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NOTICE INVITING TENDER

(Document No PS:MSX:NIT)

Bharat Heavy Electricals Limited

Ref: **BHEL/ NR/SCT/ BHEL/ NR/SCT/VYASI /HTG/1046**
Date: 14/12/2016

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NOTICE INVITING E-TENDER (NIT)
BIDDER TO SUBMIT OFFERS ON PORTAL
https://bheleps.buyjunction.in

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To

Dear Sir/Madam

Sub : NOTICE INVITING E-TENDER

Sealed offers in two part bid system are invited from reputed & experienced 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. **Salient Features of NIT**

SL NO	ISSUE	DESCRIPTION	
i	**TENDER NUMBER**	**BHEL/ NR/SCT/ BHEL/ NR/SCT/VYASI /HTG/1046**	
ii	**Broad Scope of job**	ERECTION & COMMISSIONING WORK OF HYDRO TURBINE GENERATOR (HTG) PACKAGE INCLUDING BOPs AND MATERIAL HANDLING WORK OF RECEIPT & UNLOADING OF PLANT MATERIALS AT BHEL STORES/WORK SITE, LOADING OF MATERIALS FROM BHEL STORES ,LOCAL TRANSPORTATION FROM BHEL STORES TO POWER HOUSE/WORK SITE ,PERFORMANCE TESTING AT SITE,FINAL PAINTING OF EQUIPMENTS AT SITE AND HANDING OVER TO CUSTOMER. AT BHEL 2X60MW VYASI HEP SITE, DISTT. DEHRADHUN , UTTRAKHAND	
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**	**From BHEL website (www.bhel.com) and** ***https://bheleps.buyjunction.in*** Tender documents will be available at website till due date of submission	*Applicable*
v	**DUE DATE & TIME OF OFFER SUBMISSION**	***Date : 04/01/2017 , Time : 15:00_ HRS*** ***Place : on https://bheleps.buyjunction.in***	*Applicable*

vi	**OPENING OF TENDER**	***At due date / time*** ***Date : 04/01/2017 , Time :15:30 HRS*** *Notes:* *(1) In case the due date of opening of tender becomes a non-working day, then the due date & time of offer submission and opening of tenders get extended to the next working day.* *(2) Bidder may depute representative to witness the opening of tender.* ***However it being an e-tender it shall be opened online***	*Applicable*
vii	**EMD AMOUNT**	***Rs 10,18,000/-.***	*Applicable*
viii	**COST OF TENDER**	***Rs 2000/-.***	*Applicable*
ix	**LAST DATE FOR SEEKING CLARIFICATION**	***Five days before bid submission due date****.* *Along with soft version also, addressing to undersigned & to others as per contact address given below*	*Applicable*
x	**SCHEDULE OF Pre Bid Discussion (PBD)**		*Not applicable.*
xi	**INTEGRITY PACT & DETAILS OF INDEPENDENT EXTERNAL MONITOR (IEM)**	*Shri D.R.S Chaudhary, IAS (Retd.)* *E-1/164 Arera Colony* *Bhopal 462016* dilip.chaudhary@icloud.com	*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) & portal https://bheleps.buyjunction.in **and not in the newspapers**. Bidders to keep themselves updated with all such information	
xiii	**Tender submission**	on portal https://bheleps.buyjunction.in	

2. 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, **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. 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 Noida 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 Noida, Sundays and second/ last Saturdays.

   As this tender is an E-Tender and no paper bids will be accepted therefore the scanned copy of the Demand Draft or the Cash Receipt issued by BHEL PSNR should be uploaded in the E procurement portal. Hard Copy of the demand draft should reach BHEL PSNR HQ Noida before the due date and time of bid submission. BHEL shall not be responsible for postal or any other delays in this regard.

4. Unless specifically stated otherwise, bidder shall deposit EMD through Cash Deposit (as permissible under the extant Income Tax Act) (before tender opening), Electronic Fund Transfer credited in BHEL account (before

Tender Opening) or Banker's Cheque/ Demand Draft/ Pay Order in favour of Bharat Heavy Electricals Ltd, payable at Noida (along with offer).

'One Time EMD' will not be considered for this tender. All the bidders who have 'One Time EMD' with BHEL and want to participate in this tender, would also submit the requisite amount of EMD as mentioned in Clause No. 1, Salient Features of NIT, Sl. No. (vii) above.
However, the One Time EMD can be adjusted against the EMD applicable against this tender on specific request of bidder.

For Electronic Fund Transfer the details are as below-:

a) **Name of the Beneficiary** -: Bharat Heavy Electricals Limited

b) Bank Particulars

i).	Bank Name -:	STATE BANK OF INDIA
ii).	Bank Telephone No.(with STD code)-:	011-23352180
iii).	Branch Address-:	CAG BRANCH, NEW DELHI
iv).	Bank Fax No. (with STD code) -:	011-23353101
v).	Branch Code -:	SBIN0009996
vi).	9 Digit MICR Code of the Bank Branch -:	110002201
vii).	Bank Account Number -:	10813608647
viii).	Bank Account Type -:	CASH CREDIT
ix).	11 Digit IFSC Code of Beneficiary Branch-:	SBIN0009996

(Note-: In case of E-Tenders, no paper bids shall be accepted, therefore, the scanned copy of the Banker's Cheque/ Demand Draft/ Pay Order/ Details of payment made through Electronic Fund Transfer should be uploaded in the E-Procurement Portal and hard copy of the same should reach BHEL-PSNR HQ Noida before the due date and time of bid submission. BHEL shall not be responsible for postal or any other delays in this regard.)

For other details please refer General Conditions of Contract.

5. **Procedure for Submission of Tenders**: This is an E-tender floated online through our E-Procurement Site **https://bheleps.buyjunction.in**. The bidder should respond by submitting their offer online only in our e-Procurement platform at https://bheleps.buyjunction.in. Offers are invited in two-parts only.

Documents Comprising the e-Tender

The tender shall be submitted online ONLY EXCEPT TENDER FEE & EMD (in physical form) as mentioned below:

a. Technical Tender (UN priced Tender)

All Technical details (eg. Eligibility Criteria requested (as mentioned below)) should be attached in e-tendering module, failing which the tender stands invalid & may be REJECTED. Bidders shall furnish the following information along with technical tender (preferably in pdf format):

- **i.** Tender Cost and Earnest money Deposit (EMD) furnished in accordance with NIT Clause 3.0 & 4.0. Alternatively, documentary evidence for claiming exemption as per clause 29 of NIT
- **ii.** Technical Bid (without indicating any prices).

b. Price Bid:

i. Prices are to be quoted in the attached Price Bid format online on e-tender portal.
ii. The price should be quoted for the accounting unit indicated in the e-tender document.
iii. Note: It is the responsibility of tenderer to go through the Tender document to ensure furnishing all required documents in addition to above, if any. Any deviation would result in REJECTION of tender and would not be considered at a later stage at any cost by BHEL.
iv. A person signing (manually or digitally) the tender form or any documents forming part of the contract on behalf of another shall be deemed to warrantee that he has authority to bind such other persons

and if, on enquiry, it appears that the persons so signing had no authority to do so, the purchaser may, without prejudice to other civil and criminal remedies, cancel the contract and hold the signatory liable for all cost and damages.

v. A tender, which does not fulfil any of the above requirements and/or gives evasive information/reply against any such requirement, shall be liable to be ignored and rejected.

vi. In case offer is sent through hard copy/fax/telex/cable/electronically in place of e-tender, same shall not be considered.

DO NOT"S

Bidders are requested NOT to submit the hard copy of the Bid. In case offer is sent through hard copy/fax/telex/cable/electronically in place of e-tender, the same shall not be considered. **Also, uploading of the price bid in prequalification bid or technical bid may RESULT IN REJECTION of the tender**.

Digital Signing of e-Tender

Tenders shall be uploaded with all relevant PDF/zip format. The relevant tender documents should be uploaded by an authorized person having Class 3- SHA2- 2048 BIT- SIGNING & ENCRYPTION digital signature certificate (DSC).

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The Requirement:

1. A PC with Internet connectivity &
2. DSC (Digital Signature Certificate)(**Class 3- SHA2- 2048 BIT- SIGNING & ENCRYPTION**)

BHEL has finalized the e-procurement service Provider-:

M/s M Junction services Limited, Kolkata

Godrej Water Side, 3rd Floor, Tower-1, Plot-V, Block - DP
Sector - V, Salt Lake, Kolkata-700091, West Bengal, INDIA

The contact details of the service provider are given below:

1. **First level:**
   - MJ Helpdesk : 033-66011717, eps.customercare@mjunction.in
2. **Second Level:**
   - Bhaskar Chakraborty: 8584008205, bhaskar.chakraborty@mjunction.in, eps.customercare@mjunction.in
   - Santosh Kumar: 9717149600, santosh.kumar@mjunction.in
3. **Third Level:**
   - Rimi Ghosh: 9650044156, rimi.ghosh@mjunction.in

1. Customer care Help Desk of M/s MJUNCTION SERVICES LIMITED, Kolkata:
   Tel ~ 033 - 66011717 (From 9.30 am to 5.30 pm),
   Mob - 91633 48283 - 86/ 85840 08116 (From 5.30 pm to 8.30 pm)
   HELPDESK email: eps.customercare@mjunction.in,
   The process of utilizing e-procurement necessitates usage of **DSC (Digital Signature Certificate)(Class 3- SHA2- 2048 BIT- SIGNING & ENCRYPTION)** and you are requested to procure the same immediately, if not presently available with you. Please note that only with DSC, you will be able to login the e-procurement secured site and take part in the tendering process.

2. The contact details of the DSC Certifying Authority as given below

1	**GNFC**	www.ncodesolutions.com
2	**e-Mudhra**	http://www.e-Mudhra.com

3	**Safescrypt**	www.safescrypt.com

Vendors are also requested to go through seller manual available on www.bheleps.buyjunction.in

6. **Not Used**

7. Deviation with respect to tender clauses and additional clauses/suggestions in Techno-commercial bid / Price bid shall NOT be considered by BHEL. Bidders are requested to positively comply with the same.

8. 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. **Assessment of Capacity of Bidders:**

Bidders capacity for executing the job under tender shall be assessed (with category of work as "R&M" for R&M tenders and "Non R&M" for Non R & M tenders as applicable), 'LOAD' wise and 'PERFORMANCE' wise as per the following.

I. **LOAD**: Load takes into consideration **ALL** the contracts of the Bidder under execution with BHEL Regions, irrespective of whether they are similar to the tendered scope or not. The 'Load' is the sum of the unit wise identified packages (refer Table-1) for contracts with BHEL Regions. The cut off month for reckoning 'Load' shall be the month, two (2) months preceding the month corresponding to the 'latest date of bid submission', in the following manner:

(Note: For example if latest bid submission is in Aug 2011, then the 'load' shall be calculated upto and inclusive of June 2011)

i). Total number of Packages
Total number of Packages in hand = P
Where
- 'P' is the sum of all unit wise identified packages under execution with BHEL Regions as of the cut off month defined above, including packages yet to be commenced, excepting packages which are on HOLD due to reasons not attributable to Bidder..

II. **PERFORMANCE**: Here 'Monthly Performance' of the bidder for all the packages (**under execution**/ executed during the 'Period of Assessment' in all the Power Sector Regions of BHEL) **SIMILAR** to the packages covered under the tendered scope, excepting packages not commenced shall be taken into consideration. The 'Period of Assessment' shall be 6 months preceding the cut off month. The cut off month for reckoning 'Period of Assessment' shall be the month two (2) months preceding the month corresponding to the 'latest date of bid submission', in the following manner:

(**Note**: For example if 'latest date of bid submission' is in Aug 2011, then the 'performance' shall be assessed for a 6 month period upto and inclusive of June 2011, for all the unit wise identified packages (refer Table I)

i). Calculation of Overall 'Performance Rating' for 'similar Package/Packages' for the tendered scope under execution at Power Sector Regions for the 'Period of Assessment':
This shall be obtained by summing up the 'Monthly Performance Evaluation' scores obtained by the bidder in all Regions for all the similar Package/packages', divided by the total number of Package months for which evaluation should have been done, as per procedure below:

a) $P_1, P_2, P_3, P_4, P_5, \ldots P_N$ etc be the packages (**under execution**/ executed during the 'Period of Assessment' in all Regions) **SIMILAR** to the packages covered under the tendered scope, excepting packages not commenced. Total number of similar packages for all Regions = $\mathbf{P_T}$ (ie $P_T = P_1 + P_2 + P_3 + P_4 + .. P_N$)

b) Number of Months 'T_1' for which 'Monthly Performance Evaluation' as per relevant formats, should have been done in the 'Period of Assessment' for the corresponding similar package P_1.

Similarly T_2 for package P_2, T_3 for package P_3, etc for the tendered scope. Now calculate cumulative total months '$\mathbf{T_T}$' for total similar Packages '$\mathbf{P_T}$' for all Regions (i.e $\mathbf{T_T} = T_1 + T_2 + T_3 + T_4 + .. T_N$)

c) Sum 'S_1 ' of 'Monthly Performance Evaluation' Scores ($S_{1\text{-}1}$, $S_{1\text{-}2}$, $S_{1\text{-}3}$, $S_{1\text{-}4}$, $S_{1\text{-}5}$,…. $S_{1\text{-}N}$) for similar package P_1, for the 'period of assessment' 'T_1' (i.e $S_1 = S_{1\text{-}1} + S_{1\text{-}2} + S_{1\text{-}3} + S_{1\text{-}4} + S_{1\text{-}5} + \ldots S_{1\text{-}N}$). Similarly S_2 for package P_2 for period T_2, S_3 for package P_3 for period T_3, etc for the tendered scope for all Regions. Now calculate cumulative sum 'S_T' of 'Monthly Performance Evaluation' Scores for total similar Packages '$\mathbf{P_T}$' for all Regions (i.e 'S_T'$= S_1 + S_2 + S_3 + S_4 + S_5 + \ldots S_N$.)

d) **Overall Performance Rating 'R_{BEHL}' for the similar Package/Packages** (**under execution**/ executed during the 'Period of Assessment') in all the Power Sector Regions of BHEL)**:**

$$= \frac{\text{Aggregate of Performance scores for all similar packages in all the Regions}}{\text{Aggregate of months for each of the similar package for which performance should have been evaluated in all the Regions}}$$

$$= \frac{S_T}{T_T}$$

e) Bidders to note that the risk of non evaluation or non availability of the 'Monthly Performance Evaluation' reports as per relevant formats is to be borne by the Bidder

f) Table showing methodology for calculating 'a', 'b' and 'c' above

Sl no	Item Description	Details for all Regions							Total
(i)	(ii)	(iii)	(iv)	(v)	(vi)	(vii)	(viii)	(ix)	(x)
1	Similar Packages for all Regions → (under execution/ executed during period of assessment)	P_1	P_2	P_3	P_4	P_5	…	P_N	Total No of similar packages for all Regions = $\mathbf{P_T}$ ie Sum (Σ) of columns (iii) to (ix)
2	Number of Months for which 'Monthly Performance Evaluation' as per relevant formats should have been done in the 'period of assessment for corresponding similar Package (as in row 1)	T_1	T_2	T_3	T_4	T_5	…	T_N	Sum (Σ) of columns (iii) to (ix) = $\mathbf{T_T}$
3	Monthly performance scores for the corresponding period (as in Row 2)	$S_{1\text{-}1}$, $S_{1\text{-}2}$, $S_{1\text{-}3}$, $S_{1\text{-}4}$, … $S_{1\text{-}T1}$	$S_{2\text{-}1}$, $S_{2\text{-}2}$, $S_{2\text{-}3}$, $S_{2\text{-}4}$, … $S_{2\text{-}T2}$	$S_{3\text{-}1}$, $S_{3\text{-}2}$, $S_{3\text{-}3}$, $S_{3\text{-}4}$, … $S_{3\text{-}T3}$	$S_{4\text{-}1}$, $S_{4\text{-}2}$, $S_{4\text{-}3}$, $S_{4\text{-}4}$, … $S_{4\text{-}T4}$	$S_{5\text{-}1}$, $S_{5\text{-}2}$, $S_{5\text{-}3}$, $S_{5\text{-}4}$, … $S_{5\text{-}T5}$	.. … … … …	$S_{N\text{-}1}$, $S_{N\text{-}2}$, $S_{N\text{-}3}$, $S_{N\text{-}4}$, … $S_{N\text{-}TN}$	---------
4	Sum of Monthly Performance scores of the corresponding Package for the corresponding period (as in row-3)	S_1	S_2	S_3	S_4	S_5	…	S_N	Sum (Σ) of columns (iii) to (ix) = $\mathbf{S_T}$

ii) Calculation of Overall 'Performance Rating' (**R_{BHEL}**) in case 'similar Package/Packages' for the tendered scope ARE NOT AVAILABLE, during the 'Period of Assessment':

This shall be obtained by summing up the 'Monthly Performance Evaluation' scores obtained by the bidder in all Regions for ALL the packages, divided by the total number of Package months for which evaluation should have been done. 'R_{BHEL} ' shall be calculated subject to availability of 'performance scores' for at least.6 'package months' in the order of precedence below:

a) 'Period of Assessment.
b) 12 months preceding the cut-off month
c) 24 months preceding the cut-off month
d) 36 months preceding the cut-off month

In case, R_{BHEL} cannot be calculated as above, then Bidder shall be treated as 'NEW VENDOR'. Further eligibility and qualification of this bidder shall be as per definition of 'NEW VENDOR' described in 'Explanatory Notes'

iii) Factor "L" assigned based on Overall Performance Rating (R_{BHEL}) at Power Sector Regions,:

Sl no	Overall Performance Rating (R_{BHEL})	Corresponding value of 'L'
1	=60	NA
2	> 60 and ≤ 65	0.4
3	> 65 and ≤ 70	0.35
4	> 70 and ≤ 75	0.25
5	> 75 and < 80	0.2
6	≥ 80	NA

III. 'Assessment of Capacity of Bidder':

'Assessment of Capacity of Bidder' is based on the Maximum number of packages for which a vendor is eligible, considering the performance scores of similar packages, as below:

Max number of packages P_{Max}= (R_{BHEL}- 60) divided by corresponding value of 'L'
i.e. (R_{BHEL}- 60)/L

Note:

i. In case the value of P_{Max} results in a fraction, the value of P_{Max} is to be rounded off to next whole number
ii. For R_{BHEL} = 60 , P_{Max} = '1'
iii. For R_{BHEL} ≥ 80, there will be no upper limit on P_{Max}

The Bidder shall be considered 'Qualified' as per 'Assessment of Capacity of Bidder' for the subject Tender if $P \leq P_{Max}$
(where P is calculated as per clause 9.I)

IV. **Explanatory note**:

a) Similar package means Boiler or ESP or Piping or Turbine or Civil or Structure or Electrical or CI, etc at the individual level irrespective of rating of Plant, and irrespective of whether the subject tender is a single package or as part of combined/composite packages. Normally Boiler, ESP, Piping, Turbine, Electrical, CI, Civil, Structure, etc is considered individual level of package. For example in case the tendered scope is a Boiler Vertical Package comprising of Boiler, ESP and Power Cycle Piping (i.e the 'identified packages as per Table-1 below), the 'PERFORMANCE' part against sl no II above, needs to be evaluated considering all the identified packages (ie Boiler, ESP and Power Cycle Piping) and finally the Bidder's capacity to execute the tendered scope is assessed in line with III above
b) Identified Packages (Unit wise)

Table-1

	Civil	Electrical & CI	Mechanical
	i). Enabling works ii). Pile and Pile Caps iii). Civil Works including foundations	i). Electrical ii). CI iii). Others (Elec & CI)	i). Boiler & Aux (All types including CW Piping if applicable) ii). Power Cycle Piping/Critical Piping iii). LP Piping

	iv). Structural Steel Fabrication & Erection v). Chimney vi). Cooling Tower vii). Others (Civil)		iv). ESP v). Steam Turbine Generator set & Aux vi). Gas Turbine Generator set & Aux vii). Hydro Turbine Generator set & Aux viii). Turbo Blower (including Steam Turbine) ix). Material Handling x). Material Management xi). Material Handling & Material Management xii). Others (Mechanical)

c) Bidders who have not been evaluated for at least six package months in the last 36 months in the online BHEL system for contractor performance evaluation in BHEL PS Regions, wef July'2010 shall be considered "NEW VENDOR".

