UJVN LIMITED

(A GOVT. OF UTTARAKHAND ENTERPRISE)

Name of Work: "General Maintenance of 75 MVA Generating Transformers and related fabrication works at GTs Bay of Vyasi Hydro Power Station (2x60MW), Hathiyari (Dehradun)."

NIT No.: 12/EE (Generation)/Vyasi/2023-24

Invited By:

EXECUTIVE ENGINEER (GEN),
VYASI POWER STATION
HATHIYARI

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3	Bid reference	12/EE(Generation)/Vyasi/2023-24
4	Time for Completion	The date of completion of 60 days from the date of shutdown
5	Estimated Cost	Rs 24,40,900.00 (Rs Twenty-four lakhs forty thousand nine hundred only + GST extra).
6	Availability of Bid Document on Nigam website	Available on Nigam's website www.ujvnl.com from 05.01.2024 from 16:00 Hrs.
7	Last Date/Time for submission of Bid Document	Date: 27.01.2024 Time: up to 14:00 hrs
9	Earnest Money	INR 73500/-(Rs. Seventy-Three Thousand Five Hundred only)
10	Time, Date & Venue for opening of Tender	Date 29.01.2024 Time: 11:30 hrs Venue: Executive Engineer (Generation), Vyasi Power Station, Hathiyari, Dakpathar, Dehradun.
11	Bid Validity Period	90 days from the date of opening
12	Cost of Bid Document	Rs 1180/- only (inclusive of 18% GST)

Notice Inviting Tender

(For Publishing in News Papers)

UJVN LTD.
H.O.: "UJJWAL", Maharani Bagh, G.M.S. Road, Dehradun-248006
Telephones: 0135-2763808, Fax: 0135-2763508
CIN No.U40101UR2001SGC025866,
Website:www.ujvnl.com

Tender Notice

The office of Executive Engineer (Generation), Vyasi Power Station, Dakpathar invites sealed bids from interested parties. Brief summary of tender is given below:

Tender No: 12**/EE(Generation)/Vyasi/2023-24:** "General Maintenance of 75 MVA Generating Transformers and related fabrication works at GTs bay of Vyasi Hydro Power Station (2x60MW), Hathiyari (Dehradun)"

Estimated cost: **₹ 24,40,900.00 (GST Extra)**

Date of availability of bid on website: **05.01.2024, 16:00 hrs**
Last date for submission of tender: 27**.01.2024, 14:00 hrs**
For further details, kindly visit our website. The tender documents can be downloaded from the Nigam's website www.ujvnl.com

Executive Engineer (Gen)

"Avoid wasteful use of Electricity"

यूजेवीएन लिमिटेड
मुख्यालय "उज्जवल" महारानी बाग, जी० एम० एस० रोड, देहरादून–06
दूरभाष: 0135–2763808 फैक्स: 0135–2763508
CIN No. U40101UR2001SGC025866
वेब साइट www.ujvnl.com

निविदा सूचना

कार्यालय अधिशासी अभियन्ता (उत्पादन) व्यासी विद्युत् गृह, डाकपत्थर इच्छुक निविदादाताओं से मुहरबंद निविदा आमन्त्रित करता है। निविदा का संक्षिप्त विवरण निम्नवत है।

निविदा सं0 : 12/ अ0अ0(उत्पादन)/ व्यासी /23–24 : 2X60 मेगावाट व्यासी विद्युत् गृह 2 नग 75 एम० वी० ए० जनरेटर ट्रांसफार्मर के अनुरक्षण एवं अन्य फेब्रिकेशन का कार्य ।

अनुमानित लागत : **₹ 24,40,900.00 (जी.एस.टी.अतिरिक्त)**

वेबसाईट पर निविदा प्रपत्र की उपलब्धता की तिथिः– 05.01.2024, 16:00 बजे ।
निविदा जमा करने की अन्तिम तिथिः– 27.01.2024, 14:00 बजे तक ।
अन्य जानकारी हेतु कृपया वेबसाईट देखें। निविदा प्रपत्र निगम की वेबसाइट www.ujvnl.com से डाउनलोड किये जा सकते हैं।

अधिशासी अभियन्ता (उ0)

"बिजली के दुरूपयोग से बचें"

Submitted By	Recommended By	Approved By
EE(Gen)	DGM(O&M)	GM(LVP)

DETAIL NOTICE INVITING BIDS

Sealed & Separate Tenders are invited for & on behalf of the UJVN Limited ("the Employer")from the Tenderers in two Envelope systems for the Works *"General Maintenance of 75 MVA Generating Transformers and related fabrication works at GTs bay of Vyasi Hydro Power Station (2x60MW), Hathiyari (Dehradun)"*

Completion Time

The entire Work under the Contract shall have to be completed in all respects 30 days for each machine from the date of shut down given for the Work by UJVNL.

1. **Procurement of Tender Document**
   The complete set of Tender Document can be downloaded from the **Nigam's website "www.ujvnl.com".**

2. **Submission of Tenders**

Sealed Tenders superscripted *"General Maintenance of 75 MVA Generating Transformers and related fabrication works at GTs bay of Vyasi Hydro Power Station (2x60MW), Hathiyari (Dehradun)"* shall be submitted in two separate sealed envelopes.

Part-1 Tender cost, declaration for EMD as per Clause 30(b) of ITB, with "Application Downloading Form" & otherdownloaded tender documents, non judicial stamp paper worth Rs. 100.00 duly affixed with Rs. 1.00 revenue stamp for validity guarantee/agreement and documents required in Eligibility Criteria in a separate sealed envelope super scribed as Part-I against specificationNo: *12/EE(Gen)/Vyasi/2023-24*.

Part-2 Containing price schedule on the prescribed proforma in a sealed envelope superscribed as "Price bid" against specification No: 12/EE(Gen)/Vyasi/2023-24.

The Tender document must reach in the following Offices by 27.01.2024 up to 14:00 hrs

1. Office of the Executive Engineer (Generation)Vyasi Power Station, Hathyari, UJVN Ltd.Dakpathar.
2. Office of the General Manager (E&M), Lakhwar-Vyasi UJVN Limited, Dakpathar, Dehradun.
3. Office of the Manager (A&S), Corporate Office, UJVN Limited, "UJJWAL" Maharani Bagh, GMS Road, Dehradun.

If the due date of receipt of Tenders as aforesaid is declared holiday/strike/bandh/on anyaccount, Tenders would be received on the next working day up to stipulated time.

Tenders received late on account of any reason whatsoever and telegraphic/fax Tenders &incomplete Tenders will not be entertained.

3. **Opening of Tender**
   Techno-Commercial Bid will be opened by the Executive Engineer (Generation)Vyasi Power Station, Hathyari, UJVN Ltd. Dakpathar or his authorized representative (s) on 29.01.2024 at 11:30 hrs or on the next working day in case the opening day is a holiday in the presence of authorized representative(s) of the Tenderer who choose to remain present. The financial bid of successful tenders in techno commercial bid shall be opened on the same day publicly in the presence of authorized representative(s) of the Tenderer who choose to remain present.

4. **Tender Validity Period**
   Tender shall be valid for a period of 90 days from the date of opening of Techno-Commercial Tender. Duly signed non judicial stamp paper of **Rs. 100.00** should besubmitted along with techno-commercial bid.

5. Cost of Tender Document

The cost of Tender document is Rs. **1180.00 (including GST)** which is non-refundable and the payment against the cost of Tender document shall be made in the form of Demand Draft in favour of **"Dy. General Manager (O&M), Vyasi HEP**, payable at PNB Dakpathar, Dehradun" payable at Dakpathar, Dehradun accompanied with the Bid's document part-I. In case the Demand Draft/banker's Cheque is payable outside Dakpathar, a sum of **Rs. 100.00 (or as applicable)** shall be required extra in such case on account of collection charges. However any short amount of tender fee will not be acceptable and tender shall be rejected.

6. Whom to Contact

For any further information on the Tender, the Tenderers may contact the "Office of the Executive Engineer (Generation)-Vyasi Power Station, Hathiyari , UJVN Ltd. Dakpathar"Mobile No - 09456590120
Email –tayaljeet@gmail.com

i. The Employer shall have the right to reject all or any of the Tenders and shall not be bound to accept the lowest or any other Tender or to give any reason for such decision.
ii. Tenders for part of work shall not be accepted. Telegraphic offers shall not be accepted.

For & On behalf of UJVN Limited
Sd/-

Office inviting tender
EE (Generation)
Vyasi Power Station

SECTION-1: INSTRUCTIONS TO TENDERERS AND ELIGIBILITY CRITERIA

SUBMISSION OF THE OFFER AGAINST TENDER SPECIFICATION NO. : 12/EE(Generation)/Vyasi/2023-24

1. Sealed tenders are invited from the reputed Contactors/Bidders (a bidder may be a Person, Private Entity or a Government owned entity, a firm or a company, No Joint Venture (JV) is allowed) fulfilling the Pre-Qualification Criteria, in the office of Executive Engineer (Generation), Vyasi Power Station, Lakhawar Bhawan, Dakpathar, Dehradun in two separate parts:
   Name of the work: **- "General Maintenance of 75 MVA Generating Transformers and related fabrication works at GTs bay of Vyasi Hydro Power Station (2x60MW), Hathiyari (Dehradun)"**

Part-1 Tender cost & Earnest money with **"Application Downloading Form"** in original & other downloaded tender documents, non judicial stamp paper worth Rs. 100.00 duly affixed with Rs. 1.00 revenue stamp for validity guarantee/agreement and documents required in Eligibility Criteria in a separate sealed envelope super scribed as Part-I against specification No : **12/EE(Generation)/Vyasi/2023-24.**

This part of bid shall not contain filled prices schedule.

Part-2 Containing price schedule on the prescribed proforma in a sealed envelope super scribed as **"Price bid"** against specification No: **12/EE(Generation)/Vyasi/2023-24.**

2. The tender shall be received up to 14:00 hrs. on 27.01.2024 and shall be opened on 29.01.2024 at 11:30 hrs. in the presence of the tenderers who wish to remain present at the time of opening of the tender. Part – 2 of tender shall only be opened if the firm fulfills all conditions of Part-1 of tender.

3. **Eligibility Criteria:**
   The contractor fulfilling following pre-qualification condition shall only be eligible to participate against the above tender:

(a) The bidder should also submit following document with the tender PART -I.

1. Tender Application Form.
2. Validity Agreement duly executed on Rs.100/- non-judicial stamp paper as annexure-1.
3. ITR Return Submission of last 3 years i.e. Assessment year 2020-21, 2021-22 & 2022-23 or latest.
4. Audited Financial Statements (Balance Sheets and Statement of Profit & loss along with notes) for last 3 years i.e. year 2020-21, 2021-22 & 2022-23or latest.
5. Valid Permanent Account Number (PAN).
6. Valid GST Registration. If bidders have no GST Registration, they should certified that he will be submitted GST Registration papers before first payment of bill.
7. Valid Bank Account details for RTGS / NEFT (name as appearing in Bank Account, Bank Account Number, Name of Bank, Name of Branch and Branch IFSC code).
8. Valid Technical Experience Certificates.
9. Earnest Money as required in tender document.
10. Tender Processing Fee of requisite amount in prescribed mode.
11. Declaration regarding eligibility and not being blacklisted or debarred as annexure 3.
12. Valid EPF registration and ESI.

(b) The Tenderer must submit the copy of Income tax Return duly acknowledged by IT dept. for last three years.

(c) Registration with Income tax/ PAN Number. PAN must be in the name of firm, for which the Tender documents have been downloaded.

(d) The bidder/ Firm shall inspect and examine the site, its surroundings, nature of work, risk factor and satisfy himself, before submitting the bid. In this regard, the bidder is required to submit the site certificate issued by Nigam.

(e) The bidder must be registered as A-class government contractor by Chief Electrical Inspector of Uttarakhand.

(a) **(i) Particular Experience for E&M works:**

The tenderer should have experience of having successfully completed similar works in Central /State PSUs/Govt. Organizations during last 7 years ending last day of month previous to one in which tender is invited should be either of the following: -

1. Three similar completed works each costing not less than the amount equal to 40% of the estimated cost i.e. Rs. 9,76,360.00.

   Or
2. Two similar completed works each costing not less than the amount equal to 50% of the estimated cost i.e. Rs. 12,20,450.00.

   Or
3. One similar completed work of costing not less than the amount equal to 80% of the estimated cost i.e. Rs. 19,52,720.00.

Similar work: Similar nature of work means that the bidder must have experience of completion of Steel Fabrication work in of Hydro Power Station duly supported by completion certificates and POs.

On financial capacity

(I) Average annual financial turnover during the last 3 years, ending 31st March of the previous financial year, should be at least 30% of the estimated cost i.e. Rs. 7,32,270.00.

(II) Financial standing shall be established through latest ITR, Audited Annual Report (Balance Sheet and Statement of Profit & Loss along with notes and Audit Report) of last 3 years (5 years in case of high value contracts) duly certified by a Chartered Accountant. All certifications by a Chartered Accountant must bear UDIN (Unique Document Identification Number).

(f) Bidder shall provide satisfactory evidence concerning of the following that:

- The firm does not anticipate change in the ownership during the proposed period of execution of work (if such a change is anticipated, the scope and effect thereof shall be defined)

4. Tenderers are requested to submit the price schedules and its appendices duly filled in as required and should strictly follow the instructions and notes supplementary thereof to facilitate the purchaser to prepare the comparative statement. Failure to do so may prevent the tender from being considered.

5. The item rate should mandatorily be quoted F.O.R. destination. However, overall lowest quoted rates will be the criteria for deciding the L-1 bidder.

6. In case the due date of submission/ opening of tender happens to be a holiday, the tenders shall be received and opened on the next working day without extension of due date.

7. The rates should be valid for three (03) months from the date of opening of the tenders. The tenderers are required to furnish the validity guarantee / agreement on Non-Judicial stamp paper worth Rs. 100.00. The tender without agreement of validity in Part-I of tender shall be rejected. (Format for this agreement is being enclosed as Annexure-1).

8. The tenderers are required to fill up their rates in words as well as in figures. If there is any difference in quoted rates in words and figures, the rates quoted in words shall prevail.

9. Conditional tenders shall not be entertained and will be rejected.

10. **EVALUATION OF BIDS:**

a. The Officer Inviting Tender (OIT) /Evaluators shall take up evaluation of bids with respect to the qualification information and other information furnished subject to confirmation of the Bid Security, the issuing institutions.

b. The bidder may be asked in writing to clarify the document provided in the Technical Bid, if necessary, with respect to any doubts or illegible documents. The Officer Inviting Tender may ask for any other document of historical nature during Technical evaluation of the tender. Provided in all such cases, furnishing of any documents in no way alters the Bidder's price Bid. Non submission of legible documents may render the bid nonresponsive.

c. For submission of documents for timely evaluation of tenders, 06 days time will be provided by UJVN Limited for furnishing of the document by the tenderer.

If the desired documents are not provided by the tenderer within 06 days, additional 03 days time shall be provided. If the desired documents are not provided by the tenderer, then the offer will be treated as non-responsive and cancelled forthwith. No further correspondence shall be entertained by UJVN Limited in this regard.

d. Technical evaluation of all bids shall be carried out as per information furnished by bidders. But evaluation of Bids does not exonerate bidders from checking their original documents at later date. If the bidder is found to have misled the evaluation through wrong information, action as per relevant clause of NIT/ITT shall be taken against the Bidder/Contractor.

e. The OIT/Evaluators will evaluate bids and finalize list of responsive bidders.

11. Negotiation with bidder after bid opening must be severely discouraged. However, in exceptional circumstances (as defined), negotiation may be made only with the lowest evaluated qualified bidder.

12. Name of Successful bidder and contract amount shall be mentioned in the departmental notice board / bulletin / website.

13. The bidder must not be banned/delisted/ blacklisted/debarred from business by any PSU/Govt. department on the date of submission of bid. Such bidders shall be debarred from participation and no correspondence shall be entertained in this regard. The bidder shall have to submit an affidavit in support of it along with tender document.

13. All work / supply covered by the specifications shall be carried out in accordance with the Section -2 General Conditions of Contract. In case any portion of the said contract is not clear to the contractor, clarifications must be obtained before submission of the tender.

15. **Performance Guarantee**

15.1 The successful tenderer shall be required to furnish performance guarantee/ FDR/CDR/TDR/NSC issued by any Nationalized/ Scheduled Bank Post Office (Other than Co-operative and Regional Rural Bank) equal to 10% of value of contract in the given format at the time of signing of contract & duly pledged in favour of UJVNL, Dehradun.

15.2 Bank Guarantee for Performance guarantee shall be valid for two (2) months from the date of expiry of Defect Liability Period.

15.3 Failure of the successful Bidder to comply with the requirements of Sub-clause 15.1 shall constitute sufficient grounds for cancellation of the award and forfeiture of the Bid Security.

16. Payment shall be made as per the conditions of the contract.

17. Telegraphic offers shall not be entertained.

18. The undersigned reserve the right to reject any or all the tenders without assigning any reasons.

19. The tenders should be submitted in Performa prescribed and bids received without downloading the tender documents shall not be considered. The document downloaded from website should not be tempered or photocopied from other bidder, and if any such tempering is detected before or after the opening of bids, the bidder shall be debarred for a period of one year from participating in the tenders issued by UJVN Limited.

20. The tender document should be duly signed on each page and in the original as downloaded by the tenderer. Any overwriting / cutting in tender should be duly signed and stamped.

21. **Forfeiture of Earnest Money Deposit (EMD)**
The Earnest Money Deposit (EMD) shall be forfeited:

a) If the Bidder withdraws the Bid or seeks to modify, alter, add or subtract or put any rider on any ground whatsoever, after last date and time for submission of Bid and during the period of Bid Validity; or

b) In the case of a successful Bidder, if the Bidder fails within the specified time limit to:
   i) Sign the Agreement; or
   ii) Furnish the required Performance Security.
   iii) Furnish the required Additional Performance Security.
   iv) To start the work to the satisfaction of the Engineer after Letter of Acceptance / Award has been issued.

c) If the Bidder indulges in any type of unfair or corrupt practice or submits any false information.

d) If the Bidder indulges in any type of Bid rigging, Collusive Bidding or any other type of Anti-Competitive Activity.

e) Tampers with the downloaded Bid Document and submit the bid without downloading the bid.

22. All other terms and conditions of this tender specification shall be governed by the Section-2 General Conditions of Contact.

23. The successful tenderer will have to enter into agreement within 15 days of issue of LOI/order and will have to deposit requisite amount of security deposit.

24. In case the tenderer offers any rebate, the same should be clearly mentioned in the price schedule of tender.

25. The undersigned reserve the rights to revise or amend the specification & other condition prior to the notified date for opening of the tenders. Such revision and amendments, if any will be communicated to all tenderers.

26. In case of failure of firm to execute the order within the stipulated delivery period, the purchaser shall reserve the right to cancel the order and levy any penalty as per Section-2 General Conditions of Contract.

27. The tender documents can only be downloaded from the website of UJVN Limited **www.ujvnl.com**. However it will be the responsibility of the prospective bidder to ensure the use of complete tender documents available on website.

28. If a bidder submit more than one bid, all such bids of that bidder shall be treated as non-responsive.

29. The duly filled and signed Application Downloading Form which has been used by vendor for downloading the tender documents from website should be submitted in original along with the tender document. This “Application Downloading Form” is an integral part of tender document. If this application form is not submitted in original with the tender in Part-1, it will be summarily rejected.

30. **a. The cost of downloaded tender documents Rs. 1180.00 (Cost Rs. 1000.00 + Rs. 180.00 GST) shall be submitted by the bidder together with Earnest money along with the Part-I ,bid. The cost of tender documents shall be submitted by the bidder in the form of demand draft in favour of “Dy. General Manager (O&M), Vyasi HEP, Dakpathar.**

Note: In case the Demand Draft of Tender fee is not payable at Location Dakpathar and/or PNB/ OBC Dakpathar (Dist.: Dehradun) – additional amount of DD clearance should also be added in tender fee D. D accordingly, which shall be Rs. 100/- additionally.

b. Part-I, Techno-Commercial Bid of the tender must be accompanied with Earnest Money, INR 73500/-(Rs. Seventy-Three Thousand Five Hundred only)valid up to Six months from the date

of opening of tender, failing of which, tender shall not be considered. Earnest Money shall be deposited by the Tenderer in form of FDR/CDR/TDR/NSC/ from scheduled/National/State/ Post Office (Other than Co-operative and Regional Rural Bank) & duly pledged in favors of **"Dy. General Manager (O&M), Vyasi HEP, Dakpathar.**

NO FIRM SHALL BE EXEMPTED FROM DEPOSITING EARNEST MONEY ON ANY GROUND WHATSOEVER.

31. Performance Security

The Performance security shall be 10% of contract value which shall be submitted at the time of agreement.

Within 15 (Fifteen) days of receipt of LOI or as per the time specified in LOI, the successful bidder shall deposit to the Employer a Performance Security in the form of FDR/CDR/TDR/Scheduled Bank(Other than Co-operative and Regional Rural Bank) duly pledged in favour of **"Dy. General Manager (O&M), Vyasi HEP payable at PNB Dakpathar, Dehradun"** amounting to 10% (Ten Percent) of the value of order/contract towards faithful performance of the work/supply to be carried out by him. Performance Security shall remain valid for a period of Two months from the defect liability period by the Contractor. Any defect found during this period due to bad workmanship in the jobs carried out by the Contractor shall be rectified by Contractor free of cost.

Additional Performance Security; The successful bidder shall deposit to the Employer an additional Security in the form of FDR/CDR/TDR in the form of FDR/CDR/TDR/Scheduled Bank(Other than Co-operative and Regional Rural Bank) duly pledged in favour of "**Dy. General Manager (O&M), Vyasi HEP**". The amount of additional security shall be worked out as follows;

For Item rate contract

i. No additional performance security Up to 5% below the estimated cost of the item.
ii. An additional performance security of 10% of the estimated cost of items, for item rates from 5% to 15 % below the estimated rate.
iii. An additional performance security of 15% of the estimated cost of items, for item rates more than 15% below the estimated rate.

Additional Performance Security for work part shall remain valid during the currency of the contract and shall be returned to the contractor after satisfactory completion of the work and after the payment of final bill.

Note: If the percentage below is not a whole number, any percentage above 0.5% shall be rounded off to next higher whole number and any percentage below 0.5% shall be rounded off to immediate lower whole number.

32. The cost of downloaded Tender documents is not refundable under any circumstances whatsoever.

33. **Corrupt or Fraudulent Practices**

The Employer requires the Bidders/contractors under this contract observe the highest standard of ethics during the procurement and execution of this contract. In pursuance of this policy, the Employer:

(a) defines, for the purpose of these provisions, the terms set forth below shall mean as under:
   (i) "Corrupt practice" means the offering, giving, receiving or soliciting of anything of value to influence the action of a public official in the procurement process or in contract execution; and
   (ii) "Fraudulent practice" means a misrepresentation of facts in order to influence a procurement process or the execution of a contract to be detriment of the Employer, and includes collusive practice among Bidders (prior to or after bid submission) designed to establish bid prices at artificial non-competitive levels and to deprive the Employer of the benefits of free and open competition;
   (iii) "Anti-competitive practice": any collusion, bid rigging or anti-competitive arrangement, or any other practice coming under the purview of The Competition Act, 2002, between two or more

bidders, with or without the knowledge of the Purchaser, that may impair the transparency, fairness and the progress of the procurement process or to establish bid prices at artificial, non-competitive levels;

(iv) "Coercive practice": harming or threatening to harm, persons or their property to influence their participation in the procurement process or affect the execution of a contract.

