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

NO: BHE/PW/PUR/BSI1-STG/1207

RECEIPT/COLLECTION, UNLOADING, HANDLING, STACKING, PRESERVATION, VERIFICATION OF ENTIRE PROJECT MATERIALS INCLUDING ELECTRICAL AND CONTROL & INSTRUMENTATION EQUIPMENTS/ ITEMS AND OTHER MATERIALS IN BHEL / CUSTOMER'S STORES / STORAGE YARD AS RECEIVED BY ROAD FROM MANUFACTURING UNITS / TRANSPORTERS GODOWN UNDER MATERIALS MANAGEMENT , RECEIPT / COLLECTION / LOADING / TRANSPORTATION OF MATERIALS FROM BHEL / CLINT'S STORES / STORAGE YARDS TO SITE OF WORK, UNLOADING of **Balance Materials** . ERECTION, TESTING, COMMISSIONING OF SURFACE CONDENSERS, STEAM TURBINES, TURBO BLOWERS, PUMPS & AUXILIARIES INCLUDING CONDENSATE EXTRACTION PUMPS, PIPINGS, APPLICATION OF THERMAL INSULATION, FINAL PAINTING, ASSISTANCE FOR PG TEST ETC. AND HANDING OVER OF 3 x TURBO BLOWER SET

AT

STEEL AUTHORITY OF INDIA LTD (SAIL)

BHILAI STEEL PLANT, BHILAI

DIST. DURG, (CHHATISGARH)

VOLUME – I-TECHNICAL BID

CONSISTING OF:

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

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

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Tender Specification Issue Details

Tender Specification No: BHE/PW/PUR/BSI1-STG/1207

RECEIPT/COLLECTION, UNLOADING, HANDLING, STACKING, PRESERVATION, VERIFICATION OF ENTIRE PROJECT MATERIALS INCLUDING ELECTRICAL AND CONTROL & INSTRUMENTATION EQUIPMENTS/ ITEMS AND OTHER MATERIALS IN BHEL / CUSTOMER'S STORES / STORAGE YARD AS RECEIVED BY ROAD FROM MANUFACTURING UNITS / TRANSPORTERS GODOWN UNDER MATERIALS MANAGEMENT , RECEIPT / COLLECTION / LOADING / TRANSPORTATION OF MATERIALS FROM BHEL / CLINT'S STORES / STORAGE YARDS TO SITE OF WORK, UNLOADING of **Balance Materials**. ERECTION, TESTING, COMMISSIONING OF SURFACE CONDENSERS, STEAM TURBINES, TURBO BLOWERS, PUMPS & AUXILIARIES INCLUDING CONDENSATE EXTRACTION PUMPS, PIPINGS, APPLICATION OF THERMAL INSULATION, FINAL PAINTING, ASSISTANCE FOR PG TEST ETC. AND HANDING OVER OF 3 X TURBO BLOWER SET

AT

STEEL AUTHORITY OF INDIA LTD (SAIL)

BHILAI STEEL PLANT, BHILAI

DIST. DURG, (CHHATISGARH)

EARNEST MONEY DEPOSIT: Refer Notice Inviting Tender

LAST DATE FOR TENDER SUBMISSION: Refer Notice Inviting Tender

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

M/s. ……

……

PLEASE NOTE:
THESE TENDER SPECS DOCUMENTS ARE NOT TRANSFERABLE.

For Bharat Heavy Electricals Limited

AGM (Purchase)
Place: Nagpur
Date:

1207

NOTICE INVITING TENDER

(Document No PS:MSX:NIT:Rev 01 dated 1st Jun 2012)

Bharat Heavy Electricals Limited

Ref: **BHE/PW/PUR/BSI1-STG/1207** **Dated 14/12/2013**

NOTICE INVITING TENDER (NIT)

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

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To

Dear Sir/Madam

Sub : NOTICE INVITING 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.

1.0 Salient Features of NIT

SL NO	ISSUE	DESCRIPTION	
i	**TENDER NUMBER**	**BHE/PW/PUR/BSI1-STG/1207**	
ii	**Broad Scope of job**	RECEIPT/COLLECTION, UNLOADING, HANDLING, STACKING, PRESERVATION, VERIFICATION OF ENTIRE PROJECT MATERIALS INCLUDING ELECTRICAL AND CONTROL & INSTRUMENTATION EQUIPMENTS/ ITEMS AND OTHER MATERIALS IN BHEL / CUSTOMER'S STORES / STORAGE YARD AS RECEIVED BY ROAD FROM MANUFACTURING UNITS / TRANSPORTERS GODOWN UNDER MATERIALS MANAGEMENT , RECEIPT / COLLECTION / LOADING / TRANSPORTATION OF MATERIALS FROM BHEL / CLINT'S STORES / STORAGE YARDS TO SITE OF WORK, UNLOADING of **Balance Materials** . ERECTION, TESTING, COMMISSIONING OF SURFACE CONDENSERS, STEAM TURBINES, TURBO BLOWERS, PUMPS & AUXILIARIES INCLUDING CONDENSATE EXTRACTION PUMPS, PIPINGS, APPLICATION OF THERMAL INSULATION, FINAL PAINTING, ASSISTANCE FOR PG TEST ETC. AND HANDING OVER OF 3 x TURBO BLOWER SET AT **STEEL AUTHORITY OF INDIA LTD (SAIL) BHILAI STEEL PLANT, BHILAI DIST. DURG, (CHHATISGARH)**	
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*	
e	Volume-II	*Price Schedule (Absolute value).*	*Applicable*
iv	**Issue of Tender Documents**	***1. Sale from BHEL PS Regional office at :*** ***Start : 14/12/2013,*** ***Closes: 23/12/2013 , Time :16:00 Hrs***	*Applicable/* *~~Not applicable~~*

		2. From BHEL website (www.bhel.com) Tender documents will be available for downloading from website till due date of submission	
v	**DUE DATE & TIME OF OFFER SUBMISSION**	***Date : 24/12/2013 , Time : 15:00 Hrs*** ***Place : BHEL PS Regional office at :Nagpur*** Tenders being submitted through representative shall be submitted at dispatch section of of PSWR HQ Office after making entry/registration at the reception. For any assistance on the matter kindly contact following officials: Pratish Gee Varghese/Sr Engineer(Purchase Shivkesh Meena / Engineer (Purchase)	*Applicable*
vi	**OPENING OF TENDER**	***1 hours after the latest due date and time of Offer submission*** *Notes:* *(1) In case the due date of opening of tender becomes a non-working day, 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*	*Applicable*
vii	**EMD AMOUNT**	*Rs 2,00,000/- (Rupees Two Lakhs Only)*	*Applicable*
viii	**COST OF TENDER**	*Rs 2000/-.*	*Applicable*
ix	**LAST DATE FOR SEEKING CLARIFICATION**	*Atleast 5 days before the due date of offer submission* *Along with soft version also, addressing to undersigned & to others as per contact address given below*	*Applicable*
x	**SCHEDULE OF Pre Bid Discussion (PBD)**	*Date :*	~~*Applicable*~~*/Not applicable.*
xi	**INTEGRITY PACT & DETAILS OF INDEPENDENT EXTERNAL MONITOR (IEM)**		~~*Applicable*~~*/Not Applicable*
xii	**Latest updates**	Latest updates on the important dates, Amendments, Correspondences, Corrigenda, Clarifications, Changes, Errata, Modifications, Revisions, etc to Tender Specifications will be hosted in BHEL webpage (www.bhel.com -->Tender Notifications →View Corrigendums) **and not in the newspapers**. Bidders to keep themselves updated with all such information	

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

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

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

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

- PART-I consisting of 'PART-I A (Techno Commercial Bid)' & 'PART-I B (EMD/COST of TENDER)' in two separate sealed and superscribed envelopes (ENVELOPE-I & ENVELOPE-II)
- PART-II (Price Bid) – in sealed and superscribed envelope (ENVELOPE-III)
- One set of tender documents shall be retained by the bidder for their reference

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

Sl no	Description	Remarks
	Part-I A	
	ENVELOPE – I superscribed as : PART-I (TECHNO COMMERCIAL BID) TENDER NO : NAME OF WORK : PROJECT: DUE DATE OF SUBMISSION: **CONTAINING THE FOLLOWING**:-	
i.	Covering letter/Offer forwarding letter of Tenderer.	
ii.	Duly filled-in `No Deviation Certificate' as per prescribed format to be placed after document under sl no (i) above. **Note:** a. In case of any deviation, the same should be submitted separately for technical & commercial parts, indicating respective clauses of tender against which deviation is taken by bidder. The list of such deviation shall be placed after document under sl no (i) above. It shall be specifically noted that deviation recorded elsewhere shall not be entertained. b. BHEL reserves the right to accept/reject the deviations without assigning any reasons, and BHEL decision is final and binding. i). In case of acceptance of the deviations, appropriate loading shall be done by BHEL ii). In case of unacceptable deviations, BHEL reserves the right to reject the tender	
iii.	Supporting documents/ annexure/ schedules/ drawing etc as required in line with Pre-Qualification criteria. It shall be specifically noted that all documents as per above shall be indexed properly and credential certificates issued by clients shall distinctly bear the name of organization, contact ph no, FAX no, etc.	
iv.	All Amendments/Correspondences/Corrigenda/Clarifications/Changes/ Errata etc pertinent to this NIT.	
v.	Integrity Pact Agreement (Duly signed by the authorized signatory)	If applicable
vi.	Duly filled-in annexures, formats etc as required under this Tender Specification/NIT	
vii.	Notice inviting Tender (NIT)	
viii.	Volume – I A : Technical Conditions of Contract (TCC) consisting of Scope of work, Technical Specification, Drawings, Procedures, Bill of Quantities, Terms of payment, etc	
ix.	Volume – I B : Special Conditions of Contract (SCC)	
x.	Volume – I C : General Conditions of Contract (GCC)	
xi.	Volume – I D : Forms & Procedures	
xii.	Volume – II (UNPRICED – without disclosing rates/price, but mentioning only 'QUOTED' or 'UNQUOTED' against each item	

xiii.	Any other details preferred by bidder with proper indexing.	

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

	PART-II	
	PRICE BID consisting of the following shall be enclosed	
	ENVELOPE-III superscribed as: PART-II (PRICE BID) TENDER NO : NAME OF WORK : PROJECT: DUE DATE OF SUBMISSION: **CONTAINING THE FOLLOWING**	
i	Covering letter/Offer forwarding letter of Tenderer enclosed in Part-I	
ii	Volume II – PRICE BID (Duly Filled in Schedule of Rates – rate/price to be entered in words as well as figures)	

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

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

7.0 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.

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

9.0 Assessment of Capacity of Bidders:
Bidders capacity for executing the job under tender shall be assessed '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 $S_1 = S_{1\text{-}1}+ S_{1\text{-}2}+ S_{1\text{-}3}+ S_{1\text{-}4}+ S_{1\text{-}5}+…S_{1\text{-}N}$). 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 'P_T' for all Regions (i.e 'S_T'= $S_1+ S_2+ S_3+ S_4+ S_5+…. S_N$.)

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 = **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) = **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) = **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 ≤ 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 iv). Structural Steel Fabrication & Erection v). Chimney vi). Cooling Tower vii). Others (Civil)	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). 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 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'.

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** '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

10.0 Since the job shall be executed at site**,** bidders must visit site/ work area and study the job content, facilities available, availability of materials, prevailing site conditions including law & order situation, 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.

11.0 For any clarification on the tender document, the bidder may seek the same in writing or through e-mail, as per specified format, within the scheduled date for seeking clarification, from the office of the undersigned. BHEL shall not be responsible for receipt of queries after due date of seeking clarification due to postal delay or any other delays. Any clarification / query received after last date for seeking clarification may not be normally entertained by BHEL and no time extension will be given.

12.0 BHEL may decide holding 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.

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

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

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

16.0 The Bidder has to satisfy the Pre Qualifying Requirements stipulated for this Tender in order to be qualified. The Price Bids of only those bidders will be opened who will be qualified for the subject job on the basis of 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.

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

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

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

However, if reverse auction process is unsuccessful as defined in the RA rules/procedures, or for

whatsoever reason, then the sealed 'PRICE BIDs' will be opened for deciding the successful bidder. BHEL's decision in this regard will be final and binding on bidder.

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

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

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

23.0 Consortium Bidding (or Technical Tie up) shall be allowed only if specified in Pre Qualifying Requirement (PQR) criteria, and in such a case the following shall be complied with:

23.1 Prime Bidder and Consortium Partner or partners are required to enter into a consortium agreement with a validity period of six months initially. In case the consortium is awarded the contract, then the Consortium Agreement between the Prime Bidder and Consortium Partner or partners shall be extended till contractual completion period including extension periods if any applicable.

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

23.3 Number of partners for a consortium Bidding (or Technical Tie up) shall be as specified in the PQR

23.4 Prime Bidder shall be as specified in the Pre Qualification Requirement, else the bidder who has the major share of work

23.5 In order to be qualified for the tender, Prime Bidder and Consortium partner or partners shall satisfy (i) the Technical 'Pre Qualifying Requirements' specified for the respective package, (ii) "Assessment of Capacity of Bidder' as specified in clause 9.0

23.6 Prime Bidder shall comply with additional 'Technical' criteria of PQR as defined in 'Explanatory Notes for the PQR'

23.7 Prime Bidder shall comply with all other Pre Qualifying criteria for the Tender unless otherwise specified

23.8 In case customer approval is required, then Prime Bidder and Consortium Partner or partners shall have to be individually approved by Customer for being considered for the tender.

23.9 Prime Bidder shall be responsible for the overall execution of the contract

23.10 In case of award of job, Performance shall be evaluated for Prime Bidder and Consortium Partner or partners for their respective scope of work(s) as per prescribed formats

23.11 In case the Consortium partner or partners back out, their SDs shall be encashed by BHEL. In such a case, other consortium partner or partners meeting the PQR have to be engaged by the Prime Bidder, and if not, the respective work will be withdrawn and executed on risk and cost basis of the Prime Bidder. The new consortium partner or partners shall submit fresh SDs as applicable.

23.12 In case the prime Bidder withdraws, the whole contract shall be considered cancelled and short closed.

23.13 After execution of work, the work experience shall be assigned to the Prime Bidder and the consortium partner or partners for their respective scope of work. After successful execution of two similar works with the same consortium partner or partners under direct orders of BHEL, the Prime Bidder shall be eligible for becoming a

'stand alone' bidder for similar works, subject to certification from BHEL about the active involvement of the Prime Bidder for satisfactory execution of the works.

23.14 The consortium partner shall submit SD equivalent to 2% of the total contract value in addition to the SD to be submitted by the prime Bidder for the total contract value. In case there are two consortium partners, then each partner shall submit SD equivalent to 1% of the total contract value in addition to the SD to be submitted by the prime Bidder for the total contract value.

23.15 In case of a Technical Tie up, all the clauses applicable for the Consortium partner shall be applicable for the Technical Tie up partner also

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

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

26.0 Order of Precedence

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

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

It may please be noted that guidelines/rules in respect of suspension of business dealings', 'Vendor evaluation format', 'Quality, Safety & HSE guidelines', etc may undergo change from time to time and the latest one shall be followed

for BHARAT HEAVY ELECTRICALS LTD

AGM Purchase

Enclosure

01. Annexure-1: Pre Qualifying criteria.
02. Annexure-2: Check List.
03. Annexure – 3 IMPORTANT INFORMATION
04. Other Tender documents as per this NIT.

ANNEXURE - 1

PRE QUALIFYING REQUIREMENTS

JOB	RECEIPT/COLLECTION, UNLOADING, HANDLING, STACKING, PRESERVATION, VERIFICATION OF ENTIRE PROJECT MATERIALS INCLUDING ELECTRICAL AND CONTROL & INSTRUMENTATION EQUIPMENTS/ ITEMS AND OTHER MATERIALS IN BHEL / CUSTOMER'S STORES / STORAGE YARD AS RECEIVED BY ROAD FROM MANUFACTURING UNITS / TRANSPORTERS GODOWN UNDER MATERIALS MANAGEMENT , RECEIPT / COLLECTION / LOADING / TRANSPORTATION OF MATERIALS FROM BHEL / CLINT'S STORES / STORAGE YARDS TO SITE OF WORK, UNLOADING of **Balance Materials**. ERECTION, TESTING, COMMISSIONING OF SURFACE CONDENSERS, STEAM TURBINES, TURBO BLOWERS, PUMPS & AUXILIARIES INCLUDING CONDENSATE EXTRACTION PUMPS, PIPINGS, APPLICATION OF THERMAL INSULATION, FINAL PAINTING, ASSISTANCE FOR PG TEST ETC. AND HANDING OVER OF 3 x TURBO BLOWER SET AT **STEEL AUTHORITY OF INDIA LTD (SAIL) BHILAI STEEL PLANT, BHILAI DIST. DURG, (CHHATISGARH)**
TENDER NO	**BHE/PW/PUR/BSI1-STG/1207**

SL NO	**PRE QUALIFICATION CRITERIA**	**Bidders claim in respect of fulfilling the PQR Criteria**	
		Name and Description of qualifying criteria	Page no of supporting document. **Bidder must fill up this column as per applicability**
A	Submission of Integrity Pact duly signed (if applicable) (Note: To be submitted by Prime Bidder & Consortium/Technical Tie up partner jointly in case Consortium bidding is permitted, otherwise by the sole bidder)	**NOT APPLICABLE FOR THIS TENDER**	
B	**Technical** Bidder must have executed any one of the following in last seven years as on latest date of bid submission: B.1) Erection, Testing and Commissioning of atleast One Unit of STG/GTG job of any rating. OR B.2) Erection, Testing and Commissioning of atleast One BOILER upto synchronization (with Rotating machinery) unit rating 30 MW or higher, under direct order of BHEL OR B.3) One R&M job of Steam Turbines of capacity 50 MW or higher OR B.4) Atleast three number capital overhauling work of STGs against BHEL direct orders.The rating of individual STG unit shall be atleast 190MW OR	APPLICABLE	

	B.5) Erection, Testing and Commissioning of atleast One Unit of 'Turbo Blower driven by Steam Turbine' (including erection & commissioning of steam turbine) of any rating.		
C-1	**Financial** **TURNOVER** Bidders must have achieved an average annual financial turnover (Audited) of **Rs 71.00 Lakhs** or more over last three Financial Years (FY) i.e 2010-11, 2011-12 and 2012-13.	APPLICABLE	
C-2	NETWORTH (only in case of Companies) Net worth of the Bidder based on the latest Audited Accounts as furnished for 'C-1' above should be positive	APPLICABLE	
C-3	PROFIT Bidder must have earned cash profit in any one of the three Financial Years as applicable in the last three Financial Years defined in 'C-1 above based on latest Audited Accounts.	APPLICABLE	
D	Assessment of Capacity of Bidder to execute the work as per sl no 9 of NIT (if applicable)	Applicable	By BHEL
E	Approval of Customer (if applicable) **Note:** Names of bidders (including consortium/Technical Tie up partners in case consortium bidding is permitted) who stand qualified after compliance of criteria A to D shall be forwarded to customer for their approval.	Not Applicable	BY BHEL
F	Price Bid Opening **Note:** Price Bids of only those bidders shall be opened who stand qualified after compliance of criteria A to E	APPLICABLE	BY BHEL
F	Consortium criteria (if applicable)	Not Applicable	
	Explanatory Notes for the PQR (unless otherwise specified in the PQR): 1. Bidder to submit Audited Balance Sheet and Profit and Loss Account for the respective years as indicated against C-1 above along with all annexures 2. In case audited Financial statements have not been submitted for all the three years as indicated against C-1 above, then the applicable audited statements submitted by the bidders against the requisite three years, will be averaged for three years i.e total divided by three. 3. C-2:-NETWORTH : Shall be calculated based on the latest Audited Accounts as furnished for C-1 above. Net worth = Paid up share capital + Reserves. (Net worth is required to be evaluated in case of companies) 4. C-3:- PROFIT : shall be NET profit (PAT + Non cash expenditure viz depreciation) earned during any one of the three financial years as in C-1 above ~~5. 'Additional' Criteria in respect of 'Technical' criteria of PQR (as in 'B' above) for Civil, Electrical, CI, unless otherwise specified :~~ ~~1. Bidder should have executed similar work of any one of the following:~~ ~~a. One (1) work of value not less than Rs XXX~~ ~~OR~~ ~~b. Two (2) works of not less than Rs YYY~~ ~~OR~~ ~~c. Three (3) works of not less than Rs ZZZ~~ ~~(Value XXX, YYY, ZZZ shall be as indicated by BHEL~~		

~~2. 'Similar' work for criteria 5 above means~~

~~a. Civil or Structures or Civil & Structures or Chimney respectively as applicable to the tendered scope in respect of 'CIVIL' Works~~
~~b. Electrical works in respect of 'ELECTRICAL'~~
~~c. CI works in respect of 'CI' Works~~
~~d. Material Handling and/or Management works in respect of 'MM' works~~

6. Time period for achievement of the 'Technical' criteria of PQR (as in 'B' above) will be the last 7 years ending on the 'latest date' of Bid submission
7. 'EXECUTED' means the Vendor should have achieved the criteria specified in the Technical criteria of PQR (as in 'B' above) even if the Contract has not been completed or closed
8. Unless otherwise specified, for the purpose of 'Technical' criteria of PQR (as in 'B' above), the word 'EXECUTED' means:

1. "BOILER LIGHT UP" in respect of Boiler & Aux and ESP
2. "SYNCHRONISATION" in respect of STG/GTG and 'SPINNING' in case of HTG
3. "STEAM BLOWING COMPLETION" in respect of at least Main Steam Line of Power Cycle Piping
4. "HYDRAULIC TEST" of the system in respect of Structures, Pressure parts/IBR Piping
5. "CHARGING" in respect of power Transformers, Bus ducts, HT/LT switchgears
6. "Completion of RCC Shell and liner (steel or brick as per tendered scope) up to the HEIGHT specified using slip form" in case of RCC Chimney.
7. Achievement of physical Quantities as per respective PQRs in respect of Civil & Structures and Piling Works
8. 'Readiness for coal Filling" in respect of Bunker Structure Work.
9. Boiler means HRSG or WHRB or any other types of Steam Generator
10. Critical/Power Cycle piping means Main Steam, Hot Reheat, Cold Reheat, HP Bypass, LP Bypass lines
11. For the purpose of evaluation of the PQR, one MW shall be considered equivalent to 3.5TPH where ever rating of HRSG/BOILER is mentioned in MW. Similarly, where ever rating of Gas Turbine is mentioned in terms of Frame size, ISO rating in terms of MW shall be considered for evaluation.
12. In case the experience/PO/WO certificate enclosed by bidders do not have separate break up prices for the E&C portion of Electrical and CI Works, (i.e. the certificates enclosed are for composite order for supply and erection of Electrical & CI and other works if any), then value of Erection and Commissioning for the Electrical & CI portion shall be considered as 15% of the supply & erection of Electrical & CI, unless otherwise specifically indicated in the PQR.
13. Scope for capital overhaul of STG shall cover Bearing Inspection work and overhauling of all cylinders of the Turbine unless otherwise specifically indicated in the PQR.
14. In case the tendered scope is not a Pulverised Fuel Boiler, experience of Oil/Gas Fired Boilers also can be considered unless otherwise specifically indicated in the PQR.
15. The value of work (Experience submitted against PQR B) shall be updated as per the PVC indices for "All India Avg. Consumer Price Index for Industrial Workers" with base month as date of execution (completion of contract/work) and indexed upto two months prior to bid opening month.

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 OREDER 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: Please tick (√) whichever applicable:- ONE TIME EMD / ONLY FOR THIS TENDER	
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	Whether all pages of the Tender documents including annexures, appendices etc are read understood and signed	Applicable/~~Not Applicable~~	YES/NO
10	Integrity Pact	~~Applicable~~/Not Applicable	NO
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
17	Capacity Evaluation of Bidder for current Tender	Applicable/~~Not Applicable~~	YES/NO
18	Tie Ups/Consortium Agreement are submitted as per format	~~Applicable~~/Not Applicable	YES/NO
19	Power of Attorney for Submission of Tender/Signing Contract Agreement	Applicable/~~Not Applicable~~	YES/NO
20	Analysis of Unit rates	Applicable/~~Not Applicable~~	YES/NO

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

IMPORTANT INFORMATION

1. **The offers of the bidders who are on the banned list as also the offer of the bidders, who engage the services of the banned firms, shall be rejected. The list of banned firms is available on BHEL web site (www.bhel.com ---> Tender Notification -→ List of Banned Firms)**

2. **All Statutory Requirements as applicable for this project shall be complied with.**

3. **Volume II Price Bid Specification consists of Two parts as given below:**

   a) SECTION A: Material Handling and Material Management (Price Fixed by BHEL shall be considered for evaluation). Price variation compensation as in clause 6 below will not be applicable for items in section B & C of Section A of price bid i.e for monthly hiring charges of cranes and Service month rate for Supervision /Secretarial and Menial Services.

   b) SECTION B: ET & C of TURBO BLOWER. (Bidder is to quote for the same)

4. **Please take note of following Revised Tender Clauses:**

   i. **Notice Inviting Tender: Sl No 9**

   ii. **General conditions of Contract: Clause No 1.15.13 (New), Clause No 2.8.3, 2.8.4 and 2.8.5**

5. **Following Notes are added to Form F- 15 of Volume I D 'Forms & procedures'**

   i. **It is only indicative and shall be as per the online format issued by BHEL time to time.**
   ii. **No request will be entertained after specified date of the current month w.r.t the changes requested in the scores of immediate previous month.**

6. **PRICE VARIATION CLAUSE**

Revision in Price Variation Compensation Clause no. 2.17 of Vol I C GCC:

Clause No. 2.17.9 of Vol IC GCC is revised as below:-

PVC shall be applicable only during the extended period of contract (if any) after the schedule completion date for the portion of work delayed / backlog for the reasons not attributable to Contractor. However total quantum of Price Variation amount payable/recoverable shall be regulated as follows:

i. For the portion of backlog attributable to the contractor and for the portion of backlog due to force majeure condition during contract period, PVC shall not be paid.

ii. For the period of force Majeure during extended contract period, PVC will be as per the indices applicable at the beginning of the force majeure period.
iii. void
iv. The total amount of PVC shall not exceed 20% of the cumulatively executed contract value during the extended contract period. Executed contract value for this purpose is exclusive of PVC, ORC, Supplementary/Additional Items and Extra works.

Clause No. 2.17.5 of is modified as below:-

Base date shall be the calendar month of the (schedule completion date of the contract + Period extended for the reasons attributable to Contractor & Force Majeure Condition). Schedule Completion date shall be the actual start date plus contract period as defined in Chapter VI 'Vol IA TCC'

07. OVER RUN COMPENSATION

Modification in Price Variation Compensation Clause no. 2.12 of Vol I C GCC:

Clause No. 2.12 of Vol IC GCC is Revised as below:-

IF THE CONTRACT IS EXTENDED BEYOND THE CONTRACT PERIOD FOR ANY REASON OTHER THAN THOSE ATTRIBUTABLE TO THE CONTRACTOR OR FORCE MAJEURE CONDITIONS, THE CONTRACTOR WILL BE COMPENSATED BY PAYMENT OF OVERRUN CHARGES AT THE RATE OF **RS.100000/- (One Lakh Only)** PER MONTH. OVERRUN COMPENSATION WILL BE PAID FOR THE EXTENSION ATTRIBUTABLE TO BHEL ONLY. NO OVERRUN COMPENSATION WILL BE PAYABLE FOR THE EXTENSION ON ACCOUNT OF REASONS ATTRIBUTABLE TO CONTRACTOR AND/OR FORCE MAJEURE CONDITIONS. OVERRUN COMPENSATION FOR ELIGIBLE PERIOD SHALL BE IN PROPORTION TO THE PROGRESS ACHIEVED AGAINST THE PLAN FOR RESPECTIVE PERIOD.

08. Broad Terms & Conditions of Reverse Auction

In continuation to Clause 19.0 of NIT (Notice Inviting Tender) following are the broad terms and conditions of Reverse Auction:

8.1. BHEL reserves the right to go for Reverse Auction (RA) instead of opening the sealed envelope price bid, submitted by the bidder. This will be decided after techno-commercial evaluation. All bidders to give their acceptance 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 Reverse Auction, only those bidders who have given their acceptance to participate in RA will be allowed to participate in the Reverse Auction. Those bidders who have given their acceptance to participate in Reverse Auction will have to necessarily submit „online sealed bid" in the Reverse Auction. Non-submission of „online sealed bid" by the bidder will be considered as tampering of the tender process and will invite action by BHEL as per extant guidelines in vogue.

8.2. The philosophy followed for reverse auction shall be English Reverse (No ties). English Reverse (No ties) is a type of auction where the starting price and bid decrement are announced before start of online reverse auction. The interested bidders can thereupon start bidding in an iterative process wherein the lowest bidder at any given moment can be displaced by an even lower bid of a competing bidder, within a given time frame. The bidding is with reference to the current lowest bid in the reverse auction. All bidders will see only the current lowest quoted price. The term „No ties" is used since more

than one bidder cannot give an identical price, at a given instant, during the reverse auction. In other words, there shall never be a tie in the bids.

8.3. Technically and commercially acceptable bidders only shall be eligible to participate.

8.4. BHEL will engage the services of a service provider who will provide all necessary training and assistance before commencement of on line bidding on internet. Business rules for Reverse Auction and other information like event date, time, bid decrement, extension etc. also will be communicated through service provider for compliance.

8.5. After receipt of "online sealed bids" by the participating bidders, start price & bid decrement will be decided by BHEL, before the online Reverse Auction. Only those bidders who have submitted the "on-line sealed bid" within the scheduled time shall be eligible to participate further in RA process. **However, the H1 bidder (whose quote is highest in online sealed bid) may not be allowed to participate in further RA.** Once participating bidders have given 'Online Sealed Bid' and 'start price' & 'bid decrement' is decided by BHEL, Bidding for RA will start as per RA schedule specified in business rules. Bidders may then submit their bids (current L-1 price(s) lowered by multiple decrements). If the 'start price' decided by BHEL is same as the 'Online Sealed Bid' price of any bidder, then that bidder shall be reckoned as current L1 automatically at the start of Reverse Auction and no acceptance of that price is required i.e (RA shall deemed to have started at this stage for further bidding)

8.6. If the Bidder or any of his representatives are found to be involved in Price manipulation/ cartel formation of any kind, directly or indirectly by communicating with other bidders, action *as per extant BHEL guidelines*, shall be initiated by BHEL and the results of the RA scrapped/ aborted.

8.7. The Bidder shall not divulge either his Bids or any other exclusive details of BHEL to any other party.

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TECHNICAL CONDITIONS OF CONTRACT (TCC)

BHARAT HEAVY ELECTRICALS LIMITED

TECHNICAL CONDITIONS OF CONTRACT (TCC)
CONTENTS

1.0 Project Information

1.1 INTROUCTION

STEEL AUTHORITY OF INDIA LTD (SAIL) IS HAVING ONE OF THEIR STEEL PLANT AT BHILAI DIST DURG, CHHATTISGARH, INDIA. CUSTOMER IS SETTING UP 3 X TURBO BLOWER STATIONS (PKG 012) UNDER THEIR 7.0 MTPA CRUDE STEEL EXPANSION PROGRAMME AT BHILAI STEEL PLANT, BHILAI. THE SITE IS INSIDE THE PREMISES OF EXISTING BHILAI STEEL PLANT. BHEL HAS BEEN AWARDED TURBO BLOWER PACKAGE COMPRISING OF DESIGN, ENGINEERING, MANUFACTURE, SUPPLY, TRANSPORTATION, COMPREHENSIVE INSURANCE, ERECTION, TESTING AND COMMISSIONING, AND CONDUCTING PERFORMANCE GUARANTEE (PG) TEST OF THE UNITS AND HANDING OVER OF THE PROJECT WITHIN 27 MONTHS FROM ZERO DATE / 11.11.2010.

SITE INFORMATION

a)	LOCATION	: AT. BHILAI DIST DURG STATE CHHATTISGARH
b)	LONGITUDE	: 81° 26' E
c)	LATITUDE	: 21° 13' N
d)	NEAREST RAILWAY STATION	: BHILAI POWER HOUSE & DURG
e)	NEAREST TOWN	: BHILAI DIST DURG STATE CHHATTISGARH
f)	NEAREST SEAPORT	:
g)	NEAREST AIRPORT	: RAIPUR, 25 KILOMETERS
h)	ACCESS ROAD	: WELL CONNECTED WITH NH - 6

1.2 CLIMATIC CONDITIONS

1. SEISMIC DATA

a. SEISMIC INTENSITY : AS PER IS: 1893-2002
b. ZONE : II

2. TEMPERATURE

a. MINIMUM **10**° C, MAXIMUM 45° C

BIDDERS ARE ADVISED TO ACQUAINT THEMSELVES WITH SITE LOCATION, WORKING CONDITIONS IN AND AROUND THE PROJECT PREMISES & LOCAL PREVAILING SITUATIONS PRIOR TO SUBMITTING THEIR OFFER. NO CLAIM FOR COMPENSATION WILL BE ENTERTAINED ON THE GROUNDS OF NON-FAMILIARITY WITH THE SITE CONDITION & WORKING CONDITIONS ETC. ALL COSTS FOR AND ASSOCIATED WITH SITE VISITS SHALL BE BORNE BY THE BIDDER.

BIDDERS ARE REQUESTED TO SPECIFICALLY NOTE THE FOLLOWING:

THE WORK FOR TURBO-BLOWER 1, 2 & 3 (ie material handling work and erection & commissioning of turbo blowers – 3 nos) WAS UNDER EXECUTION BY OTHER AGENCY AND SOME OF THE WORKS HAVE BEEN COMPLETED. Around 1400 MT of material is unloaded at site by agency and E & C work of Turbo Blower not yet started.

BALANCE WORKS (ie unloading of 800 MT including record keeping and verification of 2200MT and E & C of Turbo-blower) ARE BEING WITHDRAWN/ ISOLATED FROM THE SCOPE OF PREVIOUS AGENCY DUE TO UNAVOIDABLE REASONS. SUCCESSFUL BIDDER HAS TO UNDERGO FOR JOINT MEASUREMENTS IN PRESENCE OF BHEL REPRESENTATIVES AT SITE BEFORE TAKING OVER THE SITE FOR COMPLETION OF SUCCESSIVE WORKS & FREEZE THE CUT-OFF POINT OF OLD CONTRACT.

AS THIS BEING A WITHDRAWN WORK FROM OTHER AGENCY, BIDDERS ARE REQUESTED TO HAVE PRE-BID VISIT/ INSPECTION OF SITE TO MAKE THEM FULLY ACQUAINTED WITH THE ACTUAL STATUS OF WORK, SITE SITUATION & NATURE OF JOB. NO CLAIM SHALL BE ENTERTAINED AT LATER DATE ON ACCOUNT OF NON-FAMILIARIZATION OF SITE CONDITION. BIDDERS MAY FIX UP THEIR SITE VISIT IN CONSULTATION WITH CONSTRUCTION MANAGER BHEL SITE OFFICE SAIL Bhilai. NAME, ADDRESS & CONTACT POINT OF SITE IS AS BELOW:

SHRI S M BORKAR
CONSTRUCTION MANAGER
BHEL SITE OFFICE – SAIL, BHILAI
MOB: 09422806918

2.0 SCOPE OF WORK

THE WORK TO BE CARRIED OUT UNDER THE SCOPE OF THESE SPECIFICATIONS IS BROADLY AS UNDER: -

2.0 A – SCOPE OF WORK OF MATERIAL HANDLING AND MATERIALS MANAGEMENT SERVICES

THE SCOPE OF WORK OF THIS TENDER SPECIFICATION FOR MATERIAL HANDLING AND MATERIALS MANAGEMENT SERVICES FOR STG PACKAGE 3 x 18 MW SAIL BHILAI TURBO BLOWER PROJECT AT BHILAI, DISTRICT DURG IN CHHATISSGARH STATE SHALL BE BROADLY AS UNDER:

- UNLOADING OF ALL TYPES OF CONSIGNMENTS DIRECTLY FROM TRAILORS/WAGONS BY SUITABLE CRANE OR BY JACK AND SLEEPER METHOD (ALL TO BE ARRANGED BY THE CONTRACTOR), INCLUDING LEVELLING OF THE UNLOADING AREA AND ATTENDANT WORK.
- RECEIPT OF MATERIALS DISPATCHED BY ROAD TRANSPORT ON DOOR DELIVERY BASIS AT THE BHEL STORES AND UNLOADING THEREOF.

- COLLECTION OF MATERIALS DISPATCHED BY ROAD TRANSPORT/ RAIL ON GODOWN DELIVERY BASIS FROM TRANSPORTERS'/RAILWAY GODOWNS, LOADING AT TRANSPORTERS/ RAILWAY GODOWN, LOCAL TRANSPORT UP TO BHEL STORES/ STORAGE YARD AND UNLOADING THEREOF.
- PRELIMINARY VERIFICATION OF MATERIALS AT THE TIME OF UNLOADING FROM ROAD TRANSPORT VEHICLE OR WHILE RECEIVING CONSIGNMENTS FROM RAILWAY/ TRASPORTERS' GODOWN - AS THE CASE MAY BE, REPORTING IMMEDIATELY THE DISCREPANCIES LIKE DAMAGES AND SHORTAGES NOTICED.
- DETAILED VERIFICATION OF MATERIALS WITH REFERENCE TO PACKING LIST AND LOADING ADVICE SLIP AFTER UNPACKING OF BOXES & CRATES; REPACKING, WHERE CALLED FOR, AFTER DETAILED VERIFICATION; PREPARATION OF RECEIPT INSPECTION REPORTS.
- DETAILED VERIFICATION OF MATERIALS WITH REFERENCE TO PACKING LIST AND LOADING ADVICE SLIP OF ALREADY RECEIVED MATERIALS
- STACKING AND STORING AT BHEL OPEN STORAGE YARD/ COVERED STORES/ CLOSED & SEMI-CLOSED SHEDS, SUBMISSION OF STACKING/STORING RECORDS.
- PRESERVATION OF THE MATERIALS IN ACCORDANCE WITH BHEL'S PRESERVATION MANUAL AND/OR AS PER BHEL'S INSTRUCTIONS.
- GENERAL CLEANING, GRASS CUTTING AND UPKEEP OF STORAGE YARD, COVERED AND SEMI-CLOSED STORES SHEDS WITHIN THE QUOTED RATES FOR UNLOADING, VERIFICATION AND STACKING.
- PROVIDING MATERIALS MANAGEMENT SERVICES AS SPECIFIED IN RELEVANT CHAPTER
- REHANDLING AND RESTACKING OF MATERIALS AS AND WHEN CALLED FOR BY BHEL. THIS ALSO INCLUDES EXCESS/REDUNDANT/ SCRAP MATERIALS RETURNED TO STORES BY BHEL'S CONSTRUCTION & ERECTION CONTRACTORS.
- HANDLING AND LOADING OF OUTGOING MATERIALS THOSE ARE TO BE SENT TO OTHER DESTINATIONS.
- RECORD KEEPING OF ALL THE MATERIALS

2.0 B: SCOPE OF WORK OF ERECTION TESTING & COMMISSIONING

THE SCOPE OF WORK OF THIS TENDER SPECIFICATION FOR COLLECTION OF MATERIALS FROM BHEL/ CLIENT'S STORES/ STORAGE YARD, TRANSPORTATION TO SITE OF WORK/PRE-ASSEMBLY YARD, ERECTION, TESTING, ASSISTANCE FOR COMMISSIONING & TRIAL OPERATION, HANDING OVER OF STG PACKAGE INCLUDING, INSULATION, FINAL PAINTING FOR STG PACKAGE 3X18 MW SAIL BHILAI TURBO BLOWER PROJECT AT BHILAI, DISTRICT DURG IN CHHATISSGARH STATE SHALL BE BROADLY AS UNDER:

1) COLLECTION OF MATERIALS FROM BHEL/CLIENT'S STORES/STORAGE YARD; TRANSPORTATION TO SITE, ERECTION, TESTING & ASSISTANCE FOR COMMISSIONING, TRIAL OPERATION AND HANDING OVER OF TURBO BLOWER, INSULATION, FINAL PAINTING ETC. OF. STG PACKAGE 3X18 MW SAIL BHILAI TURBO BLOWER PROJECT AT BHILAI, DISTRICT DURG IN CHHATISSGARH STATE

2) **HEAVIER CONSIGNMENTS WEIGHING BETWEEN 55 – 60 MT I.E. SURFACE CONDENSER, BLOWER, DRIVE TURBINE HAS BEEN UNLOADED AT BHEL STORE YARD. CONTRACTOR HAS TO MAKE HIS OWN ARRANGEMENTS FOR SHIFTING OF THESE EQUIPMENTS FROM STORE YARD TO ERECTION SITE AS PER THE INSTRUCTIONS OF BHEL.**

3) PRE-ASSEMBLY/ASSEMBLY, PRE-ERECTION CHECKS AS PER REQUIREMENT.

4) ERECTION, ALIGNMENT, TESTING, COMMISSIONING OF EQUIPMENTS / SYSTEMS WITH ASSOCIATED AUXILIARIES AND STAGE INSPECTION BY STATUTORY AUTHORITIES LIKE BOILER INSPECTOR, FACTORY INSPECTOR ETC. COVERED UNDER THIS TENDER SPECIFICATION. ALL THE NECESSARY TESTS INCLUDING SUPPLY OF TESTING / MEASURING EQUIPMENTS & INSTRUMENTS SHALL BE CARRIED OUT AS PER REQUIREMENT UNDER THIS SCOPE OF TENDER SPECIFICATION.

5) CHIPPING/ BLUE-MATCHING OF CIVIL FOUNDATION, GROUTING OF EQUIPMENTS/ AUXILIARIES / PANELS WITH PORTLAND AND NON-SHRINK READY-MIX GROUTING CEMENT AS PER NORMAL ENGINEERING PRACTICE FOR SIMILAR EQUIPMENTS. CONTRACTOR SHALL ARRANGE ALL THE GROUT MATERIALS OF BHEL-APPROVED BRAND WITHIN THE QUOTED PRICE.

6) PRE-ASSEMBLY, STAGE INSPECTION AS PER REQUIREMENT OF BHEL / CUSTOMER / IBR AND OTHER STATUTORY AUTHORITIES, ERECTION, ALIGNMENT, HEAT TREATMENT, STRESS RELIEVING, WELDING, RADIOGRAPHY & OTHER NDT TESTS, FLUSHING/CHEMICAL CLEANING, HYDRAULIC TESTING, STEAM BLOWING OF PIPING INCLUDING IMPULSE PIPING.

7) ERECTION, COLD SETTING AND HOT SETTING OF PIPING SUPPORTS & HANGERS.

8) APPLICATION OF THERMAL INSULATION & CLADDING OF APPLICABLE PIPING, VESSELS & EQUIPMENTS AS APPLICABLE.

9) CHEQUERED PLATES AND STRUCTURAL STEEL WILL BE SUPPLIED FREE OF CHARGES BY BHEL/ CLIENT FOR COVERING VARIOUS OPENINGS IN THE TURBINE FLOOR. THE CONTRACTOR HAS TO CUT THESE TO REQUIRED SIZE AND FIX AT APPROPRIATE LOCATIONS INCLUDING RAISED SUPPORTS ETC TO FILL THE GAPS AROUND THE TURBO BLOWER SET FOUNDATIONS SHALL BE CARRIED BY CONTRACTOR. NO SEPARATE PAYMENT IS ENVISAGED FOR THIS ACTIVITY.