A 'NEW VENDOR' shall be considered qualified subject to satisfying all other tender conditions

A 'NEW VENDOR' if awarded a job (of package/packages identified under this clause) shall be tagged as "FIRST TIMER" on the date of first LOI/ LOA from BHEL.

The "FIRST TIMER" tag shall remain till execution of work for a period of not less than 09 months, from the commencement of work of first package

A Bidder shall not be eligible for the next job as long as the Bidder is tagged as "FIRST TIMER" excepting for the Tenders which have been opened on or before the date of the bidder being tagged as 'FIRST TIMER'.

After removal of 'FIRST TIMER' tag, the Bidder shall be considered 'QUALIFIED' for the future tenders subject to satisfying all other tender conditions including 'Capacity Evaluation of Bidders'.

In case assessment of "FIRST TIMER" cannot be done for 9 months due to ***completion of work in less than 9 months****, the "FIRST TIMER" tag will be removed and the vendor shall be considered as "NEW VENDOR" for any new tender/s, provided the average score for which Performance Evaluation has been done, is not less than 60%.*

d) In the unlikely event of all bidders shortlisted against Technical and Financial Qualification criteria not meeting the criteria on 'Assessment of Capacity of Bidders' detailed above, OR leads to a single tender response on applying the criteria of 'Assessment of Capacity of Bidders' or due to non-approval by Customer, then BHEL at its discretion reserves the right to consider the further processing of the Tender based on the **Overall Performance Rating** '$\mathbf{R_{BHEL}}$**'** only, starting from the upper band.

e) 'Under execution' shall mean works in progress as per the following:

i. up to Boiler Steam Blowing in case of Steam Generator and Auxiliaries

ii. upto Synchronisation in case of all other works excepting sl no (i) and (iii)

iii. Upto execution of at least 90% of anticipated contract value in case of Civil & Structures (unit wise), Enabling works and upto 90% of material unloading (in tonnage) as per the original contract in case of MM Package.

Note : BHEL at its discretion can extend (or reduce in exceptional cases in line with Contract conditions) the period defined against (i), (ii) and (iii) above, depending upon the balance scope of work to be completed.

f) Performance evaluation in CL 9 above is applicable to Prime bidder and consortium partner (or Technical tie up partner) for their respective scope of work.

10. 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, applicable wage structure, wage rules, 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.

11. For any clarification on the tender document, the bidder may seek the same over e-procurement portal 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. BHEL may decide holding of 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. 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. Unless specifically mentioned otherwise, bidder's quoted price shall deemed to be in compliance with tender including PBD.

15. 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 Clause No. 1, Salient Features of NIT, Sl. No. (xi) above.**

15a. **Integrity Pact (IP)**

i) IP is a tool to ensure that activities and transactions between the Company and its Bidders / Contractors are handled in a fair, transparent and corruption free manner. A panel of Independent External Monitors (IEMs) have been appointed to oversee implementation of IP in BHEL.

The IP as enclosed with the tender is to be submitted (duly signed by authorized signatory who signs in the offer) along with techno-commercial bid. Only those bidders who have entered into such an IP with BHEL would be competent to participate in the bidding. In other words, entering into this Pact would be a preliminary qualification. Details of IEM for this tender is given at point 1 (xi) above.

ii) Please refer Section-8 of the IP for Role and Responsibilities of IEMs. In case of any complaint arising out of the tendering process, the matter may be referred to the IEM mentioned in the tender.

No routine correspondence shall be addressed to the IEM (phone / post / email) regarding the clarifications, time extensions or any other administrative queries, etc. on the tender issued. All such clarification / issues shall be addressed directly to the tender issuing (procurement) department.

16. 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 satisfying the Pre Qualification Criteria specified in this NIT as per Annexure-I (as applicable), past performance etc. and date of opening of price bids shall be intimated to only such bidders. BHEL reserves the right not to consider offers of parties under HOLD.

17. In case BHEL decides on a `Public Opening', the date & time of opening of the 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. Validity of the offer shall be for **six months** from the latest due date of offer submission (including extension, if any) unless specified otherwise

19. (a) BHEL reserves the right to go for Reverse Auction (RA) (Guidelines as available on www.bhel.com) instead of opening the sealed envelope price bid, submitted by the bidder. This will be decided after techno-commercial evaluation. Bidders to give their acceptance with the offer for participation in RA. Non-acceptance to participate in RA may result in non-consideration of their bids, in case BHEL decides to go for RA.

(b) Those bidders who have given their acceptance to participate in Reverse Auction will have to necessarily submit 'Process compliance form' (to the designated service provider) as well as 'Online sealed bid' in the Reverse Auction. Non-submission of 'Process compliance form' or 'Online sealed bid' by the agreed bidder(s) will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines for suspension of business dealings with suppliers/ contractors (as available on www.bhel.com).

(c) The bidders have to necessarily submit online sealed bid less than or equal to their envelope sealed price bid already submitted to BHEL along with the offer. **The envelope sealed price bid of successful L1 bidder in RA, if conducted, shall also be opened after RA and the order will be placed on lower of the two bids (RA closing price & envelope sealed price) thus obtained. The bidder having submitted this offer specifically agrees to this condition and undertakes to execute the contract on thus awarded rates.**

(d) If it is found that L1 bidder has quoted higher in online sealed bid in comparison to envelope sealed bid for any item(s), the bidder will be issued a warning letter to this effect. However, if the same bidder again defaults on this count in any subsequent tender in the unit, it will be considered as fraud and will invite action by BHEL as per extant guidelines for suspension of business dealings with suppliers/ contractors (as available on www.bhel.com).

(e) If reverse auction process is unsuccessful, sealed envelope price bids of all the techno-commercially qualified bidders shall be opened and the tender shall be processed accordingly. However, the envelope sealed bid(s) of techno-commercially acceptable bidder(s) who had agreed to participate in the RA and had failed to submit the online sealed bid shall not be opened.

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

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

23. **Not used**

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

26. The offers of the bidders who are on the banned/ hold list as also the offer of the bidders, who engage the services of the banned/ hold firms, shall be rejected. The list of **banned/ hold firms** is available on BHEL web site www.bhel.com.

27.0 It may please be noted that **guidelines/rules** in respect of Suspension of Business dealings', 'Vendor evaluation format', 'Quality, Safety & HSE guidelines', milestone/ completion certificate, etc may **undergo change** from time to time and the latest one shall be followed. The abridge version of extant 'Guidelines for suspension of business dealings with suppliers/ contractors' is available on www.bhel.com on "**supplier registration page".**

The offers of the bidders who are under suspension as also the offers of the bidders, who engage the services of the banned firms, shall be rejected. The list of banned firms is available on BHEL website (www.bhel.com).

27.1 Integrity commitment, performance of the contract and punitive action thereof:

27.1.1 **Commitment by BHEL:**
BHEL commits to take all measures necessary to prevent corruption in connection with the tender Process and execution of the contract. BHEL will during the tender process treat all Bidder(s) in a transparent and fair manner, and with equity.

27.1.2 **Commitment by Bidder/ Supplier/ Contractor:**

(i) The bidder/ supplier/ contractor commit to take all measures to prevent corruption and will not directly or indirectly influence any decision or benefit which he is not legally entitled to nor will act or omit in any manner which tantamount to an offence punishable under any provision of the Indian Penal Code, 1860 or any other law in force in India.

(ii) The bidder/ supplier/ contractor will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract and shall adhere to relevant guidelines issued from time to time by Govt. of India/ BHEL.

(iii) The bidder/ supplier/ contractor will perform/ execute the contract as per the contract terms & conditions and will not default without any reasonable cause, which causes loss of business/ money/ reputation, to BHEL.

If any bidder/ supplier/ contractor during pre-tendering/ tendering/ post tendering/ award/ execution/ post-execution stage indulges in mal-practices, cheating, bribery, fraud or and other misconduct or formation of cartel so as to influence the bidding process or influence the prices or acts or omits in any manner which tantamount to an offence punishable under any provision of the Indian Penal Code, 1860 or any other law in force in India, then, action may be taken against such bidder/ supplier/ contractor as per extent guidelines of the company available on www.bhel.com and / or under applicable legal provisions.

28.0 **Micro and Small Enterprises (MSE)**
Any Bidder falling under MSE category, shall furnish the following details & submit documentary evidence/ Govt. Certificate etc. in support of the same along with their techno-commercial offer

Type under MSE	SC/ST owned	Others
Micro		
Small		

Note: - If the bidder does not furnish the above, offer shall be processed construing that the bidder is not falling under MSE category.

a) MSE suppliers can avail the intended benefits only if they submit along with the offer, attested copies of either Udyog Aadhaar or EM-II certificate having deemed validity (five years from the date of issue of acknowledgement in EM-II) or valid NSIC certificate or EM-II certificate along with attested copy of a CA certificate (format enclosed as Annexure – 3) where deemed validity of EM-II certificate of five years has expired applicable for the last audited financial year. Date to be reckoned for determining the deemed validity will be the last date of Technical Bid submission. Non submission of such documents will lead to consideration of their bids at par with other bidders. No benefits shall be applicable for this enquiry if the above required documents are not submitted before price bid opening. If the tender is to be submitted through e-procurement portal, then the above required documents are to be uploaded on the portal.

b) MSEs shall be exempted from payment of tender fee.

c) MSEs shall be exempted from payment of earnest money at the time of tender deposit. However, there is no exemption of security deposit submission.

d) Participating MSEs quoting price within price band of L1+15 % shall be considered for award of complete scope of work by bringing down their price to L1 price in a situation where L1 price is from someone other than a MSE. In case of more than one such MSE, MSE with lowest price shall be given the first option to match the L1 price. However, MSEs owned by the Scheduled Caste or the Scheduled Tribe entrepreneurs shall be given the preference for matching the L1 price irrespective of their standing in comparative statement of MSE bidders within price band of L1+15 %.

29.0 The Bidder along with its associate/ collaborators/ sub-contractors/ sub-vendors/ consultants/ service providers shall strictly adhere to BHEL Fraud Prevention Policy displayed on BHEL website http://www.bhel.com and shall immediately bring to the notice of BHEL Management about any fraud or suspected fraud as soon as it comes to their notice.

30.0 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:-

(i) Annexure-1: Pre Qualifying criteria.
(ii) Annexure-2: Check List.
(iii) Annexure-3: Chartered Accountant certificate for MSMED
(iv) Annexure-4: Authorization of representative who will participate in the online Reverse Auction Process
(v) Annexure-5: Feedback form
(vi) Annexure-6: Integrity Pact
(vii) Other Tender documents as per this NIT.

ANNEXURE - 1

PRE QUALIFYING REQUIREMENTS

JOB	**ERECTION & COMMISSIONING WORK OF HYDRO TURBINE GENERATOR (HTG) PACKAGE INCLUDING BOPs AND MATERIAL HANDLING WORK OF RECEIPT & UNLOADING OF PLANT MATERIALS AT BHEL STORES/WORK SITE, LOADING OF MATERIALS FROM BHEL STORES ,LOCAL TRANSPORTATION FROM BHEL STORES TO POWER HOUSE/WORK SITE ,PERFORMANCE TESTING AT SITE,FINAL PAINTING OF EQUIPMENTS AT SITE AND HANDING OVER TO CUSTOMER AT BHEL 2X60MW VYASI HEP SITE, DISTT. DEHRADHUN , UTTRAKHAND**
TENDER NO	**BHEL/ NR/SCT/VYASI /HTG/1046**

SL NO	PRE QUALIFICATION CRITERIA	Bidders claim in respect of fulfilling the PQR Criteria
A	Submission of Integrity Pact duly signed	Applicable
B	**Technical** Bidder who wish to participate : Should have 'executed', at least two units of any type or from any of the combinations below, in last 7 years ending on the 'latest date of bid submission' of tender-	Applicable
B-1	Vertical Hydro Turbine Generator with Pelton Turbine of >=30MW	
	Or	
B-2	Vertical Hydro Turbine Generator with Francis Turbine of >=10MW	
	Or	
B-3	Vertical Hydro Turbine Generator with Kaplan Turbine of >= 6 MW	
	Or	
B-4	Vertical Reversible Pump Turbine Generator of >= 10 MW	
	Or	
B-5	Vertical Francis type Pump motor of >= 10 MW	
C C-1	**Financial Criteria** **TURNOVER:** Bidders must have achieved an average annual financial turnover (Audited) of Rs. 152.70 Lakhs or more over last three Financial Years (FY) i.e. (2013-2014, 2014-2015, 2015-2016). Bidder shall submit audited accounts (balance sheets and profit & loss account) in support of this. In case audited Financial statements have not been submitted for all the three years as indicated above, then the applicable audited statements submitted by the bidders against the requisite three years, will be averaged for three years. If financial statements are not required to be audited statutorily, then instead of audited financial statements, financial statements are required to be certified by Chartered Accountant.	Applicable
C-2	**Net Worth:** Net Worth (Only in case of companies) of the bidder should be positive.	Applicable

	Net worth shall be calculated based on the latest Audited Accounts as furnished for 'C-1' above. Net worth = Paid up share capital* + Reserves (* : Share Capital OR Partnership Capital OR Proprietor Capital as the case may be)	
C-3	**Profit:** Bidder must have earned profit in any one of the three financial years as applicable in the last three financial years as furnished for 'C-1' above. PROFIT shall be PBT earned during any one year of last three financial years as in 'C-1' above	Applicable
D	Relevant documents meeting above requirement at 'B' and 'C' shall be submitted by bidder	Applicable
E	Assessment of Capacity of Bidder to execute the work as per Sl no. 9 of NIT	Applicable
F	Approval of Customer by BHEL	Applicable
G	Consortium criteria	Not Applicable

Explanatory Notes for PQR

1. For evaluation of PQR, the credentials of the Bidder alone, and not that of the Group Company shall be considered.
2. For B, 'Executed' means the bidder should have achieved the 'Spinning' milestone, even if the total contract has not been completed or closed.

BIDDER SHALL SUBMIT ABOVE PRE-QUALIFICATION CRITERIA FORMAT, DULY FILLED-IN, SPECIFYING RESPECTIVE ANNEXURE NUMBER AGAINST EACH CRITERIA AND FURNISH RELEVANT DOCUMENT INCLUSIVE OF WORK ORDER AND WORK COMPLETION CERTIFICATE ETC 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.a	Details of Contact person for this Tender	Name : Mr/Ms Designation: Telephone No: Mobile No: Email ID: Fax No:	
3.b	Details of alternate Contact person for this Tender	Name : Mr/Ms Designation: Telephone No: Mobile No: Email ID: Fax No:	
4	EMD DETAILS	DD No: Date : Bank : Amount:	
5	Validity of Offer	TO BE VALID FOR SIX MONTHS FROM DUE DATE	
		APPLICABILITY (BY BHEL)	ENCLOSED BY BIDDER
6	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
7	Audited profit and Loss Account for the last three years	Applicable/~~Not Applicable~~	YES/NO
8	Copy of PAN Card	Applicable/~~Not Applicable~~	YES/NO
9	Not used		
10	Integrity Pact	Applicable/~~Not Applicable~~	
11	Declaration by Authorised Signatory	Applicable/~~Not Applicable~~	YES/NO
12	No Deviation Certificate	Applicable/~~Not Applicable~~	YES/NO
13	Declaration confirming knowledge about Site Conditions	Applicable/~~Not Applicable~~	YES/NO
14	Declaration for relation in BHEL	Applicable/~~Not Applicable~~	YES/NO
15	Non Disclosure Certificate	Applicable/~~Not Applicable~~	YES/NO
16	Bank Account Details for E-Payment	Applicable/~~Not Applicable~~	YES/NO
18	Tie Ups/Consortium Agreement are submitted as per format	~~Applicable~~/Not Applicable	
19	Not used		

20	Analysis of Unit rates	Applicable/~~Not Applicable~~	

NOTE : STRIKE OFF 'YES' OR 'NO', AS APPLICABLE. TENDER NOT ACCOMPANIED BY THE PRESCRIBED **ABOVE APPLICABLE DOCUMENTS** ARE LIABLE TO BE SUMMARILY REJECTED.

DATE :

AUTHORISED SIGNATORY
(With Name, Designation and Company seal)

Annexure-3

Certificate by Chartered Accountant on letter head

This is to Certify that M/S ..... , (hereinafter referred to as 'company') having its registered office at ..... is registered under MSMED Act 2006, (Entrepreneur Memorandum No (Part—II) ..... dtd:..... , Category: ..... (Micro/Small)). (Copy enclosed).

Further verified from the Books of Accounts that the investment of the company as per the latest audited financial year..... as per MSMED Act 2006 is as follows:

1. **For Manufacturing Enterprises:** Investment in plant and machinery (i.e. original cost excluding land and building and the items specified by the Ministry of Small Scale Industries vide its notification No. S.O.1722(E) dated October 5, 2006:
   Rs.....Lacs

2. **For Service Enterprises:** Investment in equipment (original cost excluding land and building and furniture, fittings and other items not directly related to the service rendered or as may be notified under the **MSMED** Act, 2006:
   Rs.....Lacs

(Strike off which is not applicable)

The above investment of Rs.....Lacs is within permissible limit of Rs.....Lacs for ..... Micro / Small **(Strike off which is not applicable)**

Category under MSMED Act 2006.

Or

The company has been graduated from its original category (Micro/Small) (Strike off which is not applicable) and the date of graduation of such enterprise from its original category is ..... (dd/mm/yyyy) which is within the period of 3 years from the date of graduation of such enterprise from its original category as notified vide S.O. No. 3322(E) dated 01.11.2013 published in the gazette notification dated 04.11.2013 by Ministry of MSME.

Date:

(Signature)

Name -

Membership number -

Seal of Chartered Accountant

ANNEXURE - 4

Authorization of representative who will participate in the on line Reverse Auction Process;

1	NAME & DESIGNATION OF OFFICIAL	
2	POSTAL ADDRESS (COMPLETE)	
3	TELEPHONE NOS. (LAND LINE & MOBILE BOTH)	
4	FAX NO.	
5	E-MAIL ADDRESS	
6	NAME OF PLACE/ STATE/ COUNTRY, WHEREFROM S/HE WILL PARTICIPATE IN THE REVERSE AUCTION	

ANNEXURE – 5

Feedback Form: From where did you get information reg. this tender

1	NEWSPAPER ADVERTISEMENT (NAME)	
2	BHEL WEBISTE (TENDER NOTIFICATION)	
3	CENTRAL PUBLIC PROCUREMENT PORTAL OF GOVERNMENT OF INDIA (CPP PORTAL)	
4	EMAIL COMMUNICATION FROM BHEL	
5	ANY OTHER SOURCE	

ANNEXURE -6

INTEGRITY PACT

Between

Bharat Heavy Electricals Ltd. (BHEL), a company registered under the Companies Act 1956 and having its registered office at "BHEL House", Siri Fort, New Delhi – 110049 (India) hereinafter referred to as "The Principal", which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the ONE PART

and

_____, (description of the party along with address), hereinafter referred to as "The Bidder/ Contractor" which expression unless repugnant to the context or meaning hereof shall include its successors or assigns of the OTHER PART

Preamble

The Principal intends to award, under laid-down organizational procedures, contract/s for _____

_____

_____. The Principal values full compliance with all relevant laws of the land, rules and regulations, and the principles of economic use of resources, and of fairness and transparency in its relations with its Bidder(s)/ Contractor(s).

In order to achieve these goals, the Principal will appoint Independent External Monitor(s), who will monitor the tender process and the execution of the contract for compliance with the principles mentioned above.

ANNEXURE -6

Section 1 – Commitments of the Principal

1.1 The Principal commits itself to take all measures necessary to prevent corruption and to observe the following principles:-

1.1.1 No employee of the Principal, personally or through family members, will in connection with the tender for, or the execution of a contract, demand, take a promise for or accept, for self or third person, any material or immaterial benefit which the person is not legally entitled to.

1.1.2 The Principal will, during the tender process treat all Bidder(s) with equity and reason. The Principal will in particular, before and during the tender process, provide to all Bidder(s) the same information and will not provide to any Bidder(s) confidential / additional information through which the Bidder(s) could obtain an advantage in relation to the tender process or the contract execution.