(v) "Conflict of interest: participation by a bidding firm or any of its affiliates that are either involved in the consultancy contract to which this procurement is linked; or if they are part of more than one bid in the procurement; or if the bidding firm or their personnel have relationships or financial or business transactions with any official of Purchaser who are directly or indirectly related to tender or execution process of contract; or improper use of information obtained by the (prospective) bidder from the Purchaser with an intent to gain unfair advantage in the procurement process or for personal gain; and

(vi) "Obstructive practice": materially impede the Purchaser's investigation into allegations of one or more of the above mentioned prohibited practices either by deliberately destroying, falsifying, altering; or by concealing of evidence material to the investigation; or by making false statements to investigators and/or by threatening, harassing or intimidating any party to prevent it from disclosing its knowledge of matters relevant to the investigation or from pursuing the investigation; or by impeding the Purchaser's rights of audit or access to information;

(vii) "Collusive practice": means a scheme or arrangement between two or more bidders, with or without the knowledge of the Purchaser, designed to establish bid prices at artificial, noncompetitive levels;

(b) Will reject a proposal for award of work if he determines that the Bidder recommended for award has engaged in corrupt or fraudulent practices in competing for the contract in question.

(c) Will declare a Bidder ineligible for at least one year for participation in further tenders of UJVN Ltd., if he at any time determines that the Bidder has engaged in corrupt or fraudulent practices in competing for, or in executing, the contract.

(d) Canvassing in any form is strictly prohibited and in case any Bidder is found doing the same his tender shall be summarily rejected.

34. Bidder should quote for the complete requirement for goods and / or services specified in "Schedule of Prices & Quantity" of this bid, failing which such bids will be treated as non-responsive.

35. Those prospective bidders who will download the tender documents from website will intimate the tender issuing office about its downloading so that the tenderers may be intimated in case of any alteration in tender documents (besides issuing corrigendum advertisement in News Papers).

36. In case it is found that the tenderer has submitted false information, fabricated information or incorrect information related to pre-qualification criteria of the tender then the tender will be rejected and the tenderer will be black listed for at least one year.

37. Complete Tender documents can be submitted by the tenderers at any of the following offices of the Nigam:-

i. EXECUTIVE ENGINEER (Generation), Vyasi Power Station, Hathiyari Dakpathar, Dehradun
ii. GM(E&M), LVP, UJVN Limited, Lakhawar Bhwan Dakpathar, Dehradun
iii. Manager (A&S), UJVN Limited, Ujjwal, GMS Road, Maharani Bagh, Dehradun.

38. The work shall be awarded as per the standing instructions / rules of UJVN Limited.

EXECUTIVE ENGINEER (GENERATION),
VYASI POWER STATION
HATHIYARI

SECTION-2: GENERAL CONDITIONS OF CONTRACT (GCC)

General Conditions of Contract

for

Supply of Plant & the Execution of Work

in the office of Executive Engineer (Gen) Vyasi Power Station

UJVN Limited

General Conditions of Contract (GCC) for the Supply of Plant & the Execution of Works in the UJVN Limited

1. Definition of Terms

In construing these General Conditions and annexed Specification, the following words shall have the meaning herein assigned to them unless there is anything in the subject or context inconsistent with such construction.

The “Purchaser” shall mean the UJVN Limited and shall include its successors and assigns.

The “Contractor” shall mean the Tenderer/Bidder whose tender shall be accepted by the Purchaser and shall include such Tenderer’s heirs, legal representatives, successors and assigns.

The “Sub-Contractor” shall mean the person named in the contract for any part of the work for any person to whom any part of the Contract has been sublet with the consent in writing of the Engineer and the heirs, legal representatives, successors and assigns of such person.

The “Engineer” shall mean the officer placing the order for the work with the Contractor and such other officer as may be duly authorized and appointed in writing by the Purchaser to act as Engineer for the purposes of the contract and in case where no such officer has been so appointed the Purchaser or his duly authorized representative.

“Plant”, “Equipment”, “Material”, “Work”, or “Works” shall mean respectively the plant and materials to be provided and work or works to be done by the Contractor under the contract.

The definition of person shall include: (i) an individual, (ii) a Hindu undivided family,(iii) a company, (iv) a firm, (v) an association of person or a body of individuals, whether incorporated or not,(vi) a local authority, and (vii) every artificial juridical person, not falling within any of the preceding sub-clauses.

The “Contract” shall mean and include the General Conditions, Specifications, Schedules, Drawings, Form of Tender, Covering letter, Schedule of Prices or the final General Conditions, Specification and Drawings and the Agreement to be entered into under clause 3 of these General Conditions.

The “Specification” shall mean the Specification annexed to these General Conditions and the Schedules thereto (if any).

The “Site” shall mean the site of the proposed work as detailed in the Specification or any other place where work is to be executed under the Contract.

“Tests on Completion” shall mean such tests as are prescribed by the specification to be made by the Contractor before the plant is taken over by the purchaser.

The exceptional circumstances shall mean “when there is an urgent need of work to avoid generation loss”.

“Commercial Use” shall mean that use of the work which the contract contemplates or of which it is commercially capable.

“Month” shall mean calendar month in general. However, it means 30/31 days.

“Writing” shall include any manuscript, typewritten or printed statement, under or over signature or seal, as the case may be.

“Defect Liability Period” shall mean the fixed period of time, starting from the date of handed over the site/equipment to purchaser after practical completion of the work/supply, during which the contractor has an express contractual right to return to the site to rectify defects.

“Defects Notification Period” means the period for notifying defects in the Works or a Section of work.

Words importing persons shall include Firms, Companies, Corporations, and other bodies whether incorporated or not.
Words importing the singular only shall also include the plural and vice versa where the context requires.

2. Contractor to inform himself fully

The Contractor shall be deemed to have carefully examined the General Conditions, specifications, Schedules and Drawings. If he shall have any doubt as to the meaning of any portion of these General Conditions, or of the Specification he shall, before signing the Contract, set forth the particulars thereof and submit them to the Engineer in writing, in order that such doubt may be removed.

3. Contract

A formal agreement shall, if required by the Purchaser, be entered into between the Purchaser and the Contractor for the proper fulfillment of the Contract. Further, if required by the Purchaser, the Contractor shall deposit with the purchaser as security for the due and faithful performance of the Contract such sum not being less than Ten(10) per cent of the total value of the Contract as may be fixed by the Purchaser either in cash or any other form approved by the Purchaser.

The charges in respect of vetting and execution of the contract document shall be borne by the contractor. The contractor shall be furnished with an executed stamped counterpart of the agreement. The import license fee will, in each case, have to be paid by the contractor. Import license may have to be taken in the purchaser's name.

After the tender has been accepted by the Purchaser all order or instructions to the contractor shall, except as herein otherwise provided, be given by the Engineer on behalf of Purchaser.

4. Contract Drawing

The contractor shall submit in duplicate, to the Engineer for his approval, drawings of the General Arrangement of the works to be carried out and of such detailed drawings, other than shop drawings, as may be reasonably necessary.

Within fourteen days of the receipt of such drawings the Engineer shall signify his approval or otherwise of the same, and in the event of disapproving the drawings, the Contractor shall submit further drawings for approval.

Within a reasonable period of the notification by the Engineer to the Contractor of his approval of such drawings, three sets, in ink or tracing cloth or ferrogallic prints mounted on cloth, of the drawings as approved shall be supplied to him by the Contractor and be signed by him and the Contractor respectively and be thereafter deemed to be the "Contract drawings".

These drawings when so signed shall become the property of the Purchaser and be deposited with the Engineer, and shall not be departed from in any way whatsoever except by the written permission of the Engineer, as hereinafter provided. During the execution of the works , one of the sets of drawings shall be available for reference on the site.

In the event of the Contractor desiring to possess a signed set of drawings, he shall supply four sets instead of three sets and in this case the Engineer shall sign the fourth set and return the same to the Contractor.

The contractor, if required by the Engineer, shall supply in addition copies of any drawing other than shop drawings which may reasonably be required for the purpose of the Contract and may make a reasonable charge for such copies.

The Engineer or his duly authorized representatives, whose name shall have previously been communicated in writing to the Contractor, shall have the right at all reasonable times to inspect, at the factory of the Contractor, drawings of any portion of the work.

5. Mistakes in Drawings

The contractor shall be responsible for and shall pay for any alterations of the work due to any discrepancies, errors or omissions in the drawings and other particulars supplied by him, whether such drawings or particulars have been approved by the Engineer or not, provided that if such discrepancies, errors or omissions are due to inaccurate information or particulars furnished to the Contractor by the Engineer any alterations in the work necessitated by reasons of such inaccurate information of particulars shall be paid for by the Purchaser.
If any dimensions figured upon a drawing or a plan differ from those obtained by scaling the drawing or plan the dimensions as figured upon the drawing or plan shall be taken as correct.

6. Subletting of Contract

The Contractor shall not, without consent in writing of the Engineer or Purchaser, which shall not be unreasonably withheld, assign or sublet his Contract, or any substantial part thereof other than for raw materials, for minor details, or for any part of the work of which the makers are named in the Contract provided that any such consent shall not relieve the Contractor from any obligation, duty or responsibility under the Contract.

7. Patent Rights

In the event of any claim or demand being made or action being brought against the Purchaser for infringement or alleged infringement of patent, in respect of any machine, plant, work or thing used or supplied by the contractor under this Contract or in respect of any method of using or working by the Purchaser of such machine, plant, work or thing, the Contractor will indemnify the Purchaser against such claim or demand and all costs and expenses arising

from or incurred by reasons of such claim of demand PROVIDED THAT the purchaser shall notify the Contractor immediately any claim is made and that the Contractor shall be at liberty, if he so desires, with the assistance of the Purchaser, if required but at the Contractor's own expense, to conduct all negotiations for the settlement of the same or any litigation that may arise there from and PROVIDED THAT no such machine, plant ,work or thing shall be used by the Purchaser for any purpose or in any manner other than that for which they have been supplied by the Contractor and specified under this Contract.

8. Quality of materials

The plant shall be manufactured and constructed in the best and most substantial and most workmanlike manner and with materials of the best or of approved qualities for their respective uses.

9. Packing

The contractor shall be responsible for securely, protecting and packing the plant so as to avoid damage under normal Conditions of transport.

10. Delivery

The cost of delivering the whole of the material F.O.R at the railway stations specified or on the site as the specification may define and the cost of packing and , unless otherwise agreed, import duties and customs shall be borne by the Contractor.

11. Fencing and lighting for works other than transmission lines

Except as hereinafter provided the purchaser shall ,unless otherwise specified, be responsible for the proper fencing , guarding , lighting and watching of all works other than transmission lines comprised in the Contract and for as the proper provision of temporary roadways ,footways, guards and fences as far as the same may be rendered necessary by reason of the work for the accommodation and protection of foot passengers or other traffic and of the owners and occupiers of adjacent property of the public.

For transmission lines

The Contractor shall at all times provide sufficient fencing, notice boards, lights and watchmen to protect and warn the public and guard the work of transmission lines and in case the Contractor fails to make such provision or the provision made by him is considered by the Purchaser to be inadequate , the Purchaser may make such provisions or further provisions as he may consider necessary and charge the cost thereof to the Contractor.

For all works

If during the period of erection of a plant the Contractor or his workmen or servants shall injure or destroy any part of a building or other structure continuous to the work in progress or if any damage shall be caused from any cause whatsoever to other works whether in progress or completed forming part of the works for which the plant is being installed or if any imperfections become apparent in these works the causes of which imperfections are attributable to the Contractor or his workmen or servants, Contractor shall make good such damages and imperfections and if he fails to do so within a reasonable time , the purchaser may cause the same to be made good and may deduct the cost thereof from any sum that may then or at any time thereafter become due to the Contractor or from his security deposit or the proceeds of sale thereof or of a sufficient portion thereof or may recover it otherwise.

12. Power to vary or omit work

No alterations, amendments, omissions, additions, suspensions or variations of the work (hereinafter referred to as "Variations") under the Contract as shown by the contract drawings or the Specifications shall be made by the Contractor except as directed in writing by the Engineer, but the Engineer shall have full power, subject to the provision hereinafter contained, from time to time during the execution of the Contract by notice in writing to instruct the Contractor to make such variations without prejudice to the Contract, and the Contractor shall carry out such instructions , and be bound by the same conditions, as far as applicable, as though the said variations occurred in the specification. If any suggested variations would, in the opinion of the Contractor, if carried out, prevent him from fulfilling any of the obligations or guarantees under the Contract, he shall notify the Engineer thereof in writing, and the Engineer shall decide forthwith whether or not the same shall be carried out, and if the Engineer confirms his instructions, the Contractor's obligations and guarantees shall be modified to such an extent as may be justified. The difference of cost if any, occasioned by any such variations, shall be added to, or deducted from, the contract price as the case may require. The amount of such difference, if any, shall be ascertained and determined in accordance with the rates specified in the Schedule of Prices, so far as the same may be applicable and where the rates are not contained in the said Schedules, or are not applicable , they shall be settled by the Engineer and Contractor jointly, as far as possible, before such variations are carried out: Provided that the Purchaser shall not become liable for the payment of any charge in respect of any such variations, unless the instruction for the performance of the same shall have been given in writing by the Engineer.

In the event of the Engineer requiring any variations, such reasonable and proper notice shall be given to the Contractor as will enable him to make his arrangements accordingly, and in case where goods or materials have already been prepared or any designs, drawings, or patterns have been made or work done that require to be altered, the Engineer shall allow such Compensation in respect thereof as he shall consider reasonable.

Provided that no such variations shall, except with the consent in writing of the Contractor, be such as will involve an increase or decrease of the total price payable under the contract by more than 10% thereof.

In every case in which the Contractor shall receive instructions form the Engineer for carrying out any work which either then or later will, in the opinion of the Contractor, involve a claim for additional payment, the Contractor shall as soon as reasonably possible after the receipt of such instructions, inform the Engineer of such claim for additional payment.

13. Negligence

If the Contractor shall neglect to execute the work with due diligence and expedition , or shall refuse or neglect to comply with any reasonable orders given to him in writing by the Engineer in connection with the work , or shall contravene any provision of the Contract, the Purchaser may give seven day's notice in writing to the Contractor, to make good the failure, neglect, or contravention complained of, and if the Contractor shall fail to comply with the notice within a reasonable time from the date of service thereof , in the case of a failure, neglect, or contravention capable of being made good within that time, then in such case the Purchaser shall be at liberty to employ other workmen , and forthwith perform such work as the Contractor may have neglected to do , or if the Purchaser shall think fit , it shall be lawful for him to take the work wholly , or in part, out of Contractor's hands and give it to another person on contract at a reasonable price or provide any other materials , tools , tackle or labour for the purpose of completing the work , or any part thereof , and in that event the Purchaser shall without being responsible to the Contractor for fair wear and tear of the same , have the free use of all the materials, tools, tackle or other things which may be on the site , for use at any time in connection with the work to the exclusion of any right of the Contractor over the same , and the Purchaser shall be entitled to retain and apply any balance which may be otherwise due on the Contract by him to the Contractor or such part thereof as may be necessary to the payment of the cost of executing such work as aforesaid.

If the cost of executing the work as aforesaid shall exceed the balance due to the Contractor , and Contractor fails to make good the deficiency, the Purchaser may recover it from the Contractor in any lawful manner or the Purchaser may sell the said materials , tools ,tackle or other things belonging to the Contractor , and the proceeds such sale shall be applied towards the payment of such deficiency and the cost of and incidental to such sale and any balance remaining after crediting the same shall be paid to the Contractor on the certificate of the Engineer , provided that when all expenses , costs and charges incurred in the completion of the work are paid by the Contractor , all such materials , tools , tackle or other things remaining unsold shall be removed by the Contractor.

14. Deaths Bankruptcy etc.

If the Contractor shall die or commit any act of Bankruptcy, or being a corporation commence to be wound up except for reconstruction purposes or carry on its business under a Receiver, the executors, successors, or other representative in law of the estate of the Contractor or any such Receiver, liquidator, or any person in whom the contract may become vested , shall forthwith give notice thereof in writing to the Purchaser and shall for one month, during which he shall take all reasonable steps to prevent a stoppage of the works, have the option of carrying out the contract , subject to his or their providing such guarantee as may be required by the Purchaser, but not exceeding the value of the work , for the time being remaining unexecuted. In the event of stoppage of the works, period of the option under this clause shall be fourteen days only, provided that, should the above option not be exercised, the contract may be determined by the purchaser by notice in writing to the contractor, and the purchaser may exercise the same power which he could exercise and will have the same rights which he would have under the last preceding clause if the work had been taken out of the contractor's hands under that clause.

15. Inspection and testing

The Engineer, and his duly authorized representatives, shall have at all reasonable times access to the Contractor's premises, and shall have , the powers at all reasonable times, to inspect and examine the materials and workmanship of the plant during its manufacture there, and if part of the plant is being manufactured on other premises, the Contractor shall obtain for the Engineer and for his duly authorized representative permission to inspect it as if the plant was manufactured on the Contractor's own premises.

The Engineer shall, on giving seven day's notices in writing to the Contractor setting out any ground of objections which he may have in respect of the work, be at liberty to reject all or any plant or workmanship connected with such work, which , in his opinion, are not in accordance with the Contract, or are, in his opinion, defective for any reason whatsoever : Provided that, if such notice be not sent to the Contractor within reasonable time after the grounds upon which such notice is based have come to the knowledge of the Engineer, he shall not be

entitled to reject the said plant or workmanship on such grounds. Unless specifically provided otherwise all tests shall be made at Contractor's works before shipment.

The Contractor shall, if required, give the Engineer notice of any material being ready for testing, and the Engineer, or his said representative, if so desired, shall, on giving twenty four hours previous notice in writing to the Contractor, attend at the Contractor's premises within seven days of the date on which the material is notified as being ready; failing which visit the contractor may proceed with the tests , which shall be deemed to have been made in the Engineer's presence, and he shall forthwith forward to the Engineer duly certified copies of the tests in duplicate.

Test at Contractor's premises

In all cases where the Contract provides for tests, whether at the premises of the Contractor or of any sub-contractor, the Contractor, except where otherwise specified, shall provide, free of charge such labour, materials, electricity, fuel, water , stores, apparatus and instruments as may reasonably be demanded to carry out efficiently such tests of the plant in accordance with the Contract and shall give facilities to the Engineer or to his authorized representative to accomplish such testing.

If special tests, other than those specified in the Contract are required they shall be paid for by the Purchaser as "Variation" under clause 12.

When the tests have been satisfactorily completed at the Contractor's works the Engineer shall issue a certificate to that effect.

Test on site

In all cases where the Contract provides for tests on the site, the Purchaser, except otherwise specified, shall provide, free of charge, such labour, materials, electricity, fuel, water, stores, apparatus and instruments as may be required from time to time and as may reasonably be demanded, efficiently to carry out such tests of the plant or workmanship in accordance with the Contract. In the case of contractor requiring electricity for tests on site such electricity shall be supplied to the Contractor in the most convenient from available.

Third Party Inspection may be carried out by the purchaser.

16. Delivery of Plant

The plant or material shall not be forwarded until shipping /despatch instruction shall have been given to the Contractor. Notification of delivery or despatch in regard to each and every consignment shall be made to the Purchaser immediately after despatch or delivery. The supplier shall further supply to the Consignee a priced invoice and packing account of all stores delivered or despatched by him. All packages, containers, bundles and loose materials forming part of each and every consignment shall be described in full in the packing account and full details of the contents of packages and quantity of materials shall be given to enable the Consignee to check the stores on arrival at destination.

17. Access to site and work on site

Suitable access to, and possession of the site shall be afforded to the Contractor by the Purchaser in reasonable time, and the Purchaser shall have any foundations to be provided by him ready when required by the Contractor. Where a crane is available, its safe lifting capacity shall be stated in the Specification, and it shall be available for free use of the Contractor until plant is taken over.

Only applicable to complete erection Contracts

The work, so far as it is carried out on the Purchaser's premises, shall be carried out at such time as the Purchaser may approve, and so as not to interfere unnecessarily with the conduct of the purchaser's business, but the Purchaser shall give the Contractor all reasonable facilities for carrying out the work. No person other than the Contractor, subcontractors and workmen and the Contractor's duly authorized agents shall, except with the special permission in writing, of the Engineer or his representative, be allowed to do any work on the site in connection with the erection of the work, but access to the works shall at all times be accorded to the Engineer and his representatives and other authorized officials of the Purchaser.

The Contractor shall permit the execution of work by other contractors or tradesmen whose names shall have been previously communicated in writing to the Contractor by the Engineer, and afford them every facility for the execution of their several works simultaneously with his own.

The Purchaser shall provide all the unskilled labour and facilities necessary for the execution of work included in the Contract unless otherwise specified.

18. Engineer's Supervision

All the works shall be carried out under the direction and to the reasonable satisfaction of the Engineer .If supervision of erection or complete erection is included in the contract, the Contractor shall be responsible for the correctness of the positions, levels and dimensions of the works according to the drawings notwithstanding that he may have been assisted by the Engineer in setting out the same.

19. Engineer's decision

In respect of all matters, which are left to the decision of the Engineer, including the granting or withholding of certificates, the Engineer shall, if required so to do by the Contractor, give in writing a decision thereon, and his reasons for such decision. If the decision is not accepted by the Contractor, the matter shall at the request of the Contractor, be referred to arbitration under the provision for arbitration hereinafter contained but subject to this right of reference to arbitration such decision shall be final and binding on the Contractor.

20. Contractor's representative and workmen

If the supervision of erection or complete erection is also included in the Contract, the Contractor shall employ at least one competent representative, whose name or names shall have previously been communicated in writing to the Engineer by the Contractor to superintend the erection of the plant and the carrying out of the works. The said representative, or if more than one shall be employed, then one of such representatives shall be present on the site during working hours, and any written orders or instructions which the Engineer or his duly authorized representative whose name shall have been previously communicated in writing to the Contractor may give to the said representative of the Contractor shall be deemed to have been given to the Contractor.
The Engineer shall be at liberty to object to any representative or person employed by the Contractor in the execution of or otherwise about the works who shall in his opinion misconduct himself or be incompetent or negligent, and the Contractor shall remove the person so objected to upon receipt from the Engineer of notice in writing requiring him so to do, and shall provide in his place a competent representative at the Contractor's expense.
The purchaser shall provide suitable living accommodation on the site for the use of the Contractor's representative unless the Contractor exempts him from his liability.

21. Liability for accidents and damage

The Contractor shall be responsible for the loss, damage or depreciation of the plant until the same is taken over under clause 35 or is deemed under that clause to have been taken over, provided ALWAYS that the Contractor shall not be responsible for any such loss, damage and depreciation occurring during such period that plant is operated by the Purchaser's staff prior to being taken over in accordance with clause 35.

Until the plant is taken over or is deemed to have been taken over as aforesaid , the Contractor shall also be liable for and shall indemnify the Purchaser in respect of all injury to person or damage to property resulting from the negligence of the Contractor or his workmen or sub-contractors or from defective design or work , but not from any other cause : Provided that the Contractor shall not be liable for any loss of profit or loss of Contract or any other claim made against the Purchaser not already provided for in the Contract , nor for any injury or damage caused by or arising from the acts of the Purchaser or of any other person, or due to circumstances over which the Contractor has no control , nor shall his total liability for loss , damage or injury under this clause exceed the total value of the Contract.
Only applicable to complete erection contract

The Contractor will indemnify and save harmless the Purchaser against all actions , suits , claims costs , or expenses arising in connection with injuries other than such as may be attributable to the Purchaser or his employees suffered prior to the date when the plant shall have been taken over under clause 35 hereof , by persons employed by the Contractor or his sub-Contractor on the works , whether at Common Law or under the Workmen's Compensation Act 1923 , or any other Statue in force at the date of Contract relating to the question of the liability of employees for injuries suffered by employees , and will , if called up to do so , take out the necessary policy or policies of insurance to cover such indemnity.

