mm	5	**	7.5
15.	Horizontal Elbow of 900mm bending radius with coupler plates for Perforated Type Cable tray, w=600mm	3	**	20
16.	Vertical Elbow – Up of 600mm bending radius with coupler plates for Perforated Type Cable tray, w=300mm	5	**	7.5

STRUCTURAL STEELS

Sl.no	Description	Quantity (K.gs)	Unit Wt. per kG (kg)
1.	ISMC 100x50x6 mm Channels	500	9.2
2.	ISA 50x50x6 mm Runner angles	1200	4.5

Note:

1. These materials are supplied for site to make supports for cable trays (in the buried RCC trenches, Overhead tray arrangement on pipe racks and Cable Tray arrangement in Cellars & other arrangements as applicable for the project. Also these are required for making of frames for PB stations and junction boxes as per the project requirements.
2. All steel structure used for electrical installation shall be painted with one coat of Red Oxide Zinc Chromate Primer of approved shade for indoor installations.

PLANT EARTHING MATERIALS

Sl. No	Description	Quantity (in mtrs)	Make	Remarks
1.	50 x 6 mm Cu Strip	3500	**	For above ground equipment earthing.
2.	1cx120sqmm PVC Cu cable	2500	**	---do---
3.	1cx50sqmm PVC Cu cable	3500		---do---
4.	1cx35sqmm PVC Cu cable	5000		---do---
5.	1cx6sqmm PVC Cu cable	8000		---do---

(N) Balance of Plant Equipment – Control & Instrumentation:

TECHNICAL CONDITIONS OF CONTRACT (TCC)
Annexure-II:
Tentative Weight Details and Dimensions of Major Equipments For Each Unit

1.0 List of Items to be Procured, Erected & Commissioned by Erection Contractor

Sl. No.	Item Description	Applicability (Note1)	Quantity	Remarks
1	Cable Glands (Non –ex proof), Double compression, Ni coated brass/SS.			
	Size- ½" (Weight:200gm/item)	Y	500	
	Size- ¾" (Weight:300gm/item)	Y	300	
	Size-1" (Weight:400gm/item)	Y	300	
	Size-1-1/4" (Weight:500gm/item)	Y	200	
	Size- 1-1/2" (Weight:650gm/item)	N	400	
	Size- 2" (Weight:800gm/item)	N	200	
2	Cable Glands (Ex- proof)), Double compression, Ni coated brass/SS.			
	Size- ½" (Weight:400gm/item)	Y	-	
	Size- ¾" (Weight:600gm/item)	Y	-	
	Size-1" (Weight:700gm/item)	Y	-	
	Size-1-1/4" (Weight:850gm/item)	Y	-	
	Size- 1-1/2" (Weight:950gm/item)	N	-	
	Size- 2" (Weight:1100gm/item)	N	-	
3	Tinned Cable Lugs at both ends			
	Size- for 0.5 mm2 cable (Weight:50gm/item)	Y	3000	
	Size- for 1 mm2 cable (Weight:75gm/item)	N	2000	
	Size- for 1.5 mm2 cable (Weight:100gm/item)	Y	4000	
	Size- for 2.5 mm2 cable (Weight:200gm/item)	Y	2500	
4.	PVC Cable Gland shrouds (covers) (Weight:20gm/item)	Y	As per cable glands	
5	Cable ferruling numbers & characters (Weight:2gm/item)	Y	As required	
6.	Name plates/Tag plates with tying/fixing material for cable's both end & filed instruments (Weight:300gm/item)	Y	1500	@ 100 meters per run of cable
7	Cable Markers (Weight:2gm/item)	Y	10000	@ 100 meters per run of cable
8	Cable Supporting channels/angles (MS) with clamps, from JB to instrument (Weight:4Kg/meter)	Y	500	@25 meters from JB to each inst.
9	2" GI pipe for transmitter and JB mounting (Weight:3Kg/1.5 meter)	Y	1200 Mts	@1.5 meter per transmitter
	2" Pipe Caps (Weight:300gm/item)		500	
	2" GI pipe Elbow (Weight:500gm/item)		500	

