

TENDER SPECIFICATION

Ref: BHEL/PSSR/SAS/SCT/T-10/2021-22

Date:06.07.2021

ESP R&M works at Unit.No.1,3 & 4 at NALCO, Damanjodi SPP
(Balance works)

NALCO-Damanjodi, Steam cum Power Plant Alumina Refinery,
Orissa

DUE DATE FOR SUBMISSION: 11.00 Hrs. – 16.07.2021

VOLUME-I BOOK-I

TECHNOCOMMERCIAL BID - Consists of Book- I & Book- II

Book- I Consists of

- Notice Inviting Tender
- Volume-IA: Technical Conditions of Contract

Book-II consists of

- Volume-IB : Special conditions of Contract,
Rev 01 Dtd.1st June, 2012
Amendment 01 Dtd.1st October, 2015
- Volume-IC : General conditions of Contract,
Rev.02 Dtd.16th June, 2021
- Volume-ID : Forms & Procedures
Rev 01 Dtd.1st June, 2012
Amendment 01 Dtd.1st October, 2015



BHARAT HEAVY ELECTRICALS LIMITED

(A Government of India Undertaking)

Power Sector – Southern Region

Services After Sales Division - , Ek Tara Building
39, Sarojini Devi Road, Secunderabad-500 003.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

NOTICE INVITING TENDER (NIT)

Submission only through E-Procurement Portal

<https://eprocurebhel.co.in>

Note: Bidder may download Tender Documents from web sites

To,

Dear Sir / Madam

Sub: NOTICE INVITING TENDER

Online Sealed offers in two part bid system are invited from reputed & experienced bidders (meeting PRE QUALIFICATION CRITERIA as mentioned below) through E-Procurement Portal <https://eprocurebhel.co.in> only, 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.

This tender shall be under category of National Competitive Bidding (NCB).

1.0 Salient Features of NIT

Sl. No	ISSUE	DESCRIPTION	
i	TENDER No:	BHEL/PSSR/SAS/SCT/T-10/2021-22 Date: 06.07.2021	
ii	Broad Scope of Work	ESP R&M works at Unit.No.1,3 & 4 at NALCO, Damanjodi SPP (Balance works)	
iii	DETAILS OF TENDER DOCUMENT		
a	VOLUME-IA BOOK-I	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, Rev 01 dated 1st June 2012, Amendment 01 dated October 01, 2015	Applicable
c	VOLUME-IC	General conditions of Contract Rev 01 dated 1st June 2012, Amendment 03 dated October 01, 2015	Applicable
d	VOLUME-ID	Forms & Procedures Rev 01 dated 1st June 2012 Amendment 01 dated October 01,2015	Applicable
e	VOLUME-II	Price Schedule (Absolute value).	Applicable

TECHNICAL CONDITIONS OF CONTRACT (TCC)

iv	Issue of Tender Documents	1. This is an E-tender floated online through our E-Procurement Portal https://eprocurebhel.co.in 2. issue Start: 06.07.2021 3. From BHEL website (www.bhel.com->Tender->Notifications): Tender documents for bidder's reference can be downloaded from this website till due date of submission.	Applicable
v	DUE DATE & TIME OF OFFER SUBMISSION	Date : 16.07.2021, Time : 11:00 Hrs The bidder should submit their offer online in e-Procurement portal at https://eprocurebhel.co.in Offers are invited in two-parts only. Bidders are requested to upload their offer well in advance in order to avoid last minute congestion at this website. Hard copy bid or bids through E-mail / fax shall not be accepted.	Applicable
vi	OPENING OF TENDER	Date : 16.07.2021, Time :15:00 Hrs Notes: (1) In case the due date of opening of tender becomes a non-working day, tenders shall be opened on next working day at the same time. (2) Bidder may record their presence online, during tender opening. However, this being an e-tender it shall be opened online.	
vii	EMD AMOUNT	Rs 21,00,000/- (Rupees Twenty One Lakhs Only) - EMD Exemption for MSEs is not applicable for this tender. - One time EMD not applicable for this tender. Refer clause 2.0 of NIT for mode of deposit of EMD	Applicable
viii	Last Date For Seeking Clarification	Bidders may submit their queries at least 3 days before the scheduled due date of offer submission along with soft version also, addressing to undersigned & to others as per contact address of Tender issuing department given below: For any clarification on the tender document, you may seek the same in writing or through e-procurement	Applicable

TECHNICAL CONDITIONS OF CONTRACT (TCC)

		portal/platform as per specified format within the last date of seeking clarification as per tender. BHEL shall not be responsible for receipt of queries after due date of seeking clarification due to postal delay, and receipt of any query after due date shall not be entertained.	
ix	Reverse Auction	BHEL shall be resorting to Reverse Auction (RA) (Guidelines as available on www.bhel.com on “supplier registration page”) for this tender. RA shall be conducted among all the techno-commercially qualified bidders. Price bids of all techno-commercially qualified bidders shall be opened and same shall be considered as initial bids of bidders in RA. In case any bidder(s) do(es) not participate in online Reverse Auction, their sealed envelope price bid along with applicable loading, if any, shall be considered for ranking.	Applicable
x	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), and portal https://eprocurebhel.co.in Bidders to keep themselves updated with all such information. This also form part of tender hence the same shall be enclosed with their offer.	Applicable
xi	Tender issuing department contact details	Routine correspondences regarding the clarifications, time extensions or any other administrative queries, etc. on the tender issued shall be posted in https://eprocurebhel.co.in Any other queries may be addressed directly to the tender issuing department as mentioned below: 1. Shri.MVN Rambabu Phone: 040 27700827 Mobile: 09533099966 E-mail: mvnrambabu@bhel.in	

TECHNICAL CONDITIONS OF CONTRACT (TCC)

		2. Shri. N Jayasankar Phone: 040 27702905 Mobile: 09441300814 E-mail: njs@bhel.in	
xii	PRE QUALIFICATION CRITERIA (TECHNICAL)	Agency should have executed successfully the project of renovation/modification/retrofitting/greenfield erection of ESP in unit of 18.5MW or above in the last 7 years (from latest date of bid submission) against direct orders from BHEL/PSUs/State electricity utilities/Multinational companies. Note: 1. Relevant supporting documents of Work Order Copy and Work Completion certificates shall be submitted. Work completion certificate is not required if works are executed under BHEL. 2. The work EXECUTED means: Boiler light up activity is completed.	Applicable
xiii	PRE QUALIFICATION CRITERIA (FINANCIAL)	1) Bidder Should have average annual turnover of minimum Rs.328.01 Lakhs during 3(THREE) Consecutive Financial Years 2017-18, 2018-19 and 2019-20. Audited Balance Sheet and Profit & Loss Account for the three Financial Years (FY) as indicated above. need to be submitted in support of above. In case audited Financial statements have not been submitted for all the three years as indicated above, then the applicable audited statements submitted by the bidders against the requisite three years, will be averaged for three years. If financial statements are not required to be audited statutorily, then instead of audited financial statements, financial statements are required to be certified by Chartered Accountant 2) Net worth (only in case of companies) of the bidder should be positive Note: Net worth shall be calculated based on	Applicable

TECHNICAL CONDITIONS OF CONTRACT (TCC)

		the latest Audited Accounts as furnished above. Net worth = Paid up share capital + Reserves 3) Bidders must have earned Profit in any one of the three financial years as indicated above. Note: PROFIT shall be "PBT" earned during any one of the three financial years as indicated above. 4) Bidder must not be under Bankruptcy Code Proceedings (IBC) by NCLT or under liquidation/BIFR	
xiv	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	Applicable
xv	Validity of offer	The rates should be quoted as given in the tender schedule with validity up to 24 months from the date of tender opening.	Applicable
xvi	Integrity Pact	a. Integrity Pact (IP) is a tool to ensure that activities and transactions between the Company and its Bidders/ Contractors are handled in a fair, transparent and corruption free manner. Following Independent External Monitors (IEMs) on the present panel have been appointed by BHEL with the approval of CVC to oversee implementation of IP in BHEL:	Applicable

TECHNICAL CONDITIONS OF CONTRACT (TCC)

		1. Shri. Arun Chandra Verma, IPS(Retd.) E Mail: acverma1@gmail.com 2. Shri. Virendra Bahadur Singh, IPS (Retd.), E Mail: vbsinghips@gmail.com b. The IP as per format given in NIT of this tender is to be submitted (duly signed by the authorized signatory) along with Techno Commercial Bid (Part1, in case of two/ three part bid). Only those bidders who have entered into such an IP with BHEL would be competent to participate in the bidding. In other words, entering into this pact would be a preliminary qualification. c. Please refer section- 8 of the IP (refer the format given in NIT) for Role and Responsibilities of IEMs. In case of any complaint arising out of the tendering process, the matter may be referred to any of the above IEMs. All correspondence with the IEMs shall be done through E-mail only. Note: No routine correspondence shall be addressed to the IEM (Phone / Post / E mail) regarding the clarifications, time extensions or any other administrative queries, etc. on the tender issued. All such clarification / issues shall be addressed directly to the tender issuing department's officials whose contact details are provided at sl. xi.	
xvii	Customer approval	All technically qualified bidders list will be forwarded to NALCO Damanjodi customer for further approval. Bidders approved by NALCO Damanjodi customer shall be considered for further processing of tender and price bid opening/reverse auction as applicable.	Applicable

TECHNICAL CONDITIONS OF CONTRACT (TCC)

2.0 **EARNEST MONEY DEPOSIT**

EMD for this tender shall be Rs. 21,00,000/- (Rupees Twenty One Lakhs only). Offers submitted without EMD will be liable for rejection. Please refer clause 1.9 of General Conditions of Contract for mode of deposit.

2.1 In case of Electronic Fund Transfer, bank details are as follows:

Account Name: **BHARAT HEAVY ELECTRICALS LTD,**
BANK : **STATE BANK OF INDIA ,**
BRANCH : **ST. Marys Road branch (Secunderabad)**
Account No : **00000030359171259,**
IFS CODE : **SBIN0008779**

On transfer of amount through NEFT, receipt of the same to be enclosed along with technical bid.

2.2 Bank Details for the purpose of Taking EMD BG are mentioned below :-

Name and Address of Beneficiary	Bharat Heavy Electricals Ltd Power Sector– Southern Region, Service After Sales 39, Sarojini Devi Road, Ek Tara Building, Secunderabad – 500003.(Telangana)
Name of Bank of Client	State Bank of India, ST. Marys Road branch (Secunderabad)
IFSC Code	SBIN0008779
Account No	00000030359171259

Details for SFMS (Structured Financial Messaging System) transmission of BG

Bank and Branch	SBI Secunderabad
Branch Code	0916
SWIFT Code	SBININBB321
IFSC Code	SBIN0000916

Format for BG towards EMD is attached as Annexure-B

Note: If EMD is submitted in the mode of BG/ Fixed Deposit Receipt/ Banker's cheque / Pay order / Demand draft, the same should be forwarded along with covering letter mentioning the tender reference, description & due date for tender submission (mention the same details on envelope also) to the following address so as to reach us on/before due date.

**DGM - Sub Contracts,
Bharat heavy Electrical Ltd.,**

TECHNICAL CONDITIONS OF CONTRACT (TCC)

**Power Sector Services After Sales,
EK Tara Building,
39, Sarojini Devi Road,
SECUNDERABAD – 500 003.
Phone: 040 27702905.**

- 3.0 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.**

- 4.0 **Procedure for Submission of Tenders:** This is an E-tender floated online through our E-Procurement portal <https://eprocurebhel.co.in>. The bidder should respond by submitting their offer online only in our e-Procurement portal at <https://eprocurebhel.co.in>. Hard copy bid or bids through email/fax shall not be accepted.

Documents Comprising the e-Tender

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

a. Technical Tender (UN priced Tender)

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

- i. Earnest Money Deposit (EMD) furnished in accordance with NIT Clause 2.0.
- ii. Technical Bid (without indicating any prices).

b. Price Bid:

- i. Prices are to be quoted in the attached Price Bid format online on e-tender portal.
- ii. The price should be quoted for the accounting unit indicated in the e-tender document.
- iii. Note: It is the responsibility of tenderer to go through the Tender document to ensure furnishing all required documents in addition to above, if any. Any deviation would result in REJECTION of tender and would not be considered at a later stage at any cost by BHEL.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

iv. A person signing (manually or digitally) the tender form or any documents forming part of the contract on behalf of another shall be deemed to warrant that he has authority to bind such other persons and if, on enquiry, it appears that the persons so signing had no authority to do so, the purchaser may, without prejudice to other civil and criminal remedies, cancel the contract and hold the signatory liable for all cost and damages.

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

DO NOT'S

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

Digital Signing of e-Tender

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

The Requirement:

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

BHEL has finalized the e-procurement service Provider-:

NIC PORTAL (<https://eprocurebhel.co.in>)

For E-PROCUREMENT ASSISTANCE & TRAINING, NIC PORTAL HELPDESK CONTACTS AS PER FOLLOWING: -

For any technical related queries please call at 24 x 7 Help Desk Number

0120-4001 002

0120-4200 462

0120-4001 005

0120-6277 787

1. Peter Raj, NIC, Ph: 9942069052

Email Support: support-eproc@nic.in

The process of utilizing e-procurement necessitates usage of DSC (Digital Signature Certificate) (Class 3- SHA2- 2048 BIT- SIGNING

TECHNICAL CONDITIONS OF CONTRACT (TCC)

& ENCRYPTION) and you are requested to procure the same immediately, if not presently available with you. Please note that only with DSC, you will be able to login the eprocurement secured site and take part in the tendering process.

The contact details of the DSC Certifying Authority as given below:

Sl. No.	Name	Website Link
1	(n) Code solutions	https://www.ncodesolutions.com/
2	e-Mudhra	https://www.e-mudhra.com/
3	Safescrypt	www.safescrypt.com

Vendors are also requested to go through seller manual available on <https://eprocurebhel.co.in>

5.0 **DOCUMENTS TO BE UPLOADED & MODALITY OF UPLOADING in EPROCUREMENT PORTAL [HTTPS://EPROCUREBHEL.CO.IN](https://eprocurebhel.co.in) SHALL BE AS DETAILED BELOW:**

Sl.No	Description	Remarks
	Techno-Commercial Bid 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: 1. 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 attached along with document under sl no (i) above. It shall be specifically noted that deviation recorded elsewhere shall not be entertained. 2. BHEL reserves the right to accept / reject the deviations without assigning any reasons,	Refer "Bidders Manual Kit" available at https://eprocurebhel.co.in .

TECHNICAL CONDITIONS OF CONTRACT (TCC)

	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	All Amendments / Correspondences / Corrigenda / Clarifications / Changes / Errata etc. pertinent to this NIT.	
iv	NIT document along with Scope of works, specific conditions, HSE PLAN FOR SITE OPERATIONS BY BHEL'S SUBCONTRACTORS and GENERAL & SPECIAL CONDITIONS OF CONTRACT [FOR SERVICES JOB] and Un-priced price bid (price bid without disclosing rates/price, but mentioning only 'QUOTED' or 'UNQUOTED' against each item)	
v	EMD Remittance Proof	
vi	Declaration by bidder for price opening through Reverse Auction.	
vii	Declaration by bidder regarding NIL Insolvency proceedings.	
viii	Declaration regarding related firms	
ix	Declaration regarding minimum local content in line with revised public procurement (preference to Make In India), order 2017	
x	Integrity Pact as per the format	
xi	Declaration regarding compliance to restrictions under rule 144 (xi) of GFR 2017.	
xii	Work order copies & work completion certificates as mentioned in pre-qualification criteria	
xiii	Financial documents as mentioned in pre-qualification criteria	
xiv	PAN NO & Photo Copy of PAN CARD.	
xv	Photo Copy of GSTN Registration	

TECHNICAL CONDITIONS OF CONTRACT (TCC)

	Certificate.	
xvi	Photo Copy of PF Registration certificate	
xvii	Photo Copy of ESI Registration certificate	
xviii	Bank Account Details for E-Payment	
xix	Attested copies of partnership deed, power of attorney and tender specifications duly signed as mentioned in the tender documents.	
xx	Check list as per Annexure-I	
xxi	Any other details preferred by bidder with proper indexing.	
Caution to Bidders: - The duly signed & stamped copies of NIT document along with Scope of works, specific conditions, HSE PLAN FOR SITE OPERATIONS BY BHEL'S SUBCONTRACTORS and GENERAL & SPECIAL CONDITIONS OF CONTRACT [FOR SERVICES JOB] and Un-priced price bid are to be attached under the form Techno-commercial Bid. For any further queries, Refer "Bidders Manual Kit" available at https://eprocurebhel.co.in .		

Sl.No	Description	Remarks
i	Price/ Total Amount corresponding to the total works as specified shall be quoted in the format named 'PRICE BID. Format to quote Total Amount' available in e-Procurement portal under 'Packet details -> Tender covers -> Finance '(Cover Type Description – Price Bid). Bidders to note that total amount quoted by the bidder in this format shall be considered for evaluation of offer.	Refer "Bidders Manual Kit" available at https://eprocurebhel.co.in .

SPECIAL NOTE:

i) All documents / annexures submitted with the offer shall be properly attached / entered / uploaded in the respective sections. BHEL shall not be responsible for any missing documents.

ii) Your offer & documents submitted along with offer shall be signed & stamped in each page by your authorized representative. No overwriting

TECHNICAL CONDITIONS OF CONTRACT (TCC)

/ correction in tender documents by bidders shall be allowed. However, if correction is unavoidable, the same may be signed by authorized signatory.

6.0 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.

7.0 Bid should be free from correction, over writings using corrective fluid etc. Any interlineation, cutting erasure or overwriting shall be valid only if they are attested under full signature(s) of person(s) signing the bid else bid shall be liable for rejection.

8.0 **TOTAL PRICE:**

8.1 Prices quoted will be taken as the TOTAL PRICE FOR CARRYING OUT THE ENTIRE WORK AS PER THE SCOPE OF WORK SPECIFIED AND ALL THE RELEVANT DETAILS FURNISHED IN THIS TENDER. The rates should be quoted both in figures and in words. All corrections to be initialed. In case of variance between figures and words, the rates advantageous to BHEL shall be taken as final for all purposes.

8.2 The rates offered shall be firm inclusive of everything and no variation will be allowed whether in cost of labour or any other factor affecting the price of the contract.

8.3 BHEL does not bind itself to accept the lowest tender. BHEL reserves the right to accept or reject the lowest or any other tender without assigning any reason and the work may be allotted to one or more than one contractors.

9.0 **SECURITY DEPOSIT**

9.1 **Please refer clause 1.10 of General Conditions of Contract for security deposit related clauses and mode of deposit.**

9.2 **Format for BG towards SD is attached as Annexure-B**

9.3 Penalty for Delayed Remittance of Security Deposit

If the contractor fails to furnish SD before start of work, in line with 1.10.3 above, simple Interest against delayed remittance of the Security Deposit shall be deducted from the sub-contractor at the rate of SBI PLR + 2% on the value of 50% SD of the contract, for the delayed period (i.e., period between start of work and date of remittance of Initial SD, i.e., atleast 50% of SD). In case, the delayed period has different SBI PLR rates, Simple Interest shall be calculated based on different rates by considering the corresponding time period. On similar

TECHNICAL CONDITIONS OF CONTRACT (TCC)

lines Penalty shall be levied for delayed remittance of Additional Security Deposit (if applicable).

- 10.0 The entire work shall be carried out by the successful bidder as decided by Resident Manager / BHEL / SAS with the best skills and know how available. The scope of work is only an indicated and not exhaustive. However, successful bidder should abide by the decision of the Resident Manager for any variations of the work.
- 11.0 Any deductions made by customer from BHEL towards non-compliance of statutory requirement, safety requirement, etc. by the contractor engaged by BHEL, will be recovered from any of the dues payable to contractor.
- 11.0 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.
- 12.0 For any clarification on the tender document, the bidder may seek the same in clarification provision available in e-procurement portal or 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.
- 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 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, past performance and approved by NALCO Damanjodi customer etc. and date of opening of price bids shall be intimated to only such

TECHNICAL CONDITIONS OF CONTRACT (TCC)

bidders. BHEL reserves the right NOT to consider offers of parties under HOLD.

- 15.0 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 authorized 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.
- 16.0 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.
- 17.0 The bidders shall not enter into any undisclosed M.O.U. or any understanding amongst themselves with respect to tender.
- 18.0 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.
- 19.0 The bidder may have to produce original document for verification if so decided by BHEL.
- 20.0 Integrity commitment, performance of the contract and punitive action thereof:
- 21.0 Commitment by BHEL:
- 21.1 BHEL commits to take all measures necessary to prevent corruption in connection with the tender process and execution of the contract. BHEL will during the tender process treat all Bidder(s) in a transparent and fair manner, and with equity.
- 21.2 Commitment by Bidder / Supplier / Contractor:
- 21.2.1 The bidder / supplier / contractor commit to take all measures to prevent corruption and will not directly or indirectly influence any decision or benefit which he is not legally entitled to nor will act or omit in any manner which tantamount to an offence punishable under any provision of the Indian Penal Code, 1898 or any other law in force in India.
- 21.2.2 The bidder / supplier / contractor will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries

TECHNICAL CONDITIONS OF CONTRACT (TCC)

in connection with the award of the contract and shall adhere to relevant guidelines issued from time to time by Govt. of India/ BHEL.

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

If any bidder / supplier / contractor during pre-tendering / tendering / post tendering / award / execution / post-execution stage indulges in mal-practices, cheating, bribery, fraud or and other misconduct or formation of cartel so as to influence the bidding process or influence the price or acts or omits in any manner which tantamount to an offence punishable under any provision of the Indian Penal Code, 1898 or any other law in force in India, then, action may be taken against such bidder / supplier / contractor as per extant guidelines of the company available on www.bhel.com and / or under applicable legal provisions.

22.0 **Clauses of Deduction**

- a. Any job if carried out leads to safety regulation violation then the contractor will be penalized appropriately by the management.
- b. Failure to comply with EHS guidelines.
- c. Any activity that leads to the disruption in the production activities that are being carried out without any written approval will be penalized.
- d. Damage to property will be recovered from the contractor.
- e. Non-compliance of statutory requirements.

23.0 **LABOUR LAWS:**

The Governing Acts as applicable and as amended shall be strictly followed. Some of such acts are given below. List of Labour legislation under which compliance, maintenance of registers and sending of returns shall be ensured by contractor. While complying with the Act complying with relevant rules issued under the said Acts and administrative circulars there on shall also be ensured by the contractor.

- a. The Factories Act, 1948
- b. The Contract Labour (R&A) Act, 1970
- c. The Employees Provident Fund and Misc. Provision Act, 1952
- d. The Employees' Compensation Act, 1923
- e. The Minimum Wages Act, 1948
- f. The Building and Other Construction Workers (Regulation of Employment and Conditions of Service) Act, 1996
- g. The Building and Other Construction Workers Welfare Cess Act, 1996
- h. The Inter State Migrant Workmen (Regulation of Employment and Conditions of Service) Act, 1979

TECHNICAL CONDITIONS OF CONTRACT (TCC)

- i. The Payment of Wages Act, 1936
- j. The Payment of Bonus Act, 1965
- k. Maternity Benefit Act, 1971
- l. The Child Labour (Prohibition And Regulation) Act, 1986
- m. The Employees' State Insurance Act, 1948
- n. Equal Remuneration Act, 1976
- o. The Industrial Disputes Act, 1947
- p. The Payment of Gratuity Act, 1972
- q. The Trade Union Act, 1926
- r. The Apprentices Act, 1961
- s. Industrial Employment (Standing Orders) Act, 1946
- t. The Employment Exchanges (Compulsory Notification of Vacancies) Act, 1959.
- u. Any other acts/rules as may be applicable from time to time

24.0 STATUTORY REQUIREMENTS LIKE PF, ESI CLEARANCE AS PER ODISHA GOVT. AND AS PER NALCO DAMANJODI-HRD TO BE FULLY COMPLIED WITH. ANY SPECIAL RULES OR ALLOWANCES APPLICABLE AS PER NALCO DAMANJODI-HRD TO BE FULLY COMPLIED WITH.

25.0 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".

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

27.0 SUSPENSION OF BUSINESS DEALINGS

"BHEL reserves the right to take action against contractors who either fail to perform or Tenderers/Contractor who indulge in malpractices, by suspending business dealings with them in line with BHEL guidelines issued from time to time displayed on BHEL website <http://www.bhel.com>".

28.0 **In view of the Post COVID scenario, successful bidder must abide by the statutory requirement and guidelines issued by central government and respective state governments (from time to time) during mobilisation and execution of the work. BHEL shall not compensate against any claim of the successful bidder on above account.**

TECHNICAL CONDITIONS OF CONTRACT (TCC)

- 29.0 Special arrangements to be made for tackling COVID-19 pandemic – Contractor shall make arrangements for stay of workers within their premises as far as possible and/ or adjacent building and for implementation of STANDARD OPERATING PROTOCOL (SOP) as per government order. The transportation of workers to work place shall be arranged by the contractor in dedicated transport by ensuring social distance. Any person violating the COVID -19 measures published vide government order time to time will be liable to be proceeded for legal action as per the government order. Following shall be observed in work place:
- 29.1 All work places shall have adequate arrangements for temperature screening and provide sanitizers at convenient places.
- 29.2 Work places shall have a gap of one hour between shifts and will stagger the lunch breaks of staff, to ensure social distancing.
- 29.3 Use of AROGYA SETU will be encouraged for all employees both private and public.
- 29.4 Contractor shall sanitize their work place between shifts.
- 29.5 Large meetings to be prohibited. Spitting shall be strictly prohibited. Wearing of face cover is compulsory.
- 29.6 Government order (local/state/center) being issued time to time for protective measures of COVID-19 pandemic shall be complied with strictly until government (local/state/ center) declares end of pandemic.
- 29.7 Standard operating procedure for social distancing for workplace and offices
The following measures shall be implemented by contractor for their office and workplaces:
1. All areas in the work premises including the following shall be disinfected completely using user friendly disinfectant mediums:
 - a. Entrance gate of work place, office, if any
 - b. Cafeteria and canteens, if any
 - c. Meeting room, conference halls/ open area available/ verandah/ entrance gate of site, bunkers, porta cabins, buildings, etc.
 - d. Equipments and lifts
 - e. Washroom, toilet, sink, water points, etc
 - f. Wall/ all other surfaces
 2. For workers coming from outside, special transportation facility shall be arranged without any dependency on the public transport system. These vehicles should be allowed to work only with 30- 40% passenger capacity.
 3. All vehicles and machinery entering the premise should be disinfected by spray mandatorily.
 4. Mandatory thermal scanning of everyone entering and exiting the work place to be done.
 5. Medical insurance for the workers to be made mandatory.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

6. Provision for hand wash & sanitizer preferably with touch free mechanism shall be made at all entry and exit points and common areas. Sufficient quantities of all the items should be available.
 7. Work places shall have a gap of one hour between shifts and will stagger the lunch breaks of staff, to ensure social distancing.
 8. Large gatherings or meetings of 10 or more people to discouraged. Seating at least 6 feet away from others on job sites and in gatherings, meetings and training sessions.
 9. Not more than 2/4 persons (depending on size) will be allowed to travel in lifts or hoists.
 10. Use of staircase for climbing should be encourages.
 11. There should be strict ban of gutka, tobacco, etc. and spitting should be strictly prohibited.
 12. There should be total ban on non-essential visitors at sites.
 13. Hospitals/ clinics in the nearby areas, which are authorized to treat COVID-19 patients, should be identified and list should be available at work place all the times.
 14. In addition to the above, Contractor shall strictly follow all the SOPs issued from time to time by BHEL, Customer, local authorities, State Government and Central Government.
- 30.0 The Bidder declares that they will not enter into any illegal or undisclosed agreement or understanding, whether formal or informal with other Bidder(s). This applies in particular to prices, specifications, certifications, subsidiary contracts, submission or non-submission of bids or any other actions to restrict competitiveness or to introduce cartelization in the bidding process.
- In case, the Bidder is found having indulged in above activities, suitable action shall be taken by BHEL as per extant policies/ guidelines.
- 31.0 ***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 qualify for the subject job on the basis of pre-qualification evaluation & Techno-Commercial bids etc. BHEL reserves the right to reject the bidders with unsatisfactory past performance in the execution of a contract. BHEL's decision in this regard shall be final & binding.***
- 32.0 "For this procurement, the local content to categorize a supplier as a Class-I local supplier/ Class-II local supplier/ Non-Local supplier and purchase preference to Class-I local supplier, is as defined in Public Procurement (Preference to Make in India), Order 2017 dated 04-06-2020 issued by DPIIT. In case of subsequent orders issued by the Nodal Ministry, changing the definition of local content for the items of the NIT, the same shall be applicable even if issued after issue of this NIT, but before opening of Part-II bids against this NIT".

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Duly filled & signed Form (Declaration regarding minimum local content in line with revised public procurement (preference to Make In India), order 2017), as applicable, to be submitted by bidders along with their techno-commercial offer.

33.0 **Compliance to Restrictions under Rule 144 (xi) of GFR 2017**

- I. Any bidder from a country which shares a land border with India will be eligible to bid in this tender only if the bidder is registered with the Competent Authority. The Competent Authority for the purpose of this Clause shall be the Registration Committee constituted by the Department for Promotion of Industry and Internal Trade (DPIIT).
- II. “Bidder” (including the term ‘tenderer’, ‘consultant’ or ‘service provider’ in certain contexts) means any person or firm or company, including any member of a consortium or joint venture (that is an association of several persons, or firms or companies), every artificial juridical person not falling in any of the descriptions of bidders stated hereinbefore, including any agency branch or office controlled by such person, participating in a procurement process.
- III. “Bidder from a country which shares a land border with India” for the purpose of this order means: -
 - a. An entity incorporated, established or registered in such a country; or
 - b. A subsidiary of an entity incorporated, established or registered in such a country; or
 - c. An entity substantially controlled through entities incorporated, established or registered in such a country; or
 - d. An entity whose beneficial owner is situated in such a country; or
 - e. An Indian (or other) agent of such an entity; or
 - f. A natural person who is a citizen of such a country; or
 - g. A consortium or joint venture where any member of the consortium or joint venture falls under any of the above
- IV. The beneficial owner for the purpose of (III) above will be as under:
 1. In case of a company or Limited Liability Partnership, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person, has a controlling ownership interest or who exercises control through other means.

Explanation

 - a. “Controlling ownership interest” means ownership of or entitlement to more than twenty-five per cent. of shares or capital or profits of the company;

TECHNICAL CONDITIONS OF CONTRACT (TCC)

- b. "Control" shall include the right to appoint majority of the directors or to control the management or policy decisions including by virtue of their shareholding or management rights or shareholders agreements or voting agreements;
 2. In case of a partnership firm, the beneficial owner is the natural person(s) who, whether acting alone or together, or through one or more juridical person, has ownership of entitlement to more than fifteen percent of capital or profits of the partnership;
 3. In case of an unincorporated association or body of individuals, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person, has ownership of or entitlement to more than fifteen percent of the property or capital or profits of such association or body of individuals;
 4. Where no natural person is identified under (1) or (2) or (3) above, the beneficial owner is the relevant natural person who holds the position of senior managing official;
 5. In case of a trust, the identification of beneficial owner(s) shall include identification of the author of the trust, the trustee, the beneficiaries with fifteen percent or more interest in the trust and any other natural person exercising ultimate effective control over the trust through a chain of control or ownership.
- V. An agent is a person employed to do any act for another, or to represent another in dealings with third person.
- VI. The successful bidder shall not be allowed to sub-contract works to any contractor from a country which shares a land border with India unless such contractor is registered with the Competent Authority. However, in this regard, relevant provisions of GSCC shall also be applicable.

Note:

The bidder shall provide undertaking for their compliance to this Clause, in the Format (DECLARATION REGARDING COMPLIANCE TO RESTRICTIONS UNDER RULE 144 (xi) OF GFR 2017).

Registration of the bidder with Competent Authority should be valid at the time of submission as well as acceptance of the bids.

- 34.0 Guidelines/rules in respect of Suspension of Business dealings, Vendor evaluation format, Quality, Safety & HSE guidelines, Experience Certificate, etc. may undergo change from time to time and the latest one shall be followed. The abridged version of extant 'Guidelines for suspension of business dealings with suppliers/ contractors' is available on www.bhel.com on "supplier registration page".
- 35.0 ***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***

TECHNICAL CONDITIONS OF CONTRACT (TCC)

reason thereof. Also BHEL shall not entertain any correspondence from bidders in this matter (except for the refund of EMD).

For and on behalf of BHEL,

Sd/-

**(N Jayasankar)
DGM /SCT**

TECHNICAL CONDITIONS OF CONTRACT (TCC)

ANNEXURE - 1

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		
3a	Details of Contact person for this Tender: Name : Mr / Ms Designation: Telephone No: Mobile No: Fax No: E-mail ID:		
3b	Details of alternate Contact person for this Tender: Name : Mr / Ms Designation: Telephone No: Mobile No: Fax No: E-mail ID:		
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 24 months from due date	
		APPLICABILITY	BIDDER REPLY
6	Whether the format for compliance with PRE QUALIFICATION CRITERIA is understood and filled with proper supporting documents referenced in the specified format	Applicable / Not applicable	YES / NO
7	Audited profit and Loss Account for the last three years submitted	Applicable / Not applicable	YES/NO

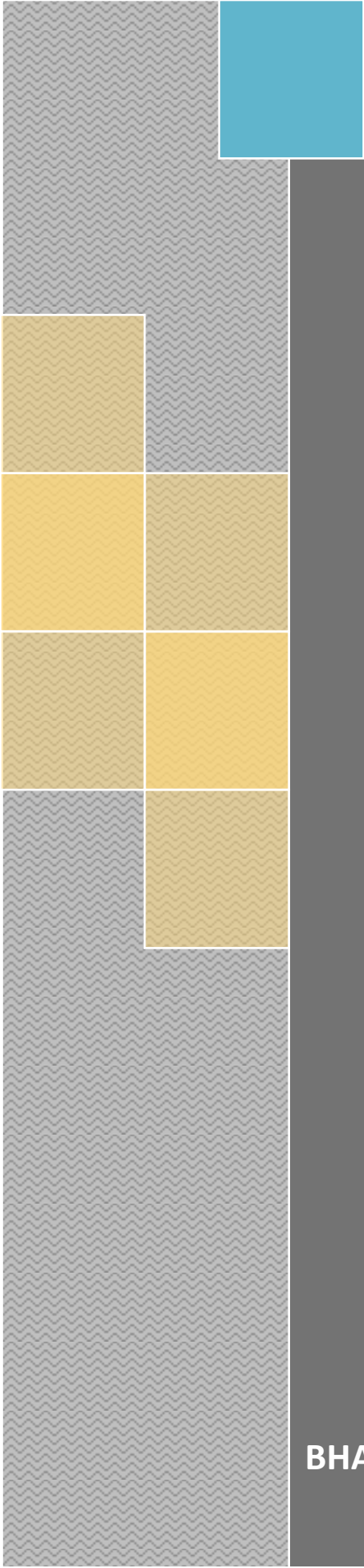
TECHNICAL CONDITIONS OF CONTRACT (TCC)

8	Copy of PAN Card submitted	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	YES/NO
11	Declaration by Authorized 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
16	Capacity Evaluation of Bidder for current Tender	Applicable / Not applicable	YES/NO
17	Tie Ups / Consortium Agreement are submitted as per format	Applicable / Not applicable	YES/NO
18	Power of Attorney for Submission of Tender / Signing Contract Agreement	Applicable / Not applicable	YES/NO
19	Analysis of Unit rates	Applicable / Not applicable	YES/NO
20	Unquoted price bid submitted or not	Applicable / Not applicable	YES/NO

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

DATE:

AUTHORISED SIGNATORY
(With Name, Designation and Company seal)



VOLUME – IA

Part I & II

TECHNICAL CONDITIONS OF CONTRACT (TCC)

BHARAT HEAVY ELECTRICALS LIMITED



TECHNICAL CONDITIONS OF CONTRACT (TCC)

CONTENTS

SI no	DESCRIPTION	Chapter	No. of Pages
Vol I A	Part-I: Contract specific details		
1	Project Information	Chapter-I	01
2	Scope of works	Chapter-II	16
3	Facilities in the scope of Contractor / BHEL (Scope Matrix)	Chapter-III	05
4	T&Ps and MMEs to be deployed by Contractor	Chapter-IV	01
5	T&Ps and MMEs to be deployed by BHEL on sharing basis	Chapter-V	01
6	Time Schedule	Chapter-VI	02
7	Terms of Payment	Chapter-VII	02
8	Taxes and other Duties	Chapter-VIII	02
9	Weight schedule	Chapter-IX	16
10	General	Chapter-X	04
11	Foundation & Grouting	Chapter-XI	02
12	Handling & storage	Chapter-XII	01
13	Erection	Chapter-XIII	06
14	Progress of work	Chapter-XIV	02
15	Welding	Chapter-XV	01
16	Electrical Works	Chapter-XVI	23
17	Testing & Commissioning	Chapter-XVII	04
18	Painting	Chapter-XVIII	02
19	Corrections/ Revisions in special conditions of contract, General conditions of Contract and Forms & Procedures.	Chapter-XIX	14
20	Painting scheme for ESP	Chapter-XX	01

TECHNICAL CONDITIONS OF CONTRACT (TCC)

VOLUME-IA PART – I CHAPTER – I PROJECT INFORMATION

NALCO-Damanjodi SPP-3X200TPH(3X18.5MW)

1. Project Name : NALCO – Damanjodi
2. Project Stage : Completed
3. No. of Units x Capacity : 3X200 TPH Boilers
4. Project setting up by : NALCO – Damanjodi
5. LOCATION AND APPROACH : (i) NALCO Damanjodi, Orissa.
From Visakhapatnam Airport 200 km
(ii) District: Koraput
(iii) State : Orissa
6. Nearest Railway Station : i) Damanjodi
7. Nearest Major Town & Distance : Rayagada , 60 km.
8. Nearest Airport & Distance : Visakhapatnam Airport 200 km
9. Nearest Highway & Distance : -
10. Temperature: (Dry bulb) : Absolute Max. 47⁰ C
: Absolute Min. 9.1⁰ C
11. Relative Humidity :
Maximum : 98.2 %
Minimum : 12.2 %
12. Annual Rainfall : 1559.0 mm
13. Annual maximum Wind speed : 19.3 Km/hr
14. Transport:
a) By Rail : Broad Gauge Railway line of Eastern Railway
b) Road : District High way
15. Seismic Data : Zone – II as defined in IS: 1893 - 2002

TECHNICAL CONDITIONS OF CONTRACT (TCC)

VOLUME-IA PART – I CHAPTER – II

SCOPE OF WORKS

UP Gradation, Renovation & Modernisation work of existing ESPs, Unloading at Site Stores / Storage yard, Transportation to Site of Work, Dismantling of Existing Equipment including duct, Pre-assembly, Assembly, Erection, Pre-commissioning, Gas Distribution Test, Trial operation, Testing, Commissioning and Performance Testing of Existing Electrostatic Precipitator after erection of new parallel path including application of insulation and supply and application of final painting at NALCO-Damanjodi SPP-ESP, 3X200TPH boilers of Unit-1,3,4(**3X18.5MW**)

The work has to be started immediately

The scope of the work will comprise of but not limited to the following:

- 1.2.1.1 Receipt of materials / component to be erected by the contractor from lorries / trailers / trucks / train etc. Unloading at Site Stores / Storage yard, stacking, storage and preservation. **If required Restacking (Material handling)**
- 1.2.1.2 Receipt of erection materials for ESP of Unit-1,3&4 from site stores / storage yard, transportation to erection site, Preassembly, Erection, Testing, Commissioning, Trial operation and reliability operation / PG Test of equipment. **(Replacement of ducts between APH and ID suction)**
- 1.2.1.3 Receipt of erection materials from site stores / storage yard, transportation to erection site, Preassembly, Erection, Testing, Commissioning, Trial operation and reliability operation / PG Test of equipment (**Erection of two new additional ESP pass for Unit-1 & 3**)
- 1.2.1.4 Dismantling of existing all three Units (1,3 & 4) ESP internals and old ducts between APH to ID Fan inlet, existing casing & its column, Hopper, Funnel and transporting to dump yard (**Dismantling of old ducts & ESP Passes**)
- 1.2.1.5 Modernisation of existing ESP of Unit-1,3 & 4 includes 100% replacement of all internals including Replacement of existing casing & its column, Hopper, Funnel will be dismantled and erection of New internals, New Casing, Hopper, Funnel. Erection of two new passes for Unit-1&3, It also includes testing, commissioning, trial operation and PG test of the equipment of all Unit-1,3,4. **(The Existing Supporting structures and Its Foundations will be retained only) (Modernisations of existing ESP).**
- 1.2.1.6 Application of insulation for the All Renovated ESP, New ESP Passes and its connected ducts between APH and ID Fan, new additional pass ESP and existing ESP wherever required along with supply of scaffolding materials and

TECHNICAL CONDITIONS OF CONTRACT (TCC)

providing scaffolding material to facilitate the insulation material (**Thermal Insulation for ducts and ESP**)

- 1.2.1.7 Supply and application of painting for the structures ESP roof, platforms, Gates, actuators, etc as per the drawings/documents for the equipment's/systems covered in the scope of erection (**Final painting including supply of paints**).
- 1.2.1.8 **Structure, pipeline, cable tray etc. dismantling & Re-storation / rerouting for crane position is in contractor scope.**
- 1.2.1.9 Ramp preparation & erection, Dismantling after completion of work for crane position in contractor scope.
- 1.2.1.10 All fouling while ESP & duct dismantling & erection shall be addressed by the contractor. No extra payment will be paid for this.
- 1.2.1.11 All dismantled material shall be properly segregated, transported to BHEL/customer designated scrap yard.

Shutdown period will be 45 Days for New parallel ESP hook up with existing ESP, Carry out modification in flue gas duct and to isolate one pass of existing ESP for necessary up gradation.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

BRIEF SCOPE OF WORK

MECHANICAL SCOPE OF WORK FOR ERECTION AND COMMISSIONING:

The scope of the work will comprise of but not limited to the following:

Safety:

Adherences to safety are upper most during execution of work. 100% safety norms to be strictly followed. Tenderer should appoint qualified safety officer to implement safety. He should interact with BHEL and customer for day to day activities. As the work is to be executed in the running plant, all work forces to undergo for a safety classes and obtain the certificate from customer. No person will be allowed without safety training.

Trained and certified safety supervisors to be appointed for every 50 work men. The safety officer, supervisors are not allowed to assigning any work other than safety. Heavy penalty will be levied if any un -safe practices are found during execution of work.

Quality:

Qualified and certified quality engineer to be posted at site for quality assurance. The quality person should maintain all records and reports to be generated as per BHEL quality standards. He should interact with customer and BHEL and all the stage wise protocols to be prepared after joint inspection and get is signed by BHEL and customer. All the record to be maintained and he is responsible for quality audit carried out by BHEL and customer.

AA.:Materials handling:

This works includes Receipt, unloading, verification stacking, restacking, transportation from storage yard to site and maintaining the records set by BHEL. The scope of work includes arranging of lifting tools, T&P, Cranes, hydra, trailers etc. as required for satisfactory and safe handling of the equipment

The material handling scope includes providing fencing & steel gate of storage yard (storage yard size 4000 Sq.m (80MX50M size approximately)), bush cutting & clearing if required, in storage yard, clearing of scrap material available at storage space provided by customer, illumination arrangement, ground leveling, supply of PC, qualified and trained manpower of minimum 3 persons to maintain DBR, STOCK REGISTER, MDR, SAR etc as required to work under BHEL STORES/MM in charge. Marking of DBR number in each items with paint (paint will be in contractor scope). Verification of box material, as per site requirement stacking & restacking of material. No separate amount will be paid for these services and the quoted amount includes these services in Material handling. The services has to be provided upto completion of the project.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

structures & its foundation will be retained. The duct materials will be supplied by BHEL Free of cost as erection materials. Gate, actuator, damper, PG test pocket erection is also in the contractor's scope. Necessary fabrications, preassembly erection, testing and commissioning to be carried out by tenderer. If required, the old and removed duct materials have to be reused for certain modifications. Any structure, pipeline foul during duct replacement work, same has to be dismantled and re erected after completion of duct replacement work without any extra cost. Tests like air tightness test, GD test etc., as required for satisfactory performance is to be conducted by tenderer. The work involves re location of duct expansion joints, gates/dampers as required for satisfactory completion of work. The work includes erection of thermal insulation, supply and application of paints as required.

Dismantling and Re-erection of existing flue gas conditioning system/ammonia dozing system in ESP inlet duct is also included in the scope. While erecting existing flue gas conditioning system any extra tube is required then the same is arranged by the contractor.

Temporary spool piece fabrication using new/old material, erection, welding at ESP inlet funnel and outlet funnel for pass charging shall be in contractor scope.

During duct modification, the tests like air tightness test, kerosene test etc., as required for satisfactory performance is to be conducted by tenderer. Necessary assistance for satisfactory completion of tests to be provided by the tenderer. No separate payment will be paid for the above tests and the quoted rate shall include the same.

CC 2: Duct Replacement/modifications in unit 4:

Outlet duct gate actuator platform erection & welding in pass A&B.

One segment of inlet and outlet duct is to be connected with inlet & outlet funnel in pass B.

Erection of hopper, knife gate valve, transition piece, approach platform in inlet duct of pass A&B to avoid ash accumulation.

Re erection of dismantled structure of outlet duct

TECHNICAL CONDITIONS OF CONTRACT (TCC)

DD 1: Upgradation of existing ESP in unit 1&3:

1. One pass of existing ESP modification work will be commenced after commissioning & charging of new parallel ESP, completion of duct modification and isolation of one existing ESP pass. The scope of work involves dismantling of pent house, electric operated hoist, monorail, transformer, rectifier handling structure, outer and inner roof, geared motors, disconnecting switches, etc located on top of ESP. Dismantling of ESP internals including collecting and emitting frames, support and shaft insulators emitting and collecting electrodes, rapping mechanism, shafts etc. Casing shell, casing structure, water washing system, guide bearing, hopper & its accessories, inlet & outlet funnel, screen sheet etc will also be removed. All the removed materials to be shifted to customer scrap yard as instructed by customer. **The existing ESP supporting structure & foundation will be retained only.**

The new casing will accommodate with increased field height 13.5 m, 400 mm pitch design internals having 750 mm wide collecting electrodes. There will be 2 pass of modified ESP per unit. Regular ESP erection with all supports insulators, casing structure, casing shell, rapping frames, inner and outer roofs, disconnection switches, transformer, hoist, monorail, hopper, its accessories & approach platform, rapping drive & mechanism, collecting & emitting electrode, inlet & outlet funnel, screen sheet etc will be carried out as a new ESP. The work includes erection of thermal insulation, supply and application of paints as required. **It is to be noted that existing staircase to ESP roof and hopper approach platform is to be retained.**

Once the ESP erection works is completed, the ESP will be cold commissioned. After cold commissioning, the ESP will be charged with flue gasses by opening the gates installed during duct modification. The dummy plates if any erected for safe isolation will be removed and new parallel & upgraded existing ESP'S will be taken in service.

Now second and last pass of existing ESP will be isolated and modification activities repeated.

ESP existing dry ash handling system erection is also included in the scope. While erecting existing dry ash handling system any item gets damaged or not usable, then same is to be arranged by the contractor.

During modification of ESP, the tests like air tightness test, air load test, GD test etc., as required for satisfactory performance is to be conducted by tenderer. Necessary assistance for satisfactory completion of tests to be provided by the tenderer. No separate payment will be paid for the above tests and the quoted rate shall include the same.

DD 2: Upgradation of existing ESP in unit 4:

TECHNICAL CONDITIONS OF CONTRACT (TCC)

1. One pass of existing ESP modification work will be commenced after isolation of that ESP pass. The scope of work involves dismantling of pent house, electric operated hoist, monorail, transformer, rectifier handling structure, outer and inner roof after removal of ESP transformers, geared motors, disconnecting switches, etc., located on top of ESP. Dismantling of ESP internals including collecting and emitting frames, support and shaft insulators emitting and collecting electrodes, rapping mechanism, shafts etc. Casing shell, casing structure, water washing system, guide bearing, hopper & its accessories, inlet & outlet funnel, screen sheet etc., will be removed. Existing hopper approach platform will be retained / reused. All the removed materials to be shifted to customer scrap yard as instructed by customer. **The existing ESP supporting structure & foundation will be retained only.**

As per Design / Drawing strengthening of Columns has to be provided by ranging additional Bracings

The new casing will accommodate with increased field height 13.5 m, 400 mm pitch design internals having 750 mm wide collecting electrodes. There will be 2 pass of modified ESP per unit. Regular ESP erection with all supports insulators, casing structure, casing shell, rapping frames, inner and outer roofs, disconnection switches, transformer, hoist, monorail, hopper, its accessories & approach platform, rapping drive & mechanism, collecting & emitting electrode, inlet & outlet funnel, screen sheet etc., will be carried out as a new ESP. The work includes erection of thermal insulation, supply and application of paints as required. **It is to be noted that existing staircase to ESP roof and hopper approach platform is to be retained.**

Once the ESP erection works is completed, the ESP will be cold commissioned. After cold commissioning, the ESP will be charged with flue gasses by opening the gates. The dummy plates if any erected for safe isolation will be removed and upgraded existing ESP'S will be taken in service.

