



BHARATIYA NABHIKIYA VIDYUT NIGAM LIMITED
(A Government of India Enterprise)
Kalpakkam – 603 102, Kancheepuram District, Tamil Nadu.

Tender No - BHAVINI/IT/08/111/10

Name of Work

PUBLIC ADDRESS SYSTEM FOR PFBR
BHAVINI,
Kalpakkam.



BHARATIYA NABHIKIYA VIDYUT NIGAM LIMITED
(A Government of India Enterprise)
Kalpakkam - 603 102, Kancheepuram Dist. (TN)

Tender No: BHAVINI /IT/08/111/10

Submission of Tender upto		Opening of Tender	
Date	Time	Date	Time
03.12.2008	14:00 hrs	03.12.2008	15:00 hrs

Important Notes:

- Tender forms shall be signed at the appropriate places by the intending tenderers.
- The tenderer shall submit their offer in original Tender documents without changing the Tender format which satisfies each and every condition laid down in the tender documents, failing which the tender is liable to be rejected.
- Contractor shall furnish the unconditional bid undertaking failing which their tender shall be considered incomplete and liable for rejection summarily.
- This tender document should be returned with all papers intact without detaching any part of it.

Tender Issued to M/s.

By

BHARATIYA NABHIKIYA VIDYUT NIGAM LIMITED
(A Government of India Enterprise)
Kalpakkam

Name of the work: Design, material, construction features, engineering, manufacture, packing, transportation, delivery, unloading, safe storage, installation, testing, commissioning, training, documentation & guarantee of Public Address system for 500MWe Prototype Fast Breeder Reactor(PFBR) BHAVINI, Kalpakkam, Kancheepuram District, Tamil Nadu, PIN-603 102

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SECTION I

A) CHECKLIST

Before submitting the tender the bidder must check the following

Sl.No	Description	Response
1	Required EMD is placed in separate sealed envelope	Yes/No
2	Latest Income Tax Clearance certificate enclosed	Yes/No
3	Sec II of the document (Contract memorandum) signed with seal and date	Yes/No
4	Section VIII is filled and submitted	Yes/No
5	No pre-condition has been specified by the contractor as per tender conditions.	Yes/No
6	Legal documents are enclosed for Power of Attorney etc.	Yes/No
7	List of works executed by the firm during the last seven years as per the format.	Yes/No
8	List of equipment, machinery & Man-power are enclosed. (As per given format)	Yes/No
9	Drawings enclosed with tender documents are properly signed by the contractor for having studied the drawings before tendering	Yes/No
10	All the drawings which are enclosed with tender document are returned to department along with tenders.	Yes/No
11	Rates in Figures and in words are written properly and amount of each item & Total amount has been worked out properly.	Yes/No
12	Each page of Schedule of quantities are signed by the contractor with seal	Yes/No
13	Details of financial statement enclosed (As per given format)	Yes/No
14	Enclosed Statement of induction of workers	Yes/No
15	Enclosed Solvency certificate	Yes/No
16	Tentative bar chart showing various activities and milestones	Yes/No
17	Undertaking (Section III B) signed	Yes/No
18	Agree to complete the work within the Stipulated period as per the phased programme?	Yes/No
19	Submitted tender quotation in duplicate	Yes/No

Signature of the Tenderer with date and seal



BHARATIYA NABHIKIYA VIDYUT NIGAM LIMITED

(A Government of India Enterprise)

Kalpakkam – 603 102, Kancheepuram District.

NOTICE INVITING TENDER

Tender Notice No: BHAVINI/IT/08/111/10

Sealed tenders are invited by Station Director on behalf of BHARATIYA NABHIKIYA VIDYUT NIGAM LIMITED (BHAVINI), for **Design, material, construction features, engineering, manufacture, packing, transportation, delivery, unloading, safe storage, installation, testing, commissioning, training, documentation & guarantee of Public Address system for 500MWe Prototype Fast Breeder Reactor(PFBR) BHAVINI, Kalpakkam, Kancheepuram District, Tamil Nadu, PIN-603 102** as per the details given below:

1.0 Brief Scope of Work:

Scope of work **Design, material, construction features, engineering, manufacture, packing, transportation, delivery, unloading, safe storage, installation, testing, commissioning, training, documentation & guarantee of Public Address system for 500MWe Prototype Fast Breeder Reactor(PFBR) BHAVINI, Kalpakkam, Kancheepuram District, Tamil Nadu, PIN-603 102** Detailed scope of work enclosed as Annexure-I.