10) ERECTION OF ELECTRICAL MOTORISED & CONTROL VALVES

11) FINAL PAINTING OF ERECTED ITEMS

12) ERECTION, PRE-COMMISSIONING & COMMISSIONING CHECKS/TESTS AND COMMISSIONING INCLUDING TRIAL RUN OPERATION OF APPLICABLE EQUIPMENTS AND AUXILIARIES.

13) TRIAL OPERATION OF TURBO BLOWER SETS, FINAL PAINTING, PROVIDING ASSISTANCE DURING PG TEST OF THE EQUIPMENTS AND HANDING OVER OF THE UNIT TO BHEL'S CLIENT.

14) COMPLETION OF ALL FACILITIES/SYSTEMS

Sl. No	Description PART I	Scope / to be taken care by		Remarks
		BHEL	Bidder	
3.1	**ESTABLISHMENT**			
3.1.1	**FOR CONSTRUCTION PURPOSE**:			
a	Open space for office (as per availability)	Yes		Location will be finalized after joint survey with owner
b	Open space for storage (as per availability)	Yes		Location will be finalized after joint survey with owner
c	Construction of bidder's office, canteen and storage building including supply of materials and other services		Yes	
d	Bidder's all office equipments, office / store / canteen consumables		Yes	
e	Canteen facilities for the bidder's staff, supervisors and engineers etc		Yes	
f	Fire fighting equipments like buckets, extinguishers etc		Yes	
g	Fencing of storage area, office, canteen etc of the bidder		Yes	
3.1.2	**FOR LIVING PURPOSES OF THE BIDDER**			
a	Open space for labour colony (as per availability)		Yes	

Sl. No	Description PART I	Scope / to be taken care by		Remarks
		BHEL	Bidder	
b	Labour Colony with internal roads, sanitation, complying with statutory requirements		Yes	
3.2.0	**ELECTRICITY**			
3.2.1	**Electricity For construction purposes** of Voltage 415/440 V			FREE
a	Single point source	Yes		At a distance of 1000 M from site (Distance is only estimated, it may vary upto an extent depending on site condition)
b	Further distribution including all materials, Energy Meter, Protection devices and its service		Yes	
c	Duties and deposits including statutory clearances if applicable		Yes	
3.2.2	**Electricity for the office, stores, canteen etc of the bidder**			Chargeable as per standard rate
a	Single point source		Yes	
b	Further distribution including all materials, Energy Meter, Protection devices and its service			**NA**

Sl. No	Description PART I	Scope / to be taken care by		Remarks
		BHEL	Bidder	
c	Duties and deposits including statutory clearances if applicable		Yes	
3.2.3	**Electricity for living accommodation of the bidder's staff, engineers, supervisors etc**			
a	Single point source		Yes	
b	Further distribution including all materials, Energy Meter, Protection devices and its service		Yes	
c	Duties and deposits including statutory clearances if applicable		Yes	
3.3.0	**WATER SUPPLY**			
3.3.1	**For construction purposes:**			FREE
a	Making the water available at single point	Yes		In case of inadequate supply / non-availability of construction water from customer, contractor shall have to arrange construction water at his own expenses.
b	Further distribution as per the requirement of work including supply of materials and execution		Yes	
3.3.2	Water supply for bidder's office, stores, canteen etc.			
a	Making the water available at single point		Yes	

Sl. No	Description PART I	Scope / to be taken care by		Remarks
		BHEL	Bidder	
b	Further distribution as per the requirement of work including supply of materials and execution			**NA**
3.3.3	**Water supply for Living Purpose**			
a	Making the water available at single point		Yes	
b	Further distribution as per the requirement of work including supply of materials and execution		Yes	
3.4.0	**LIGHTING**			
a	For construction work (supply of all the necessary materials) 1. At office/storage area 2. At the preassembly area 3. At the construction site /area		Yes	
b	For construction work (execution of the lighting work/ arrangements) 1. At office/storage area 2. At the preassembly area 3 At the construction site /area		Yes	
c	Providing the necessary consumables like bulbs, switches, etc during the course of project work		Yes	

Sl. No	Description PART I	Scope / to be taken care by		Remarks
		BHEL	Bidder	
d	Lighting for the living purposes of the bidder at the colony / quarters		Yes	
3.5.0	**COMMUNICATION FACILITIES FOR SITE OPERATIONS OF THE BIDDER**			
a	Telephone, fax, internet, intranet, e-mail etc.		Yes	
3.6.0	**COMPRESSED AIR wherever required for the work**			
3.7.0	**Demobilization of all the above facilities**		**YES**	
3.8.0	**TRANSPORTATION**			
a	For site personnel of the bidder		Yes	
b	For bidder's equipments and consumables (T&P, Consumables etc)		Yes	

Sl. No	Description **PART II** **3.9.0 ERECTION FACILITIES**	Scope / to be taken care by		Remarks
		BHEL	**Bidder**	
3.9.1	Engineering works for construction:			
a	Providing the erection drawings for all the equipments covered under this scope	Yes		
b	Drawings for construction methods	Yes	Yes	In consultation with BHEL
c	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**	”
d	Shipping lists etc for reference and planning the activities	Yes		”
e	Preparation of site erection schedules and other input requirements		Yes	”
f	Review of performance and revision of site erection schedules in order to achieve the end dates and other commitments	Yes	Yes	”
g	Weekly erection schedules based on SL No. e		Yes	”
h	Daily erection / work plan based on SL No. g		Yes	”

Sl. No	Description **PART II** **3.9.0 ERECTION FACILITIES**	Scope / to be taken care by		Remarks
		BHEL	**Bidder**	
i	Periodic visit of the senior official of the bidder to site to review the progress so that works are completed as per schedule. It is suggested this review by the senior official of the bidder should be done once in every two months.		Yes	
j	Preparation of preassembly bay		Yes	
k	Laying of racks for gantry crane if provided by BHEL or brought by the contractor/bidder himself		Yes	
L	Arranging the materials required for preassembly		YES	

SN	DESCRIPTION OF EQUIPMENT	CAPACITY	MINIMUM QUANTITY	REMARKS
01	PICK AND CARRY CRANE	12 T	01	**01 No. TO BE start of contract period. Payment for this, shall be made as per Rates indicated in item No B.1 of Section of A Voll II Price bid specification and shall be regulated as Note no. 4, 4.1 & 5 of this chapter**
02	Crane	40 / 75 MT	01	**Contractor has to arrange this crane for short duration for erection of Cold blast pipe line and suction air filter as required at site (at no additional cost)**
03	AIR COMPRESSOR (ELECTRIC)	140 CFM	01	TO BE DEPLOYED AT APPROPRIATE STAGE OF WORK AS PER INSTRUCTION OF BHEL ENGINEER
04	3 ph DISTRIBUTION BOARD WITH COMPLETE SET UP FOR DRAWING CONSTRUCTION POWER, FITTED WITH ENERGY METER	AS Required	As required	AS REQUIRED AND AS PER INSTRUCTION OF BHEL ENGINEER
05	WELDING GENERATOR (ELECTRIC & DIESEL)	300 AMPS	AS REQUIRED	TO BE DEPLOYED PROGRESSIVELY AS PER INSTRUCTION OF BHEL ENGINEER
06	ELECTRIC CABLE FOR DRAWAL & DISTRIBUTION OF CONSTRUCTION POWER	AS REQUIRED	AS REQUIRED	TO BE DEPLOYED FROM BEGINNING OF START OF MATERIAL HANDLING TILL COMPLETION
07	BAKING OVEN AND HOLDING OVEN WITH THERMOSTAT AND TEMPERATURE GAUGE FOR BAKING COATED WELDING ELECTRODES	AS REQUIRED	01 SET EACH	TO BE DEPLOYED AT APPROPRIATE STAGE OF WORK AS PER INSTRUCTION OF BHEL ENGINEER
08	PORTABLE OVEN FOR COATED WELDING ELECTRODES	AS REQUIRED	AS REQUIRED	TO BE DEPLOYED PROGRESSIVELY AS PER INSTRUCTION OF BHEL ENGINEER

09	SLINGS, 'D'-SHACKLES, HYDRAULIC JACKS, ETC.	AS REQUIRED	AS REQUIRED	WITH TEST REPORTS

10	RADIOGRAPHY ARRANGEMENT INCLUDING THE SOURCE AND FILM VIEWER		-DO-
11	TIG WELDING SETS		-DO-
12	MIXER FOR GROUTING OF EQUIPMENT FOUNDATIONS		-DO-
13	VACUUM CLEANER (INDUSTRIAL)		-DO-
14	PIPE CUTTING AND BEVELLING MACHINE		-DO-
15	PIPE BENDING M/C	(ELECTRIC/ ELECTRO- HYDRAULIC- UPTO 4" SIZE)	**-DO-**
16	STEP DOWN TRANSFORMER,	230V/24V	AS PER REQUIREMENT
17	CONDENSER TUBE EXPANDER SET	ADEQUATE CAPACITY	-DO-
18	ELECTRICALLY OPERATED WINCHES	ADEQUATE CAPACITY	-DO-
19	JACKING BOLTS / PRESSOUT BOLTS OF ALL SIZES (FOR ST. TURBINE ROLL CHECKS ETC.)	ADEQUATE CAPACITY	-DO-
a	**HYDRAULIC JACKS OF VARIOUS CAPACITIES FOR TURBO-BLOWER :**		**AS PER REQUIREMENT**
B	JACKS	100 T	
20	JACKS	50 T	
A	**GANG OPERATED JACKS CONSISTING OF THE FOLLOWING :**		
b	JACKS	100 T	10 NOS (HAVING BROAD BASE ONE INCH LIFT)
21	JACKS	63 T	10 NOS (WITH 4-6 INCH LIFT)
22	TORQUE WRENCH	0 TO 200 N-M CAP.	AS PER REQUIREMENT
23	TORQE WRENCH -	UPTO 2000 N-M CAP.	AS PER REQUIREMENT
24	SLINGS FOR TURBINE MODULE		AS PER REQUIREMENT
25	SLINGS FOR BLOWER		AS PER REQUIREMENT
26	LONG FEELER GAUGE SET		AS PER REQUIREMENT

27	SPANNERS / EYE BOLTS (OF ALL SIZES)		AS PER REQUIREMENT
28	**Hand Operated Hydraulic Test Pump of suitable capacity**		AS PER REQUIREMENT
29	HYDRO TEST PUMP CAPACITY -250/450 KG/CM2		AS PER REQUIREMENT

OTHER T & Ps AND MEASURING AND MONITORING DEVICES (MMD):

AS PER REQUIREMENT TO BE FINALIZED AT SITE, SHALL MEET THE REQUIREMENTS AS

PER FIELD QUALITY PLAN AND OTHER ERECTION, TESTING RELATED ACTIVITIES.

NOTE:

1. THIS ABOVE LIST IS ONLY INDICATIVE AND NEITHER EXHAUSTIVE NOR LIMITING. QUANTITIES INDICATED ABOVE ARE ONLY THE MINIMUM REQUIRED. CONTRACTOR SHALL DEPLOY ALL NECESSARY T&P TO MEET THE SCHEDULES & AS PRESCRIBED BY BHEL ENGINEER AND REQUIRED FOR COMPLETION OF WORK.

2. IF T&P AS PRESCRIBED BY BHEL ENGINEER AND REQUIRED FOR COMPLETION OF WORK ARE NOT DEPLOYED IN SPECIFIED TIME BHEL WILL CHARGE TO CONTRACTOR AS PER GCC-REV 01.

3. IF WORK GETS DELAYED DUE TO NON AVAILABILITY OF T&P, 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. OVERHEADS WILL BE CHARGED ON DIFFERENTIAL AMOUNT.

4. IN CASE OF NON COMPLIANCE IF ANY AS LISTED BELOW IN SL. NO. 4.1, THE CHARGES AS MENTIONED IN SL. NO. 5 SHALL BE DEDUCTED IN THE RUNNING BILLS OF THE RESPECTIVE MONTHS.

4.1. LIST OF NON COMPLIANCE:

- NON AVAILABILITY/NOT WORKING CONDITION OF THE PARTICULAR CRANE CUMULATIVELY FOR MORE THAN FIVE DAYS IN THE CALENDAR MONTH DURING THE PERIOD MENTIONED IN THE DEPLOYMENT PLAN.
- NON AVAILABILITY/NOT WORKING CONDITION OF THE PARTICULAR CRANE FOR MORE THAN FIVE CONSECUTIVE WORKING DAYS IN THE MONTH DURING THE PERIOD MENTIONED IN THE DEPLOYMENT PLAN.

5. THE DEDUCTION SHALL BE AS GIVEN BELOW:

   DEDUCTION FOR THE MONTH = OUTAGE BEYOND FIVE DAYS X (MONTHLY CRANE CHARGES/30)

   NOTE: I) FOR CALCULATION NO. OF DAYS IN A CALENDAR MONTH IS TAKEN AS 30.

   II) MONTHLY CRANE CHARGES AS DERIVED IN THE PRICE BID SECTION A.

6. THE MANUFACTURING YEAR OF ALL MAJOR T&PS DEPLOYED BY THE CONTRACTOR ~~(40 MT MOBILE CRANE, 14 MT MOBILE CRANE AND~~ 12 TON HYDRA CRANE) SHOULD NOT BE MORE

THAN 10 YEARS AS ON THE DATE OF DEPLOYMENT. THE DOCUMENTARY PROOF TO BE SUBMITTED TO SITE INCHARGE.

7. CRANE LOG SHEET FOR EACH OF THE CRANE ON DAILY BASIS ARE TO BE CERTIFIED BY THE BHEL ENGINEER. CONTRACTOR SHALL SUBMIT THE MONTHLY RUNNING ACCOUNT BILLS ALONG WITH DULY CERTIFIED LOG SHEETS.
8. ANY OR PART OR ALL OF THE T & PS OF THE CONTRACTOR IDENTIFIED FOR THE TENDERED PACKAGE SHALL NOT BE ENGAGED FOR ANY WORKS OTHER THAN THAT OF THE WORKS INTENDED IN THIS TENDER.
9. DURING THE EXTENDED PERIOD OF THE CONTRACT, SERVICES OF T&Ps SHALL BE PROVIDED BY THE CONTRACTOR AS PER THE INSTRUCTION OF BHEL ENGINEER. THE MONTHLY CHARGES TOWARDS DEPLOYMENT OF THE PARTICULAR CRANE SHALL BE PAID AT THE RATE OF 90% OF MONTHLY RATES OF PRICE BID SECTION-B FOR A PERIOD OF 12 MONTHS AFTER COMPLETION OF CONTRACT PERIOD. THEREAFTER (CONTRACT PERIOD + 12 MONTHS) RATE WILL BE DECIDED AFTER MUTUAL AGREEMENT. NO EXTRA PAYMENT SHALL BE MADE FOR T&Ps OTHER THAN CRANES.

SN	DESCRIPTION AND CAPACITY OF T&P	REMARKS
01	EOT CRANE	FOR HANDLING AND ERECTION WITHIN TG HALL ON SHARING BASIS AS AVAILABLE AND SUBJECT TO THEIR ACCESSIBILITY AND APPROACHABILITY

NOTE:

1. CUSTOMER WILL PROVIDE THE EOT CRANE, HOWEVER CONTRACTOR WILL HAVE TO PROVIDE THE EOT CRANE OPERATOR FOR HIS OPERATIONS AND WILL CARRY OUT THE DAY TODAY OPERATIONAL MAINTENANCE, GENERAL CLEANLINESS, ATTENDING OF GEAR BOX LEAKAGES ETC., APPLYING CALADIUM COMPOUND ON SLINGS AND HOLDING/SUPPORTING THE SUPPLY CABLES ETC. AS PART OF SCOPE OF WORK

2. EOT CRANES WILL BE USED ON SHARING BASIS BY OTHER AGENCIES WORKING WITHIN THE TG HALL UNDER THE INSTRUCTION OF BHEL. CONTRACTOR HAS TO PLAN HIS ACTIVITIES WELL IN ADVANCE AND INFORM BHEL ENGINEER IN CHARGE/ CONSTRUCTION MANAGER THE DATE OF ACTUAL USE.

6.1 TIME SCHEDULE & MOBILIZATION

6.1.1 INITIAL MOBILIZATION

AFTER RECEIPT OF FAX LOI, CONTRACTOR SHALL DISCUSS WITH PROJECT MANAGER / CONSTRUCTION MANAGER REGARDING INITIAL MOBILIZATION. CONTRACTOR SHALL MOBILIZE NECESSARY RESOURCES WITHIN 2 WEEKS OF ISSUE OF FAX 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.

6.1.2 MOBILIZATION FOR ERECTION, TESTING, ASSISTANCE FOR COMMISSIONING ETC.

THE ACTIVITIES FOR ERECTION, TESTING ETC. SHALL BE STARTED AS PER DIRECTIONS OF CONSTRUCTION MANAGER OF BHEL. CONTRACTOR SHALL MOBILIZE FURTHER RESOURCES (IN ADDITION TO THOSE REQUIRED FOR ACTIVITIES UNDER CLAUSE NO. 6.1.1) AS PER REQUIREMENT TO COMMENCE THE WORK OF ERECTION, TESTING ETC. OF STG AND PROGRESSIVELY AUGMENT THE RESOURCES TO MATCH SCHEDULE OF THE PROJECT.

6.1.3.A

COMMENCEMENT OF CONTRACT PERIOD AND TENTATIVE SCHEDULE

ERECTION/PLACEMENT ON ITS DESIGNATED FOUNDATION / LOCATION, OF THE FIRST MAJOR PERMANENT EQUIPMENT / COMPONENT / COLUMN COVERED IN THE SCOPE OF THESE SPECIFICATIONS SHALL BE RECOGNIZED AS "**START OF CONTRACT PERIOD"**. SMALLER ITEMS LIKE PACKER PLATES, SHIMS, ANCHORS, INSERTS ETC. WILL NOT BE CONSIDERED AS START OF CONTRACT PERIOD. ALSO START OF ACTIVITIES PERTAINING TO MATERIAL HANDLING/MANAGEMENT SHALL NOT BE RECKONED AS 'START OF CONTRACT

THE CONTRACTOR HAS TO SUBSEQUENTLY AUGMENT HIS RESOURCES IN SUCH A MANNER THAT FOLLOWING MAJOR MILESTONES OF ERECTION & COMMISSION ARE ACHIEVED ON SPECIFIED SCHEDULES:
ACCORDING TO THE CONTRACT BETWEEN BHEL AND OWNER THE SCHEDULE OF IMPORTANT MILESTONES IS AS FOLLOWS:

Major milestones

ACTIVITY	SCHEDULE OF COMPLETION
LIFTING & PLACEMENT OF CONDENSER ON FOUNDATION	WITHIN 1 MONTH FROM START OF ERECTION WORK
LIFTING & PLACEMENT OF STEAM TURBINE & TURBO- BLOWER ON FOUNDATION	WITHIN 2 MONTHS FROM START OF ERECTION WORK
OIL FLUSHING COMPLETION	WITHIN 5 MONTHS FROM START OF ERECTION WORK

BARRING GEAR OPERATION	WITHIN 06 MONTHS FROM START OF ERECTION WORK
ROLLING & READINESS WITH TURBO-BLOWER	WITHIN 06 MONTHS FROM START OF ERECTION WORK
TRIAL OPERATION COMPLETION	WITHIN 07 MONTHS FROM START OF ERECTION WORK
COMPLETION OF ALL OTHER WORKS AND PG TEST OF TURBO BLOWERS	WITHIN 08 MONTHS FROM START OF ERECTION WORK

ON AVAILABLE OF FRONTS CONTRACTOR HAVE TO WORK PARALLELY ON ALL THE 03 UNITS. ACCORDINGLY CONTRACTOR HAS TO PLAN HIS MANPOWER & RESOURCES.

IN ORDER TO MEET ABOVE SCHEDULE IN GENERAL, AND ANY OTHER INTERMEDIATE TARGETS SET, TO MEET CUSTOMER/ PROJECT SCHEDULE REQUIREMENTS, CONTRACTOR SHALL ARRANGE & AUGMENT ALL NECESSARY RESOURCES FROM TIME TO TIME ON THE INSTRUCTIONS OF BHEL.

THE CONTRACT PERIOD FOR COMPLETION OF ENTIRE WORK OF STG UNDER THIS SCOPE SHALL BE **08 (EIGHT MONTHS)** FROM THE "**START OF CONTRACT PERIOD**" AS SPECIFIED EARLIER.

The progressive payment for Material Handling and Management Services on accepted price of contract value (**Rate schedule SECTION A**) will be released as per the break up given hereinafter:

SL NO	Description of Activity	% of payment
7.1.1.0	**UNLOADING FROM TRUCKS/TRAILERS (For item nos A .1 & A.4 of Rate Schedule SECTION A)**	
7.1.1.1	UNLOADING, SHIFTING TO OPEN/ COVERED STORES	30%
7.1.1.2	UPDATION OF RECEIPT DETAILS, IN STORE MATERIAL REGISTERS/BHEL MM PACKAGE SYSTEM	15%
7.1.1.3	STACKING AND VERIFICATION	15%
7.1.1.4	UPDATION OF VERIFICATION DETAILS IN MATERIAL STOCK REGISTERS, SUBMISSION OF REPORTS AS PER SPECIFIED FORMATS FOR SHORTAGE/OPEN DELIVERY, LODGING OF POLICE REPORTS IF REQUIRED, DOCUMENTS FOR INSURANCE CLAIMS ETC, AND PREPARATION OF MATERIAL RECEIPT CERTIFICATES IN PRESCRIBED FORMATS WHERE EVER APPLICABLE	25%
7.1.1.5	IDENTIFICATION OF MATERIAL IN READY TO LIFT POSITION FOR ISSUE TO BHEL/ERECTION AGENCY, AND UPDATION OF ISSUE DETAILS IN STORES RECORDS	12%
7.1.1.6	COMPLETION OF CONTRACTUAL OBLIGATIONS	3%
	Total	100%
7.1.2.0	**UNLOADING FROM RAILWAY WAGONS AND COLLECTION FROM TRANSPORTER GODOWN (For item A.2 & A.3 of Rate Schedule SECTION A)**	
7.1.2.1	UNLOADING FROM RAILWAY WAGONS OR COLLECTION FROM TRANSPORTER GODOWNS, RE-LOADING, TRANSPORTATION TO SITE AND UNLOADING	30%
7.1.2.2	UPDATION OF RECEIPT DETAILS, IN STORE MATERIAL REGISTERS/BHEL MM PACKAGE SYSTEM	15%
7.1.2.3	STACKING AND VERIFICATION	15%
7.1.2.4	UPDATION OF VERIFICATION DETAILS IN MATERIAL STOCK REGISTERS, SUBMISSION OF REPORTS AS PER SPECIFIED FORMATS FOR SHORTAGE/OPEN DELIVERY, LODGING OF POLICE REPORT IF REQUIRED, DOCUMENTS FOR INSURANCE CLAIMS ETC, AND PREPARATION OF MATERIAL RECEIPT CERTIFICATES IN PRESCRIBED FORMATS WHERE EVER APPLICABLE	25%
7.1.2.5	IDENTIFICATION OF MATERIAL IN READY TO LIFT POSITION FOR ISSUE TO BHEL/ERECTION AGENCY, AND UPDATION OF ISSUE DETAILS IN STORES RECORDS	12%
7.1.2.6	COMPLETION OF CONTRACTUAL OBLIGATIONS	3%
7.1.3.0	**MATERIAL RE-SHIFTING/RE STACKING WITHIN THE PROJECT PREMISE (For item A.5 of Rate Schedule SECTION A)**	
7.1.3.1	MATERIAL RE-SHIFTING/RE STACKING	85%

7.1.3.2	UPDATION OF STORE MATERIAL REGISTERS/BHEL MM PACKAGE SYSTEM	12%
7.1.3.3	COMPLETION OF CONTRACTUAL OBLIGATIONS	3%
	Total	100%
7.1.4.0	**OUTGOING MATERIALS (For item A.6 of Rate Schedule SECTION A)**	
7.1.4.1	IDENTIFICATION OF MATERIALS, TAGGING, PACKING IF REQUIRED, PREPARATION OF GATE PASSES ETC	40%
7.1.4.2	LOADING OF MATERIALS, INCLUDING T&P OF BHEL, INTO TRUCKS/CARRIERS AT SITE STORES/ERECTION SITE FOR ONWARD TRANSPORTATION TO OTHER DESTINATIONS (TRANSPORTATION BY OTHER AGENCIES.)	45%
7.1.4.3	UPDATION OF STORE DOCUMENTS/BHEL MM PACKAGE SYSTEM	12%
7.1.4.4	COMPLETION OF CONTRACTUAL OBLIGATIONS	3%
	Total	100%
7.1.5.0	**FOR EXISTING RECEIVED MATERIALS (For item A.7 of Rate Schedule SECTION A)**	
7.1.5.1	UPDATION OF RECEIPT DETAILS, IN STORE MATERIAL REGISTERS/BHEL MM PACKAGE SYSTEM	45%
7.1.5.2	STACKING AND VERIFICATION	15%
7.1.5.3	UPDATION OF VERIFICATION DETAILS IN MATERIAL STOCK REGISTERS, SUBMISSION OF REPORTS AS PER SPECIFIED FORMATS FOR SHORTAGE/OPEN DELIVERY, LODGING OF POLICE REPORTS IF REQUIRED, DOCUMENTS FOR INSURANCE CLAIMS ETC, AND PREPARATION OF MATERIAL RECEIPT CERTIFICATES IN PRESCRIBED FORMATS WHERE EVER APPLICABLE	25%
7.1.5.4	IDENTIFICATION OF MATERIAL IN READY TO LIFT POSITION FOR ISSUE TO BHEL/ERECTION AGENCY, AND UPDATION OF ISSUE DETAILS IN STORES RECORDS	12%
7.1.5.5	COMPLETION OF CONTRACTUAL OBLIGATIONS	3%
	Total	100%
7.1.6.0	**OTHERS**	
	% from every RA Bill to be paid only after satisfactory completion otherwise forfeited	
1	REMOVAL OF GRASS/WEEDS AND OTHER PLANT GROWTH IN THE STORE AREA	1%
2	PRESERVATION planned for the month	1%
3	Safe working & availability of adequate illumination at the place of work	1%

The progressive payment for Erection, Testing and Commissioning on accepted price of contract value (**Rate Schedule SECTION B**) will be released as per the break up given hereinafter:

		CND (1)	TUR (2)	BLO (3)	PMP & AUX/ EQ (4)	HEATERS AND DEAERATORS (5)	MISCELLANEOUS ITEMS (6)	INTEGRAL PPG (7)	PIPING (8) ON PER MT BASIS
	Overall weightage for each area out of lumpsum value quoted for STG	**20%**	**18%**	**15%**	**13%**	**11%**	**7%**	**16%**	
Sl. No.	**Activity/Work Description**	**%**							
I	**PRO RATA PAYMENTS (85%)**								
1	**CONDENSER (weightage 20%)**								
1.1	PREPARATION OF FOUNDATION	2%			--			--	
1.2	PLACEMENT, ALIGNMENT, ASSEMBLY AND WELDING OF BOTTOM PLATE SEGMENTS, HOT WELL, NDT AND SPRING ELEMENTS PLACEMENT & GROUTING.	10%			--			--	
1.3	ASSEMBLY AND POSITIONING OF WATER CHAMBER, SIDE PLATES, BOTTOM PLATES, WELDING AND NDT INCLUDING HINGE ASSY	12%		--	--			--	
1.4	ASSEMBLY, ALIGNMENT AND WELDING & NDT OF TUBE SUPPORT PLATES AND INTERNALS LIKE BAFFLE PLATES, AIR EVACUATION PIPES ETC.	13%		--	--			--	
1.5	ASSEMBLY, WELDING & NDT OF DOME WALLS AND DOME STIFFENERS, EXTRACTION PIPING AND STEAM THROW DEVICE, LPH-1 SUPPORT ETC.	10%		--	--			--	
1.6	INSERTION, EXPANSION, CUTTING ETC. OF CONDENSER TUBES	15%		--	--			--	
1.9	HYDRO TEST OF STEAM AND WATER SIDE	10%		--	--			--	
1.10	WELDING OF CONDENSER NECK JOINT AND NDT& COMPLETION OF BALANCE WORKS	10%		--	--			--	
1.11	ERECTION, COMMISSIONING, LOAD TESTING OF CONDENSER WATER BOX HANDLING SYSTEM	3%		--	--			--	
	Subtotal for condenser	**85%**							

2	**TURBINE (18 %)**							--	
2.1	PREPARATION OF FOUNDATION, PLACEMENT, ALIGNMENT AND GROUTING OF BASE PLATES AND BEARING PEDESTALS	--	14%		--			--	
2.2	PLACEMENT AND ALIGNMENT OF TURBINE ON FOUNDATION AND LEVELLING	--	12%		--			--	
2.3	ALLIGNMENT OF TURBINE WITH TURBO BLOWER	--	14%		--			--	
2.4	REAMING AND COUPLING OF TURBINE	--	14%		--			--	
2.5	GROUTING OF TURBINE BASE PLATES / FRAMES	--	2%		--			--	
2.6	FIXING AND ASSEMBLY OF STEAM ADMISSION & CONTROL VALVES	--	5%		--			--	
2.7	ASSEMBLY OF REGULATION SYSTEM AND GOVERNING CONSOLE	--	9%		--			--	
2.14	TURBO VISORY WORKS COMPLETION	--	5%		--			--	
2.15	ASSEMBLY AND PREPARATION OF HYDRO-TEST, STEAM BLOWING DEVICES AND NORMALISATION ETC.	--	5%		--			--	
2.16	FINAL BOXING UP OF PEDESTALS AFTER OIL FLUSHING COMPLETION	--	5%		--			--	
	Subtotal for Turbine		**85%**						
3	**TURBO BLOWER (15%)**	--		--	--			--	
3.1	PREPARATION OF FOUNDATION, LEVELLING, MATCHING AND GROUTING OF FOUNDATION PLATES	--		10%				--	
3.2	LIFTING, LEVELLING AND PLACEMENT OF BLOWER ON FOUNDATION			23%				--	
3.3	ALLIGNMENT OF TURBO-BLOWER & TURBINE	--	--	16%				--	
3.4	REAMING AND COUPLING OF TURBO - BLOWER	--	--	9%				--	
3.5	ERECTION OF SUCTION FILTER & SILENCER (AIR INTAKE SYSTEM)	--	--	11%				--	

3.6	ERECTION OF AIR DISCHARGE SYSTEM	--	--	11%				--	
3.9	FINAL BOX UP OF BEARINGS OF TURBO - BLOWER	--	--	5%				--	
	Subtotal for Generator			**85%**					
4	**PUMPS AND AUXILIARIES (13 %)**	--	--		--			--	
4.1	ERECTION / TESTING and commissioning OF MAIN OIL PUMP, JOP, EOP, AOP, CENTRALISED LUBE OIL PURIFICATION SYSTEM, ALONG WITH ALL AUXILLIARIES	--	--		45%			--	
4.6	ERECTION, TESTING, GROUTING ETC. OF CONDENSATE EXTRACTION PUMPS	--	--	--	40%			--	
	Subtotal for pumps and Auxilliaries				**85%**				
5	**HEATERS AND DEAERATORS (11%)**								
5.2	ERECTION, TESTING & COMMISSIONING OF GLAND STEAM CONDENSER, DRAIN COOLERS	--	--	--		45%		--	
5.3	ERECTION, TESTING & COMMISSIONING OF STEAM JET AIR EJECTOR	--	--	--		40%		--	
	Subtotal FOR HEATERS AND DEAERATORS	**--**	**--**	**--**		**85%**		**--**	
6	**MISCELLANEOUS ITEMS (7%)**								
6.1	DUPLEX FILTERS, OIL CENTRIFUGE, OIL ACCUMULATOR ETC						30%		
6.2	MAIN OIL TANK & OVER HEAD LUBE OIL TANK	--	--	--			30%		
6.3	ERECTION, TESTING & COMMISSIONING OF LUBE OIL COOLERS, FILTERS ETC.	--	--	--			25%		
	Subtotal for MISCELLANEOUS ITEMS						**85%**		
7	**INTEGRAL PIPING (16%)**	--	--	--				--	

7.1	Turbine Integral piping and Generator Integral piping consisting of Lube oil, Jacking oil, Oil vapour extraction, Seal Oil, Control oil, Seal steam, Condensate spray/Exhaust Hood spray, Turbine water drainage, Gas Piping, Primary Stator Water piping, etc including all accessories like thermowells, probes, orifices etc and hangers and supports (Erection and commissioning on prorata basis)	--	--	--				85%	
	Total for integral piping							**85%**	
8	**PIPING**								
8.1	ON PRE-ASSEMBLY WHEREVER APPLICABLE (IF NOT APPLICABLE, THIS PORTION TO BE PAID ALONG WITH PLACEMENT IN POSITION)								15%
8.2	PLACEMENT IN POSITION								20%
8.3	ALIGNMENT								15%
8.4	WELDING/BOLTING/FIXING								20%
8.5	COMPLETION OF NON DESTRUCTIVE EXAMINATION & STRESS RELIEVING/ HEAT TREATMENT (if not applicable, then this portion to be clubbed with next activity)								5%
8.6	HANGERS & SUPPORTS ETC WHEREVER NECESSARY AS PER DRG								5%
8.7	HYDRAULIC TEST/PNEUMATIC TEST WHERE EVER APPLICABLE								5%
	Total for Prorata (85%)	**85%**	**85%**	**85%**	**85%**	**85%**	**85%**	**85%**	**85%**
II	**STAGE/MILESTONE PAYMENTS (15%)**								
1	Boiler Light Up	0%	0%	0%	0%	0%	0%	0%	0%
2	ABO	0%	0%	0%	0%	0%	0%	0%	0%
3	Steam Blowing	0%	0%	0%	0%	0%	0%	0%	0%
4	Safety Valve Floating	0%	0%	0%	0%	0%	0%	0%	0%
5	Oil Flushing	1%	1%	1%	1%	1%	1%	1%	1%
6	Barring Gear (TG)	1%	1%	1%	1%	1%	1%	1%	1%
7	Readiness of Condensate system	2%	2%	2%	2%	2%	2%	2%	2%
8	Coal Firing	0%	0%	0%	0%	0%	0%	0%	0%
9	Rolling and Readiness of TURBO-BLOWER	3%	3%	3%	3%	3%	3%	3%	3%

10	Trial Operation of Unit	2%	2%	2%	2%	2%	2%	2%	2%
11	Painting (including arrow marking, nomenclature, etc)	2%	2%	2%	2%	2%	2%	2%	2%
12	Area cleaning, temporary structures cutting/removal and return of scrap	1%	1%	1%	1%	1%	1%	1%	1%
13	Punch List points/pending points liquidation	1%	1%	1%	1%	1%	1%	1%	1%
14	Submission of 'As Built Drawings'								
15	Material Reconciliation	1%	1%	1%	1%	1%	1%	1%	1%
16	Completion of Contractual Obligations	1%	1%	1%	1%	1%	1%	1%	1%
	Total for Milestone/Stage payments (15%)	**15%**	**15%**	**15%**	**15%**	**15%**	**15%**	**15%**	**15%**
	Total of I & II	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**	**100%**

8.0 TAXES, DUTIES, LEVIES (Consolidated Rev 03 dated 09/04/2013)

8.1. For All types of works excepting works covered under sl no 8.2

8.1.1

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 and Value Added Tax (VAT) on output services and goods shall be as per following clauses.

8.1.2 Service Tax & Cess on Service Tax

Contractor's price/rates shall be exclusive of Service Tax and Cess on Services. In case, it becomes mandatory for the contractor under provisions of relevant act/law to collect the Service Tax & Cess from BHEL and pay the same to the concerned tax authorities, such applicable amount will be paid by BHEL at the prevailing Service Tax Rate (presently 12.36 %) on the admitted bill value.

Contractor shall submit to BHEL documentary evidence of Service Tax registration certificate specifying name of services covered under this contract. Contractor shall submit serially numbered Service Tax and Cess Invoice, signed by him or a person authorized by him in respect of taxable service provided, and shall contain the following, namely,

1. **The name, address and the registration number of the contractor,**
2. **The name and address of the party receiving taxable service,**
3. **Description, classification and value of taxable service provided and,**
4. **The service tax payable thereon.**

All the Four conditions shall be fulfilled in the invoice before release of service tax payment.

Wherever, more than one route/option are available for discharge of service tax liability under a particular service, (e.g. "works contract Service"), contractor shall obtain prior written consent from BHEL site before billing the amount towards Service Tax.

8.1.3 VAT (Sales Tax /WCT)

As regards Value Added Tax (VAT)/CST on transfer of property in goods involved in Works Contract (previously known as Works Contract Tax) applicable as per local laws, the price quoted by the contractor shall be inclusive of the same and in no case input or output VAT/CST will be reimbursed extra.

In any case the Contractor shall register himself with the respective Sales Tax authorities of the state and submit proof of such registration to BHEL along with the first RA bill. Contractor will submit all the details of VAT/CST paid for the contract in the prescribed format of the respective state VAT laws. Also, the

contractor will issue the tax Invoices to BHEL as per the Tax laws of respective state on monthly basis. Contractor shall also be required to furnish to BHEL necessary proof of VAT remittance on monthly basis.

Deduction of tax at source shall be made as per the provisions of law and is to be construed as an advance tax paid by the contractor and no reimbursement thereof will be made.

Further, if BHEL, at the instance of customer or otherwise adopts the specific route for discharging output VAT liability itself, benefit of the reduction in liability of the contractor will be passed on to BHEL.

In case, BHEL is forced to pay any VAT liability on behalf of contractor, the same will be recovered from contractor's bill or otherwise as deemed fit

~~8.2~~ ~~'Enabling Works'~~

~~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.~~ **~~(i.e. rates quoted by bidder shall be inclusive of Service Tax, VAT/WCT and all other taxes and duties)~~**

~~However, Since the proposed work is in the nature of 'Works Contract service' as per Service tax law, Hence, For non-corporate contractors being Individual, HUF, Proprietary Firm, Partnership Firm or Association of Persons (AOP), BHEL shall recover the applicable Service Tax under reverse charge mechanism from the contractor and remit the same with the Government as per the provisions of Law. Necessary advice/confirmation of remittance shall be issued to the contractor. The contractor shall not be eligible for any refund/reimbursement of such service tax from BHEL. It shall be the responsibility of the contractor to submit proper invoice giving all the requisite details as per Service Tax Law for the determination of the service tax liability of BHEL under reverse charge mechanism. BHEL reserves the right to determine such liability based on the invoice submitted by the contractor or otherwise independently and remittance of the same with the Government.~~

8.3 New Taxes/Levies

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.

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.

No reimbursement/recovery on account of increase/reduction in the rate of taxes, levies, duties etc. on input goods/services/work shall be made. Such impact shall be taken care of by the Price Variation/Adjustment Clause (PVC) if any. In case PVC is not applicable for the contract, Bidder has to make his own assessment of the impact of future variation if any, in rates of taxes/duties/ levies etc. in his price bid.

SPECIFIC INCLUSIONS

10.0 exclusions

THE FOLLOWING WORKS ARE SPECIFIC EXCLUSIONS FROM THE SCOPE OF WORK UNDER ERECTION, TESTING & COMMISSIONING OF TENDER SPECIFICATION-

I) CIVIL WORKS

II) EXCEPT TO THE EXTENT SPECIFICALLY INDICATED ELSEWHERE IN THIS TENDER.

II) SUPPLY OF PRIMER AND PAINTS FOR FINAL PAINTING

iii. SUB-DELIVERY ITEMS AND ELECTRICAL COMPONENTS SUCH AS PUSH-BUTTONS, JUNCTION BOXES ETC.
iv. E&C WORK OF CABLE TRAYS, CABLES AND EARTHING ETC
v. CONTROL PANELS, EPMS, MCC ETC.
vi. ALL ELECTRICAL AND CONTROL & INSTRUMENTATION RELATED TO ITEMS EXCEPT THOSE SPECIFIED ELSEWHERE IN THESE SPECIFICATIONS.
vii. TESTING AND COMMISSIONING OF HEATING ELEMENTS, THERMOSTATS, AND HV RECTIFIER TRANSFORMERS.
viii. PNEUMATIC COPPER TUBING AND FITTINGS THEREOF.
ix. ELECTRICAL AND C&I ITEMS OF VARIABLE FREQUENCY DRIVES AS PROVIDED ELSEWHERE IN THESE SPECIFICATIONS.

TENTATIVE SCOPE OF EQUIPMENTS/SYSTEMS COVERED UNDER THIS TENDER SPECIFICATION FOR ERECTION, TESTING AND COMMISSIONING FOR EACH UNIT.

(A) SURFACE CONDENSER

1. SHELL ASSEMBLY (WITH SHELL, TUBE SHEET, SUPPORT PLATES, SPACERS ETS)
2. TUBES
3. DOME, SHELL, WATER BOXES ,HOTWELL, RUPTURE DISC
4. STEEL BELLOWS WITH CONDENSER NECK, COLLAR, TOP CONNECTING PIECE
5. STAND & SURGE PIPES, SACRIFICIAL ANODES, WATER EXPANSION RELIEF VALVE, VENTS & DRAIN VALVES,
6. FOUNDATION PARTS

(B) STEAM TURBINE & AUXILIARIES:

1. STEAM TURBINE MULTI STAGES WITH BASE FRAME
2. BEARING AND COUPLINGS
3. EMERGENCY OVER SPEED GOVERNOR
4. MAIN THROTTLE VALVE
5. BARRING GEAR CONSOLE (AC/DC MOTOR DRIVEN TURNING/BARRING GEAR WITH MANUAL OPERATION FACILITY)
6. TURBINE SUPERVISORY INSTRUMENTS
7. STEAM TURBINE-MULTISTAGE WITH BASE FRAME
8. EMERGENCY TRIP CUM STOP VALVE
9. TRIPPING DEVICE
10. BLANKET PLATE FOR STEAM BLOWING
11. STEAM TURBINE GOVERNING VALVE
12. STEAM STRAINER BUILT INTO STOP VALVE
13. COUPLING & COUPLING GUARD BETWEEN STEAM TURBINE & TURBO-BLOWER
14. SOLENOID VALVE FOR REMOTE TRIPPING
15. TURBINE SOLE PLATES & FOUNDATION BOLTS
16. SHAFT GROUNDING DEVICE
17. MATING FLANGES FOR TURBINE INLET & EXTRACTION FLANGES
18. GLAND SEALING SYSTEM (AUTOMATIC)
19. GLAND STEAM LEAK OFF PIPING.
20. TURBINE DRAIN WATER PIPING WITHIN AT ONE POINT TG BLOCK/HALL.
21. QCNRV FOR BLEED STEAM PIPING
22. VACUUM BREAKER VALVES
23. CASING DRAIN VALVE

(C) OIL SUPPLY SYSTEM:

1. LUB OIL TANK
2. CENTRAL OIL STORAGE TANK WITH PUMPS
3. LUBE OIL PUMP ASSEMBLY
4. EMERGENCY OIL PUMP ASSEMBLY

5. OVERHEAD EMERGENCY OIL TANK
6. LUB OIL ACCUMULATORS
7. GOVERNING OIL ACCUMULATORS
8. DUPLEX FILTER OF LUB OIL
9. SUCTION FILTER AND SILENCER
10. GOVERNING CONSOLE
11. OIL RESERVOIR VAPOUR EXTRACTORS / OIL MIST FANS
12. OVERFLOW TYPE SIGHT FLOW INDICATOR
13. SHAFT DRIVEN MAIN OIL PUMP
14. TURBINE SHAFT DRIVEN MAIN OIL PUMP (MOP)
15. A.C MOTOR DRIVEN AUXILIARY OIL PUMP (AOP)
16. A.C MOTOR DRIVEN JACKING OIL PUMP (JOP)
17. DC MOTOR DRIVEN EMERGENCY OIL PUMP (EOP)
18. OIL COOLER
19. OIL STRAINER (OIL FILTER)
20. OIL CENTRIFUGE (TROLLEY TYPE)
21. OIL HEATER
22. POLISHING FILTER
23. FILTER VESSEL
24. MOTOR DRIVEN VENT BLOWER (OIL MIST FAN)

(D) STEAM JET AIR EJECTOR

1. AIR EJECTOR
2. INTER CONDENSER DRAINS
3. AFTER CONDENSER DRAINS
4. STARTING EJECTOR
5. STEAM & AIR VAPOUR SUCTION HEADERS
6. SLIDE PLATES & FOUNDATION PARTS
7. ISOLATION VALVES ON STEAM SUPPLY HEADER & INDIVIDUAL EJECTOR
8. WATER EXPANSION RELIEF VALVES
9. INSTRUMENTS ISOLATION VALVES
10. VENTS & DRAIN VALVES
11. SILENCER FOR STARTING EJECTOR
12. STRAINERS

(E)

GLAND STEAM CONDENSER WITH STEAM JET EJECTORS 2X100%, WATER EXPANSION RELIEF VALVE, STAND PIPE, and ISOLATION VALVES FOR INSTRUMENTS & STAND PIPES, VENTS & DRAIN VALVES.