Now second and last pass of existing ESP will be isolated and modification activities repeated.

ESP dry ash handling system erection is also included in the scope. While erecting existing dry ash handling system any item gets damaged or not usable, then same is to be arranged by the contractor.

Painting of both A&B pass of ESP is under the contractor scope.

150 Nos. Scaffolding has to be removed.

During modification of ESP, the tests like air tightness test, GD test etc., as required for satisfactory performance is to be conducted by tenderer. Necessary assistance for satisfactory completion of tests to be provided by the tenderer. No separate payment will be paid for the above tests and the quoted rate shall include the same.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

FOLLOWING IS THE LIST OF PENDING PUNCH POINTS FOR DUCT AND ESP OF UNIT#4

Specific for PASS – A

Illumination of Pass-A of Unit#4.
IOS for Unit#4 Pass- A of Unit#4.
Painting of Pass-A.
Erection of Interlock JB
Removal of Scaffolding.

Common for PASS – A & B

Out let duct gate/Actuator platform frame erection Unit#4 Pass-A and Pass-B.
One segment of outlet duct (will be connected with outlet funnel of U#4 pass-B).
Erection of hoist (Common)
Scheme to avoid ash accumulation in inlet Duct of Unit#4 Pass-A and Pass-B (Erection of Hopper, knife gate valve, transition piece, ISMB200, approach platforms etc).
Erection of ESP Galleries and Stairs (common for both passes).
Re-erection of dismantled structure of outlet duct.

EE: Dismantling of ducts, ESP and Ash handling system:

All the existing duct between APH to ID fan suction as marked in BHEL drawing including Gate, damper, flue gas conditioning system/ammonia dosing system to be dismantled safely and to be transported to BHEL/customer designated stack/dump yard. Similarly, existing ESP items viz casing shell, casing structure, hopper, funnel, internals, roof, roof equipment (e.g. TR sets, disconnecting switches, EOH etc.) to be dismantled and transported to BHEL/Customer designated stack/dump yard. ***This scope also includes dismantling of ESP wet & dry ash handling system.*** After completion of duct/ESP internal etc., dismantling structure to be properly cleaned and give clearance for erection work.

FF: PAINTING:

The painting to be carried out as per the painting scheme detailed in separate chapter.

GG: PG TEST:

On satisfactory completion of R&M works in all respects, PG test of entire ESP will be conducted. The bidder should provide required manpower and T& P and assist BHEL team for satisfactory completion of PG Test. The necessary assistance includes repair of defective fields which were erected/renovated by the contractor facilities like providing

TECHNICAL CONDITIONS OF CONTRACT (TCC)

approach platforms, water washing of ESP if required to be carried out by bidder. PG test is in the scope of work and all the expenditure in this regard falls within the quoted rate/price.

HH: Miscellaneous works:

As the work is to be carried out in running plant with confined space, miscellaneous works like shifting of ducts of nearby equipment's, power cables, structure/pipe etc may arise during execution of work. Such works have to be carried out under guidance and close supervisions of customer and BHEL. The quoted rate shall include such sundry works and no separate payment shall be paid. However, the materials required for such works shall be provided by customer/BHEL free of charges

II: T&P, cranes, erection tools etc:

All the tools tackles, including heavy duty crane like one number 120MT tire mounted crane and 2Nos Tower crane, hydra, trailers, Derik arrangements required for satisfactory and safe execution of work to arranged by tenderer at his cost.

No T&P will be provided by BHEL except huck bolting machine and Blower, open space for their office and as listed in BHEL scope. The quoted rate includes total completion of work including arrangements for labor colony for their workers stay. Customer will not provide any quarters for labor stay.

All the above activities included in the quoted rate. No separate amount will be paid for any work. The ESP R&M work completion means completion of work in all respects and takeover by customer. Any miscellaneous work required for satisfactory completion of work to be carried out by bidder without any extra amount.

-OoO-

SCOPE OF WORK FOR ELETRICAL & C&I

The Electrical Scope of Works includes up-gradation, Renovation & Modernisation, erection and commissioning of Electrical components of existing ESPs and erection and commissioning of additional new parallel pass ESP's (Pass-C)viz. Dismantling & Replacement of existing Electrical equipment's of Old ESP's as required, Erection & Commissioning of new electrical components such as Service transformers, HT cables laying and termination with HT jointing kits, Illumination of ESP control room and ESP area, LT Motors for ESP, LT Switch gears, MCC, PCC modules, DB's, Junction Boxes, Electrical operated hoists, High voltage Bus duct connections, Interlock systems, Electrical heaters, Local start & stop push buttons and Junction boxes, Ash level

TECHNICAL CONDITIONS OF CONTRACT (TCC)

indicators, laying of Power , control, instrumentation & special cables, cable trays and supports, Insulators along with heating systems, ESP IOS system, Opacity monitor and Sox, NOx analyzer etc. of Units 1,3 & 4 of 4 X 200 TPH (3X18.5MW)Capacity Steam power plant of Nalco, Damanjodi,Odisha.

2.1.0 GENERAL

The scope of work will comprise but not limited to the following:

- 2.1.1 Dismantling of existing electrical components of ESP namely control room panels, cables, cable trays, junction boxes, support & shaft insulator heaters and ash level indicators, opacity monitors, Operator computer in ESP control room etc.,. The scope of work also includes shifting and proper storage of dismantled materials at storage yard. The dismantled materials should be segregated and unusable materials should be devoluted to Customer scrap yard.The work includes segregating the Materials, weighment, transporting and handing over at storage/scrap yard inside plant premises. Some of the dismantled components which require to be reused shall be properly packed and stored after weighment.The healthiness of the retaining equipment has to be checked/serviced/repaired and proper working of this equipment has to be ensured before re-erection.

Identification of equipments at storage yard, technical assistance for checking and making the shortage/damage reports, taking delivery at storage yard/stores and calibration, erection, aligning, fastening, supporting, cleaning, checking, testing, commissioning, troubleshooting and carrying out statutory tests as required, trial operation, up to the time of completion of commissioning activities and commercial operation of the unit and handing over to customer or till completion of contract period whichever is earlier, along with the supply of all consumables, tools and tackles and testing instruments

- 2.1.2 It is not the intent to specify herein all details of materials. Any item related to this work not covered, but necessary to complete the system will be deemed to have been included in the scope of the work.
- 2.1.3 Re-routing or re-location of above ground electrical cables, cable trays, equipment's, fouling of any electrical cablings, trays etc. associated with new pass ESP shall be done by the sub-contractor within the quoted rates.
- 2.1.4 All the work shall be carried out as per instructions of BHEL engineer. BHEL engineer's decision regarding the correctness of the work and method of working shall be final and binding on the contractor.
- 2.1.5 Contractor shall dismantle the items as per the sequence prescribed by BHEL at site. Contractor shall erect all items/materials etc.,as per sequence prescribed by BHEL at

TECHNICAL CONDITIONS OF CONTRACT (TCC)

site. BHEL engineer depending upon the availability of materials/ work fronts etc will decide the sequence of erection / commissioning methodology. No claims for extra payment from the contractor will be entertained on the grounds of deviation from the methods of erection / commissioning adopted in erection / commissioning of similar job or for any reasons whatsoever.

- 2.1.6 Site testing wherever required shall be carried out for all items / materials installed by the contractor to ensure proper installation and functioning in accordance with drawings, specifications and manufacturer's recommendations.
- 2.1.7 The contractor shall co-ordinate and provide experienced engineers for satisfactory testing, pre-commissioning, commissioning and trial run of the connected equipment under overall guidance of BHEL and shall locate any cause of malfunction and rectify same for proper operation. Testing shall also include any additional tests, which the Engineer feels necessary because of site conditions and also to meet system specification.
- 2.1.8 During the course of dismantling, erection, testing and commissioning Electrical/ C & I work, certain rework / modification / rectification / repairs / fabrication etc. may be necessary on account of feedback from other power stations or units already commissioned and/ or units under erection and commissioning and also on account of design changes and manufacturing incompatibilities and site operation / maintenance requirements. Contractor shall carry out such rework / modification / rectification / fabrication / repairs etc., promptly and expeditiously and the same shall be deemed to be part of the scope of work.
- 2.1.9 The work shall be executed under the usual conditions without affecting power plant construction and in conjunction with other operations and contracting agencies at site. The contractor and his personnel shall co-operate with the personnel of other agencies, co-ordinate his work with others and proceed in a manner that shall not delay or hinder the progress of work as a whole.
- 2.1.10 All necessary certificates and licenses required to carry out this work are to be arranged by the contractor expeditiously at his cost.
- 2.1.11 The contractor shall take delivery of item, materials, from the storage yard / stores / sheds of BHEL / customer which is within a radius of 5km. He shall also make arrangements for, safe custody, watch and ward of equipment after it has been handed over to him till they are fully erected, tested and commissioned till the contract period. The contractor shall note that items / materials shall be transported to erection site / assembly yard etc., by the prescribed route without disturbing and causing damage to other works in the most professional

TECHNICAL CONDITIONS OF CONTRACT (TCC)

manner. All items, Hardware, etc. shall be stored in appropriate manner as per BHEL's instructions.

- 2.1.12 The contractor shall take delivery of items/materials, and consumables from the stores/ storage area / sheds of BHEL / customer after getting approval of engineer/ customer in the prescribed indent forms of BHEL/ customer.
- 2.1.13 After completing all the works, contractor shall hand over all remaining extra materials with proper identification tags in packed condition to BHEL stores. In case of any use over actual design requirements, BHEL reserves the right to recover the cost of material used in excess or misused. Decision of BHEL engineer in this regard will be final and binding on the contractor.
- 2.1.14 Contractor shall transport all materials to site and unload at site / working area, or pre-assembly yard for inspection and checking. All material handling equipment required shall be arranged by the contractor.
- 2.1.15 Contractor shall retain all T&P/ Testing instrument /Material handling instrument etc at site as per advice of BHEL engineer and same shall be taken out from site only after getting the clearances from engineer in charge.
- 2.1.16 Contractor shall remove all scrap materials periodically generated from his working area in and around power station and collect the same at one place earmarked for the same. Load of scraps is to be shifted to a place earmarked by BHEL. Failure to collect the scrap is likely to lead to accidents and as such BHEL reserves the right to collect and remove the scrap at contractor's risk and cost if there is any failure on the part of contractor in this respect. All the package materials, including special transporting frames, etc., shall be returned to the BHEL stores /customer's stores by the contractor.
- 2.1.17 If any item or equipment not covered but requires being erected / commissioned, same shall be carried out by the contractor. Equivalent or proportional unit rate shall be considered wherever possible from the BOQ. The rates quoted by the contractor shall be uniform as far as possible for similar items appearing in rate schedule.
- 2.1.18 The contractor at his cost shall arrange necessary security measures for adequate protection of his machinery, equipment, tools, materials etc. BHEL shall not be responsible for any loss or damage to the contractor's construction equipment and materials. The contractor may consult the Engineer-in-Charge on the arrangements made for general site security for protection of his machinery, equipments, tools etc.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

- 2.1.19 The contractor shall ensure that his premises are always kept clean and tidy to the extent possible. Any untidiness noted on the part of the contractor shall be brought to the attention of the contractor's site representative who shall take immediate action to clean the surroundings to the satisfaction of the Engineer-in-Charge.
- 2.1.20 The Contractor may have to execute work in such a place and condition where other agencies also will be under such circumstances.
- 2.1.21 Scope of work covered under this specification requires quality workmanship, engineering and construction management. The contractor shall ensure timely completion of work. The contractor shall have adequate tools, measuring instruments, calibrating equipments etc. in his possession. He shall also have adequate trained, qualified and experienced engineers, supervisory staff and skilled personnel. The manpower deployed by contractor shall match with above scope of works.
- 2.1.22 All the surplus, damaged, unused materials, package materials, containers, special transporting frames, etc. shall be returned to the BHEL stores / customer's stores by the contractor.
- 2.1.23 Any wrong erection shall be removed and re-erected promptly to comply with the design requirements to the satisfaction of Site Engineer.
- 2.1.24 The scope of specification covers the installation, testing and commissioning of the instrument, hardware along with accessories as detailed in Bill of Materials.
- 2.1.25 Shutdown work:
- a. Relocation (including cable removal and retermination and any other miscellaneous work for relocation) of EC panels in the existing control rooms of Unit#1&3 is to be done by contractor to accommodate EC panels of Pass-C.
 - b. Relocation (including cable removal and retermination and any other miscellaneous work for relocation) of old JBs in the same EC panels room is also to be done by contractor to accommodate EC panels of Pass-C.
 - c. Hook-up of Old ESP pass with corresponding new ESP Switchgear is to be done by contractor in Unit# 1&3, decision to hook-up of particular pass will be given by BHEL site engineer.
- 2.1.26 The scope of specification covers shifting of EC panels and JBs (customer use) of old ESP control rooms of Unit#1&3 so as to accommodate new EC panels (07 nos.) and ALI panels (02 nos.) in the same room.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

2.1.27 Since passwise shutdown will be given by customer and pass-A&B are combined/joined by single incomer, the contractor shall Hook up pass-A, ACP panel (located in old U#1&3 ESP control rooms) with equipments of old ESP pass-A in U#1&3 respectively.

2.1.28 Following is the scope and tentative quantity for Relocation of ESP Control room works and associated works

(A) **Existing ESP control room --EC panel room**

1. Disconnecting old Cables (power, control, feedback) from Old EC panels and Junction boxes.

- a. EC panel power cables 2Cx95 Sq.mm. —28 nos.
- b. EC panel control cables 10Cx1.5 Sq.mm. — 14 nos.
- c. EC panel feedback cables 4Cx1.5 Sq.mm. —14 nos.
- d. EC panel feedback cables 3Cx1.5 Sq.mm. —14 nos.
- e. Junction Box 3.5Cx50 Sq.mm. — 01 no.
- f. Junction Box 4Cx16 Sq.mm. — 02 nos.
- g. Junction Box 4Cx4 Sq.mm. — 03 nos.
- h. Junction Box 4Cx6 Sq.mm. — 02 nos.
- i. Junction Box 12Cx1.5 Sq.mm. — 01 no.
- j. Junction Box 3C x2.5 Sq.mm. —15 nos.

2. Disconnection /Removal of earth flats (02 nos. for each panel) from 14 old EC panels(pass-A&B).

3. Shifting of pass-A&B EC panels and junction boxes (06 nos.) along with required modification

4. Reconnecting of Old Cables(power, control, feedback) to Old EC panels and Junction boxes.

- a. EC panel power cables 2Cx95 Sq.mm. —28 nos.
- b. EC panel control cables 10Cx1.5 Sq.mm. — 14 nos.
- c. EC panel feedback cables 4Cx1.5 Sq.mm. —14 nos.
- d. EC panel feedback cables 3Cx1.5 Sq.mm. —14 nos.
- e. Junction Box 3.5Cx50 Sq.mm. — 01 no.
- f. Junction Box 4Cx16 Sq.mm. — 02 nos.
- g. Junction Box 4Cx4 Sq.mm. — 03 nos.
- h. Junction Box 4Cx6 Sq.mm. — 02 nos.
- i. Junction Box 12Cx1.5 Sq.mm. — 01 no.
- j. Junction Box 3C x2.5 Sq.mm. —15 nos"

5. Reconnecting earth flats (02 nos. for each panel) from 14 old EC panels(pass-A&B).

TECHNICAL CONDITIONS OF CONTRACT (TCC)

6. Jointing of cables in EC Panels and JB's if required:
- a. EC panel power cables 2CX 95 Sq.mm.—28 nos.
 - b. EC panel control cables 10CX1.5 Sq.mm. — 14 nos.
 - c. EC panel feedback cables 4Cx 1.5 Sq.mm.—14 nos.
 - d. EC panel feedback cables 3Cx 1.5 Sq.mm.—14 nos.
 - e. Junction Box 3.5Cx50 Sq.mm. — 01 no.
 - f. Junction Box 4Cx16 Sq.mm. — 02 nos.
 - g. Junction Box 4Cx4 Sq.mm. — 03 nos.
 - h. Junction Box 4Cx6 Sq.mm. — 02 nos.
 - i. Junction Box 12Cx1.5 Sq.mm. — 01 no.
 - j. Junction Box 3C x2.5 Sq.mm. —15 nos.

(B) **Existing ESP control room --ACP panel room**

7. Disconnecting of old cables (Power, control, feedback) in Old ACP panel.
- a. EOH power cable: 3Cx10 Sq.mm. --01 no.
 - b. Collecting and Emitting electrode motors power cables: 3Cx6 Sq.mm.-- 14 nos.
 - c. Collecting and Emitting electrode motors control cables: 10Cx1.5 Sq.mm.-- 06 nos.
 - d. Support insulator heater power cable: 3Cx35 Sq.mm.-- 01 no.
 - e. Support insulator heater control cable: 3Cx1.5 Sq.mm.-- 01 no.
 - f. Shaft insulator heater power cable: 3Cx10 Sq.mm.-- 01 no.
 - g. Hopper heater power cables: 3Cx10 Sq.mm.-- 07 nos.
 - h. Hopper heater control cables: 10Cx1.5 Sq.mm.-- 02 nos.
8. EC panel power cables re-routing from Old LTMSB panel to new ESP Switchgear panel for pass-A: 2Cx95 Sq.mm.-- 07 nos.
9. Termination of old cables (power, control, feedback) in old ACP panel
- a. EOH power cable: 3Cx10 Sq.mm. --01 no.
 - b. Collecting and Emitting electrode motors power cables: 3Cx6 Sq.mm.-- 14 nos.
 - c. Collecting and Emitting electrode motors control cables: 10Cx1.5 Sq.mm.-- 06 nos.
 - d. Support insulator heater power cable: 3Cx35 Sq.mm.-- 01 no.
 - e. Support insulator heater control cable: 3Cx1.5 Sq.mm.-- 01 no.
 - f. Shaft insulator heater power cable: 3Cx10 Sq.mm.-- 01 no.
 - g. Hopper heater power cables: 3Cx10 Sq.mm.-- 07 nos.
 - h. Hopper heater control cables: 10Cx1.5 Sq.mm.-- 02 nos."
11. Testing and trial run of old equipments of pass-A with new Switchgear panel(ACP).

Note:

TECHNICAL CONDITIONS OF CONTRACT (TCC)

- 1. Bill of Materials (BOM) contains detailed specification of various instruments and items along with relevant clause for scope of works.**
- 2. The Rate Schedule contains the consolidated list of BOM with brief description of items.**
- 3. Rates are to be filled only in the Rate Schedule.**
- 4. Before filling the rates in the rate schedule, the bidder shall go through the detailed specification of all items of BOM as well as Scope of Work as specified in relevant Clause of this document.**
- 5. The quantity indicated in the BOM / Rate Schedule is tentative only and is liable for variation. Payment will be made as per actual quantum of job executed at the unit rate accepted by BHEL.**
- 6. Section III contains General Guide Lines for Erection and Commissioning of C&I System.**
- 7. Any consumables e.g. lugs, straight jointers etc. required in carrying out the works mentioned in 2.1.25 & 2.1.26 shall be in contractors scope**

Note:

FOR FURTHER DETAILED SCOPE OF WORKS REFER RELEVANT CHAPTERS IN THIS BOOK

SPECIAL NOTE:

- 1. PVC and ORC shall be applicable as per GCC for this work**

TECHNICAL CONDITIONS OF CONTRACT (TCC)

VOLUME-IA PART – I CHAPTER – III FACILITIES IN THE SCOPE OF CONTRACTOR / BHEL (SCOPE MATRIX)

Sl.No	Description PART I	Scope to be taken care by		Remarks
		BHEL	Bidder	
1.3.1.1.0	ESTABLISHMENT			
1.3.1.1.1	FOR CONSTRUCTION PURPOSE:			
A	Open space for office	Yes		
B	Open space for storage	Yes		
C	Construction of bidder's office, canteen and storage building including supply of materials and other services		Yes	
D	Bidder's all office 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	
1.3.1.1.2	FOR LIVING PURPOSES OF THE BIDDER			
A	Open space		Yes	
B	Living accommodation		Yes	
1.3.1.2.0	ELECTRICITY			
1.3.1.2.1	Electricity For construction purposes (to be specified whether chargeable or free)			
1.3.1.2.1.1	Single point source	Yes		Free for construction purpose. Chargeable for labour colony etc

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Sl.No	Description	Scope to be taken care by		Remarks
		BHEL	Bidder	
	PART I			
1.3.1.2.1.2	Further distribution for the work to be done which include supply of materials and execution		Yes	
1.3.1.2.2	Electricity for the office, stores, canteen etc of the bidder which include:		Yes	
1.3.1.2.2.1	Distribution from single point including supply of materials and service		Yes	
1.3.1.2.2.2	Supply, installation and connection of material of energy meter including operation and maintenance		Yes	
1.3.1.2.2.3	Duties and deposits including statutory clearances for the above		Yes	
1.3.1.2.2.4	Living facilities for office use including charges		Yes	
1.3.1.2.2.5	Demobilization of the facilities after completion of works		Yes	
1.3.1.2.3	Electricity for living accommodation of the bidder's staff, engineers, supervisors etc on the above lines.(in case BHEL provides this facility, the scope should be given without ambiguity)		Yes	
1.3.1.3.0	WATER SUPPLY			
1.3.1.3.1	For construction purposes:			
1.3.1.3.1.1	Making the water available at single point	Yes		
1.3.1.3.1.2	Further distribution as per the requirement of work including supply of materials and execution		Yes	
1.3.1.3.2	Water supply for bidder's office, stores, canteen etc			
1.3.1.3.2.1	Making the water available at single point		Yes	

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Sl.No	Description	Scope to be taken care by		Remarks
		BHEL	Bidder	
	PART I			
1.3.1.3.2.2	Further distribution as per the requirement of work including supply of materials and execution.		Yes	
1.3.1.4.0	LIGHTING			
1.3.1.4.1	For construction work (supply of all the necessary materials) At office storage area At the preassembly area At the construction site /area		Yes	
1.3.1.4.2	For construction work (Execution of the lighting work / arrangements) At office storage area At the preassembly area At the construction site /area		Yes	
1.3.1.5.0	COMMUNICATION FACILITIES for site operations of the bidder	-		
1.3.1.5.1	Telephone, Fax, internet, intranet, email etc		Yes	
1.3.1.6.0	COMPRESSED AIR SUPPLY			
1.3.1.6.1	Supply of Compressor and all other equipments required for compressor & compressed air system including pipes, valves, storage systems etc	-	Yes	
1.3.1.6.2	Installation of above system and operation & maintenance of the same	-	Yes	
1.3.1.6.3	Supply of the all the consumables for the above system during the contract period		Yes	

Sl.No	Description	Scope to be taken care by		Remarks
		BHEL	Bidder	
	PART II			
	ERECTION FACILITIES			

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Sl.No	Description	Scope to be taken care by		Remarks
		BHEL	Bidder	
	PART II			
1.3.2.1.0	Engineering works for construction			
1.3.2.1.1	Providing the erection drawings for all the equipments covered under this scope	Yes		
1.3.2.1.2	Drawings for construction methods		Yes	In consultation with BHEL
1.3.2.1.3	As-built drawings – wherever deviations observed and executed and also based on the decisions taken at site- example – routing of small bore pipes	Yes		”
1.3.2.1.4	Shipping lists etc for reference and planning the activities	Yes		”
1.3.2.1.5	Preparation of site erection schedules and other input requirements		Yes	”
1.3.2.1.6	Review of performance and revision of site erection schedules in order to achieve the end dates and other commitments		Yes	
1.3.2.1.7	Weekly erection schedules based on Sl. No 2.1.5		Yes	
1.3.2.1.8	Daily erection / work plan based on Sl. No 1.3.2.1.7		Yes	For daily monitoring meeting at site
1.3.2.1.9	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	
1.3.2.1.10	Preparation of preassembly bay		Yes	
1.3.2.1.11	Laying of racks for gantry crane if provided by BHEL or brought by the contractor / bidder himself			Not applicable

TECHNICAL CONDITIONS OF CONTRACT (TCC)

1.3.3 OPEN SPACE:

Open space for building of temporary office shed, contractor's stores shed(s) will be provided free of hire charges. Contractor has to make his own arrangements for labour colony.

1.3.4 ELECTRICITY:

1.3.4.1 The contractor shall be provided with free supply of Electricity for the purpose of execution of work at single point only at work site. For further distribution contractor shall make his own arrangements. Electricity for all other services if required will be provided on **chargeable basis** as per NALCO-DAMANJODI norms.

- a) Consumption charges as per NALCO-DAMANJODI norms
- b) Any dispute regarding consumption, BHEL engineer's decision is final.

1.3.4.2 Any duty, deposit involved in getting the Electricity shall be borne by the bidder. As regards contractor's office shed also all such expenditure shall be borne by the contractor.

1.3.4.3 Provision of distribution of electrical power from the given single central common point to the required places with proper distribution boards, approved cables and cable laying including supply of all materials like cables, switch boards, pipes etc., observing the safety rules laid down by electrical authority of the State / BHEL / their customer with appropriate statutory requirements shall be the responsibility of the tenderer / contractor.

1.3.4.4 BHEL is not responsible for any loss or damage to the contractor's equipment as a result of variations in voltage / frequency or interruptions in power supply.

1.3.5 WATER:

The contractor shall be provided with free supply of water for the purpose of Execution of work at single point only. Necessary tapping/extension/distribution shall be the responsibility of bidder.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

VOLUME-IA PART – I CHAPTER – IV T&PS and MMEs TO BE DEPLOYED BY CONTRACTOR

The following minimum major Tools & Plants shall be deployed by the contractor:

S no	Description	Capacity	Minimum quantity	Remarks
1	Pick & Carry crane	14 T	04	
2	Crawler /Tyre mounted crane	120MT	01	
3	Tower crane	10 T	02	
4	Electrical winches	05 T	05	
5	High speed winch	01 T	03	
6	Trailor	20 T	02	

The above list is only tentative. The contractor has to provide required type and capacity of cranes/lifting tools for satisfactory completion of work within a given outage time. The contractor to visit site to study the site layout/conditions and **assess dimension of Boom lengths**. The T&P required based on the site conditions and customer recommendations before quoting the tender.

Jib length of Tower crane shall be as per site requirement

NOTE:

1. As there are bound to be interruptions in regular power supply, power cut/ load shedding in any construction site due to inherent power shortage in state; it shall be the responsibility of the contractor to have minimum numbers of diesel operated welding generator sets to get urgent and important work to go on without interruptions. The consumables required to operate the generators are to be provided by the bidders at their cost. No separate payment shall be made for this contingency.
2. Depending upon the nature of work and availability of facilities locally, contractor may have to arrange for a temporary workshop for facilitating uninterrupted progress of work
3. All the T&Ps required for this scope of work, except the T&Ps provided by BHEL are to be arranged by the contractor within the quoted rates. No Separate payment will be made
4. Also refer relevant clauses in SCC

TECHNICAL CONDITIONS OF CONTRACT (TCC)

VOLUME-IA PART – I CHAPTER - V T&Ps AND MMEs TO BE DEPLOYED BY BHEL ON SHARING BASIS

List of T&Ps to be made available by BHEL to contractor free of hire charges on sharable basis.

- | | | |
|-----|--|--------|
| 01. | Huck bolting machine | 2 Nos |
| 02. | Stretching tool | 4 Nos. |
| 03. | Blower and associated Piping for conducting air tightness test | 1 set |

Necessary installation of above T&P has to be done by contractors

TECHNICAL CONDITIONS OF CONTRACT (TCC)

VOLUME-IA PART – I CHAPTER-VI TIME SCHEDULE

1.6.1 TIME SCHEDULE

- 1.6.1.1 The entire work (Mechanical & Electrical) of Material handling, Dismantling of existing equipment, Erection, Testing and Commissioning of Electrostatic Precipitator and replacement of entire duct between APH and ID Fan including Supply and Application of Final Painting for unit – 1,3 & 4 (3x 200TPH) Boiler ESP at NALCO Damanjodi, Orissa as detailed in the Tender Specification shall be completed within 24 (Twenty four) months from the date of commencement of work at site.
- 1.6.1.2 During the total period of contract, the contractor has to carry out the activities in a phased manner as required by BHEL and the program of milestone events.
- 1.6.1.3 The erection work shall be commenced on the mutually agreed date between the bidder and BHEL engineer and shall be deemed as completed in all respect only when the unit is in operation. The decision of BHEL in this regard shall be final and binding of the contractor. The scope of work under this contract is deemed to be completed only when so certified by the site Engineer.

1.6.2 COMMENCEMENT OF CONTRACT PERIOD

The date of commencement of contract period shall be the mutually agreed date between the bidder and BHEL engineer to start the work. In case of discrepancy the decision of BHEL engineer is final.

1.6.3 MOBILISATION FOR ERECTION, TESTING, ASSISTANCE FOR COMMISSIONING ETC.,

The activities for erection, testing etc shall be started as per directions of BHEL Engineer. The contractor has to augment his resources in such a manner that following major milestones of erection & commission are achieved on specified schedules:

The entire work covered under the scope of this contract is to be completed within 24 **Months** from Date of LOI.

Material Handling and Execution of main ESP work (Dismantling, R&M of Existing ESP & Erection & Commissioning of New ESP)

Total work has to be completed within 24 Months (Break up: 21 **Months for Material Handling & Dismantling, Erection, testing and Commissioning of Mechanical & Electrical items** and 3 **Months for PG test** (1 Month for each Unit).

TECHNICAL CONDITIONS OF CONTRACT (TCC)

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.

1.6.4 In case any requirement is there to compress the schedule of activities to achieve project completion, bidder shall arrange & augment all necessary resources from time to time to meet the project schedule with in a quoted price. No extra amount shall be payable on such accounts.

1.6.5 CONTRACT PERIOD

The entire work covered under the scope of this contract is to be completed within **24 Months** from Date of LOI.

1.6.6 GUARANTEE PERIOD

The guarantee period shall be 12 running months of the system after successful performance guarantee test and handing over the system to Customer.

Completion of performance guarantee test means PG test report is to be accepted by customer.

Handing over the system will be done after completion of one month after stable operation of system after successful PG test.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

VOLUME-IA PART – I CHAPTER-VII TERMS OF PAYMENT

1.7 Terms of payment (For items mentioned in VOLUME-II PRICE BID Part C : Bill of Quantities):

AA. DISMANTLING OF ESP INTERNALS, DUCT BETWEEN APH AND ID FAN SUCTION INCLUDING GATES, DAMPERS/AMMONIA DOSSING SYSTEM & ASH HANDLING SYSTEM:

SI No:	Description	ESP (rate schedule)
A.	PRO RATA PAYMENTS (85%)	%
1	SATISFACTORY COMPLETION DISMANTLING OF DUCTS, ESP INTERNALS , ASH HANDLING SYSTEM WORKS IN ALL RESPECTS	85
TOTAL (A) FOR PRO RATA PAYMENTS		85
B	STAGE/MILESTONE PAYMENTS (15%)	
2	SHIFTING OF DISMANTLED MATERIALS TO DUMP YARD./ SCRAP YARD/ OTHER AREA AS DIRECTED BY BHEL/NALCO	5
3	CLEANING OF STRUCTURES AFTER DISMANTLING AND CLEARED FOR NEW ERECTION, AREA CLEANING, TEMPORARY STRUCTURES CUTTING/ REMOVAL AND RETURN OF SCRAP	5
4	COMPLETION OF CONTRACTUAL OBLIGATION	5
TOTAL (B) FOR STAGE / MILESTONE PAYMENTS (15%)		15
TOTAL BREAK-UP FOR BB (A+B)		100

BB: ERECTION, TESTING & COMMISSIONING OF ELECTRICAL ITEMS:

SI No:	Description	ESP(rate schedule)
1	DISMANTLING AND SHIFTING TO STORAGE YARD/OTHER PLACE AS DIRECTED BY BHEL/NALCO	20
2	ERECTION	40
3	TESTING	20

TECHNICAL CONDITIONS OF CONTRACT (TCC)

4	COMMISSIONING	15
5	TRAIL OPERATION TEST	1
6	GAS DISTRIBUTION TEST	1
7	P G TEST	1
8	MATERIAL RECONCILIATION	1
9	COMPLETION OF CONTRACTUAL OBLIGATION	1
	TOTAL BREAK-UP FOR GG (1 to 9)	100

CC: Control Panel shifting, other misc electrical works in ESP control room for Unit#1 & Unit#3 (BBU No:II)

- a) Erection :40%
- b) Commissioning :60%

DD: All other Items except which are not covered in above Payment terms 100% payable on completion of activities / work on prorata basis.

Note:

1. In case any requirement is there to compress the time schedule of activities to achieve project completion, NO additional expenses will be paid. Contractor to complete total project with in a quoted price.
2. Recovery of PSD amount as per relevant clauses of GCC.
3. RA bill payments as per as per relevant clauses of of SCC
4. Payment for the first running bill will be released only on production of the following.
 - i. PF Regn. No.
 - ii. Labour License No.
 - iii. Workmen Insurance Policy No.
 - iv. Wage sheet along with every bill duly certified by the contractor to be submitted.
 - v. Unqualified Acceptance for Detailed L.O.I.
 - vi. Initial 50% Security Deposit.
 - vii. Rs 100 /- Stamp Paper for Preparation of Contract agreement.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

VOLUME-IA PART – I CHAPTER VIII TAXES AND OTHER DUTIES

TAXES AND OTHER DUTIES

Goods and service Tax (GST) & Cess

1. The successful bidder shall furnish proof of GST registration with **GSTN Portal in the State in which the Project is being executed**, covering the services under this contract. Registration should also bear endorsement for the premises from where the billing shall be done by the successful bidder on BHEL for this project / work.
2. Contractor's price / rates shall be exclusive of GST & Cess (if applicable) (herein after termed as GST). Contractor shall submit to BHEL the GST compliant tax invoice / debit note / revised tax invoice on the basis of which BHEL will claim the input tax credit in its return. Since this is a works contract, the applicable rate shall be @ 18% GST, as applicable presently.
3. Bidder shall note that the GST Tax Invoice complying with GST Invoice Rules wherein the 'Bill To' details will as below:

BHEL GSTN:21AAACB4146P1ZR

NAME: BHARAT HEAVY ELECTRICALS LIMITED

ADDRESS: BHEL Site Office,

NALCO DAMANJODI,

Damanjodi, Koraput,

ODISHA , 763008.

4. GST charged in the tax invoice/debit note/revised tax invoice by the contractor shall be released separately to the contractor only after contractor files GSTR 3B and the outward supply details in GSTR-1 on GSTN portal and input tax credit of such invoice is matched with corresponding details of outward supply of the contractor and has paid the GST at the time of filing the monthly return
5. In case BHEL has to incur any liability (like interest / penalty etc.) due to denial/reversal / delay of input tax credit in respect of the invoice submitted by the contractor, for the reasons attributable to the contractor, the same shall be recovered from the contractor.
6. Further, in case BHEL is deprived of the Input tax credit due to any reason attributable to contractor, the same shall not be paid or Recovered if already paid to the contractor.
7. Tax invoice / debit Note / revised tax invoice shall contain all such particulars as prescribed in GST law and comply to the timelines for issue of the same. Invoices shall be submitted on time to the concerned BHEL Engineer In Charge.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

8. TDS under GST is applicable and the same shall be deducted at prevailing rates on gross invoice value from the running bills.
9. E-way bills / Transit passes / Road Permits, if required for materials / T&P etc., bought into the project site is to be arranged by the Contractor only.
10. BHEL shall not reimburse any amounts towards any interest / penalty etc., incurred by contractor. Any additional claim at a later date due to issues such as wrong rates / wrong classification by contractor shall not be paid by BHEL.
11. All taxes and duty other than GST & Cess :
The contractor shall pay all (except the specific exclusion viz., GST & Cess) taxes, fees, license charges, deposits, duties, tools, royalty, commissions, Stamp Duties, or other charges / levies, which may be levied on the input goods & services consumed and output goods & services delivered in course of his operations in executing the contract and the same shall not be reimbursed by BHEL. 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.
12. Statutory Variations:
Statutory variations are applicable under the GST Acts, against production of proof. The changes implemented by the Central / State Government during the tenure of the contract viz. increase / decrease in the rate of taxes, applicability, etc. and its impact on upward revision / downward revision are to be suitably paid/ adjusted from the date of respective variation. The bidder shall give the benefit of downward revision in favour of BHEL. No other variations shall be allowed during the tenure of the contract.
13. New Taxes / Levies:
In case Government imposes any new levy / tax after submission of bid during the tenure of the contract, BHEL shall reimburse the same at actual on submission of documentary proof of payment subject to the satisfaction of BHEL that such new levy / tax is applicable to this contract.
14. Direct Tax:
BHEL shall not be liable towards Income Tax of whatever nature including variations thereof arising out of this contract as well as tax liability of the bidder and their personnel. Deduction of tax at source at the prevailing rates shall be effected by BHEL before release of payment as a statutory obligation, unless exemption certificate is produced by the bidder. TDS certificate will be issued by BHEL as per the provisions of Income Tax Act.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

VOLUME-IA PART – I CHAPTER - IX WEIGHT SCHEDULE

List of Material from Ranipet-for Unit-1&3 - R&M (No. of ESPs/BLR:02)

PG – MA	Description	Weight (KG)/BLR
78-001	ESP SUPPORTS	6000
05	SUB-DELIVERY COMPONENTS OF ESP	180
06	INSULATOR HOUSING ASSEMBLY	12000
08	GAS DISTRIBUTOR ASSEMBLY (3 Screen arrgt. at inlet)	11000
09	GD RAPPING MECHANISM	2200
10	GD DRIVE ARRANGEMENT	220
11	GAS SCREENING	6600
13	EMITTING SYSTEM SUSPENSION	3900
14	SUPPORT INSULATOR	3200
15	EMITTING ELECTRODE	2800
16	EMITTING ELECTRODE RAPPING	4900
17	DRIVE ARRANGEMENT FOR EMITTING SYSTEM	7400
19	SUSPENSION ARRANGEMENT FOR COLLECTING	16000
20	COLLECTING ELECTRODE 1.25mm thick,750mm wide(Inc. CE Packing Wt)	150000
21	FRAME OF EMITTING SYSTEM TOP	14200
22	FRAME OF EMITTING SYSTEM – BOTTOM	19800
23	INSPECTION DOORS	2350
24	SHOCK BARS	12400
25	COLLECTING ELECTRODE RAPPING MECHANISM	13600
26	DRIVE ARRANGEMENT FOR COLLECTING RAPPING	1500
28	ESP ROOF BEAMS	17000
30	ELECTRICAL SUB DELIVERY COMPONENTS	4560
31	GEARED MOTOR FOR RAPPING MECHANISM	5400
32	FRAME OF EMITTING SYSTEM MIDDLE	22600
37	JUNCTION BOX & PUSH BUTT ON STATION	440
41	ELECTRICAL MISCELLANEOUS ITEMS (EARTHING MATERIALS,CABLE LUG, CABLE TAG, FLEXIBLE CONDUIT & JUNCTION BOX ,LINK CHAIN, FASTENERS FOR CABLE TRAYS)	6700
42	OUTER ROOF	32400
43	RIDGES	5000
44	HOPPER UPPER PART	24500
45	HOPPER LOWER & MIDDLE PART (Including SS lining weight 1100 kg)	30000

TECHNICAL CONDITIONS OF CONTRACT (TCC)

46	INSULATOR SUPPORT PANEL	16800
47	ROOF PANEL ASSEMBLY	14200
48	CASING (STRUCTURE)	77000
49	CASING (SHELL,SIDE PANELS,GABLES,&GD HOUSING)	164000
50	ESP FUNNELS including Blanking plates	23000
55	PENT HO USE(canopy for TR set)	7000
56	RECTIFIER HANDLING SYSTEM	15000
57	SPLITTER & GUIDE VANES	3200
58	ESP FLOW MODEL ASSEMBLY (applicable)	0
59	SUPPORTS FOR CABLE TRAYS, PANELS & JUNCTION BOXES, EARTHING MATERIALS	16300
60	LT POWER AND CONTROL CABLES	45100
61	ESP TEST EQUIPMENT	200
62	CABLE TRAYS	34600
63	ASH LEVEL INDICATOR(High level & Low level)	300
64	MISCELLENI EOUS – MECH ANICAL	0
65	HOPPER APPROACH PLATFORM	0
66	WATER WASHING SYSTEM	1000
67	MINERAL WOOL FOR ESP INSULATION (50 mm thick,100 Kg/m3)	35400
68	FIXING COMPONENTS FOR ESP INSULATION	12400
72	INTERLOCKS	540
73	ELECTRICALLY OPERAT ED HOIST (1 No)	1500
74	OPACITY MONITOR	400
76	RECTIFIER AND CONTROL PANELS	25200
77	ESP SWICTH GEAR-2 NOS AND PCC PANEL 1NO	15000
78	MICROPROCESSOR BASED ESP COMPONENTS	200
80	FOUNDATION MATERIALS FOR ESP	0
81	SUPPORTING STRUCTURES FOR ESP (For additional portal beam & strengthening)	67600
90	HEATING ELEMENTS AND THERMOSTATS	500
91	PANEL TYPE HEATER	0
92	AUXILIARY CONTROL PANEL	0
95	IOS PANEL	300
988	COMMISSIONING SPARES	100
996	TOOLS & TACKLES	200
999	RECOMMENDED SPARES	0
997	MANDATORY SPARES	0
89-610	GALLERIES AND RAILINGS OF ESP	5000
89-611	ESP ROOF HANDRAILS	3000
89-612	FLOOR GRI LLS AND STEP TREAD FOR ESP	6110
89-613	FLOOR GRI LLS AND MOBILE LADDER FOR HOPPER APPROACH PLATFORM	0
	HOPPER APPROACH PLATFORM	0

TECHNICAL CONDITIONS OF CONTRACT (TCC)

89-614	PENT HOUSE (canopy for TR set) - COLOR COATED SHEETS	1400
89-615	INSULATION CLADDING SHEET (0.6 MM THICK PLAIN ALUMINUM SHEET as per tender)	10600
78-051	EXPANSION JOINTS (Metallic) – Corten steel	3700
52	DUCTS BETW EEN APH & EP	60600
53	DUCTS BETW EEN ESP & ID FAN	45300
69	MINERAL WOOL FOR DUCT INSULATION-(50 MM THICK MINERAL WOOL)	7200
70	FIXING COMPONENT FOR DUCT INSULATION	2550
89617	PLAIN ALUMINIUM SHEET FOR DUCT INSULATION CLADDING(0.6MM THICK AS PER TENDER)	2350
	GATES ,CONTROL DAMPERS & THEIR ACCESSORIES (Ref er G&D BOM)	32970
79	FOUNDATION MATERIAL FOR DUCT SUPPORTS	1000
82	SUPPORTS FOR DUCT BETWEEN APH & ESP	16500
83	SUPPORTS FOR DUCT BETWEEN ESP & ID FAN	16500
84	SUPPORTS FOR DUCT BETWEEN ID FAN & CHIMNEY	0
85	DUCT SUPPORTS	5000
86	ACCESS DOOR & PLATFORM FOR DUCTS	2300
	Weight (KG) for each unit Including CE Package	1237970
	Weight (KG) for two unit (1&3) Including CE Package	2475940
	Weight (MT) for two unit (1&3) Including CE Package	2475.94

List of Material from Ranipet-for Unit-1&3 -New Parallel ESP (No. of ESPs/BLR:01)			
PG – MA	Description	Weight (KG)/BLR	Balance Material
78-101	ESP SUPPORTS	3000	1216
05	SUB-DELIVERY COMPONENTS OF ESP	100	100
06	INSULATOR HOUSING ASSEMBLY	6000	6000
08	GAS DISTRIBUTOR ASSEMBLY (3 Screen arrgt. at inlet)	5500	5500
09	GD RAPPING MECHANISM	1100	1100
10	GD DRIVE ARRANGEMENT	110	110
11	GAS SCREENING	3300	3300
13	EMITTING SYSTEM SUSPENSION	1950	1950
14	SUPPORT INSULATOR- 28 Nos(508mm height)	1600	1600
15	EMITTING ELECTRODE (4737 Nos including 0.25% extra)	1400	1400
16	EMITTING ELECTRODE RAPPING	2450	2450
17	DRIVE ARRANGEMENT FOR EMITTING SYSTEM	3700	3700
19	SUSPENSION ARRANGEMENT FOR COLLECTING ELECTRODE	8000	8000
20	COLLECTING ELECTRODE 1.25 mm thick -560 Nos (including CE Packing)	75000	75000

TECHNICAL CONDITIONS OF CONTRACT (TCC)

21	FRAME OF EMITTING SYSTEM TOP	7100	7100
22	FRAME OF EMITTING SYSTEM – BOTTOM	9900	9900
23	INSPECTION DOORS	1200	1200
24	SHOCK BARS	6200	6200
25	COLLECTING ELECTRODE RAPPING MECHANISM	6800	6800
26	DRIVE ARRANGEMENT FOR COLLECTING RAPPING	750	750
28	ESP ROOF BEAMS	8500	8500
30	ELECTRICAL SUB DELIVERY COMPONENTS	2300	2300
31	GEARED MOTOR FOR RAPPING MECHANISM -15 Nos	2700	2700
32	FRAME OF EMITTING SYSTEM MIDDLE	11300	11300
37	JUNCTION BOX & PUSH BUTTON STATION	220	220
41	ELECTRICAL MISCELLANEOUS ITEMS (EARTHING MATERIALS, CABLE LUG, CABLE TAG, FLEXIBLE, CONDUIT & JUNCTION BOX , LINK CHAIN, FASTENERS FOR CABLE TRAYS)	4500	4500
42	OUTER ROOF (5mm thk)	16200	16200
43	RIDGES	2500	2500
44	HOPPER UPPER PART (Hopper height 6.7m, valley angle 60 deg.)	20000	20000
45	HOPPER LOWER & MIDDLE PART (including SS lining 570 kgs and blanking plates)	19400	19400
46	INSULATOR SUPPORT PANEL, 5mm thk	8400	8400
47	ROOF PANEL ASSEMBLY, 5mm thk	7200	7200
48	CASING (STRUCTURE)	28000	28000
49	CASING (SHELL, SIDE, PANELS, GABLES, & GD HOUSING), 5mm thk	83000	83000
50	ESP FUNNELS including Blanking plates.	11500	11500
55	PENT HOUSE as per tender	21000	21000
56	RECTIFIER HANDLING SYSTEM	10300	10300
57	SPLITTER & GUIDE VANES	1600	1600
58	ESP FLOW MODEL ASSEMBLY (applicable)	0	0
59	SUPPORTS FOR CABLE TRAYS, PANELS & JUNCTION BOXES	9900	9900
60	LT POWER AND CONTROL CABLES	16500	16500
61	ESP TEST EQUIPMENT	200	200
62	CABLE TRAY, FLEXIBLE CABLE TRAY SUPPORTS, COUPLER PLATE	16600	16600
63	ASH LEVEL INDICATOR(High level & Low level)	150	150
64	MISCELLANEOUS – MECHANICAL	0	0
65	HOPPER APPROACH PLATFORM	7000	7000
66	WATER WASHING SYSTEM	1000	1000
67	MINERAL WOOL FOR ESP INSULATION (50 mmthick, 100 kg/m density)	18500	18500
68	FIXING COMPONENTS FOR ESP INSULATION	6800	6800
72	INTERLOCKS	270	270
73	ELECTRICALLY OPERATED HOIST (1 Nos)	1500	1500

TECHNICAL CONDITIONS OF CONTRACT (TCC)