2.0 Qualifying requirements:

The bidder who intends to participate shall satisfy the following requirement.

Requirement A - Financial requirement:

1. Average Annual financial turn over of the bidder during last 3 financial years ending 31st March 08 should be at least equal to 30% of the estimated cost.
and
2. Experience of having successfully completed similar works during last 7 years ending last day of month previous to the one in which applications are existed should be either of the following.
 - a. Three (3) similar works completed costing not less than the amount equal to 40% of the estimated cost
Or
 - b. Two (2) similar works completed costing not less than the amount equal to 50% of the estimated cost
Or
 - c. One (1) similar work completed costing not less than the amount equal to 80% of the estimated cost

Here the word 'similar' refers to the works mentioned under Scope of Work.

The bidder should have latest solvency certificate of atleast 30% of the NIT cost. Tenderers should submit their profit and loss account and balance sheet for last 3 years with tender.

Requirement B - Technical requirement:

- a) The bidder shall, on the strength of their own experience, has designed, manufactured, installed and successfully commissioned equal or higher rated equipment/system in atleast two (2) numbers of NPCIL / DAE units / PSUs / Reputed Industrial establishments / Commercial Establishments each of which has been in satisfactory operation for beneficial use for at least 02 years (in previous seven years) and the bidders are regularly in such jobs for at least last 5 years.

3.0 General Conditions:

- 3.1 Tender document (Non transferable) will be issued by Project Director, BHAVINI or his authorized representative, to only those who prima-facie meet the qualifying requirements as stated above, after scrutiny of the supporting details / documents furnished along with the request for tender documents. However issue of tender document will not automatically construe the qualification of tenderer, which will be determined during the tender technical bid evaluation. Tender document will be issued on submission of proof of technical experience, annual audited reports for the last three years indicating balance sheets, annual turnover and latest solvency certificate and work completion certificate for similar works mentioned above.

Note: Bidders who download the document from internet should submit their offer along with requisite tender fee. The offer not accompanied with the tender fee at the time of submission of tender will be rejected.

3.2 Tender details are as follows:

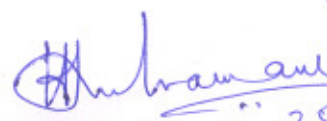
I. Tender Number	: BHAVINI/IT/111/10
II. Estimated Cost	: Rs.191 lakhs
III. EMD	: Rs. 1(One) lakh
IV. Cost of tender document	: Rs. 1,040/- (Non refundable)
V. Sale of tender	: From 28.10.08
VI. Last date for Sale of Tender	: 17.11.08 upto 16:00hrs
VII. Due date for submission of tender	: 03.12.08 upto 14:00hrs
VIII. Date and Time of Opening tender	: 03.12.08 at 15:00 hrs
IX. Completion Time	: 10 months
X. Security Deposit	: 5% of contract value subject to Minimum of Rs. 04lakhs

- 3.3 The Tender Documents will be available with Manager (F&A). Against a written request through authorized person, the same will be issued by BHAVINI, Kalpakkam between 10:00 Hrs. and 16:00 Hrs. on any working day during the sale period against Demand

Draft / Bankers Cheque drawn in favour of "Bharatiya Nabhikiya Vidyut Nigam Ltd." payable at State Bank of India / Canara Bank, Kalpakkam or by Cash. Tender documents will not be sent by post. Decision to issue the tender document is at the sole discretion of BHAVINI.