In the event of any claim being made, or action brought against the Purchaser involving the Contractor and arising out of the matters referred to and in respect of which the Contractor is liable under this clause, the Contractor shall be immediately notified thereof and he shall, with the assistance, if he so require, of the Purchaser, but at the sole expense of the Contractor, conduct all negotiations for the settlement of the same or any litigation that may arise therefrom. In such case, the Purchaser shall, at the request and expense of the Contractor, afford all reasonable and available assistance for any such purpose.

22. Insurance

The Contractor shall insure the plant and shall keep it insured against loss by theft, destruction or damage by fire, flood, undue exposure to the weather, or through riot , civil commotion, war or rebellion, for the full value of the

plant from the time of delivery F.O.R. works until the plant is taken over under clause 35. This insurance shall cover loss by theft on site in the case of Contracts where the Contractor is responsible for complete erection, but not in other cases.

23. Replacement of defective plant or materials

If during the progress of the work the Engineer shall decide and notify in writing to the Contractor that the Contractor has executed any unsound or imperfect work or has supplied any plant inferior in quality to that specified, the contractor, on receiving details of such defects or deficiency shall, at his own expense, within such time as may be reasonably necessary for making it good , proceed to alter, reconstruct or remove such work , or supply fresh materials up to the standard of the specification, and in case the Contractor shall fail so to do, the purchaser may, on giving the Contractor seven day's notice in writing of his intention so to do, proceed to remove the work complained of , and at the cost of the Contractor , perform all such works or supply all such materials , provided that nothing in this clause shall be deemed to deprive the purchaser of or affect any rights under the Contract which he may otherwise have in respect of such defects or deficiencies.

24. Deduction from contract price

All costs, damages or expenses which the purchaser may have paid, for which under the Contract the Contractor is liable, may be deducted by the Purchaser from any money due or which may become due by him to the Contractor under this contract, or may be recovered by suit or otherwise from the contractor.

Any some of money due and payable to the Contractor (including security deposit returnable to him under this contract) may be appropriated by the Purchaser and set off against any claim of the Purchaser for the payment of a sum of money arising out of or under any other contract made by the contractor with the Purchaser.

25. Terms of payment

(i) Subject to any deduction which the Purchaser may be authorized to make under the contract, or subject to any additions or deductions provided for under clause 12, the contractor shall, be entitled to payments as follows:

Supply of Plant / Equipment / Material:

[Where tender / contract is only for supply of Plant / Equipment / Material and supply part can be ascertained]

(a) Eighty Percent (80%) of measured value of the 'Plant / Equipment / Material Supply Contract' upon receipt and checking of Plant / Equipment / Material by Engineer at site and after receipt of invoice along with dispatch documents.

(b) Ten Percent (10%) of the 'Plant / Equipment / Material Supply Contract' Value upon satisfactory installation, satisfactory quality test results and final acceptance of the entire plant / equipment / material by the Engineer.

(c) Ten Percent (10%) of the 'Plant / Equipment / Material Supply Contract' Value at the end of twelve (12) months from the date of final acceptance of the entire Plant / Equipment / material by the Engineer or completion of Defect Liability Period, whichever is earlier.

Installation Work (Services):

[Where tender / contract is only for Installation Work (Services) and where Work (Services) part can be ascertained]

(a) Eighty Percent (80%) of the measured value of the 'Work Contract' performed by the contractor during the preceding month on receipt of invoice along with the certificate of the Engineer.

(b) Ten Percent (10%) of the 'Work Contract' Value upon satisfactory installation, satisfactory quality test results and final acceptance of the entire Work (Services) by the Engineer.

(c) Ten Percent (10%) of the 'Work Contract' Value at the end of twelve (12) months from the date of final acceptance of the entire Work (Services) by the Engineer or completion of Defect Liability Period, whichever is earlier.

Supply and Installation Work (Services):

[Where there is one combined tender / contract for Supply and Installation (Services) and it is impossible to separate or ascertain both portions.]

(a) Eighty Percent (80%) of the measured value of the 'Supply and Installation Work (Services) Contract' performed by the contractor during the preceding month on receipt of invoice along with the certificate of the Engineer.

(b) Ten Percent (10%) of the 'Supply and Installation Work (Services) Contract' Value upon satisfactory installation, satisfactory quality test results and final acceptance of the entire Supply and Installation Work (Services) by the Engineer.

(c) Ten Percent (10%) of the 'Supply and Installation Work (Services) Contract' Value at the end of twelve (12) months from the date of final acceptance of the entire Work (Services) by the Engineer or completion of Defect Liability Period, whichever is earlier.

(ii) If at the time at which either of the installments due under Sub-clause (a) (b) and (c) of clause (i) hereof becomes payable there are minor defects in the plant which are not of such importance as to effect the full commercial use of the plant, then the purchaser shall be entitled to retain such part of the installments then due as represents the cost of making good such minor defects, and any sum so retained shall, subject to the provisions of clause 36, become due upon such minor defects being made good. In case the defects identified by the Engineer still persist at the end of defect liability period, the amount so retained will be forfeited.

(iii) All interim / progress payments before final payment shall be regarded as provisional payments only and not as payment for work actually completed and shall not preclude defective / imperfect / incomplete work to be removed. Any interim / progress payment will not be considered as an admission by the Employer of the due performance of the Contract or any part thereof by the Contractor nor shall it preclude, determine or affect in any way the powers of the Purchaser / Employer under these conditions or in any other way vary or affect the Contract.

(iv) All payments to contractor will be made only through RTGS / NEFT.

(v) If the Purchaser desires that the plant or any portion should not be despatched by the contractor when it is due for despatch, the Contractor shall store such plant or portion at his works and be responsible for all risks. For such storage the Purchaser shall pay to the contractor at a rate to be mutually agreed upon between the parties but not exceeding Rs.15 (fifteen rupees) per tonne per week payable quarterly plus interest @ 1 percent per annum above the current rate of the State Bank of India, on 80 per cent of the contract value of the plant or portion thereof so stored, for the period from the date on which the said plant or portion becomes due and is ready for shipment up to the date on which it is actually shipped .

26. No interest on any dues

No interest shall be payable by the UJVN Limited on amounts, due to contractors pending final settlement of claim. Further, no interest shall be payable by UJVN Limited on any delayed amount / payment. No interest shall be payable on Earnest Money Deposit, Performance Security, Security Deposit or any other withheld / retained amount.

27. No Claim Certificate:

The Contractor will submit a "No Claim Certificate" to Engineer / UJVN Limited before Release of Performance Security.
[Format of "No Claim Certificate" is enclosed]

28. Provisional sums

In any case where the contract price includes a provisional sum to be provided by the contractor for meeting the expenses of extra work or for work to be done or materials to be supplied by a sub-contractor, such sum shall be expended or used, either wholly or in part, or be not used at the discretion of the Engineer and entirely as he may decide and direct. If no part or only a part thereof be used, then the whole or the part not used, as the case may be, shall be deducted from the contract price. If the sum used is more than such provisional sum the contractor shall pay the excess. In the case of material, supplied or work done by a sub- Contractor, the total of the net sum paid to the sub-contractor on account of such material or works and a sum equal to 10 percent of net sum allowed as contractor's profit shall be deemed to be the sum used. None of the work or articles to which such sum of money refers shall be done or purchased without the written order of the Engineer. The Contractor shall allow the sub-contractor every facility for the supply of materials or execution of their several works simultaneously with his own, and shall, within fourteen days after the engineer has requested him in writing so to do, pay the dues of such Sub-Contractors on account of such materials or works : PROVIDED

ALWAYS that the contractor shall have no responsibility with regard to such works or articles unless he shall have previously approved the sub-contractor and/or the material or plant to be supplied.

29. Certificates of Engineer

Every application to the Engineer for a certificate must be accompanied by a detailed invoice (in duplicate) setting forth in the order of the Schedule of prices, particulars of the plant supplied and the certificates as to such plant as is in the reasonable opinion of the Engineer, in accordance with the Contract shall be issued within fourteen days of the application for the same as is reasonably necessary on communication with the site.
The Engineer may, by any certificate, make any correction or modification in any previous certificate which shall have been issued by him and payments shall be regulated and adjusted accordingly.

30. Certified not to effect rights of the Purchaser or contractor

No certificate of the Engineer on account, nor any sum paid on account by the Purchaser, nor any extension of time granted under clause 31 shall affect or prejudice the rights of the Purchaser against the Contractor, either under this Agreement or under the law, or relieve the Contractor of his obligations for the due performance of the contract, or be interpreted as approval of the work or of the material supplied. No certificate of the Engineer shall create liability on the purchaser to pay for any alternation, amendments, variations or additions not ordered in writing by the Engineer, or absolve the Contractor of his liability for the payment of damages whether due, ascertained, or certified or not or of any sum against the payment of which he is bound to indemnify the Purchaser nor shall any such certificate nor the acceptance by him of any sum paid on account or otherwise affect or prejudice the rights of the Contractor against the Purchaser, under this agreement or under the law.

31. Suspension of works

The purchaser shall pay to the Contractor all reasonable expenses, incurred by the contractor by reason of suspension of the work or delay in shipment by order in writing of the Purchaser or the Engineer unless such suspension or delay shall be due to some default on the part of the Contractor or Sub-Contractor.

32. Extension of time for completion

The time given to the Contractor for dispatch, delivery, erection or completion, as the case may be, shall be reckoned from the date of receipt by the Contractor of the order, together with all necessary information and drawings, to enable the work to be put in hand. In all cases in which progress shall be delayed by strikes, lockouts, fire accidents, defective materials, delays in approval of drawings or any cause whatsoever beyond the reasonable control of the Contractor, and whether such delays or impediment shall occur before or after the time or extended time, for despatch, erection or completion, a reasonable extension of time shall be granted.

33. Force Majeure

Neither party shall be considered to be in default or in breach of his obligations under the Contract to the extent that performance of such obligations is prevented by any circumstances of Force Majeure which arise after the date of the Letter of Acceptance or the date when the Contract becomes effective, whichever is the earlier.

For purposes of this Clause, “Force Majeure” means an event or situation beyond the control of the Supplier that is unforeseeable, or unavoidable, and its origin is not due to negligence or lack of care on the part of the Supplier. Such events may include, but not be limited to, acts of the Purchaser in its sovereign capacity, wars or revolutions, fires, floods, epidemics/pandemics, quarantine restrictions, and freight embargoes.

If a Force Majeure situation arises, the Supplier shall promptly notify the Purchaser in writing of such condition and the cause thereof. Unless otherwise directed by the Purchaser in writing, the Supplier shall continue to perform its obligations under the Contract as far as is reasonably practical, and shall seek all reasonable alternative means for performance not prevented by the Force Majeure event.

34. Price reduction clause

If the Contractor shall fail in the due performance of his Contract within the time fixed by the Contract or any extension thereof, the Contractor agrees to accept a reduction of the Contract price by half percent per week reckoned on the contract value of such portion only of the plant as cannot, in consequence of the delay, be used commercially and efficiently during each week between the appointed or extended time, as the case may be, and the actual time of acceptance under clause 35, and such reduction shall be in full satisfaction of the Contractor’s liability for delay but shall not in any case exceed 10 per cent of the contract value of such portion of the plant.

35. Test on completion

Whenever possible all tests shall be carried out before shipment. Should , however , it be necessary for the final test as to performance and guarantees to be held over until plant is erected at site , they shall be carried out in the presence of the Contractor's representative within one month of completion of erection. If the result of these tests shall not come within the margin specified, the tests shall, if required, be repeated within one month from the date the plant is ready for re-test, and the Contractor shall re-pay to the Purchaser all reasonable expenses to which he may be put by such tests.

36. Rejection of defective plant

If the completed plant, or any portion thereof, before it is taken over under clause 35 be found to be defective, or fails to fulfil the requirements of the Contract, the Engineer shall give the Contractor notice setting forth particulars of such defects of failure, and the Contractor shall forthwith make the defective plant good, or alter the same to make it comply with the requirements of contract. If the Contractor fails to do so within a reasonable time the Purchaser may reject and replace, at the cost of the contractor, the whole or any portion of the plant, as the case may be, which is defective, or fails to fulfil the requirements of the Contract. Such replacement shall be carried out by the purchaser within a reasonable time and a reasonable price, and where reasonably possible to the same specification and under competitive conditions. In case of such replacement by the Purchaser the Contractor shall be liable to pay to the Purchaser the extra cost, if any, of such replacement delivered and /or erected as provided for in the original Contract, such extra cost being the ascertained difference between the price paid by the purchaser, under the provisions above mentioned, for such replacement and the Contract price for the plant so replaced and also to repay any sum paid by the Purchaser to the contractor in respect of such defective Plant. If the Purchaser does not so replace the rejected plant within a reasonable time, the contractor shall be liable only to repay to the Purchaser all moneys paid by the Purchaser to him in respect of such plant.

In the event of such rejection, the Purchaser shall be entitled to the use of the plant in a reasonable and proper manner for a time reasonably sufficient to enable him to obtain other replacement plant. During the period the rejected plant is used commercially the Contractor shall be entitled to a reasonable sum as payment for such use.

37. Taking over

Where the specification calls for performance tests before shipment and these have been successfully carried out, the plant shall be accepted and taken over when it has been satisfactorily put into operation on site, or within one month of its being ready to be put into operation whichever shall be the earlier and the Engineer shall forth issue a Taking over Certificate.

In the event of final or any outstanding tests being held over until the plant is erected, such Taking over Certificate shall be issued subject to the results of such final or outstanding tests which shall be carried out in accordance with clause 33.

When the Specification calls for tests on site the plant shall be taken over and the Taking-over Certificate issued immediately after such tests have been satisfactorily carried out.

If for any reason other than the default of the Contractor such last-mentioned tests on site shall not be carried out within one month of notice by the Contractor to the Purchaser of the plant being ready for test the plant shall be deemed to have been taken over as on the last day of such period and payments due to the Contractor on taking over shall be made , but nevertheless the Contractor shall, if called upon so to do by the Purchaser , but at Purchaser's expense ,make the said tests during the maintenance period and accept as aforesaid under the same obligation as specification Clause 33.

The Engineer shall not delay the issue of any Taking over Certificate contemplated by this clause on account of minor deficiencies of material or defects in the plant which don't materially affect the commercial use thereof, provided that the Contractor shall undertake to make good the same in due course.

38. Maintenance

Up to defect liability period, commencing from the date on which the plant is taken over is deemed to have been taken over under clause 35 (called "the maintenance period"), the Contractor shall remain liable to replace any defective parts that may develop in plant of his own manufacture or those of his sub-contractors approved under clause 6, under conditions provided for by the Contract under proper use and arising solely from faulty design, materials or workmanship : PROVIDED ALWAYS that such defective parts as are not repairable at the site and are not essential in the meantime to the maintenance in commercial use of the plant, are promptly returned to the Contractor's works at the expense of the Contractor unless otherwise arranged.

If it becomes necessary for the Contractor to replace or renew any defective parts of the plant under this clause, the provisions of the first paragraph of this clause shall apply to the parts of the plant so replaced or renewed until the expiration of six months from the date of such replacement or renewal or until the end of the above mentioned period of the twelve months whichever may be the later. If any defects be not remedied within a reasonable time, the Purchaser may proceed to do the work at the Contractor's risk and expense, but without prejudice to any other rights which the purchaser may have against the Contractor in respect of such defects.

The repaired or new parts will be delivered in accordance with clause 10. The Contractor shall bear reasonable cost of minor repairs carried out on his behalf at site.

At the end of the maintenance period the Contractor's liability shall cease. In respect of goods not covered by the first paragraph of this clause, the Purchaser shall be entitled to the benefit of any guarantee given to the Contractor by the original supplier or manufacturer of such goods.

39. Regulations of Local Authorities

The Purchaser shall , throughout the continuance of the Contract and in respect of all matters arising in the performance thereof , serve all notices and obtain all consents , way-leaves, approval and permission required in connection with the regulations and by-laws of any local or other authority which shall be applicable to the works.

All works shall be executed in accordance with the Indian Electricity Rules, 1956 and any statutory modifications thereof, wherever are applicable, unless otherwise agreed to in writing by the Engineer.

40. DISPUTE AVOIDANCE AND RESOLUTION (DAR)

Dispute Resolution Mechanism:

i. Application for bringing any claim shall include the nature of dispute, reason for bringing the claim, amount of claim with detailed justification for claim amount with the relevant supporting documents. The contractor shall be required to provide all supporting documents to the Engineer In-Charge and satisfy him about the claim.
ii. Any claim notification shall be submitted to the Engineer In-Charge within Fifteen (15) days and claim shall be raised within Ninety (90) days from the day when the Contractor became aware of the event and circumstance giving rise to the claim.
iii. Engineer In-Charge shall give its decision in writing within Thirty (30) days of claim being referred to it. If the contractor dissatisfied with the Engineer In-Charge's decision or if the Engineer In-Charge fails to give the decision within the stipulated time of Thirty (30) days, the Contractor may approach internal mechanism for dispute resolution by giving a prior written notice to the Engineer In-Charge.
iv. Engineer In-Charge of the contract shall be required to give reasons for accepting or rejecting a claim and to substantiate his reasons with the help of relevant documents wherever possible.
v. There shall be no provision for arbitration in the contract. Internal & External mechanisms of dispute resolution shall be the available mode of dispute resolution. If the dispute is not resolved through internal mechanism, then external mode of dispute resolution by Civil Court/Commercial Court shall be available to the parties.

40.1 Internal mechanism for dispute resolution

40.1.1 When dispute arises

i. In case the cause of dispute is either attributed to the Contractor or not justified in the facts, Employer shall communicate in writing to the Contractor with relevant facts and provisions of the Contract.
ii. Employer shall give a fair chance to the Contractor to take remedial measures within a specified time limit, failing which; the actions shall be taken by Employer within the purview of the Contract.
iii. In case the cause of dispute/default is being attributed to Employer, Employer shall first verify the information and examine the same in light of the relevant contractual provisions and if the claim of the contractor is legitimate, Employer shall take remedial measures within reasonable time and act upon it without any delay whatsoever.
iv. Employer and the contractor shall approach with an intention of resolving the dispute at Negotiation/Conciliation through Conciliator or ESC/DRB level itself and it will be made mandatory that until, and unless there is some reasonable ground, the decision of Conciliator or ESC/DRB shall be honoured by both the parties.
v. In cases, where statutes provide for mandatory process of mediation/ conciliation, such as under Section 12A of the Commercial Courts Act, 2015 and Section 18 of MSME Development Act, 2006, the procedure provided by such Statute shall be followed and in those cases the provisions of this internal mechanism for dispute resolution through conciliation shall not apply.

40.1.2 Negotiation/Mutual Consultation

i. If the dispute is not resolved at Engineer In-Charge level, the claim shall be referred to next higher authority within Fifteen (15) days from the date of the claim is denied by Engineer In-Charge and a meeting shall be convened at the next higher level in the Employer wherein authorized representatives of both parties shall discuss all issues.

ii. All the issues shall be discussed and parties will try to negotiate with a view to reconcile the disputes and look for solutions.

iii. The process shall be completed within sixty (60) days. However if any party is not satisfied with the decision, the aggrieved party to the case, in next fifteen (15) days from the date of recommendation/decision by the said higher authority, may refer its claim for conciliation by sole conciliator OR Expert Settlement committee (ESC).

40.1.3 Conciliation by Conciliator/Expert Settlement Committee (ESC)

i. If negotiation does not resolve the dispute between the parties, dispute shall be referred to Conciliation by Sole Conciliator or ESC to resolve the dispute through conciliation. Aggrieved party, within a period of fifteen (15) days from the date of failure to resolve the same through mutual consultation/negotiation, shall notify the other party in writing about such a dispute it wishes to refer for Conciliation. Such Invitation for Conciliation shall contain sufficient information as to the dispute to enable the other party to be fully informed as to the nature of the dispute, amount of the monetary claim, if any, and apparent cause of action.

ii. The Sole conciliator or one of the members of ESC shall be appointed by the Employer. For appointing a sole conciliator consent of the other party shall be taken. For 2 member ESC, 1 member will be nominated by the each party. For 3 member ESC, one member will be nominated by the each party and the third member will be nominated by the above two nominated members.

iii. The Sole conciliator / members of ESC shall be nominated as per eligibility criteria laid down under section 43 of Arbitration & Conciliation Act 1996 & subsequent amendment or from the panel of experts approved by Employer.

iv. If Conciliator/ESC is not appointed until the request for Conciliation is initiated, Engineer In-Charge will initiate the case for appointment of Conciliator or ESC within a week from receiving the proposal for conciliation. After appointment of Conciliator/ESC by the Employer, Engineer In-Charge will notify the same to the other party.

v. The party seeking conciliation shall submit their claim to the appointed Conciliator/ESC, with a copy of claim to other party within a period of fourteen (14) days from the date of appointment of Conciliator/ESC.

vi. The other party shall submit their counter claim to the Conciliator/ESC, with a copy of counter claim to first party, within a period of fourteen (14) days from the date of receiving the claim of first party.

vii. Parties may file their rejoinder/additional documents, if any in support of their claim/counterclaim within next fifteen (15) days. No documents shall be allowed thereafter, except with the permission of Conciliator/ESC.

viii. Depending on the volume of work and the claim amount involved, conciliator/ESC shall be free to take assistance of persons with the requisite technical know-how during the conciliation proceedings.

ix. The parties shall file their claim and counterclaim in the following format

a. Chronology of the dispute.
b. Brief of the contract.
c. Brief history of the dispute.
d. Issues.

S. No.	Description of Claims / Counter Claims	Amount (in INR)	Relevant Contract Clause

e. Details of Claim(s)/Counter Claim(s)
f. Basis/Ground of claim(s)/counter claim(s) (along with relevant clause of contract.
g. Other relevant information with respect to claim/dispute.