74	OPACITY MONITOR (1No.)	200	200
75	AIR CONDITIONING VENTILATION & ILLUMINATION	0	0
76	RECTIFIER AND CONTROL PANELS	12600	12600
77	ESP SWITCHGEAR PANEL	5000	5000
78	MICROPROCESSOR BASED ESP COMPONENTS	50	50
80	FOUNDATION MATERIALS FOR ESP	3000	3000
81	SUPPORTING STRUCTURES FOR ESP	30500	10846.57
90	HEATING ELEMENTS AND THERMOSTATS	250	250
91	PANEL TYPE HEATER	0	0
92	AUXILIARY CONTROL PANEL	0	0
93	RAPPER CONTROL PANEL	0	0
95	IOS PANEL(Included in modified ESP BOM)	0	0
988	COMMISSIONING SPARES	50	50
996	TOOLS & TACKLES(Included in modified ESP BOM)	0	0
999	RECOMMENDED SPARES	0	0
997	MANDATORY SPARES	0	0
89-610	GALLERIES AND RAILINGS OF ESP	9000	9000
89-611	ESP ROOF HANDRAILS	1500	1500
89-612	FLOOR GRILLS AND STEP TREAD FOR ESP	7600	7600
89-613	FLOOR GRILLS AND MOBILE LADDER FOR HOPPER APPROACH PLATFORM	3000	3000
89-614	PEN T HOUSE COLOR COATED SHEETS(0.6 mm thick)FOR PENT HOUSE	3000	3000
89-615	INSULATION CLADDING SHEET (0.6 MM THICK PLAIN ALUMINUM SHEET)	5200	5200
	Weight (KG) for each unit of new parallel ESP	563150	541712.57
	Weight (KG) for two unit (1&3) of new parallel ESP Including CE packing	1126300	1104862.57
	Weight (MT) for two unit (1&3) of new parallel ESP Including CE packing	1126.3	1104.86
List of Material from Ranipet-for Unit-4			
PG – MA	Description	Weight (KG)/BLR	Balance Material
77-301	ESP SUPPORTS	7300	5135.00
05	SUB-DELIVERY COMPONENTS OF ESP	200	143.42
06	INSULATOR HOUSING ASSEMBLY	12000	6249.87
08	GAS DISTRIBUTOR ASSEMBLY (3 Screen arrgt. at inlet)	15200	8730.97
09	GD RAPPING MECHANISM	3500	1944.44
10	GD DRIVE ARRANGEMENT	220	113.56

TECHNICAL CONDITIONS OF CONTRACT (TCC)

11	GAS SCREENING	4500	3800.19
13	EMITTING SYSTEM SUSPENSION	3300	1681.87
14	SUPPORT INSULATOR	2750	1382.00
15	EMITTING ELECTRODE	4370	2211.42
16	EMITTING ELECTRODE RAPPING	7100	3578.83
17	DRIVE ARRANGEMENT FOR EMITTING SYSTEM	6700	3772.14
19	SUSPENSION ARRANGEMENT FOR COLLECTING ELECTRODE	24000	12446.20
20	COLLECTING ELECTRODE 1.25mm thick ,750mm wide (including CE packing)	233400	129752.31
21	FRAME OF EMITTING SYSTEM TOP	22300	11853.77
22	FRAME OF EMITTING SYSTEM – BOTTOM	31200	19060.47
23	INSPECTION DOORS	2700	1415.09
24	SHOCK BARS	18400	8862.07
25	COLLECTING ELECTRODE RAPPING MECHANISM	17500	10427.12
26	DRIVE ARRANGEMENT FOR COLLECTING RAPPING	1300	681.49
28	ESP ROOF BEAMS	27300	15309.99
30	ELECTRICAL SUB DELIVERY COMPONENTS	4000	2164.00
31	GEARED MOTOR FOR RAPPING MECHANISM	4680	2865.74
32	FRAME OF EMITTING SYSTEM MIDDLE	35600	17952.97
37	JUNCTION BOX & PUSH BUTT ON STATION	350	350
41	ELECTRICAL MISCELLANEOUS ITEMS (EARTHING MATERIALS,CABLE LUG, CABLE TAG, FLEXIBLE CONDUIT & JUNCTION BOX ,LINK CHAIN, FASTENERS FOR CABLE TRAYS)	6700	6700
42	OUTER ROOF	50400	41653.23
43	RIDGES	12600	7152.91
44	HOPPER UPPER PART -	75000	50039.14
45	HOPPER LOWER & MIDDLE PART (Including SS lining weight 1700 kg)	90000	46540.56
46	INSULATOR SUPPORT PANEL	16500	9978.51

TECHNICAL CONDITIONS OF CONTRACT (TCC)

47	ROOF PANEL ASSEMBLY	24300	13141.41
48	CASING (STRUCTURE)	98600	60454.40
49	CASING (SHELL,SIDE PANELS,GABLES,& GD HOUSING)	165600	68670.95
50	ESP FUNNELS including Blanking plates	35000	18045.880
51	EXPANSION JOINT (Corten steel)	0	
55	PENT HO USE(canopy for TR set)	6000	3793.61
56	RECTIFIER HANDLING SYSTEM	15000	11865.84
57	SPLITTER & GUIDE VANES	6600	4766.85
58	ESP FLOW MODEL ASSEMBLY	0	0
59	SUPPORTS FOR CABLE TRAYS, PANELS & JUNCTION BOXES, EARTHING MATERIALS	16300	12459.10
60	LT POWER AND CONTROL CABLES	45100	45100
61	ESP TEST EQUIPMENT	200	100
62	CABLE TRAYS	34600	17300
63	ASH LEVEL INDICATOR(High level & Low level)-	500	250
64	MISCELLANEOUS – MECHANICAL	0	0
65	HOPPER APPROACH PLATFORM	0	0
66	WATER WASHING SYSTEM	2000	2000
67	MINERAL WOOL FOR ESP INSULATION (50mm thick,100 Kg/m3)	42500	22888.8
68	FIXING COMPONENTS FOR ESP INSULATION	15200	10067.5
72	INTERLOCKS	380	256.20
73	ELECTRICALLY OPERATED HOIST (1 No)	1500	1500
74	OPACITY MONITOR	400	400
76	RECTIFIER AND CONTROL PANELS	21600	10800
77	ESP LTMSB PANEL	0	0
78	MICROPROCESSOR BASED ESP COMPONENTS	200	100
80	FOUNDATION MATERIALS FOR ESP	0	0
81	SUPPORTING STRUCTURES FOR ESP (For strengthening)	25600	33147.02
90	HEATING ELEMENTS AND THERMOSTATS	760	386.00
91	PANEL TYPE HEATER	0	0
92	AUXILIARY CONTROL PANEL	13500	6750
95	IOS PANEL	300	300
988	COMMISSIONING SPARES	90	90
996	TOOLS & TACKLES	200	200
999	RECOMMENDED SPARES	0	0
997	MANDATORY SPARES	0	0

TECHNICAL CONDITIONS OF CONTRACT (TCC)

89-610	GALLERIES AND RAILINGS OF ESP	5000	8306.36
89-611	ESP ROOF HANDRAILS	2100	1047.11
89-612	FLOOR GRILLS AND STEP TREAD FOR ESP	3000	400
89-613	FLOOR GRILLS AND MOBILE LADDER FOR HOPPER APPROACH PLATFORM	0	0
89-614	PENT HOUSE (canopy for TR set) -COLOR COATED SHEETS	1200	600
89-615	INSULATION CLADDING SHEET (0.6 MM THICK PLAIN ALUMINUM SHEET as per tender)	17000	11624
77-351	EXPANSION JOINTS (Metallic) – Corten steel	3200	1400.076
52	DUCTS BETWEEN APH & EP	46000	6210.232
53	DUCTS BETWEEN ESP & ID FAN	45000	11775.760
54	DUCTS BETWEEN ID FAN & CHIMNEY	0	0
69	MINERAL WOOL FOR DUCT INSULATION-(50 MM THICK MINERAL WOOL)	6600	307
70	FIXING COMPONENT FOR DUCT INSULATION	2100	1318
89617	PLAIN ALUMINIUM SHEET FOR DUCT INSULATION CLADDING(0.6MM THICK AS PER TENDER)	2100	268.8
	GATES AND CONTROL DAMPERS (Refer G&D BOM)	33900	5988.236
79	FOUNDATION MATERIAL FOR DUCT SUPPORTS	0	0
82	SUPPORTS FOR DUCT BETWEEN APH & ESP	0	0
83	SUPPORTS FOR DUCT BETWEEN ESP & ID	0	0
84	SUPPORTS FOR DUCT BETWEEN ID FAN & CHIMNEY	0	0
85	DUCT SUPPORTS	5000	1209.000
86	ACCESS DOOR & PLATFORM FOR DUCTS	2000	2000
	Weight (KG) for unit 4 Including CE Package	1487300	831237.4
	Weight (MT) for unit 4 Including CE Package	1487.3	831.237

List of Material from BHEL/Bhopal-for Unit-1,3&4

S.N.	Description	Weight (KG)(for all three ESP units)
1	Civil Material (Reinforcement rod ,structural steel etc)	130000
2	ASH handling system	170000
3	LT Power & Control Cable (1.1KV Armoured)	67800
4	Illumination System	105000
5	Fire sealing	250

TECHNICAL CONDITIONS OF CONTRACT (TCC)

6	Rubber Mat	750
7	AC Fuse Board & DC Fuse Board	120
8	Cable Tray ,450mm width	20000
	Weight (KG) for all three unit 1,3 & 4	493920
	Weight (MT) for all three unit 1,3 & 4	493.92

BHEL-Ranipet Supply for ELECTRICAL / C&I INPUT FOR ESP FOR NALCO DAMANJODI - UNIT-1&3

SL No	Description	Units	QTY PER BOILER
1	SUPPORT INSULATOR (67 Kg PER INSULATOR)	Nos	84
2	SHAFT INSULATOR (24 Kg PER SHAFT INSULATOR)	Nos	21
3	BUSHING INSULATORS (102 Kg PER INSULATOR)	Nos	21
4	DISCONNECTING SWITCH VAR.05 (1200 L x 1100 D x 750 H) (180 PER DIS. SWITCH)	Nos	21
5	GEARED MOTOR FOR COLLECTING ELECTRODE RAPPING 0.33 KW, 1.1RPM (950 L x 350 D x 400 H) (160 Kg PER MOTOR)	Nos	21
6	GEARED MOTOR FOR GD SCREEN RAPPING MOTOR 0.33KW, 1.1RPM (950 L x 350 D x 400 H) (160 Kg PER MOTOR)	Nos	3
7	GEARED MOTOR FOR EMITTING ELECTRODE RAPPING MOTOR 0.33KW, 2.5 RPM (950 L x 350 D x 400 H) (106 Kg PER MOTOR)	Nos	21
8	LOCAL START STOP PUSH BUTTON FOR RAPPING MOTOR (180 L x 100 D x 250 H) (2.5 PER PB)	Nos	45
9	GAL. JUNCTION BOX FOR SUPPORT INSULATOR HEATERS (VAR.06) (450 L x 150 D x 300 H) (20 PER JB)	Nos	3
10	GAL. JUNCTION BOX FOR SHAFT INSULATOR HEATERS – (VAR.01) (450 L x 150 D x 300 H) (20 PER JB)	Nos	3
11	GAL. JUNCTION BOX FOR START STOP PUSH BUTTON (VAR-C2) (250 L x 150 D x 400 H) (20 PER JB)	Nos	6

TECHNICAL CONDITIONS OF CONTRACT (TCC)

12	GAL. JUNCTION BOX FOR HOPPER HEATER (VAR-P1) (250 L x 150 D x 400 H) (20 PER JB)	Nos	21
12	FRP JUNCTION BOX FOR ASH LEVEL INDICATOR LOW&HIGH (VAR-C2) (250 L x 150 D x 400 H) (20 PER JB)	Nos	3
13	FRP JUNCTION BOX FOR OPACITY MONITOR CONTROL (VAR-C2) (250 L x 150 D x 400 H) (20 PER JB)	Nos	3
14	FRP JUNCTION BOX FOR HOPPER HEATER FEEDBACK THERMOSTAT (VAR-C2) (250 L x 150 D x 400 H) (20 PER JB)	Nos	3
15	SUPPORT MATERIALS		
	(i) MC 75X40 (10700)	MT	1500
	(ii) ISA 50X50X6 (3300)	MT	750
16	LT POWER CABLES		
	2C-70 SQ.MM AL (3850)	Mtrs	3500
	3C-10 SQ.MM AL (12160)	Mtrs	3000
	3C-2.5 SQ.MM CU (2325)	Mtrs	5000
	2C-2.5 SQ.MM CU (1260)	Mtrs	3000
	3C-35 SQ.MM AL (450)	Mtrs	500
	3.5C-300 SQ.MM AL (2747)	Mtrs	500
17	<u>LT CONTROL CABLES (ARMOURED)</u>		
	i) 10C-1.5 SQ.MM CU (1755)	Mtrs	4500
	ii) 3C-1.5 SQ.MM CU (3300)	Mtrs	4500
18	LT SCREENED COPPER UN-ARMOURED CABLE - 4C-1.5 SQ.MM (2975)	Mtrs	7000
19	GI FLAT 50 MM x 6 MM (1884)	Mtrs	800
20	GI FALT 30 MM x 5 MM (589)	Mtrs	500
25	600MM PTCT 2.5MM THICK CABLE TRAY (5382)	Mtrs	300
26	450MM Perforated Type Cable Tray(PTCT)- 2.5MM THICK CABLE TRAY (2337)	Mtrs	250
27	300MM Ladder Type Cable Tray(LTCT) 2.0MM TH VAR-A (1748)	Mtrs	250

TECHNICAL CONDITIONS OF CONTRACT (TCC)

28	150MM Ladder Type Cable Tray(LTCT) 2.0MM TH VAR-A (2000)	Mtrs	325
29	150MM Ladder Type Cable Tray(LTCT) 2.0MM TH VAR-B (878)	Mtrs	188
32	ASH LEVEL INDICATOR PANEL (900 L x 100 D x 100 H)	Nos	2
33	INTERLOCKS (268 PER SET)	SETS	3
34	ELECTRICALLY OPERATED HOIST 3T (EOH) (450 PER EOH)	Nos	2
35	OPACITY MONITOR (80 PER OPM)	Nos	3
36	IOS PC WITH COLOUR MONITOR (1220 L x 762 D) (39)	SET	1
37	PRINTER (INKJET) (762 L x 610 W) (10 PER PRINTER)	No	1
38	BAPCON (ARECA II) CONTROLLER TO BE FITTED IN EC PANEL (280 L x 210 D x 210 H) (02 PER ARECA)	Nos	21
39	IAM CONTROLLER FOR ALI (1.5KG)	Nos	2
40	INTERSFACING CABLE (0.75KG)	Nos	21
41	HEATING ELEMENTS FOR SUPPORT INSULATORS (2.5 PER HE)	Nos	84
42	HEATING ELEMENTS FOR SHAFT INSULATOR HEATERS (3 PER HE)	Nos	21
43	THERMOSTAT FOR SUPPORT INSULATOR (35 L x 100 D x 100 H) (1 PER TH)	Nos	3
44	HEATING ELEMENTS FOR HOPPER (88 KG PER SET)	Nos	252
45	THERMOSTAT FOR HOPPER HEATER (1 PER TH)	Nos	21
46	LT SWITCH GEAR PANEL (10000 L X 1000 W x 2500 H) (7000 KG PER SET)	SET	3
47	PCC PANEL (8000 L X 1000 W x 2500 H) (6000 KG PER SET)	SET	1
48	IOS PANEL (1000 L x 650 W x 2000 H) (300 PER PANEL)	No	1

TECHNICAL CONDITIONS OF CONTRACT (TCC)

49	HIGH VOLTAGE TRANSFORMER RECTIFIER – 95 Kv , 500 mA (1600L x 1700 D x 2300 H) (1600 PER PANEL)	Nos	21
50	ELECTRONIC CONTROL PANEL (600L x550 W x2000 H) (250 PER PANEL)	Nos	21
Note : the above BHEL/Ranipet Electrical and C&I quantities for Unit-1&3 are for <u>one Boiler only</u>. For 2 Boilers you have to consider multiplied by 2			
BHEL-RANIPET SUPPLY FOR ELECTRICAL / C&I INPUT FOR ESP FOR NALCO DAMANJODI UNIT-4			
51	SUPPORT INSULATOR (67 Kg PER INSULATOR)	Nos	48
52	SHAFT INSULATOR (24 Kg PER SHAFT INSULATOR)	Nos	12
53	BUSHING INSULATORS (102 Kg PER INSULATOR)	Nos	12
54	DISCONNECTING SWITCH VAR.05 (180 PER DIS. SWITCH) 1200 L x 1100 D x 750 H	Nos	12
55	GEARED MOTOR FOR COLLECTING ELECTRODE RAPPING 0.33 KW, 1.1RPM 950 L x 350 D x 400 H, (160 Kg PER MOTOR)	Nos	12
56	GEARED MOTOR FOR GD SCREEN RAPPING MOTOR 0.33KW, 1.1RPM 950 L x 350 D x 400 H, (160 Kg PER MOTOR)	Nos	2
57	GEARED MOTOR FOR EMITTING ELECTRODE RAPPING MOTOR 0.33KW, 2.5 RPM 950 L x 350 D x 400 H, (106 Kg PER MOTOR)	Nos	12
58	LOCAL START STOP PUSH BUTTON FOR RAPPING MOTOR	Nos	26
59	GAL. JUNCTION BOX FOR SUPPORT INSULATOR HEATERS (VAR.06) (450 L x 150 D x 300 H)	Nos	4
60	GAL. JUNCTION BOX FOR SHAFT INSULATOR HEATERS – (VAR.01) (450 L x 150 D x 300 H)	Nos	2
61	GAL. JUNCTION BOX FOR START STOP PUSH BUTTON (VAR-C2) (250 L x 150 D x 400 H)	Nos	12
62	GAL. JUNCTION BOX FOR ASH LEVEL INDICATOR LOW&HIGH (VAR-C2) (250 L x 150 D x 400 H)	Nos	2
63	GAL, JUNCTION BOX FOR OPACITY MONITOR CONTROL (VAR-C2) (250 L x 150 D x 400 H)	Nos	2
64	GAL. JUNCTION BOX FOR HOPPER HEATER FEEDBACK THERMOSTAT (VAR-C2) (250 Lx 150 D x 400 H)	Nos	2
65	SUPPORT MATERIALS		

TECHNICAL CONDITIONS OF CONTRACT (TCC)

66	(i) MC 75X40	MT	10.7
67	(ii) ISA 50X50X6	MT	3.3
68	LT POWER CABLES		
69	2C-95 SQ.MM AL	MTRs	3500
70	3C-10 SQ.MM AL	MTRs	1500
71	3C-2.5 SQ.MM CU	MTRs	2800
72	2C-2.5 SQ.MM CU	MTRs	2000
73	3C-35 SQ.MM AL	MTRs	500
74	3.5C-300 SQ.MM AL	MTRs	500
75	LT CONTROL CABLES (ARMOURED)		
76	i) 10C-1.5 SQ.MM CU	MTRs	2500
77	ii) 2C-1.5 SQ.MM CU	MTRs	2000
78	iii) 3C-1.5 SQ.MM CU	MTRs	4000
79	LT SCREENED COPPER UN-ARMOURED CABLE - 4C-1.5 SQ.MM	MTRs	4000
80	GI FLAT 50 MM x 6 MM	MTRs	800
81	GI FALT 30 MM x 5 MM	MTRs	500
82	600MM PTCT 2.5MM THICK CABLE TRAY	MTRS	188
83	450MM PTCT 2.5MM THICK CABLE TRAY	MTRS	125
84	300MM LTCT 2.0MM TH VAR-A	MTRS	188
85	150MM LTCT 2.0MM TH VAR-A	MTRS	188

TECHNICAL CONDITIONS OF CONTRACT (TCC)

86	150MM LTCT 2.0MM TH VAR-B	MTRS	188
87	ASH LEVEL INDICATOR PANEL (900 L x 100 D x 100 H)	Nos	2
88	INTERLOCKS (268 PER SET)	Sets	2
89	ELECTRICALLY OPERATED HOIST 3T (EOH) - 450Kgs PER EOH	Nos	2
90	OPACITY MONITOR - 80 PER OPM	Nos	2
91	IOS PC WITH COLOUR MONITOR -1220 L x 762 D	Nos	1
92	PRINTER (INKJET)	Nos	1
93	BAPCON (ARECA II) CONTROLLER TO BE FITTED IN EC PANEL - (280 L x 210 D x 210 H)	Nos	72
94	IAM CONTROLLER FOR ALI	Nos	2
95	INTERSFACING CABLE	Mtrs	14
96	HEATING ELEMENTS FOR SUPPORT INSULATORS	Nos	288
97	HEATING ELEMENTS FOR SHAFT INSULATOR HEATERS	Nos	12
98	THERMOSTAT FOR SUPPORT INSULATOR - (35 L x 100 D x 100 H)	Nos	2
99	HEATING ELEMENTS FOR HOPPER	Nos	288
100	THERMOSTAT FOR HOPPER HEATER	Nos	12
101	AUXILIARY CONTROL PANEL (12700 L X 1000 W x 2500 H) - 37800 KG PER SET	Sets	4
102	IOS PANEL - (1000 L x 650 W x 2000 H) -(300Kgs PER PANEL)	Nos	1
103	HIGH VOLATGE TRANSFORMER RECTIFIER – 95 Kv , 800 mA - 1600L x 1700 D x 2300 H (1600kgs PER PANEL)	Nos	12
104	ELECTRONIC CONTROL PANEL (600L x550 W x2000 H) (250Kgs PER PANEL)	Nos	12

RMSG SUPPLY ESP ELECTRICAL ITEMS FOR NALCO DAMANJODI, UNIT 1,3 & 4

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Sr. No.	Item Description	Unit	Total Quantity
A	LT Power & Control Cable (1.1KV, Armoured)		
	1CX630 sq.mm.	Mtr.	22700
	3.5CX70 sq.mm.	Mtr.	600
	2CX6 sq.mm.	Mtr.	400
	4CX35 sq.mm.	Mtr.	500
	3CX2.5 sq.mm.	Mtr.	500
	5CX2.5 sq.mm.	Mtr.	750
B	Illumination System		
	Light Fittings in ESP Control Room & ESP Area	Nos.	1208
	Point wiring for above fittings	Nos.	1208
	Lighting Panels	Nos.	6
	LDB with Transformer	Nos.	3
	Switch Box	Nos.	20
	Receptacle 5/15 Amps & 20 Amps (Control Rooms)	Nos.	20
	Receptacle 125 Amps (ESP Area)	Nos.	16
	4CX35 sq.mm.	Mtrs.	1100
	3.5CX120 sq.mm.	Mtrs.	1000
	2CX4 sq.mm.	Mtrs.	1800
	2Cx2.5 sq.mm.	Mtrs.	5400
	Sockets in ESP Area (230V AC / 24 V AC / 20 Amps AC / 24 V DC)	Nos.	128
C	Fire Sealing	Lot	1
D	Rubber Mat	Nos.	160
E	AC Fuse Board & DC Fuse Board	Nos.	4
F	Cable Tray - Ladder Type, 450 mm Width	Mtr.	2500

List of Material from BHEL/EDN Bangalore-for Unit-1,3&4		
S.N.	Description	Weight (KG) (for all three ESP units)
1	Continuous Stack Emission Monitoring System Multi Gas Analyser (Sox/Nox)	120
2	Pressure Transmitters	90
3	Multi Gas Analyser (Sox/Nox) Spares item	40
	Weight (KG) for all three unit 1,3&4	250
	Weight (MT) for all three unit 1,3&4	0.25

TECHNICAL CONDITIONS OF CONTRACT (TCC)

NOTE FOR WEIGHT SCHEDULE:

1. **The above weight schedule is tentative for all units. However bidder should refer quantities in BOQ in price schedule before quoting their price.**
2. The weights given are only approximate and for general guidance and they are subject to variation as per design consideration.
3. The above weight schedule is tentative for all units. However, Bidder should refer quantities in BOQ in price schedule before quoting their price
4. The information furnished is only a description regarding the items to be erected by the contractor. BHEL reserves the right to add or exclude any components / items / system according to the site requirements / customer requirements to complete the systems in all respects.
5. Any other systems / Components which are integral to ESP & auxiliaries, supplied by BHEL manufacturing units are also to be erected and commissioned by the contractor within the quoted / accepted tonnage rate / lump sum value.
6. Insulation: With respect to insulation, it shall not be limited to only the application of insulation for the inner roof of ESP including fixing components
7. Erection & dismantling of air blowers and connecting pipes & ducts, providing blanks/ dummies at the required locations and conducting gas-tightness test is in the scope contract and shall be carried out within the quoted price.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

VOLUME-IA PART –I CHAPTER -X GENERAL

The scope of the work will comprise of but not limited to the following:

- 1.10.1 All the works such as cleaning, leveling, aligning, trial assembly, dismantling of certain components for checking and cleaning, surface preparation, fabrication of sheets, tubes and pipes as per general engineering practice and as per BHEL Engineer's instructions at site, cutting, weld depositing, grinding, straightening, chamfering, filing, chipping, drilling, reaming, scrapping, lapping, fitting-up etc., as may be applicable in such erection works and are necessary to complete the work satisfactorily, shall be carried out by the contractor as part of the work within the quoted rate. Major machining work, which is only to be carried out in workshops, will be arranged by BHEL.
- 1.10.2 The work shall conform to dimensions and tolerances given in various drawings and quality manuals provided by BHEL. If any portion of work is found to be defective in workmanship not conforming to drawings or other stipulations, the contractor shall dismantle and redo the work duly replacing the defective materials at his cost, failing which the job will be carried out by BHEL by engaging other agencies and recoveries will be effected from contractor's bill towards expenditure incurred including BHEL's overhead charges.
- 1.10.3 Contractor shall execute the work as per sequence and procedure prescribed by BHEL at site. The applicable erection manuals which are available with BHEL site office are to be referred for compliance and guidance before taking up the work. Any rework on this failure to comply with will be to account contractor only. BHEL engineer, depending upon the availability of materials, fronts etc, will decide the sequence of erection and methodology. No claims for extra payment from the contractor will be entertained on the grounds of deviation from the method of erection adopted in erection of similar jobs or for any reason whatsoever.
- 1.10.4 Contractor has to work in close co-ordination with other erection agency at site. BHEL engineer will co-ordinate area clearance. In a project of such magnitude, it is possible that the area clearance may be less/more at a particular given time. Activities and erection program have to be planned in such a way that the milestones are achieved as per schedule/ plans. Contractor shall arrange & augment the resources accordingly.
- 1.10.5 The contractor is strictly prohibited from using BHEL's regular components like angles, channels, beams, plates, pipe/tubes, and handrails etc for any temporary supporting or scaffolding works. Contractor shall arrange himself all such

TECHNICAL CONDITIONS OF CONTRACT (TCC)

materials. In case of such misuse of BHEL materials, a sum as determined by BHEL engineer will be recovered from the contractor's bill. The decision of BHEL engineer is final and binding on the contractor.

- 1.10.6 The contractor will be responsible for the safe custody and proper accounting of all materials in connection with the work. If the contractor has drawn materials in excess of design requirements, recoveries will be affected for such excess draws at the rate prescribed by manufacturing units.
- 1.10.7 No member of the already erected structure/ platform, pipes, grills, platform, other component and auxiliaries should be cut without specific approval of BHEL engineer.
- 1.10.8 Contractors shall ensure that all their Staff/Employees are exposed to periodical training programme conducted by qualified agencies/ personnel on ISO 9001 – 2000 Standards.
- 1.10.9 For other agencies, such as piping, cabling, instrumentation, insulation etc., to commence their work from/on the equipment coming under this scope, Contractor has to clear the front, expeditiously and promptly as instructed by BHEL Engineer. Some time it may be required to re-schedule the activities to enable other agencies to commence/continue the work so as to keep the overall project schedule.
- 1.10.10 The terminal points decided by BHEL are final and binding on the contractor for deciding the scope of work and effecting the payment for the work done up to the terminals.
- 1.10.11 For the purpose of planning, contractor shall furnish the estimated requirement of power (month wise) for execution of work in terms of maximum KW demand.
- 1.10.12 On Completion of work, all the temporary buildings, structures, pipe lines, cable etc. shall be dismantled and leveled and debris shall be removed as per instruction of BHEL by the contractor at his cost. In the event of his failure to do so, the expenditure towards clearance of the same will be recovered from the contractor. The decision of BHEL Engineer in this regard is final.
- 1.10.13 All the necessary certificates and licenses required to carry out this scope of work are to be arranged by the contractor then and there at no extra cost.
- 1.10.14 The contractor must obtain the signature and permission of the security personnel of the customer for bringing any of their materials inside the site

TECHNICAL CONDITIONS OF CONTRACT (TCC)

premises. Without the Entry Gate Pass these materials will not be allowed to be taken outside.

- 1.10.15 Crane operators deployed by the contractor shall be tested by BHEL before he is allowed to operate the cranes.
- 1.10.16 All the necessary certificates and licenses required to carry out this scope of work are to be arranged by the contractor then and there at no extra cost.
- 1.10.17 All IBR related issues, obtaining required permissions and liaising etc., to be taken care by the contractor. Charges towards IBR clearance is in contractor scope.
- 1.10.18 First aid facilities to be arranged by contractor.
- 1.10.19 Firefighting equipment at erection, fabrication and storage yard is to be arranged by contractor.
- 1.10.20 **SITE INSPECTION**

The owner/employer or his authorized agents may inspect various stages of work during the currency of the contract awarded to him. The contractor shall make necessary arrangements for such inspection and carry out the rectification pointed out by the owner/employer without any extra cost to the owner / employer. No cost whatsoever such duplication of inspection of work be entertained.
- 1.10.21 **UTILITY POINTS**

Number of utility points (Service / plant air, service / plant water, service / washing steam, inert gas (N₂) etc., shall be indicated in the P & I diagram. The utility points shall be located at convenient point to handle. Contractor to locate the utility points as advised by site engineer.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

SAFETY

Safety is the prime most important. Everybody should implement 100% safety norms set by the organization. A safety document to be followed is attached to tender document for 100 % compliance. Salient norms are listed here for ready reference.

- The person who is entering the plant premises including visitors to undergo a safety training which will be given by customer. The training period will be decided by the customer based on the individual's purpose of visit.
- 100 % safety appliance to be used before entry in to the plant gate. A safety officer will be present a gate and any person not adhere to safety norms will not be allowed inside the gate.
- Contractor to engage qualified safety officers during execution of work from the customer recommended agencies. The number officers engaged is based on the deployment of work men. One trained safety officer per 50 workers to be engaged.
- A safety plan to be submitted to customer before commencement of work.
- Overall coordinator safety office to interact with customer and BHEL for day to day interactions.
- Heavy penalty will be imposed if a person found without 100% safety harness.
- The PPE's will be periodically inspected and any found defective or become old to be replaced with new one.
- All T&P and lifting tools will be inspected first before entry in to plant gate .All new and quality PPE's and T&P to be used. No second hand/ unsafe items are allowed
- Before entry of gate, all work men to be produced a valid fitness certificate issued by a register medical practioner.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

VOLUME-IA PART –I CHAPTER -XI FOUNDATIONS AND GROUTING

- 1.11.1 Foundation for the equipments to be erected shall be provided by BHEL/ clients of BHEL. The dimension of the foundation and anchor bolt pits shall be checked by the contractor for their correctness as per drawings. Further, top elevation of foundations shall be checked with respect to bench mark etc. All adjustments of foundations surfaces, enlarging the pockets in foundations etc. as may be required for the erection of equipments plants shall be carried out by the contractor.
- 1.11.2 Cleaning of foundation surfaces, pocket holes and anchor bolt pits etc., de-watering, making them free of oil, grease, sand and other foreign materials by soda wash, water wash, compressed air or any other approved methods etc., form/shuttering work are within the scope this work.
- 1.11.3 It shall be contractor's responsibility to check the various equipment foundations for their correctness with respect to level, orientation, dimensions etc., and ascertained dimensions shall be measured and submitted to BHEL for approval before erection. Also minor chipping, dressing of foundations up to 30 mm for obtaining proper face for packer plates/shims, and may be required for the erection of the equipment/plants will have to be carried out by the contractor without extra cost.
- 1.11.4 The surface of foundations shall be dressed to bring the surface of the foundations to the required level and smoothness prior to placement of equipments
- 1.11.5 Foundation pockets are to be cleaned thoroughly before placing the columns / equipments. Verticality of foundation bolts to be checked along with correctness of the threads and freeness of the nuts movement. If required cleaning of the threads to be done with proper dies.
- 1.11.6 The concrete foundation, surfaces shall be properly prepared by chipping, as required to bring the top of such foundation to the required level to provide the necessary roughness for bondage and to ensure enough bearing strength. All laitance and surface film shall be removed and cleaned and the packers placed with suitable mortar prior to erection of the equipment. Packer plates should not only be blue matched with foundation but also inter-packer contact surfaces between the packers and foundation frame etc., shall also be blue matched by Prussian Blue match checks and required percentage contact shall be achieved by chipping and scrapping as per BHEL Engineers instructions.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

- 1.11.7 Certain packer plates and shims over and above the quantity received as part of supplies from manufacturing units of BHEL will have to be cut out from steel plates/sheets at site by the contractor to meet site requirement. However machining of the packers, wherever necessary, will be arranged by BHEL at free of cost.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

VOLUME-IA PART –I CHAPTER -XII MATERIAL HANDLING AND SITE STORAGE

The scope of the work will comprise of but not limited to the following:

- 1.12.1 Unloading & loading at BHEL/Customer stores and storage yard, transport to site, unloading at site/working area of equipment placement on respective foundation/location, fabrication yard, pre-assembly bay or at working area are in the scope of work. Shifting of material from preassembly bay/fabrication yard to working area is also included in the scope. The scope includes taking materials / Equipments from customer stores / storage yard also. Contractors Quoted / Accepted rate shall be inclusive of the same. Required cranes, tractors, trailer or trucks/ slings/ tools and tackles/labour including operators Fuel lubricants etc for loading & unloading of materials will be in the scope of contractor.
- 1.12.2 The equipments / materials from the storage yard shall be moved in sequence to the actual site of erection /location at the appropriate time as per the direction of BHEL Engineer so as to avoid damage/loss of such equipment at site.
- 1.12.3 Sometimes it may become necessary for the contractor to handle & shift certain unrequired components in order to take out the required materials in storage yard. The contractor has to take this contingency also into account. No extra payment is payable for such contingencies.
- 1.12.4 Materials shall be stacked neatly, preserved and stored in the contractor's shed/work area in an orderly manner. In case it is necessary to shift and re-stack the materials kept at work area/site to enable other agencies to carry out their work, same shall be done by the contractor at no extra cost.
- 1.12.5 All pipe and tube ends shall be covered with plastic caps or will be closed with wooden plugs as the case may be.
- 1.12.6 The contractor shall provide any fixtures, concrete blocks & wooden sleepers, which are required for temporary supporting of the components at site.
- 1.12.7 Contractor has to arrange required fire & water proof tarpaulins to protect the machined components / assembled parts in storage yard and after drawn from BHEL before and after erection at their cost.
- 1.12.8 Fencing, steel gate fixing, bush cutting, area leveling at storage yard if required will be in the scope of contractor.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

VOLUME-IA PART – I CHAPTER- XIII ERECTION

The scope of the work will comprise of but not limited to the following:

- 1.13.1 Ducts / expansion pieces are dispatched to site in loose walls / plates and these are to be assembled at site before erection.
- 1.13.2 All the dampers, valves, lifting equipments, power cylinders, etc., shall be serviced and lubricated to the satisfaction of BHEL engineer before erecting the same and also during pre-commissioning. The bearings of dampers shall be properly cleaned, serviced and lubricated before commissioning at no extra cost. Even after commissioning in the equipments, if there are problems in the operation they have to be attended by the contractor during the tenure of the contract.
- 1.13.3 In the case of structural members / ducts in certain cases, the raw material will be supplied in random lengths and the contractor will have to make up the length / prepare the edges to suit the matching profiles, weld / bolt connect the joints at no extra cost.
- 1.13.4 Any other systems / Components which are integral to ESP & auxiliaries, supplied by BHEL manufacturing units are also to be erected and commissioned by the contractor within the quoted / accepted tonnage rate / lump sum value.
- 1.13.5 The Erection & Alignment of HV rectifier transformers, geared motors, heating elements is in the scope of contractor.
- 1.13.6 Erection & dismantling of air blowers and connecting pipes & ducts, providing blanks/ dummies at the required locations and conducting gas-tightness test is in the scope contract and shall be carried out with in the quoted rate.
- 1.13.7 Fine fittings and other small bore piping have to be routed according to site conditions and hence shall be done only in position as per the 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 pipelines when after completion, to suit the site conditions. The contractor should absorb this cost in his quoted rate.
- 1.13.8 All welded joints should be painted with anti-corrosive paint, once NDE works are over.
- 1.13.9 It shall be the responsibility of the contractor to provide ladders on column for initial works till such time stairways are completed. For this the ladder should not

TECHNICAL CONDITIONS OF CONTRACT (TCC)

be welded on the column and should be pre-fabricated clamping type ladders. No temporary welding on any structural member is permitted except under special circumstances with the approval of BHEL.

- 1.13.10 Work such as minor rectification of foundation bolts, reaming of holes, drilling of dowels, matching of bolts and nuts, making new dowel pin, etc. are covered in the scope of work.
- 1.13.11 Certain extra lengths of various tubes/pipes and fabricated ducts are provided as erection allowance and the same have to be cut/adjusted to suit the site conditions and layouts or certain small lengths may have to be added for adjustments to suit the site conditions. For any mismatch while matching the joints in tubes, the cutting, adjusting, re welding, addition spool pieces should be done by the contractor to match site conditions without any extra payment.
- 1.13.12 All hangers, supports and anchors (including concreting or welding) shall be installed as per drawing to obtain are reliable and complete installation as per instructions of BHEL Engineer. Normally supports are issued in running meters. Any additional supports as called for by BHEL Engineer shall be fabricated by the contractor and provided at no extra cost. However, the raw material required for fabrication of such supports shall be supplied by BHEL free of cost. (Any machining or threading is involved will only be done by BHEL).
- 1.13.13 All Rotating machineries and equipment shall be cleaned, lubricated, checked for their smooth rotation, if necessary dismantling and refitting before erection. If in the opinion of BHEL Engineer, the equipment is to be checked for clearance, tolerance at any stage of work or during commissioning period, all such works are to be carried out by contractor at his cost.
- 1.13.14 D.S.L / equivalent system for hoisting equipments are also to be erected and commissioned including load testing by the contractor within the quoted rates. Required manpower including electricians are to be arranged by the contractor for carrying out commissioning of electrical hoist and load testing of the above electrical hoist. Required loads will be provided by BHEL free of cost.
- 1.13.15 The temporary structures/items welded to permanent members/pipes are to be cut and removed without any damage. Any damage so to be made good by the contractor at his cost.
- 1.13.16 Before lifting the heavy components, soft materials like gunny bags to be used while lashing the rope to avoid dents, rubbing marks etc. The capacity, number of sheave pulleys, size of the rope, guide pulley locations are to be decided at site

TECHNICAL CONDITIONS OF CONTRACT (TCC)

with respect to the capacity and positioning of the winch. The end caps provided at shop for various stubs are to be removed during final fit up only.

- 1.13.17 Prior to erection of any components inspection to be done for any foreign materials and damages and they are to be removed / attended as per BHEL engineer. Fixing, welding of necessary instrumentation tapping points, to be provided on auxiliaries covered within the scope of this specification will also be the responsibility of the contractor and will be done as per the instructions of BHEL Engineer. The fixing / welding of all the above items will be contractor's responsibility even if the
- i) Product groups under which these items are not specifically indicated in the Tender Specification.
 - ii) Items are supplied by an agency other than BHEL
- 1.13.18 For skid mounted equipment, the checking and re-alignment required at site is in the scope of work.
- 1.13.19 All the shafts of rotating equipment shall have to be properly aligned to those of matching equipment to perfection, accuracy as required and the equipment shall be free from excessive vibration so as to avoid overheating of bearings or other conditions which may tend to shorten the life of the equipment.
- 1.13.20 All the equipments /material to be taken inside the plant building shall be cleaned thoroughly before taking them inside and erect. The contractor shall clean, wherever necessary and paint inside surfaces of the equipments like coolers, oil tanks, Rubber expansion joints assemble and other components as per instruction of BHEL Engineer during erection at the quoted rate.
- 1.13.21 Wherever equipments are supplied in pre-fabricated assembled packages, there may be necessity to make minor changes, including strengthening by additional welds. This shall be treated as part of the contractor's scope.
- 1.13.22 All the bearings, Gearboxes etc., of the equipment and electrical motors to be erected are provided with protective greases only. Contractor shall arrange as and when required by the engineer for cleaning the bearing/gear boxes etc., with kerosene or some other agent if necessary by dismantling some of the parts of the equipment during erection and shall arrange for re-greasing/lubricating them with recommended lubricants and assembling back.
- 1.13.23 Certain instruments like pressure switches, gauges, air sets, regulators, filters, junction boxes, power cylinders, dial gauges, thermometers, flow meters, valve

TECHNICAL CONDITIONS OF CONTRACT (TCC)

actuators, flow indicators etc., are received in assembled conditions as integral part of equipments. Contractor shall dismantle such instruments and re-erect whenever required prior to commissioning. Sometime this may have to be handed over to store or instrumentation contractor.

- 1.13.24 Attachments, welding of necessary instrumentation tapping points for ash level indicator probe fixing, to be provided on E.S.P / its auxiliaries or pipelines covered within the scope of this tender will also be the responsibility of the contractor and the same will be done as per the instruction of BHEL Engineer with in the quoted price.
- 1.13.25 All the motors/pumps shall be stripped opened, thoroughly serviced with proper care and re-assembled properly before erection by the contractor. During servicing, pre-commissioning & commissioning, if any deficiency is observed the same should be taken up with BHEL Engineer at site and rectified at site without any delay.
- 1.13.26 All site-fabricated pipes will be issued in running meters as straight. These are to be cut and edge prepared at site to required length to suit layout as given in the erection drawing. All the attachments like lugs, stoppers, cleats etc., will be supplied as loose items and to be cut and welded to the pipes at site as per erection drawing necessary drilling of holes on main pipe for welding stubs shall also be done at site by the contractor. Fittings like bends, tees, elbow, mitre bends, reducers, flanges etc., will be supplied as loose items.
- 1.13.27 ESP collecting Electrodes may require straightening and repair due to minor transport damages before erection and spot heating in position to get correct alignment which shall be done by contractor with in the quoted price.
- 1.13.28 Additional platforms of permanent nature for approaching different equipments, as per site requirement which may not be indicated in drawings shall be fabricated and installed by the contractor. However the contractor will be paid for this work on accepted tonnage rate for erection. The material required for platform will be supplied by BHEL free of cost.
- 1.13.29 One layer of insulation mattress on roof top of E.S.P roof (inner) shall be applied before outer roof is placed. The scope shall also include the above work even though the materials are supplied under some other product group and the erected materials shall be paid at the accepted tonnage rate for ESP.
- 1.13.30 Pipes above 2" diameter have to be cleaned by means of wire brush as per the instruction of BHEL Engineer and subsequently flushed with air before lifting

TECHNICAL CONDITIONS OF CONTRACT (TCC)

them into position. For pipes below 2" diameter, shall be sponge cleaned with air flushing.

- 1.13.31 In case of piping connected to equipment, matching of flanges for achieving the parallelism and alignment at equipment end by suitably resorting to heat correction or other method as instructed by BHEL Engineer is within scope of work.
- 1.13.32 All piping items including pipes, valves, flanges, fittings etc. shall be supplied as commercially available. Hence Fit-ups, edge preparation including welding of stubs, shall be included in the contractor's scope.
- 1.13.33 Wherever elbows of 45 deg or any other angle are required, the same shall be cut from 90 deg. elbow supplied and used. No extra cost shall be paid.
- 1.13.34 Erection of flow switches, filters, flow meters, other metering elements, flow orifices, flow indicators, control valves supplied either by BHEL or customer forming part of the system is in the scope of work. This will include collecting from BHEL/Customer stores, transport to site, suitably cutting the erected piping, cleaning, erection, welding, radiography and stress relieving and commissioning.
- 1.13.35 Contractor shall also weld small length of piping with root valve to the pressure, flow and level tapping points on piping or flow nozzles/orifices/ metering elements fixed on piping as per the instructions of BHEL Engineer.
- 1.13.36 Welding of all thermo wells, draft, pressure and temperature instrumentation points and all other instrumentation points on piping and auxiliaries and welding of thermocouple pads are in the scope of work.
- 1.13.37 Plate / Pipe shoes for piping supports shall be fabricated at site by the contractor at no extra cost. Other supports namely Hangers, U-clamps etc., shall be supplied by BHEL duly bent and threaded. Assembly and necessary cutting work etc., shall be carried out at site by contractor within the quoted rate.
- 1.13.38 Wherever hanger and support materials are not received from manufacturing unit in time to suit the erection schedule, contractor shall erect the system on temporary supports to ensure the progress of work. The required structural steel materials will be issued on free of charges by BHEL, either from scrap/spare materials. The same shall be removed and returned to BHEL store after erection of permanent supports.
- 1.13.39 No separate payment will be made for the edge preparation of pipes, Standard fittings such as bends, Tees etc.,

TECHNICAL CONDITIONS OF CONTRACT (TCC)

- 1.13.40 Contractors has to carryout fabrication works such as welding of stubs / nipples, attachments etc., preparation of surface for rust preventive coating and application of rust preventive is within the quoted / accepted rate.
- 1.13.41 Adjustments like removal of ovalities in pipes and opening or closing the fabricated bends piping to suit the layout shall be considered part of work and the contractor is required to carry out such work free of cost, as per instructions of BHEL.
- 1.13.42 One Mechanical and one electrical technical expert (Retired BHEL) is required to be deputed to during entire execution of the works.
- 1.13.43 Within the quoted price, the bidder has to arrange new set of utensils (cooking and serving), Stoves, gas cylinders /gas oven, electric heaters, chairs, Dining tables, 21 inches color television etc, including cooks/ helpers for preparation of food for approx.10 BHEL persons. The successful bidder will also be responsible for taking over and vacate the BHEL mess quarter. Bidder has to provide foods for the cook and helper. Otherwise suitable deduction Rs:20000/Month deducted with confirmation of BHEL Site.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

VOLUME-IA PART – I CHAPTER - XIV

PROGRESS OF WORK

The scope of the work will comprise of but not limited to the following:

1.14.1 Contractor has to produce execution plan during shutdown period / Pass wise execution plan/ Monthly Execution Plan / New Pass execution plan. Plan and review will be done as per the format provided by BHEL.

1.14.2 Contractor is required to draw mutually agreed monthly erection programs in consultation with BHEL well in advance. Contractor shall ensure achievement of agreed program and shall also timely arrange additional resources considered necessary at no extra cost to BHEL.

1.14.3 Progress review meetings will be held at site during which actual progress during the week vis-a-vis scheduled program shall be discussed for actions to be taken for achieving targets. Contractor shall also present the program for subsequent week. The contractor shall constantly update / revise his work program to meet the overall requirement. All quality problems shall also be discussed during above review meetings. Necessary preventive and corrective action shall be discussed and decided upon in such review meetings and shall be implemented by the contractor in time bound manner so as to eliminate the cause of nonconformities.

1.14.4 The contractor shall submit daily, weekly and monthly progress reports, manpower reports, materials reports, consumables (gases / electrodes) report, cranes availability report and other reports as per Performa considered necessary by the Engineer as per the format enclosed with this tender document.

1.14.5 The contractor shall submit weekly / fortnightly / monthly statement report regarding consumption of all consumables for cost analysis purposes.