- 3.4 Alternatively, full tender document can be downloaded from websites www.bhavini.co.in / www.bhavini.nic.in / www.tenders.gov.in. In case the tender document is downloaded directly from website as mentioned above, the offer shall be submitted along with requisite tender fee in addition to **EMD** as mentioned in the form of Demand draft / Bankers Cheque drawn in favour of **"Bharatiya Nabhikiya Vidyut Nigam Ltd."** payable at **State Bank of India or Canara Bank, Kalpakkam or Indian Bank, Anupuram.**
- 3.5 The tenderers are advised to inspect and survey the site and its surrounding and satisfy themselves before submitting their tenders as to the form and nature of the site, the means of access to the site, the accommodation they may require, etc. In general, tenderers shall themselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their tender. The tenderer shall be deemed to have full knowledge of the site, whether he inspects it or not and no extra claims due to any misunderstanding or otherwise shall be allowed.
- 3.6 Submission of a tender by a tenderer implies that he has read this notice and all other contract documents and has made himself aware of the scope and specification of the work to be done and of conditions and rates at which stores, tools and plant, etc, will be issued to him by the corporation and local conditions and other factors bearing on the execution of the works.
- 3.7 The tenderer should quote his rates in figures as well as in words. Tenderers may please note that only rates quoted in words shall be considered. The amount for each item should be worked out in the schedule enclosed with this tender document. The total amount shall be written both in figures and in words. If not complied with the above, the tender will be summarily rejected. When there is a difference between the rates in figures and in words, the rates which correspond to the amounts worked out by the bidder, shall be taken as correct. When the amount of an item is not worked out by the bidder or it does not correspond with the rates written either in figures or in words, then the rate quoted by the bidder in words shall be taken as correct. When the rate quoted by the bidder in figures and in words tallies but the amount is not worked out correctly, the rates quoted by the bidder shall be taken as correct and not the amount.
- 3.8 Rate quoted shall be inclusive of all taxes and duties applicable on the date of submission of tender document and the corporation will not entertain any claim whatsoever in this respect except service tax which will be reimbursed on production of proof of payment.
- 3.8. Applicable statutory duties and levies will be deducted from the payment due to the contractor (WCT, Income tax etc.)
- 3.9. In case of an arithmetic error in total amount calculation, the amounts quoted in words for individual items shall be considered.

- 3.10. This Notice Inviting Tender shall form part of the contract document. The rates shall be strictly quoted in the format given in this tender document, failing which the tender will be summarily rejected.
- 3.11. The tender shall be submitted in the original tender document in separate sealed cover superscribed with the name of the work.
- 3.12. BHAVINI reserves to themselves right of accepting the whole or any part of the tender and the tenderer shall be bound to perform the same at his quoted rates.
- 3.13. BHAVINI reserves the right to reject any or all tenders or to allot part of the works to different agencies without assigning any reason thereof.
- 3.14. BHAVINI do not bind them selves to accept the lowest or any tender or to give any reasons of their decisions.
- 3.15. The quoted rate shall be inclusive of all taxes and duties except service tax and the corporation will not entertain any claim whatsoever in this respect. For Service Tax the claim is to be made and reimbursement will be subject to documentary proof of payment. While quoting the tender shall separately indicate supply and erection charges. Further it may be noted that BHAVINI-PFBR Project is entitled for Mega Power Project Concession and will issue PAC to avail Mega Power Concession. The tenderer shall take this into account while submitting price bid.
- 3.16. The tenders submitted shall remain valid for acceptance for a period of **120 days** from the date of opening of the tender. The tenderer shall not be entitled during the said period of validity to revoke or cancel his tender or vary the tender given or any item thereof. In case of tenderer revokes or cancels his tender or varies any terms in regard thereof, the earnest money paid by the tenderer along with the tender shall be forfeited to BHAVINI.
- 3.17. The tender document duly completed in all respects shall be submitted in separate sealed cover superscribed with the name of the work at the office of **PROJECT ENGINEER (IT) BHAVINI**, Kalpakkam on or before the date mentioned above. The tenders received after 14:00 Hrs on **03.12.2008** will not be accepted.