1.1.3 The Principal will exclude from the process all known prejudiced persons.

1.2 If the Principal obtains information on the conduct of any of its employees which is a penal offence under the Indian Penal Code 1860 and Prevention of Corruption Act 1988 or any other statutory penal enactment, or if there be a substantive suspicion in this regard, the Principal will inform its Vigilance Office and in addition can initiate disciplinary actions.

Section 2 – Commitments of the Bidder(s)/ Contractor(s)

2.1 The Bidder(s)/ Contractor(s) commit himself to take all measures necessary to prevent corruption. He commits himself to observe the following principles during his participation in the tender process and during the contract execution.

2.1.1 The Bidder(s)/ Contractor(s) will not, directly or through any other person or firm, offer, promise or give to the Principal or to any of the Principal's employees involved

in the tender process or the execution of the contract or to any third person any material, immaterial or any other benefit which he / she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.

2.1.2 The Bidder(s)/ Contractor(s) will not enter with other Bidder(s) into any illegal or undisclosed agreement or understanding, whether formal or informal. This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.

2.1.3 The Bidder(s)/ Contractor(s) will not commit any penal offence under the relevant IPC/ PC Act; further the Bidder(s)/ Contractor(s) will not use improperly, for purposes of competition or personal gain, or pass on to others, any information or document provided by the Principal as part of the business relationship, regarding plans, technical proposals and business details, including information contained or transmitted electronically.

2.1.4 The Bidder(s)/ Contractor(s) will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.

2.2 The Bidder(s)/ Contractor(s) will not instigate third persons to commit offences outlined above or be an accessory to such offences.

ANNEXURE -6

Section 3 – Disqualification from tender process and exclusion from future contracts

If the Bidder(s)/ Contractor(s), before award or during execution has committed a transgression through a violation of Section 2 above, or acts in any other manner such as to put his reliability or credibility in question, the Principal is entitled to disqualify the Bidder(s)/ Contractor(s) from the tender process or take action as per the separate "Guidelines on Banning of Business dealings with Suppliers/ Contractors". framed by the Principal.

Section 4 – Compensation for Damages

4.1 If the Principal has disqualified the Bidder from the tender process prior to the award according to Section 3, the Principal is entitled to demand and recover the damages equivalent Earnest Money Deposit/Bid Security.

4.2 If the Principal has terminated the contract according to Section 3, or if the Principal is entitled to terminate the contract according to section 3, the Principal shall be entitled to demand and recover from the Contractor liquidated damages equivalent to 5% of the contract value or the amount equivalent to Security Deposit/Performance Bank Guarantee, whichever is higher.

Section 5 – Previous Transgression

5.1 The Bidder declares that no previous transgressions occurred in the last 3 years with any other company in any country conforming to the anti-corruption approach or with any other Public Sector Enterprise in India that could justify his exclusion from the tender process.

5.2 If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

Section 6 – Equal treatment of all Bidders/ Contractors/ Sub-contractors

6.1 The Bidder(s)/ Contractor(s) undertake(s) to obtain from all subcontractors a commitment consistent with this Integrity Pact and report Compliance to the Principal. This commitment shall be taken only from those sub-contractors whose contract value is more than 20 % of Bidder's/ Contractor's contract value with the Principal. The Bidder(s)/ Contractor(s) shall continue to remain responsible for any default by his Sub-contractor(s).

6.2 The Principal will enter into agreements with identical conditions as this one with all Bidders and Contractors.

6.3 The Principal will disqualify from the tender process all bidders who do not sign this pact or violate its provisions.

Section 7 – Criminal Charges against violating Bidders/ Contractors /Sub-contractors

If the Principal obtains knowledge of conduct of a Bidder, Contractor or Subcontractor, or of an employee or a representative or an associate of a Bidder, Contractor or Subcontractor which constitutes corruption, or if the Principal has substantive suspicion in this regard, the Principal will inform the Vigilance Office.

Section 8 –Independent External Monitor(s)

8.1 The Principal appoints competent and credible Independent External Monitor for this Pact. The task of the Monitor is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement.

8.2 The Monitor is not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the CMD, BHEL.

8.3 The Bidder(s)/ Contractor(s) accepts that the Monitor has the right to access without restriction to all contract documentation of the Principal including that provided by the Bidder(s)/ Contractor(s). The Bidder(s)/ Contractor(s) will grant the monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his contract documentation. The same is applicable to Sub-contractor(s). The Monitor is under contractual obligation to treat the information and documents of the Bidder(s)/ Contractor(s) / Sub-contractor(s) with confidentiality.

8.4 The Principal will provide to the Monitor sufficient information about all meetings among the parties related to the contract provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the Monitor the option to participate in such meetings.

8.5 As soon as the Monitor notices, or believes to notice, a violation of this agreement, he will so inform the Management of the Principal and request the Management to discontinue or take corrective action, or heal the situation, or to take other relevant action. The Monitor can in this regard submit non-binding recommendations. Beyond this, the Monitor has no right to demand from the parties that they act in a specific manner, refrain from action or tolerate action.

8.6 The Monitor will submit a written report to the CMD, BHEL within 8 to 10 weeks from the date of reference or intimation to him by the Principal and, should the occasion arise, submit proposals for correcting problematic situations.

8.7 The CMD, BHEL shall decide the compensation to be paid to the Monitor and its terms and conditions.

8.8 If the Monitor has reported to the CMD, BHEL, a substantiated suspicion of an offence under relevant IPC / PC Act, and the CMD, BHEL has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Vigilance Office, the

Monitor may also transmit this information directly to the Central Vigilance Commissioner, Government of India.

8.9 The number of Independent External Monitor(s) shall be decided by the CMD, BHEL.

8.10 The word 'Monitor' would include both singular and plural.

Section 9 – Pact Duration

9.1 This Pact begins and shall be binding on and from the submission of bid(s) by bidder(s). It expires for the Contractor 12 months after the last payment under the respective contract and for all other Bidders 6 months after the contract has been awarded.

9.2 If any claim is made / lodged during this time, the same shall be binding and continue to be valid despite the lapse of this pact as specified as above, unless it is discharged/ determined by the CMD, BHEL.

Section 10 – Other Provisions

10.1 This agreement is subject to Indian Laws and jurisdiction shall be registered office of the Principal, i.e. New Delhi.

10.2 Changes and supplements as well as termination notices need to be made in writing. Side agreements have not been made.

10.3 If the Contractor is a partnership or a consortium, this agreement must be signed by all partners or consortium members.

10.4 Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.

ANNEXURE -6

10.5 Only those bidders/ contractors who have entered into this agreement with the Principal would be competent to participate in the bidding. In other words, entering into this agreement would be a preliminary qualification.

For & On behalf of the Principal

(Office Seal)

For & On behalf of the Bidder/ Contractor

(Office Seal)

Place----------

Date----------

Witness: _____

(Name & Address) _____

_____

Witness: _____

(Name & Address)_____

_____

Rev 00
6th JULY
2010

VOLUME- IA (PART-I) : TECHNICAL CONDITIONS OF CONTRACT (TCC)

NAME OF WORK: ERECTION & COMMISSIONING WORK OF HYDRO TURBINE GENERATOR (HTG) PACKAGE INCLUDING BOPs AND MATERIAL HANDLING WORK OF RECEIPT & UNLOADING OF PLANT MATERIALS AT BHEL STORES/WORK SITE, LOADING OF MATERIALS FROM BHEL STORES ,LOCAL TRANSPORTATION FROM BHEL STORES TO POWER HOUSE/WORK SITE ,PERFORMANCE TESTING AT SITE,FINAL PAINTING OF EQUIPMENTS AT SITE AND HANDING OVER TO CUSTOMER. AT BHEL 2X60MW VYASI HEP SITE, DISTT. DEHRADHUN , UTTRAKHAND

BHARAT HEAVY ELECTRICALS LIMITED

VOLUME – I A (PART – I) : CONTRACT SPECIFIC DETAILS

1. Project Information

1.1. INTROUCTION

Name of Customer	:	UTTARAKHAND JAL VIDYUT NIGAM LIMITED
Address	:	2X60 MW, VYASI HEP SITE, DISTT. DEHRADUN, UTTARAKHAND, INDIA.
New Installation	:	2 X 60 MW
Nearest Railway station	:	Dehradun Railway Station- 60 Kms from Project Site.
Nearest City / Town	:	Vikas Nagar- 20 Kms.
		Dehradun- 55 Kms.
Maximum Temperature	:	40 deg. C.
Minimum Temperature	:	0 deg. C.

Note:- The bidder is advised to visit and examine the site of WORKS and its surroundings and obtain for himself on his own responsibility all information that may be necessary for preparing the bid and entering into the CONTRACT. All costs for and associated with site visits shall be borne by the bidder.

Contact Person for site visit-

1.) Shri Alok Kumar Chaturvedi (Construction Manager)-09997999089

2.) Shri Umesh Chandra Mishra (Manager) -09634071114

2. Scope of works

2.1. Scope of these specifications cover complete work in two parts

A) MATERIAL HANDLING WORKS

BHEL has been awarded the work of Design, Manufacture, supply, installation erection, testing & commissioning of 2X60 MW Vyasi Hydro Electric Power Project. These materials will be supplied from our manufacturing units located all over the country as well as our vendors located both inland and overseas.

Total plant materials/equipment's involved for material handling work under this tender will be approx. -3100 MT.

The scope of work under this tender shall comprise the receipt, unloading, verification, proper storage stacking, preservation of materials/equipment in project stores /closed storage sheds including loading from project store/closed storage shed to power house or work site or vice versa including unloading and handing over to erection agency of BHEL .

The plant material shall be unloaded at power house with E.O.T cranes and shall be unloaded/loaded at BHEL stores /work site by BHEL Hydra/Mobile cranes. The E.O.T cranes/Hydra /mobile crane shall be provided by BHEL/customer on free of cost for material handling work. In case EOT cranes/Hydra/Mobile crane are not available or under breakdown at Power house /work site/BHEL stores, contractor shall arrange his own Hydra/cranes /alternative arrangement which is acceptable to BHEL site engineer for material handling work loading / unloading of the plant materials /equipment and shall carry out the material handling work at project site .

Some consignments of Plant materials have already been received at BHEL stores and these materials are to verified, re-stacked, preserved, record keeping & loaded from store and transported to power house /work site and handed over to erection agency.

Brief descriptions of different packages with their weights are indicated under chapter – IV.

Description of Equipment for Material Handling & Transportation

Sr.No.	Package Description	QTY (Nos.)
1	Francis Turbine and Accessories	02
2	Governing System & Accessories	02

3	Turbine MIV & Accessories (Butterfly Valve)	02
4	Generator & Accessories	02
5	Static Excitation and DVR	02
6	11 KV Busduct including CT ,PTs etc	02
7	75MVA Generator step up transformers	02
8	220 KV Outdoor switchyard	01 Lot
9	220V and 48V DC System	01 Lot
10	Control & Monitoring system (SCADA System)	01 Lot
11	Protection system	01 Lot
12	Power and Control cables including cable trays and accessories	01 Lot
13	A. 415 V AC Switchgear system B. UAT, SST	01 Lot
14	500KVA Silent DG sets	02
15	PLCC Equipment	01 Lot
16	Illumination System	01 Lot
17	EOT cranes of Power House and service bay	01 Lot
18	Cooling Water system	01 Lot
10	Drainage and Dewatering water system	01 Lot
20	HVAC System	01 Lot
21	Grounding System	01 Lot
22	HP & LP Compressed air system	01 Lot
23	Fire Fighting system	01 Lot
24	Oil filtration system	01 Lot
25	220 KV XLPE Cables	01 Lot

26	Elevators	01 Lot
27	Electrical workshop equipment	01 Lot
28	Mechanical workshop equipment	01 Lot
29	A. 11 KV Switchgear system B. 5 MVA Station Transformer	01 Lot
30	Spares, tools & Devices and mandatory spares for all above package.	01 Lot

NOTE:- 01 No MOT Crane of 5T capacity is to be installed in closed storage sheds by contractor. Structural stability to ensured and strengthen (if required) shall be done by contractor. It is the property of the contractor and shall be dismantled and taken back after completion of work.

B) ERECTION, TESTING & COMMISSIONING WORKS:

The scope of work under this part of tender consists of the materials Approx**. 2150 MT** weight are to be erected, commissioned & handed over to customer. Brief descriptions of different packages with their weights are indicated under chapter – IV.

Pre-erection assembly, erection, testing (including hydraulic testing , NDT, electrical testing's & final HV test including dry out etc. of relevant equipment's at various stages) during erection, pre-commissioning and commissioning including trial run, handing over to customer UJVN Limited of the following equipment's for two units of 2X60MW Vyasi HEP, Rated speed 250 RPM ,11KV Generator , vertical Francis type hydro turbines, Main Inlet Valve (BFV), semi umbrella type hydro generators (Rotor rim building at site) connected to three phase generator transformers through 11 KV IP Bus duct .

As most of the component with rubber items or other seals assembled are being supplied and stored at site, such components prior to actual start of erection of assemblies, during erection /testing/pre commissioning /commissioning /operation of turbine , generator auxiliaries, governing and oil Pressure system, MIV, Power packs supplied as T&P, MIV servomotors, valves and OPUs etc will have to be attended for replacement of rubber items ,seals for normal operation if required at the discretion of BHEL Engineer, Such pre assembly/pre erection works shall be part of erection/commissioning work to be carried out within the quoted rates and at no extra cost shall be payable to contractor.

Brief Description of Equipment for erection, testing & commissioning work.

Sr.No.	Package Description	QTY (Nos.)
1	Francis Turbine and Accessories including field testing	02
2	Governing System & Accessories	02
3	Turbine MIV & Accessories (Butter fly Valve)	02
4	Generator & Accessories including field testing	02
5	Static Excitation and DVR	02
6	11 KV Busduct including CT, PTs	02
7	75 MVA Generator step up transformers	02
8	220V and 48V DC System	01 Lot
9	Control & Monitoring system (SCADA System) including fiber optics cable	01 Lot
10	Protection system excluding switchyard	01 Lot
11	Power and Control cables including cable trays and accessories excluding switchyard	01 Lot
12	C. 415 V AC Switchgear system D. UAT, SST Dry type	01 Lot
13	Cooling Water system	01 Lot
14	Drainage and dewatering system	01 Lot
15	Grounding System excluding switchyard	01 Lot
16	HP & LP Compressed air system	01 Lot
17	Fire Fighting system excluding switch yard	01 Lot
18	Oil filtration system	01 Lot

19	A. 11 KV Switchgear system B. Oil filled 5 MVA Station Transformer	01 Lot
20	Erection Tools & Devices for all above package.	01 Lot

NOTE:- 1.) Erection of some first stage embedded and piping work of units might be carried out by other contractor of BHEL. In such case ,balance pipe lines, valves of first stage pipes & embedment like draft tube , MIV drain, pen stock drain, drainage /dewatering pipes, CW pipes etc shall be under scope of this contract Further completion/extension of first stage piping shall also be in the scope of present contractor.

2.) Erection of embedded parts and foundation parts (up to spiral casing erection) may have to be carried out by mobile crane (To be provided by BHEL/Customer free of cost) due to non-availability of EOT crane in power house. This shall be part of erection work within the quoted rates. Contractor has to arrange consumables /fuels etc. no extract cost shall be payable to contractor.

DETAILED SCOPE OF WORK IS AS GIVEN BELOW:

1. TURBINE SYSTEM AND ACCESSORIES

1.1 Fixed /Embedded Component

The embedded component are comprises of Draft tube liner, Pier nose liner Stay Ring, Spiral Casing, pit liners and embedded pipes etc in 1st and 2nd stage concreting.

Draft Tube Liner:- The draft tube liner has been fabricated from carbon steel plate of pressure vessel quality and shall be supplied to site in 10 segments. Tentative weights of the draft tube liner segments shall be 23 MT

Stay Ring: - The Stay ring has been fabricated from carbon steel plate of pressure vessel quality and shall be supplied to site in 01 Piece. Tentative weights of the stay ring assembly shall be 16 MT.

Spiral Casing: - The Spiral Casing has been fabricated from carbon steel plate of pressure vessel quality and shall be supplied to site in 09 segments. Tentative weights of the spiral casing assembly shall be 40 MT. Center line of spiral casing is at EL-510.30 M

Pit Liners: - The Pit liner has been fabricated from heavy steel plate. The lower pit liner shall be supplied to site in 03 segments. Tentative weights of the lower pit liner assembly shall be 07 MT.

The upper pit liner shall be supplied to site in 02 segments. Tentative weights of the upper pit liner assembly shall be 07 MT.

Embedment pipes in first stage and second stages.

The embedded pipelines in first stage for all units have been foreseen in primary concreting which mainly comprise penstock drain, draft tube drain, spiral casing drains, cooling water piping from draft tube ,dewatering piping , drainage sump connecting piping etc. All welding shall be checked as per drawings.

Pipelines are supplied in straight length to be bent and laid as per site requirements. The pipes are to be laid and welded at site as per drawing. All welds are to be 100% DP tested. All pipes are to be hydraulically tested as per drawing at site after welding.

1.2 Stationary /removable components

The Stationary /removable components are comprises Draft tube cone, head cover, bottom ring, discharge ring etc.

Draft tube Cones: The draft tube cones has been fabricated from carbon steel plate of pressure vessel quality and shall be supplied to site in 03 segments. Tentative weights of the draft tube cone assembly shall be 11 MT.

Head Cover: - The head cover has been fabricated from carbon steel plate of pressure vessel quality and shall be supplied to site in single piece. Tentative weights of the head cover assembly shall be 16 MT. It shall be bolted and dowelled to a flanged on the stay ring.

Bottom ring (Pivot ring) :- The bottom ring has been fabricated from carbon steel plate of pressure vessel quality and shall be supplied to site in single piece . Tentative weights of the bottom ring assembly shall be 07 MT. It shall be bolted and dowelled to a flanged on the stay ring.

1.3 Guide apparatus:- 20 Nos guide vanes of 270kg each are located at PCD of 3233mm.Regulating ring is located outside the guide vane PCD. Two nos guide vane servomotor are mounted on base plate to be installed /levelled at site.

Other parts of guide apparatus to be installed are upper bush housing, lower bush housing, upper bush, lower bush middle bush, G.V. lines strap etc.

1.4 **Turbine guide bearing** :- The turbine guide bearing is provided for radial support of the turbine main shaft .The bearing arrangement shall permit axial movement of the shaft .Eight (08) nos Guide pad are provided for supporting shaft.

1**.5** **Shaft seals** :- Two (02) shaft seals ,one as main working seal and another as maintenance seal. Main working seal shall be provided below the bearing which shall prevent the leakage of water along the shaft .The shaft seal shall be arranged for water lubrication air operated isolating seal are provided.

1.6 Rotating Parts

The rotating components are comprises runner, turbine shaft etc.

Runner: - The Francis type runner assembly with OD 2974 mm and tentative weights of the runner assembly shall be 14 MT. The runner shall be a cast fabricated construction of 13Cr-4NI stainless steel. The runner shall be connected to the turbine shaft by through bolts with nuts and locking devices.

Turbine hollow shaft: - The turbine shaft assembly with dia 686mm and length 3070mm long is flanged at both ends .The turbine shaft shall be made of forged/ fabricated carbon or alloy steel properly heat treated. Tentative weights of the turbine shaft assembly shall be 15 MT.

1.7 Auxiliary Systems and miscellaneous components of turbine

The auxiliary systems and miscellaneous components are comprises centralized grease lubrication system ,turbine pit, drainage ,air admission system ,walk ways, access platforms and stairs ,turbine pit hoist ,access door to turbine pit ,acoustic barrier for runner removal gallery ,name plate, rails for runner carts etc. and shall be in the scope of work.

2. DIGITAL GOVERNINING SYSTEM AND ACCESSORIES

The scope of work shall be a comprehensive functional system complete in every respect including but not be limited to following

- Two sets of digital electronic controlled units
- Two sets of hydraulic actuator units
- Two sets of oil pumping units
- Two sets of interconnecting cables, termination, all types of pipes, fitting, valves etc.

3. MAIN INLET VALVE AND ACCESSORIES (BUTTERFLY VALVE)

The main inlet valve assembly comprises valve body ,seals and seats ,By pass assembly ,valve operating mechanism ,pressure oil station ,automatic shut off control system ,control and indication panel ,lubrication system, inlet pipe to be welded with penstock, downstream dismantling joint,servo motors walkway ,ladders, counterweights ,CGL etc.