(F)

BLOWER IN ASSEMBLED CONDITION WITH AIR VOLUMES REGULATOR, ANTI SURGE CONTROL DEVICE AND ANTI CHOKE CONTROLLER, SUCTION AIR FILTERS, SILENCER, SUCTION AIR INTAKE ETC

~~**(G) STEAM TURBINE CONTROL, PROTECTION AND SUPERVISORY SYSTEM:**~~

~~**(I)** TURBINE CONTROL PANELS HOUSING ELECTRONIC GOVERNOR, TURBINE SHAFT VIBRATION & AXIAL DISPLACEMENT MONITORING SYSTEM, TSI PROXIMITORS/PROBES, TEMPERATURE SCANNERS, PUSH BUTTONS & LAMPS FOR REMOTE OPERATIONS, FIELD AND LOCAL INSTRUMENTS/GAUGES LIKE TEMPERATURE GAUGES/ PRESSURE GAUGES, TRANSMITTERS , FLOW ELEMENTS, LEVEL INDICATORS ETC, LOCAL GAUGE BOARD.~~

(H) BALANCE OF PLANT- MECHANICAL

1. 2X120% CAPACITY (1W+1S) CONDENSATE EXTRACTION PUMPS (02 NO.S) WITH SUCTION & DISCHARGE CONNECTION AND PUMP BEARING
2. CONDENSATE PIPING FROM HOTWELL TO CEP,
3. CONDENSATE PIPING FROM CEP TO GSC AND STEAM JET AIR EJECTOR ETC.
4. AIR AND STEAM PIPING BETWEEN CONDENSER AND EJECTOR.
5. DRAIN PIPING FROM DRAIN COOLER, GLAND STEAM CONDENSER AND EJECTOR CONDENSERS TO CONDENSER.
6. CONDENSER HOTWELL LEVEL CONTROL SYSTEM INCLUDING MAIN AND RE-CIRCULATION CONTROL VALVES
7. BLOWER EXHAUST PIPING FROM BLOWER TO TERMINAL POINT.
8. APPLICATION OF THERMAL INSULATION OF EQUIPMENTS (EXCLUDING SPRAY INSULATION OF STEAM TURBINE) AND PIPING.
9. TURBINE DRAINS PIPING.
10. GLAND STEAM LEAK OFF PIPING.
11. VACUUM BREAKER VALVE WITH PIPING.
12. QCNRV WITH EXTRACTION PIPING.

NOTE:

BILL OF QUANTITY, DIMENSION, WEIGHT OF COMPONENTS ARE TENTATIVE AND WILL BE RECEIVED IN LOOSE CONDITION. APART FROM ABOVE CERTAIN ITEMS WILL BE SUPPLIED IN ASSEMBLED CONDITION. ENTIRE WORK ALONG WITH INSTRUMENTS/ITEMS SUPPLIED IN ASSEMBLED CONDITION SHALL BE CARRIED AT SITE AS PER BHEL DRAWINGS & TERMINAL POINTS ISSUED AT SITE & INSTRUCTION OF BHEL SITE ENGINEER.

APPENDIX -1

TENTATIVE WEIGHT DETAILS EQUIPMENTS

HEAT EXCHANGERS (Surface Condenser, Twin Oil Cooler, Steam Jet Ejector, GSC Assy.) **(FOR EACH UNIT)**				
Sl. No	**Material Description**	**PGMA Description**	**Qty.**	**Net.Wt (KG)**
1	TWIN OIL COOLER	ST OIL COOLER	1	5,868.75
2	SURFACE CONDENSER ASSLY	CONDENSER ASSLEMBLY	1	48,500.00
3	STAND PIPE ASSLY I	Stand/Surge Pipe for C	1	168
4	PIPE(SMLS)- 33.4X 4.55 CS SA106 GR B	Stand/Surge Pipe for C	4	12.948
5	GLOBE VLV CS PTFE PKG 1" CL 800 SW ENDS	Stand/Surge Pipe for C	4	13.6
6	FLANGE SOW CS 1" CL 300 RAISED FACE	Stand/Surge Pipe for C	2	3
7	STUD 2 NUTS M16X90	Stand/Surge Pipe for C	8	2.048
8	NAB M.S.W. GASKET SIZE 1" #300 PTFE	Stand/Surge Pipe for C	2	0.04
9	PIPE(SMLS)- 21.3 X4.78 CS SA106 GR B	Stand/Surge Pipe for C	0.5	0.974
10	GL0BE VALVE,CS 1/2", 800,SOCKET	Stand/Surge Pipe for C	2	3.2
11	STAND PIPE ASSLY II	Stand/Surge Pipe for C	1	138
12	PIPE(SMLS)- 33.4X 4.55 CS SA106 GR B	Stand/Surge Pipe for C	10	32.37
13	GLOBE VLV CS PTFE PKG 1" CL 800 SW ENDS	Stand/Surge Pipe for C	10	34
14	FLANGE SOW CS 1" CL 300 RAISED FACE	Stand/Surge Pipe for C	2	3
15	STUD 2 NUTS M16X90	Stand/Surge Pipe for C	8	2.048
16	NAB M.S.W. GASKET SIZE 1" #300 PTFE	Stand/Surge Pipe for C	2	0.04
17	PIPE(SMLS)- 21.3 X4.78 CS SA106 GR B	Stand/Surge Pipe for C	0.5	0.974
18	GL0BE VALVE,CS 1/2", 800,SOCKET	Stand/Surge Pipe for C	2	3.2
19	SURGE PIPE ASSLY	Stand/Surge Pipe for C	1	927
20	HOTWELL ASSLY	Loose items for Condense	1	2,715.00
21	PIPE	Loose items for Condense	1	51
22	COLLAR	Loose items for Condense	1	135

23	SS EXPN BELLOW	Loose items for Condense	1	600
24	TOP CONN. PIECE ASSLY	Loose items for Condense	1	1,060.00
25	PIPE	Loose items for Condense	2	3.2
26	SS SEAMLESS TUBES.DIA.3/4"X20 BWGX7000 M	Loose items for Condense	2,000.00	19,800.00
27	SS SEAMLESS TUBES.DIA.3/4"X20 BWGX7000 M	Loose items for Condense	4,600.00	19,800.00
28	SS SEAMLESS TUBES.DIA.3/4"X20 BWGX7000 M	Loose items for Condense	2,000.00	19,800.00
29	SS SEAMLESS TUBES.DIA.3/4"X20 BWGX7000 M	Loose items for Condense	4,600.00	19,800.00
30	PIPE	Loose items for Condense	2	4.4
31	GLOBE VLV CS(SA105)2"CL800PTFE PKG SOC	Loose items for Condense	12	133.2
32	PIPE	Loose items for Condense	1	11.7
33	GL0BE VALVE,CS 1/2", 800,SOCKET	Loose items for Condense	9	14.4
34	BEND PIPE	Loose items for Condense	2	3.7
35	WER VALVE 3/4"X1"SW, SET PR 4ATG	Loose items for Condense	2	30
36	SORF FLANGE CL-150-28"	Loose items for Condense	4	600
37	STUD 2 NUTS M33X3X190	Loose items for Condense	120	240.6
38	PACKING	Loose items for Condense	4	32
39	VALVE ATY 24" 77131-113400KG/H	Loose items for Condense	1	75
40	STUD 2 NUTS M33X3X200	Loose items for Condense	20	41.44
41	NAB M.S.W. GASKET SIZE 24" #150 PTFE	Loose items for Condense	1	0.5
42	FOUNDATION BOLT ASSLY.	Loose items for Condense	8	44.24
43	NUT HEX P M36-8	Loose items for Condense	8	3.168
44	WASHER MCD 37ST	Loose items for Condense	8	0.712
45	BED PLATE	Loose items for Condense	2	790
46	PACKING (FOR RWB. SIDE) (CUT TO SHAPE)	Loose items for Condense	2	8
47	PACKING (CUT TO SHAPE) (FOR FWB. SIDE)	Loose items for Condense	2	30
48	HOTWELL RIB	Loose items for Condense	20	700
49	PACKER PLATE	Loose items for Condense	10	375
50	PACKER PLATE	Loose items for Condense	10	294
51	PACKER PLATE	Loose items for Condense	10	230

52	PACKER PLATE	Loose items for Condense	10	188
53	PACKER PLATE	Loose items for Condense	10	110
54	PACKER PLATE	Loose items for Condense	10	70
55	PACKER PLATE	Loose items for Condense	10	37
56	PACKER PLATE	Loose items for Condense	10	23
57	PACKER PLATE	Loose items for Condense	10	1.1
58	PACKER PLATE	Loose items for Condense	10	5.9
59	HINGE ASSLY.	Loose items for Condense	4	426.528
60	STEAM JET AIR EJECTOR ASSLY.	EJECTOR ASSLY	1	6,030.00
61	EJECTOR ASSLY.(STARTING)	Loose items for Ejector	1	68.2
62	AIR PIPING ASSLY.	Loose items for Ejector	1	230.6
63	GATE VLV CS(A216WCB)4" SG CL150 BW	Loose items for Ejector	3	144
64	STEAM PIPING	Loose items for Ejector	1	330
65	GLOBE VALVE CS 2" CL 300 FLANGED RF ENDS	Loose items for Ejector	3	105
66	GLOBE VALVE CS 1 1/2" CL300 FLGD RF ENDS	Loose items for Ejector	4	120
67	WER VALVE 3/4"X1"SW, SET PR 16ATG	Loose items for Ejector	2	30
68	GL0BE VALVE,CS 1/2", 800,SOCKET	Loose items for Ejector	2	3.2
69	STUD 2 NUTS M16X110	Loose items for Ejector	8	2.296
70	NAB M.S.W. GASKET SIZE 4" #150 PTFE	Loose items for Ejector	1	0.08
71	FLANGE SOW CS 6" CL 150 RAISED FACE	Loose items for Ejector	1	7.8
72	STUD 2 NUTS M20X110	Loose items for Ejector	8	3.712
73	NAB M.S.W. GASKET SIZE 6" #150 PTFE	Loose items for Ejector	1	0.15
74	FLANGE SOW CS 6" CL 300 RAISED FACE	Loose items for Ejector	4	66
75	NON ASBESTOS M.S.W. GASKET SIZE 6" CLAS	Loose items for Ejector	4	0.6
76	PIPE	Loose items for Ejector	1	6
77	GL0BE VALVE,CS 1/2", 800,SOCKET	Loose items for Ejector	10	16
78	GLOBE VLV CS(SA105)2"CL800PTFE PKG SOC	Loose items for Ejector	4	44.4
79	STUD 2 NUTS M20X100	Loose items for Ejector	16	7.024
80	NAB M.S.W. GASKET SIZE 1 1/2"#300 PTFE	Loose items for Ejector	1	0.035

81	STUD 2 NUTS M27X325	Loose items for Ejector	8	18.64
82	STUD 2 NUTS M27X120	Loose items for Ejector	8	7.536
83	WASHER MCD 28-ST	Loose items for Ejector	32	1.344
84	RIB	Loose items for Ejector	1	5.2
85	RIB	Loose items for Ejector	1	6.5
86	EJECTOR SILENCER. (4"/6"-350)	Loose items for Ejector	1	226.62
87	GROUTING PLATE (FOR SJAE)	Loose items for Ejector	2	38
88	WELDED ON PIECE M 33 X 2	Loose items for Ejector	2	9
89	PLUG M 33X2	Loose items for Ejector	4	0.8
90	STAND PIPE ASSLY	Gland Steam CONDENSER	1	30
91	STUD 2 NUTS M24X300	Gland Steam CONDENSER	8	10.712
92	WASHER MCD 25ST	Gland Steam CONDENSER	16	0.496
93	WER VALVE 3/4"X1"SW, SET PR 16ATG	Gland Steam CONDENSER	1	5
94	GLOBE VALVE CS 1/2" CL 800 SW ENDS	Gland Steam CONDENSER	7	11.2
95	GLOBE VALVE CS 1" CL 800 SW ENDS	Gland Steam CONDENSER	7	23.8
96	GLOBE VALVE CS 2" CL 800 SW ENDS	Gland Steam CONDENSER	2	22.2
97	PIPE(SMLS)- 21.3 X3.73 CS SA106 GR B	Gland Steam CONDENSER	2	3.232
98	PIPE(SMLS)- 33.4X 4.55 CS SA106 GR B	Gland Steam CONDENSER	3	9.711
99	PIPE(SMLS) 60.3X 5.54 CS SA106 GR B	Gland Steam CONDENSER	2	14.964
100	FLANGE SOW CS 1" CL 300 RAISED FACE	Gland Steam CONDENSER	2	3
101	ELBOW LR 90DEG CS 2" SCH 80 BW ENDS	Gland Steam CONDENSER	2	1.8
102	STUD 2 NUTS M16X90	Gland Steam CONDENSER	8	2.048
103	CAF SHEET 3.0,4*1595.00*2000.00MM	Gland Steam CONDENSER	12.76	60.1
104	FLANGE SOW CS 6" CL 150 RAISED FACE	Gland Steam CONDENSER	2	15.6
105	STRAIGHT TEE CS 2" SCH 40 BUTT WELD ENDS	Gland Steam CONDENSER	2	3.6
106	GATE VALVE GL SEALED CS 2" CLI50 BW ENDS	Gland Steam CONDENSER	2	40
107	EJECTOR SILENCER (3"/6"-1500L)	Gland Steam CONDENSER	2	296.72
108	GSC ASSLY	Gland Steam CONDENSER	1	950
109	EJECTOR ASSLY FOR GSC.	Gland Steam CONDENSER	1	210

110	TEST RING		1	40
111	SLIDING PLATE		2	24.4
112	BOLT FDN M20X500	LOOSE ITEMS FOR ST OIL C	8	12.816
113	NUT HEX P M20-8	LOOSE ITEMS FOR ST OIL C	8	0.512
114	EYE BOLT CS M16 COL DIA 35 EYE ID 35 CP	LOOSE ITEMS FOR ST OIL C	4	2
115	NIPPLE CS 1" SCH 80 L=100 NPT MALE ENDS	LOOSE ITEMS FOR ST OIL C	6	4.2
116	GATE VLV CS(SA105)1" CL800 SCR NPT	LOOSE ITEMS FOR ST OIL C	6	21.78
117	NIPPLE CS 3/4" SCH80 L=100 NPT MALE ENDS	LOOSE ITEMS FOR ST OIL C	6	0.3
118	GLOBE VALVE CS 3/4" CL800 SCREWD NPT END	LOOSE ITEMS FOR ST OIL C	6	10.8
119	GATE VLV CS(A216WCB)6" CL150 FLNGD RF	LOOSE ITEMS FOR ST OIL C	2	180
120	GLV CS NB 6"-PRCL 150 FLNG RF ASMEB16.34	LOOSE ITEMS FOR ST OIL C	2	220
HEAT EXCHANGERS (TOTAL)				**153761**

BLOWER WITH VALVES AND SILENCER (FOR EACH UNIT)				
Sl. No	**Material Description**	**PGMA Description**	**Qty.**	**Net.Wt(KG)**
1	SKID MOUNTED AXIAL BLOWER PACKAGE (RSP)		1	51,000.00
2	MOTOR OPERATED BUTTERFLY VALVE DN1200	VALVES	1	2,500.00
3	BLOW OFF SILENCER 40" FLOW 286000 KG/H	VALVES	2	5,000.00
4	BLOW OFF SILENCER 24" FLOW 80000 KG/H	VALVES	1	2,000.00
5	DISCHARGE SILENCER	VALVES	1	3,000.00
6	EXPANSION BELLOW 32"SS (TP 304)-VAR02	VALVES	1	800
7	EXPANSION BELLOW 32"SS (TP 304)-VAR03	VALVES	1	1,500.00
8	EXPANSION BELLOW 32"SS (TP 304)-VAR04	VALVES	1	1,500.00
9	EXPANSION BELLOW 20"SS (TP 304)-VAR05	VALVES	1	800
10	AIR FILTER SILENCER,FLOW 220500NM3/HR	INTAKE AIR SUCTION FILTE	1	30,000.00
BLOWER WITH VALVES AND SILENCER (TOTAL)				**98,100.00**

BLOWER DRIVE TURBINE AND AUXILIARIES (FOR EACH UNIT)				
Sl. No	**Material Description**	**PGMA Description**	**Qty.**	**Net.Wt (KG)**
1	STEAM TURBINE ASSY		1	54,508.58
2	NAB M.S.W. GASKET SIZE 6"#600 GRPH		2	0.3
3	BED PLATE (EXHAUST HOOD) EXECUTION-I	BED PLATE UNDER EXHAUST HOOD	2	1,800.00
4	SEISMIC RING	BED PLATE UNDER EXHAUST HOOD	4	32.4
5	HEX.SOC.HEAD GRUB SCREW M64X2X150	BED PLATE UNDER EXHAUST HOOD	8	28.8
6	GUIDE OF EXHAUST HOOD 71	GUIDE OF EXHAUST HOOD	1	44
7	STEAM VENT	STEAM VENT FRONT	1	18.73
8	STEAM VENT REAR	STEAM VENT REAR	1	40.58
9	SPANNER 162X700X9		1	9.4
10	GOVERNING OIL CONSOLE	GOVERNING OIL CONSOLE	1	650
11	BG CONSOLE,2LPM,DIS.PR.100KG/SQ.CM(G)	BARRING GEAR	1	450
12	FORCING OFF SCREW M24X100	TURBINE ASSEMBLY	1	0.7
13	GUIDE PIN 40 X 1100	TURBINE ASSEMBLY	1	11
14	GUIDE PIN 50 X 1140	TURBINE ASSEMBLY	1	16.9
15	NUT HEX P M30-8	TURBINE ASSEMBLY	2	0.462
16	FORCING OFF SCREW M36X500	TURBINE ASSEMBLY	2	7.82
17	FORCING OFF SCREW M56 X 640	TURBINE ASSEMBLY	2	20.2
18	FORCING OFF SCREW M56 X 380	TURBINE ASSEMBLY	2	15.48
19	NEEDLE VAV-PR REDN,12 LPM,6MM	QUICK CLOSING NRV'S & VALVES(DD)	6	3
20	GLOBE VLV CS(SA105)1/2"CL1500 SW ENDS	DO	8	40
21	GLOBE VALVE CS 3/4" CL 800 SW ENDS	DO	3	5.4
22	BALL VLV CS NB2" CL150 FLRF	DO	1	7.4
23	GLOBE VALVE CS 1/2" CL 800 SW ENDS	DO	2	3.2
24	GLOBE VLV SS(F304)1" CL800 SOC WELDED	DO	4	13.6

25	GATE VALVE CS 1 1/2" CL 800 SW ENDS	DO	1	6.47
26	S.S SWING CHECK NRV - 3"-150-RF	DO	2	72
27	WAFER TYPE BUTTER-FLY VLV3"CL150RF CS	DO	2	8.2
28	GATE VALVE SS 1"CL800SW	DO	4	14.52
29	GLOBE VALVE SS 1 1/2" CL 800 SW ENDS	DO	2	13
30	GLOBE VALVE SS(F304)-1/2"-800# NPT	DO	1	1.6
31	GATE VLV SS(A351CF8)3" CL150 FLNGD RF	DO	1	41
32	GATE VLV SS(A351CF8)4" CL150 FLNGD RF	DO	2	120
33	GLOBE VALVE SS(F304)-1/2"-800# NPT	DO	4	6.4
34	GATE VLV SS(A351CF8)3" CL150 FLNGD RF	DO	1	41
35	GLOBE VALVE SS(F304)-1/2"-800# NPT	DO	6	9.6
36	GATE VLV SS(A351CF8)4" CL150 FLNGD RF	DO	1	60
37	SS SWING CHECK NON RETURN VALVE 4" 150RF	DO	1	45
38	S.S SWING CHECK NRV - 3"-150-RF	DO	1	36
39	GATE VLV SS(A351CF8)3" CL150 FLNGD RF	DO	1	41
40	GLOBE VALVE SS(F304)-1/2"-800# NPT	DO	2	3.2
41	GATE VALVE SS 1"CL800SW	DO	2	7.26
42	GLOBE VALVE SS(F304)-1/2"-800# NPT	DO	8	12.8
43	GATE VLV SS(A351CF8)2" CL150 FLNGD RF	DO	2	44
44	GATE VALVE SS 1"CL800SW	DO	2	7.26
45	S.S SWING CHECK NRV - 3"-150-RF	DO	1	36
46	GATE VLV SS(A351CF8)4" CL150 FLNGD RF	DO	2	120
47	GATE VALVE SS 1"CL800SW	DO	2	7.26
48	GLOBE VALVE SS(F304)-1/2"-800# NPT	DO	2	3.2
49	GATE VALVE CS 1 1/2" CL 800 SW ENDS	DO	1	6.47
50	GATE VLV CS(A216WCB)6" CL150 FLNGD RF	DO	1	90
51	GLOBE VLV MOP RD CS 1"CL800SW W/O INT ST	DO	1	75
52	GATE VALVE CS 1" CL 800 SOCKET WELD ENDS	DO	2	7.3
53	GLOBE VALVE CS 1/2" CL800 SCREWD NPT END	DO	1	1.6

54	GATE VLV CS(A216WCB)6" CL150 FLNGD RF	DO	2	180
55	GLOBE VLV MOP RDCS1 1/2"#800SW W/OINT ST	DO	1	90
56	GATE VALVE CS 1" CL 800 SOCKET WELD ENDS	DO	1	3.65
57	GLOBE VALVE CS 1/2" CL800 SCREWD NPT END	DO	3	4.8
58	GLOBE VALVE CS 1/2" CL800 SCREWD NPT END	DO	1	1.6
59	GLOBE VLV CS GRAPHOIL PKG 1/2" CL 800 SW	DO	5	8
60	GLOBE VLV MOP RD CS 1"CL800SW W/O INT ST	DO	5	375
61	GLOBE VALVE CS 1" CL 800 SW ENDS	DO	2	6.8
62	GATE VALVE CS 1" CL 800 SOCKET WELD ENDS	DO	4	14.6
63	GATE VLV CS(A216WCB)4" CL300 FLNGD RF	DO	1	84
64	GLOBE VALVE CS 1/2" CL800 SCREWD NPT END	DO	1	1.6
65	MOP GLOBE VALVE 2"SS#150 WITH INTEGRAL S	DO	2	50
66	CS GATE VALVE 4" #300 RF WITH GS	DO	1	100
67	'CS REG. GLOBE VALVE 3/4"" #800 SW	DO	1	27
68	GLOBE VALVE SS(A351CF8M)2"CL150 FLNGE RF	DO	6	180
69	GATE VLV SS(A351CF8)4" CL150 FLNGD RF	DO	2	120
70	SS SWING CHECK NON RETURN VALVE 4" 150RF	DO	2	90
71	SS GATE VLV 1 1/2"CL 800 SW ENDS	DO	1	6.5
72	SS PISTON LIFT NRV- 1 1/2"-800-SW ENDS	DO	1	10.4
73	CHECK VLV PL CS(SA105)3/4"CL800 SOC WELD	DO	2	3
74	TURBINE ENCLOSURE AS PER TC64327-76	TURBINE COVER	1	9,000.00
75	PIPE(SMLS)- 33.4X 4.55 CS SA106 GR B	JET SPRAY COOLER	42	135.954
76	STRAIGHT TEE CS 1" SCH 80 BUTT WELD ENDS	JET SPRAY COOLER	6	2.1
77	REDUCER PIECE 1"//3/8"	JET SPRAY COOLER	5	0.5
78	ELBOW LR 90DEG CS 1" SCH 80 BW ENDS	JET SPRAY COOLER	7	1.4
79	PIPE(SMLS)- 17.1X 2.31 CS SA106 GR B	JET SPRAY COOLER	15	12.645
80	DT PRL MALE STUD COUPLING 1/2",CS,G1B12G	JET SPRAY COOLER	5	0.05
81	FLANGE WELD NECK CS 1" SCH 80 CL 300 RF	JET SPRAY COOLER	8	15.2
82	WELD NECK FLANGE C25X33.4	JET SPRAY COOLER	2	3

83	THERMOCOUPLE ASSEMBLY (K TYPE)	JET SPRAY COOLER	1	51
84	SCRU HEX M16X55-8.8	JET SPRAY COOLER	16	1.856
85	NUT HEX P M16 P8 ELEGAL	JET SPRAY COOLER	16	0.528
86	GASKET NON ASBT M.S.W CL300,1"GRPHT FLLR	JET SPRAY COOLER	4	0.08
87	DIRT TRAP,Y-TYPE STRAINER,NB25	JET SPRAY COOLER	1	0.5
88	GLOBE VALVE CS 1" CL 800 SW ENDS	JET SPRAY COOLER	3	10.2
89	2/2 WAY SOL VLV,SS BODY, 24V DC,1"CL.300	JET SPRAY COOLER	1	20
90	SCRU HEX M16X55-8.8	JET SPRAY COOLER	8	0.928
91	NUT HEX P M16 P8 ELEGAL	JET SPRAY COOLER	8	0.264
92	GASKET NON ASBT M.S.W CL300,1"GRPHT FLLR	JET SPRAY COOLER	2	0.04
93	STIRRUP (UPPER HALF)	FRONT STIRRUP	1	29
94	STIRRUP (LOWER HALF)	FRONT STIRRUP	1	14.2
95	PLATE	FRONT STIRRUP	2	18.4
96	STUD M30/M20	FRONT STIRRUP	2	5.6
97	THREADED PIN DIA 40/M30	FRONT STIRRUP	2	0.3
98	STUD M27 X 105	FRONT STIRRUP	2	1.6
99	HEX NUT M30	FRONT STIRRUP	2	0.46
100	WASHER MCD 66 ST	FRONT STIRRUP	2	0.972
101	STIRRUP BODY (LOWER HALF)	REAR STIRRUP	1	21
102	PLATE	REAR STIRRUP	2	42.62
103	BODY(UPPER HALF)	REAR STIRRUP	1	38
104	STUD M36X1.5/M24	REAR STIRRUP	2	4.72
105	THREADED PIN DIA. 45/M30	REAR STIRRUP	2	2.36
106	SEAT CONICAL 42	REAR STIRRUP	2	0.472
107	WASHER SPHERICAL AS 37 IS4297	REAR STIRRUP	2	0.174
108	NUT M36 X 1.5	REAR STIRRUP	2	0.6
109	HEX.SCREW M52X165	REAR STIRRUP	4	17.88
110	BI-LINGUVAL RATING PL,(COND. ST-K TYPE)	RATING PLATES	1	0.516
111	COMPANY MNGRM PLT STNLS ST NOM.SIZE 200	RATING PLATES	2	0.504

112	SCRU SLT CHS A-4.8,M4X6	RATING PLATES	12	0.012
113	WASHER MCD 5.3-ST	RATING PLATES	12	0.012
114	BOLT HEATING EQUIPMENT (ELECTRICAL)	BOLT HEATING EQUIPMENT	1	900
115	FLANGE AND PIPE ASSY	BLOWING DOWN EQUIPMENT	1	157.5
116	PLATE	BLOWING DOWN EQUIPMENT	1	10.4
117	SPINDLE	BLOWING DOWN EQUIPMENT	1	3.38
118	WASHER	BLOWING DOWN EQUIPMENT	1	33.6
119	PLT CS 5,2*20.00*50.00MM	BLOWING DOWN EQUIPMENT	0.078	0.078
120	PACKING DIA.600XDIA.400X2	BLOWING DOWN EQUIPMENT	1	0.58
121	FOUNDATION BOLT M56X3250	FOUNDATION BOLTS	4	304.8
122	PLATE	FOUNDATION BOLTS	4	71.6
123	HEX.NUT M56	FOUNDATION BOLTS	8	12
124	SHT CS 4.0,4*30.00*300.00MM	FOUNDATION BOLTS	1.132	1.132
125	FOUNDATION BOLT M64X3200	FOUNDATION BOLTS	6	574.2
126	PLATE, D=68	FOUNDATION BOLTS	6	106.8
127	HEX.NUT M64	FOUNDATION BOLTS	12	23.76
128	CS FL40X6,6*150.00MM	FOUNDATION BOLTS	1.692	1.692
129	PACKING PLATE 160X100X28	PACKING PLATES	57	200.64
130	PACKING PLATE 160X100X10	PACKING PLATES	114	143.184
131	PACKING PLATE 160X100X2	PACKING PLATES	114	28.614
132	PACKING PLATE 160X100X1.6	PACKING PLATES	114	22.914
133	PACKING (SS) 160X100X0.5 MM	PACKING PLATES	57	3.705
134	LIFTING EQUIPMENT FOR ROTOR	LIFTING EQUIPMENT OF ROTOR	1	953
135	WIRE ROPE SLING GALV ROPEDIA32 SLING4.5M	LIFTING EQUIPMENT OF ROTOR	2	40
136	WIRE ROPE SLING GALV ROPEDIA32 SLING 2M	LIFTING EQUIPMENT OF ROTOR	2	24
137	DUPLEX LUBE OIL FILTER,1920 LPM	GENERAL ENGG SUB DELIVERIES	1	2,600.00

138	MESH ELEM SET,40MIC,SS(1920L D.FILTER)	GENERAL ENGG SUB DELIVERIES	1	24
139	FIBR ELEM SET,5 MIC,FOR 1920L D.FILTER	GENERAL ENGG SUB DELIVERIES	1	16
140	GASKET & O-RING SET FOR 1920L,DPLX FILTR	GENERAL ENGG SUB DELIVERIES	1	2
141	JO PUMP+AC MOT AS A CONS 30LPM,150KSC(G)	GENERAL ENGG SUB DELIVERIES	1	700
142	OIL ACCMULATOR SET 2X35L IN SINGLE STAND	GENERAL ENGG SUB DELIVERIES	1	250
143	CEN EXH FAN+AC MTR,0.11M3/S,415V,2900RPM	GENERAL ENGG SUB DELIVERIES	2	150
144	TRANSF OIL PUMP ASSY,50 LPM,3 KSC(G)	GENERAL ENGG SUB DELIVERIES	1	200
145	HOR LOP & EOP (CENTRIFUGAL) ASSEMBLY	GENERAL ENGG SUB DELIVERIES	1	3,000.00
146	COP+2 AC MTR CONSOL 250 LPM 19 KG/SQCM2	GENERAL ENGG SUB DELIVERIES	1	250
147	PILOT OP REL VLV,100LPM,3-315B,1"BSP-F	GENERAL ENGG SUB DELIVERIES	1	4
148	SIMPLEX FILTER 640 LPM	GENERAL ENGG SUB DELIVERIES	1	550
149	FILTER ELEM SET,5 MIC,SS,640L,SIMPLEX	GENERAL ENGG SUB DELIVERIES	1	4
150	FILTER ELEM SET,40 MIC,SS,640L,SIMPLEX	GENERAL ENGG SUB DELIVERIES	1	7
151	OIL PURIF UNT,FXD,1000LPH,DRG23080000040	GENERAL ENGG SUB DELIVERIES	1	1,250.00
152	GASKET &O-RING SET FOR 640L SIMPLX FILTR	GENERAL ENGG SUB DELIVERIES	1	1
153	CHARGING KIT FOR 35/55L ACCUMULATOR	GENERAL ENGG SUB DELIVERIES	1	10
154	LUBE OIL TANK SS (10000 LTS.)	LUBE OIL TANK (30901+30902+30915)	1	3,055.00
155	OIL SEPERATOR	OIL SEPERATOR	1	29.24
156	FLOAT OIL GAUGE	LEVEL GAUGE (MECHANICAL)	1	53
157	OVER HEAD OIL TANK 10000 LTS.	OVER HEAD OIL TANK	1	2,355.00
158	SCRU HEX M20X100-8.8	OVER HEAD OIL TANK	6	1.686
159	NUT HEX P M20 P8 ELEGAL	OVER HEAD OIL TANK	6	0.384
160	PIPE SS 33.4 X 3.4 A312 TP321	ARRGT OF MECH LEVEL GAUGE	12	30.768

161	ELBOW LR 90DEG SS 1" SCH 40S BW ENDS	ARRGT OF MECH LEVEL GAUGE	2	0.6
162	FLANGE SOW SS 1" CL 300 RAISED FACE	ARRGT OF MECH LEVEL GAUGE	2	3
163	CHNL CS 150,1*750.00MM	ARRGT OF MECH LEVEL GAUGE	12.6	12.6
164	SCR HEX GR.A M8X25-P 8.8 IS1364	ARRGT OF MECH LEVEL GAUGE	4	0.056
165	NUT HEX P M 8-8	ARRGT OF MECH LEVEL GAUGE	4	0.02
166	VERTICAL COLUMN	SUPPORT FOR OIL TANK	4	658.44
167	HORIZONTAL BEAM	SUPPORT FOR OIL TANK	2	351.16
168	SCRU HEX M36X100-8.8	SUPPORT FOR OIL TANK	8	9.2
169	NUT HEX P M36-8	SUPPORT FOR OIL TANK	8	3.168
170	BOLT FDN M20X400-4.6	SUPPORT FOR OIL TANK	16	18.72
171	NUT HEX P M20-8	SUPPORT FOR OIL TANK	16	1.024
172	DRAIN OIL TANK 10000 LTS.	DRAIN TANK/OIL COLLECTING TANK	1	2,388.00
173	SCRU HEX M20X100-8.8	DO	6	1.686
174	NUT HEX P M20 P8 ELEGAL	DO	6	0.384
175	CV AS PER TC65039-59	CONTROL VALVES	1	50
176	CV AS PER TC65039-60	CONTROL VALVES	1	50
177	SELF ACTUATED LO DOWNSTREAM PR CTRL VLV	CONTROL VALVES	1	50
178	THERMAL RELEIF VALVE TSV	CONTROL VALVES	2	20
179	CONTROL VALVE ASPER TC65037-07	CONTROL VALVES	1	30
180	PIPE SS 6 X 1.0 A312 TP321	PNEUMATIC ERECTION MATERIALS	100	12.6
181	NIPPLE SS 1/2"SCH80S L=100 NPT & BW ENDS	DO	6	0.9
182	AIR DIST POT+5TAKEOFF OF 1/4&1/2"NPTF IL	DO	3	30
183	UNION TUBE 1/4"	DO	15	1.5
184	CONNECTOR TUBE MALE 1/4X1/4 NPT	DO	30	3
185	NEEDLE VALVE 1/4" ANSI:316SS	DO	20	3.2
186	TEE TUBE UNION 1/4	DO	10	1
187	CONNECTOR TUBE MALE 1/2"X1/2"	DO	10	1

188	CONNECTOR TUBE FEMALE1/2"X1/2"	DO	10	1
189	LUBE OIL STRAINER 4"X4" SS	LUBE OIL SUCTION STRAINERS	2	100
190	L.O STRAINER 3"X2" SS	LUBE OIL SUCTION STRAINERS	1	28
191	PLT CS 10,2*1000.00MM	SUSPENSIONS & SUPPORTS (STOCK CATEGORY)	123.308	123.308
192	ANGLE CS 50X50X6,1*10000.00MM	DO	45	45
193	ANGLE CS 75X75X8,1*10000.00MM	DO	89	89
194	ANG CS 100X100X10,1*6000.00MM	DO	89.4	89.4
195	PIPE(SMLS)- 33.4X 4.55 CS SA106 GR B	DO	6	19.422
196	PIPE(SMLS) 114.3X 6.02 CS SA106 GR B	DO	6	96.45
197	PIPE(SMLS)168.3X 7.11 CS SA106 GR B	DO	6	169.584
198	U-BOLT GALVZD 12"	DO	8	21.68
199	U-BOLT GALVZD 6"	DO	15	15
200	U-BOLT GALVZD 4"	DO	10	8.4
201	U-BOLT GALVZD 3"	DO	15	6
202	U-BOLT GALVZD 2"	DO	25	8.3
203	U-BOLT GALVZD 1 1/2"	DO	10	1.6
204	U-BOLT GALVZD 1"	DO	25	5.625
205	U-BOLT GALVZD 3/4"	DO	25	2.5
206	U-BOLT 1/2"	DO	15	1.5
207	FORK 12	DO	6	4.314
208	SPRING HOUSING 63/150	DO	2	16
209	SPRING HOUSING 100/150	DO	2	16.32
210	SPRING HOUSING 160/150	DO	2	17.82
211	FORK 12	DO	70	50.33
212	L.H-EYE ROD DIA 12	DO	26	8.242
213	EYE ROD DIA 12	DO	66	34.32
214	TURN BUCKLE M12	DO	52	34.32
215	L.H-SUSPENSION BOLT DIA 12	DO	35	18.655

216	R.H-SUSPENSION BOLT DIA 12	DO	8	4.264
217	CLAMP AS WITH 3 BOLTS DIA.49	DO	1	0.706
218	CLAMP WITH THREE BOLTS DIA.61MM.	DO	2	3.638
219	CLAMP AS WITH 3 BOLTS DIA.89	DO	24	50.4
220	CLAMP AS WITH 3 BOLTS DIA.115	DO	7	29.106
221	CLAMP AS WITH 3 BOLTS DIA.169	DO	8	76.584
222	CLAMP AS WITH 3 BOLTS DIA.324	DO	5	128.15
223	CS Clamp + 3 Bolts Galvzd -12"	DO	1	25.63
224	CLAMP+3 BOLTS GALVZD-8"	DO	3	1.5
225	FORK M30X160 (VAR.N0.04)	DO	2	6.8
226	TURN BUCKLE M12	DO	25	16.5
227	TURN BUCKLE M24	DO	2	5.6
228	CLAMP+3 BOLTS GALVZD-2"	DO	2	3.638
229	CLAMP+3 BOLTS GALVZD-3"	DO	5	10.5
230	CLAMP+3 BOLTS GALVZD-6"	DO	18	172.314
231	CS Clamp + 3 Bolts Galvzd -10"	DO	2	46.56
232	PLT CS 10,2*1000000.00MM2	DO	157	157
233	L.H-EYE ROD DIA 12	DO	25	7.925
234	L.H-EYE ROD DIA 25	DO	2	3.08
235	EYE ROD DIA 12	DO	25	13
236	EYE ROD DIA 25	DO	2	5.01
237	VAR. SPRING SUPPORT (PEDESTAL)1600/150	DO	3	139.5
238	VARIABLE SPRING (PEDEWSTAL)2500/150	DO	2	110
239	VARIABL SPRING SUPPORT (PEDESTAL)25/100	DO	1	15
240	SPRING SUPPORT VAR (PEDESTAL)630/150	DO	2	46
241	SET OF CONST LOAD AND SPRING HANGER ASY	DO	1	4,200.00
BLOWER DRIVE TURBINE AND AUXILIARIES				**97,650**

TURBINE AND AUXILIARIES PIPING (INTEGRAL) (FOR EACH UNIT)				
Sl. No	**Material Description**	**PGMA Description**	**Qty.**	**Net.Wt (KG)**
1	BALANCE PISTON PIPING	BALANCE PISTON PIPING	1	205
2	MOP SUCTION PIPING ASSY(VLV.8"-150#RF)	MOP SUCTION PIPING ASSY	1	129
3	FLANGE SOW SS 8" CL 150 RAISED FACE	MOP SUCTION PIPING ASSY	1	12.5
4	NAB M.S.W. GASKET SIZE 8" #150 GRPH	MOP SUCTION PIPING ASSY	2	0.4
5	STUD 2 NUTS M20X250	MOP SUCTION PIPING ASSY	8	6.472
6	PIPE SS 17.1 X 1.8 A312 TP321	IMPULSE LINE ERECTION MATERIAL	1	0.692
7	TUBE SS 12.7 X 2.1	DO	450	251.55
8	TEE CS 1/2" CL 3000 SOCKET WELD ENDS	DO	40	11.2
9	COUPLING CS 1/2" CL 3000 SOC WELD ENDS	DO	50	5.65
10	COUPLING AS 1/2" CL 6000 SOC WELD ENDS	DO	10	2.27
11	PR GAGE VLV 3WAY 250KSC CS M20X1.5 R/R/L	DO	40	140
12	PR GAGE VLV 3WAY 250KSC SS M20X1.5 R/R/L	DO	30	105
13	GLOBE VLV CS(SA105)1/2"CL1500 SW ENDS	DO	35	175
14	NIPPLE CS 1/2" SCH80 L=100 NPT & BW ENDS	DO	35	7
15	NIPPLE SS 1/2"SCH80S L=100 NPT & BW ENDS	DO	43	6.45
16	CAP CS 1/2" CL 3000 NPT END	DO	35	8.05
17	PLUG HEX HD SS 1/2" NPT ENDS	DO	15	3.75
18	MFOLD 5VLV 1/2" CL3000 SS 1/2 NPT-F2V180	DO	13	10.4
19	NUT SLID PR GAG 640KSC CS M20X1.5D=16.5	DO	2	0.34
20	NIPPLE CS 20A PR GAGE NUTM20X1.5 640KSC	DO	2	0.07
21	WELDON ETN PCE SS PR GAGE 20X1.5L640KSC	DO	5	0.8
22	CONNECTOR TUBE MALE 1/2"X1/2"	DO	180	18
23	UNION TUBE 1/2"	DO	80	8
24	DT ST COUPLING,1/2",SS,G1A 16	DO	45	18
25	ADAPTER RDCG 1/2" NPT M20X1.5	DO	30	9