Station Director 25/10/08

For and on behalf of

Bharatiya Nabhikiya Vidyut Nigam limited
Kalpakkam


25/10/08

SECTION – II

FORM OF TENDER

SECTION II
FORM OF TENDER AND GENERAL RULES AND DIRECTIONS
FOR THE GUIDANCE OF CONTRACTORS

1. All work proposed for execution by contract will be notified in a form of invitation to tender posted in public places and signed by the Engineer.

This form will state the work to be carried out as well as the date of submitting and opening tenders and the time allowed for carrying out the work, also the amount of earnest money to be deposited by the successful tenderer and the percentage, if any, to be deducted from bills. Copies of the specifications, designs and drawings and any other documents required in connection with the work signed for the purpose of identification by the Engineer shall also be open for inspection by the contractor at the “Engineer In Charge’s Office” during office hours.

2. In the event of the tender being submitted by a Partnership firm, it must be signed separately by each member thereof, or in the event of the absence of any partner, it must be signed on his behalf by a person holding a power of attorney to be produced with the tender, and it must disclose that the firm is duly registered under the Indian Partnership Act.
3. Receipt of payments made on account of a work, when executed by a partnership firm, must also be signed by the several partners except where the contractors are described in their tender as a firm, in which case the receipts must be signed in the name of the firm by one of the partners, or by some other person having authority to give effectual receipt for the firm.
4. Any person who submits a tender shall fill-up the prescribed form, stating at what rate he is willing to undertake each item of the work. Tenders, which proposed any alteration in the work specified in the said form of invitation to tender, or in the time allowed for carrying out the work, or which contain any other conditions, of any sort, will be liable to rejection. Tenders shall have the name and number of the work which they refer written outside the envelopes.
5. The rate(s) and /or amount(s) must be quoted in decimal coinage both in words and figures.
6. The Engineer or his duly authorized representative will open tenders individually, in the presence of this respective tenderer or his representative who may be present at the time. In the event of a tender being accepted, a receipt for the earnest money forwarded therewith shall thereupon be given to the contractor who shall there upon for the purpose of identification, signed copies of the specifications and other documents mentioned in Rule 1. In the event of a tender being rejected, the earnest money forwarded with such unaccepted tender shall thereupon be returned to the contractor remitting the same.
7. The Officer inviting tenders shall have the right to reject all or any of the tenders, and will not be bound to accept the lowest tender.
8. The receipt of an accountant or clerk for any money paid by the contractor will not be considered as an acknowledgment of payment to the Engineer and the contractor shall be responsible for seeing that he procures a receipt signed by the Engineer, or by the Manager (F&A), PFBR Project, Kalpakkam, Kancheepuram District, TamilNadu.
9. The memorandum of work, tender form and the schedule of materials to be supplied by the

PFBR Project and their issue rates shall be filled in and completed in the office of the Engineer before the tender form is issued. If a form is issued to an intending tenderer without having been so filled in and completed, he shall request the office to have this done before he completes and delivers his tender.

TENDERS NOT ACCOMPANIED BY THE FOLLOWING ARE LIABLE TO BE SUMMARILY REJECTED.

1. Earnest Money Deposit in any one of the following forms:

- i) A deposit at call Receipt of any Schedule Bank.
- ii) Demand Draft of any Schedule Bank drawn in favour of "Bharatiya Nabhikiya Vidyut Nigam Ltd.", payable at State Bank of India / Canara Bank, Kalpakkam or Indian Bank, Anupuram.
- iii) Bank Guarantee from any Schedule Bank in an acceptable form.

Note: Cash and cheques for Earnest Money Deposit will not be accepted.

2. In case of tenders downloaded from website, tender fee in any one of the following forms:

- i) Demand Draft / Bankers Cheque drawn in favour of "Bharatiya Nabhikiya Vidyut Nigam Ltd.", payable at State bank of India/Canara Bank, Kalpakkam or Indian Bank, Anupuram.

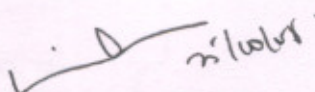
Note: Cash for tender document will not be accepted.