Note: Statement of claims shall be restricted to maximum limit of 20 pages.

x. The parties shall be represented by their in house employees. No party shall be allowed to bring any advocate or outside consultant/advisor/agent to contest on their behalf. Ex-officers of Employer who have handled the subject matter in any capacity shall not be allowed to attend and present the case before Conciliator/ESC on behalf of contractor. However, ex-employees of parties may represent their respective organizations. Parties shall not claim any interest on claims/counter-claims from the date of notice invoking Conciliation till execution of settlement agreement, if so arrived. In case, parties are unable to reach a settlement, no interest shall be claimed by either party for the period from the date of notice invoking Conciliation till the date of recommendations by Conciliator/ESC and thirty (30) days thereafter in any further proceeding.

xi. Conciliator/ESC will conclude its proceedings in maximum 10 meetings and give its recommendations within 90 days to 180 days from its first meeting depending upon the claim amount & documentation involved. Conciliator/ESC shall give its recommendations to both the parties recommending possible terms of settlement.

xii. Conciliator/ESC may grant variation in the time limits mentioned for various steps to be taken by either party during proceedings of Conciliation, based on genuine reasons/grounds. Employer may extend the time/number of meetings, in exceptional cases, if Conciliator requests for the same with sufficient reasons.

xiii. Fee of conciliator/ESC shall be decided by Employer, subject to condition that it will not exceed the fee schedule given in the Arbitration & Conciliation Act 1996 & subsequent amendment. The cost of Conciliation proceedings including but not limited to fees for Conciliator/Chairman & members of ESC, cost towards Air/Train/Car travel, Local transport, fooding & lodging, conference facility etc., as per convenience of conciliator/ESC members, shall be paid as determined by Employer from time to time and shall be paid equally by both the parties to the dispute.

xiv. If the parties reach an agreement during the conciliation proceedings a Settlement Agreement under section 73 of the Arbitration & Conciliation Act 1996 & subsequent amendment, will be signed within fifteen (15) days of contractor's acceptance and same shall be authenticated by the Conciliator/ESC. Parties shall be free to terminate Conciliation proceedings at any stage as provided under the Arbitration & Conciliation Act 1996 & subsequent amendment.

xv. The parties shall keep confidential all matters relating to the Conciliation proceedings. Parties shall not rely upon them as evidence in arbitration proceedings or court proceedings.

xvi. In the event conciliation process does not bear a fruitful result, the aggrieved party, may refer the claim to Dispute Resolution Board (DRB) within fifteen (15) days from the date of conclusion of such Conciliation process or within fifteen (15) days of knowledge of such failure of conciliation.

xvii. If the party initiating Conciliation does not receive any reply within thirty (30) days from the date for Conciliation request, it shall be treated as rejection of the request for conciliation by the other party and the aggrieved party shall have right to refer the claim to Dispute Resolution Board (DRB)/ External Mechanism for Dispute Resolution.

Line of action for decision making, in case of decision by Conciliator/ESC:

i. During the conciliation process, if it appears to the conciliator/ESC that there exist elements of settlement, which may be acceptable to both parties, it shall formulate terms of possible settlement & submit it to the parties for their observation.

ii. Once settlement agreement shall be finalized & agreed by both the parties, the draft agreement proposed to be signed by Engineer In-Charge on behalf of Employer shall require prior approval and the same be submitted with detailed justification for approval by Employer.

iii. Approval of the payment shall be granted by Employer.

iv. After signing of settlement agreement, provision under section-74 of Arbitration & Conciliation Act 1996 & subsequent amendment, will apply.

v. Engineer In-Charge as per provision of settlement agreement shall take necessary action and agreed payment shall be released.

vi. No dues and other details shall be obtained from the contractor towards full and final settlement of the claim under the agreement, prior to release of payment.

vii. All provision of arbitration and conciliation Act 1996 as amended time to time shall be applicable in totality.

40.2 External Mechanism for Dispute Resolution

In case the dispute could not be resolved through internal mechanism for dispute resolution, the dispute has to be adjudicated externally through litigation in a Court of law. The Jurisdiction of the court in case of civil suit will be the District court of the project area and in case of commercial suit will be Commercial Court at Dehradun.

40.3 General norms applicable to Conciliator/ESC Chairman & members:

Following general norms shall be kept in mind while finalizing nomination for Conciliator/Chairman & members of ESC or DRB:

a. The person of general reputation of fairness, integrity and capable to apply objectivity in arriving at settlement of disputes;
b. The person must be impartial and neutral and avoid entering into any financial business or other relationship that is likely to affect impartiality or might reasonably create an appearance of partiality or bias amongst the parties;
c. The person should not involve in any legal proceeding and avoid any potential conflict connected with any dispute to be arbitrator by him;
d. The person should not have been convicted or an offence involving moral turpitude or economic offence;
e. The person shall be conversant with the Constitution of India, principles of natural justice, equity, common and customary laws, commercial laws, labour laws, law of torts, making and enforcing the arbitral awards;

f. The person should possess robust understanding of the domestic and international legal system on arbitration and international best practices in regard thereto;
g. The person should be able to understand key elements of contractual obligations in civil and commercial disputes and be able to apply legal principles to a situation under dispute and also to apply judicial decisions on a given matter relating to arbitration; and
h. The person should be capable of suggesting, recommending or writing a reasoned and enforceable arbitral award in any dispute which comes before him for adjudication.

Employer may form its own panel of experts with above eligibility criteria for nomination as Conciliator/Chairman & members of ESC or DRB.

40.4 Fee for Conciliator/Chairman & members of ESC:

a. Subjected to provisions of section 11(14), 31(8) and 31(A) of Arbitration & Conciliation Act 1996 & subsequent amendment, the Arbitrators may be paid fees as per "The Fourth Schedule" of The Arbitration and Conciliation (Amendment) Act 2015. The fee structure of schedule is detailed ahead:

Sum in Dispute	**Model Fee**
Up to Rs. 5 Lakhs	Rs. 45,000/-
Above Rs.5 Lakhs to Rs. 20 Lakhs	Rs. 45,000/-plus 3.5% of the claim amount over and above Rs. 5 Lakhs.
Above Rs. 20 Lakhs and up to Rs. 1 Crore	Rs.97,500/- plus 3% of the claim amount over and above Rs. 20 Lakhs.
Above Rs. 1 Crore and up to Rs. 10 Crore	Rs. 3,37,500/- plus 1% of the claim amount over and above Rs. 1 Crore.
Above Rs. 10 Crore and up to Rs. 20 Crore	Rs. 12,37,500/- plus 0.75% of the claim amount over and above Rs. 10 Crore.
Above Rs. 20 Crore	Rs. 19,87,500/- plus 0.5% of the claim amount over and above Rs. 20 Crore with a ceiling of Rs. 30 Lakhs

b. The above fee may also be allowed for Conciliator/Chairman and members of ESC or DRB.
c. The above fee shall be shared equally by both the parties. The above fees exclude taxes which will be paid additionally**.**
d. Each party shall be responsible for making arrangements for the travel and stay etc. of the member of ESC or DRB appointed by it. As regards the expenditure related to sole Conciliator/Chairman of ESC or DRB, the expenses incurred on fee, his travel, boarding/lodging etc. shall be shared equally by both the parties.

41. Banning/Debarring/Blacklisting of the Bidders/ Contractors

i. Indulging in unfair / Corrupt practice in tender process
ii. Indulging in bid rigging or collusive bidding
iii. Subcontracting of whole or part of supply/ work without permission of Employer/UJVN Ltd
iv. Tampering with downloaded bid document form the website.
v. Non submission of tender fee and earnest money.

Note: Blacklisting policy of UJVN Ltd. is available on website of UJVN Ltd. i.e. www.ujvnl.com

42. Construction of contract

The Contract shall in all respects be construed and operate as a Contract as defined in the Indian Contract Act, 1872, and all payments thereunder shall be made in rupees unless otherwise specified.

43. Any Plant, Equipment, Material, etc. issued to the fabrication / maintenance / other contractors must be issued only after due execution of an "Indemnity Bond" in favour of UJVN Limited for an amount equal to the market value of such Plant, Equipment, Material, etc being issued to be decided by the Engineer-in -Charge.

44. Format for "Letter of Acceptance / Award of Contract" in the draft SBD. An indicative Format is given in Annexure-2.

45. It is suggested that kindly incorporate format for "Affidavit / Undertaking" to be submitted by the Bidder at the time of Tender in the draft SBD. An indicative Format is given in Annexure-3.

46. Termination of Contract

The contract shall be terminated any time in case it is found that the supply is not being made to the satisfaction of Engineer Incharge. Under such condition the complete supply will be got done through any other agency and all such excess expenditure / loss to UJVN Limited will be debatable / chargeable to the contractors account.

Termination / Cancellation of Contract for Default

Without prejudice to any other remedy for breach of contract, such as removal from the list of enlisted contractor, by written notice of default sent to the Contractor, the contract may be terminated in whole or in part, if:

i) the contractor has seriously or repeatedly breached the contract, including:
   a) failure to complete the work within the time period(s) specified in the contract, or any extension thereof granted;
   b) failure to obey instructions in relation to his progress or defective work, material or plant;
   c) breach of the prohibition against sub-contracting;
   d) failure to supply sufficient and suitable constructional plant, temporary works, labour and material as proposed in the work programme;
   e) substantial suspension of work for more than the specified days without authority from the engineer and failure to proceed with the work within the specified days of receipt of notice from the engineer;
   f) failure to comply with the requirements regarding JVs.

ii) the contractor has committed fraud;

iii) the contractor fails to perform any other obligation under the contract within the period specified in the contract or any extension thereof granted;

iv) if the contract is terminated in whole or in part, recourse may be taken to any one or more of the following actions:
   a) forfeiture of the performance security;
   b) upon such terms and in such manner as it deems appropriate, taking over the site and to complete the works himself or with another contractor (risk Purchase) and use the contractor's materials, equipment, temporary works as he/ they think proper. In small value contracts, instead of Risk Purchase, a fixed percentage recovery may be provided in the SBD; and
   c) However, the contractor shall continue to fulfil the contract to the extent not terminated.

Termination of Contract for Insolvency

If the contractor becomes bankrupt or becomes otherwise insolvent or undergoes liquidation or loses substantially the technical or financial capability (based on which he was selected for award of contract), at any time, the contract may be terminated, by giving a written notice to the contractor, without compensation to the contractor, provided that such termination will not prejudice or affect any right of action or remedy which has accrued or will accrue thereafter to Procuring Entity.

Termination of Contract by Other Mean

If the contract termination/ fore closure is triggered on account of orders by Courts, Govt. of India and/or Govt. of Uttarakhand, no claim of contractor whatsoever due to such termination or/fore closure of contract shall be payable by the UJVN Limited and no correspondence in this regard shall be entertained.

SPECIAL CONDITIONS FOR WORK OF "GENERAL MAINTENANCE OF 75 MVA GENERATING TRANSFORMERS AND RELATED FABRICATION WORKS AT GTS BAY OF VYASI HYDRO POWER STATION (2X60MW), HATHIYARI (DEHRADUN)"

1.0 These Special Conditions shall be read and construed along with General Conditions of Contract Form (GCC) as modified by the provisions hereof, but if there be any conflict or in consistency between the provisions hereof and those contained in General Conditions of Contract Form (GCC) then these special conditions shall prevail.

2.0 SCOPE OF WORK: The scope of work includes "General Maintenance of 75 MVA Generating Transformers and related fabrication works at GTs Bay of Vyasi Hydro Power Station (2x60MW), Hathiyari (Dehradun)" as mentioned in the technical specifications attached herewith.

3.0 PRICES: The Prices should be F.O.R Dakpathar. Overall lowest bidder will be considered for award of contract.

4.0 DATE OF START: The date of start shall be as mentioned in the letter of intent.

5.0 DATE OF COMPLETION: The date of completion of work will be 60 days from the date of shut down.

6.0 LEVY OF PENALTY: If the Contractor fails to complete the work within stipulated period i.e. 30 days for each unit then Penalty @ 0.5% per week subject to the maximum of 3% of the Contract value shall be levied on the Contractor.

7.0 ACCIDENT/DEATH OF WORKERS: The contractor shall be responsible for payment of accidental benefit and compensation in case of death of any worker engaged by him as per provisions, rules/orders of the Govt. No liability whatsoever will be acceptable by the Nigam.

8.0 INSURANCE OF THE WORKERS: The insurance of the persons engaged by the Contractor shall be carried-out by him as per provision of the Factory Act and workmen compensation Act, and such compensation as may be due shall be paid by the Contractor. No liability whatsoever will be acceptable by the Nigam.

9.0 PERMISSION FOR ENTERING IN THE POWER STATION: The Contractor shall obtain permission cards for himself and for his staff/workers to enter into the Power House premises/area for the execution of the work. The Contractor will take full responsibility for the good conduct of his staff/workers engaged for the execution of Job.

10.0 CONSUMBABLES: All consumables required for the execution of work will be arranged by the Contractor at his cost & the same shall have to be supplied on quarterly basis to the supervision authority before starting the work.

11.0 TERMINATION OF THE CONTRACT: The contract can be terminated at any time in case it is found that the work is not being carried-out to the satisfaction of the engineer-in-charge or to the satisfaction of his representative. Under such condition the complete work will be got done through other agency/agencies, and all such extra expenditures will be debited to the contractor's account.

12.0 TRANSPORTATION OF MEN AND MATERIAL: Contractor will make his own arrangement for the transport of his men and material to work site and back. Site material storage facility will be provided to the Contractor free of cost.

13.0 PAYMENT: 100% payment of against satisfactory completion of work.

14.0 PERFORMANCE SECURITY: The successful bidder shall deposit to the Employer a Performance Security in the form of FDR/CDR/TDR/Scheduled Bank (Other than Co-operative and Regional Rural Bank) duly pledged in favour of "Dy. General Manager (Civil), Vyasi Project payable at PNB Dakpathar, Dehradun" amounting to 10% (Ten Percent) of the value of order/contract towards faithful performance of the work/supply to be carried out by him. Performance Security shall remain valid for a period of Two months from the defect liability period (as per clause 20 of SCC) by the Contractor. Any defect found during this period due to bad workmanship in the jobs carried out by the Contractor shall be rectified by Contractor free of cost.

15.0 The Engineer-In-Charge shall have the right to object to employment or presence of any person labour employed by the contractor for non-compliance, negligence, mis-conduct or being considered undesirable in the interest of work and on receipt of such objections the contractor shall be bound to remove person(s) from the work area.

16.0 The work shall not be sub-let to any other agency by the Contractor.

17.0 NOTICE TO CONTRACTOR: Any notice to be given to the Contractor as per the Purchaser thinks fit, be posted to his address or handed over to his authorized representative and such posting or acknowledgement, shall be deemed to have

been served such notice and the time mentioned and the general conditions for doing any act after notice shall be reckoned from the date on which notice should reach him in normal course.

18.0 Income Tax / Trade Tax as applicable shall be deducted from Contractor's bill.

19.0 Tax (GST) should be mentioned clearly, otherwise quoted rates shall be considered inclusive of tax (GST).

20.0 DEFECT LIABILITY PERIOD: Defect liability period of this contract will be one year (12 months) from the dated of completion of the work. Contractor shall ensure to rectify all the manufacturing or erection defect during this period without any extra cost to the satisfaction level of engineer-in-charge within 15 days of notification in writing.

21.0 The work shall be supervised by Assistant Engineer (E&M), vyasi Project.

22.0 All dispute arising out of or touching or relating to the subject matter of this Agreement shall be subject to the jurisdiction of Local Courts at Dehradun and High Court of Nainital only.

23.0 Contrector should take all precaution relateded to the COVID 19 during the works .

Excutive Engineer(Generation)

TECHNICAL SPECIFICATIONS

Name of work:- General Maintenance of 75 MVA Generating Transformers and related fabrication works at GTs bay of Vyasi Hydro Power Station (2x60MW), Hathiyari (Dehradun).

GSU TRANSFORMERS 75MVA,11/220KV

Parameters	Particular
General	
Type/designation	GT
General	
Manufacturer	BHEL
Place of manufacture	JHANSI
Applicable standards	IEC-60076
No of phase	3
No of windings	2
Rated frequency	50 Hz
Rated continuous power of each winding at all tapings and at max cooling water temperature	75 MVA
Rated voltage	
-HV winding	220 KV
- LV winding	11 KV
Highest voltage of equipment Um for	
-HV winding	245 KV
- LV winding	12 KV
Vector group	YNd11
Electrical Characteristics	
Nominal currents	
-HV principal tapping	196.82A
- HV highest tapping	183.09A
- HV lowest tapping	201.87A
-LV	3936.48A
Connections	
-HV Winding	Star
-LV Winding	Delta
Type of cooling	OFWF
Maximum noise level	81 dB
No load losses at rated voltage and rated frequency at principal tap	40 (Max) kW
No load losses at the voltage corresponding to the highest tap	40 (Max) kW
Load loss at rated output rated frequency and corrected for 75 Degc. Winding temperature	240 (Max) kW
Auxiliary losses at the rated out put rated voltage rated frequency and ambient temperature	5 (Max) kW
Total losses at rated output, rated voltage and rated frequency inclusive of auxiliary losses	285 kW
Temperature	
Maximum temperature rises, at rated power	
- top oil (measured by thermometer)	50 Deg.C.
- winding (Measured by resistance)	60 Deg.C.
Limit of hot spot temperature for which the transformer is designed	120 Deg.C.
Time for which transformer can be run at full load	

without exceeding the maximum permission	
- Water supply is cut off & oil pumps are working	10 min
-Water supply is working and oil pumps fails	10 min
- When both water and power supply to oil pumps is cut off.	10 min
% impedance voltage at rated power referred to 75 Deg.C. winding temperature.	12.5% ± IEC Tol.
Constructional Features	
Details of core	3- limbed Core
Type of core	core type
Flux density at rated voltage and frequency and at principal tap	1.656T
Details of winding	HV Disc,LV- Helical
Type of winding	
Material of the winding conductor	Electrolytic Copper
Type of tank	Conventional
Minimum vacuum withstand and overpressure withstand of the tank	As per spec.
No of oil water coolers (350kW capacity each)	1 running + 1 stand by
No of oil pumps	1 running + 1 stand by
Type of conservator	Air Bag Type
Oil Quality	**IEC-296**
Resistivity (min)	
at 90 Deg.c	2×10^{12}
at 27Deg.c	25×10^{12}
Oxidation stability (164 hours at 120 deg.c with copper catalyst)	As per IEC61125
Dielectric dissipation factor (tan delta) at 90 Deg.C. (max)	0.005
Total acidity	0.03 mgKOH/gm
Total sludge (Max)	0.03 % by weight
Oxidation inhibitor	Not applicable
PCA Content(max)	3 %
PCB Content	Note detectable (<2mg/kg)
Impulse BDV (Min) Needs negative to sphere gnd 1" gap	No general requirement
Gas & oil operated relay	
- Make & type	As per Approved Venders/GAS OPTD
Oil Temperature indicator	
Make & type	As per Approved Venders/liquid expen.
Permissible setting range for alarm and trip	20-140 Deg.c
Winding temperature indicator	
Make & type	As per Approved Venders/heated bellow
Permissible setting range for alarm and trip	30-150 Deg.c
Rail gauges fro longitudinal and transversal movement	1676 mm
Class of rail	As per Indian Railway-52Kg/m
Weights (Approx.) Kgs	
Total weight of complete transformer (filled with oil)	**107000**
Weight of oil filling	27000
Transportation weight	76000
Total mass of cellulose insulation	2800
Total mass of copper in the main winding	11000
Approx. overall dimensions (LXWXH)	9100x4200x7200
Approx. shipping dimensions (LXWXH)	6650x2700x3750
Untanking Weight	8500

STATION TRANSFORMER 220/11KV, 5 MVA

Parameters	Particular
General	
Type/designation	ST
General	
Manufacturer	BHEL
Place of manufacture	JHANSI
Applicable standards	IEC-60076
No of phase	3
No of windings	2
Rated frequency	50 Hz
Rated continuous power of each winding at all tapings and at max cooling water temperature	5 MVA
Rated voltage	
-HV winding	220 KV
- LV winding	11 KV
Highest voltage of equipment Um for	
-HV winding	245 KV
- LV winding	12 KV
Vector group	YNd11
Electrical Characteristics	
Nominal currents	
-HV principal tapping	12.5A
- HV highest tapping	13.12A
- HV lowest tapping	13.81A
-LV	262.43A
Connections	
-HV Winding	Star
-LV Winding	Delta
Type of cooling	ONAN
Maximum noise level	73 dB
Temperature	
Maximum temperature rises, at rated power	
- top oil (measured by thermometer)	50 Deg.C.
- winding (Measured by resistance)	60 Deg.C.
Limit of hot spot temperature for which the transformer is designed	120 Deg.C.
% impedance voltage at rated power referred to 75 Deg.C. winding temperature.	7.5% ± IEC Tol.
Constructional Features	
Details of core	3- limbed Core
Type of core	core type
Flux density at rated voltage and frequency and at principal tap	1.656T
Constructional Features	
Details of core	3- limbed Core
Type of core	core type
Flux density at rated voltage and frequency and at principal tap	1.656T
Details of winding	HV Disc, LV- Helical
Type of winding	

Material of the winding conductor	Electrolytic copper
Type of tank	Conventional

Type of conservator	Air Bag Type
Oil Quality	**IEC-296**
Gas & oil operated relay	
- Make & type	As per Approved Venders/GAS OPTD
Oil Temperature indicator	
Make & type	As per Approved Venders/liquid expen.
Permissible setting range for alarm and trip	20-140 Deg.c
Winding temperature indicator	
Make & type	As per Approved Venders/heated bellow
Permissible setting range for alarm and trip	30-150 Deg.c
On line moisture indicators	
Make & type	Reputed type/on line type
Permissible setting range for alarm and trip	Shall be shared after finalisation
Rail gauges fro longitudinal and transversal movement	1676 mm
Class of rail	As per Indian Railway-52Kg/m
Guaranteed losses at rated voltage and rated capacity at 75°C (Normal Tap)	
Iron loss	13 KW
Copper loss	18 KW
Auxiliary loss	NA
Weights (Approx.)	
Total weight of complete transformer (filled with oil)	**46000 Kgs**
Weight of oil filling	16000 Kgs
Total oil quantity (Liters)	18000 Ltrs
Shipping weight	30000 **Kgs**
Tank and fitting	16000 **Kgs**
Untanking Weight	14000 **Kgs**
Outside Finish Paint	EPOXY to shade 631 of IS-5

Minimum vacuum withstand and overpressure withstand of the tank	As per spec.

(A) DETAILED TECHNICAL SPECIFICATION OF MAINTENANCE WORK:-

1. DGA, PPM and BDV testing of Transformer oil of 75 MVA, 11kv/220kv and 5 MVA Transformer:- The work comprises as:-

(Dissolved Gas Analysis, Water content /PPM and BDV) of 11/220 KV, 75 MVA GSU Transformer #1, 2 and 220/11KV, 5 MVA Station Transformer. The test containing Inspection, Testing of DGA, PPM & BDV of 75MVA Transformer. (Collect the oil sample on sample bottle and testing of DGA, PPM & BDV by reputed Laboratory and submit the test certificate).

The quantity of above work is 03 jobs for two 75 MVA GSU Transformers and one 5 MVA station Transformer.

All the T & P and associated equipment with all the consumables will be provided by the contractor.

2. Overhauling/maintenance and Testing of Oil coolers, NRV and Gate valves, Motor and pump set of 75 MVA GSU Transformer as per technical specification: -

Each 75 MVA having OFWF type cooling system, consists of 02 Nos Oil coolers (01 running + 01 Stand by). Oil coolers are of BHEL make, Coolers are shell and Tube type, Heat dissipation 350 KW, Design Pr tube side 1.0 Kg/Cm^2 , Design pressure shell side 6.5 Kg/cm^2, Test Pr tube side 1.5 Kg/cm^2. Hot oil for cooling taken by motor (5 HP, 3-Phase AC, 2800 rpm) driven oil pumps (discharge 1000 LPM) from the top of the Transformer oil tank and passed the oil through coolers then feed to bottom of the Transformer. Two separate pumps are installed for two coolers. One pump and coolers is rated for normal cooling of oil. Water passes through the coolers by natural water head pressure of approx 10 kg/cm^2. 80 NB line is connected for water flow and 100NB line for oil flow.

Water tubes are mostly clogged due to deposition of foreign matters and erode of tubes. The valves and NRVs of oil and water circuit are also got erode/ leakage due to continue flow and aging effect. These coolers, their valves and NRVs are required to be cleaned and damaged parts to be replaced with new one.