1.14.6 The monthly report ending on 24th of every month shall be submitted as a booklet and shall contain the following details :-

- a) Colour Progress photographs to accompany the report should be submitted.
- b) Erection progress in terms of tonnage, welding joints, radiography, stress relieving, etc., completed as relevant to the respective work areas against planned.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

- c) Site Organization chart of engineers & supervisors as on 24th of the month with further mobilization plan
 - d) Category- wise man hours engaged during the previous month under the categories of fitters, welders, riggers, khalasis, grinder-men, gas-cutters, electricians, crane operations and helpers. Data will be spilt up under the work area of Boiler
 - e) Consumables report giving consumption of all types of gases and electrodes during the previous month.
 - f) Availability report of cranes
 - g) Safety implementation report in the format
 - h) Pending material and any other inputs required from BHEL for activities planned during the subsequent month.
- 1.14.7 The manpower reports shall clearly indicate the manpower deployed, category wise specifying also the activities in which they are engaged.
- 1.14.8 During the course of erection, if the progress is found unsatisfactory, or if the target dates fixed from time to time for every milestone are to be advanced, or in the opinion of BHEL, if it is found that the skilled workmen like fitters, operators, technicians employed are not sufficient BHEL will induct required additional workmen to improve the progress and recover all charges incurred on this account including all expenses together with BHEL overheads from contractor's bills.
- 1.14.9 From the day of commencement of works, Computer / Laptop with Latest configuration and All in one printer, High Speed Internet Facility and Computer operator, Office boy must be provided at BHEL site office. If this facility is not provided, BHEL will recover reasonable amount as per RM's recommendation. Recovery towards non-provision of personal computer/ printer/operator/ Office boy shall be Rs.5,000/- per day. This is including of your contract. No separate payment shall be made for these services. This services has to be provided upto completion of project.
- 1.14.10 Contractor shall deploy one attendant at BHEL site office.
- 1.14.11 Contractor has to deploy manpower round the clock (in three shifts) as per the site requirement.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

VOLUME-IA PART – I CHAPTER - XV WELDING

The scope of the work will comprise of but not limited to the following:

- 1.15.1 All welders including tack welders, structural and high pressure welder shall be tested and approved by BHEL Engineer before they are actually engaged on work even though they may possess a valid certificate. BHEL reserves the right to reject any welder if the welder's performance is not found to be satisfactory. The contractor shall maintain the records of qualification AND performance of welders. BHEL Engineer will issue all the welders qualified for the work, an identity card. The welder will keep the same with him at work place at all times. He may be stopped from work if he is not found in possession of the same.
- 1.15.2 Engineer may stop any welder from the work if his performance is unsatisfactory for any technical reason or if there is a high percentage of rejection in the joints welded by him. The welders having passed qualification tests does not absolve the contractor of contractual obligation to continuously check the welder's performance.
- 1.15.3 Faulty welds caused by the poor workmanship shall be cut and re-welded at the contractor's expense. The Engineer prior to any repair being made shall approve the procedure for the repair of defective welds. After the repair has been carried out, the compliance shall be submitted to the quality engineer.
- 1.15.4 All expenses for testing of contractor's welders including destructive and Non-destructive tests conducted by BHEL at site or at laboratory shall have to be borne by the contractor only. Limited quantity of tube and pipe material required for making test pieces will be supplied by BHEL free of cost.
- 1.15.5 Only BHEL approved electrodes and filler wire will be used. All electrodes shall be baked and dried in the electric electrode-drying oven to the required temperature for the period specified by the Engineer before these are used in erection work. All welders shall have electrodes drying portable oven at the work spot.
- 1.15.6 The contractor shall also be equipped for carrying out other NDT like LPI /MPI / Hardness test etc. as required as per welding schedules / drawings within the finally accepted price / rates.
- 1.15.7 The Contractor shall deployed 2 Q/c Engineer with 5 years' Experience with Minimum 1 Level 2 OF NDT.The contractor shall deployed 2 erection engineer with

TECHNICAL CONDITIONS OF CONTRACT (TCC)

minimum 10 years' experience in ESP & Duct work..Otherwise suitable deduction Rs:40000/Engg/Month will be deducted from Contractor RA Bill.

VOLUME-IA PART – I, CHAPTER- XVI ELECTRICAL WORKS

2.2.0 SCOPE OF WORK

2.2.1 The works shall be covered for ESP and other auxiliaries.

2.2.2 The Scope of Electrical/ C&I work covered in the above package shall be as follows.

1. Dismantling of existing electrical components of esp namely esp control room panels, cables, cable trays, junction boxes, supp. & shaft insulator heaters, opacity monitor, Sox & Nox, IOS system if any etc. the work includes segregating the materials, weighment, transporting and handing over at scrap yard inside plant premises. some of the dismantled components which require to be reused shall be properly stored after weighment.
2. Erection and commissioning of LT MCC, ACP, Electronic Controllers (ECs) and other control panels in ESP MCC and control room area.
3. Fabrication and Installation of cable tray supports for cable trays.
4. Installation of various types of trays with accessories.
5. Installation of above ground earthing grid, equipment earthing of all equipment, cable racks, trays etc.,
6. Installation of local Push Button stations, Junction Boxes etc.,
7. Laying & Termination with proper tagging as per latest industrial standards of all types of power/ control/ instrumentation cables etc.,
8. Fabrication and installation of steel supports wherever required.
9. Supply and installation of cable sealing material for sealing of unused openings in panels/ JB's etc.,
10. Testing and commissioning Heating Elements and Thermostats
11. Erection and commissioning of Ash Level Instruments.
12. Erection and commissioning of Opacity monitors, Sox, NOx analyzers in ESP outlet ducts.
12. Supply of paints and painting of items covered in the scope of works.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

13. Supply of all consumables required for installation as detailed elsewhere in the specification.
14. Installation of any other items that have not been specifically indicated, but required for completing installation.
15. Re-routing or re-location of above ground electrical cables, cable trays, equipment's, fouling of any electrical cabling, trays etc. associated with new pass ESP shall be done by the sub-contractor within the quoted rates.
16. Erection and commissioning of mono rail electrical hoists.
17. Testing and commissioning of Collecting electrode, emitting electrode and GD rapping motors with laying and termination of necessary control cables and power cabling.
18. Oil top up, filtration, testing and commissioning of HVR transformers
19. Illumination by erecting necessary conduits, supports, structures and fixtures and testing and commissioning of the same in the areas of ESP MCC, ESP control room, ESP staircases, on all the operating floors of ESP's, ground floors areas etc. as required shall be done by contractor within quoted price.
20. Laying of incoming & outgoing cables of DCFB & ACFB shall be in the scope of contractor.
21. New gate dampers for inlet and outlet for pass isolation complete with electrical actuator cabling and controls from the existing DCS system shall also be provided by the Contractor. Existing power & control cables of existing inlet & outlet damper can be used for upgraded dampers for controls from existing DCS System

2.3.0 DETAILED SCOPE OF WORK:

The scope of work for items like Instruments, Panels, Hardware etc. covers identification of items at stores/ yards, checking, reporting the damages if any, loading, transportation, unloading at Contractor's stores/workingyard, keeping in safe custody in contractor's stores, pre-assembly, calibration, checking, erection, testing, loop checking & commissioning, supply of consumables like electrodes, gas, cable dressing materials, tag plates, ferrules, lugs (specific sizes), specific types of fasteners, paints and consumables. Deployment of skilled /unskilled manpower, engineers/ supervisors, T&P, material handling equipments, Testing instruments(except proprietary type instruments), returning of unused materials/ items to stores are also covered in the scope of work.

2.3.1 DISMANTLING OF CONTROL ROOM PANELS, FIELD INSTRUMENTS, CABLES AND CABLE TRAYS

- a. All the electrical works involving dismantling of all the existing electrically operated Monorail hoists, High Voltage Transformer Rectifiers, High voltage bus ducts, disconnecting switches, support insulators, bushing insulators, pin insulators, shaft insulators, Geared motors of both Emitting & Collecting electrode rapping system, PB stations, earthing, existing dust

TECHNICAL CONDITIONS OF CONTRACT (TCC)

level indicators, Junction boxes, Power & control cables, all existing luminaries , complete dismantling of Power & Control cables of existing ESP etc.

- b The work includes segregating the Materials, weighment, transporting and handing over at storage/scrap yard inside plant premises.
- c Some of the dismantled components which require to be reused shall be properly packed and stored after weighment.
- d The healthiness of the retaining equipment has to be checked/serviced/repared and proper working of this equipment has to be ensured before re-erection.
- e Any dismantling and re-erection of existing material/s that is required to complete the specified work shall form part of the work and shall be carried out at no extra cost to BHEL.
- f Dismantling of existing High Voltage Rectifier (HVR) Transformers and Erection & alignment of new HVRs shall be carried out by other agencies. However, testing and commissioning shall be in the scope the contractor.
- g Fabrication and erection of temporary structures, platforms, supports etc. for dismantling and erection of Electrical components of ESP forms part of the work. The temporary structures etc. erected shall be removed after completion of work at no extra cost.
- h Being a retrofitting job, any work like cutting/grinding etc. of supplied materials/existing materials to suit to site conditions shall form part of the erection work and no extra charges will be paid on this account.
- i The scope of work also includes shifting and proper storage of dismantled materials at storage yard. The dismantled materials should be segregated and unusable materials should be devoluted to Customer scrap yard.

2.3.2 SCOPE OF WORK FOR LT SWITCHGEARS,

TRANSFORMERS AND OTHER CONTROL PANELS:

- a. LT MCCs are simple/ double module type with isolators and fuses. However, some of the MCCs are Double Front draw out type consisting of circuit breakers unit, contactors/starter fuse switch units, MCB etc., These MCCs and ACDBs are mainly supplied to cater the requirement of drives, valves, etc.,
- b. The base frames shall normally be supplied along with the boards. These shall be aligned, levelled and grouted in position as per approved drawings. All minor concrete chipping and finishing works are included in the scope of the job. If any grouting bolts are required for the panel, the same shall be supplied at no extra cost.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

- c. Wherever the base channels are not available, the same shall be fabricated, erected and painted at site. The material for this shall be supplied by BHEL. For fabrication & erection of base frame, separate rate shall be paid on Tonnage basis.
- d. For the panels to be mounted on the trenches, channel supports have to be provided across the cable trenches over which the base frames of the panels shall be mounted. The contractor shall carry out fabrication and erection of these support structures. Separate rate shall be paid on Tonnage basis for fabrication and erection of support structures.
- e. The contractor shall take the panels to the desired locations either through floor openings or temporary openings. No claims will be entertained for taking the panels to the location owing to change of route or non-availability of openings as per nearest route.
- f. Panels will be delivered in different shipping sections. The contractor shall set each section of equipment on its foundation or supporting structures and assemble the panels as required. Necessary interconnection of busbar, inter panel wiring, etc. will have to be done by the contractor.
- g. Normally the panels shall be supplied with complete instrument mounting and wiring. However, if necessary, dismantling of the existing components, making minor modifications in the wiring to suit operating conditions, mounting and rewiring of new components shall be carried out without any extra cost. Mounting and wiring of any instruments, meters, relays, push buttons, indicating lamps, contactors etc. if supplied loose for safety in transit, shall also be included in the scope of the job. However, if any major wiring modifications is involved inside the panel, the same shall be carried out at extra cost. The decision of BHEL Engineer shall be final in respect of above extra works.
- h. The contractor shall carry out touch up painting for panels wherever required and this includes supply of paints also.
- i. The contractor shall calibrate and commission all switchgear/ panel mounted instruments, protection relays, transducers, Recorders, Indicators, energy meters etc with well-experienced Engineers/Technicians.
- j. MCC incomer bus shall be connected to PCC of customer. The contractor shall co-ordinate for proper connection at PCC.
- k. Scope of work shall include drilling of bottom gland plates for cable entry for all the cables to be terminated on the panel, as per requirement.
- l. Contractor shall co-ordinate with other cable-laying agency for proper cable termination.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

- m. The contractor shall close unused opening at the panel bottom plate with suitable material in consultation with Site Engineer as part of panel erection.
- n. Rubber mats for Switchgear shall be supplied by BHEL, and these shall be laid, wherever required, by the contractor.
- o. The scope of work shall include Testing, Calibration and adjustment of relays, electronic cards and instruments mounted on the panels.
- p. The commissioning of Switchgear shall also involve the trial runs and commissioning of all connected equipment like servomotors and drives etc. The contractor will have to keep his people round the clock, if necessary during the trial runs and promptly take action for any repair, checks and rectification etc. required in the equipment erected by him. (Separate rate shall be paid for commissioning of associated electrical drives as per Rate Schedule).
- q. All T&P, Material handling equipment including cranes and Relay testing / HV Testing Calibration equipment/Instruments shall be arranged by contractor.
- r. All testing Instruments/ Equipment deployed to site shall be calibrated before putting the same into service. A copy of calibration certificate shall be submitted to BHEL Engineer for his verification and approval.
- s. Contractor shall prepare all erection/commissioning log sheets, protocols / test certificates as per field quality plan, get it signed by the concerned BHEL / Customer Engineer and submit the same to BHEL Engineer as per his instruction.
- t. The contractor shall maintain the charged and commissioned equipment till the same is taken over by customer.
- u. If any removal/ Re-fixing of contactors/ relays becomes necessary for the completion of the system, the same shall be done by the contractor at no extra cost.
- v. Contractor shall put his watch and ward for the equipment under his custody and erected in location against theft and damage by other agencies working on the same area.
- w. Any loose supplied items like lamps, lens, contactor, fuse/ relays/ instruments etc. missed from the custody of the contractor shall be replaced by the contractor at no extra cost.
- x. Dimensions & weights indicated in the BOQ against various panels are approximate only. There may be variations in the weight and dimensions. Variations in depth, height or weight of the panel shall not be considered for payment. Any variation in length within $\pm 20\%$ shall not be

TECHNICAL CONDITIONS OF CONTRACT (TCC)

- considered for payment. If the panels have any variation in length beyond $\pm 20\%$ as compared to actual length indicated in the BOQ, payment shall be considered proportional to the length of the panel only.
- y. Service transformers supplied by BHEL are to be erected, tested and commissioned as per the drawings provided under the guidance of BHEL engineers which may include laying and termination of HT cables with HT jointing kits.
- z. (i) Old EC panels (pass-A&B) in old ESP control rooms of U#1&3 are to be shifted by disconnecting cables connected to these EC panels. After shifting EC panels to a new location (within the same room) the same old cables are to be re connected to the respective EC panels.
- (ii) Junction Boxes (customer use) fixed in a frame which is located adjacent to EC panel is to be shifted near by the adjacent wall in the same room. For shifting the frame, cables connected to respective JB's may have to be removed and terminated again in the respective JB's after the final positioning of the frame.

Note:-BHEL shall provide vendors' support for commissioning of proprietary type of micro processor based instruments, protection relay switch requires software loading and programmer etc. However over all responsibility lies with contractor and the contractor shall provide all support like manpower, standard T&P, instruments etc. for calibration and commissioning of above proprietary type instruments.

The contractor shall carry out testing and commissioning works with their own testing equipments and testing teams. Testing shall be done under the supervision of BHEL/Customer Engineers.

2.3.3 SCOPE OF WORK FOR CABLES:

- a. BHEL will supply HT 11kV, and LT 1.1KV, armoured/ unarmoured, Aluminium/ Copper PVC FRLS insulation, Power, Control and Instrumentation cables of different sizes.
- b. The scope of work includes laying & termination of cables, fixing of glands, ferrules, tag plates with necessary numbering and dressing of cable, as per BHEL specification and BHEL engineer's instructions.
- c. Separate rate shall be paid for cable termination of higher size cables. Such cables will be indicated in the BOM/ Rate Schedule. For other cables, a composite rate covering laying and termination shall be applicable.
- d. Unit rate quoted for cable shall cover laying, drilling of holes on the gland plates of the panels/JB or Enlargement of cable entry holes by tapping or any modification required fixing of cable glands, fixing of glands, ferrules termination, and and providing tag plates and dressing.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

- e. Unit rates quoted for cabling shall also include supply of clamping/dressing materials such as Aluminium/GI strips or PVC ties, ferrules, tag plates, lugs upto 2.5 sq. mm. apart from the work mentioned above. Supply of above material shall confirm to the specification detailed in Section III.
- f. Uniform unit rate shall be quoted for the cables whether laid on cable trays or routed through duct bank, conduits, cable shafts etc.
- g. The contractor shall provide Tools/ equipment required for the connections and termination of cable wherever necessary. No separate rate shall be paid for cable terminations. For cable joining, if any, no separate rate shall be considered. Contractor has to execute as per site requirement.
- h. The contractor shall carry out cable dressing and clamping for all the cables laid by the contractor. However, if any other agency laid cables of lesser quantity for which no separate trays have been allotted, the contractor shall do clamping along with the cables.
- i. Wherever cable entry holes have not been provided for equipment installed by another agency, the contractor shall co-operate to get the same done.
- j. During testing and commissioning, if the equipment on which the cables are terminated not functioning, it is the responsibility of the contractor to check and establish in coordination with the commissioning agencies that there is no defect in the cabling, The contractor shall promptly depute his supervisor or technicians to assist the commissioning agencies to check the inter connecting cables.
- k. Contractor shall carefully plan the cutting schedule for each cable drum in consultation with Engineer such that wastage is minimized and any resultant short lengths can be used where appropriate route lengths are available.
- l. Contractor shall shift power cables(for EC panel) from OLD LTMSB panel of Pass-A(07 fields) to new ACP panel pass-A and the same cables shall be terminated to respective dedicated modules(in pass-A ACP panel) for EC panels.

2.3.4 SCOPE OF CABLE TERMINATION

- a. The scope of termination shall include termination of cables on various equipment installed by others.
- b. Re-termination if required during testing/ commissioning shall be carried out without additional cost.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

- c. Scope of termination shall include supply of insulating sleeves. The sleeves shall be fire resistant and long enough to over pass conductor insulation.
- d. Old cables of Pass-A which were removed from OLD pass-A ACP panel shall be re-terminated to new Pass-A ACP panel.
- e. Contractor shall arrange all type of termination and crimping Tools/ equipments required for the connections/terminations.
- f. **Only printed ferrules should be used and contractor shall arrange necessary ferrules printer.**
- g. After cable terminations, the debris shall be removed then & there

2.3.5 SCOPE OF WORK FOR CABLE TRAYS:

Scope of cable tray works covers erection of various sizes of Ladder type trays with accessories mostly for branch trays in Power House building. All type of cable trays including, standard trays accessories shall be supplied by BHEL.

The scope of work for cable trays shall be as follows:

- a. The unit rate for erection of trays shall be on meter basis. The unit rate quoted for erection of tray shall also include erection of all tray accessories such as elbow, cross, TEEs, bends such as vertical and Horizontal, reducers, coupler plates / fixing plates, anchor bolts, fasteners etc.,
- b. For routing of trays standard tray accessories supplied by BHEL shall be used. However if above standard tray accessories are not supplied, the same shall be fabricated and installed at no extra cost.
- c. If standard tray accessories like TEEs, Reducers, Bends, cross etc requires any modification to suit the tray routing, the same shall be carried out at no extra cost.
- d. The unit rate quoted for trays shall also cover making of offsets by means of cutting standard tray sections and inserting suitable trays to match with the existing arrangement.
- e. No separate rate shall be paid for any such site fabrication / modification on trays or on tray accessories.
- f. The contractor shall quote a uniform rate on meter basis for erection of trays and tray accessories like TEEs, Reducers, Bends, cross etc.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

- g. Tray covers are to be erected after completion of cable laying and no separate payment will be made for fixing these covers. GI strip clamps are to be used for fixing the tray covers.
- h. Welded Joints of trays shall be painted with red lead and aluminium paint in turn with bitumen as per IS 3043. The unit rate shall also include supply of paints, thinner, other consumables and brush etc.

2.3.6 SCOPE OF WORK FOR JUNCTION BOXES/CJCBs /PUSH BUTTON

BOXES:

- a. Different Junction Boxes/ CJCBs/ Push Button boxes with gland plates shall be supplied by BHEL.
- b. The unit rate quoted for erection of junction boxes/push button boxes shall cover the following also.
 - Providing necessary supports
 - Drilling of bottom gland plates for cable glands as required
 - Painting the tag Nos. or fixing a separate tag plate on junction boxes / push button boxes
 - Minor chipping, grouting as required for mounting the JB/PB
 - Supply of all bolts and nuts (Fasteners) including grouting bolts as required for mounting the junction box/push button.
 - Closing all unused holes on the gland plates using grommet or any other suitable materials.
 - Any modification like replacement of terminals, enlarging gland holes etc., that may be required to accommodate power cables.
- c. All bolts and nuts (Fasteners) required for mounting the junction box shall be arranged by the contractor.
- d. For CJCBs/ RJCBs, the rate for Junction Boxes similar size, as per Rate Schedule, will be applicable.
- e. Canopies are to be fabricated and erected for the JB/PB as per the site requirement.
- f. For fabrication and fixing of supports/ frames/ canopy, rate shall be paid on tonnage basis.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

2.3.7 SCOPE OF WORK FOR FABRICATION & ERECTION OF STEEL MATERIALS:

- a. Scope of steel fabrication and installation covers, fabrication and installation of various type of supports for cable tray, instruments, impulse pipes, GI pipes, support angles for copper tubing, mounting frames for JB, Control Box / Panel, local PB Stations, canopy for local instruments and local instrument rack etc. wherever required.
- b. The fabrication steel materials such as angles, channels, plates, etc., shall be supplied in standard lengths by BHEL. Fabrication shall be carried out by the contractor as per schemes in consultation with site engineers.
- c. Immediately after fabrication, primer shall be applied to prevent corrosion. The installation shall be carried out only after applying the primer as detailed in painting clause.
- d. All fabricated steel materials shall be painted as detailed in the scope of painting.
- e. A composite rate shall be quoted for fabrication and installation of steel, on tonnage basis. The above rate shall include supply of paints and painting, grouting and grouting material as required.

2.3.7.1 FLEXIBLE CABLE TRAYS SUPPORT SYSTEM

- a Cable tray support system shall be pre-fabricated similar or equivalent to "Unistrut make". Support system for cable trays shall essentially comprise of the two components i.e. main support channel and cantilever arms. The main support channel shall be of two types:

(i) C1:- having provision of supporting cable trays on one side and

(ii) C2:-having provision of supporting cable trays on both sides.

The support system shall be the type described hereunder

- b Cable supporting steel work for cable racks/cables shall comprise of various channel sections, cantilever arms, various brackets, clamps, floor plates, all hardware such as lock washers, hexagon nuts, hexagon head bolt, support hooks, stud nuts, hexagon head screw, channel nut, channel nut with springs, fixing studs, etc.
- c The system shall be designed such that it allows easy assembly at site by using bolting. All cable supporting steel work, hardware fittings and accessories shall be pre-fabricated factory galvanized.
- d The main support and cantilever arms shall be fixed at site using necessary brackets, clamps, fittings, bolts, nuts and other hardware etc. to form various arrangements required to support the cable trays. Welding of the components shall not be allowed. However, welding of the

TECHNICAL CONDITIONS OF CONTRACT (TCC)

bracket (to which the main support channel is bolted) to the overhead beams, structural steel, insert plated or reinforcement bars will be permitted. Any cutting or welding of the galvanized surface shall be brushed and red lead primer, oil primer & aluminum paint shall be applied.

- e All steel components, accessories, fitting and hardware shall be hot dip galvanized after completing welding, cutting, drilling and other machining operation.
- f The main support channel and cantilever arms shall be fabricated out of minimum 2.5 thick rolled steel sheets conforming to IS.
- g Cantilever arms of 300 mm, 600 mm and 750 mm in length are required. The arm portion shall be suitable for assembling the complete arm assembly on to component constructed of standard channel section. The back plate shall allow sufficient clearance for fixing bolt to be tightened with tray in position.
- h The size of structural steel members or thickness of sheet steel of main support channel and cantilever arms and other accessories and indicated above are indicative only. Main support channels may be supplied in any suitable lengths to minimize the wastage. Nevertheless, the support system shall be designed by the bidder to fully meet the requirements of type tests as specified. In case the system fails in the tests, the components design modification shall be done by the Bidder without any additional cost to the Employer.

2.3.8 SCOPE OF OPACITY MONITOR , SO_x, NO_x Analyzer

- a. OPACITY MONITOR, Sox, NOx systems consists of an electronic unit, receiver unit, control unit, purge air system, PLCs and connecting cables.
- b. The total OPM unit has to be installed in the outlet duct of ESP at specified location by a suitable opening and welding an adapter. All the materials like clamps, flexible conduits, fixing bolts etc. will be supplied by BHEL on free issue basis.
- c. The contractor shall also carry out the purge air line connections to the OPM.
- d. The Unit rate shall also cover marking tag Nos. of instruments/racks, either by paint or a separate tag plate as per BHEL Engineer directive.
- e. Separate rates shall be paid for fabrication and erection of supports/brackets as per rate schedule.
- f. Temporary protection by polythene sheets / steel sheets shall be provided by contractor for safe guarding the OPM against damages. The protective covers shall be provided at no extra cost by contractor.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

2.3.9 SCOPE OF EARTHING

- a. The scope of earthing covered in this contract is above ground earthing in ESP Area, MCC and control room area. BHEL will provide earthing system comprising of main earthing conductor buried in soil, embedded in concrete in Power house areas. The scope covers Installation of earthing conductors and connecting equipments pertaining to the plant earth grid.
- b. The contractor shall carry out earthing for all Electrical equipment which may be erected by the contractor or some other agency. Different type of earthing materials shall be supplied and the contractor shall lay and connect the earthing materials as per site requirement and as detailed in Section III.
- c. Unit rate for earthing material shall be paid on running metre basis.
- d. Connections to the equipments shall be bolted and the same shall be painted with anti- corrosive paint/ compound. Connection between the equipment earth lead and the grid conductor shall be welded. For rust protection, the welds shall be treated with zinc chromate primer and coated with zinc rich paint.
- e. If the equipment is not available at the time of earthing conductor laying, tap connections from the main earthing conductor shall be brought out upto slab equipment foundation level with at least 200mm spare length left for further connections to equipment earthing terminals.
- f. Wherever possible and as directed by site engineers, localized internal earthing ring shall be formed and connected to the ground earthing through vertical risers.
- g. All equipment shall be earthed by two separate and distinct connections. Earthing terminals will be available in all the equipment supplied by BHEL.
- h. A continuous earthing conductor shall be installed in all cable trays. When two or more trays supporting power cables run on parallel, continuous earthing conductors shall be provided on one tray only with tap-offs to the control cable trays. All valve and damper motor and rapping motors will be earthed to this conductor.
- i. Entire system shall be earthed in accordance with the provisions of the relevant IEC recommendations /IS code of practice IS 3043-1947 and Indian Electricity Rules, so that the values of the step and contact potentials in case of faults are kept within safe permissible limits. Parts of all electrical equipment and machinery not intended to be alive shall have two separate and distinct earth connections each to conform to the stipulation of the Indian Electricity Rules and apparatus rated 240V and below may have single earth connections.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

2.3.10 SCOPE OF PAINTING:

- a. The scope of painting generally covers all the steel fabrication works such as supports, racks, frames, canopy, LIE / LIR / LGB, impulse pipes etc. carried out by the contractor. Painting shall be carried out for any bare copper tube also.
- b. Touch up painting only is generally required for trays, control panels, junction boxes and full painting shall be required only for specific equipments as per the scope of erection.
- c. The painting shall include two coats of Red oxide primer and two coats of final painting of synthetic enamel paint of colour approved by BHEL.
- d. All damaged painted surfaces shall be cleaned and coated with two (2) coats of primer followed by a finishing coat of approved colour.
- e. All damaged galvanized surfaces including cable trays shall be coated with cold galvanizing paint.
- f. Unless other wise instructed, final painting shall be carried out in the field, only after mechanical completion and completion of cable laying.
- g. The scope of work includes supply of paints, primers, consumables like brushes, emery papers, thinner etc., also.
- h. Paints shall be arranged from standard reputed suppliers in consultation with BHEL.
- i. All painting materials brought to site by contractor for application shall be procured directly from manufacturer as per specifications and shall be accompanied by manufacturer's test certificates. The paint manufacturer's instructions shall be followed at all times.
- j. No separate rate shall be paid for painting and supply of paints, and other consumables. Painting shall be accommodated in the unit rate quoted for items which calls for painting as per scope of work.

2.3.11 SCOPE OF CIVIL WORKS

Minor civil works like drilling, chipping and punching holes on slabs and brick- walls and grouting related to installation of, control panels, junction boxes etc., shall be included in the erection cost of such items. No separate payment is applicable. The scope also includes supply of grouting material. More details regarding scope of civil are given in the respective equipment erection.

2.3.12 SCOPE OF CALIBRATION:

- a. Contractor shall calibrate all the instruments, panel mounted

TECHNICAL CONDITIONS OF CONTRACT (TCC)

- instruments including that will be supplied along with equipments mounted in or as loose.
- b. Contractor shall submit calibration records as per the BHEL format enclosed in the tender specification.
 - c. All testing Instruments/ Equipment deployed for calibration shall be calibrated before taking it into service. A copy of valid calibration certificate issued by recognized /accredited agencies. shall be submitted to BHEL Engineer for verification and approval.
 - d. **BHEL will provide vendor support for calibration of proprietary instruments such as analysers etc., If BHEL is unable to provide or arrange vendor support for above mentioned proprietary instruments, contractor shall carry out the calibration through authorized agency, at extra cost. The actual cost of such calibration carried out by out side agency shall be reimbursed. However, if above such calibrator is available with BHEL at site the calibration shall be carried out by the contractor with in the quoted rate. However, overall responsibility lies with contractor and contractor shall provide all supports like manpower, standard T&P's, Instruments etc., for calibration and testing of above proprietary type instruments.**
 - e. **The contractor shall carry out calibration with their own calibration and testing equipments and shall be done under the supervision of BHEL / Customer Engineers.**

2.3.13 SCOPE OF COMMISSIONING OF EQUIPMENT ERECTED BY THE MECHANICAL CONTRACTOR.

- 1. ESP HEATING ELEMENTS AND THERMOSTATS
 - a) Checking the healthiness of Elements and Thermostats.
 - b) Setting the value
 - c) Replacement of defective Elements and Thermostats.
- 2. INSTRUMENTS MOUNTED ON THE EQUIPMENTS/ SKIDS/ PANELS

Scope of work covers removal, re-calibration, re-fixing, and re-termination of cables, checking the continuity, replacing any defective parts or replacing the total instrument, if required.

NOTE:

The scope of work covered in 2.3.10 also includes collecting the replacement instruments/ parts from BHEL/customer stores, stockyard etc.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

Separate group shall be identified for commissioning. The above group shall be available right from Trial run to full load operation including shift operation.

3. ELECTRICAL ACTUATOR FOR GATE,DAMPERS
Scope of work covers termination of cabling , local and remote commissioning of Actuators

2.3.14 SCOPE OF PRE-COMMISSIONING/ COMMISSIONING AND POST COMMISSIONING WORKS:

1. The scope of commissioning works covers commissioning of all instruments covered in the BOQ including loopchecking and establishing the operation of instruments/ systems to meet plant commissioning/ operation. The contractor shall be responsible for over all commissioning of all the instruments and systems covered in the BOQ.
2. Scope of commissioning starts with the commissioning of various equipment / instruments/ systems erected by the contractor and making them available, as required, for the various commissioning activities of the main plants. The commissioning activities of the main plant shall be as below:
 - i) Charging of panels
 - ii) Dry out of HVR's and geared motors.
 - iii) Trial run of various equipment.
 - iv) OCC / SCC of HVrs
 - v) Dummy load test of ECs.
 - vi) Commissioning of heating elements
 - vii) Commissioning of ALI
 - viii) Commissioning of Areca controllers
 - ix) Commissioning of electrical operated hoist
 - x) Commissioning of opacity monitor, Sox, NOx analyzers
 - xi) Commissioning of IOS system
 - xii) Commissioning of the above activities, tests, trial runs may have to be repeated till satisfactory results are obtained to the satisfaction of customer/ consultant/ statutory authorities like boiler inspector, electrical inspector etc.
 - xiii) Commissioning (Hookup activity) of Unit#1&3, ESP pass-A old equipments with respective new ACP panels.

The contractor shall co-ordinate with other contractor's during the above main plant commissioning activities to ensure successful commissioning of total plant.

3. The pre-commissioning activities of the main power plant will start with run of various equipments prior to light up of boiler and commissioning operations shall continue till the unit is handed over to customer. The contractor shall simultaneously start commissioning

TECHNICAL CONDITIONS OF CONTRACT (TCC)

activities for the equipment erected to match with the various milestone activities of commissioning programme of the project.

4. Contractor shall arrange experienced commissioning engineers, Supervisors including electricians/ instrument mechanics in each area to be associated with BHEL commissioning staff. Contractor shall earmark separate manpower for various commissioning activities. The manpower shall not be disturbed or diverted. It shall be specifically noted that above employees of the contractor may have to work round the clock along with BHEL commissioning engineers involving considerable payment of overtime, which forms part of Contractors Scope.
5. The mobilization of these commissioning groups shall be such that planned activities are taken up in time and also completed as per schedule and the work undertaken round the clock if required. It is the responsibility of contractor to discuss on day to day / weekly / monthly basis the requirement of manpower, consumables, tools and tackles with BHEL engineer and arrange for the the same. If at any time the requisite manpower, consumables, T&P are not arranged then BHEL shall make alternate arrangements and necessary recoveries the requisite manpower, consumables, T & P are not arranged then BHEL shall make alternate arrangements and necessary recoveries with over head cost will be made from the bills of the contractor.
6. After erection of various equipment prior to commissioning and after commssioning, protocols have to be made with BHEL's customer. The formats will be given by BHEL and have to be printed by the contractor in adequate numbers.
7. For electrical works, 415 volts and above, the contractor has to bring qualified electricians and the total work has to be certified by electrical license holder. The expenditures towards work certificate and all statutory requirements connected towards the high voltage system shall be borne by the contractor.
8. In case any rework/repair/rectification/modification/fabrication etc. is required because of contractor's faulty erection which is noticed during commissioning at any stage, the same has to be rectified by the contractor at his cost. If during commissioning, any improvement/ repair/ rework/ rectification/ fabrication/ modification due to design improvement/ requirement is involved, the same shall be carried out by the contractor promptly and expeditiously. Claims if any, for such works from the contractor shall be governed by clauses covered elsewhere .
9. During commssioning activities and carrying out various tests, if any of the instruments has to be temporarily erected and commissioned to suit the commissioning activities, the contractor have to carry out the

TECHNICAL CONDITIONS OF CONTRACT (TCC)

erection of the same. After completion of activities the temporary systems have to be removed and returned to stores and no extra rate shall be paid for this.

10. All the T&P instruments required for commissioning are to be arranged by the contractor. However, any special instruments, which are of proprietary nature, shall be arranged by BHEL.
11. It shall be the responsibility of the contractor to arrange and complete all the testing, pre-commissioning and commissioning activities for the particular equipment as per relevant standard, code of practice, manufacturer's instructions and BHEL norms. All the above will be witnessed by the BHEL engineers and reports signed shortly. Contractor shall follow check list of BHEL and testing & commissioning activities shall be carried out in accordance with the check list.
12. The scope of commissioning shall also cover the commissioning of the equipment/ drives erected by the mechanical contractors.(as detailed in the BOQ)

SPECIAL NOTE : IN ADDITION TO THE ABOVE, CONTRACTOR SHALL CARRY-OUT RE-ROUTING/REMOVAL AND RE-ERECTION OF EXISTING ABOVE GROUND STRUCTURES/PIPELINES/CABLES/ CABLE TRAYS ETC., THAT MAY LIKELY TO FOUL DURING INSTALLATION OF NEW SYSTEM. NO EXTRA PAYMENT WILL BE MADE.

2.4.0 COLLECTION OF BHEL SCOPE OF SUPPLY MATERIALS

- 2.4.1 BHEL shall issue materials covered in BHEL scope from their stores at site. The contractor shall collect such materials from BHEL stores and transport to his work site at the contractor's cost.
- 2.4.2 The contractor shall inspect such materials as soon as received by the contractor and shall bring to the attention of the Engineer-in-Charge any shortage / damage or other defects noticed before taking over the materials. Materials once taken over will be deemed to have been received in good condition and incorrect quantities except for intrinsic defects which can not be observed by visual and dimensional inspection and weighing.
- 2.4.3 Upon receipt by the contractor the responsibility for any loss, damage and / or misuse of such materials shall rest with the contractor.
- 2.4.4 All materials issued by BHEL shall be properly stored and systematic records of receipts, issue and disposal will be maintained. Periodic inventory shall be made available to BHEL Engineer-in-Charge.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

- 2.4.5 All materials issued by BHEL shall be utilized as directed by Engineer-in-charge or most economically in the absence of such direction. The contractor shall be responsible for the return to BHEL Stores of all surplus material, as determined by the Engineer-in-Charge.
- 2.4.6 If the materials issued by BHEL are lost, damaged or unaccounted, the cost of such items shall be recovered from payments to the contractor. However, the contractor shall raise FIR and inform BHEL all details.

2.5.0 STORAGE

- 2.5.1 The equipment should be preferably in its original package and should not be unpacked until it absolutely necessary for its installation. The equipment should be best protected in its cases. It should be arranged away from walls.
- 2.5.2 The wooden pallet provided for packing itself can be retained for raised Platform to protect equipment from ground damp, sinking into ground and to circulate air under the stored equipment. This will also help in lifting the packing with fork lift truck.
- 2.5.3 Periodic inspection of silica gel placed inside the equipment is necessary. It has to be replaced when decolorisation takes place or regenerated. BHEL shall supply the material and contractor shall replace.
- 2.5.4 Due care should be taken to ensure that the equipment is not exposed to fumes gases etc. which can affect electrical contacts of relays and terminal boards.
- 2.5.5 The storage room and the equipment should be checked at regular interval of 3 months to ensure protection from termites, mould growth, condensation of water etc. which can damage the equipment.
- 2.5.6 Contractor shall keep BHEL informed about such problem and try to rectify the problem at his risk and cost.
- 2.5.7 All the instrument, materials and goods kept in the store room should be identified and registered in a book. Inspection report should be recorded. Any discrepancy observed should be communicated to site.
- 2.5.8 Packing material shall be retained if the cubicle to be repacked after inspection
- 2.5.9 All sub-assemblies should be kept in a separate place where it is easily accessible.
- 2.5.10 Sub-assemblies should have a protective cover in case it is stored without wooden packing / case to prevent accumulation of dust. Silicagel

TECHNICAL CONDITIONS OF CONTRACT (TCC)

packets should also be kept along with it. Sub-assemblies should not be stacked one above the other.

2.5.11 The loose items supplied for the main equipment falls into various categories like tools, modules, prefabricated cables, console inserts, recorders, modules and display units, printers, sensors and transducers, PCs, monitors, cable glands, cable ducts, frames etc. are to be categorised and stored separately.

2.6.0 T&P TO BE PROVIDED BY BHEL FREE OF CHARGE

-NIL- except special informed

2.7.0 TOOLS AND PLANTS TO BE ARRANGED BY THE CONTRACTOR

2.7.1 Equipment, vehicles, tools and plants and materials brought to site by the contractor from his resources shall have distinctive identification marks and the contractor shall intimate the description and quantity to BHEL in writing.

2.7.2 All construction materials brought by the contractor shall have prior approval regarding quality and quantity by BHEL. The contractor shall also provide with out extra cost necessary enclosures containers and protective materials for proper storage of materials inside, whenever so instructed by the purchaser with out any extra cost.

2.7.3 No material or equipment or tools etc. shall be taken out of the work-site without the written consent of BHEL.

2.7.4 BHEL shall not be responsible for the safety and protection of the materials of the contractor and the contractor shall make his arrangements for proper watch and ward for his materials.

2.7.5 Until such time the work is taken over by BHEL, the contractor shall be responsible for proper protection including proper fencing, guarding, lighting, flagging, watching. The contractor shall during the progress of work properly cover up and protect any part of the work liable to damage by exposure to the weather and shall take every reasonable precaution against accident or damage to the work from any cause.

2.8.0 MATERIALS/CONSUMABLES TO BE ARRANGED BY THE CONTRACTOR WITHIN THE RATE QUOTED FOR ERECTION AND COMMISSIONING OF RESPECTIVE EQUIPMENT/ITEMS (as required for the work).

- a. Welding electrodes and gas
- b. Provision for Temporary Scaffoldings.
- c. "U" Clamps with nuts and washers for impulse pipes and GI pipe clamping.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

- d. Tags- Plates. Al/Fiberglass/ Stainless Steel
- e. Insulation tape.
- f. Teflon tape for instrument air system piping.
- g. Paints required for primer coating and final coating of synthetic enamel paint of approved colour, Consumables like thinner, brushes, emery paper etc.
- h. Solder wire (Lead) -(60/40)
- i. Protocol/Calibration report sheets as per BHEL Format.
- j. Fastener for mounting JB and local PB Boxes.
- k. Panel/ JB Sealing compound material(for cable entry from bottom/Top of Panel).
- l. PVC cable tie, Aluminium or GI strips and fasteners for clamping of cables and other dressing materials required for cable dressing,grommet
- m. Printed Ferrules, sleeves for cables Yellow/White
- n. Lugs upto 2.5 sq. mm Solderless crimping type

2.9.0 MANPOWER REQUIREMENT

Manpower requirement per unit for Erection shall as follows:

There shall be one Erection In-Charge. Erection In-charge shall have minimum 1 erection engineer with adequate supervisors and Technicians. Similarly commissioning Engineers also shall be identified separately for each package and the minimum requirement shall be as indicated below.

The commissioning group shall be identified at the Pre-commissioning and commissioning time. The commissioning group shall have the knowledge of various systems referred in the tender and also should have adequate experience.

In addition to the above, the contractor shall provide data entry operator for documentation works such as preparation of calibration records, protocols, progress reports etc.

The above manpower is only tentative and for any additional manpower as per site requirement the same shall be arranged by the contractor. Besides the above, there will be separate engineers for Planning, Safety and quality. For all practical purposes, each of the above In-charges shall be provided with a PC and good communication facilities.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

If the contractor fails to deploy the above Engineer/ Supervisor/ Technican at appropriate time of commissioning, BHEL Engineer will have the right to with hold the payment towards commissioning activites as defined in terms of payment.

2.10.0 DOCUMENTATION

2.10.1 The following information shall be furnished after commencement of works.

- a. Calibration certificates for the Instruments calibrated at site.
- b. Test certificates of various tests conducted at site.
- c. Erection and commissioning protocols signed by customer & BHEL

2.10.2 As built drawings :

After successful completion, testing and commissioning of installation work, the above listed Purchaser's drawings/documents shall be updated in line with the actual work carried out and as built drawings / documents shall be submitted by the contractor as agreed for the project.

2.11.0 PROGRESS AND MONITORING OF WORK

2.11.1 It shall be the responsibility of the contractor to provide all the relevant information on a regular basis regarding erection progress, welding progress, labour availability, equipment deployment, consumption of electrodes, gases, etc.

2.11.2 The contractor shall submit daily, weekly and monthly progress reports, manpower reports, material reports, equipment reports etc. as per formats specified by BHEL. The progress reports shall indicate the progress achieved against planned with reasons indicating the delays, if any. The report shall also give the remedial actions which the contractor intends to make good the slippage or lost time so that further works can proceed as per the original programme and the slippage do not accumulate and affect the overall programme.

2.12.0 ELECTRICAL INSPECTORATE'S APPROVAL: (if applicable)

2.12.1 All electrical installations covered in contracts scope is to be inspected / approved by the electrical inspector/statutory authority. Contractor is responsible for getting the Electrical inspector approval.

For getting electrical inspector approval, contractor shall co ordinate with Electrical contractor. Necessary completion/ test certificate for the Electrical equipments covered in the scopeshall be arranged by the contractor.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

2.12.2 Contractor shall carry out the modifications/ rectifications if any as suggested by the authority at his cost.

2.12.3 BHEL shall pay all fees(Fees for visits, Inspection fees, registration fees, etc)

2.12.4 However any expenditure related to documentation shall be borne by contractor.

2.13.0 DETAILS TO BE FURNISHED BY THE TENDERERS

2.13.1 A part from other details called for in the tender document under the various other provisions, the tenderers along with their offers shall submit the following details. Please also refer the checklist.

2.13.2 Tenderers shall go through very carefully all the provisions under Section II and shall submit manpower deployment plan as per appendix I D. The contractor along with his offer shall, also submit the list of T&P and instruments that are available with him for mobilisation for the work as specified in Appendix I D. Tenderers shall indicate the present location and submit a schedule of tools and plants for this site to meet the schedules of erection and commissioning.

2.13.3 Apart from other details called for in the tender document under the various other provisions, the tenderers along with technical bid shall submit the following details.

- a. HQ Organisation chart
- b. Site Organisation Chart Covering various function
- c. Month wise Manpower deployment plan
- d. T&P deployment plan

2.13.4 The following information shall be furnished within two weeks of award of contract for approval:

- a. Final field quality plan
- b. Detailed organization chart
- c. Erection Schedule.
- d. Experience details of site staff
- e. Details of calibration instruments

2.14.0 MEASUREMENTS & WASTAGE & CUTTING ALLOWANCES:

2.14.1 For all payment purposes, measurement shall be made on the basis of the execution of drawings/physical measurements. Physical

TECHNICAL CONDITIONS OF CONTRACT (TCC)

measurements shall be made by the contractor in the presence of the Engineer.

2.14.2 The measurement for cable, impulse pipes/ tubes, GI pipe, conduits, flexible conduits, trays etc. shall be made on the basis of length actually laid.

2.14.3 All the surplus, scrap and serviceable materials, out of the quantity issued to the contractor shall be returned to BHEL in good condition and as directed by the engineer.

2.14.4 All materials returned to stores should carry an aluminium tag indicating the size and type. More than 5 metres length termed as serviceable material and shall be returned size wise and category wise to the owner's stores/yard. Cable of serviceable length being returned to the stores indrums shall have their free ends sealed and the balance lengths on the drum(s) shall be noted and certified by the Engineer-in-charge. This shall be applicable only for the purpose of accounting the cables issued for installation.

2.14.5 While carrying out material reconciliation with contractor, all the above points will be taken into account. All serviceable material returned by the contractor shall be deducted from the quantities issued for the respective sizes and categories and the balance quantity(ies) will be taken as the net quantity(ies) issued to the contractor. Material appropriation shall be done and allowable scrap quantity calculated as per wastage allowance specified. Any scrap/wastage generated by the contractor in excess of the allowable percentage shall be charged at the rates decided by the Engineer whose decision shall be final and binding on the contractor.

2.14.6 For all site-fabricated steel items such as supports, racks, frames, Canopy etc. physical measurement shall be made and then converted to tonnage. For steel material supplied to the contractor, all scrap shall be returned to BHEL stores with due accounting.

2.14.7 Every month the contractor shall submit an account for all the materials issued to him by BHEL in the standard pro forma prescribed for this purpose by the site in charge.

2.14.8 The erection contractor shall make every effort to minimize wastage during erection work. In any case, the wastage shall not exceed the following limits;

S.No.	Item	% Wastage on issued Qty
1.	Fabrication steel	2
2.	Each size of power cables	1
3.	Each size of control/Instrumentation cables	2

TECHNICAL CONDITIONS OF CONTRACT (TCC)

4 Impulse pipe/tubes/GI pipes/copper tube 1

2.14.9 If the actual wastage be more than the specified figure, then equivalent price of the excess portion will be deducted from the contractor's bill.