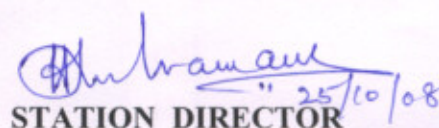
3. In case of contractors in the approved list of CPWD, State PWD, MES, Railways, Public Sector Undertakings etc. evidence showing appropriate and eligible class to which they belong.

4. Relevant experience certificates as per above.

5. Particulars regarding annual turnover with respect to similar works carried out, financial soundness, availability of equipment, manpower etc.

BHAVINI reserves the right to reject any or all tenders or to allot part of the works to different agencies without assigning any reason thereof.

 21/10/08

 25/10/08

STATION DIRECTOR

For and on behalf of BHAVINI

ADDITIONAL RULES AND DIRECTIONS FOR THE GUIDANCE OF BIDDERS

1. The bidders are requested to send the covering letter accompanying the tender documents.
2. The tender shall be valid for a minimum period of 120 days from the date of opening of tenders.
3. All pages in the tender document shall be signed by the bidders and returned along with their offer for this work.
4. **Contractor shall sign the Tender Documents at the appropriate places failing which tenders shall be liable to be rejected.**

BHARATIYA NABHIKIYA VIDYUT NIGAM LIMITED
(A Government of India Enterprise)
Kalpakkam 603 102, Kancheepuram Dist. (TN)

PFBR PROJECT
TENDER FOR WORKS

I/We hereby tender for the execution for the Bharatiya Nabhikiya Vidyut Nigam Limited of the work specified in the underwritten Memorandum within the time specified in such memorandum at the rate specified therein, and in accordance in all respects with the specifications, designs, drawings and instructions in writing referred to in Rule 1 hereof and in Clause 11 of the General Conditions of Contract and with such materials as are provided for, by and in all respects in accordance with, such conditions so far as possible.

MEMORANDUM

a. **General description:** Design, material, construction features, engineering, manufacture, packing, transportation, delivery, unloading, safe storage, installation, testing, commissioning, training, documentation & guarantee of Public Address system for 500MWe Prototype Fast Breeder Reactor(PFBR) BHAVINI, Kalpakkam, Kancheepuram District, Tamil Nadu, PIN-603 102

- | | |
|--------------------------|--|
| b. Estimated cost | : Rs. 191 lakhs. |
| c. Time of completion | : 10 months |
| d. Earnest money deposit | : Rs. 01 lakh (one lakh) |
| e. Security deposit | : 5% of contract value subject to minimum of Rs 04 lakhs |

On award of the work, Earnest Money deposited at the time of tender will be treated as part of Security Deposit. The balance amount of the Security Deposit as per Schedule "A" of General Conditions of Contract (G.C.C) will be collected by deductions from the running account bills of the contractor at the rate of 10 % of the value of work done in each bill till the balance amount stands recovered from the contractor so as to make-up the total amount of 10% of Contract value (Subjected to minimum as mentioned in "Schedule – A").

The Security Deposit will also be accepted in Cash or in Government Securities and Fixed Deposit Receipts and Guarantee Bonds of State Bank of India or any other Schedule Bank of India.

SHOULD THIS TENDER BE ACCEPTED IN WHOLE OR IN PART, I/WE HEREBY AGREE:

RULE (1): to abide by and fulfill all the terms and provisions of the said conditions annexed hereto and all the terms and provisions contained in the notice inviting tender so far as applicable, and/or in default thereof to forfeit and pay to BHARATIYA NABHIKIYA VIDYUT NIGAM LTD. the sum of money mentioned in the said conditions. A sum of Rs. 1,00,000/- (Rupees one lakh only) is hereby forwarded by Deposit at call receipt of a Schedule Bank, Guarantee Bond of a Schedule Bank or State Bank of India Guaranteed by the Reserve Bank of India as Earnest Money. If I/We fail to commence the work specified in the above Memorandum, I/We agree that the said Corporation shall without prejudice to any other right or remedy, be at liberty to forfeit the said Earnest Money absolutely, otherwise the said earnest money shall be retained by the Corporation towards security deposit as mentioned against relevant clause of General Conditions of Contract.