The following works has to perform during annual maintenance work of the oil coolers and the accessories of Transformers.

- Dismantling of both the coolers, NRVs, Gate valves, Oil & water pipelines (100NB and 80NB respectively) etc and shifted to suitable location for performing maintenance work.
- Cleaning the tube nest assembly and other part with the help of compatible and suitable chemical solution or by suitable cleaning agent to remove scaling & choking of the tubes.
- Check the tube nest assembly at a pressure of 1.5 Kg/cm2 for half hour.
- Repair the leaked tube/diaphragm by brazing/soldering or replaced by new one.
- Assembling the cooler assembly and other part by new fasteners.
- Testing of water pipeline gate valve at a pressure 12 kg/cm2 for half hour.
- Repairing of 8 Nos. gate valve in complete respect i.e. wedge, spindle, bronze nut and gland seal etc**. (consumables material so, if required, shall be under the scope of the contractor).**
- Checking the DE & NDE bearings and terminal plate of the motor & pump and change/overhauled as required. **(bearings are in the scope of contractor if required)**
- Replacement of defective oil and water pressure gauges, flow indicators and temperature detectors, Thermometers etc fitted on 75 MVA GSU Transformers.
- Checking of oil Leakage from flanges of the Oil Coolers, valves water and oil lines of 75 MVA transformers. If any leakage found, defects shall be rectified by the contractor.
- Checking of coolers water leakage detection system.

- Assembling after providing and fixing all gaskets of synthetic rubber bonded cork sheet GR- RC 70 /NBC on all assembling joint surfaces of above main assembling parts like coolers, pipe line, valve etc. Champion gasket shall be used for water path surfaces. All the nut and bolt shall be replaced with new nut & bolt H8. (All gaskets and seals required shall be under the scope of contractor).
- Cleaning & Painting on air exposed surfaces of coolers, valves and all other associated pipe lines. Cleaning of surfaces means clean all dirt, oil, grease by the cotton and emery paper at inner surface and outer surface. Painting means two coat of synthetic oil based enamel paint by spray at outer surfaces and epoxy paint on inner surfaces of cooler by two coat. Painting on water inlet and outlet of coolers inner side by two coat of black epoxy paint. (Paints and enamels shall be under the scope of contractor)

  All the associated material required for the satisfactory completion of the job like NBC/synthetic rubber bonded cork sheet, Nytril rubber cord, adhesive, Rustoline, CRC and different cleaner, Petrol and fastener like Nut Bolt, flat washer, spring washer, shall be in the scope of contractor i.e. no extra cost shall be paid by UJVNL for these material.
- After assembling ensure the satisfactory operation and functioning of coolers, gate valves, flow meters, gauges etc.

The quantity of above work is 04 jobs for two 75 MVA GSU Transformer.

Scope of UJVNL: Any spares/Assembly which is irreparable shall be under the scope of UJVNL.
All the T & P and testing equipments with all the consumables will be provided by the contractor.

3. Inspection and testing of Outdoor Marshalling Kiosk. (ODMK), of 11/220KV, 75 MVA GSU Transformer and their associated equipments and control circuitry as per technical specifications:-

Each GSU Transformer contains Marshalling Kiosk for controlling the oil pump motor, temp measurement and tapping of protection circuit. The following works required to be carried out to perform the maintenance work of the Kiosk:-

- Checking of any loose connection in the marshalling box.
- Thorough cleaning of complete Kiosk.
- To check the proper functioning of Space heaters, contactors, Timers setting of overload relays of Oil pump motor.
- Setting and calibration of WTI and OTI for alarm and tripping.
- OTI and WTI of LV and HV winding to be calibrated and checked properly, replaced if found defective. (New OIT and WTI shall be under the scope of UJVN)
- Checking bucholz relay circuit, Transformer differential protection circuit, Earth fault protection circuit overload protection.
- Checking of satisfactory functioning of Oil pump motor on Auto, Remote and local mode.
- Replacement of all defective components if required.

  All the consumables required are in the scope of the contractor and spares are in the scope of department.
- Checking of wire and cables for any damage from transformer auxiliaries to marshalling box.

All the consumables required are in the scope of the contractor and spares are in the scope of department.
The quantity of above work is 02 jobs for two 75 MVA Station Transformer.
All the T & P and associated equipment with all the consumables will be provided by the contractor.

4. Inspection and testing of Outdoor Marshalling Kiosk. (ODMK), of 220/11KV, 5 MVA Station Transformer and their associated equipments and control circuitry as per technical specification:-

Station Transformer contains Marshalling Kiosk for controlling the oil pump motor, temp measurement and tapping of protection circuit. The following works required to be carried out to perform the maintenance work of the Kiosk:-

- Checking of any loose connection in the marshalling box.
- Thorough cleaning of complete Kiosk.
- To check the proper functioning of Space heaters, contactors, Timers setting of overload relays of Oil pump motor.
- Setting and calibration of WTI and OTI for alarm and tripping.
- Checking bucholz relay circuit, Transformer differential protection circuit, Earth fault protection circuit overload protection.
- OTI and WTI of LV and HV winding to be calibrated and checked properly, replaced if found defective. (New OIT and WTI shall be under the scope of UJVN)
- Checking of satisfactory functioning of Oil pump motor on Auto, Remote and local mode.
- Replacement of all defective components if required.
  All the consumables required are in the scope of the contractor and spares are in the scope of department.
- Checking of wire and cables for any damage from transformer auxiliaries to marshalling box.

All the consumables required are in the scope of the contractor and spares are in the scope of department.
The quantity of above work is 01 jobs for one 5 MVA Station Transformers.

All the T & P and associated equipments with all the consumables will be provided by the contractor.

5. Inspection, testing and overhauling of Main cooling valve and NRV 100mm of 11/220KV 75 MVA GSU Transformer: - Each GSU transformer contain main cooling valve and NRV. The work included as:-

- Overhauling and testing of NRV and replace the seal and gasket.
- Overhauling and testing of Main cooling valve, replace the gland seal and gasket of the valve.
- Replacement of all defective components if required.

All the consumables required are in the scope of the contractor and spares are in the scope of department.

The quantity of above work is 02 jobs for two 75 MVA Station Transformer.

All the T & P and associated equipments with all the consumables will be provided by the contractor.

6. Fabrication of Stairs and Platform for servicing of 75 MVA Transformers and fire protection coating in HT 5MVA & 1000 KVA SAT Transformer (Total length of coating 6 mtr) as per Technical specifications: -

i) Fabrication of Stairs:- Fabrication of Stairs approx. 28 steps by using squire pipe of size 75x75x3mm, chequered plates 3mm, Round pipe for Railing of size 40mm dia 2 mm thick(Size of Stair step frame is w x L (12" x 36"). Height of complete stairs is approx 25 feet as per requirement at site.

ii) Fabrication of Platform:- Fabrication of Platform of size 12x4 Feet or as per site requirement. Fabrication of platform legs/support/pillars by using square pipe size of square pipe 100x100x3mm standing the square pipe by using grout the MS plate with fasteners and welding the square pipe in plate than making the platform frame by using Angle size 50x50x3mm. Then fabricate the MS Plate size 3mm to all the Platform size.

- Material required for the fabrication for the scope i.e. chequered plates/MS Plate, Flats/Beams/Channel/Angles etc are in the scope of the contractor. All required material to be sourced only from JINDAL,JAI BHARAT, RANA, TATA, ESSAR.
- Electrode Make : ESAB/L&T, D&H, ADOR.
- Fabrication, welding, destructive, non-destructive tested by penetration inspection test kit.

All the T & P and associated equipments with all the consumables will be provided by the contractor.

The quantity of above work is 02 jobs for two 75 MVA Station Transformer.

7. Painting of Stairs and Platform as per Technical Specifications:- Painting of Stairs and Platform with one coat of Metal Primer and two coat of BERGER/NEROLAC make High quality oil based (Water based paints shall not be allowed in any condition) including all Labour, Material, T&P etc complete in all respect. Approximate area to be painted is 61.75 Sqm.

The quantity of above work is 02 jobs for two 75 MVA Station Transformer.

All the T & P and associated equipments with all the consumables will be provided by the contractor.

8. Testing of New welded joints as per Technical specifications:- Testing of all new welded joints by using DP Test kit including T&P, Man & material and consumables as required for satisfactory completion of work at site.

The quantity of above work is 01 jobs for two 75 MVA Station Transformer.

All the T & P and associated equipments with all the consumables will be provided by the contractor.

Note: all the consumable/minor spares will be in scope of contractor.

EE (Gen)
Vyasi P/Station

BILL OF QUANTITY

SCHEDULE OF PRICES FOR WORK OF "GENERAL MAINTENANCE OF 75 MVA GENERATING TRANSFORMERS AND RELATED FABRICATION WORKS AT GTS BAY OF VYASI HYDRO POWER STATION (2X60MW), HATHIYARI (DEHRADUN)."

S. No.	Description	Unit	Qty	Rate	Amount
1	DGA, PPM and BDV testing of Transformer oil of 75 MVA, 11kv/220kv and 5 MVA Transformer.	JOB	3		
2	Overhauling, maintenance and Testing of Oil coolers, NRV and Gate valves, Motor and pump set of 75 MVA GSU Transformer as per technical specification.	JOB	4		
3	Inspection and testing of Outdoor Marshalling Kiosk. (ODMK), of 11/220KV, 75 MVA GSU Transformer and their associated equipments and control circuitry as per technical specifications.	JOB	2		
4	Inspection and testing of Outdoor Marshalling Kiosk. (ODMK), of 220/11KV, 5 MVA Station Transformer and their associated equipments and control circuitry as per technical specification.	JOB	1		
5	Inspection, testing and overhauling of Main cooling valve and NRV 100mm of 11/220KV 75 MVA GSU Transformer.	JOB	2		
6	Fabrication of Stairs and Platform for servicing of 75 MVA Transformers with coating as per technical specifications and fire protection coating in HT 5MVA ST (Total length of coating 6 mtr) as per Technical specifications.	JOB	2		
7	Painting of Stairs and Platform with one coat of Metal Primer and two coat of BERGER/NEROLAC make High quality oil based	Job	2		
8	Testing of New welded joints as per Technical specifications.	JOB	1		

F.O.R DAKPATHAR

In Words Rs.……

Taxes Extra @ ……

SIGNATURE OF TENDERER WITH SEAL

NOTE:

1. The rate quoted shall be considered including of all Govt. taxes such as I.T. Road tax etc. and EPF & insurance of labours also. However, the Goods and Service Tax shall be paid extra by the Nigam as per applicable rule.
2. Bidder has to enter only item rates in Bill of Quantity. Lump- Sum rates shall not be considered in any case and tender shall be rejected without giving any reason.
3. Bidder shall not write anything on bill of quantity except rates. After quoting rates in bill of quantity, nothing shall be added or deducted by the bidder from quoted rates, such practice shall not accepted and only quoted rates shall be considered for bidding.
4. Contractor or his authorized representative shall keep close liaison daily with J.E. /A.E. concerned for taking day to day instructions progress/complaints pertaining to the work.
5. Contractor has to follow the labour rules, other rules applicable for this type of work and statuary rules laid by GOUK/GOI.
6. No T&P will be issued by the Nigam and rates should be inclusive of cost of all T&P etc.
7. Any penalty if imposed by any authority on account of illegal querying and transportation for same and other reasons thereof shall be borne by the contractor.

Signature of Bidder

Annexure- 1

FORMAT FOR BID VALIDITY AGREEMENT BETWEEN THE TENDERER AND UJVN LIMITED

(Referred to in clause 7 of ITT)

(On a non-judicial stamp of Rs.100/- and revenue stamp of Re.1/-)

AGREEMENT

Tender invited by: UJVN Limited
Tender for: ……
Tender Notice No.: ……
Name of tenderer: ……

IN CONSIDERATION of the UJVN Limited having treated the tenderer to be an eligible person whose tender may be considered the tenderer hereby agrees to the conditions that the proposal in response to the above invitation shall not be withdrawn within Three months from the date of opening of the tender; also to the condition that if thereafter the tenderer does withdraw his proposal within the said period the Earnest Money deposited by him / her may be forfeited to the UJVN Limited, at the discretion of UJVN Limited.
Signed this on ____ day of _____ 20___.

Witness:
1._____

2._____

Signed by

Tenderer

Annexure-2

FORMAT FOR LETTER OF ACCEPTANCE / AWARD OF CONTRACT

Letter of Award of Contract
Confidential

Tender No. _____
Contract No: _____
Contract Title: _____

To,
M/ s. [Insert name & address]

Sub: Award of contract for contract title: [insert contract title]

Reference: Your offer no. [insert offer number] against our tender no. [insert tender no] opened on [insert date of opening of tender]

Dear Sir/ Madam

I am directed to inform you that after evaluating the bid documents submitted by you on [enter date] UJVN Limited is pleased to inform you that you have been selected as the successful bidder for the supply / work of [enter description]. The total purchase / work price shall be [enter amount] as indicated in your financial bid submitted on [enter date], in accordance with the procedures intimated in the relevant bid documents.

You/ your authorized representative(s) are requested to be personally present at [insert address] for the signing of the contract by [enter date].

In this respect, we also request you to submit the performance security of [insert amount of Rupees in words] by [insert date]. Security deposit being [insert percentage] percent of the total cost = Rs.....

You are requested to execute necessary agreement within seven days from the date of issue of this letter in the enclosed agreement form on a non-judicial stamp paper of prescribed amount.

Acceptance of any Bank Guarantee(s) submitted by you will be subject to its confirmation by the issuing bank through SFMS and manual (Hard Copy / Post) mode.

This notification concludes the legally binding contract between you and the UJVN Limited, till issue of a formal contract.
Yours truly,

[Authorised Officer

For
UJVN Limited]
Date: _____
Place: _____

Enclosure: Agreement Form along with the schedule of delivery

Annexure-3

AFFIDAVIT / UNDERTAKING*

I / we, the undersigned, do hereby certify that all the statements made in the required attachments to Tender No._____ for supply / work of _____ are true and correct.

1. The undersigned understand(s) and agree(s) that further qualifying information may be requested, and agrees to furnish any such information at the request of the UJVN Limited.
2. The undersigned binds himself with all the stipulations of the Bidding Document including period of completion, provision of adequate equipment, personnel and other resources required for completion within the stipulated completion period and agrees to augment them, if found necessary for timely completion of the Project / Work, as desired by the Engineer / UJVN Limited.
3. The undersigned also hereby certifies that our proprietorship / firm / company M/s …….. has not been black-listed / debarred / banned by Government of India / any State Government / Semi-Government Department / Organization / Government Corporation / PSU / Local Body at any stage of bidding in any tender / procurement process / in execution of supply / works.
4. If any false document is found enclosed by us, our firm M/s …… may be debarred by UJVN Ld. As per rules & regulations, along with forfeiture of Earnest Money deposit.

I / we, the undersigned confirm that the bid shall be valid for Three (3) Months from the opening date of technical bid.

(Signed by an Authorized Officer of the Proprietorship / Firm / Company)
Title of Officer
Name of Firm
Date: _____
Place: _____

* To be executed on a non-judicial stamp paper of requisite value.

Annexure

FORMAT FOR NO CLAIM CERTIFICATE

(On proprietorship / firm / company letterhead of the contractor / supplier)

To,
(Contract Executing Officer)
Procuring Office of UJVN Limited

NO CLAIM CERTIFICATE

Sub: Contract Agreement No. _____ dated _____ for the work / supply of _____ [enter description of work / supply] against Tender No._____.

We have received the sum of Rs._____/- (Rupees ..... only) in full and final settlement of all the payments due to us for the work / supply of _____ [enter description of work / supply] under the above mentioned contract agreement, between us and UJVN Limited. We hereby unconditionally, and without any reservation whatsoever, certify that with this payment, we shall have no claim whatsoever, of any description, on any account, against UJVN Limited, against aforesaid contract agreement executed by us. We further declare unequivocally, that with this payment, we have received all the amounts payable to us, and have no dispute of any description whatsoever, regarding the amounts worked out as payable to us and received by us, and that we shall continue to be bound by the terms and conditions of the contract agreement, as regards performance of the contract.

Yours faithfully,

Signatures of contractor or
Officer authorised to sign the contract documents
on behalf of the contractor
(Company stamp)
Date: .....
Place: .....

Form of Agreement

(Referred to in clause 3 of GCC)

THIS AGREEMENT made on the day of 20___

BETWEEN (hereinafter referred to as "the Contractor") of the one part AND the UJVN Limited (hereinafter called "the purchaser") of the other part;

WHEREAS the purchaser is about to erect and maintain the…… …… (hereinafter called "the works") and for the purpose requires the plants and machinery mentioned and specified in certain general conditions, specifications, schedules, drawings, form of tender, covering letter and schedule of prices which, for the purpose of identification, have been signed by . . . . on behalf of the Contractor and . . . . (the Engineer or the Purchaser) on behalf of the Purchaser all of which are deemed to from part of this Contract as though separately set out herein and are included in the expression "Contract" whenever herein used.

AND WHEREAS the Purchaser has accepted the tender of the Contractor for the supply and delivery of the said plant and machinery for the sum of . . . . . .

upon the terms and subject to the conditions hereinafter mentioned, which shall form an integral part of this agreement.

NOW THESE PRESENT WITNESSES and the parties hereto hereby agree and declare as follows, that is to say, in consideration of the payment to be made to the Contractor by the Purchaser as hereinafter mentioned, the Contractor shall fully provide the said plant and machinery for the said works on the terms and conditions mentioned in the Contract.

AND in consideration of the due provisions of the said plant and machinery by the Contractor and due performance of his part of contract, the Purchaser does hereby for himself, his successors or assigns covenant with the Contractor that he, the Purchaser, his successors or assigns will pay to the Contractor the said sum of . . . .

or such other sum as may be become payable to the Contractor under the provision of the Contract, such payments to be made at such time and in such manner as is provided by this contract.

IN WITNESS WHEREOF the parties hereto have signed this Deed hereunder on the dates respectively mentioned against the signatures of each.

Signed	Signed
(for and on behalf of the Purchaser)	(Contractor)
(date)	(date)
in the presence of	in the presence of

SECTION-6: SAFETY MANUAL

CONTENTS

CHAPTER I
GENERAL

1.1 GENERAL:

The Engineers at site shall at all times exercise reasonable and proper safety precautions for the safety of the people at all works under their control, in accordance with instructions contained in this Manual. They shall also ensure strict compliance of the same by their subordinates. Also, they shall see that the contractors executing works under their control adopt stipulated safety measures and adequately protect their workers.

In addition to instructions contained in this manual the safety regulations contained in the below mentioned ISI codes shall also apply wherever the provisions in the ISI codes are exhaustive in nature:

I.S. SAFETY CODES:

1. IS 3764 1992 Excavation work
2. IS 4756 1978 Tunnelling Work (first revision)

3. IS 7293 1974 Working with Construction Machinery

4.	IS 7969	1975	Handling & Storage of building materials
5.	IS 4081	1991	Blasting and related drilling operations.
6.	IS 3696	1987	Scaffolds & ladders (Pt. I (Pt. I) Scaffolds)
7.	IS 3696	1999	Scaffolds & ladders (Pt. II (Pt. II) ladders)
8.	IS 4138	1977	Working in compressed air (Ist revision)
9.	IS 818	1968	Safety and health protection in electric gas in welding and cutting operations.
10.	IS 4912	1978	Safety requirements for floor and wall openings Railway and toe Boards.
11.	IS 5121	1969	Piling & other Deep foundations
12.	IS 4130	1991	Demolition of Buildings (Ist revision)
13.	IS 5916	1970	Construction involving use of hot bituminous materials.
14.	IS 3016	1982	Fire protection in welding and cutting operations.

1.2 **ENFORCEMENT OF SAFETY REGULATIONS**:

1.2.1 General Managers/Chief Engineers, Superintending Engineers, Executive Engineers, Supervisors and all other officials in charge of execution of work at the various organisational levels in the project shall ensure strict enforcement of safety regulations in the execution of works.

1.2.2 To assist the executive and supervisory staff of the project in spelling out the safety programmes and regulations prescribed in the Manual, a separate safety unit should be included in the project staff. This unit should consist of a Safety Engineer of the rank of Executive Engineer or Senior Assistant Engineer and a number of safety inspectors to assist him. The number of safety inspectors will depend on the magnitude and distribution of work. The safety engineer will be directly responsible to the General Manager or other Engineer-in-Charge of the project in keeping him informed of the compliance or otherwise of all safety regulations and standards by the various executives, supervisory staff and contracting firms and assist him in maintaining safe standards of working.

The detailed duties of the safety staff shall be as under:

a) To look into all procedures and practices and examine temporary structures, the failure of any of which may result in an accident.
b) To go around the works regularly and advise the contractors and the department as to the measures to be taken to ensure safety of the works whether under the contractors or under the department.

c) To see that the rules and regulations laid down in the safety manual are observed. Non-compliance with these regulations if any, should be brought to the notice of the Safety Engineer.
d) To develop and execute programmes for the training of supervisory personnel in the application and observance of safety practices.
e) To receive and analyse reports of all accidents and fires and initiate corrective actions warranted by the situations.
f) To conduct safety education and propaganda.
g) To recommend revisions or additions to the safety manual on safety measures in the light of project experience.
h) To prepare safety posters, signs, displays, leaflets, bulletins, etc., and display them on neat attractive bulletin boards. Cartoons may also be displayed.
i) Suggestions from the workers may also be obtained by means of suggestion boxes which may be kept at various places.
j) Make certain that all Central Government, State Government or local laws and ordinance are complied with

1.2.3 A Project Safety Committee shall be constituted under the Chairmanship of General Manager of the Project, and shall have members from amongst the Senior Officers, Safety Engineer and representative of the contractor. The number of the members may vary and shall be decided by the General Manager according to the magnitude of the work and jobs involved. This Committee would meet from time to time, generally supervise the Safety arrangements, advise and give suggestions to the Safety Engineer, and consider the reports of the safety engineer.

1.3 CONTRACTORS' SPECIAL RESPONSIBILITIES:

1.3.1 The contractors shall at all times exercise reasonable and proper precautions for the safety of the people on the works and shall comply with the provisions of current safety laws, building and construction codes of the State Governments as may be applicable. All machinery and equipment and other sources of physical hazards shall be guarded in accordance with the requirements of this manual and regulations or laws of the State Governments of the Government of India.

1.3.2 In order to supervise the work from point of view of safety, the contractor shall provide a full time Safety Engineer who shall report and be responsible to the Safety Engineer of the Nigam, an executive or his designated representative and shall be responsible for coordinating the safety Programmes .

1.3.3 The contractor shall provide all necessary fencing and lights to protect the public from accidents and shall be bound to bear all the expenses of defence of every suit, action & other proceedings at Law that may be brought by any person for injury sustained owing to neglect of the above precautions and to pay any damages and costs which may be awarded in any such suit, action & proceedings to any such persons or which may with the consent of the contractor be paid to compromise any claim by any person.