The MIV shall be supplied to site in single piece. Tentative weights of the MIV assembly shall be 55 MT.

These assembled main inlet valve assemblies are required to be hydraulically tested for checking its operation and leakages in S/bay before lowering on foundation. However during pressure testing if leakage is found the same is to be attended by the contractor within this scope

4. GENERATOR SYSTEM

a. General:

The generators shall be of semi umbrella type with combined thrust and guide bearing located below the the rotor and another guide bearing above the rotor. Static excitation system is provided for energizing the field winding of rotor. This supply is fed through slip rings located above the generator rotor.

b. Main shaft and coupling (Top shaft, Bottom shaft ,Tubular shaft)

The Generator shaft shall be made of the best quality forged carbon or alloy steel properly heat treated. Tentative weights of the generator bottom shaft assembly shall be 20 MT and length 3489 MM .The weight of Top shaft is 7.0T and length 1736 MM .Both the shafts are to be coupled with rotor spider.

c. Bearings:

The generator shall be provided with thrust cum lower guide bearing arranged below the rotor on bottom bracket and upper guide bearing arranged on the top bracket above rotor.

d. **Brakes and Jacks System**

A combined hand operated and solenoid operated air valve to control the operation of the generator brakes shall be supplied and mounted in the actuator cabinet-brake control panel.

The brake cylinder shall also be to serve as hydraulic jack to lift the generator rotor to a

height to facilities removal & adjustment of thrust bearing pads. Brake & Jacks system comprises of limit switches, brake dust collector with houses, air oil piping etc before lowering of rotor brake & Jacks system is to be tested hydraulically.

e. **Stator and stator winding:**

The Partially wound stator segments has been dispatched to site in three (03) Parts. The outside dimension of stator frame A/F is approx 8700 MM. The stator core outside diameter is 8040 mm, inside diameter 6600 mm. and Core height is 950mm. Laying of coiled type diamond shaped winding bars at the partial wound stator joints, laying of bus ring connectors including lacing and their brazing etc .Mounting of pole to pole jumper connections including farming and their brazing for completion of stator in all respect. Total tentative weight of wound stator shall be 127 MT (Including lifting beam) . Coil to coil, pole to pole and bus ring to bus ring connects are to be brazed as per drawing.

The HV test and other required test is to be carried out on complete stator including stage testing at site as per drawing.

f. **Rotor**

The rotor shall be designed for assembly on the rotor assembly bay in the erection area of the power house.

Rotor Spider:- Rotor spider is a fabricated structure having central holes and 6 arms integral .The segment type brake track is mounted on the spider .

Rotor rim :- The rotor rims ,which are to be assembled around rotor spider at site is built up from sheet steel laminations. The rim segments do not come in equal weight due to variation in their thickness. Therefore these RIM segments are to be cleaned & segregated in groups of equal thickness by weight measurement & accordingly assembled.

Pole with field winding: - There are 24 Poles each having 4 no 'T' shaped heads to engage with corresponding T shaped slot in rotor. Weight of each rotor is approx. 1.7 T. Total tentative eight of rotor shall be approx. 140 T & OD is 6550 mm.

g. **Cooling system of stator windings**

The unit shall be self-ventilating, its own circulation action being utilized by the fans installed on the rotor to force air through the windings duct and air coolers etc.

h. **Fire protection**

An automatic CO2 fire protection system shall be provided complete with auxiliary, Carbon dioxide shall be forced to the generator housing through piping and nozzles to fill the housing.

Two Co2 banks each consisting of an adequate numbers of co2 cylinder shall be provided.

i. **Safety and monitoring devices**

Vibration monitoring ,partial discharge monitoring system ,moisture detection system ,air gap monitoring system and shaft current ,voltage monitoring device ,temp monitoring ,RTI,SSG shall be part of generator erection .

j. **Miscellaneous Provisions**

Instrumentation for field assembly and tests, terminal boxes .control wiring and conduits, instrumentation, control and safety devices, piping, tubing valves and cabling etc is the part of generator erection.

k. **Generator Auxiliaries**

HS lubrication system, carbon duct collector system from slip ring, upper & lower air baffles and air guide ,generator leveling ,pit air sealing and anti-condensation heaters etc.

5. EXCITATION SYSTEM & DVR

The Excitation System and DVR for two units shall consist of

- Two (02) sets of dry type excitation transformer ,
- Two sets of full wave fully controlled rectifier system complete with firing circuit, control system etc.
- Two sets of digital voltage regulator with all limiters & power system stabilizer.
- Two (02) sets of power supply units,
- Two (02) sets of field flashing equipment's incl. transformer,
- Two (02) sets of DC field circuit Breaker
- Two (02) sets of discharge resistors
- Two (02) sets of digital control and metering equipment,
- Two (02) sets of excitation cable connection the rotor to DC field breaker.

6. 11 KV ISOLATED PHASE BUS DUCT INCLUDING CT,PTs

It mainly comprising of following:

- Two (02) sets each of three phase (3ϕ) isolated main bus duct for the connection between generator terminals and generator transformer terminals.
- Two (02) sets of tap off bus ducts for unit auxiliary transformers complete with flexible connectors, seal off bushing etc.
- Two (02) sets of tap off bus ducts for excitation transformers complete with flexible connectors, seal off bushing etc.
- Two (02) sets of tap off bus ducts for potential transformer and surge protection cubicles complete with flexible connectors, seal off bushing etc.

- Two (02) sets of bus ducts assembly for generator neutral side complete with with all the necessary items for neutral formation including flexible connector flexible connectors, seal off bushing etc.
- Two (02) sets current transformers in phase and neutral side for relaying and metering scheme including split phase protection
- Two (02) sets of neutral grounding cubicle complete with neutral grounding transformers, current limiting resistor, disconnecting switch etc.
- Two (02) sets of PT and SP cubicles complete with lightening arrester, surge capacitor, 2 PTs with two cores in secondary DVR, metering, relaying and one spare.
- Two (02) sets of isolating links in the bus for individual isolation of all the tap off ducts and generator terminal.
- Two (02) sets of supporting structures, columns, frames, wall plates, hangers mounting plates, hardware etc.
- Two (02) sets of items not specified above but are necessary for satisfactory operation of bus ducts.
- Connection and disconnection of various shorting links etc. during pre-commissioning /commissioning and field testing are included in this contract. Welding and NDT shall be carried out as per drawings.
- All consumables for welding(MIG/MAG/Arc) shall be included in the scope of work

7. GENERATOR STEP UP TRANSFORMERS

It comprised of two (02) 75 MVA, 3ϕ, 11/220 kV generator step up transformers with all accessories including oil conservator, explosion vent bushings, undercarriage, off-circuit tap charger, coolers, instrumentation, CTs and fittings etc .

Two (2) sets of valves, piping, mounting plates, hangers, hardware, etc. for the cooling water supply within the transformer area.
One set of rails for transformers hall extended up to power house service bay etc.
The power generated by generator shall be stepped up to 220 kV from 11 kV by two nos. generator step up transformers.

8. **220 V and 48 V DC SYSTEM FOR POWER HOUSE**

220 V and 48 V DC System shall comprises of :

One (1) 220 V DC system with two maintenance free VRLA type 600Ah or higher capacity battery banks and associated racks two chargers and distribution system**.**

One (1) 48 V DC system with one maintenance free VRLA type 200Ah or higher capacity battery banks and associated racks one chargers and distribution system**.**

Two (02) uninterrupted power supply system (UPS).

9. CONTROL & MONITORING (SCADA) SYSTEM (Computerized system)

The computerized control and Monitoring (SCADA) system shall contain

- **Local Control Boards:-**

  Two (02) sets of unit control board (UCB) with all necessary accessories,

  One (1) set of LCB for unit common services & all other station auxiliary services and Dam Monitoring board with all necessary accessories,

  One (1) set of LCB for 220KV switch control Board with all necessary accessories.

- Process Control networks & Power House LAN
- Central control center:
- Process control networks & Power house LAN
- Link between power house and Dam through OFC.
- Interfacing services
- Miscellaneous items like printers, instruments ,computers and peripherals ,operator workstations, engineering stations ,portable engineering stations ,local control cubicles ,optical fiber, communication, video display units and key boards interfacing large screen display etc.

10. PROTECTION SYSTEM

The protection scheme shall cater for protection of following equipment's

- Two (02) 66.67 MVA turbine –generator units along with main inlet valves.
- Two 75 MVA, 11/220KV generator transformer along with bus ducts, excitation transformers and unit auxiliary transformers.
- 11KV Switchgear
- One 5MVA ,220KV/11KV station transformer
- 415V,LT Switchgear
- Two 1250KVA,11/0.415KV station service transformer

- Two 500 KVA D.G.Sets
- AC and DC supplies for power house

11. POWER AND CONTROL CABLES

The scope of work shall be a comprehensive functional system complete in every respect including but not be limited to following

- All cabling laying work of HT & LT power cables and control cables, cable routing & termination in power house and all adjoining functional areas
- All cable trays ,supporting structure, cables terminals etc

12. 415 V SWITCHGEAR,AUXILIRY AND STATION SERVICE TRANSFORMERS

The UATs, SSTs and associated 415 V systems shall be consisting of :-

- Two (02) 11KV/415V, 630KVA, unit auxiliary transformers (Dry type) complete with cubicles and all necessary accessories.
- Two (02) 11KV/ 415V, 1250KVA, station service transformers (Dry type) complete with cubicles and all necessary accessories.
- Two (02) unit auxiliary boards, Two (02) station service board of indoor metal enclosed 415 V switchgear type, completed with cubicles, protection, metering bus bar system.

13. COOLING WATER SYSTEM

The scope of work shall be a comprehensive functional system complete in every respect including but not be limited to following

- Two (02) sets of CW system (Open loop) for turbine ,generator transformer ,shaft seal etc
- Two (02) sets of CW pumps ,tapping from draft tube/Penstocks , cyclone separators ,strainers and filters pipes ,valves and accessories, control ,monitoring and related supply etc.
- Insulation with vapour proof cladding for all exposed piping
- Necessary piping incl. valves all types, air scouring arrangement, flow meter, maintenance valves, regulating office, pressure & temperature sensing devices, all type of consumables and other materials including welding electrodes etc.
- Starter panels ,cabling etc for cooling water system equipment.

14. DRAINAGE AND DEWATERING SYSTEMS

The drainage and dewatering systems shall comprises of:

- Three (03) submersible pump with starter panels for power house drainage (PH) sump.
- Two (02) submersible pump with starter panels for dewatering sump
- Necessary piping along with fittings, valves, and non-returning valve level switches, starter panels, flow indicators, maintenance valves.
- The water for drainage/dewatering pump shall be pumped to the tailrace channel.

15. GROUNDING SYSTEM

Scope of work covers connection of all E& M equipment's of power house with earthing risers. Erection of electronic panel earthling shall also be in scope of bidder .The contractor shall erect/lay all embedded conductor system and the connection rods/flats.

All the equipment's are to be connected with embedded system at all of two points

All cubicles, steel structures, mounting supports and equipment are to be connected to the grounding system. All connections (Crossing points and connections to equipment etc) are to welded.

16. HP & LP COMPRESSED AIR SYSTEM

HP Compressed Air System shall comprise of :

02 nos. HP air compressor, 2 nos. Air Dryer, , 1 no. HP Air Receiver, 1 no LP air receiver with, 1 no. Pressure reducer, piping, valves, fittings, starter/control panel, pressure and temperature indicator switches, safety devices, suction filter, coupling, non-return and accessories. The HP compressed air system shall cater the air requirement for oil pressure unit for turbine and MIV.

LP Compressed Air System shall comprise of:

02 nos. LP air compressor, 2 nos. air dryer, 1 no. Air Receiver, piping, valves, fittings, starter/control panel, pressure and temperature indicator switches, safety devices, suction filter coupling, non-return and accessories. The LP air system shall cater the requirement of brakes, shear pin, shaft seal, pneumatic type drains valves fire protection system, service air at different points etc

17. FIRE FIGHTING SYSTEM

The Fire fighting system shall be consists of

- **Fire detection and notification devices** :- Automatic fire detectors, smoke detectors ,ionization type smoke detectors ,photo electric detectors, thermal detectors and notification appliances etc.
- **Fire Extinguishing System**:- Fire Hydrant system and hose reels ,fire hose cabinet ,water sprinkler and spray systems ,portable fire extinguishers etc

- **Fire Alarm and signaling system**:- Power supplies, main fire alarm control panel ,Main Mimic, cables & wires etc
- GSU,SST,OPU, cable spreading area including cable tray ,office power house floors ,cable tunnels misc. area etc
- Insulation with vapour proof cladding for all exposed piping as per drawing.
- All piping of all floors, overhead tanks, all type valves etc including consumables for all types for firefighting system.
- Pumps strainers ,valves, panels & instrumentation panels etc

18. OIL FILTRATION SYSTEM

The Oil filtration system shall comprise of:

- Vacuum Type transformer oil purifying system
- Lubrication oil purifying System
- Oil tank ,oil transfer pump ,pipe fitting and hoses ,air dryers etc

19. 11 KV SWITCHGEAR AND 5MVA OIL FILLED STATION TRANSFORMER

The 11 KV switchgear and 5MVA station transformer systems shall be consisting of :

- One 11 KV switch gear comprising three incoming and four outgoing feeder trucks/trolleys.
- One 220/11 KV step down ,5MVA station transformer (oil filled) complete with all necessary item such as bushing ,undercarriage ,off load tap charger ,neutral CT, radiators instrumentations ,marshaling boxes, fitting and insulating oil etc.
- All cabling and interconnection for making the system functional.

2.2. The equipment and piping shall be erected in conformity with the provisions of standards/ specifications and as may be directed by BHEL. The method of welding (Arc, gas, TIG, MIG/MAG or other method) may be indicated in the detailed drawing/ schedules. BHEL engineer will have option of changing the method of welding as per site requirements.

2.3. On the discretion of BHEL site engineer, which is depending upon the site requirement, some of the material may be directly unloaded in the powerhouse/work site with EOT Carnes or Own crane or suitable alternative own arrangement of contractor. Contractor shall keep record of the same. For such works contractor shall be paid under material-handling work of packages.

2.4. EOT cranes (Two nos.) are being installed by BHEL PSNR . The EOT cranes shall be provided free of hire charges and on sharing basis. The contractor will have to provide qualified operator for operating the mobile crane and EOT cranes round the clock if required or as per requirement.

2.5. Construction drawings and documents shall be provided at site to the successful bidder for erection of work.

2.6. On the discretion of BHEL site engineer**, Construction power to BHEL other contractors/vendors shall be provided by contractor on chargeable basis.** Construction Power supply at 11KV,3 Phase ,50HZ at single suitable point of power house shall be arranged By BHEL/Customer . However electricity bill raised by power supplier is to be paid by bidder .The bill may include fixed charges, minimum consumption charges, taxes, duties etc. The Step down transformer 11KV/0.415KV of adequate capacity (To be decided mutually by BHEL site, customer & Bidder) , circuit breakers ,protection panels ,distribution board and further distribution for the construction power work to be done by the contractor. Bidder shall also install his 125 KVA silent type DG set for construction power and for backup power as per site requirement.

2.7. **Installation, maintenance and operation of 01 No MOT Crane of at least 05 T capacity in closed storage shed. The crane shall remain the property of vendor and will have to be dismantled and taken back after completion of work. Approx. span of rail is 10 M, however tenderer to verify the span before sending suitable MOT crane to site.**

2.8. Details of Major equipment along with weights & Dimensions, supplied by BHEL under this scope are given in (Volume-IA, Part-I, Chapter-IV). However changes on account of change in design may occur, for which no compensation will be payable and contractor shall complete the entire work as detailed in the tender specifications within finally accepted rates/ prices.As per instructions of BHEL site engineer and or due to space constraint at service bay/power house /work site, some of the assemblies, devices like the Stator/rotor lifting devices, hydraulic test device , other T&P may require multiple handling for shifting from power house/work site to BHEL stores and stores to power house /work site. This shall be responsibility of contractor and charges for such material shall be applicable as per Sr.no-2 of rate schedule.

2.9. The welding electrodes required for site welding of major components of turbine like Draft Tube ,Turbine casing, spiral casing ,CW system of turbine , inlet /outlet pipes of MIV, some high pressure piping and any other special consumables **which are supplied by manufacturing units** along with plant material shall be issued to contractor for subject work free of cost .Contractor shall maintain proper records for all those consumables. However general purpose electrodes & for systems like piping of generator transformer/generator and its auxiliaries bus ducts and other auxiliary pipelines etc. Electrodes /filler wires shall be the responsibilities of contractor.

2.10. **COMMENCEMENT OF GUARNTEE PERIOD:-**The Guarantee period shall commence only after completion & taking over certificate by Customer UJVNL of the entire work of this tender. The BHEL engineer shall certify to the contractor the date on which the work is completed & Taking over and the date there of for commencement of Guarantee Period .The duration of guarantee period shall be as per GCC.

2.11. **PAINTING:-** All the plant equipment's /items shall be painted with required coat of red oxide primer & required coat of synthetic enamel paint ,colour as per drawings and site requirement . Paint shall be supplied by BHEL supplying units.

2.12. The contractor shall have to deploy adequate engineers and supervisors for material handing work and erection, commissioning, pre-commissioning, testing/checking work , trial run and attending pending points of the units, minimum man-months deployment required shall not be less than the following:-

Sl No	Type of Manpower	Quantity (Nos)	Minimum Man-months
1	Engineer (Degree holders)	02	48
2	Supervisor (Diploma holders)	04	96
3	Welding Supervisor / NDT level-II	01	12
3	Safety supervisor	01	24

2.13. The above figures for deployment of engineers and supervisors for material handing work and erection, commissioning, pre-commissioning, testing/checking works are tentative only and if need for any additional manpower over and above the mentioned figures are required as per site requirement, the same shall be arranged by the contractor at no extra cost to BHEL. If the contractor fails to deploy the above category at appropriate time at Vyasi HEP site as per site requirement then deduction shall be made from his bills at the rate of Rs. 50,000/- per man month for Engineer and Rs. 25,000/- per man month for supervisors .
If any of the above category is not utilized fully, it shall be converted in to other category keeping in view the rates at the discretion of BHEL

2.14. The contractor under this contract shall also provide services of skilled/Unskilled persons for a total period of **96 Man-Months** exclusively for use by BHEL. This manpower will be required for following services:

- **Skilled workers for office, colony, stores, for 48 Man months.**
- **Semi-Skilled workers for office, colony, stores for 48 Man months.**

Persons so deployed shall have to work in extended hours whenever required. Workmen provided as per the above provisions shall be fully trained and experienced in the nature of work for which they are deployed.

In case contractor fails to provide above-mentioned manpower as desired by BHEL, the latter shall have the right to hire such services from other agencies at the risk and cost of the contractor. However, if BHEL does not utilize the man months as per above provision, fully or partly, recovery at the rate of the prevailing minimum wages at Site for the categories given plus 10% will be made from the final bill of the contractor.

However if the above man month are consumed, the contractor has to provide the above category of man months if required. BHEL shall pay extra for extra manpower at the rate of minimum wages prevailing at the time of deployment of that particular skill category.

2.15. **Deletion of SCC Clauses: -** Clause no- 4.1.4, 8.3.2 and 8.3.4 of SCC (Statutory Inspection of work) shall not be applicable.

2.16 **In order to give phillip to Pradhan Mantri Kaushal Vlkas Yojna:** The contractor shall, at all stages of work deploy skilled/semi-skilled tradesmen who are qualified and possess certificate in particular trade from CPWD Training Institute/ Industrial Training Institute/ National Institute of Construction Management and Research (NICMAR), National Academy of Construction, CIDC or any similar reputed and recognized Institute managed/ certified by State/ Central Government. The number of such qualified tradesmen shall not be less than 20% of total skilled/ semi-skilled workers required in each trade at any stage of work. The contractor shall submit number of man days required in respect of each trade, its scheduling and the list of qualified tradesmen along with requisite certificate from recognized Institute to Engineer-in-Charge for approval. Notwithstanding such approval, if the tradesmen are found to have inadequate skill to execute the work of respective trade, the contractor shall substitute such tradesmen within two days of written notice from Engineer-in-Charge. Failure on the part of contractor to obtain approval of Engineer-in-Charge or failure to deploy qualified tradesmen will attract a compensation to be paid by contractor at the rate of Rs. 100 per such tradesman per day. Decision of Engineer-in-Charge as to whether particular tradesman possesses requisite skill and amount of compensation in case of default shall be final and binding.