(ii) to execute all the works referred to in the tender documents upon the terms and conditions contained or referred to therein and to carry out such deviations as may be ordered, at the rates quoted in the tender document for respective items of work so long as the entire total cost of the work executed by me/us under this contract is within the limits of +25% and -25% of the contract amount entered into the agreement and evaluated at the rates quoted in the tender document and those in excess of that limit at the rates to be determined in accordance with the provisions contained in Clause 10 of General Conditions of Contract.

Dated the ----- day of ----- 2008

Witness ----- Signature of contractor -----

Address -----

Occupation -----

The above tender is hereby accepted by me for and on behalf of the Bharatiya Nabhikiya Vidyut Nigam Limited.

Dated the ----- day of ----- 2008

Signature of Officer by whom accepted -----



FORM OF AGREEMENT

BHARATIYA NABHIKIYA VIDYUT NIGAM LIMITED
(A Government of India Enterprise)
Kalpakkam - 603 102, Kancheepuram Dist. (TN)

Agreement No.

AGREEMENT For: “Design, material, construction features, engineering, manufacture, packing, transportation, delivery, unloading, safe storage, installation, testing, commissioning, training, documentation & guarantee of Public Address system, for 500MWe Prototype Fast Breeder Reactor(PFBR) BHAVINI, Kalpakkam, Kancheepuram District, Tamil Nadu, PIN-603 102”.

Agreement made this ----- between Bharatiya Nabhikiya Vidyut Nigam Limited, Kalpakkam, (herein after called “BHAVINI”) acting through the Project Director, BHAVINI of the one part and

M/s ----- (hereinafter called the ‘Contractor’) on the other part. Where as the Project Director, BHAVINI on behalf of BHAVINI Ltd. Proposed for the work of **“Design, material, construction features, engineering, manufacture, packing, transportation, delivery, unloading, safe storage, installation, testing, commissioning, training, documentation & guarantee of Public Address system for 500MWe Prototype Fast Breeder Reactor(PFBR) BHAVINI, Kalpakkam, Kancheepuram District, Tamil Nadu, PIN-603 102”.**

AND WHEREAS the offer submitted by the contractor for the aforesaid work was accepted by the BHAVINI under the ----- dated -----And where as the contractor has accepted the work order for the aforesaid work by their letter No. ----- dated -----.

Now the agreement witness and it is hereby agreed by and between the parties here to as follows:

1. This agreement, inter alia, consisting of two pages inclusive here to annexed contains the entire correspondences for construing the contractor between the two parties. All the work executed by the contractor under the work order and undertakings given by the either party in term of the work order shall be deemed to be executed or given under the terms and conditions of the Agreement.

2. In consideration of the payments to be made by BHAVINI to the contractor as mentioned in this contract, the contractor hereby covenants with BHAVINI to carry out the aforesaid work as per the terms and conditions mentioned in the contract.

3. BHAVINI hereby covenants to pay to the contractor in consideration of the execution of aforesaid work in the manner mentioned in this Agreement.

In witness where of Shri ----- for and on behalf of BHAVINI and

Shri. -----for and on

behalf of M/s. ----- have

executed this agreement on the day, month and year herein above written.

(SIGNED SEALED AND DELIVERED BY
IN THE PRESENCE OF WITNESS)

(SIGNED SEALED AND DELIVERED BY
BHAVINI IN THE PRESENCE OF WITNESS)