10	MS angle iron- 50x50x6 mm for panel base frame & its site fabrication (Weight:4.5Kg/meter)	Y	10 Mts/Panel	As per no of panels
11	MS angle iron- 50x50x6 mm for JB mounting & its site fabrication (Weight:4.5Kg/meter)	Y	4mts/JB	For 30 JB's
12	Impulse line supporting clamps for			@ interval of ¼ meter.
	Pipe-3/4" (Weight:300gm/item)	Y	3000	
	Pipe-1/2" (Weight:200gm/item)	Y	3000	
	Tube-1/4" (Weight:100gm/item)	Y	1500	
13	Laminated JB Terminal Drawing	Y	Qty same as JB's	@ 2 copies per JB
14	Sheet 2mm TH for Canopy for transmitters, MS (Weight:5Kg/meter)	Y	30m x 1m	
15	Gusset Plates (6mm TH) 200mm x 80mm, MS (Weight:6Kg/meter)	Y	1000	
16	Base Plates (6mm TH) 250mm x 250mm, MS (Weight:9Kg/meter)	Y	500	
17	Sheet 2mm TH for Canopy for transmitters, MS (Weight:5Kg/meter)	Y	30m x 1m	
18	40x40x4 mm Angle, MS (Weight:3.5Kg/meter)	Y	500m	
19	35x35x4 mm Angle, MS (Weight:3Kg/meter)	Y	500m	
20	100x50 mm Channel, MS (Weight:5Kg/meter)	Y	100m	
21	6mm TH plate, MS (Weight:2Kg/meter)	Y	20m x 20m	
22	50 x 6 mm Flat, MS (Weight:4Kg/meter)	Y	100m	
23	Nuts & Bolts, Clamps (Weight:100Kgs)	Y	3500	
24	Cable Fastening Material (Weight:20Kgs)	Y	2000	

2.0 Items to be Supplied by PED(C&I) and Erected & Commissioned by Erection Contractor

2.1 Instrumentation Package

S No.	Description	Qty
1	Control valves (Approx weight 80 kgs/valve)	20
2	Desuperheaters (Approx weight 100 kgs/item)	5
3	Turbine Bypass system(Approx weight 130 kgs/item)	2

4	Pressure Safety valves (Approx weight 75 kgs/valve)	8
5	Thermal Safety valves (Approx weight 75 kgs/valve)	6
6	Flow orifice plates (Approx weight 80 kgs/item)	10
7	Flow nozzles (Approx weight 80 kgs/item)	8
8	Mass flow meters (Weight:5Kg/item)	-
9	Pressure gauges (Weight:1.5Kg/item)	40
10	Pressure transmitters (Weight:7Kg/item)	30
11	Pressure switches (Weight:5Kg/ item)	20
12	Diff. pressure gauges (Weight:5Kg/ item)	10
13	Diff. pressure transmitters (Weight:7Kg/ item)	25
14	Diff. pressure switches (Weight:5Kg/ item)	10
15	Temperature gauges (Weight:1Kg/ item)	40
16	RTDs (Weight:2Kg/ item)	15
17	Thermo couples (Weight:2Kg/ item)	20
18	Level gauges (Weight:15Kg/ item)	20
19	Level transmitters (Displacer Type) (Weight:5Kg/ item)	10
20	Level switches (Weight:3Kg/ item)	20
21	Annubars (Weight:30Kg/ item)	3
22	Handheld Calibrator (Weight:750gm/ item)	2
23	Instrument canopies (Weight:10Kg/ item r)	300
24	Erection material for above items	
	(i) ~~needle/~~ globe valve (Weight:2Kg/ item)	150
	(ii)comp & con. Fittings (Weight:300Kgs)	LOT
	(iii) condensing chambers (Weight:2Kg/ item)	50
	(iv) Syphon (Weight:1Kg/ item)	40
	(v) 5 way manifolds (Weight:500gm/item)	25
	(vi) Air filter regulators (Weight:2Kg/ item)	20
	(vii) Thermowells (Weight:1Kg/ item)	70
25	Impulse pipes &tubes for impulse connection for instrument hookup	
	(i) SS tube 12.7 x 2.1 mm (Weight:200gm/meter)	600m
	(ii) SS tube 6.35 x 0.9 mm (Weight:100gm/meter)	200m
	(iii) ERW / SAW Steel tube 60.8 x 3.65 (NB 50) (Weight:500gm/meter)	1200m
	(iv) SS pipe 33.4 x 3.4 mm (Weight:750gm/meter)	500m
	(v) SS pipe 21.3 x 3.7 mm (Weight:500gm/meter)	200m
	(vi) SS pipe 6 x 1 mm (Weight:1000gm/meter)	200m
26	STRL Steel (Std Quality)	
	(i) Strl ST equal angle 50 x 50 x 6 (Weight:4.5Kg/meter)	300 Nos
	(ii) Strl St channel 100 x 50 (Weight:2Kg/meter)	200 Nos
	(iii) Strel St PL 6 (Weight:2Kg/meter)	50 Nos