3.0 Time Schedule

MOBILIZATION, TIME SCHEDULE, CONTRACT PERIOD AND GRACE PERIOD

3.1 INITIAL MOBILIZATION

After receipt of LOA, Contractor shall discuss with Project Manager / Construction Manager regarding initial mobilization. Contractor shall mobilize necessary resources within 2 weeks of issue of letter of intent or as per the directive of Project Manager / Construction Manager. Such resources shall be progressively augmented to match the schedule of milestones and commissioning.

3.2 MOBILIZATION FOR ERECTION, TESTING AND COMMISSIONING ETC.

The activities for erection, testing etc shall be started as per directions of Construction Manager of BHEL. Contractor shall mobilize further resources as per requirement to commence the work of erection, testing etc as per scope of work, and progressively augment the resources to match schedule of the project.

3.3 COMMENCEMENT OF CONTRACT PERIOD AND TENTATIVE SCHEDULE

Start of erection work/material handling work activity at site shall be considered as "start of contract period". Site mobilization will not be considered as start of contract period.

The contractor has to subsequently augment his resources in such a manner that following major milestones of erection & commissioning are achieved on specified schedules:

SN	MAJOR MILESTONE	START/ COMPLETION
1	Site Mobilization	2 weeks from Award of LOA or as decided by BHEL
2	Start of contract period (Zero date)	Start of erection work/material handling work activity at site as decided by Project Manager of BHEL
3	Completion of erection of Foundation parts up to Spiral casing	End of 6th Month from zero date
4	Completion of Turbine assembly	End of 11th Month

5	Completion of lowering of LBB, Stator, rotor and UBB	end of 15th Month
6	Completion of Unit axis alignment	end of 16th Month
7	Completion of Boxing up of units	end of 18th Month
8	Completion of pre-commissioning of units	end of 21th Month
9	Commissioning Spinning & handing over of Unit# 1 & 2	end of 22th Month
10	Completion of all facilities at site	end of 24 th Month

All dates in above schedule are from start of contract period (zero date)

3.4 **CONTRACT PERIOD**

The contract period for completion of entire work under scope shall be **24 (Twenty Four) MONTHS** from the "**START OF CONTRACT PERIOD**" as specified earlier.

The period from the commencement of preparatory work for erection till the actual "start of contract period" shall not be reckoned for the above purpose.

3.5 CONSEQUENCE OF DELAY

In case of delay in completion is attributable to the contractor, BHEL may impose LD on the contractor as per GCC.

4. Tentative Package wise Weight Schedule

4.1 Tentative weight schedule/ Details have been given below

Sr.No.	Description	QTY (Nos.)	Total Package wise tentative Weights (MT)
1	Francis Turbine and Accessories	02	400
2	Governing System & Accessories	02	50
3	Turbine MIV & Accessories (BF Valve)	02	150
5	Generator & Accessories	02	900
6	Static Excitation and DVR	02	
7	11 KV Busduct including CT PTs etc	02	60
8	75 MVA Generator step up transformers	02	180
9	220V and 48V DC System	01 Lot	10
10	Control & Monitoring system (SCADA System)	01 Lot	32
11	Protection system	01 Lot	10
12	Power and Control cables including cable trays and accessories	01 Lot	150
13	E. 415 V AC Switchgear system F. UAT, SST	01 Lot	20
14	500KVA Silent DG sets	02	20
15	Illumination System	01 Lot	40
16	EOT cranes of Power House	01 Lot	220
17	Cooling Water system	01 Lot	45
18	Drainage and Dewatering water system	01 Lot	45
19	HVAC System	01 Lot	20

20	Grounding System	01 Lot	40
21	HP & LP Compressed air system	01 Lot	25
22	Fire Fighting system	01 Lot	40
23	Oil filtration system	01 Lot	5
24	220 KV XLPE Cables	01 Lot	500
25	220 KV Outdoor switchyard	01 lot	
26	Elevators	01 Lot	10
27	Electrical workshop equipment	01 Lot	5
28	Mechanical workshop equipment	01 Lot	30
29	C. 11 KV Switchgear system D. 5 MVA Station Transformer	01 Lot	30
30	Spares tools & Devices and mandatory spares for all above package.	01 Lot	100

Note:- The above weights of items are tentative only and is liable for variation. Payment will be made on the lump sum /unit rate accepted by BHEL.

5.0 Rate Schedule/BOQ

VYASI-II HEP (2X60 MW) ETC & Material Handling work

5.1 Contractor shall fully understand equipment description and scope of work before quoting. The scope of work and responsibility of the contractor as mentioned under these specifications shall be covered within the quoted rates.

5.2 The tenderer shall quote the rates as per the rate schedule only. No cutting/ erasing / over writing shall be done.

RATE SCHEDULE CUM BOQ

Total Price ('A') in Rupees (In figures and words) for 'ERECTION,TESTING COMMISSIONING ,HANDING OVER AND MATERIAL HANDLING WORK OF OF ENTIRE WORK OF VYASI HEP"	

ITEM NO	DESCRIPTION OF WORK	Existing Rate in Rupees/MT (In figures and words)
1.	**Lumpsum price** for erection, testing ,commissioning and handing over the entire work of 2x60 MW Vyasi HEP Refer Clause 2.1 B (Chapter-II,Vol-IA,Part-I)	85 % of 'A' (Total Price)
2.	Rate in Rs./MT for entire of work as defined in this tender specification in respect of receipt, Unloading, its verification proper storage Preservation of plant materials at Project store/power house /work site and transportation to power house/work site from Store & vice versa and unloading /handed over for erection. Refer:-Chapter-II-(Scope of work) of this tender (Approxi.:- **3100MT**)	15% of 'A' (Total Price) 3100

NOTES:

1. Evaluation of bids shall be done on total price ('A') against this Rate Schedule.

2. In case of any mismatch in Rate and amount on Price discrepancy, the same will be dealt as per clause No. 1.4 of GCC.

6.0 Terms of Payment

6.1 The 'Engineer' will certify regarding the actual work executed in the measurement books and bills, which shall be accepted by the contractor in measurement book.

6.2 Contractor shall submit bills for the work completed under the specification, once in a month detailing work done during the month. The format for billing shall be approved by BHEL before raising invoices.

6.3 Shortage / damage reports to be submitted on BHEL standard materials management forms. No payment shall be released till the contractor submits these reports and are verified by the Engineer.

6.4 **PRICE VARIATION COMPENSATION**- In reference to clause no.2.17.3 of GCC, please note that component (K) for labour oriented packages will be applicable for the scope of work covered under this tender.

6.5 **RETENTION AMOUNT AND PAYMENTS**:- Retention amount shall be withheld from each RA bill as per provision of clause 2.22 and 2.23 of GCC regarding retention amount and payments

6.6 Subject to any deduction which BHEL may be authorized to make under the contract, the contractor on the certificate of the Engineer at site be entitled for payment as explained hereunder.

6.6.1 Interest bearing recoverable advance: Applicable as per clause No. 2.13 of GCC.

6.6.2 PROGRESSIVE PAYMENT SHALL BE RELEASED ON PRORATA BASIS

(A) ITEM 1 OF THE RATE SCHEDULE

100 % of contract rate of item No. 1 of rate schedule shall be payable as detailed **in Annexure -A (**enclosed)
NOTE: Further break-up and/or minor changes in the Annexure A referred above, if required depending upon the site conditions, can be done at site entirely at the discretion of BHEL site.

(B) ITEM 2 OF THE RATE SCHEDULE

(i) **15** % of the rate shall be payable on prorate basis after the materials are safely unloaded by using BHEL Cranes , shifted to stores and updating in store material register / store stocks registers as per BHEL practices such as GR/LWB/loading advice/box packing slip subject to furnishing of following information along with the bills as per above clause

- Proof of claim lodged with Railways/Transporters in respect of shortage/open delivery.
- Material Management forms duly filled/Records generated in stocks (Stock registers and computers) and certified by Engineer.

(ii) **25% of** the rate shall be payable on pro rata basis after verification , stacking /re stacking safekeeping, in line with documents and records as per BHEL standards is ensured. Opening of cases/ repacking, wherever necessary (with contractors own T&P and labour) , updation of verification records ,filling other reports & submission of information as per Material management forms by contractor immediately after verification of materials are to be completed within two weeks of receipt of packages at site failure of which 20% out of 25% shall be forfeited as certified by BHEL Engineer.

The plant materials which are already unloaded /stacked at BHEL stores by other contractor are to be verified, re stacking, & updating of verification report within two months of zero date, failure of which 20% out of 25% shall be forfeited as certified by BHEL Engineer. Required Performa would be supplied by site.

(iii) **10 %** of the rate shall be payable on pro-rata basis for preservation till these are loaded on truck/trailer for transportation to Power house/work site.

(iv) **15** % of the rate shall be payable on prorate basis after the materials are safely loaded on truck/trailer by using BHEL cranes for transportation to Power house/work site.

(v) 20 % of the rate shall be payable on pro-rata basis for on completion of transported to Power house/Work site and vice versa.

(vi) 15 % of the rate shall be payable on prorate basis after the materials are safely unloaded at power house /work site by using EOT cranes /BHEL crane and handed over to erection agency.

7.0 TAXES, DUTIES, LEVIES

7.1 The contractor shall pay all (save the specific exclusions as enumerated in this contract) taxes, fees, license charges, deposits, duties, tools, royalty, commissions or other charges which may be levied on the input goods & services consumed and output goods & services delivered in course of his operations in executing the contract. In case BHEL is forced to pay any of such taxes, BHEL shall have the right to recover the same from his bills or otherwise as deemed fit.

However, provisions regarding Service Tax on output service shall be as per following clauses.

7.2 Service Tax , Swachh Bharat Cess and Krishi Kalyan Cess.

7.2.1 Service Tax, Swachh Bharat Cess and Krishi Kalyan Cess as applicable on output Services are excluded from contractor's scope; therefore contractor's price/rates shall be exclusive of Service Tax , Swachh Bharat Cess and Krishi Kalyan Cess.

7.2.2 Contractor shall obtain prior written consent of BHEL before billing the amount towards such taxes. Where the Service Tax Act permit more than one option or methodology for discharging the liability of tax/levy/duty, BHEL will have the right to adopt the appropriate one considering the amount of tax liability on BHEL/Client as well as procedural simplicity with regard to assessment of the liability. The option chosen by BHEL shall be binding on the Contractor for discharging the obligation of BHEL in respect of the tax liability to the Contractor. Contractor shall submit to BHEL documentary evidence of Service Tax registration certificate specifying name of services covered under this contract.

7.2.3 For the purpose of claiming any Service Tax , SBC & KKC from BHEL, the following procedure shall be adopted :

7.2.3.1 Contractor shall submit serially numbered Service Tax ,SBC & KKC Invoices, signed by him or a person authorized by him in respect of taxable service provided, and shall contain the following, namely:

7.2.3.1.1 The name, address and registration number of the contractor

7.2.3.1.2 The name and address of the party receiving taxable service (BHEL)

7.2.3.1.3 Description, classification and value of taxable service provided and

7.2.3.1.4 The Service Tax and Swachh Bharat Cess and Krishi Kalyan Cess payable thereon.

7.2.3.1.5 The service invoice for output services provided should show service tax , SBC & KKC amount separately

7.2.4 All the five conditions shall be fulfilled in the invoice for payment of Service Tax , SBC & KKC by BHEL. Where more than one nature of Service as per Service Tax act is involved in the execution of contract, the invoice mentioned above shall contain the breakup of values for each nature of Service.

7.2.5 Name and address of the Contractor should be same in the service tax invoice and monthly bill as it is in the service tax registration certificate. Any change in the name and address should be supported by documentary evidence duly certified by the authorized signatory.

7.2.6 Purpose of above requirements, inter-alia, is to enable availment of Cenvat credit by BHEL. As per recent amendments, Time restrictions for taking Cenvat credit is one year from date

of invoice. Hence subcontractor must submit its invoice within 30 days from the date of completion of service.

Wherever Cenvat credit could not be availed by BHEL due to delay in submission of invoices or for any other reasons attributable to contractors, Liability towards loss of such Cenvat credit shall be passed on to sub-contractors.

7.2.7 The documentary evidence of deposition of service tax , SBC & KKC is to be submitted at the earliest opportunity.

7.2.8 The payment or service tax , SBC & KKC as per clause no 8.2 is restricted to the direct transactions between BHEL & its sub-contractor only.

7.3 Modalities of Tax Incidence on BHEL

7.3.1 Wherever the relevant tax laws permit more than one option or methodology for discharging the liability of tax/levy/duty, BHEL will have the right to adopt the appropriate one considering the amount of tax liability on BHEL/Client as well as procedural simplicity with regard to assessment of the liability. The option chosen by BHEL shall be binding on the Contractor for discharging the obligation of BHEL in respect of the tax liability to the Contractor.

7.4 New Taxes/Levies

7.4.1 In case the Government imposes any new levy/tax on the output service/ goods/work after award of the contract, the same shall be reimbursed by BHEL at actual. The reimbursement under this clause is restricted to the direct transaction between BHEL and its subcontractor only.

7.4.2 In case any new tax/levy/duty etc. becomes applicable after the date of Bidder's offer, the Bidder/Contractor must convey its impact on his price duly substantiated by documentary evidence in support of the same before opening of Price Bid. Claim for any such impact after opening the Price Bid will not be considered by BHEL for reimbursement of tax or reassessment of offer.

7.4.3 The Vendor has to ensure compliance of all laws and taxes so that benefit of inputs are not denied to BHEL by respective authorities.

7.4.4 Payment shall be released against RAB provided proper invoices in conformity with the relevant provisions of new Act/Rules have been issued by sub contractor/vendor. Later on if it is noticed that input Tax Credit is not available to BHEL due to reasons attributable to sub-contractor /vendor, same shall be recovered from next bill.

7.5 BUILDING & OTHER CONSTRUCTION WORKERS (REGULATION OF EMPLOYMENT AND CONDITIONS OF SERVICE) ACT, 1996 (BOCW Act) AND RULES OF 1998 READ WITH BUILDING & OTHER CONSTRUCTION WORKERS CESS Act, 1996 & CESS RULES, 1998.

In case any portion of work involves execution through building or construction workers, then compliance to the above titled Acts shall be ensured by the contractor and contractor shall obtain license and deposit the cess under the Act. In the circumstances it may be ensured as under:-

i. It shall be the sole responsibility of the contractor in the capacity of employer to forthwith (within a period of 15 days from the award of work) apply for a licence to the Competent Authority under the BOCW Act and obtain proper certificate thereof by specifying the scope of its work. It shall also be responsibility of the contractor to furnish a copy of such certificate of licence / permission to BHEL within a period of one month from the date of award of contract.

ii. It shall be the sole responsibility of the contractor as employer to ensure compliance of all the statutory obligations under these act and rules including that of payment / deposit of 1% cess on gross payment made for value of work involving building or construction workers engaged by the contractor within a period of one month from the receipt of payment.

iii. It shall be the responsibility of the sub-contractor to furnish the receipts / challans towards deposit of the cess together with the number, name and other details of beneficiaries (building workers) engaged by the sub-contractor during the preceding month.

iv. It shall be the absolute responsibility of the sub-contractor to make payment of all statutory payments & compensations to its workers including that is provided under the Workmen's Compensation Act, 1923.

v. The contractor shall, however ensure before deposit of any BOCW cess, that customer is not depositing the same in order to avoid excess deposit of cess.

vi. The contractor shall bear cost of BOCW cess either by way of deposit or through recovery by BHEL in case the same is deposited by the customer.

vii. In case of failure in above mentioned compliances, BOCW Cess @ 1% as well as applicable penalty as specified in BOCW Act/Rules shall be deducted from the contractor

8.0 Facilities Matrix in the scope of contractor/BHEL

PART I : ESTABLISHMENT/ FACILITY

Sl.No	Description	Scope / to be taken care by		Remarks
		BHEL	Bidder	
1.1.0	**ESTABLISHMENT**			
1.1.1	**FOR CONSTRUCTION PURPOSE:**			
A	Open space for office of BHEL	Yes		
B	Open space for storage	Yes		
C	Construction of bidder's office, canteen and storage building including supply of materials and other services		Yes	
D	Bidder's all office equipment's, office / store / canteen consumables		Yes	
E	Canteen facilities for the bidder's staff, supervisors and engineers etc		Yes	
F	Firefighting equipment's like buckets, extinguishers etc		Yes	
G	Fencing of storage area, office, canteen etc of the bidder		Yes	
1.1.2	**FOR LIVING PURPOSES OF THE BIDDER**			
A	Open space		Yes	
B	Living accommodation		Yes	
1.2.0	**ELECTRICITY**			

Sl.No	Description	Scope / to be taken care by		Remarks
		BHEL	Bidder	
1.2.1	**POWER FOR CONSTRUCTION PURPOSE (to be specified whether chargeable or free)**			Chargeable
1.2.1.1	Responsibilities of obtaining connection	Yes		1) Power supply at 11KV,3 Phase ,50HZ at single suitable point shall be arranged By BHEL/customer . However electricity bill raised by power supplier is to be paid by bidder .The bill may include fixed charges, minimum consumption charges, taxes, duties etc. 2) Bidder shall also install his 125 KVA silent type DG set for construction power and for backup power as per site requirement.
1.2.1.2	Charges for obtaining connection	Yes		
1.2.1.3	Single point of power source at PH	Yes		
1.2.1.4	Payment of electricity consumption		Yes	**As per bill of power supply agency up to completion of project.**
1.2.1.5	Maintenance of lighting, distribution boards of power at suitable working areas		Yes	

Sl.No	Description	Scope / to be taken care by		Remarks
		BHEL	Bidder	
1.2.1.6	Providing of the consumables such as sockets, switches, MCCB, bulbs etc .		Yes	
1.2.1.7	Step down transformer 11KV/0.415KV of adequate capacity, distribution board and further distribution for the work to be done which include supply of materials and execution		Yes	
1.2.2	**POWER FOR BHEL STORE**			
1.2.2.1	Responsibilities of obtaining connection	Yes		Connection of approx. 30 KW is being arranged By BHEL.
1.2.2.2	Charges for obtaining connection	Yes		
1.2.2.3	Payment of electricity consumption		Yes	Electricity bill raised by power supplier is to be paid by bidder. The bill may include fixed charges, minimum consumption charges, taxes, duties etc.
1.2.2.4	Maintenance of lighting, distribution boards of power at suitable working areas		Yes	
1.2.2.5	Providing of the consumables such as sockets, switches, MCCB, bulbs etc .		Yes	
1.2.3	**POWER for the office, stores, etc of the bidder**		Yes	
1.2.3.1	Responsibilities of obtaining connection		Yes	
1.2.3.2	Charges for obtaining connection		Yes	
1.2.3.3	Payment of electricity consumption		Yes	

Sl.No	Description	Scope / to be taken care by		Remarks
		BHEL	Bidder	
1.2.3.4	Distribution from single point including supply of materials and service		Yes	
1.2.3.5	Demobilization of the facilities after completion of works		Yes	
1.2.4	**Power for BHEL office** (Porta Cabins) in/near POWER HOUSE /BHEL store		Yes	**Located in vicinity of power house Contractor will install a separate meter for consumption reading and actual monthly electricity bill on prorate basis shall be paid to contractor by BHEL. Rates for per unit and other charges are as per UJVN Ltd tariff rates.**
1.3.0	**WATER SUPPLY**			
1.3.1	**For construction purposes AT PH:**		Yes	
1.3.1.1	Making the water available at single point		Yes	
1.3.1.2	Further distribution as per the requirement of work		Yes	
1.3.2	**Water supply for bidder's office, stores, etc**		Yes	
1.3.2.1	Making the water available at single point		Yes	
1.3.2.2	Further distribution as per the requirement of work		Yes	
1.3.3	**Water supply for BHEL office, and stores, etc**			
1.3.3.1	Water supply for BHEL office, near power house.		Yes	
1.3.3.2	Making the water available at BHEL Store		**Yes**	
1.4.0	**LIGHTING/ ILLUMINATION**			