WITNESS

WITNESS

Signature-----

Signature-----

Name-----

Name-----

Address-----

Address-----

SCHEDULE "A"		
REFERENCE TO GENERAL CONDITIONS OF CONTRACT		
Clause	Item	Stipulation
3(b)	Accepting Authority	Station Director, BHAVINI .
3(i)	Market Rate-percentage addition to cover overheads and profit	10 percent
9.1	Earnest money/Security Deposit	
(a)	Estimated cost of the Work	Rs.191 lakhs
(b)	Earnest Money (2% of the estimated cost of the Works subject to the maximum of Rs.100000/--)	Rs. 1 (One) lakh
(c)	Security Deposit	5% of contract value subject to minimum of Rs 4 lakhs
10.3.6(a)	Deviation limit beyond which sub clause 10.3.1. to 10.3.5 shall not apply and clause 11 shall apply	Plus/minus 25%
10.3.6(b)	Limit of any item or any individual trade beyond which sub clause 10.3.1 to 10.3.5 shall not apply and clause 11 shall apply	100%
12	Suspension of work	
(b)(ii)	ii. Percentage payable to cover contractor's indirect expenses for suspension exceeding 30 days and not exceeding 90 days (This percentage is on salaries and wages towards indirect expenses as per clause – 12 of GCC)	5 percent
c	Percentage payable to cover contractor's indirect expenses for suspension exceeding 90 days (This percentage is on salaries and wages towards indirect expenses as per clause – 12 of GCC)	5 percent
13.1	Time allowed for execution of work or time schedule	10 months
13.3(g)	Authority competent to decide if any other cause of delay is beyond Contractor's control	Station Director, BHAVINI
35	Authority competent to reduce compensation amount	CMD, BHAVINI
36	Defects Liability Period	12 months
37	Limit of amount in respect of any claim which the contractor may recover directly from the insurer.	Rs. Nil
49.2.	Water charges	N.A. Contractor has to make his own arrangement
50	Electricity charges	At prevailing rates (at present Rs. 5.00 per KWh)
54.1	Interim bills	Escalation not applicable to This contract
56.4	Escalation clause not applicable to this contract	Yes
59.	Authority for appointing arbitrator	PD, BHAVINI

SIGNATURE OF ISSUING OFFICER

SIGNATURE OF CONTRACTOR

BHARATIYA NABHIKIYA VIDYUT NIGAM LIMITED
PROTOTYPE FAST BREEDER REACTOR
SECTION III

Name of work :- Design, material, construction features, engineering, manufacture, packing, transportation, delivery, unloading, safe storage, installation, testing, commissioning, training, documentation & guarantee of Public Address system for 500MWe Prototype Fast Breeder Reactor(PFBR) BHAVINI, Kalpakkam, Kancheepuram District, Tamil Nadu, PIN-603 102.

SPECIAL CONDITIONS / INSTRUCTIONS TO TENDERERS.

(1) GENERAL

These special instructions supplement the General conditions of contract and shall be considered as part of the Contract document. Wherever these special instructions are at variance with the corresponding conditions, stipulations and specifications elsewhere in the tender document, these special instructions shall prevail.

(2) SPECIFICATION TO BE FOLLOWED

The work shall be carried out strictly in accordance with the Contract specifications. In the absence of any specification for any work or material, relevant Indian Standard Specifications (IS) will be applicable and where Indian Standard specifications do not exist, relevant British Standard Specifications / American Standard Specifications or equivalent International standards shall apply.

Further, in the absence of any mention in these specifications regarding work, material or workmanship, the decision regarding adaptability of relevant IS, BSS, American Standard Specifications or International Standards etc. will be solely at the discretion of the Engineer-in-Charge and shall be binding on the Contractor.

(3) CLARIFICATIONS

The tenderer shall note that if any clarifications are required regarding specifications, conditions of contract, schedule of quantities, scope of work etc. the tenderer should send their queries before the submission of tender.

No claim on account of any ambiguity in any respect shall be entertained after submission of the tender.

(4) CARE IN SUBMISSION OF TENDERS

Before submitting the tender, the tenderer will be deemed to have satisfied himself by actual inspection of the site, locality of the works, the geological and weather conditions of the site, approaches, availability of materials, camping facilities for his labour force, all security rules & regulation etc. and ensure that all conditions liable to be encountered during execution of the works are taken into account and the rates that he enters in the tender are adequate to take care of such conditions.

While quoting for this tender, the tenderer is advised to go through all Annexures provided at the end of this section and furnish all the data required therein. Tenders, which do not contain the data/ detail in full, are liable to be rejected.