26	PRGG VLV 6000PSI SS 1/2"NPT-F	DO	35	26.25
27	TEE SS 1/2" CL 3000 SOCKET WELD ENDS	DO	10	2.8
28	NIPPLE AS 1/2" SCH80 L=100 NPT & BW ENDS	DO	15	4.5
29	CAP SS 1/2" CL 3000 NPT END	DO	10	1
30	GLOBE VALVE AS 1/2" CL 2500 SW ENDS	DO	10	50
31	AS COND CHAMBR,120KSC&545C,HYD TST290KSC	DO	15	375
32	SYPHON 21.3X3.73 BW CS	DO	20	100
33	DT PRL MALE STUD COUPLING 1/2",SS,G1B12G	GOV OIL PPG FOR ESV	2	1
34	WASHER SEALING 21X25X1.5	GOV OIL PPG FOR ESV	2	0.002
35	PIPE SS 17.1 X 1.8 A312 TP321	GOV OIL PPG FOR ESV	6	4.152
36	DT PRL MALE STUD COUPLING 1/2",SS,G1B12G	GOV OIL PPG FOR ESV	2	1
37	WASHER SEALING 21X25X1.5	GOV OIL PPG FOR ESV	2	0.002
38	PIPE SS 17.1 X 1.8 A312 TP321	GOV OIL PPG FOR ESV	18	12.456
39	DT ST COUPLING, 3/8",SS, G1A 12	GOV OIL PPG FOR ESV	2	0.24
40	DT PRL MALE STUD COUPLG 11/4",SS,G1B25G	GOV OIL PPG FOR ESV	1	0.25
41	WASHER SEALING 42X51X2	GOV OIL PPG FOR ESV	1	0.002
42	PIPE SS 33.4 X 2.8 A312 TP321	GOV OIL PPG FOR ESV	6	12.918
43	ELBOW LR 90DEG SS 1" SCH 40S BW ENDS	GOV OIL PPG FOR ESV	6	1.8
44	DT ST COUPLING,1",SS,G1A 25	GOV OIL PPG FOR ESV	1	0.1
45	DT PRL MALE STUD COUPLING 1",SS,G1B20G	GOV OIL PPG FOR ESV	2	0.5
46	WASHER SEALING 33X39X2	GOV OIL PPG FOR ESV	2	0.002
47	PIPE SS 33.4 X 2.8 A312 TP321	GOV OIL PPG FOR ESV	6	12.918
48	ELBOW LR 90DEG SS 1" SCH 40S BW ENDS	GOV OIL PPG FOR ESV	16	4.8
49	RDCR CONC 1"X3/4" SCH 40SX40S	GOV OIL PPG FOR ESV	12	3.6
50	DT ST COUPLING,1",SS,G1A 25	GOV OIL PPG FOR ESV	2	0.2
51	PIPE CLAMP SHELL TYPE 1"	GOV OIL PPG FOR ESV	6	1.2
52	PIPE CLAMP SHELL TYPE 3/4"	GOV OIL PPG FOR ESV	12	1.8
53	PIPE CLAMP SHELL TYPE 3/8"	GOV OIL PPG FOR ESV	12	2.4
54	ANGLE CS 50X50X6,1*50000.00MM	GOV OIL PPG FOR ESV	225	225

55	PIPE SS 33.4 X 2.8 A312 TP321	GOV OIL PPG FOR SERVO MOTOR	12	25.836
56	DT PRL MALE STUD COUPLING 3/4",SS,G1B16G	DO	2	0.24
57	WASHER SEALING 27X32X2	DO	2	0.002
58	RDCR CONC SS 1"X1/2" SCH 40SX40S BW ENDS	DO	1	0.16
59	PIPE SS 60.3 X 2.8 A312 TP321	DO	12	48.552
60	ELBOW LR 90DEG SS 2" SCH 10S BW ENDS	DO	4	5.2
61	METAL HOSE L1000 2" ASA150RF	DO	1	12
62	STUD 2 NUTS M16X90	DO	8	2.048
63	PIPE(SMLS) 88.9X 5.49 CS SA106 GR B	DO	12	135.516
64	ELBOW LR 90DEG CS 3" SCH 40 BW ENDS	DO	3	6.15
65	FLANGE SOW CS 3" CL 150 RAISED FACE	DO	2	8
66	METAL HOSE L1000 3"ASA150RF	DO	1	15.26
67	STUD 2 NUTS M16X90	DO	8	2.048
68	CLAMP+2 BOLTS GLVNZD,AS,SIZE: 2" VAR 32	DO	2	2.72
69	CLAMP+2 BOLTS GLVNZD,AS,SIZE: 3" VAR 33	DO	2	3.28
70	PIPE CLAMP SHELL TYPE 1"	DO	6	1.2
71	U-BOLT GALVZD 2"	DO	2	0.664
72	U-BOLT GALVZD 3"	DO	2	0.8
73	ANGLE CS 50X50X6,1*50000.00MM	DO	225	225
74	ANG CS 100X100X10,1*100000.00MM	DO	1,490.00	1,490.00
75	NIPPOLET SS CL 3000 1/2" NPT	LUBE OIL PIPING	1	0.3
76	FLANGE 1 1/2" SCH ANSI 300 WNRF SS	LUBE OIL PIPING	1	3
77	GASKET NON ASBT M.S.W CL150,1 1/2"GR FLR	LUBE OIL PIPING	1	0.04
78	STUD 2 NUTS M12X60	LUBE OIL PIPING	4	0.452
79	PIPE SS 48.3 X 3.7 A312 TP321	LUBE OIL PIPING	12	49.764
80	ELBOW 90DEG SS 1 1/2" CL 3000 SW ENDS	LUBE OIL PIPING	4	8.5
81	SS Rdcr 3 x 1 1/2" Sch 80Sx40S BW(WP321)	LUBE OIL PIPING	1	1.3
82	WN FLANGE SS 3" SCH 40S #150 RF	LUBE OIL PIPING	1	1
83	NAB M.S.W. GASKET SIZE 3" #150 PTFE	LUBE OIL PIPING	1	0.07

84	STUD 2 NUTS M16X110	LUBE OIL PIPING	4	1.148
85	PIPE(SMLS) 88.9X5.5 S.S SA312 GRTP 321	LUBE OIL PIPING	6	69.168
86	ELBOW LR 90DEG SS 3" SCH 40S BW ENDS	LUBE OIL PIPING	3	11.4
87	WN FLANGE SS 3" SCH 40S #150 RF	LUBE OIL PIPING	2	2
88	NAB M.S.W. GASKET SIZE 3" #150 PTFE	LUBE OIL PIPING	2	0.14
89	STUD 2 NUTS M16X110	LUBE OIL PIPING	8	2.296
90	RDCR CONC SS 3"X2" SCH 40SX40S BW ENDS	LUBE OIL PIPING	1	1
91	FLANGE 2" PR.CL.150# WNRF SCH 40S	LUBE OIL PIPING	1	10
92	NAB M.S.W. GASKET SIZE 2" #150 GRPH	LUBE OIL PIPING	1	0.05
93	STUD 2 NUTS M16X90	LUBE OIL PIPING	4	1.024
94	SS Elbow 90 Deg LR 10" Sch 10S (WP321)	LUBE OIL PIPING	4	80.4
95	SS Rdcr 12 x 10" Sch 10Sx10S BW(WP321)	LUBE OIL PIPING	1	15
96	FLANGE SOW SS 12" CL 150 RAISED FACE	LUBE OIL PIPING	1	27
97	NAB M.S.W. GASKET SIZE 12" #150 PTFE	LUBE OIL PIPING	1	0.35
98	STUD 2 NUTS M22X130	LUBE OIL PIPING	12	7.656
99	ELBOW LR 90DEG SS 4" SCH 40S BW ENDS	LUBE OIL PIPING	3	11.7
100	NIPPOLET SS CL 3000 1/2" NPT	LUBE OIL PIPING	1	0.3
101	STUB SLNT IMMER SS M33X2-F L=64 NB4"	LUBE OIL PIPING	1	1
102	NAB M.S.W. GASKET SIZE 4" #150 PTFE	LUBE OIL PIPING	2	0.16
103	STUD 2 NUTS M16X110	LUBE OIL PIPING	8	2.296
104	ELBOW LR 90DEG SS 2" SCH 40S BW ENDS	LUBE OIL PIPING	4	7.2
105	STRAIGHT TEE SS 2" SCH 40S BW ENDS	LUBE OIL PIPING	2	3.6
106	FLANGE 2" PR.CL.150# WNRF SCH 40S	LUBE OIL PIPING	8	80
107	NAB M.S.W. GASKET SIZE 2" #150 GRPH	LUBE OIL PIPING	8	0.4
108	STUD 2 NUTS M16X90	LUBE OIL PIPING	32	8.192
109	VERTICAL INSERT SS 1" SW CL 3000	LUBE OIL PIPING	2	0.8
110	PIPE SS 33.4 X 3.4 A312 TP321	LUBE OIL PIPING	2	5.128
111	PIPE SS 114.3 X 6.0 A312 TP321	LUBE OIL PIPING	12	195.972
112	ELBOW LR 90DEG SS 4" SCH 40S BW ENDS	LUBE OIL PIPING	6	23.4

113	STUB SLNT IMMER SS M33X2-F L=64 NB4"	LUBE OIL PIPING	2	2
114	NIPPOLET SS CL 3000 1/2" NPT	LUBE OIL PIPING	1	0.3
115	VERTICAL INSERT SS 1" SW CL 3000	LUBE OIL PIPING	2	0.8
116	PIPE SS 60.3 X 3.9 A312 TP321	LUBE OIL PIPING	6	33.168
117	ELBOW LR 90DEG SS 2" SCH 40S BW ENDS	LUBE OIL PIPING	4	7.2
118	NAB M.S.W. GASKET SIZE 4" #150 PTFE	LUBE OIL PIPING	6	0.48
119	STUD 2 NUTS M16X110	LUBE OIL PIPING	24	6.888
120	PIPE SS 60.3 X 3.9 A312 TP321	LUBE OIL PIPING	6	33.168
121	SS PIPE(SML)-A312TP321-OD 273X4.2 THK	LUBE OIL PIPING	12	336
122	PIPE SS 114.3 X 6.0 A312 TP321	LUBE OIL PIPING	6	97.986
123	PIPE SS 60.3 X 3.9 A312 TP321	LUBE OIL PIPING	6	33.168
124	ELBOW LR 90DEG SS 2" SCH 40S BW ENDS	LUBE OIL PIPING	4	7.2
125	STRAIGHT TEE SS 2" SCH 40S BW ENDS	LUBE OIL PIPING	2	3.6
126	FLANGE 2" PR.CL.150# WNRF SCH 40S	LUBE OIL PIPING	8	80
127	NAB M.S.W. GASKET SIZE 2" #150 GRPH	LUBE OIL PIPING	8	0.4
128	STUD 2 NUTS M16X90	LUBE OIL PIPING	32	8.192
129	VERTICAL INSERT SS 1" SW CL 3000	LUBE OIL PIPING	2	0.8
130	PIPE SS 33.4 X 3.4 A312 TP321	LUBE OIL PIPING	2	5.128
131	PIPE SS 114.3 X 6.0 A312 TP321	LUBE OIL PIPING	12	195.972
132	ELBOW LR 90DEG SS 4" SCH 40S BW ENDS	LUBE OIL PIPING	6	23.4
133	STUB SLNT IMMER SS M33X2-F L=64 NB4"	LUBE OIL PIPING	2	2
134	NIPPOLET SS CL 3000 1/2" NPT	LUBE OIL PIPING	1	0.3
135	VERTICAL INSERT SS 1" SW CL 3000	LUBE OIL PIPING	2	0.8
136	PIPE SS 60.3 X 3.9 A312 TP321	LUBE OIL PIPING	6	33.168
137	ELBOW LR 90DEG SS 2" SCH 40S BW ENDS	LUBE OIL PIPING	4	7.2
138	NAB M.S.W. GASKET SIZE 4" #150 PTFE	LUBE OIL PIPING	6	0.48
139	STUD 2 NUTS M16X110	LUBE OIL PIPING	24	6.888
140	WN FLANGE SS 3" SCH 40S #150 RF	LUBE OIL PIPING	2	2
141	NAB M.S.W. GASKET SIZE 3" #150 PTFE	LUBE OIL PIPING	2	0.14

142	STUD 2 NUTS M16X110	LUBE OIL PIPING	8	2.296
143	FLANGE 2" PR.CL.150# WNRF SCH 40S	LUBE OIL PIPING	2	20
144	NAB M.S.W. GASKET SIZE 2" #150 GRPH	LUBE OIL PIPING	2	0.1
145	STUD 2 NUTS M16X90	LUBE OIL PIPING	8	2.048
146	RDCR CONC SS 4"X3" SCH 40SX40S BW ENDS	LUBE OIL PIPING	2	3.2
147	NAB M.S.W. GASKET SIZE 4" #150 PTFE	LUBE OIL PIPING	1	0.08
148	STUD 2 NUTS M16X110	LUBE OIL PIPING	8	2.296
149	RDCR CONC SS 4"X3" SCH 40SX40S BW ENDS	LUBE OIL PIPING	1	1.6
150	PIPE(SMLS) 88.9X5.5 S.S SA312 GRTP 321	LUBE OIL PIPING	6	69.168
151	ELBOW LR 90DEG SS 3" SCH 40S BW ENDS	LUBE OIL PIPING	3	11.4
152	WN FLANGE SS 3" SCH 40S #150 RF	LUBE OIL PIPING	2	2
153	NAB M.S.W. GASKET SIZE 3" #150 PTFE	LUBE OIL PIPING	2	0.14
154	STUD 2 NUTS M16X110	LUBE OIL PIPING	8	2.296
155	VERTICAL INSERT SS 1/2" SW CL 3000	LUBE OIL PIPING	1	0.11
156	VERTICAL INSERT SS 3/4" SW CL 3000	LUBE OIL PIPING	1	0.32
157	STRAIGHT TEE SS 3" SCH 40S BW ENDS	LUBE OIL PIPING	1	3.8
158	PIPE(SMLS) 88.9X5.5 S.S SA312 GRTP 321	LUBE OIL PIPING	12	138.336
159	ELBOW LR 90DEG SS 3" SCH 40S BW ENDS	LUBE OIL PIPING	6	22.8
160	NIPPOLET SS CL 3000 1/2" NPT	LUBE OIL PIPING	3	0.9
161	STUB SLNT IMMER SS M33X2-F L=64 NB4"	LUBE OIL PIPING	1	1
162	SS PIPE(SML)-A312TP321-OD 273X4.2 THK	LUBE OIL PIPING	12	336
163	SS Elbow 90 Deg LR 10" Sch 10S (WP321)	LUBE OIL PIPING	4	80.4
164	SS RDCR 10X8 SCH 10S BW	LUBE OIL PIPING	1	7.3
165	PIPE SS 219.1 X 3.76 A312 TP321	LUBE OIL PIPING	6	122.094
166	ELBOW LR 90DEG SS 8" SCH 10S BW ENDS	LUBE OIL PIPING	3	33.9
167	VERTICAL INSERT SS 1" SW CL 3000	LUBE OIL PIPING	3	1.2
168	STUB SLNT IMMER SS M33X2-F L=64 NB4"	LUBE OIL PIPING	1	1
169	PIPE SS 219.1 X 3.76 A312 TP321	LUBE OIL PIPING	6	122.094
170	ELBOW LR 90DEG SS 8" SCH 10S BW ENDS	LUBE OIL PIPING	3	33.9

171	STUB SLNT IMMER SS M33X2-F L=64 NB4"	LUBE OIL PIPING	2	2
172	FLANGE 1 1/2" SCH ANSI 300 WNRF SS	LUBE OIL PIPING	3	9
173	NAB M.S.W. GASKET SIZE 1/2" #300 PTFE	LUBE OIL PIPING	3	0.03
174	STUD 2 NUTS M12X90	LUBE OIL PIPING	12	1.692
175	FLANGE, 1",A182 F321, #300, WNRF	LUBE OIL PIPING	1	1.5
176	NAB M.S.W. GASKET SIZE 1" #300 PTFE	LUBE OIL PIPING	1	0.02
177	STUD 2 NUTS M16X90	LUBE OIL PIPING	4	1.024
178	PIPE SS 21.3 X 3.7 A312 TP321	LUBE OIL PIPING	12	19.644
179	ELBOW 90DEG SS 1/2" CL 3000 SW ENDS	LUBE OIL PIPING	4	1.56
180	PIPE SS 33.4 X 3.4 A312 TP321	LUBE OIL PIPING	2	5.128
181	ELBOW 90DEG SS 1" SOC WELD ENDS CL 3000	LUBE OIL PIPING	2	1.98
182	PIPE SS 48.3 X 3.7 A312 TP321	LUBE OIL PIPING	6	24.882
183	ELBOW 90DEG SS 1 1/2" CL 3000 SW ENDS	LUBE OIL PIPING	4	8.5
184	NIPPOLET SS CL 3000 1/2" NPT	LUBE OIL PIPING	1	0.3
185	ORIFICE ADJ SS ND 1 1/2"	LUBE OIL PIPING	1	2
186	PIPE SS 48.3 X 3.7 A312 TP321	LUBE OIL PIPING	6	24.882
187	ELBOW 90DEG SS 1 1/2" CL 3000 SW ENDS	LUBE OIL PIPING	2	4.25
188	NIPPOLET SS CL 3000 1/2" NPT	LUBE OIL PIPING	1	0.3
189	ORIFICE ADJ SS ND 1 1/2"	LUBE OIL PIPING	1	2
190	PIPE SS 114.3 X 6.0 A312 TP321	LUBE OIL PIPING	6	97.986
191	ELBOW LR 90DEG SS 4" SCH 40S BW ENDS	LUBE OIL PIPING	4	15.6
192	FLOW GLASS RING (PMMA) FOR 4" CL 150 RF	LUBE OIL PIPING	1	0.52
193	NAB M.S.W. GASKET SIZE 4" #150 PTFE	LUBE OIL PIPING	2	0.16
194	STUD 2 NUTS M16X110	LUBE OIL PIPING	16	4.592
195	STUB SLNT IMMER SS M33X2-F L=64 NB4"	LUBE OIL PIPING	2	2
196	PIPE SS 48.3 X 3.7 A312 TP321	LUBE OIL PIPING	6	24.882
197	ELBOW 90DEG SS 1 1/2" CL 3000 SW ENDS	LUBE OIL PIPING	4	8.5
198	ORIFICE ADJ SS ND 1 1/2"	LUBE OIL PIPING	1	2
199	NIPPOLET SS CL 3000 1/2" NPT	LUBE OIL PIPING	1	0.3

200	NAB M.S.W. GASKET SIZE 6" #150 PTFE	LUBE OIL PIPING	4	0.6
201	STUD 2 NUTS M20X110	LUBE OIL PIPING	16	7.424
202	STUD 2 NUTS M20X150	LUBE OIL PIPING	16	8.8
203	FLOW GLASS RING (PMMA) FOR 6" CL 150 RF	LUBE OIL PIPING	1	0.836
204	STUB SLNT IMMER SS M33X2-F L=64 NB4"	LUBE OIL PIPING	1	1
205	PIPE SS 33.4 X 3.4 A312 TP321	LUBE OIL PIPING	6	15.384
206	ELBOW 90DEG SS 1" SOC WELD ENDS CL 3000	LUBE OIL PIPING	2	1.98
207	ORIFICE ADJ SS ND 1"	LUBE OIL PIPING	1	2
208	NIPPOLET SS CL 3000 1/2" NPT	LUBE OIL PIPING	1	0.3
209	PIPE(SMLS) 88.9X5.5 S.S SA312 GRTP 321	LUBE OIL PIPING	6	69.168
210	ELBOW LR 90DEG SS 3" SCH 40S BW ENDS	LUBE OIL PIPING	2	7.6
211	FLOW GLASS RING (PMMA) FOR 3" CL 150 RF	LUBE OIL PIPING	1	0.39
212	WN FLANGE SS 3" SCH 40S #150 RF	LUBE OIL PIPING	2	2
213	NAB M.S.W. GASKET SIZE 3" #150 PTFE	LUBE OIL PIPING	2	0.14
214	STUD 2 NUTS M16X150 ST	LUBE OIL PIPING	8	2.808
215	NAB M.S.W. GASKET SIZE 6" #150 PTFE	LUBE OIL PIPING	1	0.15
216	STUD 2 NUTS M20X110	LUBE OIL PIPING	8	3.712
217	NIPPOLET SS CL 3000 1/2" NPT	LUBE OIL PIPING	1	0.3
218	PIPE(SMLS) 168.3X7.1 S.S SA312 GRTP321	LUBE OIL PIPING	6	172.59
219	ELBOW LR 90DEG SS 6" SCH 40S BW ENDS	LUBE OIL PIPING	4	42
220	NIPPOLET SS CL 3000 1/2" NPT	LUBE OIL PIPING	2	0.6
221	PIPE(SMLS) 168.3X7.1 S.S SA312 GRTP321	LUBE OIL PIPING	6	172.59
222	ELBOW LR 90DEG SS 6" SCH 40S BW ENDS	LUBE OIL PIPING	4	42
223	PIPE(SMLS) 88.9X5.5 S.S SA312 GRTP 321	LUBE OIL PIPING	10	115.28
224	ELBOW LR 90DEG SS 3" SCH 40S BW ENDS	LUBE OIL PIPING	4	15.2
225	NAB M.S.W. GASKET SIZE 4" #150 PTFE	LUBE OIL PIPING	7	0.56
226	STUD 2 NUTS M16X110	LUBE OIL PIPING	28	8.036
227	PIPE SS 114.3 X 6.0 A312 TP321	LUBE OIL PIPING	8	130.648
228	ELBOW LR 90DEG SS 4" SCH 40S BW ENDS	LUBE OIL PIPING	5	19.5

229	STRAIGHT TEE SS 4" SCH 40S BW ENDS	LUBE OIL PIPING	2	12.2
230	SS VERTICAL INSERT 1" NPT CL 3000	LUBE OIL PIPING	2	0.8
231	PIPE SS 33.4 X 3.4 A312 TP321	LUBE OIL PIPING	20	51.28
232	ORIFICE PLATE SS 1" CL 300 RF	LUBE OIL PIPING	1	0.079
233	RDCR CONC SS 4"X3" SCH 40SX40S BW ENDS	LUBE OIL PIPING	1	1.6
234	NAB M.S.W. GASKET SIZE 4" #150 PTFE	LUBE OIL PIPING	3	0.24
235	STUD 2 NUTS M16X110	LUBE OIL PIPING	8	2.296
236	STUD 2 NUTS M20X150	LUBE OIL PIPING	16	8.8
237	PIPE SS 114.3 X 6.0 A312 TP321	LUBE OIL PIPING	10	163.31
238	ELBOW LR 90DEG SS 4" SCH 40S BW ENDS	LUBE OIL PIPING	5	19.5
239	FLOW GLASS RING (PMMA) FOR 4" CL 150 RF	LUBE OIL PIPING	1	0.52
240	PIPE(SMLS) 168.3X7.1 S.S SA312 GRTP321	LUBE OIL PIPING	6	172.59
241	ELBOW LR 90DEG SS 6" SCH 40S BW ENDS	LUBE OIL PIPING	4	42
242	BELLOW SS ND 1 1/2"	LUBE OIL PIPING	3	6.6
243	BELLOW SS ND 6"	LUBE OIL PIPING	1	7
244	STRAINER Y-TYPE SS NOM.SIZE 1 1/2"800SW	LUBE OIL PIPING	1	2
245	FLANGE, 4",A182 F321, #150, WNRF	LUBE OIL PIPING	21	115.5
246	FLANGE 6" SCH 10S ANSI 150 WNRF SS	LUBE OIL PIPING	5	39
247	WN FLANGE SS 3" SCH 40S #150 RF	LUBE OIL PIPING	2	2
248	NAB M.S.W. GASKET SIZE 3" #150 PTFE	LUBE OIL PIPING	2	0.14
249	STUD 2 NUTS M16X110	LUBE OIL PIPING	8	2.296
250	WN FLANGE SS 3" SCH 40S #150 RF	LUBE OIL PIPING	3	3
251	S.S FLANGE 1 1/2" #300WNRF SCH 40	LUBE OIL PIPING	1	3
252	NAB M.S.W. GASKET SIZE 3" #150 PTFE	LUBE OIL PIPING	3	0.21
253	NAB M.S.W. GASKET SIZE 1 1/2"#300 PTFE	LUBE OIL PIPING	1	0.035
254	NAB M.S.W. GASKET SIZE 4" #150 PTFE	LUBE OIL PIPING	2	0.16
255	STUD 2 NUTS M16X110	LUBE OIL PIPING	32	9.184
256	STUD 2 NUTS M12X80	LUBE OIL PIPING	4	0.528
257	RDCR CONC SS 4"X3" SCH 40SX40S BW ENDS	LUBE OIL PIPING	2	3.2

258	NIPPOLET SS CL 3000 1/2" NPT	LUBE OIL PIPING	10	3
259	FLANGE WELD NECK SS 3" SCH 10S CL 150 RF	LUBE OIL PIPING	1	4
260	FLANGE WELD NECK SS 3" SCH 10S CL 150 RF	LUBE OIL PIPING	2	8
261	FLANGE WELD NECK SS 3" SCH 10S CL 150 RF	LUBE OIL PIPING	2	8
262	FLANGE WELD NECK SS 3" SCH 10S CL 150 RF	LUBE OIL PIPING	2	8
263	FLANGE WELD NECK SS 3" SCH 10S CL 150 RF	LUBE OIL PIPING	2	8
264	FLANGE WELD NECK SS 3" SCH 10S CL 150 RF	LUBE OIL PIPING	2	8
265	FLANGE WELD NECK SS 3" SCH 10S CL 150 RF	LUBE OIL PIPING	3	12
266	FLANGE SOW SS 4" CL 150 RAISED FACE	LUBE OIL PIPING	2	11
267	NAB M.S.W. GASKET SIZE 1 1/2"#300 PTFE	OIL PURIFICATION PIPING	4	0.14
268	STUD 2 NUTS M20X90	OIL PURIFICATION PIPING	32	13.28
269	PIPE SS 48.3 X 3.7 A312 TP321	OIL PURIFICATION PIPING	12	49.764
270	ELBOW 90DEG SS 1 1/2" CL 3000 SW ENDS	OIL PURIFICATION PIPING	8	17
271	GATE VALVE CS 1 1/2" CL 800 SW ENDS	OIL PURIFICATION PIPING	1	6.47
272	FLANGE SOW SS 1 1/2" CL 300 RAISED FACE	OIL PURIFICATION PIPING	4	10.4
273	PIPE SS 33.4 X 3.4 A312 TP321	JACKING OIL PIPING	6	15.384
274	PIPE SS 26.7 X 3.9 A312 TP321	JACKING OIL PIPING	66	147.51
275	PIPE SS 21.3 X 3.7 A312 TP321	JACKING OIL PIPING	12	19.644
276	PIPE SS 17.1 X 3.2 A312 TP321	JACKING OIL PIPING	3	3.354
277	PIPE SS 13.7 X 2.2 A312 TP321	JACKING OIL PIPING	42	26.712
278	PIPE CS, HTS 10.2 X 2 S/L A106GRB	JACKING OIL PIPING	9	3.636
279	PIPE SS 10 X 2 A312 TP321	JACKING OIL PIPING	1	0.402
280	ELBOW 90DEG SS 3/4" CL 6000 SW ENDS	JACKING OIL PIPING	12	13.5
281	ELBOW 90DEG SS 3/4" CL 3000 SW ENDS	JACKING OIL PIPING	12	6.84
282	ELBOW 90DEG SS 1 1/2" CL 6000 SW ENDS	JACKING OIL PIPING	12	49.2
283	TEE SS 1" CL 3000 SOCKET WELD ENDS	JACKING OIL PIPING	2	1.13
284	TEE SS 3/4" CL 3000 SOCKET WELD ENDS	JACKING OIL PIPING	4	1.48
285	TEE SS 3/4" CL 6000 SOCKET WELD ENDS	JACKING OIL PIPING	5	4.3
286	TEE UNEQ SS 1/4"X1/2"X1/4" CL3000 SW END	JACKING OIL PIPING	2	0.56

287	SOCKET REDUCER SS 34.2/27.5	JACKING OIL PIPING	4	0.72
288	ELBOW 90DEG SS 1" SOC WELD ENDS CL 3000	JACKING OIL PIPING	5	4.95
289	SOCKET REDUCER SS 22/14	JACKING OIL PIPING	3	0.537
290	SOCKET REDUCER SS 27.5X22	JACKING OIL PIPING	5	5
291	ADAPTER SS NB 14X10.7	JACKING OIL PIPING	1	0.161
292	FLANGE SOW SS 2" CL 150 RAISED FACE	JACKING OIL PIPING	1	2.2
293	FLANGE SOW SS 1" CL 300 RAISED FACE	JACKING OIL PIPING	1	1.5
294	FLANGE SOW SS 3/4" CL 300 RAISED FACE	JACKING OIL PIPING	5	6.5
295	FLANGE 1" SCH 80 ANSI 1500 WNRJ AS	JACKING OIL PIPING	1	4
296	NAB M.S.W. GASKET 2" #150 PTFE FILLER	JACKING OIL PIPING	1	0.05
297	NAB M.S.W. GASKET SIZE 1" #300 PTFE	JACKING OIL PIPING	1	0.02
298	NAB M.S.W. GASKET SIZE 3/4" 300 PTFE	JACKING OIL PIPING	5	0.25
299	RJ GASKET SS RING NO:R16 PITCH DIA 50.80	JACKING OIL PIPING	1	0.13
300	SS SWTN M16X2X90	JACKING OIL PIPING	24	4.56
301	DT PRL MALE STUD COUPLG 1/4",SS,N3B 4G	JACKING OIL PIPING	1	0.12
302	DT PRL MALE STUD COUPLG 1",SS,G2B20G	JACKING OIL PIPING	2	0.6
303	WASHER SEALING 33X39X2	JACKING OIL PIPING	2	0.002
304	WASHER SEALING 13X19X1.5	JACKING OIL PIPING	1	0.001
305	TUBE END NRV,CS,OD14,NP400KG/CM2,NB1/4"	JACKING OIL PIPING	6	1.8
306	CS STRAINER-Y-TYPE-3/4"-800#-A105 3/4	JACKING OIL PIPING	1	1.6
307	WELDON ETN PCE SS PR GAGE 20X1.5L640KSC	JACKING OIL PIPING	7	1.12
308	PIPE CLAMP SHELL TYPE 1"	JACKING OIL PIPING	5	1
309	PIPE CLAMP SHELL TYPE 3/4"	JACKING OIL PIPING	18	2.7
310	PIPE CLAMP SHELL TYPE 1/2" AR NO.4	JACKING OIL PIPING	2	0.26
311	PIPE CLAMP SHELL TYPE 1/4"	JACKING OIL PIPING	10	1.2
312	PIPE CLAMP SHELL TYPE 1/8"	JACKING OIL PIPING	2	0.2
313	ANGLE CS 50X50X6,1*15000.00MM	JACKING OIL PIPING	67.5	67.5
314	VERTICAL INSERT SS 1" SW CL 3000	JACKING OIL PIPING	2	0.8
315	VERTICAL INSERT SS 3/4" SW CL 3000	JACKING OIL PIPING	3	0.96

316	PIPE SS 60.3 X 2.8 A312 TP321	GOVERNING OIL PIPING	6	24.276
317	ELBOW LR 90DEG SS 2" SCH 10S BW ENDS	GOVERNING OIL PIPING	7	9.1
318	VERTICAL INSERT SS 1/2" SW CL 3000	GOVERNING OIL PIPING	2	0.22
319	FLANGE SOW CS 2" CL 150 RAISED FACE	GOVERNING OIL PIPING	1	2.2
320	NAB M.S.W. GASKET 2" #150 PTFE FILLER	GOVERNING OIL PIPING	2	0.1
321	STUD 2 NUTS M16X90	GOVERNING OIL PIPING	16	4.096
322	BALL VLV CS NB2" CL150 FLRF	GOVERNING OIL PIPING	1	7.4
323	PIPE(SMLS) 88.9X3.05 S.S SA312 GRTP321	GOVERNING OIL PIPING	6	39.486
324	STRAIGHT TEE SS 2" SCH 10S BW ENDS	GOVERNING OIL PIPING	1	1.3
325	GLOBE VALVE CS 1/2" CL 800 SW ENDS	GOVERNING OIL PIPING	2	3.2
326	RDCR CONC SS 3"X2" SCH 10SX10S BW ENDS	GOVERNING OIL PIPING	1	0.42
327	FLANGE WELD NECK SS 3" SCH 10S CL 150 RF	GOVERNING OIL PIPING	1	4
328	NAB M.S.W. GASKET SIZE 3" #150 PTFE	GOVERNING OIL PIPING	1	0.07
329	VERTICAL INSERT SS 1" SW CL 3000	GOVERNING OIL PIPING	1	0.4
330	DT ST COUPLING, 3/8",SS, G1A 12	GOVERNING OIL PIPING	1	0.12
331	PIPE(SMLS) 21.3X2.1 S.S SA312 GRTP321	GOVERNING OIL PIPING	6	6.078
332	ELBOW LR 90DEG SS 3" SCH 10S BW ENDS	GOVERNING OIL PIPING	1	3.1
333	RDCR CONC SS 2"X1 1/2"SCH80SX80S BW ENDS	GOVERNING OIL PIPING	1	0.8
334	PIPE SS 33.4 X 3.4 A312 TP321	PIPES FOR EQPT MOUNTED INSTR	6	15.384
335	PIPE SS 60.3 X 3.9 A312 TP321	DO	6	33.168
336	ELBOW LR 90DEG SS 1" SCH 40S BW ENDS	DO	6	1.8
337	ELBOW LR 90DEG SS 2" SCH 40S BW ENDS	DO	6	10.8
338	NAB M.S.W. GASKET SIZE 1" #300 PTFE	DO	10	0.2
339	NAB M.S.W. GASKET 2" #150 PTFE FILLER	DO	24	1.2
340	STUD 2 NUTS M16X90	DO	136	34.816
341	FLANGE SOW SS 1" CL 300 RAISED FACE	DO	10	15
342	FLANGE SOW SS 2" CL 150 RAISED FACE	DO	24	52.8
343	PIPE SS 26.7 X 3.9 A312 TP321	LO COOLER & FILTER VENT PIPING	6	13.41

344	ELBOW 90DEG SS 3/4" CL 3000 SW ENDS	DO	3	1.71
345	FLANGE SOW SS 3/4" CL 300 RAISED FACE	DO	1	1.3
346	NAB M.S.W. GASKET SIZE 3/4" 300 PTFE	DO	1	0.05
347	STUD 2 NUTS M16X90	DO	4	1.024
348	PIPE SS 33.4 X 4.5 A312 TP321	DO	6	19.614
349	ELBOW 90DEG SS 1" SOC WELD ENDS CL 3000	DO	3	2.97
350	TEE SS 1" CL 3000 SOCKET WELD ENDS	DO	1	0.565
351	FLANGE, 1",A182 F321, #300, WNRF	DO	6	9
352	NAB M.S.W. GASKET SIZE 1" #300 PTFE	DO	6	0.12
353	STUD 2 NUTS M16X90	DO	20	5.12
354	STUD 2 NUTS M16X130	DO	4	1.312
355	ORIFICE PLATE 3/4" CL 300 RF	DO	2	0.322
356	ORIFICE PLATE SS 1" CL 300 RF	DO	1	0.079
357	VERTICAL INSERT 1" NPT CL 3000	DO	1	0.4
358	HALF COUPLING SS 1" CL 3000 NPT ENDS	DO	2	0.42
359	WASHER SEALING 21X27X1.5	DO	2	0.002
360	SOCKET REDUCER SS 22/14	DO	2	0.358
361	CONC RDCR, 1/1.5",A182 F321 #3000, SW	DO	2	0.518
362	PIPE SS 33.4 X 4.5 A312 TP321	DO	6	19.614
363	ELBOW 90DEG SS 1" SOC WELD ENDS CL 3000	DO	3	2.97
364	TEE SS 1" CL 3000 SOCKET WELD ENDS	DO	1	0.565
365	FLANGE, 1",A182 F321, #300, WNRF	DO	6	9
366	NAB M.S.W. GASKET SIZE 1" #300 PTFE	DO	6	0.12
367	STUD 2 NUTS M16X90	DO	20	5.12
368	STUD 2 NUTS M16X130	DO	4	1.312
369	ORIFICE PLATE 3/4" CL 300 RF	DO	2	0.322
370	ORIFICE PLATE SS 1" CL 300 RF	DO	1	0.079
371	VERTICAL INSERT 1" NPT CL 3000	DO	1	0.4
372	HALF COUPLING SS 1" CL 3000 NPT ENDS	DO	2	0.42

373	WASHER SEALING 21X27X1.5	DO	2	0.002
374	SOCKET REDUCER SS 22/14	DO	2	0.358
375	CONC RDCR, 1/1.5",A182 F321 #3000, SW	DO	2	0.518
376	PIPE(SMLS) 88.9X5.5 S.S SA312 GRTP 321	OIL VAPOUR FAN PIPING	24	276.672
377	ELBOW LR 90DEG SS 3" SCH 40S BW ENDS	OIL VAPOUR FAN PIPING	8	30.4
378	STRAIGHT TEE SS 3" SCH 40S BW ENDS	OIL VAPOUR FAN PIPING	2	7.6
379	FLANGE SOW SS 3" CL 150 RAISED FACE	OIL VAPOUR FAN PIPING	14	56
380	NAB M.S.W. GASKET SIZE 3" #150 GRPH	OIL VAPOUR FAN PIPING	14	0.98
381	STUD 2 NUTS M16X110	OIL VAPOUR FAN PIPING	56	16.072
382	RDCR CONC 6"X3"SCH 40X40	GLAND STEAM PIPING	1	4
383	RDCR CONC CS 3"X1 1/2"SCH40X80 BW ENDS	GLAND STEAM PIPING	1	1
384	PIPE(SMLS)168.3X 7.11 CS SA106 GR B	GLAND STEAM PIPING	12	339.168
385	ELBOW LR 90DEG CS 6" SCH 40 BW ENDS	GLAND STEAM PIPING	4	42
386	NIPPOLET CS CL 3000 1" NPT	GLAND STEAM PIPING	1	1.5
387	VERTICAL INSERT CS 1" SW CL 3000	GLAND STEAM PIPING	1	0.4
388	PIPE(SMLS)168.3X 7.11 CS SA106 GR B	GLAND STEAM PIPING	12	339.168
389	ELBOW LR 90DEG CS 6" SCH 40 BW ENDS	GLAND STEAM PIPING	4	42
390	VERTICAL INSERT CS 1 1/2" SW CL 3000	GLAND STEAM PIPING	2	0.6
391	FLANGE WELD NECK CS 6" SCH 40 CL 150 RF	GLAND STEAM PIPING	4	44
392	NAB M.S.W. GASKET SIZE 6" #150 GRPH	GLAND STEAM PIPING	4	0.6
393	STUD 2 NUTS M20X110	GLAND STEAM PIPING	32	14.848
394	NIPPOLET CS CL 3000 1" NPT	GLAND STEAM PIPING	1	1.5
395	FLANGE1 1/2"WELD NECK CS SCH 80 CL300 RF	GLAND STEAM PIPING	2	6.6
396	NON ASB.MSW GASKET11/2"#300 GRAPH.FILLER	GLAND STEAM PIPING	2	0.1
397	STUD 2 NUTS M20X90	GLAND STEAM PIPING	8	3.32
398	RDCR CONC CS 3"X1 1/2"SCH40X80 BW ENDS	GLAND STEAM PIPING	2	2
399	RDCR CONC 6"X3"SCH 40X40	GLAND STEAM PIPING	2	8
400	NIPPOLET CS CL 3000 1/2" NPT	GLAND STEAM PIPING	3	1.2
401	STUB SLNT IMMER CS SCRW M33X2-F L=64 250	GLAND STEAM PIPING	2	0.8

402	RDCR CONC 6"X4" SCH40X40	GLAND STEAM PIPING	1	4
403	PIPE(SMLS)168.3X 7.11 CS SA106 GR B	GLAND STEAM PIPING	6	169.584
404	ELBOW LR 90DEG CS 6" SCH 40 BW ENDS	GLAND STEAM PIPING	2	21
405	PIPE(SMLS) 114.3X 6.02 CS SA106 GR B	GLAND STEAM PIPING	6	96.45
406	ELBOW LR 90DEG CS 4" SCH 40 BW ENDS	GLAND STEAM PIPING	2	7.8
407	PIPE(SMLS) 114.3X 6.02 CS SA106 GR B	GLAND STEAM PIPING	6	96.45
408	ELBOW LR 90DEG CS 4" SCH 40 BW ENDS	GLAND STEAM PIPING	2	7.8
409	RDCR CONC 6"X4" SCH40X40	GLAND STEAM PIPING	1	4
410	NIPPOLET CS CL 3000 1/2" NPT	GLAND STEAM PIPING	5	2
411	STUB SLNT IMMER CS SCRW M33X2-F L=64 250	GLAND STEAM PIPING	2	0.8
412	PIPE(SMLS) 60.3X 5.54 CS SA106 GR B	GL STEAM TO GSC & EXHAUST PIPING	12	89.784
413	ELBOW LR 90DEG CS 2" SCH 80 BW ENDS	DO	4	3.6
414	RDCR CONC 4"X2"SCH 80X80	DO	1	2.2
415	PIPE(SMLS) 88.9X 5.49 CS SA106 GR B	DO	12	135.516
416	ELBOW LR 90DEG CS 3" SCH 40 BW ENDS	DO	3	6.15
417	PIPE(SMLS) 114.3X 6.02 CS SA106 GR B	DO	12	192.9
418	ELBOW LR 90DEG CS 4" SCH 40 BW ENDS	DO	5	19.5
419	STRAIGHT TEE CS 4" SCH 40 BUTT WELD ENDS	DO	2	12.2
420	NIPPOLET CS CL 3000 1" NPT	DO	4	6
421	VERTICAL INSERT CS 1" SW CL 3000	DO	1	0.4
422	PIPE(SMLS)- 33.4X 4.55 CS SA106 GR B	DO	6	19.422
423	ELBOW 90DEG CS 1" SOC WELD ENDS CL 3000	DO	3	2.97
424	NIPPOLET CS CL 3000 1/2" NPT	DO	1	0.4
425	STUB SLNT IMMER CS SCRW M33X2-F L=64 250	DO	1	0.4
426	PIPE(SMLS)- 48.3X 5.08 CS SA106 GR B	AUX ST SUP PIPING INCL HEADER	12	64.98
427	ELBOW 90DEG CS 1 1/2" CL 3000 SW ENDS	DO	4	8.5
428	SOCKET REDUCER	DO	1	0.1
429	FLANGE WELD NECK CS 1" SCH 80 CL 300 RF	DO	6	11.4

430	NON ASB.MSW GASKET 1" CL300 GRAPH.FILLER	DO	6	0.12
431	STUD 2 NUTS M16X90	DO	24	6.144
432	ORIFICE PLATE SS 1" CL 300 RF	DO	1	0.079
433	NIPPOLET CS CL 3000 1/2" NPT	DO	1	0.4
434	NIPPOLET CS CL 3000 1" NPT	DO	1	1.5
435	STUB SLNT IMMER CS SCRW M33X2-F L=64 250	DO	1	0.4
436	VERTICAL INSERT CS 1" SW CL 3000	DO	1	0.4
437	PIPE(SMLS)- 33.4X 4.55 CS SA106 GR B	DO	6	19.422
438	ELBOW 90DEG CS 1" SOC WELD ENDS CL 3000	DO	2	1.98
439	PIPE(SMLS) 60.3X 5.54 CS SA106 GR B	DO	12	89.784
440	ELBOW LR 90DEG CS 2" SCH 80 BW ENDS	DO	4	3.6
441	PIPE(SMLS)- 21.3 X3.73 CS SA106 GR B	VALVES GLANDS SEALING PIPING	12	19.392
442	PIPE CS, HTS 14 X 2 S/L A106GRB	DO	6	3.552
443	TEE RED CS 1/2"X 1/4" CL 3000 SW ENDS	DO	2	0.56
444	GLOBE VALVE REG CS NB 1/4" CL800 SW ENDS	DO	2	3.2
445	DT PAR MALE STU COU,CS,G3/8",DSGN N2B 8G	DO	2	0.2
446	WASHER SEALING 17X22X1.5	DO	2	0.002
447	U-BOLT 1/2"	DO	10	1
448	ANGLE CS 50X50X6,1*10000.00MM	DO	135	135
449	PIPE(SMLS)168.3X 7.11 CS SA106 GR B	TURBINE DRAINS PIPING	2	56.528
450	ELBOW LR 90DEG CS 6" SCH 40 BW ENDS	TURBINE DRAINS PIPING	2	21
451	VERTICAL INSERT CS 1" SW CL 3000	TURBINE DRAINS PIPING	6	2.4
452	PIPE(SMLS)- 21.3 X3.73 CS SA106 GR B	TURBINE DRAINS PIPING	18	29.088
453	ELBOW 90DEG CS 1/2" CL 3000 SW ENDS	TURBINE DRAINS PIPING	4	1.56
454	DT PRL MALE STUD COUPLG 11/4",CS,G1B25G	TURBINE DRAINS PIPING	1	1.2
455	DT PRL MALE STUD COUPLING 1",CS,G1B20G	TURBINE DRAINS PIPING	1	0.34
456	DT PARALLEL MALE STUD COUPLING,	TURBINE DRAINS PIPING	1	0.2
457	WASHER SEALING 33X39X2	TURBINE DRAINS PIPING	2	0.002
458	WASHER SEALING 42X51X2	TURBINE DRAINS PIPING	2	0.004