1.4 IMPORTANT SAFETY RULES:

i) Each employee shall be provided initial indoctrination regarding safety by the contractor so as to enable him to conduct his work in a safe manner.
ii) No employee shall be given a new assignment of work unfamiliar to him without proper introduction as to the hazards incident thereto, both to himself and his fellow employees.
iii) Under no circumstances shall an employee hurry or take unnecessary chances when working under hazardous conditions.
iv) Employees must not leave naked fires unattended. Smoking shall not be permitted around fire prone areas and adequate fire fighting equipment shall be provided at crucial locations.
v) Employees under the influence of any intoxicating beverage, even to the slightest degree should not be permitted to remain at work.
vi) There shall be a suitable arrangement at every worksite for rendering prompt and sufficient first aid to the injured under the guidance of a Medical officer.
vii) The staircases and passageways, shall be adequately lighted.
viii) The employees when working around moving machinery, must not be permitted to wear loose garments. Safety shoes are recommended when working in shops or places where materials or tools are likely to fall. Only experienced workers shall be permitted to go behind guard rails or to clean around energized or moving equipment.
ix) The employees must use the standard protection equipment intended for each job. Each piece of equipment shall be inspected and after it is used.

1.5 ACCIDENT REPORTS:

1.5.1 Monthly reports on prescribed proforma of all accidents shall be promptly submitted to the Safety Engineer of the Nigam, with a copy to the Engineer-in-Charge giving such data as may be prescribed by the contracting officer.

1.5.2 On the occurrence of any accident a report should be made to the Safety Engineer of the Nigam with a copy to the Engineer-in-Charge within 12 hours of the occurrence of the accident. In case of fatal accidents or those which are so serious that they are likely to result in the death of any workman, a report should be made immediately to the Engineer-in-Charge of the work.

1.5.3 The following sample forms (specimens attached at the end of this Chapter) may be used for reporting accidents and keeping relevant statistics:

INJURY REPORT-PRELIMINARY

(To be submitted immediately after the accident)

(N.B.)-Answers to all the items should be precise and definite.

No. ……
Date……

1. Name of the person injured
2. Sex, Adult/Minor
3. Department/Project/Division
4. Designation
5. Regular/Work Charged/ Muster-Roll /Contractor's employee
6. Date & hour of accident
7. Cause of accident
8. Fatal, serious or minor

Signature with designation of
Reporting Officer

To

Medical Officer

9. Nature of injury
10. Period of estimated disablement.

Signature of Medical Officer.

Distribution:

1. Engineer-in-Charge
2. Safety Engineer

C. INJURY REPORT-DETAILED

Project……Date of Report……

Section-I Name…….Age…….Occupation

Who was injured? Employer…How long employed….

Salary or wage….Dates of previous injuries
Remarks…….

Section-II Date of injury……..Time

Time & Place Exact place where injury occurred……..

Section-III Describe injury……

Name & Severity of injury……

Did injury result in death or
Probable permanent disability……
Yes/ No.

Return to work ……..

Date of death ……

Section-IV (Description of Accident which caused the injury)

Describe the accident in full……
……

Section-V Type of Accident (Check one)

Fall of person- Same level
Falls of persons-One level to another
Flips (Causing strains not falls)
Struck by flying, rolling, sliding object
Stepping in or on object
Strains or sprains-lifting
Struck by or cut by hand tools
Other injuries from handling objects.
Burning or scalding
Electric shock or flash Explosions
Caught in or between
Striking against object
Struck by or run over by vehicle
Buried or partially buried by collapse of sides or fall of material
Drowning or suffocation
Poisoning, Infection
Other Describe……..

Section VI (Supervisor/Foreman's Statement)

I have personally investigated this accident, and concur in the analysis of causes given below:

Recommendation for prevention……...

Remarks……..

Signature of Foreman or other Immediate Superior.

Causes of the Accident

(To be completed by the Safety Engineer)

For one cross (x) in the appropriate box in Section 7, Mechanical causes; and one cross (x) in Section 8, Personal causes, Select the cause in each Section which could have been most readily removed and the removal of which would have helped most to prevent the accident. In addition to marking the appropriate box, describe briefly but exactly the causes selected. Secondary or contributing causes may be indicated by drawing a circle in the appropriate box.

Section VII Improper guarding…….
(Unguarded, inadequately guarded, guard removed etc.)

Defective substances or equipment…….
(Broke, poorly designed, slippery, defective brakes etc.)

Hazardous arrangement…….(Unsafely piled material, poor labour, poor house-keeping, loose rock etc.)

Improper illumination……..

Improper ventilation……
(poor, dusty, gassy, high humidity, excessively hot etc.)

Improper dress or appeal……
(Goggles, gloves, shoes, hard hat respirator etc.)

No mechanical cause Insufficient data to classify

Section VIII (Personal Causes)

Injured person Other person

Physical or mental defect……..
(Poor eye sight, arm amputated, deaf, epilepsy, etc)

Lack of knowledge or skill……
(Unable to read, poor training, etc.)

Wrong attitude……
(Deliberate, chance-taking, disregard for instructions, etc.)

No Personal causes Insufficient data to classify

Section IX (Supervisory Fault)
Was Inadequate or faulty supervision or foremen ship a cause or contributing cause of this accident? ……

(Yes or No)

Explain ……..

Section X (Corrective Action)
What has been done to prevent the occurrence of similar accidents in the future?……..

This Report submitted by……

(Safety Engineer)

Approved…….
(Construction Engineer or Superintendent)

CHAPTER 2
CONSTRUCTION

2.1 SCAFFOLDS:

1.1.1 Scaffolds of proper type shall be provided for all work that cannot be done from the ground or from part of a permanent structure or from a ladder or other available means of support and safe means of access shall be provided to every place at which workers are required to work.

1.1.2 Every scaffold and every part thereof including supports shall be of good construction, of suitable and sound material and of adequate strength for the purpose of which it is used and it shall be properly maintained. Construction and dismantling of every scaffold shall be under the supervision of a competent person. Boards and planks used for the floors shall be of uniform thickness, butt jointed, closely laid, and securely fastened in place.

1.1.3 Every scaffold shall be securely supported or suspended and shall, where necessary be sufficiently and properly strutted or braced to ensure stability. The use of cross braces or framework, as means of access to the working surface shall not be permitted.

1.1.4 All scaffolds or working platforms of any nature shall be securely fastened to the building or structure, or if independent of the building shall be braced or guyed to prevent sway.

1.1.5 SUSPENDED SCAFFOLDS:

i) Outriggers or other means of supports of suspended scaffolds shall be of adequate length and strength, (not more than 2m length unless specified by the Engineer-in-Charge) properly constructed, installed and securely fixed by anchor bolts or other equivalent means.

ii) Ropes chains, or other means of suspension shall be of good construction, sound material, adequate strength and free from patent defects and properly secured. The ropes and chains shall have a factor of safety of 8.

iii) The platform shall not be less than 45 cms wide and points of suspension not more than 3 metres apart and so arranged or secured that at the working position the edge is as close as practicable to the working face when persons have to work in a sitting position.

iv) All rolling scaffolds shall be equipped with a positive locking device to prevent accidental movement of the scaffolds. These shall be periodically tested.

v) Suspended scaffolds shall be tested as frequently as may be necessary to ensure that minimum safety factors are maintained. The test will be made by raising the working surface 30 cms above the ground and loading it with at least three times the maximum weight that will be imposed upon it.

1.1.6 Skips, buckets, baskets and similar equipment shall only be used for work of short duration when use of suspended scaffold is unreasonable and shall be used under the supervision of a responsible person. The skip, bucket or basket shall be at least 75 cm deep.

1.1.7 Trestle scaffolds shall not be of more than three tiers and the working platform shall not be more than 4.5 metres above the ground or floor or other surface upon which the scaffold is erected, and no trestle scaffold shall be erected on a suspended scaffold.

1.1.8 Men shall not be allowed to work from scaffolds during storms or high winds.

1.1.9 If scaffolds are to be used to a great extent or for a long period of time, a regular plank stairway, wide enough to allow two people to pass, shall be erected. Such stairways shall have hand rails on both sides.

1.1.10 When work is being performed above a scaffold platform a protective overhead covering shall be provided for the men working on the scaffold.

1.1.11 Whenever workmen have to work or constantly pass under a scaffold on which men are working a screen or other protection shall be provided to catch any falling material. Such protection shall extend outside the scaffold properly in order to catch any material falling off the edges of scaffold platforms. 12 mm wire mesh netting of No. 18 gauge or better may be used for this purpose.

1.1.12 Side screens shall be provided on scaffolds erected along passageways or other thorough fares.

1.1.13 On high scaffolds a netting or equivalent guard shall be provided for the space between toe-boards and railings.

1.1.14 During dismantling of scaffolds necessary precautions shall be taken to prevent injury to persons due to fall of loose materials, bracings and other members of the scaffold shall not be removed prematurely while dismantling, the entire scaffold shall be maintained stable and rigid so as to avoid the danger of collapse. Nails from the planking and various members of the scaffold shall be carefully removed and all material carefully piled.

1.2 PLATFORMS, GANGWAYS AND RUNS:

1.2.1 All working platforms, gangways and runs from which workers are liable to fall more than 2 meters shall be:

a) Of adequate width depending upon the type of work done and closely boarded, planked or plated. For platforms the width shall not be less than 60 cms. For gangways and runs the minimum width shall be 45 cms but when such gangways or runs are used for passage of materials the width shall not be less than 60 cms.

b) Provided with suitable guard rails of adequate strength to a height of 1 metre above the working surface and toe-boards of at least 20 cms in height to prevent fall of persons, materials or tools.

1.2.2 Every platform gangway run or stairs shall be kept free from any unnecessary obstruction, material or rubbish and from any projecting rails, and when they become slippery appropriate steps shall be taken by way of sanding, cleaning or otherwise to remedy the defect.

1.2.3 Each supporting member used in the construction of runways, platforms, ramps and scaffolds shall be securely fastened and braced. The supporting member shall be placed on a firm, rigid, smooth foundation of nature that will prevent lateral displacement. The thrust-out members from which a scaffold is suspended shall be sufficiently strong and shall extend at least 30 cms outside the platform being suspended and have a stop block or bolt at the outer end.

PLATFORMS:

1.2.4 The minimum uniformly distributed design load per sq. metre of platforms shall be 300 kgs. In case of stone masonry it shall be 450 kg per sq. metre. Any concentrated load at any point in the span shall not exceed the designed uniformly distributed load. A factor of safety of 4 shall be adopted. Planking shall not be less than 30 mm thick.

1.2.5 A scaffold platform plank shall not project beyond its end-supports to a distance exceeding four times the thickness of the plank unless it is effectively secured to prevent tipping.

1.2.6 Cantilever of scaffold planks shall be avoided. Ledgers or putlogs should be erected to support the ends of such planks.

1.2.7 Where planks are butt jointed, two parallel putlogs must be used, not more than 10 cms apart, giving each plank sufficient support.

1.2.8 The following minimum widths of platforms for various types of scaffolds are recommended:

a) Where platform is not more than 2 meters above the ground or solid floor:
   i) For painters, decorators and similar work men…….30 cms
   ii) For other types (Men and Tools only)…….50 cms

b) Where platform is more than 2 metres above the ground or solid floor;
   i) For men, tools & materials …….120 cms
   ii) For men, tools, material & vehicles ……150 cms

GANGWAYS AND RUNS:

1.2.9 All planks forming a gangway or run shall be so fixed and supported as to prevent undue or unequal sagging.

1.2.10 No gangway or run the slope of which exceeds 1 vertical to $1^{1}/_{2}$ horizontal shall be used.

1.2.11 Where the slope of a gangway or run renders additional foot-hold necessary, and in every case where the slope is more than 1 vertical to 4 horizontal, there shall be provided proper stepping laths which shall:
   i) be placed at suitable intervals, and
   ii) be of the full width of the gangway or run except that they may be interrupted over a width of not more than 10 cms to facilitate the movement of borrows.

1.3 LADDERS:

1.3.1 Every ladder and step-ladder shall be of good construction, sound material and adequate strength. These shall be inspected at least one a fortnight and observations recorded.
   a) No ladder with defective or missing rung or with any rung which depends for its support solely on nails, spikes or other similar fixing shall be used.
   b) Wooden ladders should not be pained as point covers up defects but linseed oil or clear varnish should be used.

1.3.2 The use of ladders for other than a means, of access should be eliminated as far as possible.

1.3.3 Whenever a platform is 1-5 meters or more above the ground, a ladder or stairway shall be provided, one for each successive platform. Safe access from and to ladders or stairs must be provided at all platforms.

1.3.4 Every ladder used for a vertical height of more than 9 metres shall be provided with an intermediate landing and vertical distance between two successive landing places shall not exceed 9 metres. All intermediate landings shall be provided with suitable guard rails to a height of at least 1 metre above the landing place.

1.3.5 Where a ladder is used as a means of communication or as a working place the ladder shall rise, or adequate hand-hold shall be provided, to a height of at least 1 metre above the place of landing of the highest rung to be reached by the feet of any person working on the ladder, as the case may be, or if that is not possible to the greatest practicable height.

1.3.6 When using a ladder or a step ladder, the user should always face the ladder. The transportation of materials by ladders should be reduced to the minimum. Tools and materials should wherever practicable, be pulled up with a rope.

1.3.7 Ladders should not be placed in front of doors opening towards the ladders or against window sashes. Stepladders should be opened out fully before use. Two ladders should be spliced together to provide access to a greater height than when a single ladder is used.

1.3.8 When permanent or portable ladders are used, the upper ends shall extend 110 cms above the platform. Portable ladders shall be securely fastened at the bottom and top.

1.3.9 All ladders shall be periodically inspected. The stability of ladders should be tested before using it.

1.3.10 A ladder should not be placed upon a box, barrel or other movable insecure object.

1.3.11 Portable ladders should be in a safe position before being climbed. The slipping of a ladder at either end should be carefully guarded against, especially where the supporting surfaces are smooth or vibrating. If necessary, a person shall be stationed at the base of the ladder to prevent it from slipping.

1.4 OPENING, DANGEROUS CORNERS, BREAKS OR EDGES & SLOPPING SURFACES:

1.4.1 Every accessible opening through which any person is liable to fall a depth of more than 12 metres or to fall into any liquid or material so as to involve risk of drowning or of serious injury shall be provided with guard rails 1 metre above the edge and toe boards at least 20 cms high or a covering to prevent fall of persons, tools or materials through the opening.

1.4.2 Every dangerous corner, break or a edge or any structure which is accessible to any person shall be provided with guard rails of adequate strength and, if necessary, with the toe boards.

1.4.3 Any person employed on a sloping surface of a vertical fall of more than 2 metres shall be provided with suitable ladders or crawling boards properly secured and a suitable working platform fitted with suitable guard rails and in case it is impracticable or inappropriate to provide such ladders, crawling boards or working platforms, suitable safety belt of sound material and in good condition with a rope of adequate strength and length enabling the wearer to attach himself to a secure anchorage shall be supplied, or where the wearer cannot so attach himself, a second person shall attach or hold the rope in a secure manner.

1.5 WELDING AND CUTTING:

1.5.1 All welding and cutting shall be done by workmen who are thoroughly trained in the work or by trainees under competent supervision. Shields shall be placed around the work to protect persons from glare.

1.5.2 Welding and cutting shall be not done in the immediate proximity of flammable materials.

1.5.3 Welders and helpers shall wear non-combustible helmets and gloves during welding operations they should be careful to keep out of the line of sparks and hot metal; and they should wear clothing free from grease, gasoline, oil and other flammable materials.

1.5.4 Oxygen and acetylene cylinders or container shall never be permitted in small spaces of compartments where welding operations are in progress.

1.5.5 A helper shall always be at hand to shut off the gas in case of an accident when the welder is working in a space from where escape is difficult.

1.5.6 All welding operations should be carried out in a well-ventilated space. Where any considerable amount of welding is to be done, an exhaust system for carrying away the fumes should be installed. If brass, bronze or zinc is to be welded, a suitable respirator should be worn if exhaust system is not installed.

1.5.7 All torches, regulators, cylinders and other such equipments shall be of an approved design, regularly inspected and kept in good condition. Defective apparatus and equipment shall be removed services, replaced or repaired and re-inspected before again being placed in service. Repairs shall be made only by persons thoroughly familiar with such apparatus.

1.5.8 Welders and helpers shall wear suitable eye-protective devices during welding and cutting operations. Eyes exposed to welding or flashes should be washed with Rose water for better relief.

FIRE PROTECTION:

1.5.9 To avoid fire hazards the following additional precautions should be observed on all oxy-acetylene cutting and welding:

a) Keep hose and cylinder valves free from grease, oil, dust and dirt.
b) Keep cylinders away from stoves, furnaces and other sources of heat.
c) Only 'Gas Lighter' be used to light the torch.
d) Avoid use of oxy-acetylene flame in confined spaces.
e) Clean thoroughly with steam all containers that have been used for storage of flammable liquids, or wash with hot water and soda, and ventilate thoroughly before welding and cutting.
f) When testing for leaks use only soap water and watch for bubbles.
g) Valve protection caps shall be in place when cylinders are not in use.
h) All employees shall be made familiar with the location and proper use of fire extinguishers in their area of work.

GAS CYLINDERS:

Due care shall be taken while loading and unloading oxygen/acetylene gas cylinders.

1.5.10 Gas cylinders shall be kept up right in approved safe places where they cannot be knocked over, and well separated from radiators, furnaces and combustible materials. These safe places shall be painted with appropriate warning signs. Empty cylinders should be marked "EMPTY' and the valves closed. Loaded and empty cylinders should be kept in separate places.

1.5.11 Oxygen cylinders shall not be stored in close proximity to acetylene cylinders or other fuel gas inside the building and in no circumstances either oxygen or acetylene cylinders shall be stored under direct rays of sun or in places where excessive rise of temperature is likely to occur.

1.5.12 Tempering with or attempting to repair safety devices or valves of gas cylinders shall be prohibited and if trouble is experienced in any cylinder, a report shall be sent to the supplier forthwith describing the character of the trouble and particulars of the cylinder.

1.5.13 When acetylene cylinders are coupled, approved flash arrestors shall be inserted between each cylinder and the coupler block or between the coupler block and the regulator and only cylinder of approximately equal capacity shall be coupled.

1.5.14 Cylinders found to have leaky valves or fittings which the closing of the valve will not stop shall be taken into the open way from any source of ignition, and slowly drained of gas.

1.5.15 Electric magnets or direct slings shall not be used for handling cylinders and only special cradles shall be used.

HOSES AND TORCHES

1.5.16 The hose shall be specially designed for use on cutting and welding operations. Special care shall be taken to avoid interchange of oxygen and acetylene hoses, as the mixture of these gases is highly explosive. Some coloured code should always be used on each gas-red for fuel gas and black for oxygen. Glycerine shall be used for lubricating valves.

1.5.17 Some manufactures dust the inside of the hoses with fine talc, new hoses shall, therefore, be thoroughly cleaned on the interior before attaching to the torch. Compressed air shall never be used to clean hoses as it may contain oil from the compressor. Oxygen shall be used to clean oxygen hoses and acetylene shall be used to clean acetylene hoses.

1.5.18 Torches that leak at any connection get hot, or flash black shall not be used. Copper or brass wire shall be used to clean the tips. Hardwood sticks may also be used.

GAS WELDING AND CUTTING OPERATIONS:

1.5.19 The gas cylinders shall not be used unless fitted with the following: high pressure gauge on cylinder, reducing valve with pressure regulator and safety relief device, low pressure gauge for indicating pressure on the torch. The fuel gas and oxygen cylinder shall have left hand and right hand threads respectively so, that they cannot be interchanged.

1.5.20 Cylinder valves shall be opened only with hand wheels or tools, specially designed for that purpose and left in place while cylinders are in use. Cylinder valves shall be closed when not in use.

1.5.21 Since an explosion may occur oxygen/acetylene gas cylinders and fittings shall be kept away from oily or greasy substance and shall not be handled with oily hands or gloves. A jet of oxygen shall not be directed at oil surfaces, greasy clothes, or within a fuel oil other storage tank or vessel.

1.5.22 Under no circumstances shall acetylene be used at a pressure exceeding 1.1 kg per sq. cm. Oxygen pressure should always be such that acetylene does not flow back into the oxygen cylinder, as oxy-acetylene mixture is highly explosives.

1.5.23 After attaching the regulator and before opening the cylinder valve, the operator should see that the adjusting screw of the regulator is released. Oxygen should not be permitted to enter the regulator suddenly. The cylinder valve should be opened slowly.

1.5.24 Oxygen and acetylene hoses shall be tapped or clamped together at 1 meter intervals. Tape shall never be used to make repairs to hoses.

1.5.25 Oxygen or acetylene cylinders shall never be placed where they can be contacted by electric wires or with ground wires of electrical equipment. If electric arc welding is being done in the same vicinity, such precautions as necessary must be observed to make sure that the oxygen-acetylene gas equipment does not come in contract with electric are welding equipment.

1.5.26 Closed tanks or containers shall never be welded until they are thoroughly cleaned, dried out and ventilated and it has been determined that they contain no explosive or harmful fumes.

1.5.27 No smoking shall be permitted by workmen or welders, while handling gas cylinders.

ELECTRIC ARC WELDING AND CUTTING:

1.5.28 The flash from electric are welding is much more severe than that from oxy-acetylene welding, therefore, the welder shall have adequate eye protection and all persons working in the immediate vicinity should wear suitable coloured goggles unless the work is completely shielded.

1.5.29 Welding shall not be done in the presence of any person not amply protected from the flash. Persons should never look at an electric are with the naked eye; to do so may cause serious eye injury.

1.5.30 Only heavy-duty electric cable with unbroken insulation shall be used, and all connections shall be water-proof. All connections shall be checked before welding is started, and frequent inspection shall be made during welding operations.

1.5.31 When it is necessary to couple several lengths of cable for use as a welding circuit and occasional coupling or uncoupling is necessary, insulated cable connectors shall be used on both the ground line and electrode holder line.

1.5.32 Frames of all electric welding machines operated from power circuits shall be effectively grounded.

1.5.33 When the operator has occasion to leave his work or stop work for any appreciable time, the power supply switch in the equipment should be opened and the unit shut down.

1.6 PAINTING:

1.6.1 Packages containing paints, varnishes, lacquers or other volatile painting materials shall be kept tightly closed when not in actual use, and shall be placed where they will not be exposed to excessive heat, sparks, flame, or direct rays of the sun.

FIRE HAZARD:

1.6.2 Most paint materials are highly combustible, and every precaution should be taken to eliminate danger from fire.

(a) No attempt should be made to heat paint materials except by placing containers in air, or water at moderate temperature. Dirty wiping rags, paint scrapings and paint saturated debris, which always involve the hazard of spontaneous combustion or ignition from other sources, should not be allowed to accumulate but should be collected and disposed of at frequent intervals.

(b) Smoking, open flame, exposed heating elements, and other source of ignition of any kind should not be permitted in paint stores or area where spray painting is done.

(c) Fire extinguishers of appropriate capacity shall always be at hand where flammable paint materials are being mixed, used or stored. Sandpails or extinguishers of the carbon dioxide and carbon tetrachloride type are generally effective.

PROTECTION FROM DUST AND FUMES:

1.6.3 Apart from its explosiveness, air laden with dust or fumes may cause suffocation or other respiratory injury and may also have toxic effects through the skin or alimentary system. In painting, the dust comes chiefly from operations preparatory to painting such as sand blasting, scaling, scraping and brushing. Injurious fumes are given off when volatile paint materials are being mixed or applied specially when they are sprayed, Dust and fume nuisance is most dangerous in constricted spaces. Coal tar paint fumes are particularly obnoxious.

a) Workmen must be provided with an ample supply of fresh air. If natural circulation is not adequate, artificial ventilation shall be provided. Ventilation shall be sufficient to carry away harmful accumulations of dust and fumes or workmen shall wear approved type respirators.

b) Spray-painting operations shall be so confined as not to contaminate the air where other men are working. Spray gun operators should be required to wear clothing, which fits snugly at the ankles, neck and wrists and should wear gloves, goggles and respirators.