Sl.No	Description	Scope / to be taken care by		Remarks
		BHEL	Bidder	
1.4.1	For construction work (supply and execution of all the necessary materials such as lamps, extension boards, hand lamps, cable etc): 1. At construction site 2. At preassembly area 3. At storage area		Yes	
1.4.4	Lighting for the living purposes of the bidder at the colony / quarters		Yes	
1.5.0	**COMMUNICATION FACILITIES FOR SITE OPERATIONS OF THE BIDDER**		YES	
1.6.0	**COMPRESSED AIR SUPPLY**			
1.6.1	Supply of Compressor and all other equipment's (including pipes, valves, storage systems etc) required for supply of compressed air at site		Yes	
1.6.2	Installation of the above system and operation and maintenance of the same.		Yes	
1.6.3	Supply of the all the consumables for the above system during the contract period		Yes	

PART II : ERECTION FACILITIES

Sl.No	Description	Scope / to be taken care by		Remarks
		BHEL	Bidder	
2.1.0	Engineering works for construction	yes		

Sl.No	Description	Scope / to be taken care by		Remarks
		BHEL	Bidder	
2.1.1	Providing the erection drawings for all the equipment's covered under this scope	Yes		
2.1.2	Drawings for construction methods	Yes		In consultation with BHEL
2.1.3	As-built drawings – where ever deviations observed and executed and also based on the decisions taken at site- example – routing of small bore pipes	Yes		Bidder to help BHEL in making as built drawings
2.1.4	Shipping lists etc for reference and planning the activities	Yes		
2.1.5	Preparation of site erection schedules and other input requirements	Yes	Yes	Bidder to prepare in consultation with BHEL
2.1.6	Weekly erection schedules based on Sl No 2.1.5	Yes	Yes	”
2.1.7	Daily erection / work plan based on Sl No 2.1.7		Yes	”
2.1.8	Review of performance and revision of site erection schedules in order to achieve the end dates and other commitments	Yes	Yes	To be jointly done on regular basis
2.1.9	Visit of the senior official (atleast once in every two months) of the bidder to site to review the progress so that works are completed as per schedule.		Yes	
2.1.10	Preparation of preassembly bay		Yes	

A	**TOOL & PLANTS (T&Ps)- INDICATIVE LIST OF T & Ps**	
Sl. No.	**EQUIPMENT**	
1	General purpose Hand tools	As per requirement
2	Drilling Machines1/4", 1/2", 3/4" & 1"	As per requirement
3	Welding Machines-	06 Nos -As per requirement
4	Gas cutting set	As per requirement
5	Trucks 10T	01No -As per requirement
6	Lorries /Trailor of adequate capacity	01No -As per requirement
7	Hydra -14 T-	01No -As per requirement
8	Torque Wrenches up to 2000 NM.	As per requirement
9	Fork lift – 3 T -01 No	As per requirement
10	Impact Wrench (Pneumatic) up to 2400 NM-	As per requirement
11	Chain pulley block of various capacities (2T, 5T, 10T,20T), Pull lift	As per requirement
12	Turn Buckle (2 T, 5 T, 10T etc)	As per requirement
13	Hydraulic / Mechanical Jacks of various capacities (5-10-20-100T)-	As per requirement
14	Air Arc Gouging Arrangement	As per requirement
15	Hydraulic pump (hand operated).	As per requirement
16	125KVA DG set	01 No As per requirement
17	MIG Welding machine set	As per requirement
18	Precision tools (IMT) TENTATIVE QUANTITY- As per requirement. 1) 0.02 accuracy block level 2) Dumpy level with accessories 3) Theodolite work station 4) Inside micrometer 5) Outside micrometer-0-25, 25/50, 50-75, 75-100, 100-150 6) Vernier calippers150, 300 7) Telescopic gauge	

	8) Slip gauge 9) Feeler gauges 10) Dial gauge with magnetic stand
NOTES:	1 The above list is only indicative and these T&Ps may not be required for entire contract period but contractor will ensure that these T & Ps are provided as per need. Contractor will assess actual quantity and period of requirement based on his experience. **Contractor has to mobilize / maintain adequate numbers of T& P for meeting the work schedule and intermediate milestones as notified by BHEL Engineer.** 2 Other terms and conditions regarding T&Ps / MMEs please also refer clause for T&Ps & MMEs in SCC. 3 All the tools and plants required for this scope of work are to be arranged by the contractor within the quoted rates. The list is suggestive in nature. Any additional T&Ps required to be arranged by the contractor. 4 If work gets delayed due to non-availability of T&Ps, BHEL reserves the right to get the work done at the risk and cost of contractor without prejudice to rights of BHEL as in GCC.
B	**MONITORING AND MEASURING EQUIPMENTS (MMEs)- INDICATIVE LIST OF MMEs TO BE PROVIDED BY CONTRACTOR AS PER REQUIRMENT AT SITE**
SL NO	EQUIPMENT
1	General purpose Hand tools-
2	Digital/Analog Multi-meter AC & DC-
3	Megger 0-1000-2000-5000V
4	Primary current injection kit
5	Tong Testers DC 30/60/300 A
6	Digital Multimeter 4&half digit
7	Phase sequence indicator 110-450V
8	Frequency meter 0-100 HZ (0-110-230-415 V)
9	Single phase variac 0-220 V, 8A
10	Three phase variac 0-415,15A

11	Digital micro Ohm meter
12	A.C. H.V. Test Kit
13	Dead weight Tester for calibration of pressure gauge.
14	Precision Thermometer
15	Sound level meter 150 db.
16	Digital Handhold Temperature meter
17	Digital Recorder
NOTES:	1. The above list is only indicative and these MMEs may not be required for entire contract period but contractor will ensure that these T & Ps are provided as per need. Contractor will assess actual quantity and period of requirement based on his experience 2. Other terms and conditions regarding T&Ps / MMEs please also refer clause for T&P& MMEs in SCC. 3. All the MMEs required for this scope of work are to be arranged by the contractor within the quoted rates. The list is suggestive in nature. Any additional MMEs required to be arranged by the contractor. 4. If work gets delayed due to non-availability of MMEs, BHEL reserves the right to get the work done at the risk and cost of contractor without prejudice to rights of BHEL as in GCC.

9.0 LIST OF T&P BEING PROVIDED BY BHEL FOR USE OF CONTRACTOR FREE OF HIRE CHARGES ON SHARING BASIS

S.NO.	EQUIPMENT	CAPACITY	QTY
1.	HYDRA CRANE	14 MT/20 MT	01
2.	MOBILE CRANE	55 MT/75 MT	01
3.	EOT CRANE (Power House)	225 MT / 35 MT	01
4.	EOT CRANE (Service bay)	100 MT/25 MT	01

NOTE: The above mentioned suitable capacity crane without slings & lifting tackles will be provided by BHEL on sharing basis. The operation and maintenance of cranes shall be the responsibility of contractor. The fuel/power shall be also given by contractor.

1. EOT cranes in the power house will be erected / commissioned by BHEL PSNR and may become operational any time during the period of subject work. These EOT cranes will also be provided by BHEL free of hire charges & on sharing basis for subject work with exclusions as advised. The major maintenance of EOT crane will be carried out by M/s BHEL. Routine maintenance shall be taken care by the contractor under this scope of work. However, contractor will not be entitled for any compensation due to non-availability of EOT crane.
2. The contractor will have to provide qualified operator for operating the mobile and EOT cranes round the clock if required or as per requirement.
3. All other terms & conditions shall be as per SCC clause no. 4.2.1 & 4.2.2.

ANNEXURE-A

BILLING BREAK UP FOR SUB-CONTRACTOR FOR INSTALLATION WORK OF VYASI HEP

SL No.	PACKAGE		UNIT NO.		COMMON	TOTAL %
		% age	I (%)	II (%)		
1	**TURBINE AND ACCESSORIES**	**27**				
1.1	Embedded portion of first stage piping, field efficiency test piping, Drainage & Dewatering Pipings and lower pit liner ,pier nose liner.		1	1		2
1.2	Lowering of stay ring on foundation.		0.5	0.5		1
1.3	Positioning and matching of spiral casing segments with stay ring and released for welding.		0.75	0.75		1.5
1.4	Welding of spiral casing segments and NDT of welding joints of spiral casing/stress relieving		1	1		2
1.5	Hydraulic testing of spiral casing.		0.5	0.5		1
1.6	Erection of second stage embedded piping, Installation of Upper Pit liner		0.5	0.5		1
1.7	Runner and shaft assembly and lowering in pit.		0.5	0.5		1
1.8	Guide apparatus trial and final assembly.		1.5	1.5		3
1.9	MIV(BF), inlet pipe,outlet pipe,accessories, servomotors assy & testing etc .		2	2		4
1.10	Turbine Guide bearing including pad scraping.		1	1		2
1.11	Installation of Shaft sealing.		0.5	0.5		1
1.12	Installation of OPU, pressure accumulator of Governor & MIV.		0.25	0.25		0.5
1.13	OPU adjustment, Dry stroking and time adjustment of Guide Apparatus.		0.5	0.5		1
1.14	Air, Water & Oil Pipe line for Turbine and MIV.		1	1		2
1.15	Cutting of bracing from Spiral casing, MIV Inlet & Outlet Pipe ,Draft tube and Installation of Draft tube cones.		0.5	0.5		1
1.16	Instrumentation and box up for readiness for spinning.		0.5	0.5		1
1.17	Pre commissioning checks.		1	1		2
2	**GENERATOR AND ACCESSORIES**	30				
2.1	Dressing of foundations & Blue Matching.		0.25	0.25		0.5
2.2	Stator assembly, joint winding, HV etc.		2	2		4
2.3	Stator shifting to pit and its Centering, levelling etc.		0.5	0.5		1
2.4	Rotor rim building in service bay.		2	2		4
2.5	Mounting of Rotor Poles, HV test etc.		2	2		4
2.6	Bottom bracket assembly in service bay.		0.25	0.25		0.5
2.7	Lowering of bottom bracket in pit.		0.25	0.25		0.5
2.8	Blue matching of bearing pads and thrust bearing components.		0.5	0.5		1

ANNEXURE-A

BILLING BREAK UP FOR SUB-CONTRACTOR FOR INSTALLATION WORK OF VYASI HEP

SL No.	PACKAGE		UNIT NO.		COMMON	TOTAL %
2.9	Shaft and thrust bearing assembly in service bay.		0.5	0.5		1
2.10	Shifting thrust bearing, shaft assembly to pit incl final installation.		0.5	0.5		1
2.11	Assembly/Installation of Brake & Jack system, Brake dust collector , HS lubrication system.		0.5	0.5		1
2.12	Lowering of Rotor in Pit.		0.5	0.5		1
2.13	Assembly of Top bracket arms & Centre piece in service bay.		0.25	0.25		0.5
2.14	Lowering of Top bracket in Pit.		0.25	0.25		0.5
2.15	Installation of stator air coolers and its associated pipings.		0.25	0.25		0.5
2.16	Fire protection system of generator.		0.5	0.5		1
2.17	Generator instrumentation, gauge panel including calibration.		0.5	0.5		1
2.18	Complete Unit Axis Alignment.		1	1		2
2.19	Extension shaft, slip ring, brush gear, CCL, carbon dust collector etc.		0.5	0.5		1
2.20	Box up of bearings, oil filling in bearings ,installation of air baffles, guide etc.		1	1		2
2.21	Pre commissioning checks		1	1		2
						0
3	Excitation sys with AVR, Ex Trans, Accessories etc.	2	1	1		2
4	11 kV bus duct isolated phase type, terminal cubicles etc.	4	2	2		4
5	75MVA ,11KV/220KV Generator step up transformer 3 phase with associated equipments.	4	2	2		4
6	220V/48V DC system, battery banks, chargers, racks, electrolyte, main & sub dist boards.	2			2	2
7	Control & Monitoring sys incl computers, VDU's, printers, optic fibre cable(incl Alarm & annunc.,sync panels, instruments, relays, automatic energy metering system etc.	2	1	1		2
8	Optic fibre cable between Dam and Power House and other if any .	1			1	1
9	Protection system for Generator ,Transformers etc.with wiring & cubicles.	1	0.5	0.5		1
10	Power, Control & Instrumentation cabling, cable trays, support structures.	4.25	1.5	1.5	1.25	4.25
11	11 kV & 415 V Switchgearwith all Accessories.	2	1	1		2
12	Unit Auxiliary (630 kVA-02 Nos.) , Station Service (1250 kVA-02 Nos.) & Station transformer (5 MVA-01 No.).	3	1	1	1	3
13	Oil handling system.	0.5			0.5	0.5

ANNEXURE-A

BILLING BREAK UP FOR SUB-CONTRACTOR FOR INSTALLATION WORK OF VYASI HEP

SL No.	PACKAGE		UNIT NO.		COMMON	TOTAL %
14	Installation of pumps,strainers etc for cooling water	0.5	0.25	0.25		0.5
15	Laying of pipelines ,valves ,flow meters etc for cooling Water System .	1.5	0.75	0.75		1.5
16	Drainage water pumps and piping etc for PH	1			1	1
17	Dewatering system pumps and piping etc	1			1	1
18	HP & LP comp air system with compressors, accessories, piping etc	2	0.5	0.5	1	2
19	Grounding System/Equipment Earthing etc.	0.75	0.25	0.25	0.25	0.75
20	Installation of pipelines ,pumps ,valves etc for Fire Fighting System	2	0.5	0.5	1	2
21	Painting of equipment	1.5	0.5	0.5	0.5	1.5
22	Spining and bearing run of unit	3	1.5	1.5		3
23	Synchronising including commissioning tests prior to synchronising	2	1	1		2
24	Load throw off tests and unit inspection	1	0.5	0.5		1
25	Field Efficiencny test for Turbine & Generator.	1			1	1
Grand Total		100				100

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VOLUME- IA(PART-II) : TECHNICAL CONDITIONS OF CONTRACT (TCC)

NAME OF WORK: ERECTION & COMMISSIONING WORK OF HYDRO TURBINE GENERATOR (HTG) PACKAGE INCLUDING BOPs AND MATERIAL HANDLING WORK OF RECEIPT & UNLOADING OF PLANT MATERIALS AT BHEL STORES/WORK SITE, LOADING OF MATERIALS FROM BHEL STORES ,LOCAL TRANSPORTATION FROM BHEL STORES TO POWER HOUSE/WORK SITE ,PERFORMANCE TESTING AT SITE,FINAL PAINTING OF EQUIPMENTS AT SITE AND HANDING OVER TO CUSTOMER. AT BHEL 2X60MW VYASI HEP SITE, DISTT. DEHRADHUN , UTTRAKHAND

BHARAT HEAVY ELECTRICALS LIMITED

VOLUME – I A (PART – II) : TECHNICAL SPECIFICATIONS

1.0 GENERAL

BHEL has been awarded the work of Design, Manufacture, supply, installation, erection, testing & commissioning of **2X60 MW VYASI HYDRO ELECTRIC POWER PROJECT.**

1.1 SCOPE OF WORK

(A) Receiving and Unloading of consignments from the Trucks/Trailers arriving from BHEL manufacturing units and its suppliers/vendors.

(B) Proper Stacking and Preservations of all the material.

(C) Keeping records and status of all materials as per BHEL practices. Verification of all the material received by contractor. Prepare shortages/damaged reports, if any.

(D) Transportation of materials from site stores to the powerhouse service bay or the pre assembly area as per site requirement and the instructions of site engineer.

(E) Construction of temporary shelters on some of the special items as per the instruction of the site engineer.

(F) Unloading and stacking of certain items in the service bay / work area with the help of EOT cranes / loading arrangement as per the instruction of BHEL engineer.

(G) Proper Housekeeping and safe working.

(H) Handing over of all the spares to customer at their stores.

(I) Handling and Transportation of scrap from power house to UJVN Ltd stores / scrap yard as per the instructions of BHEL engineer

(J) Re-conciliation of materials with BHEL and UJVN Ltd.

(K) Erection, Testing , Commissioning and Handing over as per BHEL drawing, contract specifications and as per the instructions of the BHEL engineer.

The materials will be supplied from our manufacturing units located all over the country as well as our vendors located both inland and overseas. The scope of work under this tender consists of taking delivery of the materials from transporters, unloading, shifting to their designated locations, verification & stacking etc. The delivery of these materials will mostly be inside the project campus by road transport. However, delivery of some items may also have to be taken from Godowns of transporters.

Approx. weight to be handled under this contract will be approximately **3100 MT.** The contractor has to handle whatever actual materials are dispatched for the project irrespective of any variations and payments shall be released for the actual gross tonnage handled for material handling purposes.

Though most of the material is being planned to be made available at site well in time for erection requiring proper handling, verification and storage. However certain items may be delayed, requiring direct delivery at site for erection. In such cases contractor has to unload the material directly in powerhouse/ work place and verification to be carried out. Contractor for subject work will be eligible for payment as per the rate schedule. Besides above BHEL at its discretion may get the material handling/ unloading done at any location in the premises of powerhouse, store depending upon availability of space in powerhouse/ stores.

1.2 Tenderer may note that as the place of work is inside the POWER PROJECT and the premises is being manned by Security/Safety Force of UJVNL, all necessary system related to entry of men, vehicle & material, safety & security systems, work permit system etc. as applicable will have to be followed by the contractor

2.0 **PRELIMINMARY & CIVIL WORKS**

2.1 The contractor shall as a first field activity check all the foundations for the correctness of the same as per the drawings and satisfy himself in all respects such as location of foundations, absence of voids, **levels**, correctness of **bolt holes, pocket levels**, Centre lines etc. and all measurements should be recorded and submitted to engineer **for approval** before erection. Contractor shall also involve himself for correctness of pockets, foundation etc during concreting.

2.2 Before starting erection job, contractor shall ensure that area in which work is being carried out by the bidder is sufficiently enclosed against ingress of dust and water and all debris have been cleared off from the floor to a designated area as per instruction of engineer. The contractor shall arrange to get the working area and surroundings cleared daily to ensure the dust free atmosphere **and free from seepage water** for working and shall maintain sufficient labour for general cleaning of work areas. Delay of work on this account will not be acceptable.

2.3 The contractor shall cover all opening on floor and put temporary hand railing on all sides of the floor to avoid any accident to the working personnel.

2.4 Contractor shall fix up and maintain plates, supports for X & Y axis and elevation at different locations as required for each unit and **transfer the same from bench mark and XY axis given at one point by BHEL's client.** Joint protocol records for such benchmarks shall be got signed from BHEL's Engineer, customer's Supervisory and QA Engineer.

2.5 Once X-Y axis and elevation are fixed at different floors and protected, marking for other equipment's shall be transferred from these and joint protocol as above shall be got signed for each equipment or as required as per drawings.

2.6 All matching surfaces of components shall be well cleaned with cleaning agent and burrs shall be removed by filling and blue matched. Wherever necessary sealing/lubricating/anti-seize compounds shall be applied as per recommendation of Engineer. Machining/grinding required for fitting of keys, pins, packers , dowels etc. shall be carried out by contractor.

2.7 The accuracy of all equipment/ instruments and their functioning shall be established before they are permitted for use on the job. If the Engineer doubts the accuracy of the precision tools, at any time during erection, the contractor shall arrange the checking of tools/ equipment/ instruments at his cost.

2.8 All the works shall be performed to the lines, grades and elevations indicated on the drawings. The contractor shall be responsible to locate and layout the works. The horizontal & vertical control points established by the engineer shall be used as datum for the works under this contract. Any work done without being properly located may be removed and dismantled by the Engineer at the contractor's expenses if the contractor refuse to do it.

2.9 The contractor shall create all the facility at storage site as per the tender scope of work for unloading the equipment, its safekeeping, protection and proper record . No material should be lying loose any where in the power house as well as stores.

2.10 Contractor has to take care of general cleanliness in his area of work. For area cleaning within the premises of his work, the cleanliness shall be the total responsibility of contractor. Contractor within his scope of work shall keep the separate gang of workers for cleanliness operations. If the area under the scope is found unclean, BHEL can take measures on its own for cleaning and deduct the amount so spent from the running bills of contractor. De-watering of the areas/ floors in general will be by Contractor.

2.11 Necessary civil works shall be provided by BHEL client. The dimensions & locations shall be checked by the contractor for their correctness as per drawings. Further, top elevation and axis/ centrelines of all the foundations shall be checked with respect to benchmark etc. During the civil works, contractor shall check for all the block-outs, dimensions as required in their various mechanical drawings for installation of components/ assemblies and help BHEL wherever required for checking. All minor adjustments of foundation level, dressing and chipping of foundation surfaces up to 25 to 50 mm, enlarging the pockets in foundations etc., and repair of same as may be required for the erection of equipment shall be carried out by the contractor within the finally accepted rates.