459	WASHER SEALING 21X25X1.5	TURBINE DRAINS PIPING	2	0.002
460	WASHER SEALING 27X32X2	TURBINE DRAINS PIPING	2	0.002
461	RDCR CONC CS 1"X1/2"SCH 80X80 BW ENDS	TURBINE DRAINS PIPING	1	0.25
462	PLT AS 12 HIGH YS	TURBINE DRAINS PIPING	1	1
463	SOCKET REDUCER SS 22/17.7	TURBINE DRAINS PIPING	1	0.235
464	RDCR CONC CS 1"X3/4" SCH 80X80 BW ENDS	TURBINE DRAINS PIPING	1	0.16
465	PIPE CS, HTS 10.2 X 2 S/L A106GRB	TURBINE DRAINS PIPING	1	0.404
466	SOCKET REDUCER SS 17.7/10.7	TURBINE DRAINS PIPING	3	0.459
467	SOCKET REDUCER,CS,SOCKET DIA 22/17.7	TURBINE DRAINS PIPING	3	0.459
468	PIPE(SMLS)- 21.3 X3.73 CS SA106 GR B	TURBINE DRAINS PIPING	24	38.784
469	PIPE(SMLS)- 33.4X 4.55 CS SA106 GR B	TURBINE DRAINS PIPING	12	38.844
470	ELBOW 90DEG CS 1" SOC WELD ENDS CL 3000	TURBINE DRAINS PIPING	4	3.96
471	TEE CS 1" CL 6000 SOCKET WELD ENDS	TURBINE DRAINS PIPING	1	1.45
472	FLANGE SOW CS 1" CL 300 RAISED FACE	TURBINE DRAINS PIPING	1	1.5
473	NAB M.S.W. GASKET SIZE 1" #300 PTFE	TURBINE DRAINS PIPING	1	0.02
474	STUD 2 NUTS M16X110	TURBINE DRAINS PIPING	4	1.148
475	ORIFICE PLATE SS 1" CL 300 RF	TURBINE DRAINS PIPING	1	0.079
476	PIPE(SMLS)- 33.4X 4.55 CS SA106 GR B	TURBINE DRAINS PIPING	12	38.844
477	ELBOW 90DEG CS 1" SOC WELD ENDS CL 3000	TURBINE DRAINS PIPING	8	7.92
478	U-BOLT GALVZD 1"	TURBINE DRAINS PIPING	20	4.5
479	U-BOLT 1/2"	TURBINE DRAINS PIPING	10	1
480	ANGLE CS 50X50X6,1*30000.00MM	TURBINE DRAINS PIPING	300	300
481	FORK	TURBINE DRAINS PIPING	10	7.19
482	L.H-SUSPENSION BOLT DIA 12	TURBINE DRAINS PIPING	10	5.33
483	L.H-EYE ROD DIA 12	TURBINE DRAINS PIPING	6	1.902
484	R.H-SUSPENSION BOLT DIA 12	TURBINE DRAINS PIPING	6	3.198
485	EYE ROD DIA 12	TURBINE DRAINS PIPING	4	2.08
486	TURN BUCKLE M12	TURBINE DRAINS PIPING	10	6.6
487	CLAMP AS WITH 3 BOLTS DIA.49	TURBINE DRAINS PIPING	10	7.06

488	SPRING HOUSING 63/150	TURBINE DRAINS PIPING	4	32
489	DT PRL MALE STUD COUPLING 1/2",SS,G1B12G	TURBINE DRAINS PIPING	1	0.5
490	PIPE(SMLS)- 21.3 X3.73 CS SA106 GR B	ADDL. PPG ITEMS	6	9.696
491	PIPE(SMLS)- 33.4X 4.55 CS SA106 GR B	ADDL. PPG ITEMS	6	19.422
492	PIPE(SMLS)- 48.3X 5.08 CS SA106 GR B	ADDL. PPG ITEMS	18	97.47
493	PIPE(SMLS) 60.3X 5.54 CS SA106 GR B	ADDL. PPG ITEMS	30	224.46
494	PIPE(SMLS) 114.3X 6.02 CS SA106 GR B	ADDL. PPG ITEMS	60	964.5
495	PIPE(SMLS)168.3X 7.11 CS SA106 GR B	ADDL. PPG ITEMS	84	2,374.18
496	ELBOW 90DEG CS 1" SOC WELD ENDS CL 3000	ADDL. PPG ITEMS	6	5.94
497	ELBOW 90DEG CS 1 1/2" CL 3000 SW ENDS	ADDL. PPG ITEMS	10	21.25
498	ELBOW LR 90DEG CS 4" SCH 40 BW ENDS	ADDL. PPG ITEMS	10	39
499	ELBOW LR 90DEG CS 6" SCH 40 BW ENDS	ADDL. PPG ITEMS	15	157.5
500	TEE CS 1 1/2" CL 3000 SOCKET WELD ENDS	ADDL. PPG ITEMS	3	3.84
501	CAP CS 6" SCH 40 BW	ADDL. PPG ITEMS	1	3.5
502	SOCKET REDUCER,CS, SOCKET DIA 34.2/22	ADDL. PPG ITEMS	2	0.518
503	SOCKET REDUCER,CS, SOCKET DIA 48.8/34.2	ADDL. PPG ITEMS	5	2
504	RDCR CONC CS 2"X1 1/2"SCH 80X80 BW ENDS	ADDL. PPG ITEMS	2	1.12
505	VERTICAL INSERT CS 1/2" SW CL 3000	ADDL. PPG ITEMS	5	0.55
506	VERTICAL INSERT CS 1" SW CL 3000	ADDL. PPG ITEMS	4	1.6
507	FLANGE WELD NECK CS 3" SCH 40 CL 300 RF	ADDL. PPG ITEMS	2	14.8
508	FLANGE WELD NECK CS 6" SCH 40 CL 150 RF	ADDL. PPG ITEMS	2	22
509	MSW GASKET-1"-600#GRAPHITE FILLER	ADDL. PPG ITEMS	4	0.08
510	NAB M.S.W. GASKET SIZE 3"#600 GRPH	ADDL. PPG ITEMS	2	0.14
511	NAB M.S.W. GASKET SIZE 6" #150 GRPH	ADDL. PPG ITEMS	2	0.3
512	STUD 2 NUTS M16X90	ADDL. PPG ITEMS	16	4.096
513	STUD 2 NUTS M20X90	ADDL. PPG ITEMS	16	6.64
514	STUD 2 NUTS M20X110	ADDL. PPG ITEMS	40	18.56
515	NIPPLE CS 1"X100 SCH80 NPT BW	ADDL. PPG ITEMS	6	2.4
516	CAP CS 1" CL 3000 NPT END	ADDL. PPG ITEMS	6	3.6

517	NIPPLE CS 1"X100 SCH160 NPT BW	ADDL. PPG ITEMS	1	0.42
518	CAP CS 1" CL 6000 NPT END	ADDL. PPG ITEMS	1	0.73
TURBINE AND AUXILIARIES PIPING (INTEGRAL) (TOTAL)				**16,404**

BLOWER INTERCONNECTION PIPING (FOR EACH UNIT)				
Sl. No	**Material Description**	**PGMA Description**	**Qty.**	**Net.Wt (KG)**
1	PIPE CS, HTS 711.2 X9.53 EFSW A672GRB60	PG INTERCONNECTING PIP	6.9	
2	PIPE(EFSW) 610X9.53 CS SA672 GRB60 CL22	PG INTERCONNECTING PIP	12	1,693.50
3	PIPE(EFSW) 508X9.53 CS SA672 GRB60 CL22	PG INTERCONNECTING PIP	18	2,108.74
4	LR ELBOW 90 DEG, CS, 24" SCH 20 BW ENDS	PG INTERCONNECTING PIP	3	609
5	LR ELBOW 90 DEG, CS, 20" SCH 20 BW ENDS	PG INTERCONNECTING PIP	4	560
6	CONC. REDUCER 24"X16"SCH 20X 20 BW ENDS	PG INTERCONNECTING PIP	1	70
7	CS FLANGE 24" #150 SORF	PG INTERCONNECTING PIP	4	384
8	FLANGE, 16",A105, #150, WNRF	PG INTERCONNECTING PIP	2	116
9	NAB MSW GASKET 24"" #150 RF GRAPHITE	PG INTERCONNECTING PIP	4	2
10	NAB M.S.W. GASKET SIZE 16" #150 GRPH	PG INTERCONNECTING PIP	2	0.9
11	STUD 2 NUTS M33X3X200	PG INTERCONNECTING PIP	80	165.76
12	CS PIPE(EFSW)- OD965X9.53ASTM A672GR.B6	PG INTERCONNECTING PIP	31.5	6,750.00
13	EQUAL TEE 40" SCH STD CS (SA234GR WPB-W)	PG INTERCONNECTING PIP	1	250
14	NAB M.S.W. GASKET SIZE 14" #150 PTFE	PG INTERCONNECTING PIP	1	0.4
15	STUD 2 NUTS M27X3X150	PG INTERCONNECTING PIP	44	47.388
16	CONC. REDUCER 20"X16"SCH20X20 BW ENDS	PG INTERCONNECTING PIP	1	62
17	NON ASBESTOS MSW GASKET 32" PR.CL.150#	PG INTERCONNECTING PIP	1	1
18	STUD 2 NUTS M39X3X275	PG INTERCONNECTING PIP	28	107.492
19	PIPE SS 48.3 X 3.7 A312 TP321	PG INTERCONNECTING PIP	6	24.882
20	PIPE SS 26.7 X 3.9 A312 TP321	PG INTERCONNECTING PIP	6	13.41

21	PIPE SS 60.3 X 2.8 A312 TP321	PG INTERCONNECTING PIP	36	145.656
22	PIPE SS 168.3 X 3.4 A312 TP321	PG INTERCONNECTING PIP	36	507.276
23	ELBOW LR 90DEG SS 1 1/2" SCH 40S BW ENDS	PG INTERCONNECTING PIP	3	2.31
24	ELBOW LR 90DEG SS 3/4" SCH 80S BW ENDS	PG INTERCONNECTING PIP	3	0.9
25	ELBOW LR 90DEG SS 2" SCH 10S BW ENDS	PG INTERCONNECTING PIP	6	7.8
26	ELBOW LR 90DEG SS 6" SCH 10S BW ENDS	PG INTERCONNECTING PIP	6	33
27	S.S FLANGE 1 1/2" #300WNRF SCH 40	PG INTERCONNECTING PIP	4	12
28	FLANGE, 3/4",A182 F321, #300, WNRF	PG INTERCONNECTING PIP	4	4
29	NON ASBESTOS M.S.W. GASKET SIZE 3/4" CL	PG INTERCONNECTING PIP	4	0.2
30	NAB M.S.W. GASKET SIZE 1 1/2"#300 PTFE	PG INTERCONNECTING PIP	20	0.7
31	STUD 2 NUTS M16X90	PG INTERCONNECTING PIP	16	4.096
32	VERTICAL INSERT CS 3/4" SW CL 3000	PG INTERCONNECTING PIP	10	3
33	PIPE(SMLS)- 26.7X 3.91 CS SA106 GR B	PG INTERCONNECTING PIP	6	13.188
34	GATE VALVE CS 3/4" CL 800 SW ENDS	PG INTERCONNECTING PIP	10	20.4
35	NIPPOLET CS CL 3000 1 1/2" SW	PG INTERCONNECTING PIP	15	7.5
36	FLANGE1 1/2"WELD NECK CS SCH 80 CL300 RF	PG INTERCONNECTING PIP	15	49.5
37	STUD 2 NUTS M20X90	PG INTERCONNECTING PIP	80	33.2
38	CONC. REDUCER 40"X38"SCH STDXSTD BW ENDS	PG INTERCONNECTING PIP	1	155
39	PIPE CS, HTS 1220 X 9.53 A672GRB60	PG INTERCONNECTING PIP	25.2	1,706.94
40	CS PIPE ASTM A672 GR B60 1016.4X9.52THK	PG INTERCONNECTING PIP	36	8,510.40
41	SORF FLANGE CL-150-38"	PG INTERCONNECTING PIP	2	400
42	CS PIPE ASTM A672 GR B60 1016.4X9.52THK	PG INTERCONNECTING PIP	24	5,673.60
43	PIPE CS, HTS 813 X 9.53 EFSW A672 GRB60	PG INTERCONNECTING PIP	19.2	3,399.03
44	CS FLANGE 14" #150 SORF	PG INTERCONNECTING PIP	1	35
45	FLANGE 32" #150 (SORF) CS ASME SA105	PG INTERCONNECTING PIP	1	150
46	STUD 2 NUTS M39X3X275	PG INTERCONNECTING PIP	96	368.544
47	CAF SHEET 3.0,2*1595.00*2000.00MM	PG INTERCONNECTING PIP	6.38	30.05
48	CONC.REDUCER38"X32"SCH STDXSTD BW ENDS	PG INTERCONNECTING PIP	1	200
49	CONC. REDUCER 40"X24"SCH STD X 20 BW END	PG INTERCONNECTING PIP	2	280

50	CONC.REDUCER20"X14"	PG INTERCONNECTING PIP	1	75
51	PIPE CS, HTS 1220 X 9.53 A672GRB60	PG INTERCONNECTING PIP	24	6,827.76
52	RDCR CONTC 48"X40" THK 12.7MM BW CS HT	PG INTERCONNECTING PIP	3	690
BLOWER INTERCONNECTION PIPING (TOTAL)				**42,312.52**

MECHANICAL (COMMON FOR ALL UNIT)				
Sl. No	**Material Description**	**PGMA Description**	**Qty.**	**Net.Wt (KG)**
1	VENT SILENCER,CS,287 TPH,INLET=48"	VENT SILENCER	1	900
2	CEP FOR TURBO BLOWER WITH MOTOR DRIVE	2 PER UNIT	6	18,000.00
3	ELBOW LR 90DEG CS 1" SCH 80 BW ENDS		40	8
4	ELBOW LR 90DEG CS 2" SCH 40 BW ENDS		312	202.8
5	ELBOW LR 90DEG CS 3" SCH 40 BW ENDS		30	61.5
6	ELBOW LR 90DEG CS 4" SCH 40 BW ENDS		33	128.7
7	ELBOW LR 90DEG CS 6" SCH 40 BW ENDS		99	1,039.50
8	ELBOW LR 90DEG CS 8" SCH 20 BW ENDS		18	288
9	STRAIGHT TEE CS 1" SCH 80 BUTT WELD ENDS		6	2.1
10	STRAIGHT TEE CS 2" SCH 40 BUTT WELD ENDS		27	48.6
11	STRAIGHT TEE CS 3" SCH 40 BUTT WELD ENDS		15	57
12	STRAIGHT TEE CS 4" SCH 40 BUTT WELD ENDS		3	18.3
13	STRAIGHT TEE CS 6" SCH 40 BUTT WELD ENDS		39	643.5
14	STRAIGHT TEE CS 8" SCH 20 BUTT WELD ENDS		3	72
15	RDCR CONC CS 1"X1/2"SCH 80X80 BW ENDS		34	8.5
16	RDCR CONC CS 2"X1 1/2"SCH 40X80 BW ENDS		6	2.4
17	RDCR CONC CS 3"X1 1/2"SCH40X80 BW ENDS		6	6
18	RDCR CONC 3"X2"SCH 40X40		6	6
19	CS RDCR 3X2 SCH 40 X 80 BW		10	10
20	RDCR CONC 4"X2" SCH 40X40		3	4.8
21	RDCR CONC 6"X3"SCH 40X40		9	36

22	RDCR CONC 6"X4" SCH40X40		20	80
23	WELDOLET 2" SCH 160 X 3/4" SCH 160 BW CS		10	3.2
24	WELDOLET 2"X3/4" SCH 160X80 AS BW		10	3.2
25	WELDOLET 4"X1 1/2" SCH 160X160 AS BW		3	2.4
26	ELBOW 90 DEG CS 24" SCH10 BW		15	3,375.00
27	RDCR CONC CS 1"X3/4" SCH 80X80 BW ENDS		4	0.64
28	CAP CS 2" SCH 40 BW		15	105
29	STRAIGHT TEES AS 1" SCH 80BW		4	1.4
30	AS EQ. TEE 2" SCH 40 BW		5	9
31	AS EQ. TEE 2" SCH 80 BW		2	3.92
32	CONCENTRIC REDUCER ALLOY STEEL(SA234 WP		2	0.36
33	RDCR CONC AS 1"X1/2" SCH 80X80 BW ENDS		2	0.4
34	AS (P11) RDCR 2" X 11/2" S40 X S80		2	1.6
35	AS (P11) RDCR 2" X 1" SCH 40 X SCH 80		2	0.8
36	RDCR CONC AS 4"X3" SCH 40X40 BW ENDS		4	6.4
37	CR AS(SA234 WP11) 6"X4" SCH 40X40BW		4	16
38	CR AS(SA234 WP11) 8"X6" SCH 40X40BW		2	13
39	CR AS(SA234 WP11) 4"X2"SCH40X40BW		4	16
40	CR AS(SA234 WP11) 4"X2"SCH 80X80BW		4	12
41	CONC RDCR AS 2"X1" SCH80 BW		6	3
42	CONC.REDUCER-8"X 4",S80X80, BW, AS		2	12
43	AS ELBOW 90 DEG 3/4"SCH 80 BW		10	1
44	LR ELBOWS 90DEG AS 1" SCH 80 BW		45	9
45	LR ELBOWS 90DEG AS 1 1/2" SCH 80 BW		8	4
46	LR ELBOWS 90DEG AS 2" SCH 40 BW		30	19.5
47	LR ELBOWS 90DEG AS 2" SCH 80 BW		6	5.4
48	GLV CS NB 2"- PRCL150 BW ASME B 16.34		24	432
49	GLOBE VALVE CS 1/2" CL 800 SW ENDS		15	24
50	GLOBE VALVE CS 1" CL 800 SW ENDS		27	91.8

51	GLOBE VLV WITH GS CS 2" 150# BW		4	180
52	GLOBE VLV CS(SA105)3/4"CL800PTFE PKG SOC		10	18
53	GLOBE VLV RD CS(A216WCB)2" SG CL150 BW		2	66
54	GLOBE VLV RD CS(A216WCB)2" SG CL150 BW		2	66
55	GATE VLV CS(A216WCB)3" CL150 BW		3	102
56	GATE VLV CS(A216WCB)6" CL150 BW		33	2,772.00
57	GATE VALVE CS 1/2" CL 800 SW ENDS		6	10.86
58	GATE VALVE CS 3/4" CL 800 SW ENDS		99	201.96
59	GATE VLV CS(SA105)1" CL800 SCR NPT		15	54.45
60	GATE VLV AS(A182F11)2" CL1500 BW		1	45
61	GATE VLV CS(A216WCB)3" SG CL150 BW		3	102
62	GATE VLV CS(A216WCB)4" SG CL150 BW		6	288
63	GATE VLV CS(A216WCB)8" SG CL150 BW		6	792
64	PISTON LIFT CHK VLV CS 1" CL 800 SW ENDS		6	76.2
65	CHECK VLV PL AS(A182F22) 1"CL1500 SW		1	4.1
66	SWING CHECK VLV CS(A216WCB) 6" CL150 BW		6	420
67	MOV REG. GLOBE VALVE CS 4" #150 BW		1	420
68	MOV REG. GLOBE VALVE CS 4" #150 BW		1	420
69	GATE VALVE AS (F11) NB 20 CL 1500 BW		16	80
70	GATE VALVE AS(F11) SIZE 3/4"#800 SW ENDS		12	24.48
71	AS(F22) MOV GLV +INT.STARTER,NB25#1500SW		1	28.4
72	MOV CS REG GLOBE FSG 2" CL 150 BW		1	150
73	MOV CS REG GLOBE FSG 2" CL 150 BW		2	150
74	MOV CS REG GLOBE FSG 2" CL 150 BW		1	150
75	MOV CS REG GLOBE FSG 2" CL 150 BW		2	150
76	GATE VALVE,CS A105, 1",#1500,BW, SCH.160		2	16.8
77	CS GATE VALVE 3/4"-1500 BW ENDS SCH 160		14	117.6
78	GATE VLV AS (A182-F11) 1" CL 1500 BW		1	20
79	CS MOV REG. GLOBE 1" 1500# SW		1	2

80	MOV CS BFLY VAL 48" RF FOR AIR LINE		1	1,500.00
81	MOV CS BFLY VAL 64"RF FOR AIR		1	2,200.00
82	FLANGE SOW CS 2" CL 150 RAISED FACE		64	140.8
83	FLANGE1 1/2"WELD NECK CS SCH 80 CL300 RF		48	158.4
84	FLANGE WELD NECK CS 3" SCH 40 CL 300 RF		10	74
85	FLANGE WELD NECK CS 4" SCH 40 CL 300 RF		10	119
86	FLANGE1/2"WELD NECK CS SCH 80 CL1500 RJ		6	13.8
87	FLANGE3/4"WELD NECK CS SCH 80 CL1500 RJ		6	16.8
88	CS BLIND FLANGE 3/4" CL 1500 RJ		5	13.5
89	AS BLIND FLANGE 3/4"CL300 RF(A182GRF11)		10	13
90	FLANGE BLIND CS 2" CL 150 RAISED FACE		18	99
91	CS FLANGE 3/4" CL 300 WNRF SCH160		42	63
92	CS FLANGE 2"CL300WNRF SCH80		10	45
93	WN FLANGE CS 3/4" SCH 160 #1500 RJ		5	15
94	FLANGE WELD NECK CS 3" SCH 40 CL 150 RF		10	30
95	FLANGE WELD NECK CS 4" SCH 40 CL 150 RF		10	19
96	FLANGE WELD NECK CS 6" SCH 40 CL 150 RF		13	39
97	FLANGE 8" 150# WNRF SCH20 CS		32	640
98	WN FLANGE AS 3/4"SCH 80 #300 RF		10	18
99	FLANGE WELD NECK AS 1" SCH 80 CL 300 RF		10	110
100	WN FLANGE AS 1 1/2" SCH 80 #300 RF		4	13.2
101	AS (F11) FLANGE 4" #300 WNRF		4	47.6
102	AS (F11) FLANGE 2" #300 WNRF		6	21.6
103	AS (F11) FLANGE 8" #300 WNRF		4	124
104	AS (F11) FLANGE 6" #300 WNRF		4	28
105	AS FLANGE 3/4" CL 900 WNRJ,SCH 80		6	16.8
106	AS FLANGE 1 1/2"CL900 WNRJ, SCH160		1	6
107	FLANGE 1" SCH 80 ANSI 1500 WNRJ AS		2	8
108	WN FLANGE AS 1/2" SCH 80 #1500 RJ		2	4.6

109	AS BLIND FLANGE 3/4"CL900 RJ		6	16.8
110	FLANGE BLIND CS 3/4" CL 300 RAISED FACE		42	168
111	FLAT CAP 1" NPT(GAL)		10	1
112	FLAT CAP 2" NPT(GAL)		2	0.07
113	ELBOW 90DEG CS 1/2" CL 3000 SW ENDS		120	46.8
114	ELBOW 90DEG CS 3/4" CL 3000 SW ENDS		36	20.52
115	ELBOW 90DEG CS 1" SOC WELD ENDS CL 3000		136	134.64
116	ELBOW 90DEG CS 1 1/2" CL 3000 SW ENDS		60	127.5
117	TEE CS 3/4" CL 3000 SOCKET WELD ENDS		18	6.66
118	TEE CS 1" CL 3000 SOCKET WELD ENDS		36	20.34
119	SOCKET REDUCER		6	1.68
120	ELBOW 90DEG CS GAL.2"-NPT-F #3000		10	5
121	ELBOW 90D,CS,GALV,1"NPT-F,CL3000		30	15
122	TEE REDR,CS,GALV,2"X2"X1"-NPT-F,CL3000		15	6
123	COUPL,CS,GALV,2"-NPT,CL3000		25	10
124	COUPL,CS,GALV,1"-NPT,CL3000		40	16
125	UN EQ TEE CS GAL 2X2X11/2" F #3000		2	0.2
126	VERTICAL INSERT 3/4" NPT CL 3000		12	4.8
127	VERTICAL INSERT 1 1/2"NPT 3000AS		2	0.9
128	VERTICAL INSERT CS 1/2" SW CL 3000		16	2.4
129	VERTICAL INSERT CS 1" SW CL 3000		30	13.5
130	VERTICAL INSERT CS 1 1/2" SW CL 3000		32	9.6
131	VERTICAL INSERT CS 3/4" SW CL 6000		99	29.7
132	GASKET RJ OVAL SI GRVNO:R12 PITCH 39.67		6	0.6
133	RJ GASKET SI RING NO:R14 PITCH DIA 44.45		8	0.96
134	RING JOINT GASKET OVEL TYPE STAINLESS		7	0.7
135	RJ GASKET SS RING NO:R14 PITCH DIA 44.45		6	0.72
136	RJ GASKET SS RING NO:R16 PITCH DIA 50.80		2	0.26
137	RJ GASKET SS RING NO:R20 PITCH DIA 68.28		1	0.17

138	NON ASBESTOS M.S.W. GASKET SIZE 3/4" CL		50	2.5
139	NON ASBESTOS M.S.W. GASKET SIZE 1 1/2"		40	1.4
140	NAB M.S.W. GASKET SIZE 2" #150 GRPH		60	3
141	NAB M.S.W. GASKET SIZE 3" #150 GRPH		10	0.7
142	NAB M.S.W. GASKET SIZE 4" #150 GRPH		10	0.8
143	NAB M.S.W. GASKET SIZE 6" #150 GRPH		15	2.25
144	NAB M.S.W. GASKET SIZE 8" #150 GRPH		50	10
145	NAB M.S.W. GASKET SIZE 4" #300 GRPH		15	1.2
146	NAB M.S.W. GASKET SIZE 6" #300 GRPH		5	0.75
147	NAB M.S.W. GASKET SIZE 8" #300 GRPH		5	1
148	NAB M.S.W. GASKET SIZE 3/4"#600 GRPH		15	0.75
149	NAB M.S.W. GASKET SIZE 1"#600 GRPH		10	0.2
150	NAB M.S.W. GASKET SIZE 1 1/2"#600 GRPH		20	0.7
151	NAB M.S.W. GASKET SIZE 2"#600 GRPH		15	0.75
152	NAB M.S.W. GASKET SIZE 3"#600 GRPH		10	0.7
153	AS STUD WITH 2 NUTS M 20X100		24	5.28
154	AS STUD WITH 2 NUTS M 20X110		65	16.25
155	AS STUD WITH 2 NUTS M 27 X 140		10	4.5
156	AS STUD WITH 2 NUTS M 22X150		60	18
157	AS STUD WITH 2NUTS M20X2.5X120		60	30
158	AS STUD WITH 2 NUTS M16X100		150	240
159	STUD 2 NUTS M16X90		624	159.744
160	STUD 2 NUTS M20X90		192	79.68
161	STUD 2 NUTS M20X100		184	80.776
162	STUD 2 NUTS M20X110		104	48.256
163	STUD 2 NUTS M22X120		8	4.864
164	STRAINER Y-TYPE CARBON S		3	3
165	STEAMTRAP BALLFLOAT CS 2" CL150RF 4.5BAR		3	45
166	STM TRP,BALL FL-CS 2"CL800 -SW,1500KG/HR		10	280

167	BELLOWS L225 8" ASA 150RF		6	168
MECHANICAL COMMON (TOTAL)				**40,191**

PIPING (COMMON FOR ALL UNIT)				
Sl. No	**Material Description**	**PGMA Description**	**Qty.**	**Net.Wt (KG)**
1	PIPE(SMLS)- 21.3 X3.73 CS SA106 GR B	COMMON PIPING	390	630.24
2	PIPE(SMLS)- 26.7X 3.91 CS SA106 GR B	COMMON PIPING	204	448.392
3	PIPE(SMLS)- 26.7X 5.56 CS SA106 GR B	COMMON PIPING	36	104.364
4	PIPE(SMLS)- 33.4X 4.55 CS SA106 GR B	COMMON PIPING	600	1,942.20
5	PIPE(SMLS)- 48.3X 5.08 CS SA106 GR B	COMMON PIPING	272	1,472.88
6	PIPE(SMLS)- 60.3X 3.91 CS SA106 GR B	COMMON PIPING	702	3,816.77
7	PIPE(SMLS) 88.9X 5.49 CS SA106 GR B	COMMON PIPING	120	1,355.16
8	PIPE(SMLS) 114.3X 6.02 CS SA106 GR B	COMMON PIPING	120	1,929.00
9	PIPE(SMLS)168.3X 7.11 CS SA106 GR B	COMMON PIPING	420	11,870.88
10	PIPE(SMLS) 219.1X 6.35 CS SA106 GR B	COMMON PIPING	60	1,999.02
11	PIPE(EFSW) 610X6.35 CS SA672 GRB60 CL22	COMMON PIPING	108.8	10,209.46
12	PIPE(SMLS) 26.7 X 3.91 AS SA335 GRP11	COMMON PIPING	180	395.64
13	PIPE(SMLS) 33.4X4.55 AS SA335 GRP11	COMMON PIPING	180	582.66
14	PIPE(SMLS) 48.3 X 5.08 AS SA335 GRP11	COMMON PIPING	24	129.96
15	PIPE(SMLS) 60.3 X 3.91 AS SA335 GRP11	COMMON PIPING	144	782.928
16	PIPE(SMLS) 60.3 X 5.54 AS SA335 GRP11	COMMON PIPING	12	89.784
17	PIPE CS 60.8 X 4.5 SAW GALV	COMMON PIPING	130	812.24
18	SAW GALVANISED PIPE DIA 48.8 X 4.0 THK	COMMON PIPING	6	54
19	PIPE CS 34.2 X 4 SAW GALV	COMMON PIPING	300	893.7
20	PIPE AS, HTS 48.3 X 7.14 S/L A335 P11	COMMON PIPING	6	43.488
21	CS PIPE ASTM A672 GR B60 1626.4X9.53THK	PIPES	108	41,040.00
22	PIPE CS, HTS 1220 X 9.53 A672GRB60	PIPES	42	11,948.58
PIPING COMMON (TOTAL)				**92,551**

INSULATION (FOR EACH UNIT)				
Sl.No	**Material Description**	**PGMA Description**	**Quantity**	**Net.Wt (KG)**
1	MINERAL ROCKWOOL MATTRESS 75X1220X1640	INSUATION ITEMS	136	1,060.80
2	SHEET(AL)22G-W=914 ROLL-IS 737 GR 19000	INSUATION ITEMS	360	360
3	WIRE GI 0.9MM-IS 280-ANLD	INSUATION ITEMS	18	18
4	THERMAL INSULATION MIN.WOOL MATT.AL.CLAD	TURBINE INSULATION	1	750
5	PIPING INSULATION AS PER TC-6-6845-R01	PIPING THERMAL INSULATION (FOR 3 Units)	1	10,000.00
INSULATION (TOTAL)				**12,189**

*** ABOVE WEIGHTS & DIMENSIONS ARE TENTATIVE AND MAY VARY. ALL EQUIPMENTS & AUX. ARE TO BE HANDLED & ERECTED AS DISPATCHED FROM MANUFACTURING UNITS & RECEIVED AT SITE. PAYMENT SHALL BE MADE ON THE BASIS OF MATERIAL SPECIFICATION OF ACTUAL MATERIAL RECEIVED AND ERECTED AT SITE.**

SUMMARY OF TENTATIVE WEIGHT SCHEDULE OF SYSTEMS INVOLVED IN THIS TENDER SPECIFICATION PER UNIT FOR 3 X TURBO-BLOWER SETS.

SUMMARY			
SL NO.	**DESCRIPTION**	**WEIGHT INVOLVED PER UNIT (MT)**	**TOTAL WEIGHT INVOLVED (MT)**
1	HEAT EXCHANGERS (SURFACE CONDENSER, TWIN OIL COOLER, STEAM JET EJECTOR, GSC Assy.)	**153.7**	**461.1**
2	BLOWER WITH VALVES & SILENCER	**98.1**	**294.3**
3	BLOWER INTERCONNECTION PIPING	**42.3**	**126.9**
4	BLOWER DRIVE TURBINE	**97.6**	**292.8**
5	TURBINE AUX PIPING (INTEGRAL)	**16.4**	**49.2**
6	INSULATION AND CLADDING MATERIAL	**5.522**	**16.566**
7	MECHANICAL COMMON		**40.1**
8	COMMON PIPING		**92.5**
	TOTAL	**414**	**1373**

NOTES:

1. BESIDES PRODUCT GROUPS INDICATED HEREIN, THERE IS LIKELIHOOD OF ADDITION OF NEW PRODUCT GROUPS BY BHEL' S UNIT FOR RELEASE OF SOME ITEMS, INTEGRAL TO THIS WORK. TENDERERS' QUOTED UNIT RATES SHALL BE APPLICABLE FOR SUCH PRODUCT GROUPS ALSO.

2. THE WEIGHTS GIVEN AGAINST PGMA'S LISTED ABOVE ARE TENTATIVE. IT MAY CHANGE AFTER DETAILED ENGINEERING IS DONE. RATE QUOTED BY THE CONTRACTOR SHALL NOT CHANGE DUE TO VARIATION IN WEIGHT.

3. BHEL'S DECISION WITH REGARD TO CLASSIFICATION OF A PARTICULAR PRODUCT GROUP FOR APPLICABLE RATE CATEGORY SHALL BE FINAL & BINDING ON THE CONTRACTOR.

4. BESIDES THE ABOVE, WEIGHT OF ALL TEMPORARY PIPING, VALVES, PUMPS, TANKS AND OTHER MISCELLANEOUS EQUIPMENTS ETC AS STATED ELSEWHERE WILL GET ADDED.

5. ALL ABOVE WEIGHT DETAILS GIVEN ARE ONLY TENTATIVE AND LIKELY TO VARY. THE ERECTION, 1TESTING, COMMISSIONING HAS TO BE CARRIED OUT FOR ALL THE EQUIPMENTS/AUXILIARIES/ITEMS COVERED UNDER THIS TENDER SPECIFICATION THAT ARE NECESSARY FOR COMPLETION OF THE TOTAL SYSTEM.

6. SITE WELD JOINTS FOR TG INTEGRAL PIPING AND EXTERNAL SYSTEM PIPING BOTH FOR IBR AND NON-IBR FOR PIPING (C.S., A.S. AND S.S. PIPING) SHALL BE AS PER DRAWING REQUIREMENT AND TO SUIT THE SITE REQUIREMENT.

7. NDT INCLUDING RADIOGRAPHY AND POST/PREHEAT TREATMENT FOR PIPING SHALL ALSO BE AS SPECIFIED IN THE RELEVANT ERECTION DOCUMENTS & BY BHEL ENGINEER AT SITE.

(WILL BE ISSUED DURING EXECUTION)

11.0 General - Material Handling and Material Management Services

11.1

THE INTENT OF SPECIFICATION IS TO PROVIDE MATERIAL HANDLING AND MATERIALS MANAGEMENT SERVICES ACCORDING TO THE MOST MODERN AND PROVEN TECHNIQUES AND CODES. THE OMISSION OF SPECIFIC REFERENCE TO ANY METHOD, EQUIPMENT OR MATERIALS NECESSARY FOR PROPER AND EFFICIENT UNLOADING, TRANSPORTATION, VERIFICATION, STACKING & PRESERVATION ETC SHALL NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF PROVIDING SUCH FACILITIES TO COMPLETE THE WORK WITHOUT ANY EXTRA COMPENSATION.

11.2

THE WORK SHALL BE EXECUTED UNDER USUAL CONDITIONS AFFECTING MAJOR THERMAL POWER PROJECTS IN AN EXISTING POWER PLANT AND IN CONJUNCTION WITH NUMEROUS OTHER OPERATIONS AT SITE. THE CONTRACTOR AND HIS PERSONNEL SHALL COOPERATE WITH PERSONNEL OF CUSTOMER'S CONTRACTORS, COORDINATING HIS WORK WITH OTHERS AND PROCEED IN A MANNER THAT SHALL NOT DELAY OR HINDER THE PROGRESS OF WORK AS A WHOLE.

11.3

ALL THE WORK SHALL BE CARRIED OUT AS PER THE INSTRUCTIONS OF BHEL ENGINEER. BHEL ENGINEER'S DECISION REGARDING CORRECTNESS OF THE WORK AND METHOD OF WORKING SHALL BE FINAL AND BINDING ON THE CONTRACTOR.

11.4

THE CONTRACTOR SHALL PERFORM ALL REQUIRED SERVICES WHICH MAY NOT BE SPECIFIED HEREIN BUT NEVERTHELESS REQUIRED FOR THE COMPLETION OF WORK WITHIN ACCEPTED RATES.

11.5

ALL NECESSARY CERTIFICATES AND LICENSES REQUIRED TO CARRY OUT THIS WORK ARE TO BE ARRANGED BY THE CONTRACTOR EXPEDITIOUSLY.

11.6

ALL CRANES, TRANSPORT EQUIPMENTS, HANDLING EQUIPMENT, TOOLS, TACKLES, FIXTURES, EQUIPMENT, MANPOWER, SUPERVISORS/ENGINEERS, CONSUMABLES ETC REQUIRED FOR THIS SCOPE OF WORK SHALL BE PROVIDED BY THE CONTRACTOR.

11.7

ALL EXPENDITURE INCLUDING TAXES AND INCIDENTALS IN THIS CONNECTION WILL HAVE TO BE BORNE BY THE CONTRACTOR UNLESS OTHERWISE SPECIFIED IN THE RELEVANT CLAUSES ELSEWHERE IN THESE SPECIFICATIONS. THE ACCEPTED RATES SHALL INCLUDE ALL SUCH CONTINGENCIES. IN THIS CONNECTION REFER RELEVANT CLAUSE OF GENERAL CONDITIONS OF CONTRACT.

11.8

THE CONTRACTOR SHALL PERFORM ALL REQUIRED SERVICES WHICH MAY NOT BE SPECIFIED HEREIN BUT NEVERTHELESS REQUIRED FOR THE COMPLETION OF WORK WITHIN ACCEPTED RATES.

11.9
THE DISTANCES INDICATED IN THESE SPECIFICATIONS ARE ONLY APPROXIMATE. HOWEVER, THE TENDERERS SHOULD ASSESS THE VARIOUS DISTANCES AND SITE CONDITIONS BY VISITING SITE BEFORE SUBMITTING THEIR OFFER. NO ADDITIONAL/EXTRA CLAIMS FOR ANY VARIATION IN THIS REGARD WILL BE ENTERTAINED.

11.10
CONTRACTOR SHALL ARRANGE FOR CUTTING AND REMOVAL OF VEGETATION GROWTH/GRASS ETC IN THE STORAGE YARD AS AND WHEN CALLED FOR BY BHEL AS INCIDENTAL TO WORK. BHEL WILL TAKE APPROPRIATE ACTION AT THE RISK & COST OF THE CONTRACTOR IN CASE OF FAILURE IN THIS REGARD.

11.11
IF THE CONTRACTOR OR HIS WORKMEN OR EMPLOYEES BREAK, DEFACE, INJURE OR DESTROY ANY PART OF A BUILDING, ROAD, KERBS, FENCE, ENCLOSURES, WATER PIPES, CABLES, DRAINS, ELECTRIC OR TELEPHONE POSTS OR WIRES, TREES OR ANY OTHER PROPERTY OR TO ANY PART OF ERECTED EQUIPMENTS, STORED COMPONENTS ETC. WITHIN THE PROJECT PREMISES OR OUTSIDE THE CONTRACTOR SHALL MAKE THE SAME GOOD AT HIS OWN EXPENSES.

11.12
CERTAIN HEAVIER COMPONENTS MAY HAVE TO BE DIRECTLY RECEIVED AND UNLOADED NEAR THE SITE OF WORK. UNLOADING, SHIFTING, LIFTING AND PLACEMENT OF HEAVY & VOLUMINOUS CONSIGNMENTS LIKE ~~SURFACE CONDENSERS, STEAM TURBINES, TURBO BLOWERS,~~ LUBE OIL TANKS, OVER HEAD OIL TANKS ETC BY USING CONTRACTOR'S OWN LIFTING TOOLS/TACKLES AND CRANE OF SUITABLE CAPACITY WITH OTHER REQUIRED ARRANGEMENTS ARE IN THE SCOPE OF CONTRACTOR

12.0 MATERIAL HANDLING AND MATERIAL MANAGEMENT OF MATERIALS RECEIVED BY ROAD

12.1
MAJORITY OF CONSIGNMENTS SHALL REACH SITE DIRECTLY FOR DELIVERY. HOWEVER A GOOD NUMBER OF CONSIGNMENTS SHALL BE BOOKED ON GODOWN DELIVERY BASIS OR DOOR DELIVERY AGAINST CONSIGNEE COPY BASIS, THE PROCEDURE OF MATERIAL COLLECTION SHALL BE ADOPTED AS DETAILED IN RELAVENT CHAPTER

12.2
IT WILL BE RESPONSIBILITY OF THE CONTRACTOR TO KEEP IN TOUCH WITH OFFICIALS OF BHEL REGARDING ADVANCE INFORMATION ABOUT ARRIVAL OF CONSIGNMENTS. THE CONTRACTOR SHALL COLLECT LORRY WAY BILLS OR OTHER SUCH DESPATCH DOCUMENTS.

12.3
THE CONTRACTOR SHALL REMAIN IN REGULAR CONTACT WITH THE CONCERNED TRANSPORTERS OR BASED ON THE DESPATCH DETAILS OBTAINED AS STATED ABOVE AND MAKE ALL NECESSARY ARRANGEMENTS FOR COLLECTION / RECEIPT OF THE CONSIGNMENT AS APPLICABLE. CONTRACTOR SHALL TAKE ADVANCE ACTION TO DEPLOY ALL NECESSARY RESOURCES FOR LOCAL TRANSPORTATION, HANDLING AND UNLOADING OF THE ANTICIPATED CONSIGNMENTS SO AS TO ENSURE NO LOSS OF TIME UPON ARRIVAL OF THE CONSIGNMENTS.

12.4
DETENTION CHARGES/DEMURRAGE/WHARFAGE ETC., WHICH RESULT DUE TO CONTRACTOR'S FAULT, SHALL BE RECOVERED FROM THE BILL PAYMENT DUE TO THE CONTRACTOR.

12.5
IT WOULD BE RESPONSIBILITY OF THE CONTRACTOR TO EXAMINE THE PACKAGES, CONSIGNMENTS ETC. IMMEDIATELY ON ARRIVAL AND BRING TO THE NOTICE OF BHEL AUTHORITIES REGARDING LOSS/DAMAGE/SHORTAGE/DISCREPANCY, IF ANY, OBSERVED IN THE CONSIGNMENTS BEFORE TAKING DELIVERY OF THE SAME.