2.14.10 The cable take off from drums shall be planned strategically such that jointing in the run of cables and wastage are avoided. for this purpose the exact route length between various equipment/panels as per the cable schedule shall be measured and the route length recorded before laying of the cables. Depending upon the route length the type of cable required for various destinations, the cable drums shall be suitably selected for cable laying. Any jointing which may be approved by the engineer all the cut pieces/ bits of cables which are not used /unused shall be returned to the purchaser for accounting towards wastage. The cables damaged by the contractor shall have to be replaced by the contractor at his own cost.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

VOLUME-IA PART - I CHAPTER - XVII TESTING AND COMMISSIONING

The scope of the work will comprise of but not limited to the following:

1.16 TESTING, PRE – COMMISSIONING & COMMISSIONING AND POST COMMISSIONING

(All the works mentioned hereunder shall be carried out within the quoted and accepted rate)

- 1.16.1 Contractor to provide necessary commissioning assistance from pre-commissioning state onwards and up to continuous operation of the unit & handing over to customer.
- 1.16.2 The contractor shall carry out all the required tests on the equipments erected such as gas tightness test for ducts, kerosene leak test, air flow test, etc., using contractor's own consumables, labour and scaffoldings.
- 1.16.3 It is the responsibility of the contractor to provide necessary manpower, tools, tackles and consumable within the quoted price to carry out the Gas Distribution test of ESP.
- 1.16.4 All required tests (Mechanical and electrical) indicated by BHEL and their clients for successful commissioning are included in the scope of these specifications. These tests / activities may not have been listed in these specifications. All the tests should be repeated till all the equipments satisfy the requirement / obligation of BHEL to their customer. All the repairs (shop welded or site welded) arising out of the failures during testing shall be done by the contractor as part of the work.
- 1.16.5 For conducting gas tightness test, it may be required to erect the blowers and connecting ducts and commission the same for tightness test. It is the responsibility of the contractor to erect the blowers & dismantle once the test is over. Contractor shall carry out the work within the quoted rate and BHEL will provide only the required materials, like Blowers and dummies free of hire charges for conducting the test.
- 1.16.6 Fixing dummy plates at required locations for conducting tightness test and normalizing after the test is over, is also covered in the scope of contract and shall be carried out with in the quoted rate. BHEL will provide raw materials for the dummy plates.
- 1.16.7 The contractor shall carryout any other test as desired by BHEL Engineer on erected equipment covered under the scope of this contract during testing, pre-commissioning, commissioning, and operation, to demonstrate the completion of any part or whole work performed by the contractor.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

- 1.16.8 The ESP rectifier transformers are to be only erected by the contractor. Testing, commissioning and oil filtering is not in the scope of this contract.
- 1.16.9 In case, any rework is required because of contractor's faulty erection, which is noticed during pre-commissioning and commissioning, the same has to be rectified by the contractor at his cost. If any equipment / part is required to be inspected during pre-commissioning and commissioning, the contractor will dismantle / open up the equipment / part and reassemble / redo the work without any extra claim.
- 1.16.10 During commissioning, opening / closing of valves, changing of gaskets, Re-alignment of rotating and other equipment, attending to leakage and adjustments of erected equipment may arise. The finally accepted price /rates shall also include all such work.
- 1.16.11 Commissioning of the equipments will involve, trial runs of all the equipments erected, blowing through the lines, flushing of all the lines by air, oil or steam as the case may be, trial run of the equipment and any other works incidental to commissioning.
- 1.16.12 The valves will have to be checked, cleaned or overhauled in full or in part before erection, after acid cleaning, steam blowing and during commissioning as may be necessary.
- 1.16.13 In case any erection defect is detected during various tests / operations trial runs such as loose components undue noises or vibration strain on connected equipment steam or oil or water leakage etc. the contractor shall immediately attend these defects and take necessary corrective measures. If any readjustment and realignments are necessary the same shall be done as per BHEL Engineer's instructions. If any part needs repairs rectification and replacement the same shall be done by the contractor at no extra cost. The parts to be replaced shall be provided by BHEL free of cost If insulation is to be removed to attend any of the defects the cost of removal and reapplication of insulation should be borne by the contractor.
- 1.16.14 The contractor shall carry out cleaning and servicing of valves and dampers / gates actuators prior to pre-commissioning tests and / or trial operations of the plant. A system for recording of such servicing operations shall be developed and maintained in a manner acceptable to BHEL Engineer to ensure that no valves and actuators are left un-serviced.
- 1.16.15 Replacing / Cleaning and servicing of all the filters of the erected equipments during pre-commissioning / commissioning stage shall be done by the contractor within the accepted price.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

- 1.16.16 Contractor may have to replace old / damaged gaskets / packing etc. in the erected equipments and the same shall be carried out by contractor as per requirement. Materials will be given by BHEL.
- 1.16.17 In case any erection defect is detected during various tests / operations trial runs, such as loose components undue noises or vibration strain on connected equipment steam or oil or water leakage etc. the contractor shall immediately attend these defects and take necessary corrective measures. The parts to be replaced shall be provided by BHEL free of cost. If the insulation is to be removed to attend any of the defects the cost of removal and reapplication of insulation should be borne by the contractor.
- 1.16.18 Contractor shall cut / open works if needed, as per BHEL engineer's instructions during commissioning for inspection, checking and make good the works after inspection is over. This contingency shall be included within the quoted value. During commissioning opening of valves, changing of gaskets, attending to leakages, minor modification / rectification works may arise. The contractor has to carry out these works at his cost by providing required manpower in all the three shifts. In case any rework is required because of contractor's faulty erection and which is noticed during commissioning the same has to be rectified by the contractor at his cost.
- 1.16.19 After charging of the system, the commissioning activities will continue. It shall be the responsibility of the contractor to provide manpower including necessary consumables, hand tools and supervision as part commissioning assistance.
- 1.16.20 It shall be the responsibility of the contractor to provide various categories of workers in sufficient numbers along with Supervisors during pre-commissioning, commissioning and post commissioning of equipment and attending any problem in the equipment erected by the contractor till handing over. The contractor will provide necessary consumables, T&Ps, IMTEs etc., and any other assistance required during this period. Association of BHEL's / Client's staff during above period will not absolve contractor from above responsibilities.
- 1.16.21 It shall be specifically noted that the contractor and employees of the contractor may have to work round the clock during the pre-commissioning, commissioning and post-commissioning period along with BHEL Engineers / customer officials. Hence contractor's quoted rate shall take into consideration of all expenses that will be incurred for such arrangement of personnel including engineers/supervisors.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

- 1.16.22 During commissioning any improvement / repair / rework / rectification / fabrication / modification due to design improvement / requirement is involved, the same shall be carried out by the contractor promptly and expeditiously.
- 1.16.23 Contractor shall lay all necessary electric cables and switches etc. required for the tests and maintain the system till the tests are completed satisfactorily.
- 1.16.24 All lubricants and chemicals required for pre-commissioning, commissioning, testing and lubricants for trial runs of the equipment shall be supplied by BHEL / BHEL's client **at free of charges**. All services including labour and T&P will be provided by the contractor for handling, filling, emptying, refilling etc. The consumption of lubricants / chemicals shall be properly accounted for. Surplus material if any shall be properly stacked / tagged and returned to BHEL / Customer stores at no extra cost to BHEL. BHEL reserves the right to recover costs for wastage by the contractor.
- 1.16.25 Transportation of oil drums from customer's / BHEL's stores. Filling of lubricants and filling of oil for flushing and first filling and subsequent topping up during commissioning and post commissioning is included in the scope of this contract. The contractor shall have to return all the empty drums to the customer/BHEL stores. Similarly transport of chemicals for various pre-commissioning, commissioning activities and related processes and returning of remaining and/or the empty containers of the chemicals to customer/BHEL stores is the responsibility of the contractor.
- 1.16.26 The contractor shall carry out the trial run of motors including checking the direction of rotation in the uncoupled condition checking aligning and coupling the motor to the respective driven equipment. Before starting the motor, IR values of insulation shall be recorded and if found necessary the contractor shall dry out to improve the IR value at no extra cost.
- 1.16.27 Necessary scaffolding and approaches for conducting the tests shall also be within the scope of the contract.
- 1.16.28 Assistance for calibrating / testing the power cylinders / actuators / valves, gauges, instruments, ash level indicators etc. and setting to actuators shall be provided by contractor within the quoted rates.
- 1.16.29 During commissioning two commissioning engineers (Retired BHEL) are required for commissioning and checking ESP control panels and HVR required to be arranged (minimum Two month for each pass) within quoted price (No extra payment shall be paid).

TECHNICAL CONDITIONS OF CONTRACT (TCC)

VOLUME-IA PART-I CHAPTER-XVIII PAINTING

The scope of the work will comprise of but not limited to the following:

1.17.0 FINAL PAINTING

- 1.17.1 The scope of work shall also include supply and application of final painting of all the erected equipment as required and specified for the components of boiler and its auxiliaries.
- 1.17.2 In the case of steel fabricated items, raw steel after fabrication has to be cleaned and subsequent painting to be carried out.
- 1.17.3 All the exposed metal parts of the equipment including piping, structures, hangers etc., wherever applicable after installation unless otherwise specified the surface protected, are to be first painted with at least one coat of suitable primer and required number of finish coats as indicated in the Painting Specification in TCC which matches the shop primer paint used, after thoroughly cleaning the dust, rust, scales, grease oil, and other foreign materials by wire brushing scrapping and chemical cleaning and the same being inspected and approved by BHEL engineers for painting. Afterwards the above parts shall be finished with as per the instructions of BHEL/Customer official.
- 1.17.4 Paint shall be applied by brushing or by spray painting as per the instruction of BHEL Engineer. Spray painting gun and compressed air arrangement has to be made by the contractor himself. It shall be ensured that brush marks are minimum.
- 1.17.5 Before applying the subsequent coats the thickness of each coat shall be measured and recorded with BHEL / Customer.
- 1.17.6 Paint used shall be stirred frequently to keep the pigment in suspension. Paint shall be of the ready mix type in original sealed containers as packed by the paint manufacturer. No thinners shall be permitted. Paint manufacturer's instructions shall be followed in method of application, handling, drying time etc.,
- 1.17.7 The scope of painting includes application of colour bands, lettering the names of the systems equipments; tag Nos of valves, marking the directions of flow and other data required by BHEL within the quoted rate.
- 1.17.8 All surfaces shall be thoroughly cleaned, free from scales, dirt and other foreign matter. Each coat shall be applied in an even & uniform film free from lumps, streaks, runs, sags and uncoated spots. Each coat (Primer, intermediate, finish) shall have a minimum thickness of dry film thickness (DFT) in microns and the

TECHNICAL CONDITIONS OF CONTRACT (TCC)

DFT of finish paint shall not be less than the specified. Necessary instrument for measuring the thickness of paint applied is to be arranged by the contractor.

- 1.17.9 Finish coat paint, No of coat and DFT shall be as indicated in the painting specification enclosed in this tender / relevant BHEL document/ customer's specifications. The painting specification which is forming part of this tender as in TCC shall be used as guidelines to be followed.
- 1.17.10 The actual colour to be applied shall be approved by the customer before starting of actual painting work.
- 1.17.11 Primer & finish paint shall be of reputed paint supplier approved by BHEL / Customer. Contractor has to procure paints from the **BHEL / Customer approved agencies** only, and the paints should be as per the customer painting specification. The quality of the finish paint shall be as per the standards of IS or equivalent as approved by BHEL / Customer. Before procurement of paint the contractor has to obtain the clearance from BHEL authorities.
- 1.17.12 No paint shall be applied when the surface temp is above 55 deg. Centigrade or below 10 deg. Centigrade, and when the humidity is greater than 90% to cause condensation on the surface or frost / foggy weather.
- 1.17.13 If needed and insisted either by BHEL / Customer in certain cases, spray painting has to be carried out within the Quoted rates.
- 1.17.14 Before commencement of final painting, contractor has to obtain written clearance from BHEL / Customer for effective completion of surface preparation.
- 1.17.15 Before applying the subsequent coats, the thickness of each coat shall be measured and recorded with BHEL/ Customer.

1.17.16 PRESERVATION / TOUCH UP PAINTING

- 1.17.16.1 Contractor shall carryout cleaning and preservation / touch up painting for the materials / equipments under this tender specification right from pre- assembly stage to till the equipment is cleared for final painting.
- 1.17.16.2 Any equipment which has been given the shop coat of primer shall be carefully examined after its erection in the field and shall be treated with touch up coat of red oxide primer wherever the shop coat has been abraded, removed or damaged during transit / erection, or defaced during welding.
- 1.17.16.3 Mostly the equipment / items/ components will be supplied with one coat of primer paint and one coat of finish paint. However during storage and handling, the same may get peeled off / deteriorate. All such surfaces are to be thoroughly cleaned and to be touch up painted with suitable approved primer and finish paint matching with shop paint / approved final colour.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

VOLUME-IA PART-I CHAPTER-XIX

CORRECTIONS / REVISIONS IN SPECIAL CONDITIONS OF CONTRACT, GENERAL CONDITIONS OF CONTRACT AND FORMS & PROCEDURES

SI No: 1

Clause 4.1.11 of SCC is deleted.

SI No: 2:

OCCUPATIONAL HEALTH, SAFETY & ENVIRONMENT MANAGEMENT/ QUALITY ASSURANCE PROGRAMME

The following clauses in Occupational Health, Safety & Environment Management / Quality Assurance Programme published in Chapter-IX of Special Conditions of Contract (Volume I Book-II) is revised as under.

Chapter IX Clause 9.1 is modified as below:

Contractor will comply with HSE (Health, Safety & Environment) requirements of BHEL as per the "HSE Plan for Site Operations by Subcontractor" (Document No. HSEP: 14 Rev01) enclosed.

Chapter IX Clause 9.1.1 to 9.1.25 stands deleted.

Chapter IX Clause 9.2 to 9.62 stands deleted.

SI No: 3:

Clause No. 10.5 on RA Bill Payments, in Special Conditions of Contract (SCC), VolumeIB, Book-II, is revised as under:

The payment for running bills will normally be released within 30 days of submission of running bill complete in all respects with all documents. It is the responsibility of the contractor to make his own arrangements for making timely payments towards labour wages, statutory payments, outstanding dues etc., and other dues in the meanwhile.

SI No: 4

Existing format on MONTHLY PLAN & REVIEW WITH CONTRACTOR, as available in Form No : Progress review Plan Form as provided by BHEL Site engineer.

SI No: 5

Existing format on Monthly Performance Evaluation of Contractor, as available in Form No F-15 of Volume ID Forms and procedure stands Deleted. Form No.- F-15 (Rev 02) is enclosed.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

SI No: 6

Existing format for Integrity Pact, as available in Volume ID Forms and procedure stands Deleted. Revised Format is enclosed in NIT.

SI No: 7

Existing format for BANK GUARANTEE FOR SECURITY DEPOSIT, as available in Form No. F-11 (Rev 00) of Volume ID Forms and procedures stands deleted. Refer Proforma of Bank Guarantee (in lieu of Security Deposit) enclosed in NIT.

TECHNICAL CONDITIONS OF CONTRACT (TCC)

VOLUME-IA PART - I CHAPTER - XX **Painting Scheme for ESP and Gates & Dampers**

Manufacturing Painting Scheme.

1) Painting Scheme for ESP Components:

Surface Preparation: Power Tool Cleaning to St3

a. Surface exposed to atmosphere:

Primer: One coat of red oxide Zinc phosphate primer to IS: 12744 to DFT of 30 μm (min)

Finish Paint: Two coats of synthetic of enamel to IS 2932 smoke grey (shade No. 692 of IS 5)

DFT of 2X20 = 40 μm (min)

Total DFT = 70 μm (min)

Surfaces (Insulated & Flue Gas Path)

Primer: Two coat of red oxide Zinc phosphate primer to IS: 12744 to DFT of 2X30 = 60 μm (min)

Emitting Electrode Hook, Machined components and foundation bolts are applied with rust preventive fluid and min DFT = 20 μm .

Stainless Steel, Aluminium and Galvanized Items are not painted.

2) Painting Scheme for Gates and Damper:

Surface exposed to atmosphere

Surface Preparation: Power Tool Cleaning

Primer: One coat of red oxide Zinc Phosphate primer to IS 12744, DFT = 30 μm (min)

Finish Paint: Two coat synthetic of enamel to IS 2932 smoke gray shade no 692 IS 5 to a DFT of 40 μm

Total DFT – 70 μm (min)

Surface under insulation and flue gas path (including Gate frame)

Primer: Two coat red oxide Zinc Phosphate primer to IS 12744, DFT = 60 μm (min)

Machined components and gate blades are protected with temporary rust preventive application.

Index for Formats

Sl.No.	Description	No.of Pages
01	DECLARATION BY BIDDER REGARDING NIL INSOLVENCY PROCEEDINGS	01 Pages
02	Claim for refund of security deposit	02 Pages
03	Request for issuance of No Dues	01 Pages
04	No Dues Certificate format	01 Pages
05	Check list to be submitted with each running bill	02 Pages
06	HR Format	01 Pages
07	Form 36B	01 Pages
08	PROFORMA OF BANK GUARANTEE (in lieu of SECURITY DEPOSIT)	03 Pages
09	MONTHLY PERFORMANCE EVALUATION OF CONTRACTOR	06 Pages

DECLARATION BY BIDDER REGARDING NIL INSOLVENCY PROCEEDINGS

(To be typed and submitted in the Letter Head of the Company / Firm of Bidder)

To,

The General Manager/SAS,
Bharat Heavy Electricals Limited,
PSSR-SAS Secunderabad,
EK Tara Building,
39, SD Road,
Secunderabad - 500 003.

Dear Sir,

Sub: Declaration by Bidder regarding NIL Insolvency proceedings

Ref: 1) NIT / Tender Specification No.....,

I, Mr_____ (Designation_____) hereby declare that,
our company has not filed/does not have any Insolvency proceedings/NCLT
proceedings pending under Competent Authority as on date of submission of
this offer. Any Insolvency / NCLT proceedings regarding the company in future
will be communicated immediately to BHEL.

Yours faithfully,

Date: (Signature, Date & Seal of Authorized Signatory of the Bidder)

**BHARAT HEAVY ELECTRICALS LIMITED
DIVISION**

**Claim for Refund of Security Deposit
(Para 4.7.4 of Works Accounts Manual)**

Ref No.:

Date:

- 1 Name and address of the contractor
- 2 Contract Agreement/Work Order No.
- 3 Date of contract agreement/work order
- 4 Name of the work undertaken
- 5 Date of commencement of the work
- 6 Date of completion of the work
- 7 Period of Maintenance
- 8 Date on which the final bill was paid
- 9 Last date of making good the defect, if any, during maintenance period
- 10 Expenditure incurred by BHEL during maintenance period, if any, recoverable
- 11 Date on which security deposit refund falls due as per contract
- 12 Amount deposited/recovered

Details	Mode	Amount

- 13 LESS amounts recoverable (with details)
 - (i) Amount spent by BHEL on maintenance:
 - (ii) Payments made on behalf of contractor :
 - (iii) Court dues / penalties / compensation :
 - (iv) Other recoveries for services etc. :
 - (v) Security deposit released with final bill (%):
- 14 Net amount recommended for release (12-13):

Details	Mode	Amount

Date:

Signature of Engineer in Charge

CERTIFICATE TO BE FURNISHED BY THE CONTRACTOR

I/We have no claim or demand outstanding against BHEL.....for the work done or for labor or material supplied or any other account arising out of or connected with the contract agreement/work order (No..... dated) and the payment of this bill shall be in full and final

Date:

Signature of Contractor

CERTIFICATE TO BE FURNISHED BY SENIOR ENGINEER

Certified that

- The payment recommended for release is in order and there are no demands other than those included in the claim outstanding from the contractor;
- The maintenance period as per the contract agreement is over and the contractor has carried out the works required to be carried out by him during the period of maintenance to our satisfaction, and all expenses incurred by the company on carrying out such works have been included for adjustment;
- All the objections raised so far have been settled;
- A note of refund of security deposit has been made in the measurement book and contract agreement/work order.

Date:

Signature of Senior Engineer

FOR USE IN FINANCE DEPARTMENT

Passed for

Rs.....(Rupees.....
.....only)

Accountant

Accounts Officer

SUB AGENCY LETTER HEAD

Ref. No: BHEL/PS/SR/SAS/No Due/SITE:DATE:.....

To,

The engineer Incharge,

Dept:

Project:.....

Unit:.....

(Through BHEL Site In-charge)

Sub : Request for issuance of "NO DUES CERTIFICATE "

Ref : 1) Customer P.O/LOI :
.....

2) BHEL P.O/LOI :
... ..

Dear Sir,

With reference to the above we request for issuance of "NO DUES CERTIFICATE" for the works for the Project:
....., Unit:

Kindly do the needful at your end please.

Thanking you

Yours faithfully,

(Name:)

Site In-charge

Company: M/s.....

Project:..... ,Unit No:

Kindly issue "No Due certificate" for the above subject works after due verification of your stores.

With thanks and regards

Site In-charge

BHEL/PSSR/SAS

PROJECT:

Unit:

NO DUES CERTIFICATE

Date:

Ref:1) P.O No:

2) Your Lr .No: BHEL/PS/SR/SAS/No Due/Site: Dtd:

This is to certify that, with the above references, M/s
....., Sub contractor of M/s BHEL/PSSR/SAS returned all the T&P and materials in
healthy condition which were received during execution of the works :

..... at project :

..... of unit No : in the period of

This "No dues certificate" issued after due verification of our stores.

Signature of principal customer

Dept :

Seal :



BHEL-PSSR, SAS Secunderabad
CHECK LIST TO BE SUBMITTED WITH EACH RUNNING BILL (R&M WORKS)

Work Order Ref.		Name of the Agency	
Brief Description of Work :		RA Bill No. & date :	
Sl.No.	DESCRIPTION	Check list (Tick in the box)	Remarks
1) Documents to be submitted by the Contractor with each RA Bill			
1.1	GST number and billing address should be as per work order. BHEL GST and vendor GST should be present in invoice. HSN Code to be specified in the invoice.		
1.2	Bill/Execution period to be mentioned in Invoice		
1.3	Validity of Labour License and Validity of Bank guarantee/FD etc., submitted towards security deposit to be verified before forwarding invoice		
1.4	Supporting Doc-Wage Sheets (with bank confirmation copy)corresponding to bill execution peroid.		
1.5	Supporting Doc-PF corresponding to bill execution peroid.		
1.6	Supporting Doc-ESI/Insurance corresponding to bill execution peroid.		
1.7	Supporting Doc-HR Format		
1.8	Form-14s for the peroid corresponding to bill execution peroid.		
1.9	WAM-06 jointly prepared by contractor and BHEL Resident engineer.		
1.10	Measurement sheet duly signed by contractor with certification from Resident engineer and Site In-charge.		
1.11	Control Register duly signed by contractor. Soft copy in Microsoft excel format to be forwarded to SAS-Finance department.		
1.12	Protocols related to works as mentioned in invoice. Protocols for milestone activities in case billing is done towards milestone activities.		
1.13	Corresponding LR copies, packing list and DBR register for processing material handling bills.		
1.14	Copies of relavant Indicies while claiming PVC bills.		
1.15	GST Remittance proof		
1.16	Contractor signed in M-Book with "Measurement accepted" with stamp.		
1.17	If the contract period has expired during execution period, vendor to give request for work order extension so that delay note proposal can be initiated by Resident Engineer. As far as possible, M Book entry / Invoice, should be made only after extension of contract to avoid delay in further processing of the bills.		
2) Additional documents to be submitted by the Contractor (in addition to listed at sl. No. 1.1 to 1.17) with First RA Bill			
2.1	Proof of SD remittance (copies of BG, FD, EFT etc.,)		
2.2	Contract agreement copy		
2.3	Letter from contractor regarding option for performance bank guarantee		
2.4	Letter regarding date of start of works certified by resident engineer		
2.5	Power of attorney for contractor representative		
2.6	E Remittance letter		

3) Additional documents to be submitted by the Contractor (in addition to listed at sl. No. 1.1 to 1.17) with Final RA Bill			
3.1	Material reconciliation duly signed by contractor and BHEL resident engineer.		
3.2	WAM-07 jointly prepared by contractor and BHEL Resident engineer.		
3.3	No Dues certificate from customer.		
3.4	No further claim certificate from contractor and certification of no further claim in M-book		
3.5	Date of completion of works (MOM)/ Date of handing over of unit (customer protocol) for considering completion date.		
3.6	Idemnity bond as per the SCC & GCC.		
3.7	Request letter along with SD refund form (GCC) for refund of SD & Performance bank guarantee.		
Signature of contractor			

Sl.No.	DESCRIPTION	Check list (Tick in the box)	Remarks
4. Certifications to be done by BHEL Resident Engineer / Site Incharge			
4.1	To ensure Compliance of all the points listed at Sl. No. 1, 2 & 3 above		
4.2	Ensure Invoice is as per the WO payment terms. Part payments not allowed without approvals. Recoveries/amount to be withheld if any, with reasons to be specified in M-book and claim to be generated accordingly with supporting documents. In case of recommendations for recoveries/amount to be withheld, Vendor's acceptance should also be taken in M-Book to avoid dispute at later stage.		
4.3	If there is any delay in completion of works w.r.t work order completion peroid, request for work order extension should be taken from the vendor and delay note proposal should be initiated. It has been obsrved that delay note approval is taking approx. one month time as the same is to be scrutinised at various level before final approval by Competent authority. Therefore, Proactive action should be taken to initiate delay note around one month prior to contract expiration date.		
4.4	Execution period corresponding to invoice to be certified in M-book.		
4.5	RAB No. & WO Ref. to be certified in M-book.		
4.6	Certification regarding payment, deployment of T&P as per the work order in M-book duly signed by Resident Engineer & Site In-charge.		
4.7	Certification on back side of original invoice.		
4.8	Claim generated and signed by Resident Engineer & Site In-charge.		
4.9	Entry to be made in Payables Management System (PMS) & acknoweldgment number generated in PMS to be mentioned in the claim generated.		
BHEL Resident Engineer/Site Incharge			

BHEL:**Site,****State****HR Clearance for releasing of First and subsequent Monthly Bill (Details check list)**

(To be enclosed along with First and subsequent Monthly Running Bills)

1. LABOUR LICENCE	AVL/NOT AVL/NA
LABOUR LICENCE – VALIDITY	CURRENT/OLD/NA
DISPLAY OF LICENCE	DONE/ NOT DONE/NA
NOTICE OF COMMENCEMENT (FORM VI A)	SENT/ NOT SENT/NA
2. NOTICE BOARD	AVL/NOT AVL/NA
3. ABSTRA OF CL (R & A) ACT /MINIMUM	DISPLAYED /
WAGES ACT/CHILD LABOUR ACT	NOT DISPLAYED/NA
4. REGISTERS TO BE MAINTAINED	
WAGES REGISTER	YES / NO/NA
MUSTER ROLL	YES / NO/NA
FINES REGISTER	YES / NO/NA
DEDUCTIONS REGISTER	YES / NO/NA
OVER TIME REGISTER	YES / NO/NA
LIST OF PERSONS EMPLOYED	YES / NO/NA
5. EMPLOYMENT CARD	ISSUED/ NOT ISSUED/NA
6. WAGE SLIPS	ISSUED/ NOT ISSUED/NA
7. FIRST AID FACILITY	AVL/NOT AVL/NA
8. LATRINES/ URINALS	AVL/NOT AVL/NA
9. DRINKING WATER PROVISION	AVL/NOT AVL/NA
10. WASHING FACILITIES	AVL/NOT AVL/NA
11. NOTICE OF COMMENCEMENT OF WORK	SENT/ NOT SENT/NA
12. HALF YEARLY RETURN – CL (R & A) ACT	SENT/ NOT SENT/NA
13. ANNUAL RETURN – MIN. WAGES ACT	SENT/ NOT SENT/NA
14. REGISTRATION UNDER BOCW(RE & CS) Act	AVAIALBLE/NOT AVAILABLE
15. BOCW CESS PAID IN THE MONTH	YES/NO/NA
16. PF RECOVERY / REMITTANCES (*)	DONE / NOT DONE/NA
17. ESI RECOVERY / REMITTANCE (*)- IF APPLICABLE	DONE / NOT DONE/NA
18. WC INSURANCE AVAILABILITY / VALIDITY	AVL/NOT AVL/ VALIDITY EXPIRED/NA

Certified that the details furnished above are true and correct. Further wages / other payments due to the workmen deployed by us are paid full and in time.

Sing. Of Contractor
Seal

The above details have been verified and found to be correct. In addition, payment of wages to the workmen witnessed and certified that correct wages are paid.

(Sign. Of Resident Engineer)

(Sign. Of HR In-charge)

(Sign. Of Head/Services)

PROFORMA STATEMENT TO BE OBTAINED FROM THE CONTRACTOR [36B]

NAME & ADDRESS OF THE PRINCIPAL EMPLOYER

TN/7835

MONTH

NAME & ADDRESS OF THE CONTRACTOR

TN/

SL NO	Name of the Employee	Father's name	Date of joining (DD/MM/YY)	PF A/c no	No.of days	Total wages paid	Wages for PF (in Rupees)	Contribution

I/We certify that all the above employees who were actually deployed in your establishment during _____ 2016, have all been covered under EPF & MP Act 2852 and the contributions in respect of them for the month of _____ 2016 have been remitted by me/us under Code No.TN/_____ maintained at _____ RO/SRO on _____

DATE:

SIGNATURE OF THE CONTRACTOR

PROFORMA OF BANK GUARANTEE (in lieu of SECURITY DEPOSIT)

(On non-Judicial paper of appropriate value)

(Para 4.7.6 of Works Accounts Manual)

Bank Guarantee No.....

Date.....

To

(Employer's Name and Address)

.....

In consideration of Bharat Heavy Electricals Limited (hereinafter referred to as the 'Employer' which expression shall unless repugnant to the context or meaning thereof, include its successors and permitted assigns) incorporated under the Companies Act, 1956 and having its registered office at *BHEL House, Siri Fort, Asiad, New Delhi – 110049* through its unit at *Bharat Heavy Electricals Limited, Power Sector Southern Region, 690, Anna Salai, Nandanam, Chennai 600035* having agreed to exempt

_____ ¹ (Name of the Vendor / Contractor / Supplier) with its registered office at _____ ² (hereinafter called the said "Contractor" which term includes supplier), from demand under the terms and conditions of the Contract arising vide Letter of Intent (LOI) reference No. _____ dated _____ ³ valued at Rs. _____ ⁴ (Rupees _____ only) ⁴ (hereinafter called the said Contract), of Security Deposit for the due fulfilment by the said Contractor of the terms and conditions contained in the said Contract, on production of a Bank Guarantee for Rs. _____ ⁵ (Rupees _____ only),

We, the _____ (Name & address of the Bank) _____ having our Head Office at _____ (hereinafter referred to as the Bank), at the request of _____ [Contractor(s)], being the Guarantor under this Guarantee, do hereby irrevocably and unconditionally undertake to forthwith and immediately pay to the Employer, an amount not exceeding Rs. _____ without any demur, immediately on demand from the Employer and without any reservation, protest, and recourse and without the Employer needing to prove or demonstrate reasons for its such demand

Any such demand made on the bank, shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs. _____ ⁵.

We undertake to pay to the Employer any money so demanded notwithstanding any dispute or disputes raised by the Contractor(s) in any suit or proceeding pending before any Court or Tribunal or Arbitrator or any other authority, our liability under this present being absolute and unequivocal.

The payment so made by us under this guarantee shall be a valid discharge of our liability for payment hereunder and the Contractor(s) shall have no claim against us for making such payment.

We, further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Contract and that it shall continue to be enforceable till all the dues of the Employer under or by virtue of the said Contract have been fully paid and its claims satisfied & the Employer certifies that the terms and conditions of the said Contract have been fully and properly carried out by the said contractor(s) or acceptance of the final bill or discharge of this guarantee by the Employer, whichever is earlier. This guarantee shall initially remain in force upto and including _____ ⁶ and shall be extended from time to time for such period as may

be desired by the Employer. Unless a demand or claim under this guarantee is made on us in writing on or before the _____⁷, we shall be discharged from all the liability under this guarantee thereafter.

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

The Bank also agrees that the Employer at its option shall be entitled to enforce this Guarantee against the Bank as a principal debtor, in the first instance without proceeding against the Contractor and notwithstanding any security or other guarantee that the Employer may have in relation to the Contractor's liabilities.

This Guarantee shall not be determined or affected by liquidation or winding up, dissolution or change of constitution or insolvency of the Contractor but shall in all respects and for all purposes be binding and operative until payment of all money payable to the Employer in terms thereof. This guarantee will not be discharged due to the change in the constitution of the Bank or the Contractor(s).

We, BANK lastly undertake not to revoke this guarantee during its currency except with the previous consent of the Employer in writing.
Notwithstanding anything to the contrary contained hereinabove:

- a) The liability of the Bank under this Guarantee shall not exceed⁵
- b) This Guarantee shall be valid up to⁶
- c) Unless the Bank is served a written claim or demand on or before _____⁷ all rights under this guarantee shall be forfeited and the Bank shall be relieved and discharged from all liabilities under this guarantee irrespective of whether or not the original bank guarantee is returned to the Bank.

We, _____ Bank, have power to issue this Guarantee under law and the undersigned as a duly authorized person has full powers to sign this Guarantee on behalf of the Bank.

Date _____ Day of _____
for _____ (indicate the name of the Bank)

(Signature of Authorised signatory)

¹ NAME OF VENDOR /CONTRACTOR / SUPPLIER

² REGISTERED OFFICE ADDRESS OF THE VENDOR /CONTRACTOR / SUPPLIER.

³ LETTER OF INTENT(LOI) REFERENCE NO. WITH DATE

⁴ CONTRACT VALUE (AS MENTIONED IN LOI)

⁵ BG AMOUNT IN FIGURES AND WORDS

⁶ VALIDITY DATE

⁷ DATE OF EXPIRY OF CLAIM PERIOD (CLAIM PERIOD SHALL BE MINIMUM OF 3 MONTHS AFTER VALIDITY DATE)

Note:

1. The BG should be on Non-Judicial Stamp paper/e-stamp paper of appropriate value as per Stamp Act prevailing in the State(s) where the BG is submitted or is to be acted upon or the rate prevailing in the State where the BG was executed, whichever is higher. The Stamp Paper/e-stamp paper shall be purchased in the name of Vendor/Contractor/Supplier /Bank issuing the guarantee.
2. In Case of Bank Guarantees submitted by Foreign Vendors-
 - a. From Nationalized/Public Sector / Private Sector/ Foreign Banks (BG issued by Branches in India) can be accepted subject to the condition that the Bank Guarantee should be enforceable in the town/city or at nearest branch where the Unit is located i.e. Demand can be presented at the Branch located in the town/city or at nearest branch where the Unit is located.
 - b. From Foreign Banks (wherein Foreign Vendors intend to provide BG from local branch of the Vendor Country's Bank)
 - b.1 In such cases, in the Tender Enquiry/ Contract itself, it may be clearly specified that Bank Guarantee issued by any of the Consortium Banks only will be accepted by BHEL. As such, Foreign Vendor needs to make necessary arrangements for issuance of Counter- Guarantee by Foreign Bank in favour of the Indian Bank's (BHEL's Consortium Bank) branch in India. It is advisable that all charges for issuance of Bank Guarantee/ counter- Guarantee should be borne by the Foreign Vendor. The tender stipulation should clearly specify these requirements.
 - b.2 In case, Foreign Vendors intend to provide BG from Overseas Branch of our Consortium Bank (e.g. if a BG is to be issued by SBI Frankfurt), the same is acceptable. However, the procedure at sl.no. b.1 will required to be followed.
 - b.3 The BG issued may preferably be subject to Uniform Rules for Demand Guarantees (URDG) 758 (as amended from time to time).

Project		Vendor			Package/Unit	
SL	Parameter for Measurement	Classification	Max Score	Score Obtained	Measurement Key/Scheduled date	Supporting Documents`
#1.01	Cumulative number of days in the month, the nominated Quality Officer or his authorised nominee was not available	QUALITY	1.5		Quality Officer or his authorised nominee should be available for all the days of working at site	Daily Log Book entry/Incident Registers/letter references
#1.02	Number of instances of non- compliance wrt FQP, Standard Drawings, Specifications, E&C Manuals etc.	QUALITY	1.5		No deviation from FQP, Standard Drawings, Specifications, E&C Manuals etc. is allowed without BHEL Engineer's approval.	Daily Log Book entry/Incident Registers/letter references
#1.03	Percentage submission of test certificates for batches of welding electrodes, cement, sand, aggregate, consumable, Paints etc. as applicable for this month OR In case of MM & MH package, monthly checks for Storage/Preservation of material.	QUALITY	1		Submission of 100% Test certificates for materials as per FQP is mandatory. MM & MH package: Storage/Preservation as per manual/procedure.	Daily Log Book entry/Incident Registers/letter references
#1.04	Number of incidences of improper storage & preservation (not in accordance to the guidelines of BHEL MUs or approved FQP) of materials, consumables (viz. gases, welding electrodes & fluxes, fuel etc.) & bought-out items (paints, fasteners etc.) under the custody of the contractor	QUALITY	1		Total number of non-compliances	Daily Log Book entry/Incident Registers/letter references
#1.05	Rework/ Rejection instances in a month necessitated due to deviation from Standard Drawings /Specifications /Manuals /E&C procedures /FQPs or due to Poor Workmanship by contractor	QUALITY	2		Reworks/ Rejection should be as minimum as possible. Total number of reworks/ rejections due to reasons attributable to contractor.	Daily Log Book entry/Incident Registers/letter references
#1.06	Delay in preparation & submission of signed protocols / log sheets / site register / NDT test reports as per approved FQP/ Qualified Welder List along with photocopies of Welder ID cards / Welder Performance Evaluation records etc. in the month OR in case of MM / MH package reconciliation statement / verification report.	QUALITY	1		Within 2 days of measurements taken or within first 3 working days of next month, as advised by BHEL Engineer	Daily Log Book entry/Incident Registers/letter references
#1.07	Number of instances for Major equipment/product failure due to negligence/improper work/poor workmanship by contractor	QUALITY	1		No such event should happen	Daily Log Book entry/Incident Registers/letter references
#1.08	Total number of complaints received in the month on the quality of finish / aesthetics	QUALITY	1		Total number of non-compliances	Daily Log Book entry/Incident Registers/letter references

Name and Signature of BHEL Package In-charge

Name and Signature of Contractor

MONTHLY PERFORMANCE EVALUATION OF CONTRACTOR

Form No.: F-15 (Rev 02)

Page 2 of 6

Project		Vendor			Package/Unit	
SL	Parameter for Measurement	Classification	Max Score	Score Obtained	Measurement Key/Scheduled date	Supporting Documents`
#2.01	Cumulative number of days of delay in submission of Plan FOR THE MONTH supported by deployment plan of Major T&Ps and Manpower (as per Form F-14) and relevant construction/layout drawings - like A4 plan / elevation views of plan status for structures / pressure parts/Civil Works, Piping isometrics for piping, Layout / PID / System reference sketch, Unloading / storage plans etc.as applicable.	PERFORMANCE	5		Number of days delayed from second working day of the month	Daily Log Book entry/Incident Registers/letter references
#2.02	Percentage of timely submission of Daily Reports for Progress of work, Resources, Consumables etc.	PERFORMANCE	1.5		Percentage of timely submission of daily reports/ Scheduled date is successive next day for each day	Daily Log Book entry/Incident Registers/letter references
#2.03	Number of days delayed for submission of FQP log sheets / protocols / Monthly Progress Reports for the work executed during the month under measurement	PERFORMANCE	1.5		Number of days delayed/Scheduled date is first 2 working days of next month	Daily Log Book entry/Incident Registers/letter references
#2.04	Shortfall attributable to contractor w.r.t. Plan as per Form-14 for the subject month	PERFORMANCE	35		Percentage of shortfall to be calculated w.r.t. Total planned target for the month as per part-A of F-14. If more than one work has been planned in a month then Weightages of works shall be assigned at the time of plan to arrive at plan vs achievement calculation.	Progress review formats
#2.05	Number of days delayed in submission of Running bills with complete supporting documents (including updated reconciliation statement of BHEL issued material) for the month	PERFORMANCE	2		Number of days delayed / Scheduled date is 7th day of next month	Daily Log Book entry/Incident Registers/letter references
#2.06	Number of times the Top Management of contractor did not respond to critical issues of site, for the month	PERFORMANCE	1		Total number of instances	Daily Log Book entry/Incident Registers/letter references
#2.07	Cumulative number of days in the month the works were stopped / refused on interpretation of contract clauses/scope due to tendency of taking undue advantage by interpreting contract clauses in their favour	PERFORMANCE	2		Cumulative number of days lost	Daily Log Book entry/Incident Registers/letter references
#2.08	Number of times rework was refused by contractor	PERFORMANCE	1		Total number of non-compliances	Daily Log Book entry/Incident Registers/letter references

Name and Signature of BHEL Package In-charge

Name and Signature of Contractor

Project		Vendor			Package/Unit	
SL	Parameter for Measurement	Classification	Max Score	Score Obtained	Measurement Key/Scheduled date	Supporting Documents`
#2.09	Cumulative number of days in the month recording / logging was not done in daily log / history register / hindrance register / soft form in a PC maintained at BHEL Site Office	PERFORMANCE	1		Cumulative number of days recording or logging was not done / all days of the month	Daily Log Book entry/Incident Registers/letter references
#3.01	Number of days of non-availability of required Manpower including supporting staff as per plan submitted in F-14 for the month.	RESOURCES	7		Cumulative number of days Sufficient Manpower was not available as per Plan in F-14	Daily Log Book entry/Incident Registers/letter references
#3.02	Number of days of non-availability of required T&P as per plan submitted in F-14 for the month.	RESOURCES	7		Cumulative number of days Sufficient T&P was not available as per Plan in F-14	Daily Log Book entry/Incident Registers/letter references
#3.03	Cumulative number of major instances in the month hampering / affecting progress of work due to breakdown or non-availability of major T&P and MME for the work, under the scope of Contractor	RESOURCES	3		Cumulative number of instances	Daily Log Book entry/Incident Registers/letter references
#3.04	Cumulative number of major instances in the month hampering / affecting progress of work due to non-availability of Consumables/ use of improper consumables under the scope of contractor	RESOURCES	3		Cumulative number of instances	Daily Log Book entry/Incident Registers/letter references
#4.01	Number of non-compliances during the month for Statutory requirements like validity of Labour Licence, Insurance Policy, Labour Insurance, PF, BOCW Compliance etc. and any other applicable laws/ Regulation, Electrical Licence, T&P fitness certificate, Contractors' All Risk Policy etc. as applicable	SITE INFRASTRUCTURE & SERVICE	1		Total number of non-compliances	Daily Log Book entry/Incident Registers/letter references
#4.02	Cumulative number of days in a month poor illumination is reported at storage area, erection area, pre-assembly area and other designated areas by BHEL site.	SITE INFRASTRUCTURE & SERVICE	0.5		Total number of non-compliances/random checks	Daily Log Book entry/Incident Registers/letter references
#4.03	Cumulative number of days of non-availability of well-maintained toilets facilities for workers (separate for men and women) and non-availability of potable drinking water stations for workers in specified areas.	SITE INFRASTRUCTURE & SERVICE	1		Total number of non-compliances/random checks	Daily Log Book entry/Incident Registers/letter references

Name and Signature of BHEL Package In-charge

Name and Signature of Contractor

Project		Vendor			Package/Unit	
SL	Parameter for Measurement	Classification	Max Score	Score Obtained	Measurement Key/Scheduled date	Supporting Documents`
#4.04	Total number of instances in the month, Housekeeping NOT attended to in spite of instructions by BHEL -i.e. removal / disposal of surplus earth / debris / scrap / unused / surplus cable drums / other electrical items / surplus steel items / packing materials, thrown out scrap like weld butts, cotton waste etc. from the working area to identified locations	SITE INFRASTRUCTURE & SERVICE	2		Total number of non-compliances/random checks	Daily Log Book entry/Incident Registers/letter references
#4.05	Total number of instances in a month, Site Office with reasonably good facilities including enough nos. of computers and printers etc. for use by office and supporting staff was not made available/maintained.	SITE INFRASTRUCTURE & SERVICE	0.5		No discrepancy during regular or surprise visits	Photograph and report of the Engineer
#5.01	Number of days delayed in making labour payments for the last month	SITE FINANCE	2		Number of days delayed / Scheduled date is 7th day of next month	Daily Log Book entry/Incident Registers/letter references
#5.02	Number of complaints from labour/ sub supplier/ sub-contractor for non-receipt of payments from contractor	SITE FINANCE	1.5		Total number of complaints or reporting	Daily Log Book entry/Incident Registers/letter references
#5.03	Number of times the site operations were hampered for want of funds at the disposal of site-in-charge.	SITE FINANCE	1.5		Total number of non-compliances	Daily Log Book entry/Incident Registers/letter references
#6.01	Cumulative number of days in a month the nominated Safety Officer was not available	HSE & SA	1		Safety Officer should be available for all the days	Daily Log Book entry/Incident Registers/letter references
#6.02	Shortfall in number of weekly safety meetings in the month conducted or attended by the Safety Officer	HSE & SA	0.5		Safety meetings to be held every week	Copy of Minutes of meeting
#6.03	Level of compliance w.r.t decisions taken in previous Safety meetings	HSE & SA	0.5		Number of consolidated issues discussed in Safety meetings	Copy of Minutes of meeting, Non-compliance intimation documents from BHEL site
#6.04	Delay in submission of monthly report on safety (including electrical safety for equipment & personnel etc.) in the prescribed form	HSE & SA	1		Number of days delayed/Scheduled date is third working day of next month	Daily Log Book entry/Incident Registers/letter references
#6.05	Number of days taken for lodging FIRs from date of occurrence/notice of incident of theft / accident etc.	HSE & SA	0.5		Number of days delayed/Scheduled date is within 24 Hrs of occurrence/notice of incidence	Copy of FIR lodged by Contractor

Name and Signature of BHEL Package In-charge

Name and Signature of Contractor

Project		Vendor			Package/Unit	
SL	Parameter for Measurement	Classification	Max Score	Score Obtained	Measurement Key/Scheduled date	Supporting Documents`
#6.06	Number of times written(email, letters etc.) warning issued for non-availability/ use of improper Fall protection and rescue arrangement as lifeline, fall arrestors, safety net, hand-railings, covered floors, man-basket, rescue basket & kit etc. by the contractor	HSE & SA	2		Total number of non-compliances	Daily Log Book entry/Incident Registers/letter references
#6.07	Number of times punitive fines imposed for unsafe practices as per contract like non-availability/use of PPEs as safety shoes, helmets, goggles, gloves, lifeline, safety belts etc.	HSE & SA	1		Total number of non-compliances	Non-compliance intimation documents from BHEL site
#6.08	Percentage compliance to Emergency preparedness and response plan: Portable Fire-extinguishers, Buckets, Fire-wardens, display of emergency numbers, mock-drills, Hazard Identification and Risk Assessment(HIRA) etc.	HSE & SA	1		Compliance should be 100% as per HSE Plan or as finalized in Safety Meetings	Non-compliance intimation documents from BHEL site
#6.09	Number of times the agency has defaulted on display of safety posters / safety slogans / safety barriers/emergency numbers etc. in identified areas	HSE & SA	0.5		Total number of instances	Non-compliance intimation documents from BHEL site
#6.10	Non compliances observed during HSE and Safety Audit	HSE & SA	0.5		Total number of non-compliances	Non-compliance intimation documents from BHEL site, Audit Reports
#6.11	Cumulative number of days in the month, non-availability of First Aid Kit, First Aider & Emergency Vehicles/Ambulance.	HSE & SA	0.5		Cumulative number of days	Non-compliance intimation documents from BHEL site
#6.12	Number of days taken for submission of Root Cause analysis (RCA) for the accident from the cut-off date intimated by BHEL for submission of RCA	HSE & SA	0.5		Number of days delayed/Scheduled date is cut-off date intimated by BHEL	Daily Log Book entry/Incident Registers/letter references
#6.13	Non conductance of training (induction, job specific, height work etc.), tool box meeting and health check-up as per Contract requirements	HSE & SA	0.5		Number of incidences of non-conductance during the month	Daily Log Book entry/Incident Registers/letter references
Total			100			

Name and Signature of BHEL Package In-charge

Name and Signature of Contractor

MONTHLY PERFORMANCE EVALUATION OF CONTRACTOR

Form No.: F-15 (Rev 02)

Page 6 of 6

Project		Vendor			Package/Unit	
SL	Parameter for Measurement	Classification	Max Score	Score Obtained	Measurement Key/Scheduled date	Supporting Documents`
	Less Deduction in Score Due to Major Accidents (Fatal, Permanent Disability or bodily injury by which person injured is prevented to resume to work within 48 hours or more after accident,, Major Damage to Equipment etc.) @ 3 points/ accident					
	Less Deduction in Score Due to Minor Accidents(All Others) @ 1 point/ accident					
	Less Deduction in Score Due to not Maintaining of Labour Colony (if applicable) as per BHEL HSE policy @2 points in a month on verification any day					
	Final Score					

Performance Score Summary for the Month	Total Score	Score Obtained
QUALITY	10	
PERFORMANCE	50	
RESOURCES	20	
SITE INFRASTRUCTURE & SERVICE	5	
SITE FINANCE	5	
HSE & SA	10	
OTHERS (deductions if any)	0	
TOTAL	100	

Name and Signature of BHEL Package In-charge

Name and Signature of Contractor

INTEGRITY PACT**Between**

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

and

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

Preamble

The Principal intends to award, under laid-down organizational procedures, contract/s for BHEL/DSSR/SAS/SCT/T-10/2021-22 Date: 06.07.2021
ESP R&M works at unit no. 1, 3 & 4 at NALCO Damanjodi
SPP (Balance works). The Principal values full compliance with all relevant laws of the land, rules and regulations, and the principles of economic use of resources, and of fairness and transparency in its relations with its Bidder(s)/ Contractor(s).

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

Section 1- Commitments of the Principal

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

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

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

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

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

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

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

2.1.1 The Bidder(s)/ Contractor(s) will not, directly or through any other person or firm, offer, promise or give to the Principal or to any of the Principal's employees involved in the tender process or the execution of the contract or to any third person any material, immaterial or any other benefit which he/ she is not legally entitled to, in order to obtain in exchange any advantage of any kind whatsoever during the tender process or during the execution of the contract.

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

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

2.1.4 Foreign Bidder(s)/ Contractor(s) shall disclose the name and address of agents and representatives in India and Indian Bidder(s)/ Contractor(s) to disclose their foreign principals or associates. The Bidder(s)/ Contractor(s) will, when presenting his bid, disclose any and all payments he has made, and is committed to or intends to make to agents, brokers or any other intermediaries in connection with the award of the contract.