HANDLING PAINT MATERIALS:

1.6.4 Serious harm may result if the skin is exposed to prolonged contact with paint materials. Injury may take the form of burns or toxic effects resulting from absorption into or through the skin. It is well be avoid the use of pain solvents for cleaning the skin. These materials are not only injurious themselves, but they also carry poisonous ingredients of the pain into the pores of the skin. There area a number of protective creams which may be applied to the skin before exposure to paint substances, and which wash off easily in warm soapsuds, taking paint off with them. The use of protective creams by all painters is recommended.
Food shall never be placed where it might be exposed to fumes or dust from paint. Painters should clean their hands before eating.

CREOSOTE

1.6.5 Creosote is a lumber preservative and is closely related to carbolic acid. Extreme care is required to prevent contact with the skin or eyes, as it will cause severe burns. Protective cream or jellies should be used on exposed skin surface when engaged in handling creosoted materials. Affected parts of the body should be washed immediately, and in most cases the services of a physician should be secured.

CHAPTER 3
PLANT AND MACHINERY

3.1 TOOLS

HAND TOOLS:

All hand tools shall be kept in good conditions and used only for the purpose for which designed.

3.1.1 Tools having mushroomed/heads, spilt or defective handles, worn parts, or other defects that will impair their strength or render them unsafe for use, shall be removed from service and shall not be reissued until the necessary repairs have been made.

3.1.2 All sharp tools shall be kept in sheaths, shields, tool chests, or other containers when not in actual use, to protect the tools, the workers and other persons.

3.1.3 Tools shall not be left on scaffolds, ladders or overhead working spaces when not is use. When work is being performed overhead on scaffolds or ladders, containers shall be used to hold tools and prevent them from failing.

3.1.4 The practice of throwing tools from one location to another, from one employee to another or dropping them to lower levels, shall not be permitted. When it is necessary to pass tools or material under the above conditions, suitable containers and/or ropes shall be used.

3.1.5 Sharp-edged or pointed tools shall be carried in workmen's pockets.

3.1.6 Only non-sparking tools shall be used in location where sources of ignition may cause a fire or explosion.

PNEUMATIC AND POWER TOOLS:

3.1.7 (a) Hand tools and portable power tools should be inspected frequently for worn-out parts and connections. The sudden cessation of operation or the 'Kicking' or 'bucking' or such a tool may cause a serious accident especially when the operator is at an elevation exposed to the danger of falling.

(b) In using heavy tools, it is best to support them where possible from some detached object or support in order to safeguard the operator's feet.

(c) Loose clothings with free ends should be worn by operators of portable electric drills, reamers, etc. Neither should gloves be worn. Smooth overalls should be worn with the jumper tucked in.

(d) All tools should be laid flat when not in use. They should never be kept standing on the nozzle or cutting edge.

PNEUMATIC TOOLS:

3.1.8 Pneumatic tools shall be used only by employees familiar with and properly instructed in their use.

3.1.9 Pneumatic tools shall be kept in good operating condition thoroughly inspected at regular intervals and particular attention given to control and exhaust valves, hose connections, die clips on hammer, and the chucks of reamers and drills.

3.1.10 Safety clips or retainers shall be installed on pneumatic impact tools to prevent dies and tools from being accidentally expelled from the barrel.

3.1.11 Pressure shall be shut off and exhausted from the line before disconnecting the line from any tool or connection.

3.1.12 Safety lashing shall be provided at connection between tool and hose.

3.1.13 Air hose shall be suitable to safely withstand the pressure for which it is intended. Leaking or defective hose shall be removed from service.

3.1.14 Hose shall not be laid over ladders, steps, scaffolds or walkways in such a manner as to create a tripping hazard.

3.1.15 The use of compressed air for blowing direct from hands, face or clothing is prohibited.

POWER TOOLS:

3.1.16 Power actuated tools shall be used only by persons who have been trained and instructed in their safe use.

3.1.17 Such supervision and safeguards as are necessary to prohibit their use by unauthorised persons shall be provided.

3.1.18 In electrically operated tools a three-conductor cord shall be used so that a ground wire may be taken off the tool.
Even a slight electric shock may result in a sudden jump on the part of the operator resulting in a bad fall or a severe bump or fracture.

3.1.19 Connecting cord should have oil resistant rubber insulation. Protection against kinking should be provided by the use of the short coiled steel spring or rubber protecting tube securely fastened in place at the motor end. Care should be taken to see that strain on the wires is not transmitted to the connection at the terminal or binding post.

(i) Never oil an electric motor to excess. This oil may prove harmful to cord insulation.

(ii) When a motor is in storage, coil the card in a free coil, not around the motor.

(iii) Inspect cord frequently.

(iv) Do not lay cord on oily or chemically saturated floor while the tool is in use.

(v) Never pull on the cord when it is kinked or pinched.

(vi) Do not lower or lift the tools with the cord; use a small rope.

(vii) Do not leave the cord where a car or truck might run over it.

3.1.20 Premature starting of the motor presents a major hazard. Wherever possible, select tools that are equipped with safety devices to guard against this danger.

3.1.21 The use of power actuated tools is prohibited in explosive or flammable atmospheres.

JACKS:

3.1.22 Maximum working load shall be permanently marked on a jack and it shall be provided with a positive stop to prevent over travel unless this is impracticable in which case the jack shall carry a warning that a stop has not been provided. Every jack shall be thoroughly examined at suitable intervals depending upon service conditions.

STORAGE BATTERY:

3.1.23 Care shall be exercised in handling acids.

3.1.24 When preparing electrolyte the acid must be added slowly to the water until the solution has the proper specific gravity. Never bring an open flame near or allow sparks to shower on a storage battery as the gases produced are explosive under certain conditions.

3.1.25 Ordinary baking soda will prevent skin and eye burns, if used with water immediately after contact with the acid or electrolyte. If soda is not available, a weak solution of ammonia or plain clear water can be used.

3.2 DRILLS:

3.2.1 All drilling equipment shall be kept in good working order. Safe handling and lifting methods should be used.

3.2.2 Drills shall be stopped before greasing the machinery or moving parts.

3.2.3 Crown blocks shall be mounted securely and should be inspected frequently for loose connections.

3.2.4 Drillers should be required to block all finished drill holes over 10 cms in diameter before moving to a new location.

3.2.5 When using compressed air drills as well as other compressed air driven equipment the hose connections should be made only after the pressure has been released.

3.2.6 Electrically operated drills and all other electrically driven equipment should be provided with specially insulated power transmission cables with water-proof connections.

3.2.7 The use of gas engine or petrol engine driven drills underground shall be prohibited. If used on open air work the engine shall be kept in good operating condition, and the operator shall be trained in the use of the tool, including necessary precautions to avoid burns from the engine. The engine shall be stopped while filling the fuel tank.

3.3 ROPES, CHAINS AND SLINGS:

3.3.1 The use of ropes, cables and chains shall be in accordance with the safe usage recommended by the manufacturer.

3.3.2 No chain or rope shall be used unless:

(a) It is of good construction, sound material, adequate strength and free from patent defects.

(b) Safe working load is plainly marked on it or an identification number is marked on it and the safe working load corresponding to this number is entered in a register maintained by the person-in-charge.

CHAINS:

3.3.3 All chains in continuous use shall be inspected once a month. Each chain shall be measured for length at each inspection. If a stretch of 2.7 cms in 1 metre is found, it shall be inspected for cracks. Any link that shows evidence of a crack or cross-section reduction by wear, nicks or cuts shall be removed. The reduced link section shall never be less than two-thirds of the original section.

3.3.4 No chain shall be used which has been broken and mended with a bolt, nor shall the end of the chain be bolted to the chain to form a loop.

3.3.5 Chains shall never be knotted, nor shall they be shortened by twisting the chain.

3.3.6 Before any strain is put on the chain, it shall be inspected to see that all links are lined up so that the pull is through the long diameter of the link.

3.3.7 All chains except those mentioned below shall be annealed once a year (6 months for 12mm bar chains and below) when in continuous use. This work shall only be attempted by competent men having the proper facilities for such work. The particulars of annealing or heat treatment and tests shall be entered in the register maintained for the purpose. It is recommended that all chains be returned to the manufacturer for annealing. Chains that need not be annealed are:

i) Bridle chains attached to derricks or masts;
ii) Chains made of malleable cast iron;
iii) Plate link chains;
iv) Chains of Steel; and
v) Pitched chains.

FIBRE ROPES:

3.3.8 Manila, sisal or hemp ropes are commonly used. For all normal use pure manila rope which is hard but pliant should be used. Sisal rope is 2 to 3 times as strong as manila rope, but its fibre are hard and stiff and have a tendency to splinter. Hemp ropes are as strong as manila ropes, but they are more soft.

3.3.9 The weight, breaking strength and safe working strength with a factor of safety of 8 of standard manila rope(3 strand) are given in the table below(The values are only suggestive):

T A B L E 5.1

Diameter (mm)	Weight per feet (kgs)	Strength(Kgs)	
		Breaking	Working
6	0.97	270	35
12	0.110	1200	150
18	0.250	2500	310
25	0.400	4080	510
32	0.625	6100	770
40	0.890	8400	1050
50	1.610	14060	1760
65	2.485	21090	2630
75	3.600	29030	3630

When a table of strengths is not available an approximation of the working strength of rope may be obtained by squaring the numerator of the diameter in eights and multiplying by 13. This gives strengths somewhat lower than those given in the table (e.g. if the dia of rope is 3/4" the dia in eights will be 6/8" and working load will be found to $(6)^2$ x 13 lbs or 468 lbs).

3.3.10 Fibre ropes should be regularly inspected for wear and tear while in use to make sure that they are in good condition.

3.3.11 Fibre ropes should be protected from abrasion by padding when drawn over square corners or sharp rough surfaces. Frozen rope or wet rope subjected to acids or excessive heat should not be used. Ropes having dark or pinkish brown colouration on them due to exposure to acids shall not be used.

3.3.12 Suitable care should be taken while uncoiling, using and storing the fibre ropes. Sheaves should have a diameter not less than 36 times the diameter of the rope.

WIRE ROPES

3.3.13 Wire ropes have almost superseded fibre ropes and chains for hoisting and haulage purposes.

(a) Standard hoisting rope consists of 6 by 19 wire strands and a fibre core made of iron, cast steel mild plow steel, plow steel or special plow steel.

(b) The breaking strength of standard wire hoisting rope is shown in the following tabulation (The values are only suggestive):

TABLE 5.2

Breaking Strength (Tons)
(*Factor of Safety=8 for working out safe working strengths)

Dia (mm)	Weight (kg/m)	Iron	Cast Steel	Mild Plow Steel	Plow Steel	Special Plow Steel
1	**2**	**3**	**4**	**5**	**6**	**7**
6	0.115	-	2.1	2.3	2.5	2.9
10	0.36	2.05	-	-	-	-
12.5	0.60	3.57	7.7	8.5	9.4	10.8
25	2.40	13.70	29.5	33.0	36.5	42.0
37.5	5.40	29.70	65	72.5	80.5	92.5
50	9.60	51.80	114	127.0	140.0	161.0

(c) Extra flexible hoisting rope, for use with smaller sheaves and drums, such as are usually found in derricks, consists of 8 by 19 wire stands and one fibre core. The breaking strength of this rope is approximately 87 per cent of the standard wire hoisting rope given in the preceding tabulation.

(d) Special flexible hoisting rope consists of 6 by 37 wire stands and one fibre core. It is extremely flexible and is specially adapted to high-speed service on cranes or where sheaves are small. The breaking strength of special flexible hoisting rope is approximately the same as that of standard wire hoisting rope.

3.3.14 Wire rope or cables shall be inspected by a competent person at the time of installation and once each week thereafter when in use.

3.3.15 No wire shall be used in hoisting or lowering if in any length of 8 diameters the total number of visible broken wires exceeds 10 per cent of the total number of wires or the rope shows signs of excessive wear, corrosion or other defect which in the opinion of the person who inspects it renders it unfit for use.

3.3.16 Wire rope removed from service shall be plainly marked or identified as being unfit for further use on cranes, hoists or other load carrying service and stored separately.

3.3.17 Wire ropes should be carefully uncoiled; coiled or used to prevent kinking; kinked strands damage the rope permanently. Even slight burning of rope reduces its load capacity because of drying out of lubrication.

3.3.18 Thimbles of proper size should always he used when a loop is formed at the end of a wire rope.

3.3.19 Socketing, splicing and seizing of cables shall be performed by qualified persons.

3.3.20 Connections, fittings, fastenings, parts etc. used in connection with ropes and cables shall be of good quality and of proper size and strength and shall be installed in accordance with recommendations of the manufacturer.

3.3.21 Drum sheaves and pulleys shall be smooth and free from surface defect such as cracks, kinks, destrands etc. Drums, sheaves or pulleys having eccentric bores or cracked hubs, spokes or flanges shall be removed from service.

3.3.22 The ratio between rope diameter and sheave diameter should never be less than 27. Good practice favours a ratio of 45. Grooves of sheaves or drums should be 2mm larger than nominal rope diameter.

3.3.23 Running lines of hoisting equipment located within 2 metres of the ground or working level shall be boxed off or otherwise guarded, the operating area restricted.

3.3.24 Hooks, shakles, rings and pad eyes, U Bolts and other fittings shall be of proper size and those showing excessive wear or that have been bent, twisted or otherwise damaged shall be removed from service.

3.3.25 Slings, their fittings and fastenings, when in use shall be inspecting daily by a qualified person for evidence of overloading, excessive wear or damage. Slings found to be defective shall be removed from service.

3.3.26 Slings shall be of proper construction and size for the load to be hoisted. Slings should not be attached to load as to provide an angle of less than 60^0 between sling leg and the horizontal. The efficiency varies with the angle of sling as follows:

TABLE 5.3

Angle (Degree)	Efficiency (Percent)	Angle (Degree)	Efficiency (Percent)
90	100	50	76
80	98	45	71
70	94	40	64
65	91	35	57
60	87	30	50
55	82	5	8.5

3.3.27 Single legged and reeved slings shall be avoided as far as possible except for small or unyielding leads under competent supervision.

3.3.28 Slinging should be done only by a crew trained for the purpose. Accidental over loading out of ignorance is frequently the cause of fatal injuries. For all normal practice 2 or 4 part sling should be used.

3.3.29 Suitable protection shall be provided between the sling and sharp unyielding surfaces of the load to be lifted.

3.3.30 The maintenance, repair and testing of slings shall be done only by qualified persons. Proper storage shall be provided for slings while not in use.

3.4 CONVEYORS AND CABLEWAYS

3.4.1 All conveyors shall be regularly inspected, repair and maintained.

BELT CONVEYORS:

3.4.2 Belt conveyors shall not be overloaded to the point where material fall of the belt. The walkway along the belts shall be kept free of materials. Where the walkway is one metre or more above the ground, a standard guard rail shall be installed.

3.4.3 Oilers shall never attempt to clean rollers while the belt is in motion. All oil and grease cups shall be so located that the oiler can service the cups without exposing himself to danger.

3.4.4 The following are the maximum allowable speeds of conveyor belts carrying sand, gravel and earth:

TABLE 5.4

Width of Belt Cms	SPEED (Mtrs per minute)
40 or less	80
40 to 60	130
60 or more	180

If the materials include abrasive lumps such as crushed rock, the speed should be reduced by 15 meters per minute on narrow belts and by 30 meters per minute on wide belts of 60 cms or more in width.

3.4.5 Where trippers are used to control the discharge from belt, a device for throwing the propelling mechanism into neutral gear shall be installed at each end of the runway.

3.4.6 Whenever the belt crosses over a travelled way, either public or private, trays shall be installed to catch all spillage from the belt. The trays and their supports shall be of ample strength to support a heaped load of wet materials and estimated weight of the cleaning crew. The trays shall not be so allowed to fill and patrolmen shall be particularly alert to prevent any spillage on travel ways.

3.4.7 Crossovers or underpasses with proper safeguards shall be provided for passage over or under all conveyors as necessary. Crossing over or under conveyors except where safe passageways are provided is prohibited.

3.4.8 All conveyor systems shall be equipped with such emergency signal devices that will provide reasonable safe control at all times. A system of signals to indicate the stopping or starting of belt shall be installed.

3.4.9 On all conveyors where reversing or runaway presents a hazards "anti-runaway" or "backup" stops or other safeguards shall be installed to protect persons and property from injury and damage.

3.4.10 Riding on conveyors shall be prohibited.

3.4.11 Baffles shall be placed across belts installed on steep grades to prevent material from rolling or bouncing off. The baffles shall be placed at intervals of about 30 metres on level belts.

3.4.12 Where conveyors are operated in tunnels, pits and similar enclosures, ample room shall be provided to allow safe access way and operating space for all workmen. Tunnels, pits and similar enclosures shall be provided with adequate drainage, lighting, ventilation and emergency controls including escape ways where it is necessary for person to work in or enter such areas.

3.4.13 All openings to hoppers, chutes, bins etc., shall be protected to prevent unauthorised entry or persons from stepping or falling into them.

CABLEWAYS:

3.4.14 While all cables shall be carefully inspected everyday special care shall be taken in the inspection of the button line at the buttons, where all grease shall be removed and the cable examined for broken wires and abrasions. Button line failures generally occur at the buttons, due to the impact of the carriers, and abrasion caused by the rebound of the carriers when they strike the buttons. Rubber and steel ferrules should be installed on each end of the buttons as shock absorbers.

3.4.15 Breaking of cable occasionally results in fatalities or serious injuries. Button line failures are sometimes caused by jamming of the carriers when they are picked up by the carriage, thus putting more strain on the line than it was designed to withstand. On some cableway systems, one end of the button line is anchored to a counter weight, which maintains a constant predetermined tension in the line. Jamming of the carriers causes a lifting of the counterweight. A limit switch can be installed above the normal travel of the counterweight, which will sound an alarm in operator's booth.

3.4.16 In night operations, clearance lights shall be installed on high blocks or other high points under cableway to assist the operator in maintaining proper clearance over such points.

3.4.17 Hoist rope failures are most serious. Regular inspection and recording of all repairs and performance is extremely necessary. Unloading of buckets should be slow so that the cable does not surge. Heavy surges cause hoist rope to twine around main cable and get excessive grinds. Sometimes the rope slips out of the pulley in the fall blocks and strands get severely damaged.

3.4.18 Hoist ropes must be replaced immediately on damage.

3.4.19 Carriers should be of such design that they do not slip.

3.4.20 Where any cableway passes above any place on a site of operation where persons employed habitually work or pass and are liable to be injured by objects falling from such cableway, appropriate screens shall be provided or other steps shall, so far as is reasonably practicable, be taken to protect such persons from being so injured.

3.5 LIGHT EQUIPMENT

WORKING MACHINERY:

3.5.1 Safe means shall be provided for the removal of sawdust, chips and shavings from all woodworking machinery.

3.5.2 A mechanical or electrical power control shall be provided on each machine, in a protected position, to prevent accidental starting and to enable the operator to cut off the power without leaving his position at the point of operation.

3.5.3 Circular ripsaws shall be provided with hood guard, splitter and anti-kick-back device. All circular saws shall be provided with hood guards.

3.5.4 The peripheral length of circular saws and cutters beneath tables shall be guarded or sides of table enclosed.

3.5.5 All planners and jointers shall be guarded and have cylindrical heads with throats in the cylinder.

3.5.6 All swing cut off and radial saws or similar machines, which are drawn across a table shall be equipped with limit stops to prevent the cutting edge of the tool from extending beyond the edge of table.

3.5.7 Band saw bladders shall be fully enclosed except at point of operation.

3.5.8 The use of cracked, bent or otherwise defective parts such as saw blades, cutters and knives is prohibited.

3.5.9 A push stick, block or other safe means shall be used in all close operations on saws, jointers and other machines having high speed cutting edges.

GRINDING WHEELS:

3.5.10 All grinding wheels shall be protected by hoods.

3.5.11 New wheels must to inspected carefully to see that they have not been damaged in transit. Suspending the wheel and tapping it with a light wooden mallet will reveal any cracks.

3.5.12 New wheels should be carefully fitted on the spindles.

3.5.13 Wheels should be tested frequently for balance and if out of round shall be 'trued-up' by a competent workman. If after being 'trued-up', if a wheel is still out of balance, it shall be discarded for use as a power operated wheel.

3.5.14 Wheels used in wet grinding shall never be left standing in water as the water soaked portion may throw the wheel out of balance.

3.5.15 Wheels designed for hand operation shall never be used on power-operated grinders.

3.5.16 Grinding on the site of the wheel in hazardous and shall not be permitted.

3.5.17 Direct current motors shall not be used for operating grinding wheels unless equipped with some approved device to prevent over speeding if the shunt field circuit should be accidentally broken.

3.5.18 When any person is wholly or mainly employed on a grinding wheel and substantial quantities of dust are given off during grinding, such grinding shall not be performed without a hood or other appliance so constructed, arranged, placed and maintained as substantially to intercept the dust throw off and a duct of adequate size so arranged as to be capable of carrying away the dust by means of a fan or other efficient means.

METAL WORKING MACHINERY:

3.5.19 Lathes, punch presses, shapers, milling machines and other metalworking tools shall be fully shielded or guarded.

3.5.20 Point of operation guards shall never be made inoperative by plugging the switch buttons or otherwise interfering with the operation of the guards.

3.5.21 Chain hoists or other power lifting devices shall be provided to light heave objects to the operating table of the machine.

3.5.22 Cleaning the hands with cutting oil or compound is dangerous and should be prohibited as small particles of metal in the oil may penetrate the skin.

3.5.23 Operators shall never wear gloves, lose clothing, loose sleeves or ties.

3.5.24 Articles made of cellubid or other flammable material shall not be worn.

3.5.25 Every machine shall have a brush conveniently placed for the operator to brush shavings or bits or metal from the machine. The bare hand should never be used for this purpose.

3.5.26 Goggles suitable for the work shall be worn and safety shoes are recommended.

3.6 LIFTING APPLIANCES

GENERAL:

3.6.1 Every lifting appliance and every part thereof including all working gear and all plant or gear used for anchoring or fixing such appliances shall:

(a) be of good mechanical construction, sound material, adequate strength and free from patent defects;

(b) be properly maintained; and

(c) as far as construction permits, be inspected at least once every week by a competent person and a report of the result of inspection entered in a register maintained for the purpose.

3.6.2 Every lifting appliance or part thereof during the course of erection, working or dismantling shall be properly supported and all the fixing and anchoring arrangements shall be adequate and secure.

TRAVELLING:

3.6.3 When lifting appliances with travelling and slewing motions are used, there shall be 2 metres clear distance between any part of the appliance in its extreme position and any guardrails or fencing or other fixtures; provided that if it is impracticable to maintain this distance, all reasonable steps shall be taken to prevent the access of any person to such guardrail, fencing or fixture.

3.6.4 Where minimum clearance of 2 metres from nearby structures is not possible, suitable warnings like peal of gongs should be sounded before crane commences to move.

3.6.5 A minimum distance of 2 metres must be maintained between the boom and all power lines of feeds during the travelling operation of a mobile crane.

3.6.6 Under no circumstances an attempt should be made to raise electric wires by a person other than the employee of the Electricity Department.

PLATFORMS AND CABINS:

3.6.7 Platforms for persons driving or operating the cranes or for signallers shall be provided with safe means of access and the floors of such platforms shall be close planked or plated and be of sufficient area for persons employed thereon.