12.6
ANY DISCREPANCY/SHORTAGE/DAMAGE FOUND IN THE CONSIGNMENT AFTER TAKING CLEAN DELIVERY FROM THE CARRIERS SHALL BE THE RESPONSIBILITY OF CONTRACTOR AND THE RESULTANT LOSS TO BHEL ON SUCH ACCOUNT SHALL BE RECOVERABLE FROM THE CONTRACTOR.

12.7
CONSIGNMENTS ARE EXPECTED TO ARRIVE DURING ANY TIME OF THE DAY, AND COUNT DOWN FOR DETENTION/DEMMURAGE/WHARFAGE CHARGES IS LIABLE TO START IMMEDIATELY. UNLOADING OF SUCH CONSIGNMENTS MAY BE NECESSITATED EVEN IN THE NIGHT OR ROUND THE CLOCK. CONTRACTOR SHALL ARRANGE TO DEPLOY HIS RESOURCES IMMEDIATELY AND CONTINUE ROUND THE CLOCK ON SUCH OCCASIONS WITHOUT ANY ADDITIONAL COST TO BHEL. CONTRACTOR SHALL ARRANGE ALL NECESSARY RESOURCES INCLUDING SPOT LIGHTING FOR WORKING AT NIGHT. THE CONTRACTOR SHALL SIMILARLY UNLOAD CONSIGNMENTS ARRIVING ON WEEKLY OFF DAYS AND HOLIDAYS.

12.8
UNLOADING AT STORAGE AREA/WORK SITE, STACKING AND RESTACKING IF NECESSITY ARISES, OF ALL MATERIALS INCLUDING HEAVY/SOPHISTICATED EQUIPMENTS LIKE TUBED WALL PANELS OF BOILER, HEAVY MOTORS, HEAVY BEARING PEDESTALS, ELECTRICAL PANELS AND TG EQUIPMENT LIKE HEAVY TURBINE COMPONENTS, PUMPS, PANELS, ETC. SHALL BE DONE AS PER STORAGE AND PRESERVATION MANUAL OF RELEVANT EQUIPMENT/COMPONENTS OF BHEL AND/OR AS PER DIRECTIONS OF BHEL ENGINEER.

12.9
THE CONTRACTOR SHALL VERIFY THE CONSIGNMENTS IN DETAIL WITHIN 12 DAYS OF RECEIPT AND REPORT THE DISCREPANCIES IN PRESCRIBED FORMATS NOT LATER THAN 14TH DAY. ANY LOSS ON ACCOUNT OF DELAYED REPORTING SHALL BE RECOVERABLE FROM CONTRACTORS BILL/ANY PAYMENT DUE. CONTRACTOR SHALL ARRANGE ALL FACILITIES TO OPEN PACKAGES - WHERE REQUIRED IN THE PRESENCE OF BHEL ENGINEER, VERIFY THE CONTENTS, REPACK WHEREVER AND WHENEVER CALLED FOR AND PROPERLY STACK THEM AS PER STORAGE MANUAL OR/AND AS MAY BE DIRECTED BY BHEL.

12.10
THE MATERIAL SHALL BE SO STACKED THAT IT SHOULD FACILITATE EASY IDENTIFICATION, RETRIEVAL AND HANDLING FOR ISSUE AS AND WHEN NEED ARISES.

12.11
PRE-DEFINED IDENTIFICATION SYSTEM OF THE LOCATIONS OF OPEN STORAGE YARD, ~~SEMI-CLOSED SHED,~~ AND COVERED STORES AS WELL AS STORAGE RACKS HAS TO BE DESIGNED BY THE CONTRACTOR WITH THE APPROVAL OF BHEL. CONTRACTOR SHALL PUT UP PROMINENT IDENTIFICATION BOARDS OF SEGMENTAL LOCATIONS (FOR OPEN ~~AND SEMI-CLOSED~~ STORES) OR INSCRIPTION (ON THE STORAGE RACKS) WITH CLEAR VISIBILITY FROM A DISTANCE. CONTRACTOR SHALL ALSO ARRANGE TO DISPLAY PLOT PLAN AT REGULAR INTERVALS IN THE COVERED/SEMI-CLOSED/OPEN STORAGE. THE CONTRACTOR SHALL ARRANGE PROPER DISPLAYS/SIGNS FOR VARIOUS REQUIREMENTS AS PER INSTRUCTIONS OF BHEL.

12.12
THE CONTRACTOR SHALL EXECUTE THE WORK IN A PROFESSIONAL MANNER. THE STORES SHALL BE HANDLED WITH DUE CARE AND DILIGENCE. THE CONTRACTOR AT HIS RISK AND COST SHALL MAKE GOOD ANY LOSS TO BHEL DUE TO CONTRACTOR'S LAPSE.

12.13
FOR ALL CONSIGNMENTS, OBSERVATIONS REGARDING LOSS/DAMAGE/SHORTAGE/ DISCREPANCY IS TO BE RECORDED IN APPROPRIATE DOCUMENT AND INFORMED TO BHEL. IN CASE IT BECOMES NECESSARY TO TAKE '**OPEN DELIVERY'** FROM THE AUTHORITIES, CONTRACTOR SHALL MAKE ALL ARRANGEMENTS FOR TAKING OPEN DELIVERIES. ALL EXPENSES CONNECTED THEREWITH SHALL BE TO THE ACCOUNT OF CONTRACTOR. ANY LOSS THAT ACCRUES TO BHEL ON ACCOUNT OF SUCH FAILURES SHALL BE DEBITED TO THE CONTRACTOR AND RECOVERY EFFECTED FROM HIS RUNNING BILLS.

12.14

THE CONTRACTOR UNDER THIS CONTRACT SHALL COMPLETE INDUCTION OF FOLLOWING CATEGORIES OF RESOURCES WITHIN THE ACCEPTED ITEM RATES, TO ENSURE ESTABLISHMENT OF PROPER **MATERIALS MANAGEMENT** AT THE PROJECT SITE.

1. COMPUTERS WITH LATEST UP-GRADATION, MEMORY AND COMPATIBLE WITH BHEL COMPUTERS/LAN EQUIPMENT TO BE INSTALLED/USED WITHIN BHEL SITE OFFICE- 02 SETS
2. ITEM RATE IN THE RATE SCHEDULE (SECTION A) HAS SPECIFIC MENTION OF "MATERIALS MANAGEMENT" WITH SOLE PURPOSE TO EMPHASIZE THE REQUIREMENT OF SUFFICIENT NO. OF ADEQUATELY QUALIFIED MANPOWER TO ENSURE BEST OBTAINABLE QUALITY OF WORK. ACCORDINGLY, SUPERVISORS/MANPOWER (APART FROM WORKMEN ON CRANES AND MATERIAL HANDLING PURPOSE) AS INDICATED AGAINST EACH ACTIVITY IN THE TABLE BELOW, NORMALLY TO WORK AT (BUT NOT LIMITED TO) BHEL SITE OFFICE

RESPONSIBILITIES OF THE CONTRACTOR -

(1) RECEIPT & ISSUE

SCOPE INCLUDES EXECUTION OF VARIOUS ACTIVITIES AS FOLLOWS:

(I) RECEIPT, UNLOADING, CARRYING OUT RECEIPT INSPECTION, DETAILED VERIFICATION, STACKING AND REGULAR STOCK VERIFICATION OF PROJECT MATERIALS AT SITE.

(II) PREPARING VARIOUS REPORTS AT APPROPRIATE STAGES AND REPORTING DAMAGE/LOSS DURING RECEIPT AS WELL AS STORAGE AND ANY OTHER ASSOCIATED RESPONSIBILITY AS ASSIGNED BY BHEL FROM TIME TO TIME. RESPONSIBILITY SHALL INCLUDE THE FOLLOWING ACTIVITIES:

a. EXAMINATION OF INCOMING CONSIGNMENTS TO DETECT ANY LOSS OR SHORTAGE OR OUTWARD DAMAGE AND RECORDING IT ON THE LR/LWB BEFORE MAKING ACKNOWLEDGEMENT OF IT'S RECEIPT FROM THE TRANSPORTER AND SIMULTANEOUSLY OBTAINING ENDORSEMENT OF THE VEHICLE DRIVER ON THE SAME.

b. REPORTING SUCH DISCREPANCY TO BHEL IMMEDIATELY ON RECEIPT OF CONSIGNMENT.

c. ASSISTING BHEL IN LODGING INSURANCE CLAIMS IN RESPECT OF LOSS/DAMAGE AS STATED ABOVE.

(III) ISSUE OF MATERIALS TO BHEL'S ERECTION CONTRACTORS, PRESERVATION OF STACKED MATERIALS, RE-STACKING/RE-HANDLING AS NECESSARY, PROGRESSIVE AND FINAL

RECONCILIATION WITH BHEL'S ERECTION AGENCIES AND PREPARATION OF NECESSARY DOCUMENT/ RECORD IN RESPECT OF THESE ACTIVITIES.

(IV) RETURN OF EXCESS/DEFECTIVE MATERIALS BY VARIOUS ERECTION CONTRACTORS OF BHEL.

(V) LOADING AND DISPATCH OF OUTGOING MATERIALS.

EXPECTED MINIMUM QUALITY OF SERVICE

CONTRACTOR SHALL RENDER THE SERVICES BY ENSURING DEPLOYMENT OF REQUISITE PERSONNEL WITH ADEQUATE EDUCATIONAL QUALIFICATION OF ENGINEERING/TECHNICAL BACKGROUND, HAVING THOROUGH EXPERIENCE IN RELATED FIELD TO ENABLE UNDERSTANDING THE INTRICACIES OF AND SPECIAL REQUIREMENTS INVOLVED IN HANDLING OF PROJECT MATERIALS, INCONSISTENCIES AND UNCERTAINTIES ASSOCIATED WITH IN/OUT FLOW OF MATERIALS, PROJECT ACTIVITIES AT ODD HOURS & HOLIDAYS AND IRREGULAR WORKING HOURS. CONTRACTOR SHALL ENSURE PROMPT AND TIMELY AVAILABILITY OF SUCH SERVICES.

(2) PRESERVATION OF COMPONENTS -

CONTRACTOR SHALL ARRANGE FOR PRESERVATION OF COMPONENTS AS PER BHEL'S STORAGE AND PRESERVATION MANUAL AND/OR AS PER INSTRUCTIONS OF BHEL ENGINEERS.

ONE OR MORE OF FOLLOWING METHODS SHALL BE ADOPTED FOR PRESERVATION.

1) COATING WITH PRESERVATIVE PAINTS/LUBRICANT/INHIBITORS

2) CAPPING/WRAPPING/COVERING

3) FILLING/IMMERSION IN OIL/CHEMICALS ETC

4) PERIODIC CHECKS/MAINTAINING REQUIRED NITROGEN PRESSURE IN TANKS OF TRANSFORMERS; BHEL WILL PROVIDE THE NITROGEN GAS FOR THE SAME. HOWEVER CONTRACTOR SHALL HANDLE THE CYLINDERS AT STORES, TRANSPORT TO POINT OF USE, FIT-UP REFILLS AND RETURN EMPTY CYLINDERS TO BHEL STORES.

5) HT MOTORS

FOR PRESERVATION OF HT MOTORS, SPACE HEATERS HAVE TO BE KEPT ENERGIZED TO AVOID INGRESS OF MOISTURE. INSULATION RESISTANCE HAS TO BE MEASURED AND RECORDED AT SPECIFIED INTERVALS TILL THESE ARE ISSUED FOR ERECTION. BHEL WILL PROVIDE NECESSARY CABLES, SWITCHES ETC. FOR THIS, HOWEVER CONTRACTOR SHALL INSTALL, OPERATE AND MAINTAIN THE SAME.

BHEL WILL PROVIDE FREE OF COST ALL PRESERVATIVES LIKE PRESERVATIVE OIL, LUBRICANTS, CHEMICALS, INHIBITORS, CAPS ETC EXCEPT PRIMERS & PAINTS. CONTRACTOR SHALL PROVIDE RED OXIDE ZINC CHROMATE (ROZC) PRIMER CONFORMING TO IS:2074 OF REPUTED MANUFACTURES (E.G. ASIAN PAINTS, BERGER, JENSON & NICHOLSON, BOMBAY PAINTS, SHALIMAR OR ANY OTHER BHEL APPROVED MANUFACTURER) REQUIRED FOR PRESERVATION SHALL BE PROVIDED BY THE CONTRACTOR AND USED FOR THIS PURPOSE.

IN THE PROCESS THE IDENTIFICATION MARKS, COMPONENT/MATERIAL CODES, MATCH MARKS MAY HAVE TO BE REPAINTED. THIS WORK AFTER PRESERVATION COMPONENTS ARE TO BE STACKED PROPERLY, PERIODICAL REPORTS ON THE PRESERVATION CARRIED OUT SHOULD BE SUBMITTED TO BHEL IN THE PRESCRIBED FORMATS.

(3) RECORD KEEPING –

CONTRACTOR SHALL PREPARE, MAINTAIN AND UPDATE VARIOUS MM RECORDS, ASSOCIATED WITH MATERIALS MANAGEMENT OPERATION OF BHEL AT PROJECT SITE. TWO SYSTEMS OF RECORD KEEPING/CAPTURING INFORMATION & DATA AT VARIOUS STAGES ARE IN VOGUE VIZ.

i. MANUAL LEDGERS & RECORDS.

ii. COMPUTERIZED DATABASE APPLICATION: BHEL HAS DEVELOPED A SOFTWARE APPLICATION NAMED SITE OPERATIONS MANAGEMENT SYSTEM (SOMS) THAT CAPTURES ALL THE DATA IN THE ENTIRE CHAIN OF TRANSACTIONS STARTING WITH MASTER LIST OF PROJECT MATERIALS, RECORDS OF DISPATCH, RECEIPT, INSPECTION, ISSUE, RETURN, CONSUMPTION ETC.

SOME OF THESE RECORDS ARE MASTER SHIPPING/PACKING LIST, LR/RR REGISTER, DAYBOOK REGISTER, STOCK REGISTER, RECORDS OF ISSUES TO & RETURN OF MATERIALS IN RESPECT OF VARIOUS ERECTION SUBCONTRACTORS, INSURANCE CLAIM RECORDS, PERIODICAL STATUS REPORTS IN VARIOUS FORMATS COVERING DESIRED ASPECTS AND OUTPUT INFORMATION AS PER BHEL/CLIENT'S REQUIREMENT.

CONTRACTOR WILL PROVIDE NECESSARY HARDWARE, SOFTWARE & STATIONARY ETC. AND SHALL TAKE UTMOST CARE TO ENSURE THAT THESE PROPERTIES AND RECORDS ARE PROTECTED FROM ANY DAMAGE OR LOSS. BHEL WILL RECOVER THE COST OF SUCH PROPERTY / EXPENSES OF RESTORATION FROM THE CONTRACTOR WITH 30% OVERHEAD CHARGES IN CASE OF ANY LOSS/DAMAGE ATTRIBUTABLE TO NEGLIGENCE/FAILURE ON CONTRACTOR'S PART.

SL NO	ACTIVITY/DESCRIPTION	MINIMUM NO. OF PERSONS	REMARKS
1	MATERIAL RECEIPT/UNLOADING, COLLECTION/ BOOKINGS	1	TO BE DEPLOYED FROM BEGINNING

SL NO	ACTIVITY/DESCRIPTION	MINIMUM NO. OF PERSONS	REMARKS
2	DETAILED VERIFICATION	1	TO BE DEPLOYED FROM BEGINNING
3	MATERIAL ISSUE	1	1ST No. FROM START OF ERECTION WORKS
4	RECORD KEEPING	1	1 FROM BEGINNING
5	RECORD KEEPING (T&P STOCK, MRC, ASSISTANCE IN INSURANCE CLAIMS, PURCHASE ETC)	1	FROM 2nd MONTH ONWARDS

NOTE: THE NO. OF PERSONS INDICATED ABOVE IS TENTATIVE AND ACTUAL DEPLOYMENT MAY VARY BASED ON WORK LOAD AND SITE REQUIREMENT, NOR THE DEPLOYMENT ABSOLVES THE CONTRACTOR FROM HIS RESPONSIBILITY TOWARDS THE SATISFACTORY EXECUTION OF THE JOB.

ITEM NO. A.1 OF RATE SCHEDULE IS INCLUSIVE OF PAYMENT AGAINST ABOVE LISTED MANPOWER. No separate payment will be made for the above listed manpower.

IN CASE THE CONTRACTOR DOES NOT DEPLOY OR DELAYS DEPLOYMENT OF ABOVE SAID MANPOWER WITH REFERENCE TO SPECIFIC INSTRUCTIONS FROM BHEL, BHEL WILL RECOVER NON-REFUNDABLE PENALTY PER MAN- DAY @ Rs 500

12.15

PAYMENT FOR ALL MATERIALS INCLUDING OD AND HEAVIER COMPONENTS RECEIVED BY ROAD SHALL BE REGULATED ON THE ACCEPTED UNIT **RATE AS PER SL NO A.1 OF RATE SCHEDULE SECTION A**.

13.0 MATERIAL HANDLING AND MATERIAL MANAGEMENT OF MATERIAL RECEIPT BY RAIL

13.1

PRESENTLY THERE IS NO RAILWAY SIDING IN THE PROJECT PREMISES. HOWEVER, IT MAY BE MADE AVAILABLE AT A LATER DATE. ALL THE CONSIGNMENTS REACHING THE PROJECT SITE BY RAIL SHALL BE UNLOADED AT THE RAILWAY SIDING, FOLLOWED BY LOADING ON TRUCK/TRAILER, LOCAL TRANSPORTATION FROM RAILWAY SIDING TO THE STORAGE YARD/STORES, UNLOADING, VERIFICATION AND STACKING AND PRESERVATION AS APPLICABLE TO THE CONSIGNMENTS ARRIVING BY ROAD. THE APPROXIMATE DISTANCE FORM MAIN STORAGE YARD TO RAILWAY SIDING WILL BE 6-7 KM.

13.2

IT WILL BE RESPONSIBILITY OF THE CONTRACTOR TO KEEP IN TOUCH WITH OFFICIALS OF BHEL AND RAILWAYS REGARDING ADVANCE INFORMATION ABOUT ARRIVAL OF CONSIGNMENTS. THE CONTRACTOR SHALL COLLECT RAILWAY RECEIPTS OR OTHER SUCH DESPATCH DOCUMENTS.

13.3
CONTRACTOR SHALL DEPLOY HIS CRANE, TRAILERS/TRUCKS AND ALL OTHER T & P INCLUDING ADDITIONAL T & P AND MANPOWER ETC FOR HANDLING OF MATERIALS AT SUCH UNLOADING BAY/ LOCATION AND TRANSPORT TO STORES/ STORAGE YARD.

13.4
CONTRACTOR SHALL IN HIS OWN INTEREST ARRANGE TO RELEASE THE RAILWAY WAGONS/RACKS WITH UTMOST ALACRITY TO AVOID ANY DEMURRAGE CHARGES. DEMURRAGE/ WHARFAGE ETC., WHICH RESULT DUE TO CONTRACTOR'S FAULT, SHALL BE RECOVERED FROM THE BILL PAYMENT DUE TO THE CONTRACTOR.

13.5
CONTRACTOR SHALL PROVIDE AREA LIGHTING AT RAILWAY SIDING FOR HANDLING OF MATERIALS DURING EVENING/ NIGHT.

13.6
ALL THE RESPONSIBILITIES SPECIFIED IN THE CONTRACTOR'S SCOPE FOR THE MATERIALS RECEIVED BY ROAD SHALL ALSO BE APPLICABLE MUTATIS-MUTANDIS FOR ALL THE CONSIGNMENTS RECEIVED BY RAIL AT RAILWAY SIDING.

13.7
FOR THE CONSIGNMENTS RECEIVED BY RAIL THE PAYMENT WILL BE REGULATED ON PRO-RATA BASIS ON THE **ACCEPTED UNIT RATE AS PER SL NO. A.2 OF RATE SCHEDULE SECTION A**. THE ABOVE ALSO INCLUDES ALL COSTS TOWARDS UNLOADING FROM THE WAGON AT THE UNLOADING SIDING IN THE PLANT AND LOADING ON THE TRANSPROT AND THE COST TOWARDS INTERNAL TRANSPORTATION TO STORAGE YARD/ STORES SHED OF BHEL/ CLIENT.

14.1 RE-SHIFTING AND RE-STACKING

OWING TO SEVERAL PROJECT REQUIREMENTS, MANY COMPONENETS MAY HAVE TO BE SHIFTED FROM ORIGINALLY STACKED LOCATIONS TO ELSEWHERE WITHIN THE PROJECT PREMISES FOR THE LEAD DISTANCE NOT EXCEEDING 2.5 KMS. THIS MAY INVOLVE LOADING OF SUCH MATERIAL ONTO A VEHICLE MOVING TO A NEW LOCATION AND UNLOADING/STACKING INCLUDING PROPER INSCRIPTION OF IDENTIFICATION MARKS IF NEEDED. LIST OF ITEMS DULY CERTIFIED BY BHEL OFFICIAL, SHIFTED, UPDATED STOCK RECORDS ABOUT CHANGE IN LOCATION ETC SHALL BE PREPARED/SUBMITTED ALONG WITH THE MONTHLY BILLS

SEPARATE ITEM RATE IS ASSIGNED FOR RESHIFTING AND RE-STACKING OF STACKED MATERIALS AND THE PAYMENT WILL BE REGULATED ON PRO-RATA BASIS ON THE ACCEPTED UNIT **RATE AS PER SL NO A.5 OF RATE SCHEDULE SECTION A**

14.2 RE-STACKING/RE-ARRANGING

OVER A PERIOD OF TIME, RESTACKING/REARRANGING OF THE MATERIALS STACKED EARLIER MAY ARISE DUE TO VARIOUS REASONS. THE HANDLING OF SUCH ITEMS WILL ALSO BE IN THE SCOPE OF THIS CONTRACT. THE RESTACKING/ RE-HANDLING MAY BE NECESSITATED FOR ANY EQUIPMENT/ MATERIALS COVERED WITHIN THIS WORK SPECIFICATION. CONTRACTOR SHALL DEPLOY NECESSARY RESOURCES LIKE MANPOWER, T&P, EQUIPMENTS ETC TO CARRY OUT THIS EXERCISE INCLUDING PROPER INSCRIPTION OF IDENTIFICATION MARKS IF NEEDED. LIST OF ITEMS DULY CERTIFIED BY BHEL OFFICIAL, RESTACKED, UPDATED STOCK RECORDS ABOUT CHANGE IN LOCATION ETC SHALL BE PREPARED/SUBMITTED ALONG WITH THE MONTHLY BILLS

RESTACKING AND REARRANGING SHALL BE APPLICABLE FOR MATERIALS RETURNED BY BHEL'S ERECTION CONTRACTORS ALSO.

15.0 MATERIAL HANDLING AND MATERIAL MANAGEMENT OF MATERIAL COLLECTION / DISPATCHES

15.1 INCOMING MATERIALS (SMALLS ETC)

15.1.1
EVEN THOUGH MAJORITY OF CONSIGNMENTS SHALL REACH SITE DIRECTLY FOR DELIVERY. A GOOD NUMBER OF CONSIGNMENTS SHALL BE BOOKED ON GOWDOWNS DELIVERY/ DOOR DELIVERY BASIS AGAINST ORIGINAL CONSIGNEE COPY BASIS, THE PROCEDURE OF MATERIAL COLLECTION SHALL BE ADOPTED AS DETAILED HERE BELOW:

15.1.2
CONTRACTOR SHALL KEEP IN TOUCH WITH OFFICIALS OF BHEL REGARDING ADVANCE INFORMATION ABOUT ARRIVAL OF CONSIGNMENTS. THE CONTRACTOR SHALL COLLECT ORIGINAL LRs/RRs/LORRY WAY BILLS OR OTHER SUCH DISPATCH DOCUMENTS

15.1.3
THE CONTRACTOR SHALL REMAIN IN REGULAR CONTACT WITH THE CONCERNED TRANSPORTERS OR RAILWAYS BASED ON THE DISPATCH DOCUMENTS OBTAINED AS STATED ABOVE AND MAKE ALL NECESSARY ARRANGEMENTS FOR COLLECTION / RECEIPT OF THE CONSIGNMENT AS APPLICABLE. CONTRACTOR SHALL TAKE ADVANCE ACTION TO DEPLOY ALL NECESSARY RESOURCES FOR LOCAL TRANSPORTATION, HANDLING AND UNLOADING OF THE ANTICIPATED CONSIGNMENTS SO AS TO ENSURE NO LOSS OF TIME UPON ARRIVAL OF THE CONSIGNMENTS. LOADING AT TRANSPORTERS GODOWN, LOCAL TRANSPORT UP TO BHEL/ CLIENT'S STORES/ SITE AND UNLOADING AT STORES/STORAGE YARD/SITE, VERIFICATION AND STACKING SHALL ALSO BE IN THE SCOPE OF CONTRACT.

15.1.4
DETENTION CHARGES/ DEMURRAGE/ WHARFAGE ETC., WHICH RESULT DUE TO CONTRACTOR'S FAULT, SHALL BE RECOVERED FROM THE BILL PAYMENT DUE TO THE CONTRACTOR.

15.1.5
SEPARATE ITEM RATE IS ASSIGNED FOR MATERIAL HANDLING AND MATERIAL MANAGEMENT OF INCOMING MATERIALS (SMALLS/FULL TRUCK LOADS) FROM TRANSPORTERS GODOWNS AND THE PAYMENT WILL BE REGULATED ON PRO-RATA BASIS ON THE **ACCEPTED UNIT RATE AS PER SL NO A.3 OF RATE SCHEDULE SECTION A** NO OTHER PAYMENT SUCH AS MINIMUM CHARGES FOR CARRIER ETC WILL BE MADE. ALL ARRANGEMENTS INCLUDING TRANSPORT, LABOUR AND OTHER T&P ETC IS IN CONTRACTOR'S SCOPE. THESE GODOWNS ARE EXPECTED TO BE LOCATED WITHIN A RADIUS OF 50 KM APPROX FROM THE PROJECT SITE.

15.1.6
ALL THE RESPONSIBILITIES SPECIFIED IN THE CONTRACTOR'S SCOPE FOR THE MATERIALS RECEIVED BY ROAD SHALL ALSO BE APPLICABLE MUTATIS-MUTANDIS FOR ALL THE CONSIGNMENTS (INCOMING SMALLS) RECEIVED FROM TRANSPORTERS GODOWN/S.

15.2 OUTGOING MATERIALS/DISPATCHES

15.2.1
FOR VARYING REASONS MANY A TIMES, PROJECT MATERIALS / BHEL ASSETS ARE TO BE DISPATCHED TO OTHER SITES/LOCATIONS.

15.2.2
CONTRACTOR SHALL IDENTIFY, TAG, PACK AND PREPARE GATE PASSES FOR THE MATERIALS TO BE DISPATCHED. MATERIALS SHALL BE LOADED ONTO THE OUTGOING VEHICLES WITH DUE CARE AND HANDED OVER TO THE TRANSPORTER WITH CLEAR GOODS RECEIPT WHICH SHALL BE SUBMITTED WITH BHEL PROMPTLY. BHEL SHALL MAKE ARRANGEMENT FOR THE TRANSPORT VEHICLES AT ITS OWN COST.
SEPARATE ITEM RATE IS ASSIGNED FOR MATERIAL HANDLING AND MATERIAL MANAGEMENT OF DISPATCH/OUTGOING MATERIALS AND THE PAYMENT WILL BE REGULATED ON PRO-RATA BASIS ON **THE ACCEPTED UNIT RATE AS PER SL NO A.3 OF RATE SCHEDULE SECTION A.**

15.2.3
SUCH MATERIALS WHICH NEED TO BE BROUGHT TO TRNASPORTER'S/RAILWAY GODOWN FOR BOOKING, ARRANGEMENTS SHALL BE ADOPTED AS MENTIONED BELOW:

CONTRACTOR SHALL ARRANGE SUITABLE VEHICLE FOR TRANSPORTATION OF MATERIALS /SMALLS FROM STORES/STORAGE YARD/SITE TO TRANSPORTERS GODOWNS, IDENTIFY, TAG, PACK AND PREPARE GATE PASSES FOR THE MATERIALS TO BE DISPATCHED. MATERIALS SHALL BE LOADED ONTO THE OUTGOING VEHICLE WITH DUE CARE AND HANDED OVER TO THE TRANSPORTER WITH CLEAR GOODS RECEIPT WHICH SHALL BE SUBMITTED WITH BHEL PROMPTLY WITHIN THE ACCEPTED RATES AS PER SL NO A.3 OF RATE SCHEDULE SECTION A

16.0 **MATERIAL MANAGEMENT SERVICES**

16.1

THE CONTRACTOR UNDER THIS CONTRACT SHALL PROVIDE FOLLOWING CATEGORIES OF SERVICES AT THE PROJECT SITE. THE RESOURCES DEPLOYED FOR MM SERVICES BY THE CONTRACTOR SHALL BE AT THE EXCLUSIVE DISPOSAL OF BHEL ON A FULL TIME BASIS. THESE SHALL NOT BE USED FOR ANY ACTIVITIES ASSOCIATED WITH THE NORMAL RESPONSIBILITIES ENVISAGED UNDER THIS CONTRACT OF MATERIAL HANDLING AND MATERIAL MANAGEMENT:

A. SUPERVISION/SECRETARIAL SERVICES

WORKING LEVEL SUPERVISION OF EACH WORK SPOT SHALL BE IN THE SCOPE OF CONTRACTOR UNDER REGULAR MATERIAL HANDLING WORK. ON THE OTHER HAND, SUPERVISORY SERVICES UNDER MM SERVICES SHALL BE AT ONE LEVEL HIGHER THAN WORKING LEVEL SUPERVISION BEING DONE AS CONTRACTOR'S RESPONSIBILITY TOWARDS MATERIAL HANDLING WORK. BHEL REQUIRES THAT THESE SERVICES SHALL BE TO OVERSEE AND MONITOR THE VARIOUS OPERATIONS/ACTIVITIES OF MATERIAL HANDLING PROCESS. MM SUPERVISORY SERVICES SHALL ENSURE SETTING BROAD GUIDELINES TO THE WORKING LEVEL SUPERVISORS, MONITORING PROGRESS OF OVERALL PLAN VIS-À-VIS IMPLEMENTATION, PROPER AND PROMPT TRACEABILITY OF STOCK IN THE STORES, IDENTIFICATION OF CORRECTIVE & PREVENTIVE ACTIONS IN MATERIAL HANDLING & STORAGE WORK AND IMPLEMENTATION OF A SYSTEMATIC PROCESS TO FINALLY ENSURE ACHIEVEMENT OF THE PROJECT SCHEDULE.

THESE SHALL ALSO INCLUDE SERVICES OF PERSONAL ASSISTANCE IN THE OFFICIAL WORK OF BHEL'S CONSTRUCTION MANAGER, SECRETARIAL SERVICES FOR CORRESPONDENCES AND DOCUMENTATION OF VARIOUS DEPARTMENTS OF BHEL SITE (ERECTION, COMMISSIONING, FINANCE & ACCOUNTS, STORES/MATERIAL MANAGEMENT ETC).

CONTRACTOR SHALL RENDER THE SERVICES BY ENSURING DEPLOYMENT OF REQUISITE PERSONNEL WITH ADEQUATE (MINIMUM DIPLOMA IN ENGINEERING FOR MM SUPERVISION, GRADUATION FOR SECRETARIAL SERVICES) EDUCATIONAL QUALIFICATION, HAVING THOROUGH EXPERIENCE IN RELATED FIELD TO ENABLE UNDERSTANDING THE INTRICACIES OF AND SPECIAL REQUIREMENTS INVOLVED IN HANDLING OF PROJECT MATERIALS, INCONSISTENCIES AND UNCERTAINTIES ASSOCIATED WITH IN/OUT FLOW OF MATERIALS, PROJECT ACTIVITIES AT ODD HOURS & HOLIDAYS AND IRREGULAR WORKING HOURS. CONTRACTOR SHALL ENSURE PROMPT AND TIMELY AVAILABILITY OF SUCH SERVICES.

APPROXIMATELY 45 SERVICE-MONTHS, SPREAD ACROSS VARIOUS NATURE OF SERVICES SHALL BE DEPLOYED PROMPTLY AS PER THE INSTRUCTION OF BHEL.

THE UNIT OF MEASUREMENT OF SUCH SERVICES RENDERED SATISFACTORILY BY ONE PERSON DURING ONE MONTH SHALL BE TERMED AS ONE **'SERVICE MONTH'.**

PAYMENT FOR THE SAME SHALL BE MADE AS PER THE SERVICE-MONTH RATE ACCEPTED IN **ITEM NO C.1 OF RATE SCHEDULE SECTION A.**

B. MENIAL SERVICES FOR BHEL OFFICE AND STORES ETC

SCOPE SHALL INCLUDE SERVICES OF OFFICE BOY/ MESSENGER/PEON AT BHEL OFFICE AND STORES, FOR HANDLING CORRESPONDENCES (DAK, DOCUMENTS, DRAWINGS ETC), AND OTHER SERVICES E.G. GARDENING, CLEANING ETC. **APPROXIMATELY 60 SERVICE-MONTHS**, SPREAD ACROSS VARIOUS NATURE OF SERVICES SHALL BE DEPLOYED PROMPTLY AS PER THE INSTRUCTION OF BHEL.

PAYMENT FOR THE SAME SHALL BE MADE AS PER THE SERVICE-MONTH RATE ASSIGNED IN **ITEM NO C.2 OF RATE SCHEDULE SECTION A.**

RATES FOR ITEM C.1 AND C.2 OF SECTION –A OF PRICE BID ARE FIXED ON THE BASIS OF TOTAL MINIMUM WAGES FOR CHHATISGARH AT THE TIME OF NIT AND THE SAME SHALL BE REVISED AT TIMES WHEN IT IS CHANGED BY THE GOVERNMENT AUTHORITIES.

THEREFORE PRICE VARATION COMPENSATION AND OVERRUN COMPENSATION WILL NOT BE APPLICABLE FOR ITEMS IN SECTION.C OF THE PRICE BID.

Payment against items in Section.C of price bid shall be calculated & paid in following manner;

- Per service month rate= 1.41 X Minimum Wages per Month (Rounded to next higher Fifty value)

Minimum wages per Month

Minimum wages per month = (Basic Wages + Special Allowance)

The minimum wages per month shall be calculated as per the rate of Department of Labor, Government of Chhatisgarh for Unskilled & Skilled category against Roads construction Building Operation & maintenance as given in the website of Ministry of Labours, Govt. of India for Chhatisgarh / OR http://www.paycheck.in/main/salary/minimumwages/.

Since the rates against manpower services are variable according to periodic revision, the Overrun compensation as per General Condition of Contract shall not be applicable for item no. C.1 (Supervision and Secretarial Services) & C.2 (Menial services for BHEL office and stores, site offices) of Price bid.

NOTE: BHEL AT ITS SOLE DISCRETION RESERVES THE RIGHT TO RE-SHUFFLE THE WORK ALLOCATION OF THE PERSONNEL DEPLOYED

IN CASE THE CONTRACTOR DOES NOT DEPLOY OR DELAYS DEPLOYMENT OF ABOVE SAID MANPOWER WITH REFERENCE TO SPECIFIC INSTRUCTIONS FROM BHEL, BHEL WILL RECOVER NON-REFUNDABLE PENALTY PER DAY OF DELAY IN THE FOLLOWING MANNER:

A. SUPERVISION/SECRETARIAL SERVICES @ Rs 500 PER MAN-DAY

B. MENIAL SERVICES FOR BHEL OFFICE AND STORES ETC @ Rs 300 PER MAN-DAY

GENERAL REQUIREMENTS – COMMON TO ALL WORK OF ERECTION TESTING AND COMMISSIONING

17.1
THE INTENT OF SPECIFICATION IS TO PROVIDE SERVICES ACCORDING TO THE MOST MODERN AND PROVEN TECHNIQUES AND CODES. THE OMISSION OF SPECIFIC REFERENCE TO ANY METHOD, EQUIPMENT OR MATERIAL NECESSARY FOR PROPER AND EFFICIENT EXECUTION OF THIS WORK SHALL NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF PROVIDING SUCH FACILITIES TO COMPLETE THE WORK WITHOUT ANY EXTRA COMPENSATION.

17.2
THE TERMINAL POINTS DECIDED BY BHEL SHALL BE FINAL AND BINDING ON THE CONTRACTOR FOR DECIDING THE SCOPE OF WORK AND EFFECTING PAYMENT FOR THE WORK DONE.

17.3
THE WORK SHALL BE EXECUTED UNDER THE USUAL CONDITIONS AFFECTING MAJOR POWER PLANT CONSTRUCTION AND IN CONJUNCTION WITH NUMEROUS OTHER OPERATIONS AT SITE. THE CONTRACTOR AND HIS PERSONNEL SHALL COOPERATE WITH PERSONNEL OF BHEL, BHEL'S CUSTOMER, CUSTOMER'S CONSULTANTS AND OTHER CONTRACTORS, COORDINATING HIS WORK WITH OTHERS AND PROCEED IN A MANNER THAT SHALL NOT DELAY OR HINDER THE PROGRESS OF WORK OF THE PROJECT AS A WHOLE.

17.4
THE WORK COVERED UNDER THIS SPECIFICATION IS OF HIGHLY SOPHISTICATED NATURE, REQUIRING THE BEST QUALITY WORKMANSHIP, SUPERVISION, ENGINEERING AND CONSTRUCTION MANAGEMENT. THE CONTRACTOR SHOULD ENSURE PROPER PLANNING AND SUCCESSFUL & TIMELY COMPLETION OF THE WORK TO MEET THE OVERALL PROJECT SCHEDULE. THE CONTRACTOR MUST DEPLOY ADEQUATE QUANTITY OF TOOLS & PLANTS, MODERN / LATEST CONSTRUCTION AIDS ETC. HE MUST ALSO DEPLOY ADEQUATE TRAINED, QUALIFIED AND EXPERIENCED SUPERVISORY STAFF AND SKILLED PERSONNEL.

17.5
CONTRACTOR SHALL ERECT AND COMMISSION ALL THE EQUIPMENTS AND AUXILIARIES AS PER THE SEQUENCE & METHODOLOGY PRESCRIBED BY BHEL DEPENDING UPON THE TECHNICAL REQUIREMENTS. AVAILABILITY OF MATERIALS AND FRONTS WILL DECIDE THIS. BHEL ENGINEER'S DECISION REGARDING CORRECTNESS OF THE WORK AND METHOD OF WORKING SHALL BE FINAL AND BINDING ON THE CONTRACTOR. NO CLAIMS FOR EXTRA PAYMENT FROM THE CONTRACTOR WILL BE ENTERTAINED ON THE GROUND OF DEVIATION FROM THE METHODS / SEQUENCE ADOPTED IN ERECTION OF SIMILAR SETS ELSEWHERE.

17.6
ALL NECESSARY CERTIFICATES AND LICENSES, PERMITS & CLEARANCES REQUIRED TO CARRY OUT THIS WORK FROM THE RESPECTIVE STATUTORY/ LOCAL AUTHORITIES ARE TO BE ARRANGED BY THE CONTRACTOR AT HIS COST IN TIME TO ENSURE SMOOTH PROGRESS OF WORK.

17.7
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17.8
THE WORK SHALL CONFIRM TO DIMENSIONS AND TOLERANCES SPECIFIED IN THE VARIOUS DRAWINGS / DOCUMENTS THAT WILL BE PROVIDED DURING VARIOUS STAGES OF ERECTION. IF ANY PORTION OF WORK IS FOUND TO BE DEFECTIVE IN WORKMANSHIP, NOT CONFORMING TO DRAWINGS OR OTHER STIPULATIONS DUE TO CONTRACTOR'S FAULT, THE CONTRACTOR SHALL DISMANTLE AND RE-DO THE WORK DULY REPLACING THE DEFECTIVE MATERIALS AT HIS COST, FAILING WHICH THE WORK WILL BE GOT DONE BY BHEL AND RECOVERIES WILL BE EFFECTED FROM THE CONTRACTOR'S BILLS TOWARDS EXPENDITURE INCURRED INCLUDING COST OF MATERIALS AND DEPARTMENTAL OVERHEADS OF BHEL.

17.9
THE CONTRACTOR SHALL PERFORM ANY SERVICES, TESTS ETC, WHICH MAY NOT BE SPECIFIED BUT NEVERTHELESS, REQUIRED FOR THE COMPLETION OF WORK WITHIN QUOTED RATES.

17.10
ALL NECESSARY CERTIFICATES AND LICENSES REQUIRED FOR CARRYING OUT THIS WORK ARE TO BE ARRANGED BY THE CONTRACTOR EXPEDITIOUSLY.

17.11
THE CONTRACTOR SHALL EXECUTE THE WORK IN THE MOST SUBSTANTIAL AND WORKMAN LIKE MANNER. THE STORES SHALL BE HANDLED WITH CARE AND DILIGENCE.

17.12
BHEL RESERVES RIGHT TO RECOVER FROM THE CONTRACTOR ANY LOSS WHICH ARISES OUT OF UNDUE DELAY / DISCREPANCY / SHORTAGE / DAMAGE OR ANY OTHER CAUSES DUE TO CONTRACTOR'S LAPSE DURING ANY STAGE OF WORK. ANY LOSS TO BHEL DUE TO CONTRACTOR'S LAPSE SHALL HAVE TO BE MADE GOOD BY THE CONTRACTOR.

17.13
ALL CRANES, TRANSPORT EQUIPMENT, HANDLING EQUIPMENT, TOOLS, TACKLES, FIXTURES, EQUIPMENT, MANPOWER, SUPERVISORS/ENGINEERS, CONSUMABLES ETC, EXCEPT OTHERWISE SPECIFIED AS BHEL SCOPE OF FREE ISSUE, REQUIRED FOR THIS SCOPE OF WORK SHALL BE PROVIDED BY THE CONTRACTOR. ALL EXPENDITURE INCLUDING TAXES AND INCIDENTALS IN THIS CONNECTION WILL HAVE TO BE BORNE BY CONTRACTOR UNLESS OTHERWISE SPECIFIED IN THE RELEVANT CLAUSES. THE CONTRACTOR'S QUOTED RATES SHOULD BE INCLUSIVE OF ALL SUCH CONTINGENCIES.

17.14
DURING THE COURSE OF ERECTION, TESTING AND COMMISSIONING CERTAIN REWORK / MODIFICATION / RECTIFICATION / REPAIR / FABRICATION ETC MAY BECOME NECESSARY ON

ACCOUNT OF FEED BACK / REVISION OF DRAWING ETC. THIS WILL ALSO INCLUDE MODIFICATIONS / RE-WORKS SUGGESTED BY BHEL / CUSTOMER / OTHER INSPECTION GROUP. CONTRACTOR SHALL CARRY OUT SUCH REWORK / MODIFICATION / RECTIFICATION / FABRICATION / REPAIR ETC PROMPTLY AND EXPEDITIOUSLY. DAILY LOG SHEETS SIGNED BY BHEL ENGINEER AND INDICATING THE DETAILS OF WORK CARRIED OUT, MAN-HOURS ETC SHALL BE MAINTAINED BY THE CONTRACTOR FOR SUCH REWORKS. CLAIM OF CONTRACTOR IF ANY, FOR SUCH WORKS WILL BE GOVERNED BY RELEVANT CLAUSES OF 'GENERAL CONDITIONS OF CONTRACT'.