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

2.3 The Bidder(s)/ Contractor(s) shall not approach the Courts while representing the matters to IEMs and will await their decision in the matter.

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

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

Section 4 - Compensation for Damages

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

4.2 If the Principal has terminated the contract according to Section 3, or if the Principal is entitled to terminate the contract according to section 3, the Principal shall be entitled to

- demand and recover from the Contractor liquidated damages equivalent to 5% of the contract value or the amount equivalent to Security Deposit/ Performance Bank Guarantee, whichever is higher.

Section 5 - Previous Transgression

- 5.1 The Bidder declares that no previous transgressions occurred in the last 3 years with any other company in any country conforming to the anti-corruption approach or with any other Public Sector Enterprise in India that could justify his exclusion from the tender process.
- 5.2 If the Bidder makes incorrect statement on this subject, he can be disqualified from the tender process or the contract, if already awarded, can be terminated for such reason.

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

- 6.1 The Principal will enter into agreements with identical conditions as this one with all Bidders and Contractors. In case of sub-contracting, the Principal contractor shall be responsible for the adoption of IP by his sub-contractors and shall continue to remain responsible for any default by his sub-contractors.
- 6.2 The Principal will disqualify from the tender process all bidders who do not sign this pact or violate its provisions.

Section 7 - Criminal Charges against violating Bidders/ Contractors /Subcontractors

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

Section 8 - Independent External Monitor(s)

- 8.1 The Principal appoints competent and credible Independent External Monitor for this Pact. The task of the Monitor is to review independently and objectively, whether and to what extent the parties comply with the obligations under this agreement.
- 8.2 The Monitor is not subject to instructions by the representatives of the parties and performs his functions neutrally and independently. He reports to the CMD, BHEL.
- 8.3 The Bidder(s)/ Contractor(s) accepts that the Monitor has the right to access without restriction to all contract documentation of the Principal including that provided by the Bidder(s)/ Contractor(s). The Bidder(s)/ Contractor(s) will grant the monitor, upon his request and demonstration of a valid interest, unrestricted and unconditional access to his contract documentation. The same is applicable to Sub-contractor(s). The Monitor is under contractual obligation to treat the information and documents of the Bidder(s)/ Contractor(s) / Sub-contractor(s) with confidentiality in line with Non- disclosure agreement.
- 8.4 The Principal will provide to the Monitor sufficient information about all meetings among the parties related to the contract provided such meetings could have an impact on the contractual relations between the Principal and the Contractor. The parties offer to the Monitor the option to participate in such meetings.

- 8.5 The role of IEMs is advisory, would not be legally binding and it is restricted to resolving issues raised by an intending bidder regarding any aspect of the tender which allegedly restricts competition or bias towards some bidders. At the same time, it must be understood that IEMs are not consultants to the Management. Their role is independent in nature and the advice once tendered would not be subject to review at the request of the organization.
- 8.6 For ensuring the desired transparency and objectivity in dealing with the complaints arising out of any tendering process, the matter should be examined by the full panel of IEMs jointly as far as possible, who would look into the records, conduct an investigation, and submit their joint recommendations to the Management.
- 8.7 The IEMs would examine all complaints received by them and give their recommendations/ views to CMD, BHEL, at the earliest. They may also send their report directly to the CVO and the Commission, in case of suspicion of serious irregularities requiring legal/ administrative action. IEMs will tender their advice on the complaints within 10 days as far as possible.
- 8.8 The CMD, BHEL shall decide the compensation to be paid to the Monitor and its terms and conditions.
- 8.9 IEM should examine the process integrity, they are not expected to concern themselves with fixing of responsibility of officers. Complaints alleging mala fide on the part of any officer of the organization should be looked into by the CVO of the concerned organisation.
- 8.10 If the Monitor has reported to the CMD, BHEL, a substantiated suspicion of an offence under relevant Indian Penal Code/ Prevention of Corruption Act, and the CMD, BHEL has not, within reasonable time, taken visible action to proceed against such offence or reported it to the Vigilance Office, the Monitor may also transmit this information directly to the Central Vigilance Commissioner, Government of India.
- 8.11 The number of Independent External Monitor(s) shall be decided by the CMD, BHEL.
- 8.12 The word 'Monitor' would include both singular and plural.

Section 9 - Pact Duration

- 9.1 This Pact shall be operative from the date IP is signed by both the parties till the final completion of contract for successful bidder and for all other bidders 6 months after the contract has been awarded. Issues like warranty / guarantee etc. should be outside the purview of IEMs.
- 9.2 If any claim is made/ lodged during currency of IP, the same shall be binding and continue to be valid despite the lapse of this pact as specified above, unless it is discharged/ determined by the CMD, BHEL.

Section 10 - Other Provisions

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

- 10.2 Changes and supplements as well as termination notices need to be made in writing. Side agreements have not been made.
- 10.3 If the Contractor is a partnership or a consortium, this agreement must be signed by all partners or consortium members.
- 10.4 Should one or several provisions of this agreement turn out to be invalid, the remainder of this agreement remains valid. In this case, the parties will strive to come to an agreement to their original intentions.
- 10.5 Only those bidders / contractors who have entered into this agreement with the Principal would be competent to participate in the bidding. In other words, entering into this agreement would be a preliminary qualification.

For & On behalf of the Principal

N. Jaya Sankar
Dy. General Manager, Services,
(Office Seal) Navy Electrical Ltd.,
Secunderabad - 500 003.

For & On behalf of the Bidder/

Contractor

(Office Seal)

Place Hyderabad

Date 06/07/2021

Witness: T. Sravana Kumar
06/07/2021

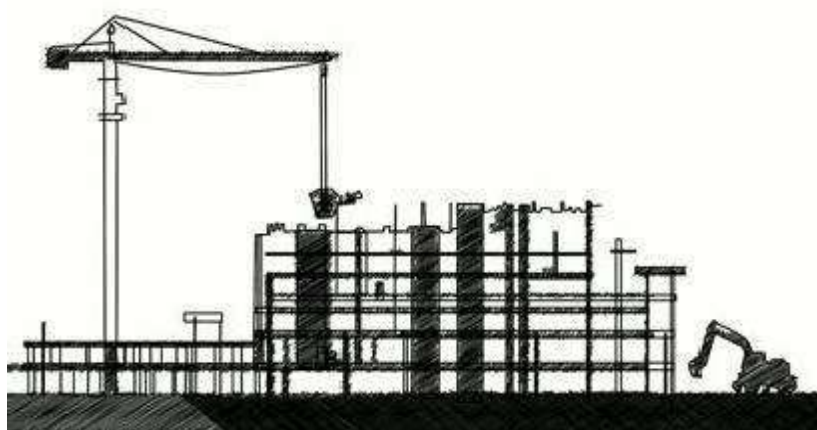
(Name & Address) T. SRAVANA KUMAR

Manager / SCT

BHEL PSSR SAS SECUNDERABAD.

Witness: _____

(Name & Address) _____



HEALTH, SAFETY and ENVIRONMENT PLAN

for

**SITE
OPERATIONS**

by

**SUB-
CONTRACTORS**

POWER SECTOR

HSE PLAN FOR SITE OPERATIONS BY BHEL'S SUBCONTRACTORS

AT A GLANCE

BEFORE START	SIGNING OF MOU	
	Agree to comply to HSE requirement- Statutory and BHEL's	
PLAN	HSE ORGANISATION	
	Manpower 1 (one) safety officer for every 500 workers or part thereof 1(one) safety-steward/ supervisor for every 100 workers Qualification As per Cl. 7.1	HSE Roles and responsibilities - Site In-charge- As per clause 7.2.1 - Safety officer- As per clause 7.2.2
PROVIDE	HSE Planning for Man, Machinery/Equipment/Tools & Tackles	
	HSE INFRASTRUCTURE	
	- PPEs - Drinking Water - Washing Facilities - Latrines and Urinals - Provision of shelter for rest - Medical facilities	- Canteen facilities - Labour Colony - Emergency Vehicle - Pest Control - Scrapyard - Illumination
TRAIN	HSE TRAINING , AWARENESS & PROMOTION	
	Training - Induction training - Height work and other critical areas - Tool Box talk & Pep Talk	Awareness & Promotion - Signage - Poster - Banner - Competition - Awards
COMMUNICATE	HSE COMMUNICATION	
	Incident Reporting - Accident- Fatal & Major - Property damage - Near Miss	Event Reporting - Celebrations - Training - Medical camp

EXECUTE SAFELY

OPERATIONAL CONTROL PROCEDURES

PERMIT TO WORK

Height work (above 2 metres), Hot Work, Heavy Lifting, Confined Space, Radiography, excavation (More than 4 metres)

SAFETY DURING WORK EXECUTION

- | | |
|--|---|
| <ul style="list-style-type: none"> • Welding • Rigging • Cylinder- storage & Movement • Demolition work • T&Ps • Chemical Handling • Electrical works | <ul style="list-style-type: none"> • Fire • Scaffolding • Height work • Working Platform • Excavation • Ladder • Lifting • Hoisting appliance |
|--|---|

HOUSE KEEPING

WASTE MANGEMENT

TRAFFIC MANAGEMENT

ENVIRONMENTAL CONTROL

EMERGENCY PREPAREDNESS AND RESPONSE PLAN

CHECKS

HSE AUDITS & INSPECTION

- | | |
|---|--|
| <ul style="list-style-type: none"> • Daily Checks • Inspection of PPEs • Inspection of T& Ps • Inspection of Cranes & Winches | <ul style="list-style-type: none"> • Inspection of Height work • Inspection of Welding and Gas cutting • Inspection of elevators etc. |
|---|--|

HSE PERFORMANCE EVALUATION PARAMETERS

NON CONFORMANCE

PENALTY for NON CONFORMANCE

Refer Clause 16

Incremental penalty

For repeated violation by the same person, the penalty would be double of the previous penalty

For repeated fatal incident in the same Unit incremental penalty to be imposed. The subcontractor will pay 2 times the penalty compared to previously paid in case there are repeated cases of fatal incidents under the same subcontractor for the same package in the same unit.

	HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE OPERATION by SUBCONTRACTORS		Doc no.: HSEP: 14
	POWER SECTOR		REV: 01
			Date: 20.01.2020

REVISION HISTORY SHEET

Date	Revision No.	Details of Changes	Reason	Prepared	Reviewed	Approved
12.08.2014	00	First Issue	First Issue	S. B. Jayant, Dy Manager- FQA & Safety	A. K. Sinha, GM-FQA & Safety	Anuj Bhatnagar, ED-FQA & Safety
20.01.2020	01	Formats added: HSEP:14-F30 – Monthly HSE Planning & Review (Page 11, Clause 8.0 - updated) HSEP:14-F13E-Excavation Inspection Format (part of F30)) HSEP:14-F32B – Job Safety Analysis Format (part of F30) HSEP:14-F31A – Daily HSE Reporting (Page 18, Clause 10.3 – added) HSEP:14-F33 – HSE Performance Evaluation (Page 31, Clause 13 – revised)	IOM No. PSHQHSE/M ONREP/02 Dated 08-Jan-2020	Rohit Kumar	Santosh Nair, GM (MSX & HSE)	



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE OPERATION by SUBCONTRACTORS

POWER SECTOR

Doc no.: HSEP: 14

REV: 01

Date: 20.01.2020

Page: 1 of 43

Sr. No.	Description	Page No.
1.0	PURPOSE	4
2.0	SCOPE	4
3.0	OBJECTIVES AND TARGETS	4
4.0	HEALTH, SAFETY & ENVIRONMENT POLICY	5
5.0	MEMORANDUM OF UNDERSTANDING	6
6.0	TERMS & DEFINITIONS	7
7.0	HSE ORGANIZATION	8
7.1	QUALIFICATION FOR HSE PERSONNEL	8
7.2	RESPONSIBILITIES	9
8.0	PLANNING BY SUBCONTRACTOR	11
8.1	MOBILISATION OF MACHINERY/EQUIPMENT/TOOLS	11
8.2	MOBILISATION OF MANPOWER BY SUBCONTRACTOR	11
8.3	PROVISION OF PPEs	12
8.4	ARRANGEMENT OF INFRASTRUCTURE	13
9.0	HSE TRAINING & AWARENESS	16
9.1	HSE INDUCTION TRAINING	16
9.2	HSE TOOLBOX TALK	17
9.3	TRAINING ON HEIGHT WORK	17
9.4	HSE TRAINING DURING PROJECT EXECUTION	17



**HEALTH, SAFETY AND ENVIRONMENT
PLAN FOR
SITE OPERATION by SUBCONTRACTORS**

POWER SECTOR

Doc no.: HSEP: 14

REV: 01

Date: 20.01.2020

Page: 2 of 43

9.5	HSE PROMOTION-SIGNAGE, POSTERS, COMPETITION, AWARDS ETC	18
10.0	HSE COMMUNICATION	18
10.1	INCIDENT REPORTING	18
10.2	HSE EVENT REPORTING	18
11.0	OPERATIONAL CONTROL	19
11.1	HSE ACTIVITIES	19
11.2	WORK PERMIT SYSTEM	20
11.3	SAFETY DURING WORK EXECUTION	20
11.4	ENVIRONMENTAL CONTROL	24
11.5	HOUSEKEEPING	24
11.6	WASTE MANAGEMENT	25
11.7	TRAFFIC MANAGEMENT SYSTEM	26
11.8	EMERGENCY PREPAREDNESS AND RESPONSE	28
12.0	HSE INSPECTION	29
12.1	DAILY HSE CHECKS	29
12.2	INSPECTION OF PPE	29
12.3	INSPECTION OF T&Ps	30
12.4	INSPECTION OF CRANES AND WINCHES	30
12.5	INSPECTION ON HEIGHT WORKING	30
12.6	INSPECTION ON WELDING AND GAS CUTTING OPERATION	30



**HEALTH, SAFETY AND ENVIRONMENT
PLAN FOR
SITE OPERATION by SUBCONTRACTORS**

Doc no.: HSEP: 14

REV: 01

Date: 20.01.2020

Page: 3 of 43

POWER SECTOR

12.7	INSPECTION ON ELECTRICAL INSTALLATION / APPLIANCES	31
12.8	INSPECTION OF ELEVATOR	31
12.9	INSPECTION OF EXCAVATION ACTIVITIES	31
13.0	HSE PERFORMANCE	31
14.0	HSE PENALTIES	32
15.0	OTHER REQUIREMENTS	32
16.0	NON COMPLIANCE	33
17.0	HSE AUDIT/INSPECTION	34
18.0	MONTHLY HSE REVIEW MEETING	34
19.0	FORMATS USED	34
20.0	Annexures	36

	HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE OPERATION by SUBCONTRACTORS	Doc no.: HSEP: 14
		REV: 01
	POWER SECTOR	Date: 20.01.2020
		Page: 4 of 43

1.0 PURPOSE

- 1.1 The purpose of this HSE Plan is to provide for the systematic identification, evaluation, prevention and control of general workplace hazards, specific job hazards, potential hazards and environmental impacts that may arise from foreseeable conditions during installation and servicing of industrial projects and power plants.
- 1.2 This document shall be followed by BHEL's subcontractors at all installation and servicing sites. In case customer specific documents are to be implemented, this document will be followed in conjunction with customer specific documents.
- 1.3 Although every effort has been made to make the procedures and guidelines in line with statutory requirements, in case of any discrepancy relevant statutory guidelines must be followed.
- 1.4 In case the customer has any specific requirement, the same is to be fulfilled.

2.0 SCOPE

The document is applicable for BHEL's Subcontractors at all installation / servicing activities of BHEL Power Sector as per the relevant contractual obligations.

3.0 OBJECTIVES AND TARGETS

The HSE Plan reflects that BHEL places high priority upon the Occupational Health, Safety and Environment at workplaces.

- Ensure the Health and Safety of all persons at work site is not adversely affected by the work.
- Ensure protection of environment of the work site.
- Comply at all times with the relevant statutory and contractual HSE requirements.
- Provide trained, experienced and competent personnel. Ensure medically fit personnel only are engaged at work.
- Provide and maintain plant, places and systems of work that are safe and without risk to health and the environment.
- Provide all personnel with adequate information, instruction, training and supervision on the safety aspect of their work.
- Effectively control, co-ordinate and monitor the activities of all personnel on the Project sites including subcontractors in respects of HSE.
- Establish effective communication on HSE matters with all relevant parties involved in the Project works.
- Ensure that all work planning takes into account all persons that may be affected by the work.
- Ensure fitness testing of all T&Ps/Lifting appliances like cranes, chain pulley blocks etc. are to be certified by competent person.
- Ensure timely provision of resources to facilitate effective implementation of HSE requirements.
- Ensure continual improvements in HSE performance
- Ensure conservation of resources and reduction of wastage.
- Capture the data of all incidents including near misses, process deviation etc. Investigate and analyze the same to find out the root cause.
- Ensure timely implementation of correction, corrective action and preventive action.



**HEALTH, SAFETY AND ENVIRONMENT
PLAN FOR
SITE OPERATION by SUBCONTRACTORS**

POWER SECTOR

Doc no.: HSEP: 14

REV: 01

Date: 20.01.2020

Page: 5 of 43

HSE TARGETS

EXPLOSION	ZERO
FATALITY	ZERO
LOST TIME INJURY	ZERO
FIRE	ZERO
VEHICLE INCIDENTS	ZERO
ENVIRONMENTAL INCIDENTS	ZERO

4.0 BHEL POWER SECTOR HEALTH, SAFETY & ENVIRONMENT POLICY

Health, Safety & Environment Policy of BHEL

In BHEL, Health, Safety and Environment (HSE) responsibilities are driven by our commitment to protect our employees and people we work with, community and environment. BHEL believes in zero tolerance for unsafe work/non-conformance to safety and in minimizing environmental footprint associated with all its business activities. We commit to continually improve our HSE performance by:

- Developing safety and sustainability culture through active leadership and by ensuring availability of required resources.
- Ensuring compliance with applicable legislation, regulations and BHEL systems.
- Taking up activities for conservation of resources and adopting sound waste management by following Reduce/Recycle/Reuse approach.
- Continually identifying, assessing and managing environmental impacts and Occupational Health & Safety risks of all activities, products and services adopting approach based on elimination/substitution/reduction/control.
- Incorporating appropriate Occupational Health, Safety and Environment criteria into business decisions, design of products & systems and for selection of plants, technologies and services.
- Imparting appropriate structured training to all persons at workplace and promoting awareness amongst customers, contractors and suppliers on HSE issues.
- Reviewing periodically this policy and HSE Management Systems to ensure its relevance, appropriateness and effectiveness.
- Communicating this policy within BHEL and making it available to interested parties.

sd/-

CMD, BHEL

	HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE OPERATION by SUBCONTRACTORS	Doc no.: HSEP: 14
		REV: 01
	POWER SECTOR	Date: 20.01.2020
		Page: 6 of 43

5.0 MEMORANDUM OF UNDERSTANDING:

After award of work, subcontractors are required to enter into a memorandum of understanding as given below:

Memorandum of Understanding

BHEL, Power Sector _____ Region is committed to Health, Safety and Environment Policy (HSE Policy).

M/s _____ do hereby also commit to comply with the same HSE Policy while executing the Contract Number _____

M/s _____ shall ensure that safe work practices as per the HSE plan. Spirit and content therein shall be reached to all workers and supervisors for compliance.

In addition to this, M/S _____ shall comply to all applicable statutory and regulatory requirements which are in force in the place of project and any special requirement specified in the contract document of the principal customer.

M/s _____ shall co-operate in HSE audits/inspections conducted by BHEL /customer/ third party and ensure to close any non-conformity observed/reported within prescribed time limit.

Signed by authorized representative of M/s -----

Name :

Place & Date:



**HEALTH, SAFETY AND ENVIRONMENT
PLAN FOR
SITE OPERATION by SUBCONTRACTORS**

POWER SECTOR

Doc no.: HSEP: 14

REV: 01

Date: 20.01.2020

Page: 7 of 43

6.0 TERMS AND DEFINITIONS

6.1 DEFINITIONS

6.1.1 INCIDENT

Work- related or natural event(s) in which an injury, or ill health (regardless of severity), damage to property or fatality occurred, or could have occurred.

6.1.2 NEAR MISS

An incident where no ill health, injury, damage or other loss occurs, but it had a potential to cause, is referred to as "Near-Miss".

6.1.3 MAN-HOURS WORKED

The total number of man hours worked by all employees including subcontractors working in the premises. It includes managerial, supervisory, professional, technical, clerical and other workers including contract labours. Man-hours worked shall be calculated from the payroll or time clock recorded including overtime. When this is not feasible, the same shall be estimated by multiplying the total man-days worked for the period covered by the number of hours worked per day. The total number of workdays for a period is the sum of the number of men at work on each day of period. If the daily hours vary from department to department separate estimate shall be made for each department and the result added together.

6.1.4 FIRST AID CASES

First aids are not essentially all reportable cases, where the injured person is given medical treatment and discharged immediately for reporting on duty, without counting any lost time.

6.1.5 LOST TIME INJURY

Any work injury which renders the injured person unable to perform his regular job or an alternative restricted work assignment on the next scheduled work day after the day on which the injury occurred.

6.1.6 MEDICAL CASES

Medical cases come under non-reportable cases, where owing to illness or other reason the employee was absent from work and seeks Medical treatment.

6.1.7 TYPE OF INCIDENTS & THEIR REPORTING:

The three categories of Incident are as follows:

Non-Reportable Cases:

An incident, where the injured person is given medical help and discharged for work without counting any lost time.



**HEALTH, SAFETY AND ENVIRONMENT
PLAN FOR
SITE OPERATION by SUBCONTRACTORS**

POWER SECTOR

Doc no.: HSEP: 14

REV: 01

Date: 20.01.2020

Page: 8 of 43

Reportable Cases:

In this case the injured person is disable for 48 hours or more and is not able to perform his duty.

Injury Cases:

These are covered under the heading of non-reportable cases. In these cases the incident caused injury to the person, but he still continues his duty.

6.1.8 TOTAL REPORTABLE FREQUENCY RATE

Frequency rate is the number of Reportable Lost Time Injury (LTI) per one Million Man hours worked. Mathematically, the formula read as:

$$\frac{\text{Number of Reportable LTI} \times 1,000,000}{\text{Total Man Hours Worked}}$$

6.1.9 SEVERITY RATE

Severity rate is the Number of days lost due to Lost Time Injury (LTI) per one Million Man hours worked. Mathematically, the formula reads as:

$$\frac{\text{Days lost due to LTI} \times 1,000,000}{\text{Total Man Hours Worked}}$$

6.1.10 INCIDENCE RATE

Incidence Rate is the Number of LTI per one thousand manpower deployed. Mathematically, the formula reads as:

$$\frac{\text{Number of LTI} \times 1000}{\text{Average number of manpower deployed}}$$

7.0 HSE ORGANISATION

Number of safety officers:

The subcontractor must deploy one safety officer for every 500 workers or part thereof in each package. In addition, there must be one safety-steward/safety-supervisor for every 100 workers.

Deployment: The subcontractor should deploy sufficient safety officers and safety-steward/Safety-supervisor, as per requirement given above, since initial stage and add more in proportion to the added strength in work force. Any delay in deployment will attract a penalty of Rs.30,000/- per man month for the delayed period.

7.1 QUALIFICATION FOR HSE PERSONNEL

Sl.no	Designation	Qualification	Experience
1	Safety officer (Construction Agency)	Degree or Diploma in Engineering with full time diploma in Industrial Safety with construction safety as one of the subjects	Minimum two years for degree holder and five years for diploma holder in the field of Construction of power plant/ major industries



**HEALTH, SAFETY AND ENVIRONMENT
PLAN FOR
SITE OPERATION by SUBCONTRACTORS**

Doc no.: HSEP: 14

REV: 01

Date: 20.01.2020

Page: 9 of 43

POWER SECTOR

2	Safety-Steward/ Supervisor	Safety- Supervisor	Degree or diploma in any discipline with full time diploma in Industrial Safety with construction safety as one of the subjects	Minimum two years
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7.2 RESPONSIBILITIES

7.2.1 SITE IN -CHARGE OF SUBCONTRACTOR

- ☐ Shall sign Memorandum of Understanding (MoU) for compliance to BHEL's HSE Plan for Site Operations as per clause 5.0
- Shall engage qualified safety officer(s) and steward (s) as per clause 7.0
- Shall adhere to the rules and regulations mentioned in this code, practice very strictly in his area of work in consultation with his concerned engineer and the safety coordinator.
- Shall screen all workmen for health and competence requirement before engaging for the job and periodically thereafter as required.
- Shall not engage any employee below 18 years.
- Shall arrange for all necessary PPEs like safety helmets, belts, full body harness, shoes, face shield, hand gloves etc. before starting the job. Shall ensure that no working men/women carry excessive weight more than stipulated in Factory Rule Regulation R57.
- Shall ensure that all T&Ps engaged are tested for fitness and have valid certificates from competent person.
- Shall ensure that provisions stipulated in contract Labour Regulation Act 1970, Chapter V C.9, canteen, rest rooms/washing facilities to contracted employees at site.
- Shall adhere to the instructions laid down in Operation Control Procedures (OCPs) available with the site management.
- Shall ensure that person working above 2.0 meter should use Safety Harness tied to a life line/stable structure.
- Shall ensure that materials are not thrown from height. Cautions to be exercised to prevent fall of material from height.
- Shall report all incidents (Fatal/Major/Minor/Near Miss) to the Site engineer /HSE officer of BHEL.
- Shall ensure that Horseplay is strictly forbidden.
- Shall ensure that adequate illumination is arranged during night work.
- Shall ensure that all personnel working under subcontractor are working safely and do not create any Hazard to self and to others.
- Shall ensure display of adequate signage/posters on HSE.
- Shall ensure that mobile phone is not used by workers while working.
- Shall ensure conductance of HSE audit, mockdrill, medical camps, induction training and training on HSE at site.
- Shall ensure full co-operation during HQ/External /Customer HSE audits.



**HEALTH, SAFETY AND ENVIRONMENT
PLAN FOR
SITE OPERATION by SUBCONTRACTORS**

POWER SECTOR

Doc no.: HSEP: 14

REV: 01

Date: 20.01.2020

Page: 10 of 43

- ☐ Shall ensure submission of look-ahead plan for procurement of HSE equipment's and PPEs as per work schedule.
- Shall ensure good housekeeping.
- Shall ensure adequate valid fire extinguishers are provided at the worksite.
- Shall ensure availability of sufficient number of toilets /restrooms and adequate drinking water at work site and labour colony.
- Shall ensure adequate emergency preparedness.
- Shall be member of site HSE committee and attend all meetings of the committee
- Power source for hand lamps shall be maximum of 24 v.
- ☐ Temporary fencing should be done for open edges if Hand – railings and Toe-guards are not available.

7.2.2 HEALTH, SAFETY AND ENVIRONMENT OFFICER OF SUBCONTRACTOR

- Carry out safety inspection of Work Area, Work Method, Men, Machine & Material, P&M and other tools and tackles.
- Facilitate inclusion of safety elements into Work Method Statement.
- Highlight the requirements of safety through Tool-box / other meetings.
- Help concerned HOS to prepare Job Specific instructions for critical jobs.
- Conduct investigation of all incident/dangerous occurrences & recommend appropriate safety measures.
- Advice & co-ordinate for implementation of HSE permit systems, OCPs & MPs.
- Convene HSE meeting & minute the proceeding for circulation & follow-up action.
- Plan procurement of PPE & Safety devices and inspect their healthiness.
- Report to PS Region/HQ on all matters pertaining to status of safety and promotional program at site level.
- Facilitate administration of First Aid
- Facilitate screening of workmen and safety induction.
- Conduct fire Drill and facilitate emergency preparedness
- Design campaigns, competitions & other special emphasis programs to promote safety in the workplace.
- ☐ Apprise PS– Region on safety related problems.
- Notify site personnel non-conformance to safety norms observed during site visits / site inspections.
- Recommend to Site In charge, immediate discontinuance of work until rectification, of such situations warranting immediate action in view of imminent danger to life or property or environment.
- To decline acceptance of such PPE / safety equipment that do not conform to specified requirements.
- Encourage raising Near Miss Report on safety along with, improvement initiatives on safety.
- Shall work as interface between various agencies such customer, package-in-charges, subcontractors on HSE matters



**HEALTH, SAFETY AND ENVIRONMENT
PLAN FOR
SITE OPERATION by SUBCONTRACTORS**

POWER SECTOR

Doc no.: HSEP: 14

REV: 01

Date: 20.01.2020

Page: 11 of 43

8.0 PLANNING BY SUBCONTRACTOR

Monthly planning and review of HSE activities shall be carried out by subcontractor as per format No. HSEP:14-F30 jointly along with BHEL.

8.1 MOBILISATION OF MACHINERY/EQUIPMENT/TOOLS BY SUBCONTRACTOR

- As a measure to ensure that machinery, equipment and tools being mobilized to the construction site are fit for purpose and are maintained in safe operating condition and complies with legislative and owner requirement, inspection shall be arranged by in-house competent authority for acceptance as applicable.
- The machinery and equipment to be embraced for this purpose shall include but not limited to the following:
 - o Mobile cranes.
 - o Side Booms.
 - o Forklifts.
 - o Grinding machine.
 - o Drilling machine.
 - o Air compressors.
 - o Welding machine.
 - o Generator sets.
 - o Dump Trucks.
 - o Excavators.
 - o Dozers
 - o Grit Blasting Equipment.
 - o Hand tools.
- Subcontractor shall notify the engineer, of his intention to bring on to site any equipment or any container, with liquid or gaseous fuel or other substance which may create a hazard. The Engineer shall have the right to prescribe the condition under which such equipment or container may be handled and used during the performance of the works and the subcontractor shall strictly adhere to such instructions. The Engineer shall have the right to inspect any construction tool and to forbid its use, if in his opinion it is unsafe. No claim due to such prohibition will be entertained.

8.2 MOBILISATION OF MANPOWER BY SUBCONTRACTOR

- The subcontractor shall arrange induction and regular health check of their employees as per schedule VII of BOCW rules by a registered medical practitioner.
- The subcontractor shall take special care of the employees affected with occupational diseases under rule 230 and schedule II of BOCW Rules. The employees not meeting the fitness requirement should not be engaged for such job.
- Ensure that the regulatory requirements of excessive weight limit (to carry/lift/ move weights beyond prescribed limits) for male and female workers are complied with.
- Appropriate accommodation to be arranged for all workmen in hygienic condition.



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE OPERATION by SUBCONTRACTORS

POWER SECTOR

Doc no.: HSEP: 14

REV: 01

Date: 20.01.2020

Page: 12 of 43

8.3 PROVISION OF PPEs

- Personnel Protective Equipment (PPEs), in adequate numbers, will be made available at site & their regular use by all concerned will be ensured
- The following matrix recommends usage of minimum PPEs against the respective job.

Sl. No	Type of work	PPEs
1	Concrete and asphalt mixing	Nose mask, hand glove, apron and gum boot
2	Welders/Grinders/ Gas cutters	Welding/face screen, apron, hand gloves, nose mask and ear muffs if noise level exceeds 90dB. Helmet fitted with welding shield is preferred for welders
3	Stone/ concrete breakers	Ear muffs, safety goggles, hand gloves
4	Electrical Work	Rubber hand glove, Electrical Resistance shoes
5	Insulation Work	Respiratory mask, Hand gloves, safety goggles
6	Work at height	Double lanyard full body harness, Fall arrestor (specific cases)
7	Grit/Sand blasting	Blast suit, blast helmet, respirator, leather gloves
8	Painting	Plastic gloves, Respirators (particularly for spray painting)
9	Radiography	As per BARC guidelines

- The PPEs shall conform to the relevant standards as below and bear ISI mark.

Relevant is-codes for personal protection

IS: 2925 – 1984	Industrial Safety Helmets.
IS: 4770 – 1968	Rubber gloves for electrical purposes.
IS: 6994 – 1973 (Part-I)	Industrial Safety Gloves (Leather & Cotton Gloves).
IS: 1989 – 1986 (Part-I-II)	Leather safety boots and shoes.
IS: 5557 – 1969	Industrial and Safety rubber knee boots.
IS: 6519 – 1971	Code of practice for selections care and repair of Safety footwear.
IS: 11226 – 1985	Leather Safety footwear having direct molding sole.
IS: 5983 – 1978	Eye protectors.
IS: 9167 – 1979	Ear protectors.
IS: 1179-1967	Eye & Face protection during welding
IS: 3521 – 1983	Industrial Safety Belts and Harness
IS: 8519 -1977	Guide for selection of industrial Safety equipment for body protection
IS: 9473-2002, 14166-1994, 14746-1999	Respiratory Protective Devices

The list is not exhaustive. The safety officer may demand additional PPEs based on specific requirement.



**HEALTH, SAFETY AND ENVIRONMENT
PLAN FOR
SITE OPERATION by SUBCONTRACTORS**

POWER SECTOR

Doc no.: HSEP: 14

REV: 01

Date: 20.01.2020

Page: 13 of 43

- Where workers are employed in sewers and manholes, which are in use, the subcontractor shall ensure that the manhole covers are opened and ventilated at least for an hour before the workers are allowed to get into manhole, and the manholes so opened shall be cordoned off with suitable railing and provided with warning signals or boards to prevent incident to the public
- Besides the PPEs mentioned above, the persons shall use helmet and safety shoe. The visitors shall use Helmet and any other PPEs as deemed appropriate for the area of work.

Colour scheme for Helmets:

- Workmen: Yellow
 - Safety staff: Green or white with green band
 - Electrician: Red
 - Others including visitors: White
- All the PPEs shall be checked for its quality before issue and the same shall be periodically checked. The users shall be advised to check the PPEs themselves for any defect before putting on. The defective ones shall be repaired/ replaced.
 - The issuing agency shall maintain register for issue and receipt of PPEs.
 - The Helmets shall have logo or name (abbreviation of agency name permitted) affixed or printed on the front.
 - The body harnesses shall be serial numbered.

8.4 ARRANGEMENT OF INFRASTRUCTURE

8.4.1 DRINKING WATER

- Drinking water shall be provided and maintained at suitable places at different elevations.
- Container should be labeled as "Drinking Water"
- Cleaning of the storage tank shall be ensured atleast once in 3 months indicating date of cleaning and next due date.
- Potability of water should be tested as per IS10500 at least once in a year.

8.4.2 WASHING FACILITIES

- In every workplace, adequate and suitable facilities for washing shall be provided and maintained.
- Separate and adequate cleaning facilities shall be provided for the use of male and female workers. Such facilities shall be conveniently accessible and shall be kept in clean and hygienic condition and dully illuminated for night use.
- Overalls shall be supplied by the subcontractor to the workmen and adequate facilities shall be provided to enable the painters and other workers to wash during the cessation of work.

8.4.3 LATRINES AND URINALS

- Latrines and urinals shall be provided in every work place.
- Urinals shall also be provided at different elevations.
- They shall be adequately lighted and shall be maintained in a clean and sanitary condition at all times, by appointing designated person.
- Separate facilities shall be provided for the use of male and female worker if any.

	HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE OPERATION by SUBCONTRACTORS	Doc no.: HSEP: 14
		REV: 01
	POWER SECTOR	Date: 20.01.2020
		Page: 14 of 43

8.4.4 PROVISION OF SHELTER DURING REST

Proper Shed & Shelter shall be provided for rest during break

8.4.5 MEDICAL FACILITIES

8.4.5.1 MEDICAL CENTRE (As per Schedule V, X and XI of BOCW central Rules, 1998)

- A medical centre shall be ensured/identified at site with basic facilities for handling medical emergencies. The medical center can be jointly developed on proportionate sharing basis with permission from BHEL
- A qualified medical professional, not less than MBBS, shall be deployed at the medical centre
- The medical centre shall be equipped with one ambulance, with trained driver and oxygen cylinder.
- Medical waste shall be disposed as per prevailing legislation (Bio-Medical Waste –Management and Handling Rules, 1998)

8.4.5.2 FIRST AIDER

- Ensure availability of Qualified First-aider throughout the working hours.
- Every injury shall be treated, recorded and reported.
- Refresher course on first aid shall be conducted as necessary.
- List of Qualified first aiders and their contact numbers should be displayed at conspicuous places.

8.4.5.3 FIRST AID BOX (as per schedule III of BOCW)

- The subcontractor shall provide necessary first aid facilities as per schedule III of BOCW. At every work place first aid facilities shall be provided and maintained.
- The first aid box shall be kept by first aider who shall always be readily available during the working hours of the work place. His name and contact no to be displayed on the box.
- The first aid boxes should be placed at various elevations so as to make them available within the reach and at the quickest possible time.
- The first aid box shall be distinctly marked with a Green Cross on white background.
- Details of contents of first aid box is given in Annexure No. 01
- Monthly inspection of First Aid Box shall be carried out by the owner as per format no. HSEP:14-F01
- The subcontractor should conduct periodical first –aid classes to keep his supervisor and Engineers properly trained for attending to any emergency.

8.4.5.4 HEALTH CHECK UP (As per schedule VII and Form XI)

The persons engaged at the site shall undergo health checkup as per the format no. HSEP:14-F02 before induction. The persons engaged in the following works shall undergo health checkup at least once in a year:

- a. Height workers
- b. Drivers/crane operators/riggers



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE OPERATION by SUBCONTRACTORS

POWER SECTOR

Doc no.: HSEP: 14

REV: 01

Date: 20.01.2020

Page: 15 of 43

- c. Confined space workers
- d. Shot/sand blaster
- e. Welding and NDE personnel

8.4.6 PROVISION OF CANTEEN FACILITY

- Canteen facilities shall be provided for the workmen of the project inside the project site.
- Proper cleaning and hygienic condition shall be maintained.
- Proper care should be taken to prevent biological contamination.
- Adequate drinking water should be available at canteen.
- Fire extinguisher shall be provided inside canteen.
- Regular health check-up and medication to the canteen workers shall be ensured.

8.4.7 PROVISION OF ACCOMODATION/LABOUR COLONY

- || The subcontractor shall arrange for the accommodation of workmen at nearby localities or by making a labour colony.
- || Regular housekeeping of the labour colony shall be ensured.
- || Proper sanitation and hygienic conditions to be maintained.
- || Drinking water and electricity to be provided at the labour colony.
- || Bathing/ washing bay
- || Room ventilation and electrification.

8.4.8 PROVISION OF EMERGENCY VEHICLE

- Dedicated emergency vehicle shall be made available at workplace by each subcontractor to handle any emergency

8.4.9 PEST CONTROL

Regular pest control should be carried out at all offices, mainly laboratories, canteen, labour colony and stores.

8.4.10 SCRAPYARD

- In consultation with customer, scrapyard shall be developed to store metal scrap, wooden scrap, waste, hazardous waste.
- Scrap/Waste shall be segregated as Bio-degradable and non-bio-degradable and stored separately.

8.4.11 ILLUMINATION

- The subcontractor shall arrange at his cost adequate lighting facilities e.g. flood lighting, hand lamps, area lighting etc. at various levels for safe and proper working operations at dark places and during night hours at the work spot as well as at the pre-assembly area.
- Adequate and suitable light shall be provided at all work places & their approaches including passage ways as per IS: 3646 (Part-II). Some recommended values are given below:



**HEALTH, SAFETY AND ENVIRONMENT
PLAN FOR
SITE OPERATION by SUBCONTRACTORS**

Doc no.: HSEP: 14

REV: 01

Date: 20.01.2020

Page: 16 of 43

POWER SECTOR

S. No.	Location	Illumination (Lux)
A. Construction Area		
1.	Outdoor areas like store yards, entrance and exit roads	20
2.	Platforms	50
3.	Entrances, corridors and stairs	100
4.	General illumination of work area	150
5.	Rough work like fabrication, assembly of major items	150
6.	Medium work like assembly of small machined parts	300
	rough measurements etc.	
7.	Fine work like precision assembly, precision	700
	measurements etc.	
8.	Sheet metal works	200
9.	Electrical and instrument labs	450
B. Office		
1.	Outdoor area like entrance and exit roads	20
2.	Entrance halls	150
3.	Corridors and lift cars	70
4.	Lift landing	150
5.	Stairs	100
6.	Office rooms, conference rooms, library reading tables	300
7.	Drawing table	450
8.	Manual telephone exchange	200

- Lamp (hand held) shall not be powered by mains supply but either by 24V or dry cells.
- Lamps shall be protected by suitable guards where necessary to prevent danger, in case of breakage of lamp.
- Emergency lighting provision for night work shall be made to minimise danger in case of main supply failure.

If the subcontractor fails to take appropriate safety precautions or to provide necessary safety devices and equipment or to carry out instructions issued by the authorized BHEL official, BHEL shall have the right to take corrective steps at the risk and cost of the subcontractor

9.0 HSE TRAINING& AWARENESS

9.1 HSE INDUCTION TRAINING

All persons entering into project site shall be given HSE induction training by the HSE officer of BHEL /subcontractor before being assigned to work.

In-house induction training subjects shall include but not limited to:

- Briefing of the Project details.
- Safety objectives and targets.
- Site HSE rules.
- Site HSE hazards and aspects.
- First aid facility.
- Emergency Contact No.
- Incident reporting.
- Fire prevention and emergency response.
- Rules to be followed in the labour colony (if applicable)



**HEALTH, SAFETY AND ENVIRONMENT
PLAN FOR
SITE OPERATION by SUBCONTRACTORS**

POWER SECTOR

Doc no.: HSEP: 14

REV: 01

Date: 20.01.2020

Page: 17 of 43

- Proper safety wear & gear must be issued to all the workers being registered for the induction (i.e., Shoes/Helmets/Goggles/Leg guard/Apron etc.)
- They must arrive fully dressed in safety wear & gear to attend the induction.
- Any one failing to conform to this safety wear& gear requirement shall not qualify to attend.
- On completing attending subcontractor's in-house HSE induction, each employee shall sign an induction training form (format no. HSEP:14-F03) to declare that he had understood the content and shall abide to follow and comply with safe work practices. They may only then be qualified to be issued with a personal I.D. card, for access to the work site.

9.2 HSE TOOLBOX TALK

- HSE tool Box talk shall be conducted by frontline foreman/supervisor of subcontractor to specific work groups prior to the start of work. The agenda shall consist of the followings:
 - o Details of the job being intended for immediate execution.
 - o The relevant hazards and risks involved in executing the job and their control and mitigating measures.
 - o Specific site condition to be considered while executing the job like high temperature, humidity, unfavorable weather etc.
 - o Recent non-compliances observed.
 - o Appreciation of good work done by any person.
 - o Any doubt clearing session at the end.
- Record of Tool box talk shall be maintained as per format no. HSEP:14-F04
- Tool box talk to be conducted at least once a week for the specific work.

9.3 TRAINING ON HEIGHT WORK

Training on height work shall be imparted to all workers working at height by in-house/external faculty at least twice in a year. The training shall include following topics:

- Use of PPEs
- Use of fall arrester, retractable fall arrester, life line, safety nets etc.
- Safe climbing through monkey ladders.
- Inspection of PPEs.
- Medical fitness requirements.
- Mock drill on rescue at height.
- Dos & Don'ts during height work.

9.4 HSE TRAINING DURING PROJECT EXECUTION

- Other HSE training shall be arranged by BHEL/ subcontractor as per the need of the project execution and recommendation of HSE committee of site.
- The topics of the HSE training shall be as follows but not limited to:
 - o Hazards identification and risk analysis (HIRA)
 - o Work Permit System
 - o Incident investigation and reporting
 - o Fire fighting
 - o First aid
 - o Fire-warden training
 - o EMS and OHSMS
 - o T & Ps fitness and operation



**HEALTH, SAFETY AND ENVIRONMENT
PLAN FOR
SITE OPERATION by SUBCONTRACTORS**

POWER SECTOR

Doc no.: HSEP: 14

REV: 01

Date: 20.01.2020

Page: 18 of 43

- o Electrical safety
- o Welding, NDE & Radiological safety
- o Storage, preservation & material handling.
- A matrix shall be maintained to keep an up-to-date record of attendance of training sessions carried out.

9.5 HSE PROMOTION-SIGNAGE, POSTERS, COMPETITION, AWARDS ETC

9.5.1 Display of HSE posters and banners

- Site shall arrange appropriate posters, banners, slogans in local/Hindi/English languages at work place

9.5.2 Display of HSE signage

- Appropriate HSE signage shall be displayed at the work area to aware workmen and passersby about the work going on and do's and don'ts to be followed

9.5.3 Competition on HSE and award

- Site will arrange different competition (slogan, poster, essay etc.) on HSE time to time (Safety day, BHEL day, World Environment Day etc.) and winners will be suitably awarded.

9.5.4 HSE awareness programme

- Subcontractor shall arrange HSE awareness programme periodically on different topics including medical awareness for all personnel working at site

10.0 HSE COMMUNICATION

10.1 INCIDENT REPORTING

- The subcontractor shall submit report of all incidents, fires and property damage etc to the Engineer immediately after such occurrence, but in any case not later than 24 hours of the occurrence. Such reports shall be furnished in the manner prescribed by BHEL. (Refer HSE procedure for incident investigation, analysis and reporting for details)
- In addition, periodic reports on safety shall also be submitted by the subcontractor to BHEL from time to time as prescribed by the Engineer. Compiled monthly reports of all kinds of incidents, fire and property damage to be submitted to BHEL safety officer as per prescribed formats.
- HSE incidents of site shall be reported to BHEL site Management as per Procedure for Incident Investigation and Reporting in format no. HSEP:14-F15. Corrective action shall be immediately implemented at the work place and compliance shall be verified by BHEL HSE officer and until then, work shall be put on hold by Construction Manager.

10.2 HSE EVENT REPORTING

- Important HSE events like HSE training, Medical camp etc. organized at site shall be reported to BHEL site management in detail with photographs for publication in different in-house magazines
- Celebration of important days like National Safety Day, World Environment Day etc. shall also be reported as mentioned above.

10.3 DAILY HSE ACTIVITY REPORTING

Daily HSE activities shall be reported by subcontractor to BHEL as per Format No. HSEP:14-F31A



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE OPERATION by SUBCONTRACTORS

POWER SECTOR

Doc no.: HSEP: 14

REV: 01

Date: 20.01.2020

Page: 19 of 43

11.0 OPERATIONAL CONTROL

All applicable OCPs (Operational control procedures) will be followed by subcontractor as per BHEL instructions. This will be done as part of normal scope of work. List of such OCPs is given below. In case any other OCP is found to be applicable during the execution of work at site, then subcontractor will follow this as well, within quoted rate. These OCPs (applicable ones) will be made available to subcontractor during work execution at site. However for reference purpose, these are kept with Safety Officer of BHEL at the Power Sector Regional HQ, or available in downloadable format in the website, which may be refereed by subcontractor, if they so desire.

LIST OF OCPs

Safe handling of chemicals	Safety in use of cranes	Hydraulic test
Electrical safety	Storage and handling of gas cylinders	Spray insulation
Energy conservation	Manual arc welding	Trial run of rotary equipment
Safe welding and gas cutting operation	Safe use of helmets	Stress relieving
Fire safety	Good house keeping	Material preservation
Safety in use of hand tools	Working at height	Cable laying/tray work
First aid	Safe excavation	Transformer charging
Food safety at canteen	Safe filling of hydrogen in cylinder	Electrical maintenance
Illumination	Vehicle maintenance	Safe handling of battery system
Handling and erection of heavy metals	Safe radiography	Computer operation
Safe acid cleaning	Waste disposal	Storage in open yard
Safe alkali boil out	Working at night	For sanitary maintenance
Safe oil flushing	Blasting	Batching
Steam blowing	DG set	Piling rig operation
Safe working in confined area	Handling & storage of mineral wool	Gas distribution test
Safe operation of passenger lift, material hoists & cages	Drilling, reaming and grinding(machining)	Cleaning of hotwell / deaerator
Electro-resistance heating	Compressor operation	O&M of control of AC plant & system
Air compressor	Passivation	Safe Loading of Unit
Safe EDTA Cleaning	Safe Chemical cleaning of Pre boiler system	Safe Boiler Light up
Safe Rolling and Synchronization		

11.1 HSE ACTIVITIES

HSE activities shall be conducted at site based on the HSEMSM developed by Power Sector and issued to site by Regions.