2.2 Cables Package

S No.	Description	Qty
1	**Signal Cables**	
	1P x 1.5 sq.mm,Individual & Overall shielded (Weight:500gm/meter)	6000m
	1T x1.5 sq.mm,Individual & Overall shielded (Weight:500gm/meter)	4000m
	1P x 16 AWG Cr-Al Extension (Weight:500gm/meter)	4000m
2	**Junction Boxes**	
	60 terminals, weather proof (Weight:60Kg/item)	50No's

2.3 Analysers Package

Erection & Commissioning of analyzers is in Erection Contractor scope.

S No.	Description	Qty
1	CONDUCTIVITY ANALYZERS	1 SET
2	PH ANALYZERS (Weight:30Kgs)	1 SET
3	DISSOLVED OXYGEN ANALYZERS	1 SET

3.0 DCS Package

S No.	Description	Qty
1	Distributed Control System (DCS from M/s.BHEL-EDN)	1 SET
~~2~~	~~Interlock PLC's (BOP PLC from M/s SIEMENS)~~	~~1~~

NOTE:

Above weights & dimensions are tentative and may vary. All equipments & Aux. are to be handled & erected as dispatched from manufacturing units & received at site.

TECHNICAL CONDITIONS OF CONTRACT (TCC)
Annexure-III: SUMMARY OF TENTATIVE WEIGHT DETAILS OF SYSTEMS INVOLVED IN THIS TENDER SPECIFICATIONS FOR BOTH UNITS

Summary of Tentative Weight Details of Systems Involved in this Tender Specification for both unit.

WEIGHT DETAILS		
Sl.No.	**EQUIPMENT / PACKAGE**	**APPROX. WT. FOR BOTH UNITS (in MT)**
A	**Steam Turbine & Auxiliaries**:	116
B	**Oil Supply System Aux,Pumps and other Auxiliaries :**	23
C	**Surface Condenser**:	76
D	**Steam Jet Air Ejector:**	28.4
E	**Gland steam Condenser:**	2.8
F	**ST Oil Cooler :**	16.4
G	**Generator and Auxiliaries:**	167
H	**STG Air Coolers :**	11.52
I	**Control & Instrumentation for STG & Integral portion :**	
J	**TG Package Control**:	43
K	**Piping**	400
L	**Balance of plant Equipment – Mechanical**	140
M	**Balance of plant Equipment –Electrical**	83
N	**Balance of Plant Equipment – Control & instrumentation**	75
	TOTAL	**1182.12**
	Rounded of:	**1200.00**