17.15

ALL WORKS SUCH AS CLEANING, LEVELING, ALIGNING, TRIAL ASSEMBLY, DISMANTLING OF CERTAIN EQUIPMENTS / COMPONENTS FOR CHECKING AND CLEANING, SURFACE PREPARATION, FABRICATION OF STRUCTURES, TUBES AND PIPES AS PER GENERAL ENGINEERING PRACTICE AND AS PER BHEL ENGINEER'S INSTRUCTIONS AT SITE, CUTTING, GOUGING, WELD DEPOSITING, GRINDING, STRAIGHTENING, CHAMFERING, FILING, CHIPPING, DRILLING, REAMING, SCRAPPING, LAPPING, FITTING UP ETC AS MAY BE APPLICABLE IN SUCH ERECTION WORKS AND WHICH ARE TREATED INCIDENTAL TO THE ERECTION WORKS AND NECESSARY TO COMPLETE THE WORK SATISFACTORILY, SHALL BE CARRIED OUT BY THE CONTRACTOR AS PART OF THE WORK WITHIN THE QUOTED RATES.

17.16

THE CONTRACTOR SHALL MAKE ALL FIXTURES, TEMPORARY SUPPORTS, STEEL STRUCTURES REQUIRED FOR JIGS & FIXTURES, ANCHORS FOR LOAD AND GUIDE PULLEYS REQUIRED FOR THE WORK. CONTRACTOR SHALL ARRANGE NECESSARY STEEL FOR SUCH USAGE.

17.17

THE CONTRACTOR SHALL TAKE DELIVERY OF THE COMPONENTS, EQUIPMENTS, CHEMICALS, AND LUBRICANTS ETC FROM THE BHEL STORES/ STORAGE AREA AFTER GETTING THE APPROVAL OF BHEL ENGINEER ON STANDARD INDENT FORMS OF BHEL. COMPLETE AND DETAILED ACCOUNT OF THE MATERIALS AND EQUIPMENTS AFTER USAGE SHALL BE SUBMITTED TO THE BHEL AND RECONCILED PERIODICALLY.

17.18

THE DISTANCE BETWEEN STORAGE AREA AND ERECTION SITE IS APPROX 1.5 TO 2 KM**.** CONTRACTOR SHALL PLAN AND TRANSPORT EQUIPMENTS, COMPONENTS FROM STORAGE TO ERECTION SITE AND ERECT THEM IN SUCH A MANNER AND SEQUENCE THAT MATERIAL ACCUMULATION AT SITE DOES NOT LEAD TO CONGESTION AT SITE OF WORK. MATERIALS SHALL BE STACKED NEATLY, PRESERVED AND STORED IN THE CONTRACTOR'S SHED AND AT WORK AREAS IN AN ORDERLY MANNER. IN CASE IT IS NECESSARY TO SHIFT AND RE-STACK THE MATERIALS KEPT AT WORK AREAS/ SITE TO ENABLE OTHER AGENCIES TO CARRY OUT THEIR WORK OR FOR ANY OTHER REASON, SAME SHALL BE DONE BY CONTRACTOR MOST EXPEDITIOUSLY AS INCIDENTAL TO WORK.

17.19

PLANT MATERIALS SHOULD NOT BE USED FOR ANY TEMPORARY SUPPORTS / SCAFFOLDING/ PREPARING PRE-ASSEMBLY BED ETC.

17.20
THE DETAILS OF EQUIPMENTS TO BE ERECTED UNDER THIS CONTRACT ARE GENERALLY AS PER THE SCHEDULE GIVEN IN RELEVANT APPENDICES. THESE DETAILS ARE APPROXIMATE AND MEANT ONLY TO GIVE A GENERAL IDEA TO THE TENDERER ABOUT THE MAGNITUDE OF THE WORK INVOLVED. ACTUAL QUANTUM AND TYPE OF EQUIPMENTS WILL BE BASED ON THE RELEVANT ERECTION DOCUMENTS WHICH WILL BE FURNISHED TO THE CONTRACTOR IN DUE COURSE OF ERECTION AND THE WEIGHT AND QUANTITY AS PER THE RELEVANT ENGINEERING DOCUMENTS WILL ONLY BE ADMISSIBLE FOR THE BILLING PURPOSE.

17.21
HANGERS & SUSPENSIONS, SUPPORTS ETC FOR TUBES, PIPING, & DUCTS ETC WILL BE SUPPLIED IN RUNNING / RANDOM LENGTHS / SIZES WHICH SHALL BE CUT TO SUITABLE SIZES AND ADJUSTED AS REQUIRED.

17.22
SPRING SUSPENSION / CONSTANT LOAD HANGERS MAY HAVE TO BE PRE-ASSEMBLED FOR REQUIRED LOAD AND ERECTION CARRIED OUT AS PER INSTRUCTIONS OF BHEL. ADJUSTMENTS, REMOVAL OF TEMPORARY ARRESTS/LOCKS, CUTTING OF EXCESS THREAD LENGTH OF HANGER TIE-ROD ETC HAVE TO BE CARRIED OUT AS AND WHEN REQUIRED. LOAD SETTING OF SPRING HANGERS, AS PER BHEL'S DOCUMENTS/INSTRUCTIONS, DURING VARIOUS STAGES OF ERECTION & TESTING AND AFTER FLOATING OF PIPING/DUCTING DURING COLD AND HOT CONDITION WILL HAVE TO BE DONE AS PART OF WORK. THIS EXERCISE MAY HAVE TO BE REPEATED TILL SATISFACTORY RESULTS ARE ACHIEVED.

17.23
LAYOUT OF FIELD ROUTED/ SMALL BORE PIPING 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.

17.24
INSTALLATION AND WELDING OF NECESSARY INSTRUMENTATION TAPPING POINTS, & MEASUREMENT DEVICES, WILL ALSO BE THE RESPONSIBILITY OF THE CONTRACTOR AND WILL BE DONE AS PER THE INSTRUCTIONS OF BHEL SITE ENGINEER. THE INSTALLATION OF ALL THE ABOVE ITEMS WILL BE CONTRACTOR'S RESPONSIBILITY EVEN IF THE:

I. ITEMS ARE NOT SPECIFICALLY INDICATED UNDER THE RESPECTIVE PRODUCT GROUPS AS GIVEN IN THE TECHNICAL SPECIFICATIONS.

II. ITEMS ARE SUPPLIED BY AN AGENCY OTHER THAN BHEL.

NDE, AND POST WELD HEAT TREATMENT FOR ABOVE SHALL BE DONE AS PER THE SPECIFICATIONS AS PART OF WORK.

17.25
ACTUATORS/DRIVES OF VALVES, DAMPERS, GATES, POWERED VANES ETC MAY HAVE TO BE SERVICED, LUBRICATED, BEFORE ERECTION, DURING PRE-COMMISSIONING & COMMISSIONING, INCLUDING CARRYING OUT MINOR ADJUSTMENTS REQUIRED AS INCIDENTAL TO THE WORK.

17.26
ALL ELECTRICAL MOTORS HAVE TO BE TESTED FOR IR & PI VALUES PRIOR TO THE TRIAL RUN. WHERE REQUIRED, DRY OUT MAY HAVE TO BE CARRIED OUT BY USING EXTERNAL HEATING SOURCE. CONTRACTOR SHALL MAKE ALL ARRANGEMENTS IN THIS REGARD AND COMPLETE THE WORK AS INSTRUCTED. BHEL WILL PROVIDE THE MOTORIZED INSULATION TESTERS.

17.27
IN INSTALLATION OF VARIOUS EQUIPMENTS IT MAY BECOME NECESSARY TO INSTALL THESE ON TEMPORARY SUPPORTS/ HANGER DUE TO VARIOUS REASONS INCLUDING NON-AVAILABILITY OF SUSPENSION MATERIALS. CONTRACTOR SHALL INSTALL SUCH TEMPORARY SUSPENSIONS/HANGERS AND LATER ON SHIFT THE RELEVANT EQUIPMENTS TO THEIR RESPECTIVE PERMANENT HANGERS/ SUSPENSIONS/ SUPPORTS AS INCIDENTAL TO WORK. REQUISITE MATERIALS FOR SUCH TEMPORARY ARRANGEMENTS WILL BE PROVIDED BY BHEL ON FREE -RETURNABLE BASIS WHICH SHALL BE RETURNED TO BHEL AFTER THE USE.

17.28
THE WORK SHALL BE CARRIED OUT STRICTLY IN ACCORDANCE TO THE “FIELD QUALITY PLAN” APPROVED BY BHEL/CLIENT. CONTRACTOR, JOINTLY WITH BHEL, SHALL PREPARE ALL NECESSARY RECORDS OF MEASUREMENTS/READINGS/ PROTOCOLS ETC.

17.29
ALL WORKS SUCH AS CLEANING, LEVELLING, ALIGNING, TRIAL ASSEMBLY, DISMANTLING OF CERTAIN EQUIPMENTS / COMPONENTS FOR CHECKING AND CLEANING, SURFACE PREPARATION, FABRICATION OF SHEETS, TUBES AND PIPES AS PER THE GENERAL ENGINEERING PRACTICE AND AS PER BHEL ENGINEERS INSTRUCTIONS AT SITE, CUTTING, WELD DESPOSING, GRINDING, STRAIGHTENING, CHAMFERING, FILING, CHIPPING, DRILLING, REAMING, SCRAPING, LAPPING, FITTING UP ETC AS MAY BE APPLICABLE IN SUCH ERECTION WORKS AND WHICH ARE TREATED INCIDENTAL TO THE ERECTION WORK AND NECESSARY TO COMPLETE THE WORK SATISFACTORILY SHALL BE CARRIED OUT BY THE CONTRACTOR AS PART OF THE WORK.

17.30
INTERCONNECTION/ HOOKUP, IF ANY, WITH THE EXISTING SYSTEM SHALL FORM PART OF WORK. SUCH INTERCONNECTIONS, HOOKUPS MAY REQUIRE SHUT DOWN OF RUNNING PLANT AND THE RELEVANT WORK HAVE TO BE COMPLETED WITHIN SUCH PLANNED SHUTDOWNS. THIS MAY CALL FOR WORKING WITH ENHANCED RESOURCES AND ON EXTENDED HOURS. CONTRACTOR'S OFFER SHALL COVER ALL SUCH CONTINGENCIES.

17.31

CONTRACTOR SHALL REGULATE FLOW OF MATERIAL TO AND FROM SITE IN SUCH A MANNER AND SEQUENCE THAT MATERIAL ACCUMULATION AT SITE DOES NOT LEAD TO CONGESTION AT SITE. IN CASE IT IS NECESSARY TO SHIFT AND RESTACK THE MATERIALS KEPT AT WORK AREAS / SITE TO ENABLE OTHER AGENCIES TO CARRY OUT THEIR WORK OR FURTHER ANY OTHER REASON, IT SHALL BE DONE BY THE CONTRACTOR MOST EXPEDITIOUSLY. NO CLAIM FOR EXTRA PAYMENT FOR SUCH WORK WILL BE ENTERTAINED.

17.32

IT MAY SO HAPPEN THAT CERTAIN COMPONENTS LIKE MANHOLE DOORS, HANGER ETC MAY BE SUPPLIED IN LOOSE ITEMS. THEY NEED TO BE ASSEMBLED AS PER RELEVENT DRAWINGS OR AS PER ADVICE OF BHEL ENGINEER PRIOR TO ERECTION. THIS FORMS THE PART OF THE SCOPE OF WORK.

17.33

THE CONTRACTOR SHALL HAVE TOTAL RESPONSIBILITY FOR ALL EQUIPMENT AND MATERIALS IN HIS CUSTODY AT CONTRACTOR'S STORES, LOOSE, SEMI-ASSEMBLED, ASSEMBLED OR ERECTED BY HIM AT SITE. HE SHALL EFFECTIVELY PROTECT THE FINISHED WORKS FROM ACTION OF WEATHER AND FROM DAMAGES OR DEFACEMENT AND SHALL ALSO COVER THE FINISHED PARTS IMMEDIATELY ON COMPLETION OF WORK AS PER BHEL ENGINEER'S INSTRUCTIONS. THE MACHINE SURFACES/FINISHED SURFACES SHOULD BE GREASED AND COVERED.

17.34

BHEL IS OPERATING WEB BASED COMPUTERIZED SITE OPERATION MANAGEMENT SYSTEM (SOMS) THAT INCLUDES, INTER-ALIA, ISSUE OF MATERIALS, DAILY PROGRESS REPORTING, CONTRACTOR'S RUNNING MONTHLY BILLING AND MATERIAL RECONCILIATION THROUGH A COMPUTERIZED DATA MANAGEMENT SYSTEM. CONTRACTOR SHALL INSTALL NECESSARY HARDWARE TO HOOK-UP WITH THE BHEL'S SYSTEM AND USE THE SAME FOR HIS SCOPE OF WORK.

IN THE EVENT THE COMPUTERIZED SOMS IS INOPERATIVE FOR ANY REASONS, THE CONTRACTOR SHALL TAKE DELIVERY OF MATERIALS FROM THE STORAGE AREA/SHEDS OF BHEL/CUSTOMER AFTER GETTING THE APPROVAL OF THE ENGINEER/CUSTOMER ON STANDARD INDENT FORMS TO BE SPECIFIED BY BHEL/CUSTOMER. ALL THESE RECORDS HOWEVER SHALL BE UPDATED IN THE SOMS AS AND WHEN THE SOMS IS REACTIVATED/ NORMALIZED.

17.35

GASES LIKE ARGON, OXYGEN, ACETYLENE ETC THAT ARE REQUIRED FOR ERECTION RELATED ACTIVITIES SHALL BE ARRANGED BY THE CONTRACTOR AT HIS COST. FOR T-91 MATERIAL SITE WELD JOINTS ARGON AS PER GRADE-3 OF IS 5760: 1998 WITH OXYGEN AND WATER VAPOUR RESTRICTED TO MAX 6 PPM EACH AND WITH ARGON PURITY LEVEL OF MINIMUM 99.99% SHALL BE ARRANGED AND USED BY THE CONTRACTOR. THE SUPPLY SHOULD ACCOMPANY TEST CERTIFICATE FOR THE BATCH INDICATING INDIVIDUAL ELEMENT 'PPM' LEVEL AND OVERALL PURITY LEVEL.

17.38

ALL LUBRICANTS AND CHEMICALS REQUIRED FOR TESTING, PRESERVATION, CHEMICAL CLEANING / ACID CLEANING, OIL FLUSHING, AND THE LUBRICANTS FOR TRIAL RUNS OF THE EQUIPMENTS AND TRIAL OPERATION OF THE UNIT WILL BE SUPPLIED BY BHEL FREE OF CHARGES.

17.39

CONTRACTOR SHALL USE HIS OWN LIFTING TOOLS & TACKLES / CRANE OF SUITABLE CAPACITY WITH OTHER REQUIRED ARRANGEMENTS FOR THE ENTIRE SCOPE OF WORK. HOWEVER BHEL'S CUSTOMER IS HAVING ONLY ONE 60 / 10 T CAPACITY ELECTRIC OVERHEAD TRAVELLING (EOT) CRANE WITHIN THE TURBINE HALL AND FACILITY OF THIS EOT CRANE WILL BE EXTENDED FREE OF HIRE CHARGES FOR THE ERECTION OF TURBINES AND TURBO BLOWER EQUIPMENTS UNDER THIS TENDER SPECIFICATION DEPENDING ON AVAILABILITY, LIFTING CAPACITY, APPROACH & ACCESSIBILITY. NO CLAIMS ON ACCOUNT OF NON-AVAILABILITY OF BHEL/CLIENT'S CRANE SHALL BE ENTERTAINED AT ANY POINT OF TIME.

17.40

HEAVIER CONSIGNMENTS WEIGHING BETWEEN 55 – 60 MT I.E. SURFACE CONDENSER, BLOWER, DRIVE TURBINE HAS BEEN UNLOADED AT BHEL STORE YARD. CONTRACTOR HAS TO MAKE HIS OWN ARRANGEMENTS FOR SHIFTING OF THESE EQUIPMENTS FROM STORE YARD TO ERECTION SITE

19.0 PREPARATION OF FOUNDATIONS, AND GROUTING OF EQUIPMENT

19.1
BUILDING FOUNDATIONS AND OTHER NECESSARY CIVIL WORKS FOR SUPPORTING STRUCTURES, EQUIPMENTS ETC WILL BE PROVIDED BY BHEL / CUSTOMER. THE CHECKING OF DIMENSIONAL ACCURACY, AXES, ELEVATION, LEVELS ETC, WITH REFERENCE TO BENCH MARKS OF FOUNDATIONS AND ANCHOR BOLT PITS HAVE TO BE CHECKED AND LOGGED BY THE CONTRACTOR. THE PERMANENT BENCHMARK / REFERENCE MARKS WILL HAVE TO BE TRANSFERRED TO NEW LOCATIONS WITH SUFFICIENT CARE TO MAINTAIN THE ACCURACY AND PROTECTED / PRESERVED WITH ADEQUATE CARE (TO ENABLE RECHECKING AT LATER DATES) AS PER BHEL INSTRUCTION.

MINOR ADJUSTMENT OF FOUNDATION LEVEL, DRESSING AND CHIPPING OF FOUNDATION SURFACES AND BLUE-MATCHING (WHEREVER REQUIRED) FOR OF ALL EQUIPMENTS AS PER BHEL ENGINEERS INSTRUCTIONS, SHOULD BE DONE BY THE CONTRACTOR AS PART OF THE WORK. CONTRACTOR/BHEL SHALL PREPARE PROTOCOLS BEFORE TAKING OVER THE FOUNDATIONS. DRESSING AND CHIPPING OF FOUNDATIONS UPTO 35MM FOR ACHIEVING PROPER LEVELS WILL BE WITHIN THE SCOPE OF WORK/SPECIFICATION.

19.2
ALL TEMPORARY FOUNDATIONS AND ANCHOR POINTS REQUIRED FOR INSTALLING ERECTION EQUIPMENTS AND WINCHES, FOUNDATIONS FOR PUMPS, TANKS ETC ARE IN THE SCOPE OF CONTRACTOR. ALL BUILDING MATERIALS LIKE CEMENT, STEEL INCLUDING RE-INFORCEMENT BARS, GRITS CEMENTS ETC FOR SUCH TEMPORARY FOUNDATIONS SHALL HAVE TO BE ARRANGED BY THE CONTRACTOR WITHIN THE QUOTED RATES. ALL SUCH FOUNDATIONS SHALL BE DEMOLISHED AND NORMAL GROUND CONDITIONS RESTORED AFTER THE USAGE.

19.3
CONTRACTOR SHALL CARRY OUT SCRAPPING AND BLUE MATCHING OF EMBEDDED PLATES/ PACKERS. CHIPPING AND THE LEVELING OF CONCRETE SURFACES, FINE DRESSING UP TO THE EXTENT REQUIRED TO OBTAIN CONTACT BETWEEN PACKER AND CONCRETE, IS ALSO COVERED IN THE SCOPE OF THIS WORK. SCRAPPING, CHIPPING AND MATCHING SHALL BE DONE SO AS TO ACHIEVE PRESCRIBED PERCENTAGE OF CONTACT BETWEEN THE TWO SURFACES.

19.4
BHEL WILL PROVIDE FREE OF COST ONLY THE SHIMS AND PACKER PLATES (EITHER MACHINED OR PLAIN) WHICH GO AS PERMANENT PART OF THE EQUIPMENT. CERTAIN PACKER PLATES AND SHIMS OVER AND ABOVE THE QUANTITY RECEIVED AS A PART OF SUPPLIES FROM MANUFACTURING UNITS OF BHEL WILL HAVE TO BE CUT OUT FROM STEEL PLATES / STEEL SHEETS AT SITE TO MEET SITE REQUIREMENT. CONTRACTOR SHALL CUT AND PREPARE PACKERS AND SHIMS BY GAS CUTTING / CHISELING / GRINDING AND DE-BURR THE SAME. HOWEVER, MACHINING OF THE PACKERS WHEREVER NECESSARY SHALL BE ARRANGED BY CONTARACTOR.

19.5

COMPLETE GROUTING OF STRUCTURES EQUIPMENTS, INCLUDING ANCHOR/ FOUNDATION BOLTS, BENEATH BASE, BASE HOLLOWS ETC, AS MAY BE APPLICABLE, IS INCLUDED IN THE SCOPE OF CONTRACTOR. ARRANGING ALL LABOUR, BUILDING MATERIALS INCLUDING CEMENT, ORDINARY PORTLAND AS WELL AS QUICK SETTING – FREE FLOW - NON-SHRINK GROUT MIX (E.G. CONBEXTRA GP1/GP2), FORM WORK, SHUTTERING, AND ANY OTHER REQUIREMENTS IS IN THE CONTRACTOR'S SCOPE. CONTRACTOR SHALL OBTAIN APPROVAL OF BHEL FOR CEMENT (ORDINARY PORTLAND AS-WELL-AS QUICK SETTING – FREE FLOW- NON-SHRINK GROUT MIX) PRIOR TO USE. CLEANING OF FOUNDATION SURFACES, POCKET HOLES AND ANCHOR BOLT PITS AND DE-WATERING AND MAKING THEM FREE OF OIL, GREASE, SAND AND OTHER FOREIGN MATERIALS BY SODA WASHING, WATER WASHING, COMPRESSED AIR AND OTHER APPROVED METHODS ARE WITHIN THE SCOPE OF THIS SPECIFICATION/ WORK.

19.6

AFTER THE GROUTING HAS FINALLY SET AND CURED, ALIGNMENT OF EQUIPMENTS INVOLVED SHALL BE CHECKED AGAIN TO VERIFY FOR ANY DISTURBANCE OR ANY OTHER REASON. IF REQUIRED, DE-COUPLING OF EQUIPMENTS HAS TO BE DONE FOR CONDUCTING THE VERIFICATION. IN CASE ANY DISTURBANCE IS NOTICED THE CAUSE, IF ANY, SHALL BE REMOVED AND RE-ALIGNMENT DONE AS PART OF WORK.

20.0 WELDING, RADIOGRAPHY AND OTHER NON-DESTRUCTIVE TESTING, POST WELD HEAT TREATMENT

20.1 WELDING

20.1.1
INSTALLATION OF EQUIPMENT INVOLVES GOOD QUALITY WELDING, NDE CHECKS, POST WELD HEAT TREATMENT ETC. CONTRACTOR'S PERSONNEL ENGAGED SHOULD HAVE ADEQUATE QUALIFICATION ON THE ABOVE WORKS.

20.1.2
THE METHOD OF WELDING (VIZ) ARC, TIG OR OTHER METHOD WILL BE INDICATED IN THE DETAILED DRAWING/DOCUMENTS. BHEL ENGINEER WILL HAVE THE OPTION OF CHANGING THE METHOD OF WELDING AS PER SITE REQUIREMENT.

20.1.3
WELDING OF HIGH PRESSURE JOINTS SHALL BE DONE BY IBR CERTIFIED HIGH PRESSURE WELDERS WHO HAVE BEEN PERMITTED BY CIB OF STATE CONCERNED FOR DEPLOYMENT AT THE SITE OF WORK.

20.1.4
WELDING OF ALL ATTACHMENTS TO PRESSURE PARTS, PIPING SHALL BE DONE ONLY BY THE QUALIFIED AND APPROVED WELDERS.

20.1.5
BEFORE ANY WELDER IS ENGAGED ON WORK, HE SHALL BE TESTED AND QUALIFIED BY BHEL/ CUSTOMER, THOUGH THEY MAY POSSESS THE IBR/OTHER CERTIFICATE. BHEL RESERVES THE RIGHT TO REJECT ANY WELDER WITHOUT ASSIGNING ANY REASON. ALL THE EXPENDITURE IN TESTING/QUALIFICATION OF THE CONTRACTOR'S WELDER SHALL BE BORNE BY CONTRACTOR.

20.1.6
UNSATISFACTORY AND CONTINUOUS POOR PERFORMANCE MAY RESULT IN DISCONTINUATION OF CONCERNED WELDER.

20.1.7
THE WELDED SURFACE SHALL BE CLEANED OF SLAG AND PAINTED WITH PRIMER PAINT TO PREVENT RUSTING, CORROSION. FOR THIS CONSUMABLES LIKE PAINT /PRIMER ETC WILL BE IN THE CONTRACTOR'S SCOPE.

20.1.8
HP JOINT FIT-UPS, SHOULD BE PROTECTED, WHERE REQUIRED, BY USE OF TAPES/PROTECTIVE PAINT AS MAY BE PRESCRIBED BY BHEL. THE CONTRACTOR SHALL SUPPLY PROTECTIVE PAINTS/TAPES ETC

20.1.9

THE CONTRACTOR SHALL MAINTAIN WELDING RECORDS IN THE FORM AS PRESCRIBED BY BHEL CONTAINING ALL NECESSARY DETAILS, AND SUBMIT THE SAME TO THE BHEL ENGINEER AS REQUIRED. INTERPRETATION OF THE BHEL ENGINEER REGARDING ACCEPTABILITY OF THE WELDS SHALL BE FINAL.

20.1.10
PREHEATING, INTER-PASS HEATING, POST WELD HEATING AND STRESS RELIEVING AFTER WELDING ARE PART OF ERECTION WORK AND SHALL BE PERFORMED BY THE CONTRACTOR IN ACCORDANCE WITH BHEL ENGINEER'S INSTRUCTIONS. NORMALLY THE ELECTRIC RESISTANCE HEATING METHOD WILL BE ADOPTED. CONTRACTOR SHALL ARRANGE TO SUPPLY HEATING EQUIPMENT WITH AUTOMATIC RECORDING DEVICES. ALSO THE CONTRACTOR SHALL HAVE TO ARRANGE FOR LABOUR, ALL HEATING ELEMENTS, THERMOCOUPLES AND ATTACHMENT UNITS, GRAPH SHEETS, THERMAL CHALKS, & INSULATING MATERIALS LIKE MINERAL WOOL, ASBESTOS CLOTH, CERAMIC BEADS, ASBESTOS ROPES ETC, REQUIRED FOR ALL HEATING AND STRESS RELIEVING WORKS.

20.1.11
ALL THE RECORDED GRAPHS FOR HEAT TREATMENT WORKS SHALL BE THE PROPERTY OF BHEL AND SHALL BE HANDED OVER TO BHEL SITE IN-CHARGE WHEN DEMANDED.

20.1.12
JOINT FIT UP WILL BE A STAGE OF INSPECTION. WHERE REQUIRED, JOINTS SHALL BE OFFERED FOR VISUAL INSPECTION AFTER ROOT RUN. SUBSEQUENT WELDING SHOULD BE MADE ONLY AFTER THE APPROVAL OF ROOT RUN.

20.2.0 SOCKET WELDING

IN EXECUTION OF THIS WORK, CONSIDERABLE NUMBER OF SOCKET WELD JOINTS IS INVOLVED. THE EXACT QUANTITY OF SUCH SOCKET WELDS OR PROBABLE VARIATION IN THE QUANTUM CANNOT BE FURNISHED. THE TENDERER SHALL TAKE NOTICE OF THIS WHILE QUOTING AS NO EXTRA CLAIM ON THIS ACCOUNT WILL BE ENTERTAINED.

20.2.1
WELDING ELECTRODES HAVE TO BE STORED IN ENCLOSURES HAVING TEMPERATURE AND HUMIDITY CONTROL ARRANGEMENTS. THIS ENCLOSURE SHALL MEET BHEL SPECIFICATIONS.

20.2.2
WELDING ELECTRODES, PRIOR TO THEIR USE, CALL FOR BAKING FOR SPECIFIED PERIOD AND WILL HAVE TO BE HELD AT SPECIFIED TEMPERATURE FOR SPECIFIED PERIOD. ALSO, DURING EXECUTION, THE WELDING ELECTRODES HAVE TO BE CARRIED IN PORTABLE OVENS.

20.2.3
THE PIPING WORK COMING UNDER IBR PURVIEW (E.G. WELDING, HEAT TREATMENT OF HP JOINTS) HAS TO BE EXECUTED AS PER THE LATEST VERSION OF INDIAN BOILER REGULATION AND AMENDMENTS THEREOF. BHEL WILL FURNISH IBR DOCUMENTS AND DRAWINGS FOR PIPING &

FITTINGS AND FURTHER APPROVALS OF IBR/ STATUTORY AUTHORITIES FOR DRAWINGS, PRE-ASSEMBLY & ERECTION AND OTHER WORKS SHALL BE TAKEN BY CONTRACTOR.

20.3.0 HEAT TREATMENT:

20.3.1
FOR THE PURPOSE OF TEMPERATURE RECORDING OF STRESS RELIEVING PROCESS WHEREVER APPLICABLE, THERMOCOUPLES HAVE TO BE ATTACHED TO THE WELD JOINT. THE NUMBER OF TEMPERATURE MEASURING POINTS AND LOCATIONS SHALL BE AS PER THE STANDARDS OF BHEL. THERMOCOUPLES HAVE TO BE ATTACHED USING CAPACITOR DISCHARGE TYPE PORTABLE THERMOCOUPLE ATTACHMENT UNIT. CONTRACTOR SHALL ARRANGE SUFFICIENT NUMBER OF THERMOCOUPLE ATTACHMENT UNITS.

20.3.2
CONTRACTOR SHOULD PROVIDE TEMPERATURE INDICATOR / TEMPERATURE RECORDER FOR MEASURING TEMPERATURE DURING PRE-HEATING FOR WELDING OR FOR CONTROLLING TEMPERATURE OF METAL FOR HOT CORRECTION ETC. THE TEMPERATURE RECORDERS SHOULD BE PREFERABLY OF SOLID STATE TYPE.

20.3.3
HEAT TREATMENT MAY BE REQUIRED TO BE CARRIED OUT AT ANY TIME (DAY OR NIGHT) TO ENSURE THE CONTINUITY OF THE PROCESS. THE CONTRACTOR SHALL MAKE ALL NECESSARY ARRANGEMENTS INCLUDING LABOURER REQUIRED FOR THE SAME AS PER DIRECTIONS OF BHEL.

20.3.4
IN CERTAIN CASES ONLY THE PRE-HEATING OF WELD JOINTS MAY BE CALLED FOR.

20.3.5
FOR WELD JOINTS OF HEAVY STRUCTURAL SECTIONS, IF HEAT TREATMENT IS REQUIRED, THE SAME SHALL BE CARRIED OUT AS PART OF THE WORK.

20.3.6
CHECKING EFFECTIVENESS OF STRESS RELIEVING BY HARDNESS TESTS (BY DIGITAL HARDNESS TESTER OR OTHER APPROVED TEST METHODS AS PER BHEL ENGINEER'S INSTRUCTION) INCLUDING NECESSARY TESTING EQUIPMENTS IS WITHIN THE SCOPE OF THE WORK / SPECIFICATION.

20.3.7
ALL THE RECORDED GRAPHS FOR HEAT TREATMENT SHALL BE HANDED OVER TO BHEL/ IBR AUTHORITIES AND DUE CLEARANCES OBTAINED.

20.3.8
RESULTS OF THESE PROCESSES SHALL BE VERIFIED/ VALIDATED AS PER REQUIREMENTS OF BHEL/CLIENT.

20.3 NON DESTRUCTIVE EXAMINATION:

20.3.1
CONTRACTOR SHALL PROVIDE ALL RESOURCES AND MAKE ALL ARRANGEMENTS FOR THE RADIOGRAPHIC EXAMINATION OF WELDS FOR THIS WORK FOR REASONS OF SAFETY; INVARIABLY THE RADIOGRAPHY WORK WILL BE CARRIED OUT AFTER THE NORMAL WORKING HOURS AND CLOSE OF OTHER SITE ACTIVITIES ONLY. IN THIS REGARD, THE CONTRACTOR HAS TO ADHERE TO THE SAFETY RULES / REGULATIONS LAID BY BARC AUTHORITIES FROM TIME TO TIME.

20.3.2
RADIOGRAPHY INSPECTION OF WELDS SHALL BE PERFORMED IN ACCORDANCE WITH REQUIREMENTS AND RECOMMENDATION OF BHEL ENGINEER. THE MINIMUM QUANTUM OF RADIOGRAPHIC INSPECTION SHALL BE AS PER PROVISION OF IBR/BHEL'S ERECTION DOCUMENTS. THEY MAY, HOWEVER BE INCREASED DEPENDING UPON THE PERFORMANCE OF THE INDIVIDUAL WELDER AT THE DISCRETION OF BHEL ENGINEER/BOILER INSPECTING AUTHORITY. BIDDER SHALL ALSO ARREAGE THE UT EQUIPMENT WITH RECORDING FACILITY AT HIS OWN COST. USAGE OF UT EQUIPMENT SHALL BE AS PER DIRECTION OF BHEL ENGINEER. RECORDS OF UT SHALL BE PRODUCED AS PER SITE REQUIREMENT.

20.3.3
ALL X-RAY / GAMMA RAY FILMS OF WELD JOINTS SHALL BE PRESERVED PROPERLY AND BE HANDED OVER TO BHEL AND REQUISITE CLEARANCES SHALL BE OBTAINED BY THE CONTRACTOR.

20.3.4
THE FIELD WELDED JOINTS SHALL BE SUBJECT TO DYE-PENETRANT/MPT/RT/ OTHER NON-DESTRUCTIVE EXAMINATION AS SPECIFIED IN THE RESPECTIVE ENGINEERING DOCUMENTS/ AS INSTRUCTED BY BHEL.

20.3.5
WHEREVER REQUIRED, SURFACE PREPARATION, LIKE SMOOTH GRINDING OF WELDED AREA, PRIOR TO RADIOGRAPHY SHALL BE DONE. IT MAY ALSO BECOME NECESSARY TO ADOPT INTER-LAYER RADIOGRAPHY/MPT/UT DEPENDING UPON THE SITE/ TECHNICAL REQUIREMENT NECESSITATING INTERRUPTIONS IN CONTINUITY OF THE WORK AND MAKING NECESSARY ARRANGEMENTS FOR CARRYING OUT THE ABOVE WORK. THE CONTRACTOR SHALL TAKE ALL THIS INTO ACCOUNT IN HIS OFFER. THE REQUIRED NDT METHOD/PROCEDURE WILL BE DECIDED BY BHEL ENGINEER AT SITE.

20.3.6
TENDERER SHALL NOTE THAT 100% RADIOGRAPHY SHALL BE TAKEN ON ALL HIGH PRESSURE WELDING TILL SUCH TIME THE WELDERS' PERFORMANCE IS FOUND BY BHEL ENGINEERS TO BE SATISFACTORY. SUBSEQUENTLY, SUBJECT TO CONSISTENCY IN WELDER'S PERFORMANCE, THE PERCENTAGE OF RADIOGRAPHY WILL BE BASED ON BHEL'S STANDARD PRACTICE/CODE REQUIREMENT. THE DEFECTS SHALL BE RECTIFIED IMMEDIATELY AND TO THE SATISFACTION OF

BHEL ENGINEER. THE DECISION OF BHEL ENGINEER REGARDING ACCEPTANCE / REJECTING THE JOINTS WILL BE FINAL AND BINDING ON THE CONTRACTOR.

20.3.7
100% RADIOGRAPH OF CERTAIN SIZES IN PIPING HAVE TO BE TAKEN AS PER BHEL STANDARDS/ DRAWINGS.

20.3.8
FOR CARRYING OUT ULTRASONIC TESTING OF WELDING JOINTS OF LARGE SIZE TUBES AND PIPES, IT WILL BE NECESSARY TO PREPARE SURFACE BY GRINDING AND BUFFING A SMOOTH FINISH AND CONTOUR AS NECESSARY. THE CONTRACTOR'S SCOPE OF WORK INCLUDES SUCH PREPARATION AS INCIDENTAL TO WORK.

20.3.9
CONTRACTOR MAY HAVE TO UNDERTAKE RADIOGRAPHY WITH COBALT-60 ISOTOPE CAMERA IN CERTAIN CASES. HOWEVER, FOR ANY REASON IF USE OF COBALT-60 IS NOT POSSIBLE THEN THESE JOINTS SHALL BE CHECKED BY RADIOGRAPHY AFTER COMPLETION OF WELDING UP TO SUITABLE PART OF THICKNESS WITH IR–192 OTHER SUITABLE SOURCE SUBSEQUENTLY AFTER COMPLETING THE JOINT UT TO BE DONE. FOR THIS CONTRACTOR HAS TO DEPLOY LEVEL–II OPERATOR CERTIFIED BY BARC.

20.3.10
NO SEPARATE PAYMENT FOR ANY NDE ACTIVITIES (INCLUDING RADIOGRAPHY) WILL BE MADE.

21.0 CONDENSER INSTALLATION

21.0.1

THE SHELL ASSEMBLY FOR EACH UNIT (WITH SHELL, TUBE SHEET, SUPPORT PLATES, SPACERS ETC) WEIGHING ABOUT 41 MT HAS BEEN RECEIVED FROM BHEL MANUFACTURING UNIT IN ASSEMBLED CONDITION. CONTRACTOR SHALL HAVE TO CARRY OUT FURTHER WORKS LIKE LOCAL TRANSPORTATION UP TO FOUNDATION, HANDLING, LIFTING, POSITIONING & PLACEMENT, FIXING AND ALIGNMENT ETC. HOWEVER OTHER PARTS LIKE CONDENSER TUBES, HOT WELL ASSY, DOME ASSY, STRAND PIPES, SURGE PIPES, COLLAR/SLEEVE PIPE, TOP CONNECTING PIECE, STAINLESS STEEL BELLOWS, FOUNDATION PARTS, AIR EXTRACTION PIPES, ETC-WILL BE SENT LOOSE. THE ASSEMBLED CONDENSER SHELL ASSY IS TO BE HANDLED AT SITE INCLUDING UNLOADING FROM THE TRAILER, TRANSPORTATION TO SITE OF WORK, LIFTING, POSITIONING & PLACEMENT ON FOUNDATION IN TURBINE HALL BY CONTRACTOR USING HIS OWN REQUIRED CAPACITY CRANE/ SUITABLE ARRANGEMENT. ASSEMBLY AND WELDING OF OTHER LOOSE PARTS LIKE HOT-WELL, COLLAR/SLEEVE, SS BELLOWS STAND/SURGE PIPES, TOP CONNECTING PIPE TO TURBINE EXHAUST HOOD COUNTER FLANGE, INSERTION, EXPANSION, FLARING OF CONDENSER TUBES SHALL BE CARRIED OUT AT SITE. WELDING OF TOP CONNECTING PIPE TO COUNTER FLANGE OF TURBINE EXHAUST HOOD WILL BE CARRIED OUT AFTER FINAL ALIGNMENT AND LEVELLING OF TURBINE, & AS PER THE SEQUENTIAL WELDING PROCEDURE.

21.0.2

IT WILL REQUIRE CLEANING OF WATER SIDE SURFACE, OPENING OF MANHOLE/WATER BOX COVERS & RETIGHTEN THE SAME AFTER REPLACEMENT OF PACKING/GASKETS, CARRY OUT HYDRAULIC TEST & WATER FILL TEST ON STEAM SIDE AND WATER SIDE SPACE. ALL ABOVE SHALL BE CARRIED BY CONTRACTOR INCLUDING ATTENDING THE LEAKAGES (IF ANY) AS PART OF WORK UNDER THIS TENDER SPECIFICATION.

21.0.3

ALL WATER SIDE SURFACES OF WATER CHAMBERS SHALL BE PAINTED ONLY AFTER COMPLETION OF WORK AND WATER FILL TEST/ HYDRO TEST. WELDING & INTERFACING OF CONDENSER COOLING WATER CONNECTION FROM CUSTOMER TERMINAL POINT WILL BE DECIDED BY BHEL ENGINEER AT SITE AND SHALL BE BINDING ON CONTRACTOR.

21.0.4

FOR SURFACE PREPARATION, THE WATER BOXES ETC., MAY HAVE TO BE SAND/SHOT BLASTED TO REMOVE ALL TRACES OF SHOP COAT OF PRIMER. THE SPECIFIED PRIMER & PROTECTIVE PAINT AS SPECIFIED (QUALITY AND FINAL DRY FILM THICKNESS) IN ERECTION DOCUMENTS SHALL BE APPLIED. PRIMER AND PAINT SHALL BE PROVIDED BY THE CONTRACTOR.

22.0 TURBO BLOWER INSTALLATION

22.0.1

BLOWER OF EACH UNIT WEIGHING ABOUT 60 MT HAS BEEN RECEIVED FROM BHEL MANUFACTURING UNIT IN FULLY ASSEMBLED CONDITION ON PERMANENT BASE FRAME. CONTRACTOR SHALL HAVE TO

CARRY OUT FURTHER WORKS LIKE LOCAL TRANSPORTATION UP TO FOUNDATION, HANDLING, LIFTING, POSITIONING & PLACEMENT, FIXING AND ALIGNMENT ETC OF THE TURBO BLOWER ON FOUNDATION IN TURBINE HALL AND FURTHER ERECTION, TESTING & COMMISSIONING ACTIVITIES.

CONTRACTOR SHALL USE HIS OWN LIFTING TOOLS & TACKLES / CRANE OF SUITABLE CAPACITY WITH OTHER REQUIRED ARRANGEMENTS FOR THE ENTIRE SCOPE OF WORK. HOWEVER BHEL'S CUSTOMER IS HAVING ONLY ONE 60 / 10 T CAPACITY ELECTRIC OVERHEAD TRAVELLING (EOT) CRANE WITHIN THE TURBINE HALL AND FACILITY OF THIS EOT CRANE WILL BE EXTENDED FREE OF HIRE CHARGES FOR THE ERECTION OF TURBINES AND TURBO BLOWER EQUIPMENTS UNDER THIS TENDER SPECIFICATION DEPENDING ON AVAILABILITY, LIFTING CAPACITY, APPROACH & ACCESSIBILITY. NO CLAIMS ON ACCOUNT OF NON-AVAILABILITY OF BHEL/CLIENT'S CRANE SHALL BE ENTERTAINED AT ANY POINT OF TIME

23.0 STEAM TURBINES INSTALLATION

23.0.1

STEAM TURBINES ALONG WITH CASING, ROTOR, BEARINGS, BASE FRAME ETC. TOTAL WEIGHING ABOUT 50 MT FOR EACH UNIT WILL HAS BEEN RECEIVED FROM BHEL MANUFACTURING UNIT IN FULLY ASSEMBLED CONDITION. CONTRACTOR SHALL HAVE TO CARRY OUT FURTHER WORKS LIKE LOCAL TRANSPORTATION UP TO FOUNDATION, HANDLING, LIFTING, POSITIONING & PLACEMENT, FIXING AND ALIGNMENT ETC. THE SERVICES OF CUSTOMERS EOT CRANE OF CAPACITY 60 / 10 MT WILL BE EXTENDED FREE OF CHARGES SUBJECT TO ITS AVAILABILITY, ACCESSIBILITY, SUITABILITY AND APPROACHABILITY. THE KEEPING IN VIEW THE MARGINAL LIFTING & HANDLING CAPACITY OF CUSTOMER EOT CRANE FOR LIFTING OF STEAM TURBINE, CONTRACTOR MAY HAVE TO DISMANTLE THE TURBINE BASE FRAME, TOP COVER, BEARINGS ETC. CONTRACTOR SHALL CARRY OUT THIS JOB BY USING HIS OWN T&P AND FABRICATE SUITABLE TEMPORARY FIXTURE/SUPPORTS BY PROVIDING REQUIRED QUANTITY STEEL MATERIALS LIKE ISMB BEAM/ANGLES SECTIONS TO KEEP STEAM TURBINE ON THIS TEMPORARY SUPPORTS/FIXTURE AND RE-ASSEMBLE THE TURBINE ON DISMANTLED PERMANENT BASE FRAME AFTER THEIR LIFTING AND PLACEMENT ON FOUNDATION. CONTRACTOR SHALL UTMOST CARE TO DISMANTLE, FABRICATE TEMPORARY SUPPORT/FIXTURE AND RE-ASSEMBLE THE STEAM TURBINE AND ALL THESE WORKS SHALL BE THE PART OF SCOPE OF ERECTION. CONTRACTOR SHALL HAVE TO CARRY OUT FURTHER WORKS LIKE HANDLING, LIFTING, POSITIONING & PLACEMENT OF THE STEAM TURBINE ON FOUNDATION IN TURBINE HALL AND FURTHER ERECTION, TESTING & COMMISSIONING WORKS.