While planning for any activity the following documents shall be referred for infrastructural requirements to establish control measures:

- 1) HSE Procedure for Register of OHS Hazards and Risks
- 2) HSE Procedure for Register of Environmental Aspects and Impacts
- 3) HSE Procedure for Register of Regulations



**HEALTH, SAFETY AND ENVIRONMENT
PLAN FOR
SITE OPERATION by SUBCONTRACTORS**

POWER SECTOR

Doc no.: HSEP: 14

REV: 01

Date: 20.01.2020

Page: 20 of 43

- 4) Operational Control Procedures
- 5) HSE Procedure for Emergency Preparedness and Response Plan
- 6) Contract documents

11.2 WORK PERMIT SYSTEM

- 11 The following activities shall come under Work Permit System
 - a. Height working above 2 metres
 - b. Hot working at height
 - c. Confined space
 - d. Radiography
 - e. Excavation more than 4 meter depth
 - f. Heavy lifting above 50 tonRefer Annexure 05 for Work permit formats.
- "HSE Procedure for Work Permit System" shall be followed while implementing permit system. Where customer is having separate Work Permit System the same shall be followed.
- 11 Permit applicant shall apply for work permit of particular work activity at particular location before starting of the work with Job Hazard Analysis.
- 11 Permit signatory shall check that all the control measures necessary for the activity are in place and issue the permit to the permit holder.
- 11 Permit holder shall implement and maintain all control measures during the period of permit .He will close the permit after completion of the work. The closed permit shall be archived in HSE Department of site.

11.3 SAFETY DURING WORK EXECUTION

Respective OCPS are to be followed and adherence to the same would be contractually binding

11.3.1 WELDING SAFETY

All safety precautions shall be taken for welding and cutting operations as per IS-818. All safety precautions shall be taken for foundation and other excavation marks as per IS-3764.

11.3.2 RIGGING

Rigging equipment shall not be loaded in excess of its recommended safe working load. Rigging equipment, when not in use, shall be removed from the original work area so as not to present a hazard to employees.

11.3.3 CYLINDERS STORAGE AND MOVEMENT

All gas cylinders shall be stored in upright position. Suitable trolley shall be used. There shall be flash-back arrestors conforming to IS-11006 at both cylinder and burner ends. Damaged tube and regulators must be immediately replaced. No of cylinders shall not exceed the specified quantity as per OCP

Cylinders shall be moved by tilting and rolling them on their bottom edges. They shall not be intentionally dragged, struck or permitted to strike each other violently.

	HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE OPERATION by SUBCONTRACTORS	Doc no.: HSEP: 14
		REV: 01
	POWER SECTOR	Date: 20.01.2020
		Page: 21 of 43

When cylinders are transported by powered vehicle they shall be secured in a vertical position.

11.3.4 DEMOLITION WORK

Before any demolition work is commenced and also during the process of the work the following shall be ensured:

- All roads and open areas adjacent to the work site shall either be closed or suitably protected.
- No electric cable or apparatus which is liable to be a source of danger nor a cable or an apparatus used by the operator shall remain electrically charged.
- All practical steps shall be taken to prevent danger to persons employed from the risks of fire or explosion or flooding. No floor, roof or other part of the building shall be so overloaded with debris or materials as to render them unsafe.

11.3.5 T&Ps

All T&Ps/ MMEs should be of reputed brand/appropriate quality & must have valid test/calibration certificates bearing endorsement from competent authority of BHEL..Subcontractor to also submit monthly reports of T&Ps deployed and validity test certificates to BHEL safety Officer as per the format/procedure of BHEL.

11.3.6 CHEMICAL HANDLING

Displaying safe handling procedures for all chemicals such as lube oil, acid, alkali, sealing compounds etc , at work place.Where it is necessary to provide and/or store petroleum products or petroleum mixture & explosives, the subcontractor shall be responsible for carrying out such provision / storage in accordance with the rules & regulations laid down in the relevant petroleum act, explosive act and petroleum and carbide of calcium manual, published by the chief inspector of explosives of India. All such storage shall have prior approval if necessary from the chief inspector of explosives or any other statutory authority. The subcontractor shall be responsible for obtaining the same.

11.3.7 ELECTRICAL SAFETY

- Providing adequate no. of 24 V sources and ensure that no hand lamps are operating at voltage level above 24 Volts.
- Fulfilling safety requirements at all power tapping points.
- High/ Low pressure welders to be identified with separate colour clothings. No welders will be deployed without passing appropriate tests and holding valid welding certificates. Approved welding procedure should be displayed at work place.
- The subcontractor shall not use any hand lamp energized by Electric power with supply voltage of more than 24 volts in confined spaces like inside water boxes, turbine casings, condensers etc.
- All portable electric tools used by the subcontractor shall have safe plugging system to source of power and be appropriately earthed. Only electricians licensed by appropriate statutory authority shall be employed by the subcontractor to carry out all types of electrical works. Details of earth resource and their test date to be given to BHEL safety officer as per the prescribed formats of BHEL
- The subcontractor shall use only properly insulated and armored cables which conform to the requirement of Indian Electricity Act and Rules for all wiring, electrical applications at site.



**HEALTH, SAFETY AND ENVIRONMENT
PLAN FOR
SITE OPERATION by SUBCONTRACTORS**

POWER SECTOR

Doc no.: HSEP: 14

REV: 01

Date: 20.01.2020

Page: 22 of 43

- BHEL reserves the right to replace any unsafe electrical installations, wiring, cabling etc. at the cost of the subcontractor.
- All electrical appliances used in the work shall be in good working condition and shall be properly earthed.
- No maintenance work shall be carried out on live equipment.
- The subcontractor shall maintain adequate number of qualified electricians to maintain his temporary electrical installations.
- Area wise Electrical safety inspection is to be carried out on monthly basis as per "Electrical Safety Inspection checklist" and the report is to be submitted to BHEL safety officer
- Adequate precautions shall be taken to prevent danger for electrical equipment. No materials on any of the sites of work shall be so stacked or placed as to cause danger or inconvenience to any person or the public
- The subcontractor shall carefully follow the safety requirement of BHEL/ the purchaser with the regard to voltages used in critical areas.

11.3.8 FIRE SAFETY

- Providing appropriate fire fighting equipment at designated work place and nominate a fire officer/warden adequately trained for his job.
- Subcontractor shall provide enough fire protecting equipment of the types and numbers at his office, stores, temporary structure in labor colony etc. Such fire protection equipment shall be easy and kept open at all times.
- The fire extinguishers shall be properly refilled and kept ready which should be certified at periodic intervals. The date of changing should be marked on the Cylinders.
- All other fire safety measures as laid down in the "codes for fire safety at construction site" issued by safety coordinator of BHEL shall be followed.
- Non-compliance of the above requirement under fire protection shall in no way relieve the subcontractor of any of his responsibility and liabilities to fire incident occurring either to his materials or equipment or those of others.
- Emergency contacts nos must be displayed at prominent locations
- Tarpaulin being inflammable should not be used (instead, only non-infusible covering materials shall be used) as protective cover while preheating, welding, stress relieving etc. at site.

11.3.9 SCAFFOLDING

- Suitable scaffolds shall be provided for workman for all works that cannot safely be done from the ground, or from solid construction except in the case of short duration of work which can be done safely from ladders.
- When a ladder is used, it shall be of rigid construction made of steel. The steps shall have a minimum width of 45 cm and a maximum rise of 30 cm. Suitable handholds of good quality wood or steel shall be provided and the ladder shall be given an inclination not steeper than $\frac{1}{4}$ horizontal and 1 vertical.
- Scaffolding or staging more than 3.6 m above the ground floor, swung or suspended from an overhead support or erected with stationery support shall have a guard rail properly bolted, braced or otherwise secured, at least 90 cm above the floor or platform of such scaffolding or staging and extending along the entire length of the outside and ends thereof with only such openings as may be necessary for the delivery of materials. Such scaffolding or staging shall be so fastened as to prevent it from savor, from swaying, from the building or structure.

11.3.10 WORK AT HEIGHT:

- Guardrails and toe-board/barricades and sound platform conforming to IS:4912-1978 should be provided.



**HEALTH, SAFETY AND ENVIRONMENT
PLAN FOR
SITE OPERATION by SUBCONTRACTORS**

POWER SECTOR

Doc no.: HSEP: 14

REV: 01

Date: 20.01.2020

Page: 23 of 43

- Wherever necessary, life-line (pp or metallic) and fall arrestor along with Polyamide rope or Retractable lifeline should be provided.
- Safety Net as per IS:11057:1984 should be used extensively for prevention/ arrest of men and materials falling from height. The safety nets shall be fire resistant, duly tested and shall be of ISI marked and the nets shall be located as per site requirements to arrest or to reduce the consequences of a possible fall of persons working at different heights.
- Reaching beyond barricaded area without lifeline support, moving with support of bracings, walking on beams without support, jumping from one level to another, throwing objects and taking shortcut must be discouraged.
- Use of Rebar steel for making Jhoola and monkey-ladder (Rods welded to vertical or inclined structural members), temporary platform etc. must be avoided.
- Monkey Ladder should be properly made and fitted with cages.
- Jhoola should be made with angles and flats and tested like any lifting tools before use.
- Lanyard must be anchored always and in case of double lanyard, each should be anchored separately.
- In case of pipe-rack, persons should not walk on pipes and walk on platforms only.
- In case of roof work, walking ladder/ platform should be provided along with lifeline and/ or fall arrestor.
- Empty drums must not be used.
- For chimney or structure painting, both hanging platform and men should be anchored separately to a firm structure along with separate fall arrestor. Rope ladder should be discouraged.

11.3.11 WORKING PLATFORM

Working platforms, gangways and stairways shall be so constructed that they do not sag unduly or unequally and if the height of the platform gangways provided is more than 3.6 m above ground level or floor level, they shall be closely boarded and shall have adequate width which shall not be less than 750 mm and be suitably fenced as described above. Every opening in the floor or a building or in a working platform shall be provided with suitable means to prevent the fall of persons or materials by providing suitable fencing or railing whose minimum height shall be 90 cm.

11.3.12 EXCAVATION

Wherever there are open excavation in ground, they shall be fenced off by suitable railing and danger signals installed at night so as to prevent persons slipping into the excavations.

11.3.13 LADDER SAFETY

Safe means of access shall be provided to all working places. Every ladder shall be securely fixed. No portable single ladder shall be over 9 m in the length while the width between side rails in rung ladder shall in no case be less than app. 29.2 cm for ladder upto and including 3 m in length. For longer ladders this width shall be increased at least ¼" for each additional foot of length.

A sketch of the ladders and scaffolds proposed to be used shall be prepared and approval of the Engineer obtained prior to Construction.

11.3.14 LIFTING SAFETY

- It will be the responsibility of the subcontractor to ensure safe lifting of the equipment, taking due precaution to avoid any incident and damage to other equipment and personnel.



**HEALTH, SAFETY AND ENVIRONMENT
PLAN FOR
SITE OPERATION by SUBCONTRACTORS**

POWER SECTOR

Doc no.: HSEP: 14

REV: 01

Date: 20.01.2020

Page: 24 of 43

- All requisite tests and inspection of handling equipment, tools & tackle shall be periodically done by the subcontractor by engaging only the Competent Persons as per law.
- Defective equipment or uncertified shall be removed from service.
- Any equipment shall not be loaded in excess of its recommended safe working load.

11.3.15 HOISTING APPLIANCE

- Motors, gearing, transmission, electric wiring and other dangerous parts of hoisting appliances should be provided with efficient safe guards.
- Hoisting appliance should be provided with such means as will reduce to the minimum the risk of any part of a suspended load becoming incidentally displaced.
- When workers employed on electrical installations which are already energized, insulating mats, wearing apparel, such as gloves, sleeves and boots as may be necessary should be provided.
- The worker should not wear any rings, watches and carry keys or other materials which are good conductor of electricity.

11.4 ENVIRONMENTAL CONTROL

Environment protection has always been given prime importance by BHEL. Environmental damage is a major concern of the principal subcontractor and every effort shall be made, to have effective control measures in place to avoid pollution of Air, Water and Land and associated life. Chlorofluorocarbons such as carbon tetrachloride and trichloroethylene shall not be used. Waste disposal shall be done in accordance with the guidelines laid down in the project specification.

Any chemical including solvents and paints, required for construction shall be stored in designated bonded areas around the site as per Material Safety Data Sheet (MSDS).

In the event of any spillage, the principle is to recover as much material as possible before it enters drainage system and to take all possible action to prevent spilled materials from running off the site. The subcontractor shall use appropriate MSDS for clean-up technique

All subcontractors shall be responsible for the cleanliness of their own areas.

The subcontractors shall ensure that noise levels generated by plant or machinery are as low as reasonably practicable. Where the subcontractor anticipates the generation of excessive noise levels from his operations the subcontractor shall inform to Construction Manager of BHEL accordingly so that reasonable & practicable precautions can be taken to protect other persons who may be affected.

It is imperative on the part of the subcontractor to join and effectively contribute in joint measures such as tree plantation, environment protection, contributing towards social upliftment, conversion of packing woods to school furniture, keeping good relation with local populace etc.

The subcontractor shall carry out periodic air and water quality check and illumination level checking in his area of work place and take suitable control measure.

11.5 HOUSEKEEPING

- Keeping the work area clean/ free from debris, removed scaffoldings, scraps, insulation/sheeting wastage /cut pieces, temporary structures, packing woods etc. will be in the scope of the subcontractor. Such cleanings has to be done by



**HEALTH, SAFETY AND ENVIRONMENT
PLAN FOR
SITE OPERATION by SUBCONTRACTORS**

POWER SECTOR

Doc no.: HSEP: 14

REV: 01

Date: 20.01.2020

Page: 25 of 43

subcontractor within quoted rate, on daily basis by an identified group. If such activity is not carried out by subcontractor / BHEL is not satisfied, then BHEL may get it done by other agency and actual cost along with BHEL overheads will be deducted from contractor's bill. Such decisions of BHEL shall be binding on the subcontractor

- Proper housekeeping to be maintained at work place and the following are to be taken care of on daily basis.
- All surplus earth and debris are removed/disposed off from the working areas to identified locations.
- Unused/Surplus cables, steel items and steel scrap lying scattered at different places/elevation within the working areas are removed to identified locations.
- All wooden scrap, empty wooden cable drums and other combustible packing materials, shall be removed from workplace to identified locations. Sufficient waste bins shall be provided at
- Different work places for easy collection of scrap/waste. Scrap chute shall be installed to remove scrap from high location.
- Access and egress (stair case, gangways, ladders etc.) path should be free from all scrap and other hindrances.
- Workmen shall be educated through tool box talk about the importance of housekeeping and encourage not to litter.
- Labour camp area shall be kept clear and materials like pipes, steel, sand, concrete, chips and bricks, etc. shall not be allowed in the camp to obstruct free movement of men and machineries.
- Fabricated steel structures, pipes & piping materials shall be stacked properly.
- No parking of trucks/trolleys, cranes and trailers etc. shall be allowed in the camp, which may obstruct the traffic movement as well as below LT/HT power line.
- Utmost care shall be taken to ensure over all cleanliness and proper upkeep of the working areas

11.6 WASTE MANAGEMENT

Take suitable measures for waste management and environment related laws/legislation as a part of normal construction activities. Compliance with the legal requirements on storage/ disposal of paint drums (including the empty ones), Lubricant containers, Chemical Containers, and transportation and storage of hazardous chemicals will be strictly maintained.

11.6.1 BINS AT WORK PLACE

- Sufficient rubbish bins shall be provided close to workplaces.
- Bins should be painted yellow and numbered.
- Sufficient nos. of drip trays shall be provided to collect oil and grease.
- Sufficient qty. of broomsticks with handle shall be provided.
- Adequate strength of employees should be deployed to ensure daily monitoring and service for waste management.

11.6.2 STORAGE AND COLLECTION

- Different types of rubbish/waste should be collected and stored separately.
- Paper, oily rags, smoking material, flammable, metal pieces should be collected in separate bins with close fitting lids.
- Rubbish should not be left or allowed to accumulate on construction and other work places.
- Do not burn construction rubbish near working site.

	HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE OPERATION by SUBCONTRACTORS	Doc no.: HSEP: 14
		REV: 01
	POWER SECTOR	Date: 20.01.2020
		Page: 26 of 43

11.6.3 SEGREGATION

- Earmark the scrap area for different types of waste.
- Store wastes away from building.
- Oil spill absorbed by non-combustible absorbent should be kept in separate bin.
- Clinical and first aid waste stored and incinerated separately.

11.6.4 DISPOSAL

- Sufficient containers and scrap disposal area should be allocated.
- All scrap bin and containers should be conveniently located.
- Provide self-closing containers for flammable/spontaneously combustible material.
- Keep drainage channels free from choking.
- Make schedule for collection and disposal of waste.

11.6.5 WARNING AND SIGNS

- Appropriate sign to be displayed at scrap storage area
- No toxic, corrosive or flammable substance to be discarded into public sewage system.
- Waste disposal shall be in accordance with best practice.
- Comply with all the requirements of Pollution Control Board (PCB) for storage and disposal of hazardous waste.

11.7 TRAFFIC MANAGEMENT SYSTEM

11.7.1 SAFE WORKPLACE TRANSPORT SYSTEM

- Traffic routes in a work place shall be suitable for the persons or vehicles using them. This shall be sufficient in number and of sufficient size. This shall reflect the suitability of traffic routes for vehicles and pedestrians.
- Where vehicles and pedestrians use the same traffic routes there shall be sufficient space between them. Where necessary all traffic routes must be suitably indicated. Pedestrians or vehicles must be able to use traffic routes without endangering those at work. There must be sufficient separation of traffic routes from doors, gates and pedestrian traffic routes.
- For internal traffic, lines marked on roads / access routes and between buildings shall clearly indicate where vehicles are to pass.
- Temporary obstacles shall be brought to the attention of drivers by warning signs or hazard cones.
- Speed limits shall be clearly displayed. Speed ramps preceded by a warning signs or marker are necessary.
- The traffic route should be wide enough to allow vehicles to pass and re-pass oncoming or parked traffic and it may be advisable to introduce on-way system or parking restrictions.
- Safest route shall be provided between places where vehicles have to call or deliver.
- Avoid vulnerable areas/items such as fuel or chemicals tanks or pipes, open or unprotected edges and structures likely to collapse



**HEALTH, SAFETY AND ENVIRONMENT
PLAN FOR
SITE OPERATION by SUBCONTRACTORS**

POWER SECTOR

Doc no.: HSEP: 14

REV: 01

Date: 20.01.2020

Page: 27 of 43

- Safe areas shall be provided for loading and unloading.
- Avoid sharp or blind bends. If this is not possible hazards should be indicated e.g. blind corner.
- Ensure road crossings are minimum and clearly signed.
- Entrance and gateways shall be wide enough to accommodate a second vehicle without causing obstruction.
- Set sensible speed limits which are clearly sign posted.
- Where necessary ramps should be used to retard speed. This shall be preceded by a warning sign or mark on the road.
- Forklift trucks shall not pass over road hump unless of a type capable of doing so.
- Overhead electric cable, pipes containing flammable hazardous chemical shall be shielded by using goal posts height gauge posts or barriers.
- Road traffic signs shall be provided on prominent locations for prevention of incidents and hazards and for quick guidance and warning to employees and public. Safety signs shall be displayed as per the project working requirement and guideline of the state in which project is done. Vehicles hired or used shall not be parked within the 15m radius of any working area. Any vehicle, that is required to be at the immediate/near the vicinity, shall be approved by the person in-charge of the site.

11.7.2 TRAFFIC ROUTE FOR PEDESTRIANS

- Where traffic routes are used by both pedestrians and vehicles road shall be wide enough to allow vehicles and pedestrians safely.
- Separate routes shall be provided for pedestrians to keep them away from vehicles. Provide suitable barriers/guard at entrances/exit and the corners or buildings.
- Where pedestrian and vehicle routes cross, appropriate crossing shall be provided.
- Where crowd is likely to use roadway e.g. at the end of shift, stop vehicles from using them at such times.
- Provide high visibility clothing for people permitted in delivery area.

11.7.3 WORK VEHICLE

Work vehicle shall be as safe stable efficient and roadworthy as private vehicles on public roads. Site management shall ensure that drivers are suitably trained. All vehicle e.g. heavy motor vehicle forklift trucks dump trucks mobile cranes shall ensure that the work equipment conforms to the following:

- o A high level of stability.
- o A safe means of access/egress.
- o Suitable and effective service and parking brakes.
- o Windscreens with wipers and external mirrors giving optimum all round visibility.
- o Provision of horn, vehicle lights, reflectors, reversing lights, reversing alarms.
- o Provision of seat belts.
- o Guards on dangerous parts.
- o Driver protection - to prevent injury from overturning and from falling objects/materials.
- o Driver protection from adverse weather.
- o No vehicle shall be parked below HT/LT power lines.
- o Valid Pollution Under Control certification for all vehicles



**HEALTH, SAFETY AND ENVIRONMENT
PLAN FOR
SITE OPERATION by SUBCONTRACTORS**

POWER SECTOR

Doc no.: HSEP: 14

REV: 01

Date: 20.01.2020

Page: 28 of 43

11.7.4 DAILY CHECK BY DRIVER

- There should also be daily safety checks containing below mentioned points by the driver before the vehicle is used.
 - o Brakes.
 - o Tires.
 - o Steering.
 - o Mirrors.
 - o Windscreen waters.
 - o Wipers.
 - o Warning signals.
 - o Specific safety system i.e. control interlocks
- Management should ensure that drivers carry out these checks.

11.7.5 TRANSPORTATION OF PERSONNEL AND MATERIALS BY VEHICLES

- All drivers shall hold a valid driving License for the class of vehicle to be driven and be registered as an authorized BHEL driver with the Administration Department.
 - Securing of the load shall be by established and approved methods, i.e. chains with patented tightening equipment for steel/heavy loads. Sharp corners on loads shall be avoided when employing ropes for securing.
 - All overhangs shall be made clearly visible and restricted to acceptable limits
 - Load shall be checked before moving off and after traveling a suitable distance.
 - On no account is construction site to be blocked by parked vehicles Drivers of vehicles shall only stop or park in the areas designate by the stringing foreman.
 - Warning signs shall be displayed during transportation of material.
- All vehicles used by BHEL shall be in worthy condition and in conformance to the Land Transport requirement.

11.7.6 MAINTENANCE

All Vehicles used for transportation of man and material shall undergo scheduled inspections on frequent intervals to secure safe operation. Such inspections shall be conducted in particular for steering, brakes, lights, horn, doors etc. Site management shall ensure that work equipment is maintained in an efficient, working order and in good repair. Inspections and services carried out at regular intervals of time and or mileage. No maintenance shall be carried below HT/LT power lines.

11.8 EMERGENCY PREPAREDNESS AND RESPONSE

- Emergency preparedness and response capability of site shall be developed as per Emergency Preparedness and Response plan issued by Regional HQ
- Availability of adequate number of first aiders and fire warden shall be ensured with BHEL and its subcontractors
- All the subcontractor's supervisory personnel and sufficient number of workers shall be trained for fire protection systems. Enough number of such trained personnel must be available during the tenure of contract. Subcontractor should nominate his supervisor to coordinate and implement the safety measures.
- Assembly point shall be earmarked and access to the same from different location shall be shown
- Fire exit shall be identified and pathway shall be clear for emergency escape.



**HEALTH, SAFETY AND ENVIRONMENT
PLAN FOR
SITE OPERATION by SUBCONTRACTORS**

POWER SECTOR

Doc no.: HSEP: 14

REV: 01

Date: 20.01.2020

Page: 29 of 43

- Appropriate type and number of fire extinguisher shall be deployed as per Fire extinguisher deployment plan and validity shall be ensured periodically through inspection
- Adequate number of first aid boxes shall be strategically placed at different work places to cater emergency need. Holder of the first aid box shall be identified on the box itself who will have the responsibility to maintain the same.
- First aid center shall be developed at site with trained medical personnel and ambulance
- Emergency contact numbers (format given in EPRP) of the site shall be displayed at prominent locations.
- Tie up with fire brigade shall be done in case customer is not having fire station.
- Tie up with hospital shall be done in case customer is not having hospital.
- Disaster Management group shall be formed at site
- Mock drill shall be arranged at regular intervals. Monthly report of the above to be given to BHEL safety Officer as per prescribed BHEL formats
- Mock drill shall be conducted on different emergencies periodically to find out gaps in emergency preparedness and taking necessary corrective action

12.0 HSE INSPECTION

Inspection on HSE for different activities being carried out at site shall be done to ensure compliance to HSEMS requirements. The subcontractor shall maintain and ensure necessary safety measures as required for inspection and tests HV test, Pneumatic test, Hydraulic test, Spring test, Bend test etc. as applicable, to enable inspection agency for performing Inspection. If any test equipment is found not complying with proper safety requirements then the Inspection Agency may withhold inspection, till such time the desired safety requirements are met.

12.1 DAILY HSE CHECKS

Both the Site Supervisors and safety officer of Subcontractor are to conduct daily site Safety inspection around work activities and premises to ensure that work methods and the sites are maintained to an acceptable standard. The following are to form the common subjects of a daily safety inspection:

- Personal Safety wears & gear compliance.
- Complying with site safety rules and permit-to-work (PTW).
- Positions and postures of workers.
- Use of tools and equipment etc. by the workers.

The inspection should be carried out just when work starts in beginning of the day, during peak activities period of the day and just before the day's work ends.

12.2 INSPECTION OF PPE

- PPEs shall be inspected by HSE officer at random once in a week as per format no. HSEP:14-F06 for its compliance to standard and compliance to use and any adverse observation shall be recorded in the PPE register.
- The applicable PPEs for carrying out particular activities are listed below.

	HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE OPERATION by SUBCONTRACTORS	Doc no.: HSEP: 14
		REV: 01
	POWER SECTOR	Date: 20.01.2020
		Page: 30 of 43

12.3 INSPECTION OF T&Ps

- A master list of T&Ps shall be maintained by each subcontractor.
- All T&Ps being used at site shall be inspected by HSE officer once in a month as per format no. HSEP:14-F07 for its healthiness and maintenance.
- The T&Ps which require third party inspection shall be checked for its validity during inspection. The third party test certificate should be accompanied with a copy of the concerned competent person's valid qualification record.
- The validity of T&P shall be monitored as per "Status of T&Ps" format no. HSEP:14-F08

12.4 INSPECTION OF CRANES AND WINCHES

- Cranes and winches shall be inspected by the operator through a daily checklist for its safe condition (as provided by the equipment manufacturer) before first use of the day.
- Cranes and Winches shall be inspected by HSE officer once in a month as per format no. HSEP:14-F09 for healthiness, maintenance and validity of third party inspection.
- The date of third party inspection and next due date shall be painted on cranes and winches.
- The operators/drivers shall be authorized by sub-contractor based on their competency and experience and shall carry the I-card.
- The operator should be above 18 years of age and should be in possession of driving license of HMV man & goods), vision test certificate and should have minimum qualification so that he can read the instructions and check list.

12.5 INSPECTION ON HEIGHT WORKING

- Inspection on height working shall be conducted daily by supervisors before start of work to ensure safe working condition including provision of
 - o Fall arrestor
 - o Lifelines
 - o Safety nets
 - o Fencing and barricading
 - o Warning signage
 - o Covering of opening
 - o Proper scaffolding with access and egress.
 - o Illumination
- Inspection on height working shall be conducted once in a week by HSE officer as per format no. HSEP:14-F10.
- Medical fitness of height worker shall be ensured.
- Height working shall not be allowed during adverse weather.

12.6 INSPECTION ON WELDING AND GAS CUTTING OPERATION

- Supervisor shall ensure that no flammable items are available in near vicinity during welding and gas cutting activity.
- Gas cylinders shall be kept upright.
- Use of Flash back arrestor shall be ensured at both ends.



**HEALTH, SAFETY AND ENVIRONMENT
PLAN FOR
SITE OPERATION by SUBCONTRACTORS**

POWER SECTOR

Doc no.: HSEP: 14

REV: 01

Date: 20.01.2020

Page: 31 of 43

- Inspection during welding and gas cutting operations shall be carried out by HSE officer once a month as per format no. HSEP:14-F11.
- Use of fire blanket to be ensured to avoid falling of splatters during welding or gas cutting operation at height.
- Availability of fire extinguisher at vicinity shall be ensured.

12.7 INSPECTION ON ELECTRICAL INSTALLATION / APPLIANCES

- Ensure proper earthing in electrical installation
- Use ELCB at electrical booth
- Electrical installation shall be properly covered at top where required
- Use appropriate PPEs while working
- Use portable electrical light < 24 V in confined space and potentially wet area.
- Monthly inspection shall be carried out as per format no. HSEP:14-F12.

12.8 INSPECTION OF ELEVATOR

- Elevators shall be inspected by concerned supervisors once in a week as per format no. HSEP:14-F13.
- All elevators shall be inspected by competent person and validity shall be ensured.
- The date of third party inspection and next due date shall be painted on elevator.

12.9 INSPECTION OF EXCAVATION

Excavation activities shall be inspected as per Format HSEP:14-F13A

13.0 HSE PERFORMANCE

- Contractor shall be assessed on monthly basis for HSE Compliance by BHEL Safety In-charge at site. The HSE compliance shall be based on Online HSE Evaluation System of BHEL as per Format No. HSEP:14-F33.
- BHEL shall reserve the right to use this assessment for evaluating bidder's capacity for future tenders
- Suitable HSE reward system shall be developed at site level to promote HSE compliance amongst workmen by the subcontractor.
To decide HSE reward, performance towards HSE shall be evaluated for workmen and it shall be awarded regularly in public gathering.
- If safety record of the subcontractor in execution of the awarded job is to the satisfaction of safety department of BHEL, issue of an appropriate certificate to recognize the safety performance of the subcontractor may be considered by BHEL after completion of the job.

	HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE OPERATION by SUBCONTRACTORS	Doc no.: HSEP: 14
		REV: 01
	POWER SECTOR	Date: 20.01.2020
		Page: 32 of 43

14.0 HSE PENALTIES

- As per contractual provision HSE penalties shall be imposed on subcontractors for non-compliance on HSE requirement as per format no. HSEP:14-F14. The list in the format is only indicative. For any other violation, not listed in the format, the minimum penalty amount is to be decided as per BOCW act.
- If principal customer/statutory and regulatory bodies impose some penalty on HSE due to the non-compliance of the subcontractor the same shall be passed on to them.
- The penalty amount shall be recovered by Site Finance department from subcontractors from the RA/Final bill.

15.0 OTHER REQUIREMENTS

- In case of any delay in completion of a job due to mishaps attributable to lapses by the subcontractor, BHEL shall have the right to recover cost of such delay from the payments due to the subcontractor, after notifying the subcontractor suitably.
- If the subcontractor fails to improve the standards of safety in its operation to the satisfaction of BHEL after being given reasonable opportunity to do so and/or if the subcontractor fails to take appropriate safety precautions or to provide necessary safety devices and equipment or to carry out instruction regarding safety issued by BHEL, BHEL shall have the right to take corrective steps at the risk and cost of the subcontractor after giving a notice of not less than 7 days indicating the steps that would be taken by BHEL.
- If the subcontractor succeeds in carrying out its job in time without any fatal or disabling injury incident and without any damage to property BHEL may, at its sole discretion, favorably consider to reward the subcontractor suitably for the performance.
- In case of any damage to property due to lapses by the subcontractor, BHEL shall have the right to recover the cost of such damages from the subcontractor after holding an appropriate enquiry.
- The subcontractor shall take all measures at the sites of the work to protect all persons from incidents and shall be bound to bear the expenses of defense of every suit, action or other proceeding of law that may be brought by any persons for injury sustained or death owing to neglect of the above precautions and to pay any such persons such compensation or which may with the consent of the subcontractor be paid to compromise any claim by any such person, should such claim proceeding be filed against BHEL, the subcontractor hereby agrees to indemnify BHEL against the same.
- The subcontractor shall not employ men below the age of 18 years and women on the work of painting with products containing lead in any form. Wherever men above the age of 18 are employed on the work of lead painting, overalls shall be supplied by the subcontractor to the workmen and adequate facilities shall be provided to enable the working painters to wash during the cessation of work.
- The subcontractor shall notify BHEL of his intention to bring to site any equipment or material which may create hazard.
- BHEL shall have the right to prescribe the conditions under which such equipment or materials may be handled and the subcontractor shall adhere to such instructions.



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE OPERATION by SUBCONTRACTORS

POWER SECTOR

Doc no.: HSEP: 14

REV: 01

Date: 20.01.2020

Page: 33 of 43

- BHEL may prohibit the use of any construction machinery, which according to the organization is unsafe. No claim for compensation due to such prohibition will be entertained by BHEL.

16. NON COMPLIANCE

NONCONFORMITY OF SAFETY RULES AND SAFETY APPLIANCES WILL BE VIEWED SERIOUSLY AND BHEL HAS RIGHT TO IMPOSE FINES ON THE SUBCONTRACTOR AS UNDER FOR EVERY INSTANCE OF VIOLATION NOTICED:

SN	Violation of Safety Norms	Fine (in Rs)
01	Not Wearing Safety Helmet	200/- *
02.	Not wearing Safety Belt or not anchoring life line	500/-*
03	Not wearing safety shoe	200/-*
04	Not keeping gas cylinders vertically	200/-
05	Not using flash back arrestors	100/-
06	Not wearing gloves	50/- *
07.	Grinding Without Goggles	50/- *
08.	Not using 24 V Supply For Internal Work	500/-
09.	Electrical Plugs Not used for hand Machine	100/-
10.	Not Sliding properly	200/-
11.	Using Damaged Sling	200/-
12.	Lifting Cylinders Without Cage	500/-
13.	Not Using Proper Welding Cable With Lot of Joints And Not Insulated Property.	200/-
14.	Not Removing Small Scrap From Platforms	500/-
15.	Gas Cutting Without Taking Proper Precaution or Not Using Sheet Below Gas Cutting	500/-
16.	Not Maintaining Electric Winches Which are Operated Dangerously	500/-
17.	Improper Earthing Of Electrical T&P	500/-
18	No or improper barricading	500/-
19.	Activity carried out without Safety work permit (Height work, Lifting activity, Hot work-each person/case)	1000/-
20.	Incident Resulting in Partial Loss in Earning Capacity	25,000/- per victim
21.	Fatal Incident Resulting in total loss in Earning Capacity	1,00,000/- per victim for first instance #

• Legend:-

*: per head. For repeated violation by the same person, the penalty would be double of the previous penalty. Date of "Repeated violation" will be counted from subsequent days.

#: or as deducted by customer, whichever is higher. For repeated fatal incident in the same Unit incremental penalty to be imposed. The subcontractor will pay 2 times the penalty compared to previously paid in case there are repeated cases of fatal incidents under the same subcontractor for the same package in the same unit.

Any other non-conformity noticed not listed above will also be fined as deemed fit by BHEL. The decision of BHEL engineer is final on the above. The amount will be deducted from running bills of the subcontractor. The amount collected above will be utilized for giving award to the employees who could avoid incident by following safety rules. Also the amount will be spent for purchasing the safety appliances and supporting the safety activity at site.



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE OPERATION by SUBCONTRACTORS

Doc no.: HSEP: 14

REV: 01

Date: 20.01.2020

Page: 34 of 43

POWER SECTOR

17.0 HSE AUDIT/INSPECTION

- Regular HSE Audit/inspection shall be carried out by Subcontractor as per Site HSE audit calendar.
- HSE checklist (**Annexure 02**) shall be used for carrying out audit/inspection and report shall be submitted to BHEL site management
- All non-conformities and observations on HSE identified during internal or external HSE audit shall be disposed off by site in a time bound manner and reported back the implementation status
- Corrective action and Preventive action on HSE issues raised by certification body issued by Regional HQs shall be implemented by site and reported to Site management.

18.0 MONTHLY HSE REVIEW MEETING

- II Site shall hold HSE review meeting every month to discuss and resolve HSE issues of site and improve HSE performance. It will also discuss the incidents occurred since previous meeting, its root cause and Corrective action and Preventive action. The agenda is given below:
 - o Implementation of earlier MOM
 - o HSE performance
 - o HSE inspection
 - o HSE audit and CAPA
 - o HSE training
 - o Health check-up camp
 - o HSE planning for the erection and commissioning and installation activities in the coming month
 - o HSE reward and promotional activities
- II The meeting shall be chaired by Construction Manager, convened by HSE coordinator and attended by all HOS, Site Incharge of Subcontractors and HSE officer of Subcontractors.
- MOM on the discussion will be circulated to the concerned for implementation.

19.0 FORMATS USED (Details available in Annexure-04)

SL. No.	Format Name	Format No.	Rev No.
01	Inspection of First Aid Box	HSEP:14-F01	00
02	Health Check Up	HSEP:14-F02	00
03	HSE Induction Training	HSEP:14-F03	00
04	Tool Box Talk	HSEP:14-F04	00
05	Monthly Site HSE Report	As specified by BHEL	00
06	Inspection of PPE	HSEP:14-F06	00



**HEALTH, SAFETY AND ENVIRONMENT
PLAN FOR
SITE OPERATION by SUBCONTRACTORS**

Doc no.: HSEP: 14

REV: 01

Date: 20.01.2020

Page: 35 of 43

POWER SECTOR

07	Inspection of T&Ps	HSEP:14-F07	00
08	Status of T&Ps	HSEP:14-F08	00
09	Inspection of Cranes and Winches	HSEP:14-F09	00
10	Inspection on Height Working	HSEP:14-F10	00
11	Inspection on Welding & Gas Cutting	HSEP:14-F11	00
12	Inspection on Electrical Installation	HSEP:14-F12	00
13	Inspection on Elevator	HSEP:14-F13	00
14	HSE Penalty	HSEP:14-F14	00
15	Accident /incident / property damage /fire incident report	HSEP:14-F15	00



**HEALTH, SAFETY AND ENVIRONMENT
PLAN FOR
SITE OPERATION by SUBCONTRACTORS**

POWER SECTOR

Doc no.: HSEP: 14

REV: 01

Date: 20.01.2020

Page: 36 of 43

20.0 ANNEXURES

ANNEXURE 01

As per Contract Labour (Regulation & Abolition Act), Central Rules, 1971,

- (1) The first-aid box shall be distinctively marked with a Red Cross on a white background and shall contain the following items, namely:

(a) For establishments in which the number of contract labour employed does not exceed fifty, each first aid box shall contain the following equipment:

(i)	6 small sterilized dressings
(ii)	3 medium size sterilized dressings
(iii)	3 large size sterilized dressings
(iv)	6 pieces of sterilized eye pads in separate sealed packets.
(v)	6 roller bandages 10 cm wide.
(vi)	6 roller bandages 5 cm wide.
(vii)	One tourniquet
(viii)	A supply of suitable splints
(ix)	Three packets of safety pins.
(x)	Kidney tray.
(xi)	3 large sterilized burn dressings.
(xii)	1 (30ml) bottle containing a two percent alcoholic solution of iodine
(xiii)	1 (30 ml) bottle containing Sal volatile having the dose and mode of administration indicated on the label
(xiv)	1 snake bite lancet
(xv)	1 (30gms) bottle of potassium permanganate crystals.
(xvi)	1 pair scissors
(xvii)	1 copy of the First-Aid leaflet issued by the Director General, Factory Advice Service and Labour Institutes, Government of India.
(xviii)	A bottle containing 100 tablets (each of 5 grains) of aspirin
(xix)	Ointment for burns
(xx)	A bottle of suitable surgical anti-septic solution

(b) For establishment in which the number of contract labour exceeds fifty each first-aid box shall contain the following equipment:

(i)	12 small sterilized dressings
(ii)	6 medium size sterilized dressings
(iii)	6 large size sterilized dressings.
(iv)	6 large size sterilized burn dressings
(v)	6 (15 grams) packets sterilized cotton wool
(vi)	12 pieces of sterilized eye pads in separate sealed packets.



**HEALTH, SAFETY AND ENVIRONMENT
PLAN FOR
SITE OPERATION by SUBCONTRACTORS**

POWER SECTOR

Doc no.: HSEP: 14

REV: 01

Date: 20.01.2020

Page: 37 of 43

(vii)	12 roller bandages 10 cm wide.
(viii)	12 roller bandages 5 cm wide.
(ix)	One tourniquet.
(x)	A supply of suitable splints.
(xi)	Three packets of safety pins.
(xii)	Kidney tray.
(xiii)	Sufficient number of eye washes bottles filled with distilled water or suitable liquid clearly indicated by a distinctive sign which shall be visible at all times.
(xiv)	4 per cent Xylocaine eye drops, and boric acid eye drops and soda by carbonate eye drops.
(xv)	1 (60ml) bottle containing a two percent alcoholic solution of iodine
(xvi)	One (two hundred ml) bottle of mercurochrome (2 per cent) solution in water.
(xvii)	1 (120ml) bottle containing Sal volatile having the dose and mode of administration indicated on the label.
(xviii)	1 roll of adhesive plaster (6 cmX1 meter)
(xix)	2 rolls of adhesive plaster (2 cmX1 meter)
(xx)	A snake bite lancet.
(xxi)	1 (30 grams) bottle of potassium permanganate crystals.
(xxii)	1 pair scissors
(xxiii)	1 copy of the First-Aid leaflet issued by the Director-General, Factory Advice service and labour Institutes, Government of India.
(xxiv)	a bottle containing 100 tablets (each of 5 grains) of aspirin
(xxv)	Ointment for burns
(xxvi)	A bottle of a suitable surgical anti septic solution.

(2) Adequate arrangement shall be made for immediate recoupment of the equipment when necessary.



HEALTH, SAFETY AND ENVIRONMENT
PLAN FOR
SITE OPERATION by SUBCONTRACTORS

POWER SECTOR

Doc no.: HSEP: 14

REV: 01

Date: 20.01.2020

Page: 38 of 43

ANNEXURE 02

HSE AUDIT/INSPECTION CHECKLIST CUM COMPLIANCE REPORT

PROJECT: _____

SUBCONTRACTOR: _____

DATE : _____

OWNER : _____

INSPECTION BY: _____

Note : write 'NA' wherever the items is not applicable

Item	Y e s	N o	Remarks	Action
HOUSEKEEPING				
Waste containers provided and used				
Passageways and walkways clear				
General neatness of working area				
Other				
PERSONNEL PROTECTIVE EQUIPMENTS				
Goggles; shields				
Face protection				
Hearing protection				
Respiratory masks etc.				
Safety belts				
Other				
EXCAVATIONS / OPENINGS				
Openings properly covered or barricaded				
Excavations shored				
Excavations barricaded				
Overnight lighting provided				
Other				
WELDING, CUTTING				
Gas cylinders chained upright				
Cable and hoses not obstructing				
Fire extinguisher (s) accessible				
Others				
SCAFFOLDING				
Fully decked platforms				
Guard and intermediate rails in place				
Toe boards in place				
Adequate shoring				
Adequate access				
Others				
LADDER				
Extension side rails 1 m above				
Top of landing				
Properly secured				



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE OPERATION by SUBCONTRACTORS

Doc no.: HSEP: 14

REV: 01

Date: 20.01.2020

Page: 39 of 43

POWER SECTOR

Angle + 70° from horizontal				
Other				
HOISTS, CRANES AND DERRICKS				
Condition of cables and sheaf OK				
Condition of slings, chains, hooks OK				
Inspection & maintenance log maintained				
Outriggers used				
Signals observed and understood				
Qualified operators				
Others				
MACHINERY, TOOLS & EQUIPMENT				
Proper instruction				
Safety devices				
Proper cords				
Inspection and maintenance				
Other				
VEHICLE AND TRAFFIC				
Rules and regulations observed				
Inspection and maintenance				
Licensed drivers				
Other				
TEMPORARY FACILITIES				
Emergency instructions posted				
Fire extinguishers provided				
Fire-aid equipment available				
General neatness				
Others				
FIRE PREVENTION				
Personnel instructed				
Fire extinguishers checked				
No smoking in prohibited areas.				
Hydrants				
Clearance				
Others				
ELECTRICAL				
Proper wiring				
ELCB's provided				
Ground fault circuit interrupters				
Protection against damage				
Prevention of tripping hazards				
Other				
HANDLING & STORAGE OF MATERIALS				
Properly stored or stacked				
Passageways clear				
Other				
FLAMMABLE GASES AND LIQUIDS				
Containers clearly identified				
Proper storage				
Fire extinguisher nearby				



HEALTH, SAFETY AND ENVIRONMENT PLAN FOR SITE OPERATION by SUBCONTRACTORS

POWER SECTOR

Doc no.: HSEP: 14

REV: 01

Date: 20.01.2020

Page: 40 of 43

Other				
WORKING AT HEIGHT				
Safety nets				
Safety belts				
Safety helmets				
Anchoring of safety belt to the life line rope				
ENVIRONMENT				
Lubricant waste/engine oils properly dispose.				
Waste from Canteen, offices, sanitation etc. disposed properly.				
Disposal of surplus earth, stripping materials, expired batteries, oily rags and combustible materials done properly.				
HEALTH CHECKS				
Hygienic conditions at labor camps O.K.				
Availability of first-aid facilities				
Proper sanitation at site, office & labor camps.				
Arrangement of medical facilities.				
Measures for dealing with illness.				
Availability of potable drinking water for workmen & staff.				
Provision of crèches for children.				



**HEALTH, SAFETY AND ENVIRONMENT
PLAN FOR
SITE OPERATION by SUBCONTRACTORS**

POWER SECTOR

Doc no.: HSEP: 14

REV: 01

Date: 20.01.2020

Page: 41 of 43

ANNEXURE 03

REFERENCES

- Contract documents
- Relevant legislations
- HSEMSM
- Relevant Indian standards as listed below (illustrative only):

SL NO	CODE NAME	TITLE
(1)	IS : 818-1888 (Reaffirmed 2003)	Code of Practice for safety and health requirements in Electric and Gas Welding and Cutting operations.
(2)	IS: 1179-1967 (Reaffirmed 2003)	Specification for Equipment for Eye & Face protection during welding.
(3)	IS : 1989 (Part 2):1986 (Reaffirmed 1997)	Specification for Leather Safety Boots & Shoes
(4)	IS:2925 – 1984 (Reaffirmed 2010)	Specification for Industrial Safety Helmets
(5)	IS:3521 : 1999 (Reaffirmed 2002)	Industrial Safety Belts & Harnesses-Specification
(6)	IS:3646(Part II) – 1966 (Reaffirmed 2003)	Code of Practice for Interior Illumination
(7)	IS:3696 (Part I) – 1987 (Reaffirmed 2002)	Safety Code for Scaffolds and Ladders
(8)	IS: 3696(Part 2) : 1991 (Reaffirmed 2002)	Scaffolds and Ladders-Code of Safety
(9)	IS:3786 – 1983 (Reaffirmed 2002)	Method for Computation of Frequency and Severity Rates for Industrial Injuries and Classification of Industrial Incidents
(10)	IS:4770 : 1991 (Reaffirmed 2006)	Rubber Gloves – Electricals purposes-Specification
(11)	IS:4912 : 1978 (Reaffirmed 2002)	Safety Requirements for Floor and Wall Openings, Railings and Toe Boards
(12)	IS: 5983 – 1980 (Reaffirmed 2002)	Specification for Eye-Protectors
(13)	IS:6519 – 1971 (Reaffirmed 1997)	Code of Practice for Selection, Care and Repair of Safety Footwear
(14)	IS:9167:1979	Specification for Ear-Protectors
(15)	IS:6994(Part I)-1973 (Re affirmed 1996)	Specification for Industrial Safety Gloves Leather and Cotton Gloves
(16)	IS:8519 – 1977 (Reaffirmed 1983)	Guide for Selection of Industrial Safety Equipment for Body Protection.
(17)	IS 11006 : 2011	Flash Back(Flame Arrestor) Specification



**HEALTH, SAFETY AND ENVIRONMENT
PLAN FOR
SITE OPERATION by SUBCONTRACTORS**

Doc no.: HSEP: 14

REV: 01

POWER SECTOR

Date: 20.01.2020

Page: **42 of 43**

(18)	IS:8520 – 1977 (Reaffirmed 2002)	Guide for Selection of Industrial Safety Equipment for Eye, Face and Ear Protection.
(19)	IS:9473:2002	Respiratory Protective Devices-Filtering Half Masks to protect against Particles-Specification.
(20)	IS:9944:1992 (Reaffirmed 2003)	Natural and Man-made Fiber Rope Slings-Recommendations on Safe working loads.
(21)	IS:11057 – 1884 (Reaffirmed 2001)	Specification for Industrial Safety Nets
(22)	IS:12254:1993 (Reaffirmed 2002)	Polyvinyl Chloride (PVC) Industrial Boots-Specification
(23)	IS:13367(Part 1):1992 (Reaffirmed 2003)	Safe Use of Cranes-Code of Practice
(24)	IS:14166:1994 (Reaffirmed 2002)	Respiratory Protective Devices-Full Face Masks Specification
(25)	IS:14746 : 1999 (Reaffirmed 2003)	Respiratory Protective Devices-Half Masks and Quarter Masks - Specification
(26)	IS : 15397 :2003 (Reaffirmed 2008)	Portable Extinguisher Mechanical Foam Type(Stored Pressure)-Specification
(27)	IS: 19011:2002	Guidelines for Quality and/or Environmental Management Systems Auditing



**HEALTH, SAFETY AND ENVIRONMENT
PLAN FOR
SITE OPERATION by SUBCONTRACTORS**

POWER SECTOR

Doc no.: HSEP: 14

REV: 01

Date: 20.01.2020

Page: **43 of 43**

**ANNEXURE 04 : SAFETY FORMATS
&
ANNEXURE 05 : WORK PERMIT FORMATS**

**POWER SECTOR****INSPECTION OF FIRST AID BOX**

FORMAT NO: HSEP:14-F01

REV NO.: 00

PAGE NO. 01 OF 02

Name of Site :	
Name of Sub-Contractor :	
Inspected by :	
Date of Inspection :	

Number of employees on the site: - _____

Sl.No.	Item	No. Available	Remarks
1	No. of small sterilized dressings		
2	No of medium sized sterilized dressings		
3	No of large sized sterilized dressings.		
4	No of large sized sterilized burn dressings		
5	No of (15 grams) packets sterilized cotton wool		
6	No of pieces of sterilized eye pads in separate sealed packets.		
7	No of roller bandages 10 cm wide.		
8	No of roller bandages 5 cm wide.		
9	Whether tourniquet available		
10	Whether supply of Suitable splints available.		
11	No of packets of safety pins.		
12	Whether kidney tray available		
13	Whether sufficient number of eye wash bottles, filled with distilled water or suitable liquid, clearly indicated by a distinctive sign which shall be visible at all times, available.		
14	Whether 4%-xylocaine eye drops, and boric acid eye drops and soda by carbonate eye drops available.		
15	Whether (60ml) bottle containing a two percent alcoholic solution of iodine available		
16	Whether (two hundred ml) bottle of mercurochrome (2 per cent) solution in water available.		