2.12 Besides above, any works required for safe and efficient operation of tools and tackles like winches, guy ropes fastening scaffoldings etc. or any other temporary supports shall also be the contractor's responsibility. For these works all materials including wood / steel and required facilities will have to be arranged by contractor at his own cost.

2.13 While on the job, care is essential to avoid too much chipping and resultant lowering of level. In case of excess chipping, contractor has to arrange additional packing plates as per requirements provided BHEL Engineer allows it. When required as per drawings/ manufacturing unit, the embedded sole plates shall be scraped and checked with

Prussian blue to get the required contact with frames and concreting at no extra cost to BHEL.

2.14 The contractor shall ensure perfect matching of packer plates including scraping and blue matching with foundation by dressing the foundation, as well as perfect matching between the packer plates and the base plate of equipment to the satisfaction of BHEL Engineer.

2.15 The contractor shall provide his T&P stores for special tools and instruments at a convenient place near to the working area.

2.16 All mechanical works of machine related to civil works including foundations, grouting, concreting, erection of chequered plates along with embedment in concrete, grouting of liners, any civil works relating to setting of anchor bolts and foundation bolts including preparation of bolt holes will be in the scope of contractor.

2.17 Customer has given land and closed sheds to BHEL near project and BHEL has developed the plot area approx. 2500 Sq. m. fenced from all sides with entrance**,** closed storage sheds (02 Nos) and 02 (Two) open storage yard. More open area may be provided by Customer subsequently. Both these locations shall be used for storage of materials. Contractor has to take over that area including open area for storage of plant material supplied by various manufacturing units of BHEL. BHEL shall develop the land one time. Temporary works like soling of land from time to time for upkeep of the storage area shall be the responsibility of the contractor

BHEL shall be providing the general security arrangement at stores. However responsibility of security (watch and ward) of plant material/ equipment during handling, in stores of BHEL/ Contractor, in power house (erected or yet to be erected) shall lie with the contractor.

3.1 The scope of work mainly involves receipt, unloading from road carriers (Trucks/Trailers etc) of total materials for two units of 60 MW of BHEL (like Hydro-turbines, valves, generators, transformers, bus-duct, piping, auxiliaries equipment, C&I, BOP and other miscellaneous materials/ equipment) at site or bringing from road carrier godown to site stores/ storage yards and shifting from place of unloading to actual storage area (stores developed by BHEL), proper storing, stacking/ restacking of materials/ equipment (in closed store sheds/ open storage yards/ project site), verification of components including opening of cases, re-packing/ stacking and preservation of the same after verification including liasioning with carrier for waiver/ reduction of demurrage, watch and ward, to provide firefighting equipment including fire extinguishers in closed and open storage yard wherever required. Also transportation of material to erection site as and when required. The contractor is to use equipments (supplied by BHEL or arranged by contractor) like suitable cranes/ trucks/ tractor-trailers and other material handling equipment including all necessary small/ major T&P required for the same for the above work.

The contractor shall maintain record of material such as receipts, issue, return, in Day – Book, ledgers, stock registers and computers, issue gate passes, record of shortages & MDR etc as per BHEL procedures and instructions. The contractor shall also assist BHEL for all correspondence regarding the insurance including preparation of claims.

3.2 Approx. weight to be handled for two units as indicated in **Volume -IA, Part- I , Chapter – IV** is of the order of 3100 MT (Approx.). But the contractor has to handle whatever actual materials are dispatched for the project irrespective of variations in weight and sizes.

Volume-IA, Part- I, Chapter-IV gives the general idea for tender's information about the weights and dimensions of some major components/ equipment. The weights and dimensions shown are approximate and are liable to vary. No increase in quoted/ accepted rates/ prices should be allowed due to change in weights and dimensions of the equipment/ materials.

3.3 Some consignments mainly small/ parcels may also be received at carriers godown through road at Dehardhun/vikash Nagar. The contractor shall have to handle such consignments as per rate quoted/ accepted at sl no. 2 given in Chapter V.

3.4 The contractor shall deploy adequate number of supervisors, storekeepers, riggers, carpenter, fitters and other skilled and unskilled workers as per requirement having adequate experience of jobs of similar nature till completion of work.

3.5 Contractor shall provide all necessary preservatives, paints, thinners, rust preventives, grease, lubricants etc. for preservation of components. All tools and tackles and other consumables required for the contractor at his own cost shall also provide preservation of components including supervision. Preservation of components also includes applying

preservatives, paints, rust preventives, greasing of threaded portions, repainting of work order Nos./ DU nos./component codes etc. After preservation wherever necessary, components will be stacked properly as per original stacking for which no additional payment shall be made.

3.6 It shall be the responsibility of the contractor to keep in touch with Engineer at site and find out arrival of road consignments. The Contractor shall collect all the lorry waybills from BHEL site office either personally or through an authorised representative. The customer or his authorised representative shall, for the purpose, visit the said office every day and collect available LWB, PWB etc. While collecting the LWB, PWB contractor or his authorised representative will sign the register maintained for the purpose indicating the date and time of collection. The contractor shall keep in touch with carriers and arrange to effect delivery of consignments immediately on their receipts. Delay may cause deterioration of goods apart from attracting demurrage charges. Contractor shall also maintain a register indicating date of LWB, PWB date of collection of the materials from road transport agencies/ lorries and date of stacking them at storage yard of BHEL.

3.7 The contractor is required to find out and follow up regularly with carriers regarding arrival of consignments even prior to the receipt of GR, if any, and take delivery of the same on 'INDEMNITY BOND'. Indemnity bonds would be executed by BHEL when the Contractor furnishes intimation regarding arrival of consignment.

3.8 It is possible that in certain cases, LWBs, PWB may not be received in time but BHEL may receive Photostat copies of the same, it is, therefore, the responsibility of contractor to collect such Photostat copies while furnishing indemnity bond from BHEL authorities at site.

3.9 Payment of all demurrages/ warfages that results due to contractor's faults would be the responsibility of contractor and to his account. If BHEL have to make payment of demurrage/ warfage together with freight, the amount so paid as demurrage/ wharfage for the reasons stated above shall be paid by the contractor forthwith or would be recovered from bills of the contractor.

3.10 In any case contractor will pursue with concerned Carrier authorities at all level (local/ HQ etc) for waiver/ reduction to the minimum of such demurrage /wharfage charges. Whenever such demurrages/ wharfages become payable due to reasons not attributable to contractor, contractor will immediately bring it to the notice of BHEL with specific request to bear such charges. The decision of the Engineer in such case will be final and binding on the contractor.

3.11 The contractor has to ensure the unloading and removal of materials from unloading place within the permitted time and ensure to keep the area free and avoid jamming. Any loss to BHEL on this account shall be recovered from the contractor.

3.12 Any discrepancy/ shortage/ damage found in the consignment after taking delivery from the carriers after giving clear receipt would be the responsibility of the contractor and the amount liable to be lost by BHEL on such accounts is recoverable from the contractor.

3.13 In case of apparent damages/ shortages in consignments/ packing noticed by the contractor, such cases shall be brought to the notice of BHEL and cleared only with their consent/ approval. The contractor shall provide all the necessary assistance to BHEL for lodging the insurance claim and all correspondence with the insurer, surveyor and transport agency. The contractor shall also help in maintaining all the records in connection of insurance claims.

3.14 It would be responsibility of the contractor to examine the packages, consignments etc. on arrival and bring to the notice of carriers and BHEL authorities regarding loss/ damages, if any, observed in the consignments proposed to be taken delivery of.

3.15 Before taking delivery, particularly of consignments in 'smalls' the weight of the package shall be checked with the invoiced weight of the packages and any discrepancy shall be reported immediately to BHEL/ carriers. In all case of loss/ damages the contractor will take open delivery from the carriers and forward such open delivery certificates (ODC) to the engineer within 15 days of receipt of such consignment. All expenses connected there with shall be to the account of contractor. BHEL reserves right to claim losses, if any, accrued to BHEL in the event of contractor non-compliance to above.

3.16 In case of short delivery and non-delivery, immediate notice of loss shall be filed with the carrier at places of dispatch and destination as also at any intermediate stations, if it is different one, under intimation to BHEL authorities at site.

3.17 BHEL reserves the right to recover from the contractor any loss which arises out of undue delay/ discrepancy/ shortage/ damages or any other cause during transit between the carriers godown/ weigh bridges and BHEL storage yard/ store sheds/ project site or during unloading at carrier godown/ storage yard/ store shed/ project site or during stacking or any time during the custody of contractor. This is applicable for optional items.

3.18 Unloading from lorries, transportation, unloading at storage area/ work site of heavy sophisticated equipment like stator, panels etc. shall be done in the presence of and as per the directions of BHEL representative, including stacking and re-stacking, if necessity arises.

3.19 Certain packages are likely to be received by BHEL by passenger bus. The relevant waybills will also be handed over to the contractor for clearing the from the Bus station. It is the responsibility of the contractor to clear the same at the bus station, transport and hand over to BHEL authorities at site under the scope of the contract. All the tender provisions indicated in the tender shall be applicable in this case also.

3.20 Since the trucks/ trailers are expected to arrive during any time of the day/ night, the contractor shall have his workmen round the clock at site as well as other places as required to unload the materials.

3.21 Consignments coming on Sundays and Holidays are also required to be handled by the contractor promptly. It will be the responsibility of the contractor to contact the site engineer /his authorized representative of BHEL at their residence, if required, and obtain instructions to make suitable arrangements.

3.22 In the event unloading from the carrier is delayed by the contractor, the detention charges, if any, will be contractors account.

3.23 Under the scope of this contract, it shall be the responsibility of the contractor to provide all necessary facilities to open the packages in the presence of the engineer, verifying the contents of the packages, repackaging where ever and whenever necessary, properly stacking them as may be directed by the engineer so as to facilitate proper handling, periodical verification of material, receipt position, stock taking etc. for this, the contractor shall have experienced person at site who can maintain the records of dispatch/ receipt/ stacking/ verification/ shortages/ damage/ missing items etc. The verification of materials shall be carried out with in 15 days and report shall be submitted as a documentary proof.

3.24 All material shall be stored 6 inches above ground level by use of concrete or wooden sleepers. No material shall be left to remain on ground at any time. Material shall not be stacked in low-lying areas where it is likely flooded during rains. Wooden sleepers/ concrete block and tarpaulins for this purpose, wherever deemed necessary be arranged by the contractor. These items shall be stacked/ stored properly at the location(s) specified by BHEL when not in use.

3.25 The material/ equipment requiring indoor storage will be handed and stacked inside the storage shed (provided by BHEL) by the contractor using material handling equipment like Hydra crane, Fork lift etc.

3.26 For checking/ verification of the components with packing slips/ LWB/ PWB etc. The contractor shall provide sufficient experience persons and other facilities as and when required by the engineer.

3.27 Stacking/restacking of the material shall be done as per the instruction and to the satisfaction of engineer. The materials shall be so stacked that the same should facilitate easy handling. In the event of any improper stacking BHEL may ask the contractor to restack the material properly or failing which BHEL may get the job done by another agency at the risk and cost of the contractor.

3.28 The contractor shall execute the work in the most substantial and workman like manner. The stores shall be handled with care and diligence. Any loss to BHEL due to contractor's lapse /negligence shall have to be made good by the contractor.

3.29 In case contractor is not able to unload, transport, stack the material at a pre-determined area, as per direction of the engineer for any reason whatsoever (including non-availability of crane, tractor, trailer and other T&P etc.) BHEL shall be at liberty to get the work done by engaging other agency/ equipment / T&P etc at the risk and cost of the contractor.

3.30 It shall be responsibility of the contractor to keep the storage areas (closed/ open) in neat and tidy conditions. Any vegetation like grass, bushes, sarkandas etc. shall be cut in open storage area and removed as per requirement and instruction of BHEL engineer within the contractual value. All surplus/ unusable packing materials shall be removed and deposited at location(s) specified by BHEL within the project premises (including weighment of the same within the project premises if required).

3.31 Normally the consignments from BHEL manufacturing units/ their sub-suppliers are sent on freight paid basis. In case any consignment is received at any place or freight to pay basis, it will be the responsibility of the contractor to pay the freight and take delivery of such consignments. The amount of freight paid by the contractor at any point of time in such cases will be limited to Rs.5000/-. However, the freight paid by the contractor will be reimbursed by BHEL within a week's time on production of relevant receipt. In case of freight amounts exceed Rs.5000/- contractor may request BHEL well in time to issue cheque/ Draft for such additional amounts in favour of carriers towards freight charges. Receipt of payment and proof of taking delivery of consignment shall be submitted to BHEL by the contractor. Delay in issuance of cheque/ drafts as above shall not in any case be taken as a cause of delay in taking delivery of consignment resulting in wharfage / demurrage leviable by carriers.

3.32 In case some materials are required to be dispatched from Site to Manufacturing Units, other sites or any other place, the contractor may be asked by the engineer to get the same packed, transport it to the nearest railway station, carriers godown and get the same booked. The rates for this work shall be mutually decided at site and shall be payable extra to contractor . In case of material required to be booked as freight paid the freight for the consignment limited to Rs. 3000/- shall be paid by the contractor. However it shall be

reimbursed by BHEL on submission of receipt within a weeks' time. The funds for freight charges exceeding Rs. 3000/- shall be arranged by BHEL. Packing material required shall be provided by BHEL free of cost.

3.33 For any exigencies during execution of the contract, the contractor shall have to depute his personnel for collection/ delivery of any material meant for site from/ to outstation if desired and instructed by the Engineer. The contractor will however be reimbursed expenses incurred for such work for person deputed, as below:

a) 2nd class train fare worth reservation / supplementary charges/ bus fare subject to furnishing details regarding ticket nos., journey details, amount of fare etc.
b) Local conveyance charges (Actual bus/ cycle rickshaw/ auto rickshaw fare for local journeys at outstation) as permitted by the Engineer.
c) Daily allowances @ Rs.250/- per day and @ Rs.500/- per day for lodging.
d) Postal/ telegraph/ telephone charges if any subject to production of proof of having incurred such expenditure.
e) Freight and other charges, if any, paid on production of actual receipts.

Payment for the above will be made by BHEL with in a month from the date of submission of bill along with details/ desired documents by the contractor subject to completion of work assigned to contractor's personnel and to the entire satisfaction of engineer.

4.0 MATERIAL HANDLING AND STORAGE & TRANSPORTATION TO POWERHOUSE

4.1 Contractor shall plan in consultation with BHEL engineer, plant/ material to be received/ delivered in powerhouse as per erection progress/ schedules and fill in the requisite formats in standard forms.

4.2. **As the storage & erection work can be spread in different areas/ locations of the project, contractor has to arrange sufficient numbers of watch & ward personals to avoid any pilferage of material.** In case any equipment/ material is lost/ damaged while in the custody of the contractor, the cost of repair/ replacement if any to bring back the equipment in original order shall be deducted from the contractor's bill. BHEL's decision in this regard shall be final and binding on the contractor.

4.3 All electrical panels, control gear, motors and such other devices shall be dried by heating before they are installed and energized. Exposed parts those required special protection such as bearings, slip rings, commentator's and other fragile items shall be protected against moisture ingress and corrosion during storage and are periodically inspected.

4.4 The contractor shall ensure that all the packing materials and protective devices used for various equipment during transit and storage are removed before the equipment is installed.

4.5 Contractor shall also ensure that lifting heavy equipment such as generator rotor, stator, Main inlet valve, shafts etc. shall be done strictly in accordance with drawing given for the purpose and using of lifting tackles supplied for the purpose. Wherever required rubber/ leather pads shall be given between the slings and the machined parts to avoid any damages, scratches to the machined surface. Contractor shall cover bearing journals with grease and cloth as per direction of engineer to avoid damages to the surface.

4.6 As per the erection requirement contractor shall deliver material to powerhouse/ work site. The maximum care has to be taken during that time of loading the material at storage area, transportation and unloading at powerhouse. No untoward damage should occur to the material at that time. Any loss of item/ damages shall be to the contractors account.

5.0 Preservation of components

Preservation of all material received at store/site shall be in the scope of contractor.

For further details regarding preservation refer to Chapter 6 of SCC clause no 6.2.

6.0 CLEANING OF EQUIPMENT

6.1 The contractor shall thoroughly clean all the components before installation of the components whose surfaces are coated with protective coating and sent to site are to be thoroughly cleaned by suitable mechanical/ chemical means as per the approved procedure.

6.2 Contractor shall ensure that the items identified by BHEL shall be cleaned with kerosene/ petrol/ CRC before assembly and erection of the equipment. For cleaning purposes he shall use only soft cotton cloth. Contractor shall never use cotton waste for cleaning any equipment. The electrical equipment before erection shall be cleaned with dry air/ vacuum cleaner.

6.3 The contractor shall clean inside of all pipes and fittings from dirt, sand and loose scales, mechanically/ chemically and by air blowing before being erected. All pipe lines be thoroughly blown/ flushed. If necessary certain pipelines may have to be cleaned by acid pickling/ chemical cleaning. The procedure for the same shall be provided by BHEL. All chemicals and inhibitors shall be arranged by the contractor with in the contract. Disposal of chemical has to be carried out by the contractor at his own cost.

7.0 Erection

7.1 All works such as cleaning, checking, levelling, blue matching, aligning, assembling, temporary erection for alignment / dismantling of certain equipment for checking, cleaning, surface preparation, fabrication at site, cutting, grinding, straightening, chamfering, filing, chipping, drilling, reaming, dowelling, scrapping, machining, surface grinding, shaping, fitting up welding, tube expansion etc. as may be applicable in such erection works are to be treated as incidental to erection and necessary to complete the work satisfactorily & shall be carried out by the contractor as part of the work.

7.2 Any fixtures, scaffolding materials, approach ladder, concrete block supports, steel structures required for temporary supporting, pre-assembly or checking, welding, lifting and handling during pre-assembly and erection shall be arranged by contractor at his cost within the finally accepted rates.

7.3 No members of the ladder/ structure/ platform should be cut without specific approval of BHEL. In case it is necessary to cut, the contractor shall rectify/ repair in a manner acceptable to BHEL/ customer without any additional cost.

7.4 The contractor shall erect scaffolding/ temporary platforms for erection. These should be of adequate capacity and shall never be over loaded. These should be replaced when not found suitable during erection work and dismantled on work completion & removed from work site.

7.5 Corrections like straightening of ladders, tube support plates adjustment/ removal of ovulates in pipes and opening or closing the fabricated bends of piping to suit the layout shall be considered part of the work and the contractor is required to carry out such work within finally accepted price/ rate as per instructions of Engineer.

7.6 The contractor shall fabricate pipes, special bends, etc. threading and welding as required and carry out the chemical cleaning of fabricated piping.

7.7 The servicing and realignment of skid-mounted equipment if required or if directed by BHEL shall be carried out by the contractor at no extra cost to BHEL.

7.8 The contractor shall completely erect & test all the piping systems, covered in the specification including sampling lines up to and including sample coolers, hangers & supports, valves & accessories in accordance with the drawings furnished. This includes all necessary bolting, welding, pre-heating, stress relieving, testing, cleaning & painting. System shall be demonstrated in condition to operate continuously in a manner acceptable to the Engineer. Welding shall be used throughout for joining pipes except

where flanged screwed or other type joints are specified or shown on the drawings. All piping shall be erected true to the lines & elevation as indicated in the drawings.

7.9 Pipes sent in standard length shall be cut to suit the site conditions and the layouts. Tubes or pipes wherever deemed to be convenient will be sent in running lengths. Bends shall be prepared and/or fabricated at site.

7.10 The contractor shall ensure lowering of pipes in position with adequate precautions as to avoid any damage to either material or men. Only the anchoring points earmarked for the purpose of lowering the pipes are to be used.

7.11 Certain adjustments in length may be necessary while erecting pipelines. The contractor should remove the extra lengths/ add extra lengths to suit the final layout after preparing edges a fresh by adopting specified heat treatment procedures, at no extra cost.

7.12 It is possible that a few flanges may not be matching. The contractor shall be required to cut and re-weld the same as and when required without any additional cost.

7.13 The contractor shall be responsible for any modifications of shop fabricated pipes prior to installation to accommodate minor site alteration in pipe which may include cutting/re welding of flanges/pipes for change of angles of bend or length adjustment at no extra cost.