23.0.2

GEAR BOX, FOUNDATION PARTS/BASE PLATES, TURBO-VISORY INSTRUMENTS LIKE PROXIMITORS/PROBES AND OTHER ASSOCIATED ITEMS/AUXILIARIES WILL BE SENT LOOSE SEPARATELY. CONTRACTOR SHALL CARRY OUT ERECTION, ASSEMBLY, PROVIDING PROTECTIVE FLEXIBLE CONDUIT AS REQUIRED FOR SUCH INSTRUMENTS LIKE PROXIMITORS/PROBES, RTDS ETC AND TESTING.

24.0 OTHER ROTATING MACHINES INSTALLATION

24.0.1

ALL ROTATING MACHINERY AND EQUIPMENTS SHALL BE CLEANED, LUBRICATED, CHECKED FOR THEIR SMOOTH ROTATION, IF NECESSARY, BY DISMANTLING AND RE-FITTING BEFORE ERECTION. IF IN THE OPINION OF BHEL ENGINEER, THE EQUIPMENT IS TO BE CHECKED FOR CLEARANCES, TOLERANCES AT ANY STAGE OF THE WORK OR DURING TESTING, PRE-COMMISSIONING, FACILITIES FOR DISMANTLING, CLEANING, LUBRICATING AND RE-FITTING SHALL BE PROVIDED BY THE CONTRACTOR. ALL ROTATING MACHINES SHAFT SHALL BE ROTATED PERIODICALLY TO AVOID BOWING OF SHAFTS.

24.0.2
TRIAL RUN OF THE DRIVE IN UN-COUPLED STATE AND THEN COUPLED WITH EQUIPMENT HAS TO BE DONE AFTER NECESSARY ALIGNMENT ETC

24.0.3
FORCED LUBE OIL SYSTEMS OF MOTORS AND/OR ROTATING EQUIPMENTS FORM THE PART OF WORK UNDER THIS SPECIFICATION

24.0.4
PERFORMANCE OF HYDRO TEST OF OIL COOLERS AND AIR COOLERS OF ROTATING MACHINES, IF ANY, IS INCLUDED IN THE SCOPE OF WORK.

24.0.5
DURING CHARGING OF SYSTEM IF ANY LEAKAGE IS FOUND IN OIL COOLER, AIR COOLER, SAME SHALL BE ATTENDED BY CONTRACTOR. BHEL WILL PROVIDE NECESSARY GASKETS ETC.

4.6.6
CERTAIN ROTATING MACHINERY AFTER, INITIAL RUNS AND COMMISSIONING OF THE EQUIPMENT, MAY HAVE TO BE HOT ALIGNED.

24.0.7
PROTECTIVE LUBRICANT COATS/FILL PROVIDED ON THE CRITICAL AREA OF EQUIPMENTS HAVE TO REMOVED AT APPROPRIATE STAGE AND REGULAR LUBRICANTS, AFTER REMOVAL/CLEANING OF PROTECTIVE COAT/FILL, AS PER SPECIFICATIONS SHOULD BE FILLED/APPLIED. CLEANING/FLUSHING AGENTS/OILS WILL BE PROVIDED BY BHEL.

24.0.8
AFTER INITIAL TRIAL OF ROTATING EQUIPMENTS, CONTROL AND POWER CABLING FOR MOTORS AND OTHER EQUIPMENTS/INSTRUMENTATION MAY HAVE TO BE DISCONNECTED FOR CHECKING ALIGNMENT AND RE-SETTING / RE-ALIGNMENT / HOT-ALIGNMENT. CONTRACTOR WILL HAVE TO ARRANGE LABOUR FOR DISCONNECTING CONTROL AND POWER CABLING AS PER BHEL ENGINEER'S INSTRUCTIONS AND CLEARANCE AND RECONNECT THE CONTROL AND POWER CABLING AFTER RE-ALIGNMENT, QUOTED TONNAGE RATE SHALL BE INCLUSIVE OF THE ABOVE.

24.0.9

EVEN THOUGH ROTATING MACHINES MAY BE GROUTED TO FOUNDATION USING NON-SHRINK GROUT MIX, BLUE MATCHING OF PACKER PLATES/SHIMS WITH FOUNDATION/BETWEEN PACKERS/EQUIPMENT BASE SHOULD BE DONE WHEREVER INSTRUCTED BY BHEL ENGINEER.

24.0.10

VITAL CLEARANCES OF SHOP ASSEMBLED ROTATING MACHINES SHOULD BE CHECKED AT SITE AND ADJUSTED IF REQUIRED.

25.0 TESTING, PRE-COMMISSIONING, COMMISSIONING AND PG TEST

25.0.1

TESTING, PRE-COMMISSIONING, & COMMISSIONING WILL INVOLVE, THOUGH NOT LIMITED TO THESE, VARIOUS TESTING, TRIAL RUNS OF VARIOUS EQUIPMENTS ERECTED AND SYSTEMS INSTALLED, FLUSHING OF THE LINES BY AIR, OIL OR STEAM AS THE CASE MAY BE, CHEMICAL CLEANING OF VARIOUS SYSTEMS & PIPING, OIL-FLUSHING, STEAM BLOWING OF THE PIPE LINES, STEAM ROLLING, COMBINED OPERATION , TRIAL OPERATION ETC, ARE SOME OF THESE ACTIVITIES. ALL THE ACTIVITIES FOR COMMISSIONING OF THE SET, AS INFORMED BY BHEL FROM TIME TO TIME SHALL BE COMPLETED.

25.0.2

ALL THE ABOVE TESTS MAY HAVE TO BE REPEATED TILL ALL THE EQUIPMENTS SATISFY THE REQUIREMENT/ OBLIGATIONS OF BHEL TO THEIR CLIENT AND ALSO THE RELEVANT STATUTORY AUTHORITY.

25.0.3

FOR THE PURPOSE OF CHEMICAL CLEANING, STEAM BLOWING, OIL FLUSHING & HYDRAULIC TEST OF PIPING, CONTRACTOR SHALL LAY/INSTALL NECESSARY TEMPORARY PIPING, VALVES FOR CONDUCT OF HYDRAULIC TEST, OIL FLUSHING, CHEMICAL CLEANING, STEAM BLOWING ETC THIS MAY INVOLVE CUTTING OF SOME PORTION OF EXISTING PIPING/VALVES, PLACING OF RUBBER WEDGES/ BLANKS IN THE VALVES AND OTHER OPENINGS, INSTALLATION OF TEMPORARY TANKS FOR CHEMICAL MIXING, TEMPORARY ACCESS PLATFORMS TO MIXING TANKS ETC WHERE REQUIRED, BENDS HAVE TO BE FABRICATED AT SITE FROM RUNNING LENGTH OF PIPE. TEMPORARY INSTALLATION ITSELF HAS TO BE TESTED, TRIED, AND SUBJECT TO NON-DESTRUCTIVE EXAMINATIONS AS PER THE INSTRUCTIONS OF BHEL AS PART OF WORK.

25.0.4

ALL MATERIALS, EQUIPMENTS NECESSARY FOR INSTALLATION OF TEMPORARY SYSTEM AS ABOVE WILL BE SUPPLIED BY BHEL IN RANDOM SIZES/LENGTHS. HOWEVER, SERVICING, FABRICATION, ERECTION, DISMANTLING OF THE SAME AFTER COMPLETION OF THE PROCESS, AND HANDING OVER BACK TO BHEL STORES WILL BE THE RESPONSIBILITY OF THE CONTRACTOR. ALL TEMPORARY DUMMY/BLANK FLANGES, FITTINGS & FIXTURES AND TEMPORARY SUPPORTS REQUIRED TO CARRY OUT STEAM BLOWING, CHEMICAL CLEANING, OIL FLUSHING AND HYDRAULIC TEST WILL BE ARRANGED BY CONTRACTOR.

25.0.5

FABRICATION, FIT-UP, WELDING, AND POST-WELD-HEAT TREATMENT IF ANY, OF REQUISITE BLANKS FOR CONDUCT OF HYDRAULIC TEST IS PART WORK. SIMILARLY, REMOVAL OF BLANKS, RESTORATION AND NORMALISATION OF THE CONCERNED SYSTEM/LINE IS TO BE DONE AS PART OF WORK. BHEL WILL PROVIDE THE MATERIAL FOR BLANKS FREE OF CHARGE. NO SEPARATE PAYMENT IS ENVISAGED FOR THESE ACTIVITIES.

25.0.6

OVERHAULING, CLEANING, SERVICING OF TANKS, PUMPS, EQUIPMENTS, VALVES, DURING ERECTION AND COMMISSIONING STAGES ARE IN THE SCOPE OF WORK. GASKETS, PACKING FOR REPLACEMENT WILL BE PROVIDED BY BHEL.

25.0.7

AFTER CHEMICAL CLEANING/PICKLING OF LUBRICATING SYSTEM (INCLUDING OIL PIPING, OIL TANK AND OTHER FITTINGS) OF STEAM TURBINES, TURBO BLOWERS, ROTATING MACHINES ETC, OIL FLUSHING FOR LUBRICATING SYSTEMS AS PER INSTRUCTIONS OF BHEL ENGINEER SHALL BE CARRIED OUT. CLEANING OF OIL TANK OF LUBRICATING OIL SYSTEM BEFORE AND AFTER OIL FLUSHING IS IN THE SCOPE OF WORK.

25.0.8

BHEL PSWR WILL PROVIDE OIL FOR FLUSHING, FRESH OIL FOR FILLING & TOPPING, UP TO TRAIL OPERATION COMPLETION. RECEIPT & HANDLING AT STORE/STORAGE YARD AND TAKING THE DELIVERY OF FLUSHED OIL, FRESH OIL BARRELS FROM STORES/STORAGE YARD FOR ENTIRE OPERATIONS OF FLUSHING, FILLING & TOPPING UP, RETURNING OF FLUSHED OIL, FRESH OIL EMPTY/UNUSED/PARTLY USED BARRELS ETC. TO BHEL STORES AFTER COMPLETION OF OPERATIONS SHALL BE THE PART THE SCOPE OF WORK. NO SEPARATE PAYMENT ON THIS ACCOUNT WILL BE MADE. SIMILARLY, FOR VARIOUS PRE-COMMISSIONING/ COMMISSIONING ACTIVITIES / PROCESSES MENTIONED IN VARIOUS CLAUSES, TRANSPORT OF CHEMICALS FROM BHEL/ CUSTOMER'S STORES, CHARGING OF CHEMICALS INTO THE SYSTEM AND RETURNING OF REMAINING AND/OR THE EMPTY CONTAINERS OF THE CHEMICALS TO CUSTOMER/BHEL STORES IS THE RESPONSIBILITY OF THE CONTRACTOR.

25.0.9

DURING PRE-COMMISSIONING/ COMMISSIONING, REPLACING/ CHANGING MECHANICAL/ OTHER SEALS OF EQUIPMENTS, PUMPS, REMOVAL AND CLEANING/REPLACING OF FILTERS ETC IS WITHIN THE SCOPE OF WORK. ITEMS REQUIRED FOR REPLACEMENT/CHANGE WILL BE PROVIDED BY BHEL.

25.0.10

IN CASE ANY DEFECT IS NOTICED DURING TESTS, TRIAL RUNS OF STEAM TURBINES AND TURBO-BLOWER SETS & ITS AUXILIARIES 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 BHEL ENGINEER'S INSTRUCTIONS. CLAIM, IF ANY,

FOR THESE WORKS FROM THE CONTRACTOR SHALL BE GOVERNED AS PER RELEVANT CLAUSES OF GCC

25.0.11

CONTRACTOR SHALL CUT/OPEN WORK, IF NEEDED, AS PER BHEL ENGINEER'S INSTRUCTIONS DURING COMMISSIONING FOR INSPECTION, CHECKING AND MAKE GOOD THE WORKS AFTER INSPECTION IS OVER.

I)

SIMILARLY, DURING THE COURSE OF ERECTION, IF CERTAIN PORTION OF EQUIPMENT'S ERECTED BY THE CONTRACTOR HAS TO BE UNDONE FOR ENABLING OTHER CONTRACTORS/AGENCIES OF BHEL/CUSTOMER TO CARRY OUT THEIR WORK, CONTRACTOR SHALL CARRY OUT SUCH JOBS EXPEDITIOUSLY AND PROMPTLY AND MAKE GOOD THE JOB AFTER COMPLETION OF WORK BY OTHER CONTRACTOR'S/ AGENCIES OF BHEL/CUSTOMER AS PER BHEL ENGINEER'S/AGENCIES OF BHEL/CUSTOMERS INSTRUCTIONS. CLAIMS, IF ANY, IN THIS REGARD SHALL BE GOVERNED AS PER RELEVANT CLAUSES OF GCC

25.0.12

DURING THIS PERIOD, THOUGH BHEL/ CLIENT'S STAFF WILL ALSO BE ASSOCIATED IN THE WORK, THE CONTRACTOR'S RESPONSIBILITY WILL BE TO ARRANGE FOR COMPLETE REQUIREMENT OF MEN AND REQUIRED TOOLS AND PLANTS, CONSUMABLES, SCAFFOLDING AND APPROACHES ETC, TILL SUCH TIME THE COMMISSIONED UNIT IS TAKEN OVER BY BHEL'S CLIENT.

25.0.13

COMMISSIONING ACTIVITIES WILL CONTINUE TILL THE COMPLETION OF TRIAL RUN/PG TEST FOR ERECTION WORKS. DURING THIS PERIOD CONTRACTOR SHALL MAKE AVAILABLE THE SERVICES OF SEPARATE DEDICATED LABOUR-FORCE COMPRISING OF SUITABLE SKILLED AND SEMI/UN-SKILLED HANDS ALONG WITH NECESSARY TOOLS AND PLANTS, CONSUMABLES ETC

25.0.14

IT SHALL BE SPECIFICALLY NOTED THAT THE CONTRACTOR MAY HAVE TO WORK ROUND THE CLOCK DURING THE PRE-COMMISSIONING AND COMMISSIONING PERIOD ALONG WITH BHEL ENGINEERS AND HENCE CONSIDERABLE OVERTIME PAYMENT IS INVOLVED. THE CONTRACTOR'S QUOTED RATES SHALL BE INCLUSIVE OF ALL THESE FACTORS.

25.0.15

THE CONTRACTOR SHALL CARRY OUT ANY OTHER TESTS AS DESIRED BY BHEL ENGINEER ON ERECTED EQUIPMENT COVERED UNDER THE SCOPE OF THIS CONTRACT DURING TESTING, PRE-COMMISSIONING AND COMMISSIONING, TO DEMONSTRATE THE COMPLETION OF ANY PART OR WHOLE OF WORK PERFORMED BY THE CONTRACTOR.

25.0.16
ASSISTANCE FOR PG TEST

THE CONTRACTOR SHALL PROVIDE ASSISTANCE FOR CONDUCTING PERFORMANCE GUARANTEE (PG) TEST TO BHEL AS A PART OF HIS REGULAR SCOPE OF WORK. THIS SHALL INCLUDE MANPOWER ASSISTANCE, SMALL T&P, PROVIDING ACCESS PLATFORMS/ SCAFFOLDING/LADDERS, LIGHTING ARRANGEMENTS AND OTHER ENABLING FACILITIES ASSOCIATED WITH TYPICAL PG TEST ACTIVITY.

26.0 PAINTING

26.0.1
COMPONENTS OF THE STEAM TURBINES & TURBO-BLOWER BOILERS WITH ASSOCIATED AUXILIARIES, PIPING AND OTHER EQUIPMENTS WITH ACCESSORIES ETC. WILL IN GENERAL BE SUPPLIED BY BHEL WITH ONE COAT OF PRIMER AND TWO COATS OF FINISH PAINT APPLIED AT THE MANUFACTURING SHOP; CONTRACTOR SHALL APPLY ONE COAT OF FINISH PAINT ON ALL SUCH COMPONENTS (WHICH ARE NOT INSULATED) AFTER ERECTION AT SITE UNLESS AND OTHERWISE THE SHOP COATING IS DAMAGED IN THE MEANWHILE. THE TENTATIVE TYPES OF PAINTS INVOLVED FOR FINAL PAINTING ARE SYNTHETIC ENAMEL, EPOXY, HEAT RESISTANT ALUMINIUM, CHLORINATED RUBBER PAINTS ETC. HOWEVER, THE FINAL TYPE OF PAINTS AND THICKNESS OF COATS SHALL BE AS PER DRAWINGS & CUSTOMER REQUIREMENTS AT SITE.

26.0.2
IN ADDITION TO COMPONENTS/EQUIPMENT AS ABOVE, THERE COULD BE LIMITED FEW WITHOUT ANY PRIOR PROTECTIVE COATING. SUCH COMPONENTS SHALL FIRST BE THOROUGHLY CLEANED OF ALL DIRT, RUST, SCALE, GREASE, OIL AND OTHER SURFACE DEPOSITS BY WIRE BRUSHING, SCRAPING, WASHING, WIPING WITH SOLVENT OR ANY APPROPRIATE METHOD AND THE SAME BEING INSPECTED AND APPROVED BY BHEL FOLLOWED BY APPLICATION OF ONE COAT OF PRIMER. AFTERWARDS, THE ABOVE PARTS SHALL BE OVER-COATED WITH TWO LAYERS OF SPECIFIED PAINT AS PER APPLICATION PROCEDURE PRESCRIBED BY THE PAINT MANUFACTURER.

26.0.3 TOUCH-UP PAINTING ON DAMAGED AREAS -

a) FOR COATINGS DAMAGED UP TO METAL SURFACE

SURFACE PREPARATION SHALL BE CARRIED OUT BY MANUAL CLEANING. MINIMUM 6 INCHES ADJOINING AREA WITH EXISTING COATING SHALL BE ROUGHENED BY WIRE BRUSHING, EMERY PAPER RUBBING ETC., FOR BEST ADHESION OF PATCH PRIMER.

PRIMER COAT OF TOUCH-UP PRIMER TO BE APPLIED BY BRUSH IMMEDIATELY AFTER THE SURFACE PREPARATION.

OVER THIS PRIMER COAT, FINISH COAT AND FINAL FINISH COAT SHALL BE APPLIED AS COVERED ABOVE BY BRUSH WITHIN MAXIMUM SEVEN (7) DAYS OF APPLICATION OF TOUCH UP PRIMER.

FOR EXECUTION ONLY THE LATEST DOCUMENT SHALL BE APPLICABLE AND NO CLAIM WHATSOEVER SHALL BE ENTERTAINED IN CASE OF ANY VARIANCE BETWEEN SUCH DOCUMENTS. SIMILARLY, DOCUMENTS AS PROVIDED PROGRESSIVELY DURING THE EXECUTION OF WORK FOR ALL OTHER PRODUCTS/ EQUIPMENTS ETC SHALL BE APPLICABLE.

26.0.4

PAINTING OF WELDED AREAS / PAINTING OF AREAS EXPOSED AFTER REMOVAL OF TEMPORARY SUPPORTS / TOUCH-UP PAINTING ON DAMAGED AREAS OF EMPLOYER'S STRUCTURES, WHERE INTER-CONNECTION, WELDING / MODIFICATION ETC. HAS BEEN CARRIED OUT BY THE BIDDER.

(A.) CLEAN THE SURFACE TO REMOVE FLUX SPATTERS AND LOOSE RUST, LOOSE COATINGS IN THE ADJOINING AREAS OF WELD SEAMS BY WIRE BRUSH AND EMERY PAPER.

(B.) PAINTING PROCEDURE TO BE FOLLOWED AS MENTIONED ABOVE FOR TOUCH-UP PAINTING ON DAMAGED AREAS.

26.0.5

THE SCOPE OF WORK INCLUDES PAINTING OF COLOUR BANDS, LETTERING, MARKING AND SIGNS FOR DIRECTION OF FLOW/ROTATION, NAMES ETC OF APPROVED COLOURS AS PER THE STANDARD COLOUR CODES AND SPECIFICATIONS SPECIFIED IN TENDER SPECIFICATION OR AS ADVISED BY BHEL/CUSTOMER ENGINEER AT SITE FOR THE EQUIPMENTS/ COMPONENTS COVERED IN THESE SPECIFICATIONS. APPLICABLE PAINTS AND PRIMER SHALL BE SUPPLIED BY BHEL.

26.0.6

ALL EXPOSED METAL PARTS OF THE EQUIPMENT INCLUDING PIPING, STRUCTURES, HAND RAILING, GRATING ETC SHALL BE THOROUGHLY CLEANED OFF DUST, RUST, SCALES AND OTHER FOREIGN MATERIALS BY MANUAL OR MECHANIZED WIRE BRUSHING, SCRAPPING, SAND BLASTING ETC AND THE SAME BEING INSPECTED AND APPROVED BY BHEL/CUSTOMER ENGINEER BEFORE APPLICATION OF PRIMER. AFTERWARDS, THE ABOVE PARTS SHALL BE FINISH PAINTED WITH SPECIFIED NUMBER OF COATS AS PER SPECIFICATION.

26.0.7

IN CERTAIN ISOLATED INSTANCES WHERE IT IS NOT POSSIBLE TO CLEAN THE EQUIPMENTS AS EXPLAINED ABOVE, CLEANING BY GRINDING MIGHT HAVE TO BE RESORTED TO. NO DAMAGE TO THE EQUIPMENT/COMPONENTS SHOULD BE CAUSED.

26.0.8

SURFACE TO BE PAINTED SHOULD BE FREE OF OIL AND GREASE. IT SHOULD BE REMOVED BY USING SUITABLE CLEANING AGENTS INCLUDING PERMITTED SOLVENTS. SURFACE CLEANED BY CHEMICAL AGENT, IF REQUIRED, SHALL BE TREATED FURTHER AS PRESCRIBED IN USE OF SUCH CLEANING

AGENTS. THE CONTRACTOR AT HIS OWN COST SHALL PROVIDE ALL THE CONSUMABLES AND APPLICATION IMPLEMENTS.

26.0.9
DURING THE PREPARATION OF SURFACE, IF THE SHOP COAT IS DAMAGE BY CHEMICAL CLEANING OR BY MECHANICAL MEANS, CONTRACTOR SHALL REPAIR THE SAME FREE OF COST TO BHEL. BHEL WILL MAKE AVAILABLE ONLY THE PRIMER AND PAINTS FREE OF ANY CHARGE TO CONTRACTOR.

26.0.10
SPECIFIED DRYING TIME SHALL BE PERMITTED FROM ONE TO ANOTHER COAT.

26.0.11
THE WORK SPREAD IS ALSO SUBSTANTIAL INVOLVING SUBSTANTIAL RUN OF STRUCTURES AND PIPING. CONTRACTOR SHALL TAKE SUFFICIENT PRECAUTIONS TO AVOID ANY ACCIDENT AND HAZARD IN ALL RESPECTS. THE ROPES, LADDERS, SCAFFOLDING MATERIALS, CLAMPS ETC AND CLIMBER USED SHOULD BE OF STANDARD QUALITY FOR SAFE AND SMOOTH EXECUTION OF WORK.

26.0.12
CONTRACTOR SHALL CARRY OUT THE WORK IN SUCH A WAY THAT OTHER ERECTED EQUIPMENT, STRUCTURE, CIVIL FOUNDATIONS AND OTHER PROPERTY ARE NOT DAMAGED. FOR DAMAGES IN ANY OF SUCH CASES DUE TO LAPSES BY CONTRACTOR, BHEL SHALL HAVE THE RIGHT TO RECOVER THE COST OF SUCH DAMAGES FROM THE CONTRACTOR.

26.0.13
CONTRACTOR SHALL TAKE DUE CARE TO COVER/PROTECT THE EQUIPMENT WHICH ARE ALREADY PAINTED WHILE CARRYING OUT THE PAINTING OF OTHER ADJACENT EQUIPMENT. IF SO HAPPENS, IT SHALL BE CLEANED AND REPAINTED BY THE CONTRACTOR WITHOUT ANY EXTRA CHARGES.

26.0.14
IN GENERAL, PAINTING OF STRUCTURAL PARTS AND COLOUR BANDS, LETTERING, MARKING OF DIRECTION OF FLOW/ROTATION ETC WILL BE CARRIED OUT BY BRUSH PAINTING. HOWEVER, AREAS/EQUIPMENTS INACCESSIBLE FOR MANUAL PAINTING HAVE TO BE PAINTED BY SPRAY PAINTING. THE DECISION OF BHEL ENGINEER, IN THIS REGARD, SHALL BE FINAL AND BINDING ON THE CONTRACTOR. FOR THE PURPOSE OF SPRAY PAINTING, AIR AT ONE POINT WILL BE MADE AVAILABLE BY BHEL FREE. LAYING OF AIR HOSE PIPE AND ANY OTHER LINE REQUIRED SHALL BE DONE BY CONTRACTOR AT HIS COST. THE CONTRACTOR SHALL PROVIDE SPRAY EQUIPMENT SET.

26.0.15
THE CONTRACTOR SHALL PROVIDE ALL THE NECESSARY SCAFFOLDING MATERIALS, TEMPORARY STRUCTURES AND NECESSARY SAFETY DEVICES ETC, DURING EXECUTION OF THE WORK.

26.0.16
FINAL PAINTING WORK SHALL BE STARTED AFTER OBTAINING CLEARANCE FROM BHEL ENGINEERS AND AS PER HIS INSTRUCTIONS.

PRIMER AND PAINTS FOR FINAL PAINTING

ALL PRIMER AND PAINTS REQUIRED FOR FINAL PAINTING SHALL BE SUPPLIED BY BHEL FREE OF CHARGES.

THE CONTRACTOR, HOWEVER, SHALL PROVIDE ACCOUNT OF ALL THE ITEMS ISSUED TO HIM AND RETURN ALL PRIMER, PAINTS ETC REMAINING EXTRA OVER THE NORMAL REQUIREMENT WITH PROPER IDENTIFICATION TAGS IN A PACKED CONDITION TO BHEL STORES. IN CASE OF ANY MISUSE OR EXCESS USE OVER THE NORMAL REQUIREMENT, BHEL RESERVES THE RIGHT TO RECOVER THE COST OF SUCH MISUSE/ EXCESS USE. DECISION OF BHEL ENGINEER IN THIS REGARD WILL BE FINAL AND BINDING ON THE CONTRACTOR.

24.0 GENERAL

24.0.1
STEAM PIPING, EXTRACTION PIPING, DRAIN LINE, OIL LINE, SERVICE AIR PIPING, COOLING AND SERVICE WATER LINES BETWEEN THE BHEL SUPPLIED EQUIPMENTS/ AUXILIARIES AND BATTERY LIMITS OF CUSTOMER IS IN THE SCOPE OF THIS TENDER SPECIFICATION.

24.0.2
IT MAY BE SPECIFICALLY NOTED THAT IT SHOULD NOT BE CONSTRUED OR CLAIMED BY THE CONTRACTOR THAT WITH THE TECHNICAL SPECIFICATION AND "EXCLUSIONS AND/OR INCLUSIONS" DETAILED IN THIS TENDER SPECIFICATION, BHEL HAS COVERED THE ENTIRE SCOPE OF WORK AND/OR THE DETAILS THEREOF TO BE EXECUTED BY THE CONTRACTOR.

24.0.3 GENERAL RESPONSIBILITY OF THE CONTRACTOR

THE CONTRACTOR SHALL HAVE TOTAL RESPONSIBILITY FOR ALL EQUIPMENT AND MATERIALS IN HIS CUSTODY AT CONTRACTOR'S STORES, LOOSE, SEMI-ASSEMBLED, ASSEMBLED OR ERECTED BY HIM AT SITE. HE SHALL EFFECTIVELY PROTECT THE FINISHED WORKS FROM ACTION OF WEATHER AND FROM DAMAGES OR DEFACEMENT AND SHALL ALSO COVER THE FINISHED PARTS IMMEDIATELY ON COMPLETION OF WORK AS PER BHEL ENGINEER'S INSTRUCTIONS. THE MACHINE SURFACES/FINISHED SURFACES SHOULD BE GREASED AND COVERED.

25.0 PRESERVATION & PROTECTION OF COMPONENTS

25.1

AT ALL STAGES OF WORK, EQUIPMENTS/MATERIALS IN THE CUSTODY OF CONTRACTOR, INCLUDING THOSE ERECTED, WILL HAVE TO BE PRESERVED AS PER THE INSTRUCTIONS OF BHEL. NECESSARY PRESERVATION AGENTS INCLUDING THE PRIMER & PAINT, FOR THE ABOVE WORK SHALL BE PROVIDED BY THE CONTRACTOR.

25.2

THE CONTRACTOR SHALL MAKE SUITABLE SECURITY ARRANGEMENTS INCLUDING EMPLOYMENT OF SECURITY PERSONNEL AND ENSURE PROTECTION OF ALL MATERIALS/ EQUIPMENT IN THEIR CUSTODY AND INSTALLED EQUIPMENTS FROM THEFT/FIRE/PILFERAGE AND ANY OTHER DAMAGES AND LOSSES.

25.3

CONTRACTOR SHALL COLLECT ALL SCRAP MATERIALS PERIODICALLY FROM VARIOUS AREA OF WORK SITE, DEPOSIT THE SAME AT ONE PLACE EARMARKED AT SITE OR SHIFT THE SAME TO A PLACE EARMARKED IN BHEL/ CLIENT'S STORES. IN CASE OF FAILURE OF CONTRACTOR IN COMPLIANCE OF THIS REQUIREMENT, BHEL WILL MAKE SUITABLE ARRANGEMENT AT CONTRACTOR'S RISK AND COST.

25.4

THE ENTIRE SURPLUS, DAMAGED, UNUSED MATERIALS, PACKAGING MATERIALS / CONTAINERS, SPECIAL TRANSPORTING FRAMES, GUNNY BAGS, ETC SHALL BE RETURNED TO BHEL STORES BY THE CONTRACTOR.

25.5

THE CONTRACTOR SHALL NOT WASTE ANY MATERIALS ISSUED TO HIM. IN CASE IT IS OBSERVED AT ANY STAGE THAT THE WASTAGE/EXCESS UTILISATION OF MATERIALS IS NOT WITHIN THE PERMISSIBLE LIMITS, RECOVERY FOR THE EXCESS QUANTITY USED OR WASTED WILL BE EFFECTED WITH DEPARTMENTAL CHARGES FROM THE CONTRACTOR. DECISION OF BHEL ON THIS WILL BE FINAL AND BINDING ON THE CONTRACTOR.

25.6

FOR ANY CLASS OF WORK FOR WHICH NO SPECIFICATIONS HAVE BEEN LAID DOWN IN THESE SPECIFICATIONS, WORK SHALL BE EXECUTED AS PER THE INSTRUCTIONS OF BHEL.

26.0 COMMON REQUIREMENTS

26.0.1

ALL WELDED JOINTS SHOULD BE PAINTED WITH ANTICORROSIVE PAINT IMMEDIATELY AFTER COMPLETION OF RADIOGRAPHY AND STRESS RELIEVING WORKS. NECESSARY PAINTS AND OTHER CONSUMABLES FOR THE ABOVE WORK ARE IN THE SCOPE OF THE CONTRACTOR.

26.0.2

SUSPENSIONS/SUPPORTS FOR TUBES/PIPING, ETC, WILL BE SUPPLIED IN RUNNING/ RANDOM LENGTHS/ SIZES WHICH SHALL BE CUT TO SUITABLE SIZES AND ADJUSTED AS REQUIRED.

26.0.3

SPRING SUSPENSION/CONSTANT LOAD HANGERS MAY HAVE TO BE PRE-ASSEMBLED FOR REQUIRED LOAD AND ERECTION CARRIED OUT AS PER INSTRUCTIONS OF BHEL. ADJUSTMENTS, REMOVAL OF TEMPORARY ARRESTS/LOCKS, CUTTING OF EXCESS THREAD LENGTH OF HANGER TIE-ROD ETC, HAVE TO BE CARRIED OUT AS AND WHEN REQUIRED. LOAD SETTING OF SPRING HANGERS, AS PER BHEL'S DOCUMENTS/INSTRUCTIONS, DURING VARIOUS STAGES OF ERECTION & TESTING AND AFTER FLOATING OF PIPING/DUCTING DURING COLD AND HOT CONDITION WILL HAVE TO BE DONE. THIS EXERCISE MAY HAVE TO BE REPEATED TILL SATISFACTORY RESULTS ARE ACHIEVED.

26.0.4

LAYOUT OF FIELD ROUTED/ SMALL BORE PIPING 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.

26.0.5

WELDING OF NECESSARY INSTRUMENTATION TAPPING POINTS, THERMOCOUPLE PADS, ROOT VALVES, CONDENSING VESSELS, FLOW METERING & MEASUREMENT DEVICES, AND CONTROL VALVES TO BE PROVIDED ON STEAM TURBINES, TURBO-BLOWERS & ITS AUXILIARIES, INTEGRAL & EXTERNAL PIPE LINES COVERED WITHIN THE SCOPE OF THIS SPECIFICATION, WILL ALSO BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE DONE AS PER THE INSTRUCTIONS OF BHEL SITE ENGINEER. THE INSTALLATION OF ALL THE ABOVE ITEMS WILL BE CONTRACTOR'S RESPONSIBILITY EVEN IF THE :

I. ITEMS ARE NOT SPECIFICALLY INDICATED UNDER THE RESPECTIVE PRODUCT GROUPS AS GIVEN IN THE TECHNICAL SPECIFICATIONS.

II. ITEMS ARE SUPPLIED BY AN AGENCY OTHER THAN BHEL.

NDE, AND POST WELD HEAT TREATMENT FOR ABOVE SHALL BE DONE AS PER THE SPECIFICATIONS AS PART OF WORK.

26.0.6

FIXING AND SEAL WELDING OF THERMO-WELLS & PLUGS BEFORE HYDRO TEST/ STEAM BLOWING OF EQUIPMENT OR OTHER PIPING SYSTEM IS WITHIN THE SCOPE OF WORK. CONTRACTOR SHALL ALSO REMOVE THE SEAL WELDED PLUGS BY PROCESS OF GRINDING AND FIX AND SEAL WELD THERMO-WELLS AFTER HYDRO TEST/STEAM BLOWING OF LINES AS PART OF WORK.

26.0.7

ACTUATORS/DRIVES OF VALVES, DAMPERS, GATES, POWERED VANES ETC. MAY HAVE TO BE SERVICED, LUBRICATED, BEFORE ERECTION, DURING PRE-COMMISSIONING & COMMISSIONING, INCLUDING CARRYING OUT MINOR ADJUSTMENTS REQUIRED AS INCIDENTAL TO THE WORK.

26.0.8

ALL ELECTRICAL MOTORS HAVE TO BE TESTED FOR IR&PI VALUES PRIOR TO THE TRIAL RUN. WHERE REQUIRED, DRY OUT MAY HAVE TO BE CARRIED OUT BY USING EXTERNAL HEATING SOURCE. CONTRACTOR SHALL MAKE ALL ARRANGEMENTS IN THIS REGARD AND COMPLETE THE WORK AS INSTRUCTED. BHEL WILL PROVIDE THE MOTORIZED INSULATION TESTERS.

27.0 INSULATION –

APPLICATION OF WOOL INSULATION, SHEET METAL CLADDING, WELDING OF STUDS/HOOKS/ SUPPORTS FOR EQUIPMENTS, TANKS/VESSELS AND PIPINGS ETC. TO HOLD INSULATION COVERED UNDER THIS CONTRACT SHALL INCLUDE, BUT NOT LIMITED TO, THE FOLLOWING :-

27.0.1
REMOVABLE TYPE OF INSULATION TO BE PROVIDED FOR VALVES, EXPANSION JOINTS, ETC AS PER THE DRAWINGS OR AS DIRECTED BY BHEL ENGINEER.

27.0.2
WOOL INSULATION ARE RECEIVED AT SITE AS BONDED AND UN-BONDED MATTRESSES IN STANDARD SIZES. THESE ARE TO BE DRESSED/CUT TO SUIT WORK

27.0.3
APPLICATION OF INSULATION WORK AND SHEET METAL CLADDING AS GIVEN IN VARIOUS DRAWINGS/ SPECIFICATIONS OF BHEL. THE DOCUMENTS FOR FURTHER DETAILS OF INSULATION OF EQUIPMENTS LIKE SJAE, GSC, FLASH TANK, STEAM TURBINES ETC. WILL BE FURNISHED AT SITE.

27.0.4
ALUMINIUM/GI SHEET CLADDING BY FABRICATION OF ALUMINIUM/GI SHEETS TO THE SIZES AND SHAPES SPECIFIED IN DRAWINGS, BEADING, SWAGING, BEVELLING OF SHEETS, CROWNING THE SHEETS, IF NECESSARY, FIXING THE SAME TO SUPPORTS, OVER WOOL INSULATION WITH SCREWS/RETAINERS AS SPECIFIED IN BHEL DRAWINGS OR AS INSTRUCTED BY BHEL ENGINEER.

27.0.5
WELDING OF STUDS/HOOKS/SUPPORTS ON EQUIPMENT AND PIPING TO SUPPORT WOOL INSULATION, AS PER THE DRAWINGS OR AS INSTRUCTED BY BHEL ENGINEERS.

27.0.6

PAINTING THE INNER SIDE OF ALUMINIUM CLADDING, WITH ANTI-CORROSIVE PAINT AS SPECIFIED. THE REQUIRED PAINT AND THINNER & OTHER ACCESSORIES/ CONSUMABLES FOR PAINTING, CLEANING THE SURFACES ETC SHALL BE ARRANGED BY THE CONTRACTOR.

27.0.7
THE CONTRACTOR SHALL LEAVE CERTAIN GAPS AND OPENINGS WHILE DOING THE WORK AS PER THE INSTRUCTIONS OF BHEL ENGINEER TO FACILITATE INSPECTION OR DURING COMMISSIONING TO FIX GAUGES, FITTINGS, INSTRUMENTS. THESE GAPS WILL HAVE TO BE FINISHED AS PER DRAWINGS AT A LATER DATE BY THE CONTRACTOR AT NO EXTRA COST TO BHEL.

27.0.8
A LOG BOOK SHALL BE MAINTAINED BY THE CONTRACTOR FOR TAKING CLEARANCE OF THE LOCATION FOR APPLICATION OF REFRACTORY AND INSULATION.

I) **WASTAGE ALLOWANCE FOR INSULATION & CLADDING**

WASTAGE ALLOWANCE ON NET ISSUED QUANTITY FOR REFRACTORY & INSULATION SHALL BE AS FOLLOWS:

I)	WOOL MATTRESSES AND CLADDING SHEETS	2%
II)	IRON & OTHER RETAINERS/FASTENERS COMPONENTS	2%

NET ISSUED QUANTITY IS THE GROSS QUANTITY ISSUED LESS THE USEABLE QUANTITY RETURNED TO BHEL. ACCEPTANCE OF ANY MATERIAL AS USEABLE WILL BE AT ABSOLUTE DISCRETION OF BHEL ENGINEER.

J) EXCLUSION: SPRAY INSULATION OF TURBINES (IF APPLICABLE) IS EXCLUDED FROM THE SCOPE OF CONTRACTOR.

28.0 **PIPING INSTALLATION**

28.0.1
THE WORK ON PIPING SYSTEMS (AIR, WATER, OIL, STEAM, GAS ETC.) WILL INCLUDE FABRICATION, LAYING, EDGE PREPARATION, FIXING & WELDING OF THE ELBOWS/FITTINGS/ VALVES ETC ON THE LINE, FIXING & ADJUSTMENT OF SUPPORTS/ANGLES SHOCK ABSORBERS AND CARRYING OUT ALL OTHER ACTIVITIES/WORK TO COMPLETE THE ERECTION AND ALSO CARRYING OUT ALL PRE-COMMISSIONING/COMMISSIONING OPERATIONS MENTIONED IN THE SPECIFICATION AS PER BHEL ENGINEERS INSTRUCTIONS AND/OR AS PER APPROVED DRAWINGS/DOCUMENTS.

28.0.2
FITTINGS LIKE BENDS TEES, ELBOWS, REDUCERS, FLANGES ETC, WILL BE SUPPLIED AS LOOSE ITEMS WHICH SHALL BE MATCHED WITH THE CORRESPONDING PIPING. BENDS OF TUBE SIZE UP TO OD 65MM WILL HAVE TO BE FABRICATED AT SITE AT NO EXTRA COST.

28.0.3
ALL PIPES & TUBES SHALL BE SENT FROM UNITS IN COMMERCIALLY AVAILABLE LENGTHS. 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 BOTH FOR IBR & NON-IBR PIPES AND ADOPTING SPECIFIED HEAT TREATMENT PROCEDURE AT NO EXTRA COST.

28.0.4
MINOR ADJUSTMENTS LIKE REMOVAL OF OVALITY IN PIPES AND OPENING AND CLOSING OF THE BENDS OF PIPE BY PROCESS OF HEAT OR CORRECTION OF ANY OTHER METHOD APPROVED BY BHEL ENGINEER TO SUIT THE LAYOUT, WITH SPECIFIED HEAT TREATMENT PROCEDURE, ARE IN THE SCOPE OF WORK.

28.0.5
FLAME CUTTING OF PIPING, WHERE REQUIRED SHALL BE DONE AS PER BHEL ENGINEERS INSTRUCTIONS.

28.0.6
ALL DRAINS/ VENTS/ RELIEF/ ESCAPE/ SAFETY VALVE PIPING TO VARIOUS TANKS/ SEWAGE/ DRAIN CANAL/ FLASH BOX / SUMP / ATMOSPHERE ETC FROM THE STUBS ON THE PIPING AND EQUIPMENTS ERECTED BY THE CONTRACTOR IS COMPLETELY COVERED IN THE SCOPE OF WORK.

28.0.7
CONNECTION (EITHER FLANGED/BOLTED OR WELDED) OF PIPING TO THE TERMINAL POINTS/EQUIPMENTS ETC IS IN THE SCOPE OF WORK EVEN THOUGH SUCH TERMINAL POINT/EQUIPMENT MAY NOT FORM PART OF THIS WORK. ALL NDE INCLUDING RADIOGRAPHY OF JOINTS SO MADE, POST-WELD-HEAT-TREATMENT IF ANY, IS ALSO WITHIN THE SCOPE OF WORK/SPECIFICATION. TERMINAL POINTS WORKS OF VARIOUS PIPING SCHEMES WITH CUSTOMER LINES AND OTHER CONTRACTOR'S LINES. THE TERMINAL POINTS WORK IS INCLUSIVE OF CUTTING OF EXISTING LINES, EDGE PREPARATION, WELDING/BLANKING AND HOOK UP WORK.

28.0.8
ERECTION, WELDING & UT/RADIOGRAPHY TEST OF BHEL SUPPLIED FLOW NOZZLES IN CUSTOMER TERMINAL/TAPPING POINTS IS THE PART OF SCOPE OF WORKS. SAME WILL BE CARRIED OUT AS PER BHEL ENGINEER'S INSTRUCTION AT SITE AND SHALL BE BINDING ON CONTRACTOR.

28.0.9
DRILLING, WELDING OF STUBS FOR DRAINS, VENTS, INSTRUMENT TAPPING POINTS, WELDING OF ATTACHMENTS FOR SUPPORTS ETC IS PART OF THE WORK. NO ADDITIONAL PAYMENT IS ENVISAGED FOR THIS WORK .

28.0.10

ERECTION AND INSTALLATION OF MOTORISED VALVES & CONTROL VALVES SHALL BE TREATED AS PART OF PIPING WORK. NO SEPARATE RATE ON THIS ACCOUNT WILL BE PAYABLE.