**POWER SECTOR****INSPECTION OF FIRST AID BOX**

FORMAT NO: HSEP:14-F01

REV NO.: 00

PAGE NO. 02 OF 02

Sl.No.	Item	No. Available	Remarks
17	Whether 120ml bottle containing Sal volatile having the dose and mode of administration indicated on the label, available.		
18	Whether roll of adhesive plaster (6 cmX1 meter) available		
19	No of rolls of adhesive plaster (2 cmX1 meter)		
20	Whether snake bite lancet available.		
21	Whether (30 grams) bottle of potassium permanganate crystals available.		
22	Whether a pair scissors available		
23	Whether copy of the First-Aid leaflet issued by the Director-General, Factory Advice service and labour Institutes, Government of India available.		
24	Whether bottle containing 100 tablets (each of 5 grains) of aspirin available		
25	Whether Ointment for burns available		
26	Whether bottle of a suitable surgical anti-septic solution available		

Signature of Subcontractor's Site I/C:

**POWER SECTOR****HEALTH CHECK UP**

FORMAT NO: HSEP:14-F02

REV NO.: 00

PAGE NO. 1 OF 02

Name of Site :	
Name of Sub-Contractor :	
Name of Employee :	

NAME:

History Of Past Illness	H/O Epilepsy
	H/O Drug Allergy
	H/O Diabetics/ Hypertension
	H/O Unconsciousness
Personal History	
EXAMINATION	
OBSERVATION	
<u>General Physical Examination</u>	
Height	:
Weight	:
BMI	:
Built And nourishment	:
Pallor	:
Temperature	:
Chest Expansion	: Inspiration Expansion
Lymph Node Enlargement	:
<u>Ear, Nose, Throat</u>	:
Ear	:
Nose	:
Throat	:

**POWER SECTOR****HEALTH CHECK UP**

FORMAT NO: HSEP:14-F02

REV NO.: 00

PAGE NO. 2 OF 02

EXAMINATION	OBSERVATION
<u>Cardiovascular System Examination :</u>	
Inspection :	
Palpation :	Pulse BP
Auscultation (Heart Sounds) :	
<u>Respiratory System :</u>	
Inspection :	Respiratory Rate
Palpation:	
Percussion :	
Auscultation (Breath Sounds) :	
<u>Examination of Abdomen :</u>	
Inspection :	
Palpation :	
Auscultation (Bowel Sounds) :	
Any Other :	
Clinical Impression	

Signature of the examining doctor

**POWER SECTOR****HSE INDUCTION TRAINING**

FORMAT NO: HSEP:14-F03

REV NO.: 00

PAGE NO. 01 OF 01

Name of Site :	
Name of Sub-Contractor :	
Date :	
Name of Training Co-ordinator	

Sl No.	Name	Designation	Organisation	Signature

Signature of Training co-ordinator :

	POWER SECTOR	FORMAT NO: HSEP:14-F04 REV NO.: 00 PAGE NO. 01 OF 01
	TOOL-BOX TALK	

Name of Site :	
Sub-Contractors Name :	
Date :	

Topic	Name of person delivered Tool Box Talk	No. of Participants attended	Remarks

Signature of Site I/C of Subcontractor :

	POWER SECTOR	FORMAT NO: HSEP:14-F06 REV NO.: 00 PAGE NO. 01 OF 01
	PERSONAL PROTECTIVE EQUIPMENTS	

Name of Site :	
Name of Sub-Contractor :	
Inspected by :	
Date of Inspection :	

Item	Issued this Month	Nos. Issued up to the Month	Percentage of usage at site
Safety Helmet			
Safety Shoes			
Full Body Harness			
Fall Arrestor			
Safety Nets			
Other PPEs.			

Signature of Site I/C of Subcontractor :

**POWER SECTOR****INSPECTION OF T&Ps**

FORMAT NO: HSEP:14-F07

REV NO.: 00

PAGE NO. 01 OF 01

Name of Site :	
Name of Sub-Contractor :	
Date of Inspection :	

Sl.No.	Description	Remarks
1.0	Name of equipment	
2.0	Basic Information of equipment	
2.1	Specification	
2.2	Sr. No. of equipment	
2.3	Make	
2.4	Year of manufacture	
3.0	Major repairs / overhauls(Furnish details of work carried out)	Date(s) of major repair/overhaul
3.1		
3.2		
3.3	Repairs carried out at site	
4.0	Any performance test conducted	Yes/No
5.0	Document Submitted	Yes/No
6.0	Manufacturer's test / guarantee certificate	Available/ Not available
7.0	Performance test	Done/ Not Done
8.0	Acceptance Norms	
9.0	Committee Observations	
10.0	Date of next review (if accepted)	

Signature-Site Safety Officer (BHEL)

Signature-Subcontractor/ Subcontractor's
Safety Officer

	POWER SECTOR	FORMAT NO: HSEP:14-F08 REV NO.: 00 PAGE NO. 01 OF 01
	STATUS OF T&Ps	

Name of Site	
Name of Sub-Contractor	
Date of Inspection	

Item	Nos. Deployed	Identification No.	Nos. Tested by competent person	Validity of Test Certificate
Winches				
Chain Blocks				
Wire Rope Slings				
Man Cages				
D-Shackles				
Air Compressors				
Crawler Cranes				
Mobile Cranes				
Hydra Cranes				
Others				

Signature of Site I/C of subcontractor:

**POWER SECTOR****INSPECTION OF CRANES AND WINCHES**

FORMAT NO: HSEP:14-F09

REV NO.: 00

PAGE NO. 01 OF 03

Name of Site :	
Name of Sub-Contractor :	
Inspected by :	
Date of Inspection:	

Crane Reg. No (Make/Model)

Name of Driver/Operator

Sl.no.	Description	Observation	Measures
1	Valid Driving license		
2	Hook & Hook Latch		
3	Over Hoist limit switch		
4	Boom limit switch		
5	Boom Angle Indicator		
6	Boom limit cutoff switch		
7	Condition of Boom		
8	Condition of ropes		
9	Number of load lines		
10	Size and condition of the slings		
11	Stability of the cranes		
12	Soil Condition		
13	Swing Break And Lock		
14	Proper Break And Lock		
15	Hoist Break And Lock		
16	Boom Break And Lock		
17	Main Clutch		
18	Leakage in Hydraulic Cylinders		
19	Out riggers fully extendable		
20	Tyre pressure		
21	Condition of Battery And Lamps		

**POWER SECTOR****INSPECTION OF CRANES AND WINCHES**

FORMAT NO: HSEP:14-F09

REV NO.: 00

PAGE NO. 2 OF 03

Sl.no.	Description	Observation	Measures
22	Guards of moving and rotating parts		
23	Load chart provided		
24	Number and position of pedant ropes		
25	Reverse Horn		
26	Load Test Details		
27	Operator's fitness		
28	Pollution under control certificate		
29	Fire extinguisher of appropriate type.		
30	Training of the operator		

WINCH

Sl. No.	Description	YES	NO	NA	Remarks
1	Has the copy of Third Party Inspection certificate been provided in winch machine shed?				
2	Is winch machine operator experienced enough to operate the winch machine?				
3	Is the winch machine operated by someone other than the winch machine operator?				
4	Is there guard provided in all moving parts like wheel and motor's shaft?				
5	Will it protect against unforeseen operational contingencies?				
6	Are brakes, clutch and locking arrangement working properly?				
7	Has it been ensured that the guard does not constitute a hazard by itself?				
8	Are the cranks and the connecting rods protected by guardrails?				
9	Is there provision for fully covered shed with wooden plank roof?				

**POWER SECTOR****INSPECTION OF CRANES AND WINCHES**

FORMAT NO: HSEP:14-F09
REV NO.: 00
PAGE NO. 3 OF 03

Sl. No.	Description	YES	NO	NA	Remarks
10	Is wire rope free from any kind of damage or wear and tear?				
11	Is split pin provided for the protection of clutch and brake locking arrangement?				
12	Is pulley inspected by competent person and certified before use?				
13	Is pulley free from any wear and tear visually?				
14	Is winch rope barricaded with clipsheet for the protection of rope and person?				
15	Is the wire rope lubricated by cardium oil?				
16	Is there any friction in wire rope which may damage the wire rope rather than the rolling parts?				
17	Is there any oil leakage in the hydraulic system of the winch machine?				
18	Has it been ensured that the guard will not cause discomfort or inconvenience to operator?				
	Total Number of NO:				
	Total Number of NA:				
	% Compliance :				

Signature of Site I/C of subcontractor :

	POWER SECTOR	FORMAT NO: HSEP:14-F10 REV NO.: 00 PAGE NO. 01 OF 02
	INSPECTION OF HEIGHT WORKING	

Name of Site :	
Name of Sub-Contractor :	
Inspected by :	
Date of Inspection:	

Sl. No.	Descriptions	Observation (Yes/No)	Remarks
1	All the workers have been explained safe work method?		
2	An established communication system has been established and explained to the workers.		
3	Adequate illumination has been ensured.		
4	Work area inspected prior to the start of the work.		
5	Area below the work place barricaded, particularly below hot work.		
6	Workers provided with bags /box to carry bolts, nuts and hand tools		
7	Arrangement for fastening hand tools made.		
8	All work platforms ensured to be of adequate strength and ergonomically suitable.		
9	Fabricated makeshift arrangements are checked for quality and type of material welding, anchoring etc.		
10.	Work at more than one elevation at the same segment is restricted.		
	ACCESS/EGRESS		
1	Walkways provided with handrail, mid-rail and toe guard?		
2	All checkered plates, gratings properly welded/ bolted?		
3	Are ladders inspected and they are in good condition?		
4	Are ladders spliced?		
5	Are ladders properly secured to prevent slipping, sliding or falling?		
6	Do side rails extend 36" above top landing?		
7	Are built up ladders constructed of sound materials?		

**POWER SECTOR****INSPECTION OF HEIGHT WORKING**

FORMAT NO: HSEP:14-F10

REV NO.: 00

PAGE NO. 02 OF 02

Sl. No.	Descriptions	Observation (Yes/No)	Remarks
8	Are rugs and cleats not over 12" on center?		
9	Metal ladders not used around electrical hazards.		
10	Proper maintenance and storage.		
11	Ladders placed at right slope.		
12	Ladders / staircases welded/ bolted properly.		
13	Any obstruction in the stairs.		
14	Are landing provided with handrails, knee rails, toe boards etc.?		
15	Whether ramp is provided with proper slope.		
16	Proper hand rails / guards provided in ramps.		
	Housekeeping		
1	Walkways, aisles & all overhead workplaces cleared of loose material.		
2	Flammable materials, if any, are cleared.		
3	All the de shuttering materials are removed after de shuttering is done.		
4	Platforms and walkways free from oil/grease or other slippery material.		
5	Collected scrap are brought down or lowered down and not dropped from height.		
	PPE And Safety Devices		
1	Use of safety helmet, safety belts ensured for all workers		
2	Anchoring points provided at all places of work.		
3	Common lifeline provided wherever linear movement at height is required.		
4	Safety nets are use wherever required.		
5	Proper fall arrest system is deployed at critical workplaces.		
6	Crawler boards/Safety system or works on fragile roof are used.		

Signature of Site I/C of subcontractor :

**POWER SECTOR****INSPECTION OF WELDING AND GAS
CUTTING**

FORMAT NO: HSEP:14-F11
REV NO.: 00
PAGE NO. 1 OF 02

Name of Site	
Name of Sub-Contractor	
Inspected by	
Date of Inspection	

Welding				
Sl.no.	Description	Y e s	N o	Remarks
1	Is electric connection given through 30 mA ELCB/RCCB to welding m/c?			
2	Is electric cable fitted properly in junction box on m/c?			
3	Is electrical cable free from joints?			
4	Are the joints attached firmly & insulated with tape?			
5	Is double earthing given to body of m/c?			
6	Is the physical condition of the m/c good?			
7	Is ON/OFF switch connected to the m/c is working and in good condition?			
8	Are indication lamps on m/c working?			
9	Is the electrode holder in good condition?			
10	Are the cables of the welding m/c lugged & tight properly?			
11	Are return lead connected properly (Rod, Angle, Channels shall not be used)			
	Total No of NO			
	Total No of YES			

**POWER SECTOR****INSPECTION OF WELDING AND GAS
CUTTING**

FORMAT NO: HSEP:14-F11
REV NO.: 00
PAGE NO. 2 OF 02

Gas Cutting				
Sl. no	Description	Yes	No	Remarks
1	Are Cylinders kept on trolleys?			
2	Physical condition of Gas cylinders Good?			
3	Is there Oil/Grease on valve of the cylinder?			
4	Are pressure regulators in good condition?			
5	Condition of hose pipe OK?			
6	Are hose pipe clamped with hose clip?			
7	Is flash back arrestor & NRV fitted on torch both for O2 and LPG cylinder?			
8	Is nozzle of the torch cleaned?			
	Total Number of NO			
	Total No of YES			
	% Compliance			

Signature of Site I/C of subcontractor :

	POWER SECTOR	FORMAT NO: HSEP:14-F12 REV NO.: 00 PAGE NO. 01 OF 02
	INSPECTION OF ELECTRICAL INSTALLATION	

Name of Site	
Name of Sub-Contractor	
Inspected by	
Date of Inspection:	

Sr. No.	Contents	Yes/No	Remarks
A	Cable		
1.	Whether the condition of cable is checked?		
2.	Are cables received from other sites checked for insulation resistance before putting them into use?		
3.	Are all main cables taken either underground / overhead?		
4.	Are welding cables routed properly above the ground?		
5.	Are welding and electrical cables overlapping?		
6.	Is any improper joining of cables/wires prevailing at site?		
B	DBs/SDBs		
1.	Is earth conductor continued up to DB / SDB?		
2.	Whether DBs and extension boards are protected from rain / water?		
3.	Is there any overloading of DBs / SDBs?		
4.	Are correct / proper fuses & CBs provided at main boards and sub-boards?		
5.	Is energized wiring in junction boxes, CB panels & similar places covered all times?		
C	ELCB		
1.	Whether the connections are routed through ELCB?		
2.	Is ELCB sensitivity maintained at 30 mA?		

**POWER SECTOR****INSPECTION OF ELECTRICAL INSTALLATION**

FORMAT NO: HSEP:14-F12

REV NO.: 00

PAGE NO. 02 OF 02

Sr. No.	Contents	Yes/No	Remarks
3.	Are the ELCB numbered and tested periodically & test results recorded in a logbook countersigned by a competent person?		
D	Grounding		
1.	Is natural earthing ensured at the source of power (main DB at Generator or Transformer)?		
2.	Whether the continuity and tightness of the earth conductor are checked?		
3.	Mention the gauge of the earth conductor used at the site.		
4.	Mention the value of Earth Resistance.		
E	Electrically operated Machines or Accessories.		
1.	Whether the plug top is provided everywhere.		
2.	Are all metal parts of electrical equipment and light fittings / accessories grounded?		
3.	Is there any shed or cover for welding machines?		
4.	Are halogen lamps fixed at proper places?		
5.	Are portable power tools maintained as per norms?		
6.	Any other information:		

Signature of Site I/C of subcontractor :

**POWER SECTOR****INSPECTION OF ELEVATOR**

FORMAT NO: HSEP:14-F13

REV NO.: 00

PAGE NO. 01 OF 01

Name of Site	
Name of Sub-Contractor	
Inspected by	
Date of Inspection	

Sr. No.	Description	Remarks
1.0	Name of equipment	
2.0	Basic Information of equipment	
2.1	Specification	
2.2	Sr. No. of equipment	
2.3	Make	
2.4	Year of manufacture	
3.0	Major repairs/overhauls(Furnish details of work carried out)	Date(s) of major repair/overhaul
3.1		
3.2		
3.3	Repairs carried out at site	
4.0	Any performance test conducted	Yes/No
5.0	Document Submitted	Yes/No
6.0	Manufacturer's test / guarantee certificate	Available/ Not available
7.0	Performance test	Done/ Not Done
8.0	Acceptance Norms	
9.0	Committee Observations	
10.0	Date of next review (if accepted)	

Signature-Subcontractor/ Subcontractor's
Safety Officer

Signature-Site Safety Officer (BHEL)

	POWER SECTOR	FORMAT NO: HSEP:14-F13E REV NO.: 00 PAGE NO. 01 OF 01
	Inspection of Excavation	

Name of Site :	
Name of Sub-Contractor :	
Inspected by :	
Date of Inspection :	

Sl.no.	Description	Yes	No	Remarks
1	Precautions taken for Underground Electrical Cable			
2	Precautions taken for Under / Above ground sewer/ Drinking Water Line			
3	Precautions taken for Underground Telecommunication Line			
4	Precautions taken for Underground Product/Utility Line			
5	Precautions taken for Underground Fire Water Line			
6	Shoring / Shuttering / Sheet piling done to prevent collapse of excavation walls. Strength of Excavation wall ensured at all times			
7	Slope Cutting / Angle Maintained			
8	Hard Barricading & Edge Protection provided			
9	Separate Safe Access for Man and Vehicle			
10	Lighting arrangement			
11	Banksman Provided			
12	Required basic PPEs provided			
13	Excavated soil / Construction Material / equipment kept away from the edge.			
14	First aid in attendance.			
15	Other:			
	Total No of YES			

Signature-Subcontractor/ Subcontractor's Safety Officer

Signature-Site Safety Officer (BHEL)

**POWER SECTOR****HSE PENALTY**

FORMAT NO: HSEP:14-F14

REV NO.: 00

PAGE NO. 1 OF 02

Sub: MEMO for Penalty for non-compliances in Safety

Following lapse (tick marked) was observed and penalty is imposed as stated at the bottom of this memo. It is requested that such occurrences be please avoided in future.

Safety Area

SN	Violation of Safety Norms	Fine (in Rs)
01.	Not Wearing Safety Helmet	200/- *
02.	Not wearing Safety Belt or not anchoring life line	500/-*
03.	Not wearing safety shoe	200/-*
04.	Not keeping gas cylinders vertically	200/-
05.	Not using flash back arrestors	100/-
06.	Not wearing gloves	50/- *
07.	Grinding Without Goggles	50/- *
08.	Not using 24 V Supply For Internal Work	500/-
09.	Electrical Plugs Not used for hand Machine	100/-
10.	Not Slings properly	200/-
11.	Using Damaged Sling	200/-
12.	Lifting Cylinders Without Cage	500/-
13.	Not Using Proper Welding Cable With Lot of Joints And Not Insulated Property.	200/-
14.	Not Removing Small Scrap From Platforms	500/-
15.	Gas Cutting Without Taking Proper Precaution or Not Using Sheet Below Gas Cutting	500/-
16.	Not Maintaining Electric Winches Which are Operated Dangerously	500/-
17.	Improper Earthing Of Electrical T&P	500/-
18.	No or improper barricading	500/-
19.	Activity carried out without Safety work permit (Height work, Lifting activity, Hot work-each person/case)	1000/-
20.	Incident Resulting in Partial Loss in Earning Capacity	25,000/- per victim
21.	Fatal Incident Resulting in total loss in Earning Capacity	1,00,000/- per victim for first instance #

Legend: -

*: per head. For repeated violation by the same person, the penalty would be double of the previous penalty. Date of "Repeated violation" will be counted from subsequent days.

#: or as deducted by customer, whichever is higher. For repeated fatal incident in the same Unit incremental penalty to be imposed. The subcontractor will pay 2 times the penalty compared to previously paid in case there are repeated cases of fatal incidents under the same subcontractor for the same package in the same unit.

**POWER SECTOR****HSE PENALTY**

FORMAT NO: HSEP:14-F14

REV NO.: 00

PAGE NO. 2 OF 02

Details (if any) related to non- compliance (Name of persons, Nature of deficiency, etc.)

Penalty imposed:

1, Rate as per above chart _____

2. No. of Persons/ machine/ event/ labour _____

3. Total Penalty= 1. X 2. = _____

Signature:

Witnessed by: (Sub- Contractor representative) (BHEL Personnel)

Name _____

Name _____

Distribution: 1 Copy: to Sub- contractor,

1 Copy to Site Construction Manager (BHEL)

	POWER SECTOR- HQ	FORMAT NO: HSEP:14-F15 REV NO.: 00 PAGE NO. 01 OF 01
	Incident Report (To be submitted within 24 hours of time of incident)	

Type of incident: Fatal/Major/ Minor/Fire/Property Damage/Near-miss

1	NAME OF SITE		3	ACTIVITY AREA	
2	SCOPE OF WORK		4	NAME OF CONTRACTOR	
			5	NAME & DESIGNATION OF BHEL ACTIVITY I/C	
6	DATE & TIME OF ACCIDENT		7	DATE RESUMED	
8	NO. OF WORK-DAYS LOST BY VICTIM (If duty not resumed, give estimated figure)				
9	NO. OF MANHOURS LOST BY OTHERS				
10	PERSONAL DETAILS OF INJURED AND / OR DETAILS OF MATERIALS / EQUIPMENT / PROPERTY DAMAGED				
NAME			NAME OF MATERIAL / EQUIPMENT / PROPERTY		
PERIOD OF EMPLOYMENT					
AGE	YRS	SEX	MALE/ FEMALE	ESTIMATED COST	ACTUAL COST
MARITAL STATUS		SINGLE / MARRIED			
OCCUPATION		NATURE OF DAMAGE			
PART OF BODY INJURED					
NATURE OF INJURY					
AGENCY (OBJECT / EQUIPMENT / SUBSTANCE) MOST RESPONSIBLE FOR CAUSING ACCIDENT / INJURY / DAMAGE					
12	PERSON (NAME & DESIGNATION) WITH MOST CONTROL OVER AGENCY (OBJECT / EQUIPMENT / SUBSTANCE) CAUSING ACCIDENT INJURY / DAMAGE				
13	DESCRIBE CLEARLY HOW THE ACCIDENT OCCURRED (USE ADDITIONAL SHEET, IF REQUIRED)				
ANALYSIS					
14	WHAT ACTS AND / OR CONDITIONS CONTRIBUTED MOST DIRECTLY TO THIS ACCIDENT				
15	WHAT ARE THE BASIC REASON FOR THE EXISTENCE OF THESE ACTS AND / OR CONDITION ?				
16	WHAT CORRECTIVE ACTIONS HAVE BEEN TAKEN TO PREVENT ACCIDENT RECURRENCE ?				
	DATE :		SIGNATURE OF SITE HSE COORDINATOR		
17	COMMENTS OF HEAD / SOX				
	DATE:		SIGNATURE OF HEAD/SOX		



POWER SECTOR

Format for Monthly HSE Planning & Review

FORMAT NO: HSEP:14-F30

REV NO.: 00

PAGE NO. 01 OF 3

Note: This is a template and can be modified in consultation with BHEL

Name of the Site		Name of the Subcontractor	
Scope of Work		Date	
PART- A: PLAN OF HSE ACTIVITIES FOR THE MONTH OF.....		PART-B: REVIEW ON	
SN.	Description of HSE Activity & Formats	Plan & Targets for the month	Review
1	Availability of First Aid Box at Required Places and Inspection thereof as per Format: Fo1	Areas 1.	
2	Health check-up as per Format: Fo2	Health check-up for Nos 1. New inductees 2. Drivers & Operators 3. Workers in following high risk areas: a. ...	
3	Induction training of newly joined workers as per Format: Fo3	Minimum No. of workers:	
4	Toolbox talks (TBT) conducted before start of work as per Format: Fo4	Locations of TBTs & No. of workers 1. ...	
5	PPE usage and issue as per Format: Fo6		
6	Inspection of T&Ps as per Format: Fo7	List of T&Ps to be inspected 1.	
7	Identification & Inspection Status of T&Ps as per Format: Fo8		
8	Inspection of Cranes & Winches as per Format: Fo9	List of Cranes & Winches & Nos. 1. ...	
9	Inspection of Height Working as per Format: F10	Areas: 1. ...	
10	Inspection of Welding & Gas Cutting operations as per Format: F11	Areas: 1. ...	
11	Inspection of Electrical Installations as per Format: F12	Locations: 1. ...	
12	Inspection of Elevators (as applicable) as per Format: F13	Locations: 1. ...	
13	Inspection of Excavation as per Format: F13E	Locations: 1. ...	



POWER SECTOR

Format for Monthly HSE Planning & Review

FORMAT NO: HSEP:14-F30

REV NO.: 00

PAGE NO. 02 OF 3

SN.	Description of HSE Activity & Formats	Plan & Targets for the month	Review
14	Job Safety Analysis as per Format F32B	Activities: 1. ...	
15	Regular Job Specific Training (Re-training) for workers involved in hazardous activities	Topics/ Hazards & No. of workers 1. ...	
16	Mass housekeeping (HK) drive in work areas	Areas 1. ...	
17	Vertigo Test of Height workers	Minimum No. of workers:	
18	Deployment of qualified HSE Officers as per contract	Location(s) & Nos. 1. ...	
19	Deployment of qualified HSE Stewards as per contract	Location(s) & Nos. 1. ...	
20	Deployment of Safety tools & Equipment (Safety Nets, Lifelines, Fall arrestors, Man-cages, flashback arrestors, scaffolding etc.)	Tool/ Equipment & Location 1. ...	
21	Safety Walks by site in charge of agency (4 -Weekly once)	Dates:	
22	Safety walks by departmental head (8-Weekly twice)	Dates:	
23	Availability/ deployment of Safety posters/ placards/ signage at strategic locations	Locations: Nos. 1. ...	
24	Provision of clean drinking water sources for workers	Locations: Nos. 1. ...	
25	Provision of toilets for workers (separate for male & female workers)	Locations: Nos. 1. ...	
26	Rest sheds for workers during lunchtime, rain, dust storm etc.	Locations: Nos. 1. ...	
27	Availability of following in Labor colony	1. Clean drinking water 2. Toilets 3. Cleanliness & Hygiene 4. Grass cutting, 5. Fogging 6. Electrical Inspection ...	

	POWER SECTOR		FORMAT NO: HSEP:14-F30 REV NO.: 00 PAGE NO. 03 OF 3
	Format for Monthly HSE Planning & Review		
SN.	Description of HSE Activity & Formats	Plan & Targets for the month	Review
28	Availability of dust/ waste bins at various locations	Locations: 1. ...	
29	Availability of Ambulance (individual/ joint) in each shift	Ambulance No.	
30	Availability of emergency vehicle in each shift	Emergency vehicle	
31	Deployment/ Availability of tested Fire Extinguishers	Locations & Nos. 1. ...	
32	Tree plantation	Locations & Nos. 1. ...	
33	Waste disposal & Scrap Bins	Locations 1. ...	
34	Illumination checks	Locations 1. ...	
35	Safety award function: 1. Display of good practices Award presentation	Minimum 1 per month	
36	Submission of Daily Reports as per Format No.F31A	Daily Reports (Night & Day Shifts)	

PLAN		REVIEW	
<u>Agency</u> Name:	<u>BHEL</u> Name:	<u>Agency</u> Name:	<u>BHEL</u> Name:
Sign:	Sign:	Sign:	Sign:
Date:	Date:	Date:	Date:



	POWER SECTOR	FORMAT NO: HSEP:14-F31 A REV NO.: 00 PAGE NO. 01 OF 1
	Format for Daily HSE Reporting	

	POWER SECTOR	FORMAT NO: HSEP:14-F31 A REV NO.: 00 PAGE NO. 01 OF 1
	Format for Daily HSE Reporting	

	POWER SECTOR	FORMAT NO: HSEP:14-F31 A REV NO.: 00 PAGE NO. 01 OF 1
	Format for Daily HSE Reporting	

	POWER SECTOR	FORMAT NO: HSEP:14-F31 A REV NO.: 00 PAGE NO. 01 OF 1
	Format for Daily HSE Reporting	

	POWER SECTOR	FORMAT NO: HSEP:14-F31 A REV NO.: 00 PAGE NO. 01 OF 1
	Format for Daily HSE Reporting	

	POWER SECTOR	FORMAT NO: HSEP:14-F31 A REV NO.: 00 PAGE NO. 01 OF 1
	Format for Daily HSE Reporting	

Night		Day	SHIFT	Year	Site
			Submitted By		
			Work Area(s)		
			Staff		
			Man-Power		
			Safety Officers		
			Safety Stewards		
			Tool Box (Topics and No. of Participants)		
			Induction Training (No. of Participants)		
			Vertigo Test (Numbers Tested)		
			On-the-Job Training (Topic & participants)		
			Work Permits		
			Job Safety Analyses conducted		
			Height Work Inspection		
			Other Hazardous Activities Inspection		
NA			T&P Inspection (Names & Nos. Inspected)		
			Safety Walk (Designation, Areas)		
NA			HSE Meeting		
NA			Safety Reward (Details)		
NA			Housekeeping/ Dust Suppression/ Tree Plantation Activities (Locations/Details)		
			Lost time Accident		
			Restricted Work Case		
			Medical Treatment Case		
			First Aid Case		
			Near miss		
			Property Damage/ Fire		
			Non-Compliances Submitted by BHEL		
			Complied by Agency		
			Any other Remarks/ Inputs		



POWER SECTOR

Job Safety Analysis Format

FORMAT NO: HSEP:14-F32B

REV NO.: 00

PAGE NO. 01 OF 1

Name of the Site	
Name of the Subcontractor	
Activity, Area	

HAZARDS				PRECAUTIONS	

(Name)	Submitted By (Agency HSE)		Reviewed By (BHEL Execution)		Approved By (BHEL HSE)	
(Sign)						
(Date)						

**POWER SECTOR- HQ**

FORMAT NO: HSEP:14-F33

REV NO.: 00

PAGE NO. 01 OF 3

Checklist for Evaluation of HSE Performance

SL	Parameter for Measurement	M/ O	Wt	Supporting Documents
1a	Induction training for new workers conducted through audio-visual medium & documented ?	M	1	Induction Training Records
1b	Tool box talk conducted regularly as per plan, and documented?	M	1	Toolbox Talk Records
1c	Contractor in charge and safety in charge attended safety meetings?	M	2	Minutes of Meeting
1d	Whether observations in safety meetings are complied before next meeting?	M	2	-do-
1e	Preparation and submission of Monthly HSE report within stipulated time	M	1	Report submission date
1f	Preparation and submission of Incident/near-miss report and RCA Report (as applicable) within stipulated time	M	1	Incident/ Near Miss Records
1g	Carrying out Inspections and submission of Inspection reports within stipulated time	M	1	Inspection Records
1h	Regular Job Specific Training ensured for High Risk Workers (through audio-visual medium) as per plan	M	1	Training & Attendance Records
2a	Whether the contractor is registered under BOCW	M	2	BOCW Registration Certificate
2b	Availability of Qualified safety officer (1 for every 500 labour)	M	2	Safety Officer qualification & experience records
2c	Availability of Qualified safety supervisor (1 for every 100 labour)	M	2	Safety Officer qualification & experience records
2d	All the workers are provided and using safety helmets and safety shoes/gum boots	M	2	PPE Issue Records, Inspection/ non-conformity records
2e	Housekeeping done on regular basis and scrap removal at site	M	1	Housekeeping records, Inspection/ non-conformity records
2f	Usage of Goggles/Face shields and Hand gloves for gas cutter and grinders		1	PPE Issue Records, Inspection/ non-conformity records
2g	Wall openings & floor openings are guarded?		1	Inspection/ non-conformity records
2h	Adequate illumination provided in all working area?		1	Inspection/ non-conformity records
2i	Safety posters, sign boards and emergency contact numbers in all prominent location are displayed?		1	Inspection/ non-conformity records
2j	Availability of automatic reverse horns, Main horn, hook latches for Vehicles, mobile cranes, Hydras		1	Inspection/ non-conformity records
2k	Ban of carrying mobile phones to work place is implemented for workers		1	Inspection/ non-conformity records
2l	Availability of Tags & Inspection Certificates for Cranes of all capacities		1	Master T&P List with internal & external test details
2l.2	Availability of Tags & Inspection Certificates for Winches of all capacities		1	Master T&P List with internal & external test details
2l.3	Availability of Tags & Inspection Certificates, color coding for Chain pulley blocks		1	Master T&P List with internal & external test details
2l.4	Availability of Tags & Inspection Certificates for Vehicles - Trailers, Dozers, Dumpers, Excavators. Mixers etc.		1	Master T&P List with internal & external test details
2l.5	Availability of Tags & Inspection Certificates for Welding machines, grinders, Drilling machines, etc.		1	Master T&P List with internal & external test details
2l.6	Availability of Tags & Inspection Certificates, colour coding for Wire rope slings etc.		1	Master T&P List with internal & external test details
2l.7	Availability of Tags & Inspection Certificates for Batching plants		1	Master T&P List with internal & external test details

**POWER SECTOR- HQ**

FORMAT NO: HSEP:14-F33

REV NO.: 00

PAGE NO. 02 OF 3

Checklist for Evaluation of HSE Performance

SL	Parameter for Measurement	M/ O	Wt	Supporting Documents
2m.1	Use of Lifting Permit as per requirement		1	Permit Records
2m.2	Use of Height Permit as per requirement		1	Permit Records
2m.3	Use of Hot Work Permit as per requirement		1	Permit Records
2m.4	Use of Excavation permit as per requirement		1	Permit Records
2m.5	Use of Confined space work permit as per requirement		1	Permit Records
2m.6	Use of Grating removal and safety net removal permit as per requirement		1	Permit Records
2m.7	Use of Lockout-Tag out permit as per requirement		1	Permit Records
2m.8	Use of Radiography permit as per requirement		1	Permit Records
2m.9	Use of Night/ Holiday Work Permit as per requirement		1	Permit Records
2m.10	Use of Any other Applicable Permit as per requirement		1	Permit Records
3a	Material safety data sheet(MSDS) available for all chemicals and displayed in usage and storage area?		1	Inspection/ non-conformity records
3b	Spillages of oil/concrete and other chemical is controlled and cleaned by proper method in case of spill?		1	Inspection/ non-conformity records
3c	Availability of adequate number of urinals in workplace and in elevations and maintained	M	1	
3d	Availability of rest rooms for workers at site	M	1	
3e	Availability of Drinking water facility at work spot		1	
3f	Hygienic Labour colony is provided for workers.		1	
4a	Is heavy/complex critical lifting permit obtained for heavy, complex materials before handling/erection activity?		1	Work Permit records
4b	Whether area below lifting activities barricaded		1	Inspection/ non-conformity records
4c	Availability of experienced rigging foreman		1	Experience details of rigging foreman
4d	Is agency is following proper storage and handling procedure as per manufacturer standard for all hazardous material?		1	Procedure for storage & handling
4e	Are oxygen and acetylene cylinders are transported to work place from storage area in trolleys		1	
5a	Whether all deep excavation has been protected by barrier		1	Inspection/ non-conformity records
5b	Sloping/benching & shoring provided for excavation as per requirement?		1	-do-
5c	Proper access and egress provided for excavations?		1	-do-
5d	Blasting is done in controlled manner?		2	-do-
6a	Whether Electrical booth is equipped with Co ₂ fire extinguishers and fire buckets filled with sand?		2	Inspection/ non-conformity records
6b	Availability of Illumination lamp in electric booth?		1	-do-
6c	whether Caution Boards have been displayed?		1	-do-
6d	Usage of Metal Plug top for all hand power tools ?		1	-do-
6e	Usage of Insulated welding cables.		1	-do-
6f	Electrical Booth/Distribution Board to be covered by proper Canopy.		1	-do-
6g	Availability of functional & individual 30mA ELCB / RCCB and MCB for protection and conducting periodical check-up?		1	-do-
6h	Double earthing for panel boards and all machinery & proper earth pit with regular inspection available?		1	-do-
6i	Whether Electrician is qualified and experienced		1	Qualification & Experience records of electrician
6j	Availability and usage of Rubber hand gloves by electrician?		1	Inspection/ non-conformity records

**POWER SECTOR- HQ****Checklist for Evaluation of HSE Performance**

FORMAT NO: HSEP:14-F33

REV NO.: 00

PAGE NO. 03 OF 3

SL	Parameter for Measurement	M/ O	Wt	Supporting Documents
7a	Whether Scaffolding pipes made with steel or aluminum, are being used and checked periodically by experienced/ certified scaffolder?		2	Inspection/ non-conformity records
7b	8mm Stainless Steel wire rope with plastic cladding is provided for life line (Vertical / Horizontal) during height work?		2	-do-
7c	Availability of emergency lighting in case of power failure		1	-do-
7d	Whether all the openings are covered with Safety Nets made of fire proof Nylon?		1	-do-
7e	Whether MS pipe rails around staircases & platforms in usage are provided with top, middle rails and toe guard ?		1	-do-
7f	Whether Ladder with vertical life line /Fall arrestor is available to climb?		1	-do-
7g	Whether all workers deployed for working at height have been issued height pass after undergoing vertigo test?		1	Height Pass records
7h	Whether all workers deployed for height work / climbing ladder are provided and using Double lanyard safety belt?		1	PPE Issue records, inspection/ non-conformity reports
7i	Is all hand tools/Small material used by height workers is tied firmly to prevent fall?		1	-do-
8a	Flash back arrestors for all gas cutting sets is available on Torch side and cylinder side		1	Inspection/ non-conformity records
8b	Oxygen/Acetylene/LPG cylinders not in use have caps in place and stored separately?		1	-do-
8c	Availability of Face screen, Hand gloves, and Apron, for welders		1	-do-
8d	Protection from falling hot molten metal during metal cutting / welding at height by providing GI sheet below the cutting area especially in fire prone areas		1	-do-
9a	Pre-employment medical check-up done for all workers and submitted?		1	Medical check records
9b	Availability of first aid center, with MBBS doctor(Own or Sharing basis)	M	2	Attendance records
9c	Availability of Ambulance facility 24 hours (Own or sharing basis)	M	2	-do-
9d	Is First aid trained personnel's are available and their names are displayed at site?	M	1	-do-
9e	Availability of Emergency vehicle at site		1	
9f	Periodical medical check-up is conducted for all the workers and submitted?		1	Medical check records
9g	Availability of sufficient number of first aid box as per standard list and maintaining record		1	Inspection records
10a	Availability of Fire extinguishers, buckets at all vulnerable points		2	Fire extinguisher records
10b	Periodic fire mock drill conducted?		1	Fire, Mock drill records
10c	Are all flammable materials are stored separately?		1	
10d	Periodic grass cutting is done in material storage area?		1	
10e	Availability of 24V DC lighting in confined space work area		1	
10f	Availability of exhaust fan in confined space work area		1	

Note:

- **M: Mandatory; O: Optional.** Points other than mandatory can be excluded with appropriate justification (scope etc.) by BHEL
- Additionally: 30 Marks for each Fatal Accident and 10 mark for each major accident shall be deducted.



SAFETY WORK CLEARANCE

Permit no. _____

Project: _____

Emergency Contact Nos: _____

Subcontractor: _____

BURNING/WELDING /HOT WORK PERMIT

Area : _____ Date: _____ Time: _____

Name of Site Engineer (Permit Requesting Authority): _____ Sign: _____

Name of Work Performing Contractor: _____

Name of Package In charge: _____ Sign: _____ Date: _____

Description of Work: _____

Work Execution Date: _____ Time Valid from: _____ to _____

The above signing person(s) will be responsible to ensure that the above described work will be done under all the safety precautions mentioned on the permit to work.

The following precautions are to be taken:

No.	Item	Yes	Not required
1.	Proper Access/Exit available		
2.	Proper ventilation and /or lighting provided.		
3.	Proper and safe scaffolding, platform, ladder provided.		
4.	Welding machine located in a clean and dry area.		
5.	Welding machine grounded at the equipment and proper leakage current protection device (ELCB) provided for welding machine.		
6.	Emergency STOP buttons are in working condition. Welder /Helper knows how to operate it.		
7.	Welding machine input/output cables, welding holder and weld return clamp (Holder) are insulated and in good condition.		
8.	Welder & Fitter trained to connect ground/work return clamps (Holder) to work place prior to energization of welding machine.		
9.	Gas cylinders are stacked vertically and not below the welding / cutting area. Regulator key is available with cylinder.		
10.	Pressure gauges/Flash back arrestor provided and in working condition.		
11.	Personal Protective equipment Minimum applicable: safety helmet, safety goggles, welding helmet, safety shoes, leather gloves, long sleeve and nose mask -provided		
12.	In case of pits, water removed from the pit and wood/rubber insulation provided.		
13.	Safety signboards are in place.		
14.	Adequate and Suitable nos. of fire fighting extinguisher provided.		
15.	Nearby combustible material removed. Housekeeping done.		
16.	Other		

Name of Contractor Safety Officer: _____ Sign: _____ Date: _____ Time: _____

Reviewed and approved by BHEL Site Engineer (Permit Issuing Authority):

Name: _____ Sign: _____ Date: _____ Time: _____

Name of BHEL Safety Representative: _____ Sign: _____

I understand the precaution to be taken as described above and as per project requirement and hereby confirm that work will be executed under my supervision by following all precaution and Safety Rules.

Name of Work Performing Authority: _____ **Sign:** _____ **Date:** _____ **Time:** _____**Permit Cancellation:**

I hereby declare that the work is complete, all workers under my control have been withdrawn and the site restored to safe tidy condition.

Name of Work performing Authority: _____ Sign: _____ Date: _____ Time: _____

Name of Site Engr. (Permit Requesting Authority): _____ Sign: _____ Date: _____ Time: _____

Name of BHEL Site Engr. (Permit Issuing Authority): _____ Sign: _____ Date: _____ Time: _____

(This permit is valid only for the date it is issued)

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SAFETY WORK CLEARANCE

Permit no. _____

Project: _____

Emergency Contact Nos: _____

Subcontractor: _____

LIFTING ACTIVITY PERMIT

Area : _____ Date: _____ Time: _____

Name of Site Engineer (Permit Requesting Authority): _____ Sign: _____ Name of Work

Performing Contractor: _____

Name of Package In charge: _____ Sign: _____ Date: _____

Description of Work: _____

Work Execution Date: _____ Time Valid from: _____ to _____

The above signing person(s) will be responsible to ensure that the above described work will be done under all the safety precautions mentioned on the permit to work.

The following precautions are to be taken:

No.	Item	Yes	Not required
1.	Crane used for lifting activity tested, certified and approved for rated lifting		
2.	All lifting tackles, gears/appliances are tested and certified for lifting works.		
3.	Crane operator is trained and competent for lifting operation.		
4.	Lifting sling/ belt is protected against sharp edge of the jobs to be lifted.		
5.	Access and exit marked and without obstruction.		
6.	Lifting arrangement adequate.		
7.	Unwanted rubbish material removed from work platform.		
8.	Minimum 2 guidelines have been provided for balancing and guiding jobs to be lifted.		
9.	Periphery area of crane booms as well as lifting job is barricaded and unauthorized/no-entry sign board posted.		
10.	Rigger and signal man is trained and competent for lifting work.		
11.	No lifting activity to be carried out during lightening, heavy wind/rain.		
12.	If scaffolding to be used during lift, scaffolding with valid tag available for use.		
13.	Double lanyards safety harness/belt checked and in working condition.		
14.	Safety shoes (non-slip), helmet with chin strap available with employees.		
15.	Others.		

Name of Contractor Safety Officer: _____ Sign: _____ Date: _____ Time: _____

Reviewed and approved by BHEL Site Engineer (Permit Issuing Authority):

Name: _____ Sign: _____ Date: _____ Time: _____

Name of BHEL Safety Representative: _____ Sign: _____

I understand the precaution to be taken as described above and as per project requirement and hereby confirm that work will be executed under my supervision by following all precaution and Safety Rules.

Name of Work Performing Authority: _____ **Sign:** _____ **Date:** _____ **Time:** _____**Permit Cancellation:**

I hereby declare that the work is complete, all workers under my control have been withdrawn and the site restored to safe tidy condition.

Name of Work performing Authority: _____ Sign: _____ Date: _____ Time: _____

Name of Site Engr. (Permit Requesting Authority): _____ Sign: _____ Date: _____ Time: _____

Name of BHEL Site Engr. (Permit Issuing Authority): _____ Sign: _____ Date: _____ Time: _____

(This permit is valid only for the date it is issued)

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SAFETY WORK CLEARANCE

Permit no. _____

Project: _____

Emergency Contact Nos: _____

Subcontractor: _____

WORKING AT HEIGHT PERMIT

Area : _____ Date: _____ Time: _____

Name of Site Engineer (Permit Requesting Authority): _____ Sign: _____ Name of Work

Performing Contractor: _____

Name of Package In charge: _____ Sign: _____ Date: _____

Description of Work: _____

Work Execution Date: _____ Time Valid from: _____ to _____

The above signing person(s) will be responsible to ensure that the above described work will be done under all the safety precautions mentioned on the permit to work.

The following precautions are to be taken:

No.	Item	Yes	Not required
1.	All workers on job are medically fit for working at height (Person should not have vertigo)		
2.	Scaffolding with valid tag available for use		
3.	Safety harness with life line support/ fall arrester are checked and in working condition		
4.	Safety shoes (non-slip), Helmet with chin strip available with employees		
5.	Safety nets are provided as per design and provided 25 ft. below working area & extending 8 ft beyond.		
6.	Horizontal life lines are provided to cater to design specification of 2300kg per person.		
7.	Ladders have been inspected and provided as per BHEL standard/contract.		
8.	All lifting / tightening tools, hand tools/equipment checked and in good condition		
9.	Access and exit marked and without obstruction.		
10.	Lighting arrangement adequate.		
11.	Unwanted and rubbish material removed from working platform.		
12.	Electrical cable, welding Hose/Compressed air hose properly secured and lay down without obstruction.		
13.	Signboards provided on working platforms		
14.	Hazards in the vicinity are identified and communicated to the worker.		
15.	Other		

Name of Contractor Safety Officer: _____ Sign: _____ Date: _____ Time: _____

Reviewed and approved by BHEL Site Engineer (Permit Issuing Authority):

Name: _____ Sign: _____ Date: _____ Time: _____

Name of BHEL Safety Representative: _____ Sign: _____

I understand the precaution to be taken as described above and as per project requirement and hereby confirm that work will be executed under my supervision by following all precaution and Safety Rules.

Name of Work Performing Authority: _____ **Sign:** _____ **Date:** _____ **Time:** _____**Permit Cancellation:**

I hereby declare that the work is complete, all workers under my control have been withdrawn and the site restored to safe tidy condition.

Name of Work performing Authority: _____ Sign: _____ Date: _____ Time: _____

Name of Site Engr. (Permit Requesting Authority): _____ Sign: _____ Date: _____ Time: _____

Name of BHEL Site Engr. (Permit Issuing Authority): _____ Sign: _____ Date: _____ Time: _____

(This permit is valid only for the date it is issued)

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