3.6.8 The driver of every power driven lifting appliance shall be provided with a suitable cabin for protection from the weather and it should be so constructed as to afford ready and safe access to parts of the lifting appliance in the cabin which required periodic inspections and maintenance and it shall not be so placed that it prevents the driver from having clear and unrestricted view of all lifting operations outside the cabin.

DRUMS AND PULLEYS:

3.6.9 Every chain or rope which terminates at the winding drums of lifting appliances shall be properly secured thereto and at least two drums of such chains or rope shall remain on the drum in every operation.

3.6.10 Drums or pulleys of lifting appliances shall be of suitable diameter in relation to the sizes of chains or wire ropes used round them.

BREAKES, CONTROLS AND SAFETY DEVICES:

3.6.11 Every crane, crab and winch shall be provided with an efficient brake, or brakes and dogs or pawls or other safety devices which will prevent the fall of the load when suspended, and by which load can be effectively controlled whilst being lowered.

3.6.12 While a load is suspended from a crane, hoist or derrick, the operator shall not leave his position at the control until the load has been lowered to the ground.

3.6.13 Side pulls shall not be made with cranes or derricks. The crane or derrick boom shall be directly over the load to be lifted.

3.6.14 Riding on loads, hooks, hammers, materials hoists, or buckets shall not be permitted. Loads, booms and buckets shall not be swung over the head of the workmen.

CRANES WITH DERRIKING JIBS:

3.6.15 On every crane having a derricking jib there shall be provided and maintained an effective interlocking arrangement of sound construction between the derricking clutch and the pawl sustaining the derricking drum except where:

(a) The hoisting drum and the derricking drum are independently driven;
(b) The mechanism driving the derricking drum is self-looking.

STABILITY:

3.6.16 Mobile lifting appliances shall not be used or soft or uneven surface or on a slope in circumstances in which the stability of appliance is likely to be effected unless adequate precautions are taken to ensure its stability.

3.6.17 No fixed crane shall be used unless it is securely anchored or adequately weighted as to secure stability.

3.6.18 Every travelling jib crane on rails shall be provided with guards to remove any loose material from the track, which shall be provided with effective stops at the end.

3.6.19 When the stability of the crane is secured by means of removable weights a diagram or notice indicating the position and amount of such weights shall be fixed on the crane where it can readily be seen.

COMPETENT PERSONS FOR OPERATION:

3.6.20 Lifting appliance shall not be operated except by a person trained and competent to operate that appliance except that for the purpose of training it shall be permissible for any person to operate the appliance provided such a person is under the direct supervision of a competent person. Operators shall have the following additional qualifications:

i) Be able to read and understand the signs, notices, operating instructions and signal code used.

ii) Be not less than 21 years of age.

iii) Must have had a physical examination within one year to determine that they have no deficiencies of eyesight or hearing or they are not subject to epilepsy, heart failure, or similar ailments that would be detrimental to safe operation of equipment.

3.6.21 If the person operating a lifting appliance has no clear view of the load, there shall be appointed signallers to give signals to the operator.

3.6.22 The crane operator should recognize signals from only one person designated as signalman.

3.6.23 Every crane operator and rigger should be made familiar with the rules and regulations for crane operators and standard crane signals for the safe operation of the crane.

TESTING AND EXAMINATION:

3.6.24 All lifting appliance shall be tested and thoroughly examined one in every period of four years and thoroughly examined once every year by a competent person.

3.6.25 Any lifting appliance, to which any substantial alteration has been carried out, shall not be taken into use unless it is tested and thoroughly examined by a competent person.

3.6.26 Results of all tests and thorough examinations shall be entered in a register to be maintained by the occupier.

MARKING OF SAFE WORKING LOADS:

3.6.27 The safe working load or safe working loads and a means of identification shall be plainly marked:

i) upon every crane, crab and which, and;

i) upon every pulley block, gin wheel, shear legs or derrick pole or mast used in the raising or lowering of any load.

3.6.28 Every crane fitted with a derricking jib shall:

i) have plainly marked upon it the safe working loads at various radii of the jib and the maximum radius at which the jib may be worked; and

ii) be fitted with an accurate indicator, clearly visible to driver, showing the radius of the jib at any time and the safe working load corresponding to the radius.

3.6.29 No jib crane with fixed or derricking jib shall be used unless it is fitted with an automatic load indicator which gives an efficient sound signal when the load lifted is in excess of safe working load at that radius, provided that if the requirements of clauses 27 and 28 are compiled with, fitting of an automatic load indicator shall not be required.

3.6.30 The lifting appliance, shear legs or derrick pole or mast or any part thereof shall not be loaded beyond the safe working load except for the purpose of testing when it may be loaded to such amount as may be decided by a competent person for carrying out such tests.

3.7 BOILERS AND COMPRESSORS:

BOILERS:

3.7.1 All steam boilers shall comply with provision of Boiler Regulations.

UNFIRED PRESSURE VESSELS:

3.7.2 Other pressure vessels shall comply with the provisions of rules framed under section 31 of Factories Act, 1948.

AIR COMPRESSORS:

3.7.3 Air Compressors should not be operated at speeds greater than those listed by the manufacturer, as explosions of compressors are sometimes due to excessive speeds.

3.7.4 Compressors should be securely anchored to firm foundation as the sudden and frequent variations in load cause considerable vibration and impose severe shocks upon the equipment.

3.7.5 At a pressure of 8 kgs per square cms as the temperature in an air cylinder may reach 200 degrees C., which is sufficient to volatilise. The lubricating oil shall, therefore, have high flash points.

3.7.6 Every air compressor shall be equipped with an automatic mechanism so arranged that the compressor will automatically stop its air compressing operation before the discharge pressure exceeds the maximum safe working pressure allowable on the weakest portion of the system to which the compressor is attached.

AIR RECEIVERS:

3.7.7 Under no circumstances should a receiver be installed without a pressure guage, and a relief or safety valve so proportioned and adjusted that the pressure will never exceed the maximum allowable working pressure of the tank by more than six percent.

3.7.8 A drain pipe should be installed at the lowest point of every compressed air tank or receiver.

3.7.9 No stop valve should be placed in the air line between the compressor and the air receiver unless spring loaded safety valves are installed between the compressor and the stop valve.

3.7.10 Gauge and valves shall be regularly inspected.

3.7.11 Air receiver shall be drained and cleaned of oil and water every six months or more often if so specified by State laws.

3.7.12 The manhole or hand hole shall be opened every six months and the inside of the receiver checked.

3.7.13 When operating under dusty conditions, the relief valve shall be checked at least every month.

3.8 HEAVY MACHINERY:

INSPECTION:

3.8.1 Before any machinery or mechanized equipment is put into use on the job, it shall be inspected by a competent person and determined to be in safe operating condition. Continued periodic inspection shall be made at such intervals as necessary to ensure its safe operating condition and proper maintenance.

3.8.2 Any machinery or equipment found to be in an unsafe operating condition shall be tagged at the operator's position, labelled "Out of order"' "Do not Use", and its use prohibited until unsafe conditions have been rectified.

3.8.3 Inspections or determinations shall be made to ensure that clearance and load capacities are safe for the passage or placing of any machinery or equipment, before permitting passage or placement.

OPERATIONS:

3.8.4 Machinery and mechanized equipment shall be operated only by qualified and authorised personnel.

3.8.5 Riding on equipment by unauthorized personnel is prohibited.

3.8.6 Getting off or on any equipment while it is in motion is prohibited.

3.8.7 Machinery or equipment requiring an operator shall not be permitted to run unattended. Where practicable, equipment left unattended shall be locked to prevent starting by unauthorized persons.

3.8.8 Machinery and equipment shall not be operated in a position where any part of the machine, suspended loads or lines can be brought closer than 3 metres from exposed high voltage lines unless the current has been shut off and positive means taken to prevent the lines from being energized. A notice of this requirement shall be posted at operator's position.

3.8.9 When rubber-tyred vehicles equipped with boom or ginpoles are being operated in the vicinity of power lines, a chain shall be attached to the metal frame with the loose and dragging on the ground.

3.8.10 Machinery or equipment shall not be operated in a manner that will endanger person or property nor shall the safe operating speeds or loads be exceeded.

3.8.11 An operator shall not be permitted to operate any machinery or equipment for more than 8 hours in any one day without a consecutive 8 hours interval of rest.

3.8.12 Operators and all workmen in the immediate vicinity shall avoid use of loose clothing, large open sleeves, bulky trousers etc.

3.8.13 No person shall take rest or sleep near a parked machine.

3.8.14 While going from one place to another, it shall be ensured that the culverts, etc. to be crossed are strong enough to take the heavy load passing over.

GUARDING, SAFETY DEVICES:

3.8.15 (i) Every moving part of prime mover, headrace and tailrace of every water wheel and water turbine and stock bar which projects beyond the head stock of a lathe shall be securely fenced.

(ii) Unless they are in such position of such construction as to be safe to every person as they would be if they were securely fenced, every part of an electric generator, a motor or rotary converter; and every part of transmission machinery and every dangerous part of any other machinery shall be securely fenced.

(iii) The fencing to be provided in (i) & (ii) shall be of substantial construction regardless of whether the machinery they are guarding are in use or not.

3.8.16 All hot surfaces of equipment, including exhaust pipes, or other lines which may be subject to high temperatures, exposed to contact by persons or which create a fire hazard, shall be suitably guarded or insulated.

3.8.17 Fuel tanks shall be located in a manner which will not allow spills or overflows to run into engine, exhaust or electrical equipments.

3.8.18 No guard, safety appliance, or device shall be removed from machinery or equipment, or made ineffective except for the purpose of making immediate repairs, lubrication or adjustments and only after the power has been shut off. All guards and devices shall be replaced immediately after completion or repairs and adjustments.

3.8.19 Suitable protection against the elements, falling or flying objects, swinging loads, and similar hazards shall be provided where appropriate for operation of all machinery or equipment. All glass used shall be "Safety Glass".

3.8.20 A warning device or services of a signalman shall be provided where there is danger to persons from moving equipment, swinging loads, buckets boom etc.

3.8.21 All machinery or equipment not equipped to prevent over-loading or excessive speed shall have safe load capacities and/or operating speed pasted at the operators position.

3.8.22 Stationary machinery and equipment shall be placed on a firm foundation and properly secured in place before being operated.

REPAIRS AND MAINTENANCE:

3.8.23 Except for testing, trial or adjustment which must necessarily be done while the machinery is in motion, all machinery and equipment shall be shut down and positive means taken to prevent its operation while repairs or manual lubrications are being made.

3.8.24 Any guard or safety device removed or ineffective shall be replaced or resorted to safe operating condition immediately after completion of work, which required its removal.

3.8.25 All repairs on machinery, equipment, or parts thereof which are suspended or held apart by use of slings, hoists, or jacks, shall also be substantially blocked or cribbed before men are permitted to work underneath or between them.

3.8.26 Heavy machinery, equipment, or parts thereof which are suspended or held apart by use of slings, hoists or jacks, shall also be substantially blocked or cribbed before men are permitted to work underneath or between them.

CHAPTER 4
MISCELLANEOUS

4.1 STORAGE OF MATERIALS:

4.1.1 All materials in bags, containers or bundles stored in tiers shall be stacked, blocked, interlocked, and limited in height so that it is stable and otherwise secured against sliding or collapse.

4.1.2 Inflammable liquids and grease shall be stored in a 'NO SMOKING' area and properly separated from other stored materials.

4.1.3 Used lumber shall have all nails withdrawn before it is stacked for storage.

4.1.4 In withdrawing sand, gravel, and crushed stone from frozen stockpiles, no overhanging shall exist at any time.

4.1.5 Materials dumped against walls or partitions shall not be stored to a height that will endanger the stability or exceed the resting strength of such walls and partitions.

4.1.6 Persons working in hoppers or on high piles of loose material shall be equipped with life lines and safety belts.

4.2 ATMOSPHERE IN CONFINED PLACES:

4.2.1 In every working place where persons are required to work in a confined place, adequate ventilation by the circulation of fresh air shall be provided an no person shall be allowed to enter any place where there is reason to apprehend that the atmosphere is poisonous or asphyxiating unless the person wears a suitable breathing apparatus and is equipped with life line held by a person stationed for the purpose in safe place.

4.2.2 When workers are employed in sewers and manholes which are in use, it shall be ensured that the manhole covers are opened and ventilated at least for an hour before the workers are allowed to get into the manholes and the manholes so opened shall be cordoned off with suitable railing and provided with warning signals or boards to prevent accidents to the public.

4.2.3 There shall also be provided in a suitable position and readily available sufficient and appropriate rescue apparatus including:

i) Suitable breathing apparatus;

ii) Suitable reviving apparatus; and

iii) Suitable safety belts of sound material with ropes of adequate length and strength.

All such equipment and apparatus shall be in charge of a competent person conversant with their use and he shall be available at all time while any person is working in the confined place. All such equipment shall be properly maintained, tested and examined at intervals of not more than one month.

4.3 PREVENTION FROM DROWNING:

4.3.1 Where adjacent to the site of any operation there is water, into which a person employed, in the course of his employment, is liable to fall with risk of drowning, suitable rescue equipment shall be provided and maintained in an efficient state and steps shall be taken for the prompt rescue of any such person in danger of drowning.

4.3.2 The rescue equipment shall include life saving skiffs properly maintained with life vests and life buoys of approved type with 16 metres of 10mm rope attached.

4.3.3 Life preservers, vests or belts shall be worn by all persons while working:

(a) On floating pipeline, pontoons, rafts, float stages etc;

(b) On open deck-floating plant not equipped with bulwarks, guardrails or other life lines;

(c) On structures extending over or adjacent to water except where proper guardrail or safety belts and life lines are provided;

(d) Working alone at night where there are potential drowning hazards regardless of other safeguards provided and;

(e) In skiffs, small boats or launches except when inside of enclosed cabin or cockpit.

4.3.4 Life preservers or working vests shall have a buoyancy of at least 7.5 kgs. When new and shall be removed from service when buoyancy decreases below 5.75 kgs.

4.3.5 Walkways and structures extending over or immediately adjacent to water shall be provided with ring buoys of 7.5 kgs buoyancy at intervals of not more than 60 metres.

4.4 FIRE PREVENTION AND PROTECTION:

FIRE PREVENTION:

4.4.1 All construction areas and storage yards should be kept clean and well arranged.

4.4.2 A clear space of 15 metres around the outer boundary of sawmills and lumber storage area may be provided. All lumber should be stored in sections with firebreaks with a distance of 15 metres between consecutive sections.

4.4.3 All combustible waste material, wood scalings, soiled rags etc. shall be removed daily and burden in suitable burning areas. The saw mill and lumber yard shall be kept free from accumulation of combustible debris.

4.4.4 Fires, welding, flame cutting shall in general not permitted in combustible areas. Fires and open flame devices shall not be left unattended.

4.4.5 Smoking shall be prohibited in all flammable material storages viz. carpentry, pain shops garages, services stations etc. "No smoking" signs should be posted on all such areas.

4.4.6 Accumulations of flammable liquids on floors, walks etc. should be prohibited. All spills of flammable liquids shall be cleaned up immediately.

4.4.7 Smoke pipes from Diesel Engines passing through roof of combustible material e.g. in compressor stations at dam site and quarry shall be insulated by asbestos. All joints of smoke pipe should be riveted, welded or otherwise securely fastened together and supported to prevent accidental displacement or separation. The joints should not be leaky.

4.4.8 Flammable liquids, lubricants etc. should be handled and transported in safety containers and drums which can be kept tightly capped.

4.4.9 Petrol or other flammable liquids with a flash point below 100^0F shall not be used for cleaning purposes.

4.4.10 Oxygen cylinders shall not be stored with combustible materials.

4.4.11 All electric installations should be properly earthed. Repairs should not be made on electrical circuits until the circuit has de-energized.

FIRE FIGHTING ARRANGEMENTS;

4.4.12 Fire extinguishers and fire buckets, painted red, shall be provided at all fire hazardous locations viz. Batching and Mixing Plant, which Houses, Workshops. Store yards, Saw-Mill, Switch Gear Room, Compressor Stations, Office establishments etc. The extinguishers shall be inspected serviced and maintained in accordance with manufacturer's instructions. The inspections shall be evidenced by notations on tag attached to the extinguisher.

4.4.13 Where building and establishments are located in or near cities or towns, definite arrangements shall be made to ensure protection by the established municipal fire department In more isolated locations, it will be necessary to provide for and install complete fire fighting facilities including provision for fire tenders commensurate with the number, size and importance of buildings, equipments, or supplies to be protected.

4.4.14 Full reliance should never be placed on portable hand extinguishers as all of these have a very limited capacity. Water, in ample amounts and under adequate pressure, should always be available for fire fighting.

4.4.15 Where a group of buildings are located beyond the range of protection from a public water supply, the installation of water system for private fire protection may be warranted. The following design factors should be considered in the planning of a private water supply. The standard fire stream is recognized as 1155 litres per minute. Multiple streams of 1155 litres must be provided for protection of important groups of buildings. While the daily domestic consumption is basis used in the design of a domestic type of water system, additional capacities should be provided for use during fire emergencies. For example, two standard fire streams (2310 litres per minute) discharged for 1/2 hour amount to 69,300 litres of water. Therefore, additional water storage for fire use must be provided. A loop system of hydrants from two directions with a reduction of friction losses and a resultant higher water pressure for fire-fighting purposes. No underground pipes that are a part of the system should be smaller than 15 cms in diameter and valves should be provided for shutting of the domestic connection outside of all building served. Hydrants should not be over 120m apart and so located that not less than two hose streams concentrate on any building. Hydrants in cold climate should be designed and installed to prevent freezing. Two 60mm outlets with standard 5 hose thread should be used for all private hydrants. It is good practice to provide hose houses at hydrants in a private water supply system. The houses should be equipped with a minimum of 60 metres of 60mm hose and accessories, including axes, spanner, wrench and other tools.

4.4.16 Excavation facilities and fire exit may be provided at all locations featuring the hazards.

4.4.17 Siren or other suitable fire alarm arrangement shall be made on all projects. Warning signs may be posted at all locations featuring fire hazards.

4.4.18 All staff shall be conversant with the use of all types of fire extinguishing apparatuses.

4.4.19 Demonstrations and training in fire fighting shall be conducted at sufficient intervals to ensure that sufficient personnel are familiar with and are cable of operating firefighting equipment.

4.5 FIRST AID AND MEDICAL CARE:

4.5.1 At every work site suitable arrangement for rendering prompt and efficient first aid to injured persons shall be maintained under the guidance of the Medical Officer in charge of the project.

4.5.2 First aid appliances including an adequate supply of sterilised dressings and sterilised cotton wool shall be maintained in a readily accessible place. The appliances shall be kept in good order and they shall be placed under the charge of a responsible person who shall be readily available during working hours. The minimum requirements of the first aid kit shall be as under:

10 cms compressed bandage - 12 Nos.

5 cms compressed bandage - 12 nos.

2.5 cms adhesive plaster - 1 reel

1 metre triangular bandage - 3 Nos.

Spirit Ammonia Aromatic - 1 bottle (4 ounces)
Tannic acid jelly - 1 tube

Tineture iodine - 1 bottle (2 ounces)
Tourniquet - 1 No.

Foreceps - 1 No.

When purchasing first aid kits, dust proof containers should be specified.

4.5.3 Where work sites are remote from regular hospitals an indoor ward in charge of a Medical Officer with such nursing staff as may be necessary shall be provided with one bed for every 250 workers.

4.5.4 Adequate identification and directional markers shall be provided to readily denote location of all first aid stations and hospitals.

4.5.5 An ambulance shall be provided to transport seriously injured persons to the hospital.

4.5.6 Small crews working at a distance from the project headquarters or from the main body of workmen shall be equipped with standard first-aid kits and at least one man in each crew shall have had first aid training.

4.5.7 Adequate lighting, heat, water and ventilation shall be provided in the first aid station and/or hospital.

4.5.8 The Medical Officer in charge of the project should be responsible for issuing special instruction indicating certain 'do's and 'don'ts' on subjects like sunstroke, heat exhaustion, sanitation, out-break of epidemics etc.

4.6 PERSONAL PROTECTIVE EQUIPMENT:

4.6.1 The following safety equipment shall be provided to workers as required and their use enforced:

Rubber boots; hard toe safety boots; hard hats; safety belts; goggles for stone or metal grinders, stone chippers, gas welding aprons; respirator shields; manila ropes and slings for life lines; gloves; flashlights; battery lamps, magazine shoes; safety nets; boatswains chairs; helmets, life and ring buoys.

4.6.2 Items of personal wear shall be maintained in serviceable condition and shall, before being reissued to other employees or returned to stores be cleaned, sterilized, inspected and repaired, if necessary.

4.6.3 Loose and frayed clothing, hand rings loose watch chains etc. shall not be worn around moving machinery or other sources of entanglement.

4.6.4 The use of personal safety equipment as occasioned by the type of work being performed has been indicated in relevant places of this Manual.

4.7 MISCELLANEOUS

SECURITY OF LOADS

4.7.1 Every receptacle used for raising or lowering stone, bricks, tiles, slates, or other objects shall be so enclosed, constructed or designed as to prevent the accidental fall of such objects.

4.7.2 All gears, tools, goods or loose material shall be properly loaded into the bucket or receptacle in which they are being raised or lowered and if necessary, properly secured or effective precautions shall be taken by enclosure or otherwise to prevent their fall.

PROJECTING NAILS:

4.7.3 No timber or material with projecting nails shall be used in any work in which they are a source of danger to such persons.

DANGER FROM COLLAPSE OF STRUCTURE:

4.7.4 When any work is carried on which is likely to affect the security or stability of a building or structure or any part thereof and endanger any persons employed, all practicable precautions shall be taken by shoring or otherwise to prevent collapse of the building of structure or fall of any part thereof and thus remove the cause of danger to such structures and the persons employed.

HANDLING OF CORROSIVE MATERIALS:

4.7.5 For persons engaged in handling of corrosive materials adequate equipment shall be provided.

4.7.6 Where in connection with any grinding, cleaning, spraying or manipulation of any material there is given off any dust or fume of such character and to such extent as is likely to be injurious to the health of persons employed, all practical measures shall be taken by securing adequate ventilation or by the provisions and use of suitable respirators or otherwise to prevent inhalation of such dust and fume.

LEAD COMPOUNDS AND OTHER POISONOUS SUBSTANCES;

4.7.7 Men below the age of 18 years and women shall not be employed on the work of painting with products containing lead in any form. Wherever men above age of eighteen years reemployed on the work of lead painting, the following precautions shall be taken:

(a) No paint containing lead or lead products shall be used except in the form of paste or readymade paint.

(b) Suitable face masks should be supplied for use by the workers when paint is applied in the form of spray or a surface having lead paint dry rubbed and scrapped.

(c) Overalls shall be supplied to the workmen and adequate facilities shall be provided to enable the working painters to wash during the cessation of work.

(d) While lead, sulphate of lead, or product containing these pigments shall not in painting operation, except in the form of pastes or paints ready for use.

(e) Cases of lead poisoning and suspected lead poisoning shall be immediately notified, and shall be subsequently verified by a member appointed by the competent authority of project.

(f) Instructions with regard to special hygienic precautions to be taken in the painting trade shall be distributed to working painters.

4.7.8 Lead compounds shall not be used in the form of a spray in the interior painting of the structures.

4.7.9 Road work:

Workers employed on mixing asphalt materials shall be provided with protective footwear and protective goggles.

Stonebreakers shall be provided with protective goggles and protective clothing and seated at sufficient safe distance from each other.