7.14 All vents and drains for piping equipment covered in the scope whether shown in the drawings or not shall terminate in atmosphere and to pit as directed by BHEL.

7.15 Wherever piping erected by the contractor is connected to equipment/ piping erected by the other agencies the joint at the connecting point shall be the responsibility of the contractor of this specification.

7.16 Normally the valves will have prepared edges for welding. But, if it becomes necessary, the contractor will prepare new edges or recondition the edges by grinding or chamfering to match the corresponding tubes and pipes. All fittings like `T' pieces, weld neck flanges, reducers etc., shall be suitably matched with pipes for welding. The valves will have to be checked, cleaned or overhauled in full or in part before erection after chemical cleaning and during commissioning.

7.17 The contractor shall be responsible for correct orientation of all valves so that seats, stems & hand wheels will be in desired location. It is the responsibility of the contractor to obtain the information regarding orientation of valves not fully located on drawings before the same are installed.

7.18 Suspension for piping, etc., will be supplied in running lengths, which shall be cut to suitable sizes and adjusted as required.

7.19 The adjustment of all supports erected for maintaining the proper slopes of piping wherever required is also included in the scope of the contractor.

7.20 No temporary supports should be welded on the piping. In case of absolute necessity prior approval should be taken from BHEL Engineer. In such cases heat treatment if required, shall be carried out by the contractor as part of subject work.

7.21 All supports and anchors shall be installed as per drawing to obtain safe and reliable and complete pipe installation as per instructions of Engineer. Any additional support as called for by Engineer shall have to be fabricated and provided by the contractor. The raw materials required for fabricating such supports shall be arranged by BHEL.

7.22 Contractor shall install piping in such a way that no excessive or destructive expansion forces exist under any condition.

7.23 The contractor shall carry out the tightening of the field bolts on the equipment and piping covered under this specification by using either the calibrated torque wrench method or the turn of part method. The methods used, the tools and the equipment deployed shall be subject to the approval of Engineer. All the torque wrenches shall be calibrated at the start of each days work and at least once during the day. The bolting work shall be carried out by the competent technicians.

7.24 The contractor shall ensure that all supporting elements, anchors & restraint have been installed and adjusted in accordance with the drawings / sketches & other written instructions of the Engineer.

7.25 Layout of small bore piping as required shall be done as per site requirement. Necessary sketch for routing these lines should be got approved from BHEL by the contractor. There is a possibility of slight change in routing the above pipe lines even after completion of erection or from aesthetic point of view which should be carried out at no extra cost.

7.26 All the valves, including motorised valves, flap valves, etc. shall be serviced and lubricated to the satisfaction of Engineer before erecting the same and during pre-commissioning also. Welding or jointing of extension spindle for valves to suit the site conditions and operational facility shall be part of erection work within the quoted rates.

7.27 Additional platforms and ladders of permanent nature incidental to the job for approaching different equipment/ valves as per site requirement, which may not be

indicated in drawings, shall be fabricated and installed by the contractor. The materials required will be supplied by BHEL free of cost.

7.28 Erection and welding of necessary instrumentation tapping points, valves to be provided on equipment, auxiliaries and pipe lines covered within the scope of this specification, will also be the responsibility of the contractor and will be done as per the instructions of BHEL Engineer at no extra cost.

7.29 All the items will be supplied in pieces/ loose and are to be assembled bolted and welded at site. Contractor has to work as per the drawings and instruction issued at site for erection and testing purposes. Weights for handling and erection are indicative only. **No claim will be entertained on account of variations in weights or change from conventional design e.g from bolted to welded connections and vice versa, increase in number of pieces etc. The bidders should take care of this point while quoting lump sum price for subject works for handling and erection works.**

7.30 It may be possible that during routing /laying of pipelines, cable trays ,HVAC ducts etc may foul with each other ,the contractor has to re-route (Minor) the above as per the decision of BHEL

7.31 In view of the tight erection schedule, limited area in both the service bay and rotor assembly being in critical path, whatever pre-erection preparatory works can be carried out in BHEL store area shall have to be planned accordingly. In particular, the cleaning, de-burring, de-greasing and segregation of rim punching by weight shall definitely be planned and carried out in store area.

Since the subsequent units shall have to be erected/ commissioned in schedule time the contractor shall have to complete the rotor assembly in the service bay by working round the clock in this area. Moreover, two-shift working shall have to be adopted by the contractor to meet the erection schedule

8.0 WELDING, HEAT TREATMENT, RADIOGRAPHY AND OTHER NON-DESTRUCTIVE TESTING

8.1 The equipment and piping shall be erected in conformity with the provisions of standard/ specification and as may be directed by BHEL The method of welding (arc, gas, TIG, MIG or other method) may be indicated in the detailed drawings/ schedules. BHEL Engineer will have the option of changing the method of welding as per site requirements.

In order to save time of assembly/erection of spiral casing, the welding shall be carried out by MIG process as far as possible. Two shifts or preferably three shifts working with deployment of sufficient number of certified welders, fitters etc shall be adopted to ensure completion of stay ring and spiral casing assembly within scheduled period.

8.2 Welding being a special process, all-welding shall be carried out by skilled and experienced welders holding valid certificates as per requirements of ISO 9002. The certificate shall be checked by BHEL before allowing the welders to be engaged on welding. BHEL at its own discretion may ask any or all welders to under go welder Qualification Test as per Standard Procedure in accordance with requirements of ISO 9002 and as per welding manual of BHEL**. The deployment of qualified welder and subsequent site testing of requisite numbers of welders shall be one of the prerequisite of contractor's site mobilisation completion.**

8.3 All welders including tack welder, structural and pipe welder shall be tested as per ASME section IX and approved by BHEL Engineer before they are actually engaged on work though they may possess the certificate. BHEL reserves the right to reject any welder if the welder's performance is not found to be satisfactory. The contractor in Performa given by BHEL Engineer shall maintain the records of qualification of welders. All the welders qualified for the work will be issued an identity card by BHEL Engineer and welder will keep the same with him at work place.

8.4 BHEL Engineer may stop any welder from the work if his performance is unsatisfactory for any technical reason or if there is a high percentage of rejection of joints welded by a particular welder which, in the opinion of the Engineer will adversely affect the quality of the welding though the welder has earlier passed the tests prescribed by Engineer. The welder's having passed qualification tests does not absolve contractor of contractual obligation to continuously check the welder's performance.

8.5 Faulty welds caused by the poor workmanship shall be cut and re-welded at the **contractor's expenses including cost of materials**. The Engineer prior to any repair being made shall approve the procedure for the repair of defective welds. Radiography or any

other NDT on completed field welds shall be conducted as per drawings or instructions of BHEL engineer.

8.6 The contractor shall carry out the root run welding of all piping, valves, instrumentation, tapping points etc. by TIG/ SMAW / MIG welding process. The contractor shall have to carry out full TIG welding of butt weld joints of tubes /pipes of lesser thickness if required. During the root runs of stainless steel joints, the contractor shall before and during welding have to purge the pipes with inert gas in case of stainless steel. All arrangements required for the above shall be the responsibility of the contractor at no additional cost.

8.7 All charges for testing of contractor's welders including consumables for welding / destructive and non destructive tests conducted by BHEL at site or at laboratory shall have to be borne by the contractor only. The test coupons raw material will be supplied by BHEL free of cost.

8.8 The regulators used on welding machines shall be calibrated before putting these into use for work. Periodic calibration for the same shall also be arranged by the Contractor at his cost.

8.9 Only **BHEL/UJVN Ltd approved electrodes and filler wire** will be used. All electrodes shall be baked and dried in the electric electrode-drying oven to the required temperature for the period specified by the Engineer before these are used in erection work. All welders shall have electrodes drying portable oven at the work spot. The electrodes brought to the site will have valid manufacturing test certificate. The test certificate will have co-relation with the lot No. /batch No given on electrode packets. No electrodes will be allowed to be used in the absence of above requirement. The thermostat and thermometer of electrode drying oven will be also calibrated and test certificate from Govt. approved / accredited test house traceable to National / International standards will be submitted to BHEL before putting the oven in use. Periodical calibration for the same shall also be arranged by the contractor within the finally accepted rates.

8.10 All butt / fillet welds shall be subject to dye penetration test as per drawing and document requirement and have to be carried out as per the instructions of the engineer within the quoted / finally accepted rates for this contract .

8.11 The contractor shall maintain a record in the form as prescribed by BHEL of all operations carried out on each weld and maintain a record indicating the number of welds, the names of welders who welded the same, date and time of start and completion, preheat temperature, radiographic results, rejection if any, percentage of rejection etc. and submit copies of the same to the BHEL Engineer as required. Interpretation of the BHEL Engineer regarding acceptability or other wise of the welds shall be final. All site welding joints shall be subject to acceptance by BHEL Engineer

8.12 All welds shall be painted with anticorrosive red oxide paint once radiography and stress reliving works are over. Necessary consumables and scaffolding etc. including paints shall be provided by contractor at his own cost.

8.13 The contractor shall carry out the edge preparation of weld joints at site in accordance with the details acceptable to BHEL. Wherever possible machining or automatic flame cutting will be allowed only wherever edge preparation otherwise is impractical. All slag's / burrs shall be removed from cuts and all the hand cuts shall be ground smooth to the satisfaction of engineer.

8.14 **Pre-heating, radiography and other NDT tests, post heating and stress relieving after welding of tubes, pipes, including attachment welding wherever necessary, are part of erection work and shall be carried out by the contractor in accordance with the instructions of Engineer. All equipment and consumables essential for carrying out the above process shall be arranged by contractor at his cost.**

8.15 Contractor shall arrange all necessary stress relieving equipment with automatic recording devices. Also the contractor shall have to arrange for labour, heating elements, thermocouples, etc. insulating materials like asbestos cloth, ceramic beads, asbestos ropes etc. required for heat treatment/ stress relieving operations. Temperature shall be measured by thermocouple and recorded on a continuous printing type recorder. All the recorded graphs for heat treatment works shall be the property of BHEL. The contractor has to provide thermal chalks, temperature recorders, thermocouple attachment units, graphs sheets, etc. for checking within the finally accepted rates. All stress relieving equipment will be used after due calibration and submission of test certificate to BHEL. Periodic calibration from Govt. approved / accredited Test Houses traceable to National / International standards will also be arranged by the contractor for such equipment at his cost. The contractor shall obtain the signature of BHEL Engineer or his representative on the chart of the recorder after setting up the weld joints for heat treatment operation prior to the starting..

8.16 **The contractor shall also be equipped for carrying out other NDT like Radiography , DP, MPI , UT etc. as required as per welding schedule/ drawings within the finally accepted price/ rates.on all equipment welding in Stay ring, Spiral, spiral inlet pipe, MIV(BFV), MIV inlet pipe, and also in piping and other areas as applicable Necessary help including surface preparation and scaffolding required for conducting all the shall be rendered by contractor at his own cost.**

8.17 The technical particulars, specification and other general details for NDT work shall be in accordance with ASME, ISO or as specified by Drawings and Manuals of BHEL / CUSTOMER.

8.18 Low speed high contrast, fine grain films (D-7 or equivalent) in 10cm. width only be used for weld joint radiography. Film density shall be between 2.0 to 4.0.

8.19 Iridium – 192 / any other approved shall be used by contractor for radiography work. The geometric un-sharpness shall not exceed 0.05 mm. Taking adequate safety precautions shall be the responsibility of the contractor while carrying out radiography. Necessary safe guards required for radiography (including personnel from BARC) shall be arranged by contractor at his own cost.

8.20 All radiographs shall be free from mechanical, chemical or process marks, to the extent they should not confuse the radiographic image and defect finding. Penetrameter as per ASME or ISO must be used for each exposure.

8.21 Lead numbers and letters are to be used (generally 6mm size) for identification of radiographs. Contract no., joint identification, source used, welder's identification and SFD are to be noted down on paper cover of radiograph.

8.22 Lead intensifying screens for front and back of the film should be used as per the above referred ASME specification.

8.23 The joint is to be marked with permanent mark A, B, C, etc. to identify the segments. For this a low stress stamp shall be used to stamp the pipe on the down stream side of the weld.

8.24 For multiple exposure, an overlap of about 25 mm of film should be provided.

8.25 Radiography personnel with sufficient experience and certified by M/s BARC as Radiographer for conducting radiographic tests in accordance with safety rules laid down by Division of Radiological protection only have to be deployed . These personnel should also be registered with BARC for film badge service.

8.26 All arrangements for carrying out radiography work including dark room with air conditioner/ blower and other accessories shall be provided by contractor within the space allotted for office at his cost. As an alternative the contractor may deploy an agency having all above facilities and who are duly approved / accredited by BARC and/or other Regulatory authorities. Detailed particulars of such agencies will be submitted and got approved by BHEL Engineer before the actual deployment of agency for radiography work.

8.27 The contractor shall have a dark room fully equipped with radiography equipment, film (unexposed), chemicals and any other dark room accessories such as Airconditioner/ Blower etc. There should be adequate number of radiography personnel with sufficient experience and certified by M/s BARC as Radiographer for conducting radiographic

tests in accordance with safety rules laid down by Division of Radiological protection. These personnel should also be registered with BARC for film badge service.

8.28 Contractor shall note that 100% radiography will be done at the initial stages on all the welding joints as specified in the drawings. Subsequently radiographic inspection will be done on the basis of quality of welding. However minimum percentage of joints to be radiographed shall not be less than the requirement of BHEL welding schedule. The percentage may be increased depending upon the quality of joints and at the discretion of BHEL. Radiography on LP piping joints is not envisaged. However other NDT test as called for in the FQP including LPI, MPI and HT will have to be carried out.

8.29 All the Radiographs shall be properly preserved and shall become the property of BHEL.

8.30 Since radioisotopes are being used, all precautions and safety rules as prescribed by BHEL/BARC/ Customer shall be strictly followed. BARC certificate/permission letter to be provided before taking up the work.

8.31 Radiography of joints shall be so planned that it does not interfere with the ongoing erection works keeping in mind the safety of the persons due to radiation exposure. The testing of the welding joints shall also be planned in a way that it is carried out at the earliest possible so as to assess the soundness of the weld joints and performance of HP welders. If the performance of welder is unsatisfactory, he shall be replaced immediately.

8.32 Wherever radiographs are not accepted, on account of bad shot, joints shall be re-radio graphed and re-shots submitted for evaluation. Radiographs shall be taken on joints after carrying out repairs. However, if the defect persists after first repair, as per radiograph, carrying out radiography shall be repeated till the joint is made acceptable. In case the joint is not repairable, the same shall be cut, re-welded and re-radio graphed at contractor's cost.

8.33 If the contractor does not carry out radiography work due to non-availability of source / film / chemical / operator etc., BHEL will get the work done departmentally or through some other agency at the risk and cost of the contractor.

8.34 Heat treatment and radiography may be required to be carried out at any time (day and night) to ensure the continuity of the progress. The contractor shall make all necessary arrangements including labour, supervisors/ Engineer required for the work as per directions of BHEL.

8.35 The contractor shall assist BHEL Engineer in preparing complete field welding schedule/procedure for all the field welding activities to be carried out in respect of piping and equipment erected by him involving high pressure welding at least 30 days prior to the scheduled start of erection work at site. Such schedules shall be strictly adhered to by the contractor.

8.35 The contractor shall assist BHEL Engineer in preparing complete field welding schedule/procedure for all the field welding activities to be carried out in respect of piping and equipment erected by him involving high pressure welding at least 30 days prior to the scheduled start of erection work at site. Such schedules shall be strictly adhered to by the contractor.

9.0 TESTING, PRE-COMMISSIONING, COMMISSIONING AND POST-COMMISSIONING.

9.1 On completion of erection of equipment, the contractor shall get the equipment checked up by the UJVN Ltd/BHEL, and their deputed supervisors, specialists concerned with the particular item of work. The testing of various equipment will be carried under the supervision of BHEL/ UJVN Ltd with the assistance of the Contractor in the manner decided by and in the presence of the owner and other authorized supervisors concerned, and to their entire satisfaction. On completion of these preliminary checks by the equipment supplier, the contractor shall make the equipment ready for conducting the test. The contractor shall rectify all defects found during the checking / testing as directed by the BHEL/ Consortium partner /Owner to ensure satisfactory operation of the equipment.

9.2 The contractor shall carry out the required tests as instructed by BHEL using contractor's own consumables, labour and scaffoldings.

9.3 All the tests shall be repeated till all the equipment satisfy the requirement / obligation of BHEL at various stages. Contractor shall also carry out repair of all the welded joints (site and suppliers) failed during testing.

9.4 The scope of testing activities cover installation of all necessary temporary piping, supports, valves, blanking, pumps, tanks etc. and other accessories with access platforms valves, pressure gauges, electric cables, switches, cutting of some of existing valve, placing of rubber wedges in the valves etc., required for hydro test, chemical cleaning, or for any other tests as the case may be and will carry out above activities under this scope of work as per instructions of BHEL. The scope also covers the off site disposal of effluents.

9.5 For testing of spiral casing, the necessary test pump and bulk heads shall be supplied by BHEL. Any other item which may be required additionally shall be arranged by contractor. The necessary blanks, pressure gauge, valve etc for testing of piping system including hardware shall be arranged by the contractor within his scope of work.

9.6 It shall be the responsibility of the contractor to provide various categories of workers in sufficient numbers along with Supervisors including necessary consumables, T&Ps, IMTEs etc., and any other assistance required during testing of equipment and attending any problem in the equipment erected by the contractor till handing over. Association of BHEL's/ Client's staff during above period will not absolve contractor from above responsibilities.

9.7 It shall be specifically noted that the above employees of the contractor may have to work round the clock along with BHEL Engineers and hence overtime payment by the contractor to his employees may be involved. The contractor's finally accepted rates/ price shall be inclusive of all these factors also.

9.8 In case, any rework is required because of contractor's faulty erection which is noticed during testing, the same has to be rectified by the contractor at his cost. If any equipment/ part is required to be inspected during testing, the contractor will dismantle /open up the equipment / part and reassemble / redo the work without any extra claim.

9.9 During testing, opening/ closing of valves, changing of gaskets, realignment of rotating and other equipment, attending to leakage and adjustments of erected equipment may arise. The finally accepted price shall also include all such work.

9.10 The contractor shall make all necessary arrangements including making of temporary closures on piping/ equipment for carrying out the hydro test on all piping equipment covered in the specification at no additional cost.

9.11 In case any defect is noticed during tests such as loose components, undue noise or vibration, strain on connected equipment etc., the contractor shall immediately attend to these defects and take necessary corrective measures. If any readjustment and realignment are necessary, the same shall be done as per Engineer's instructions including repair, rectification and replacement work by the contractor at his cost. The parts to be replaced shall be provided by BHEL.

9.12 The contractor shall carry out cleaning and servicing of valves prior to testing of the equipment under his scope. A system for recording of such servicing operations shall be developed and maintained in a manner acceptable to BHEL Engineer to ensure that no valves are left un-serviced. Wherever necessary as required by BHEL Engineer, the contractor shall arrange to lap / grind valve seats.

9.13 Cleaning & servicing of all the filters/ strainers, toppings of oils coming in the system shall be done by the contractor within the accepted price.

9.14 At the time of each inspection, the contractor shall take note of the decisions / changes proposed by the Engineer and incorporate the same at no extra cost.

10.0 Finish painting

10.1 Primer painting wherever peeled off or damaged or if required is to be carried out after thoroughly cleaning of all dirt, rust, scales, grease, oils and other foreign materials by wire brushing, scrapping, any other method as per requirement of BHEL and the same being inspected and approved by the engineer before painting. Bare surfaces / unpainted surfaces shall be provided with two coats of suitable primer. The gas cut stubs / weld seams would require to be cleaned / ground before painting. After applying the primer paints all the equipment / items shall be finished with two coats of enamel paint or any other paint as issued by BHEL. The exterior surface may have to be cement / coal tar painted as directed by BHEL

10.2 As the equipment/ items are to be spray painted, the contractor shall make arrangements of the required equipment for spray painting. Spray painting at the job/ site shall be permitted only items approved by the owner / Engineer.

10.3 While the primers and paints will be issued by BHEL as free issue item, all tools and other consumables including scaffolding materials required for finish painting shall be supplied by contractor within their quoted rate.