(5) SITE INVESTIGATION

The tenderer shall ensure that he has satisfied himself as to the nature and location of the work, the general and local conditions, particularly those bearing upon transportation, disposal, handling and storage of materials, availability of labour, water, electric power, roads and uncertainties of weather, or similar physical conditions of the site, the conformation and conditions of the ground character, the quality and quantities of surface and sub-surface materials to be encountered, including the sub-soil water level, the character of equipments / facilities needed, preliminary to and during the progress of the work, and all other matters upon which information is reasonably obtainable and which can in any way affect the work or its cost thereof under this contract. Any failure of the contractor to acquaint himself with all the available information concerning these conditions will not relieve him of the responsibility of estimating properly, the difficulty or cost of successfully performing the work. Non-familiarity with site conditions will not be considered a reason either for extra claims or for not carrying out the work in strict conformity with the drawings and specifications. The contractor shall note that if any clarifications regarding drawings, specifications, and conditions of contract, Schedule of Quantities, scope, etc., are required, he would contact the office of the engineer before submission of tender. No claims on account of ambiguity in any respect shall be entertained after opening of tender.

(6) SPECIFICATIONS AND DRAWINGS

The tenderer shall note that

6.1 The work shall confirm to the contract specifications enclosed.

6.2 The work shall also confirm to the construction drawings, and to such other drawings relating thereto as may be issued from time to time during construction, by the Engineer-in-charge, in explanation of details or modifications, including such modifications as the Engineer-in-charge may consider necessary to meet conditions found during the execution of the work.

(7) CONSTRUCTION PROGRAMME / CONSTRUCTION SCHEDULE

The time allowed for carrying out the work as entered in the tender shall be strictly observed by the Contractor and shall be deemed to be the essence of the contract on the part of the Contractor and shall be reckoned from the date from which the work is reckoned to have started as per work order/ letter of intent from the Fifteenth day after the day on which BHAVINI issues written order to commence the work or such time period as mentioned in the letter of award as the case may be. The entire work shall be completed in accordance with the completion time specified. Monsoon or inclement weather will not be considered as a reason for any extra claim. Should the work be affected due to reasons beyond the control of

the Contractor / BHAVINI, suitable extension of the time will be granted for completing the work as per General conditions of Contract (Sec-IV). On award of work, the Contractor shall submit a detailed construction time schedule, keeping the phasing of the work generally in line with the completion time schedule, discussed with this document for the approval of the Engineer-in-charge and such an approved programme shall be strictly adhered to by the Contractor.

(8) SECURITY RULES

The Contractor shall follow all security rules as may be framed by BHAVINI or by local security-in-charge of the units at Kalpakkam from time to time regarding movement of materials and equipment to and from site, issue of identity cards, control of entry of personnel and all similar matters. The Contractor and his personnel shall abide by all security measures imposed by the Engineer-in-charge or his duly authorized representative from time to time. Contractor shall also follow all rules and regulations made applicable to the area from time to time by the authorities or authority of Nuclear Power Stations, IGCAR, BARC Facilities etc. existing in the vicinity or any other statutory orders. The contractor shall have to obtain necessary Police verification certificate, village administrative officer certificate etc. for the purpose of arranging photo passes, entry permits etc for the labourers and the contractor personnel. All the materials brought to PFBR site by the contractor for the use in PFBR site shall be properly entered in the security register and the materials-in-pass. These passes should be preserved carefully and based on these only contractor will be permitted to take back the materials outside the gate. Nothing extra will be payable on account of stoppage / hindrance of the work due to the security requirements.

The Contractor, his employees and agents shall not disclose any information or drawings furnished to him by BHAVINI. Any drawings, reports and other information prepared by the Contractor or by BHAVINI or jointly by both for the execution of the Contract, shall not be disclosed without prior written approval of the Engineer-in-charge. No photographs of the works or plant premises shall be taken, without the prior written permission of the Engineer-in-charge. For specific guidelines on security issues, kindly refer Section III C.

(9) TEMPORARY APPROACH ROADS

The Contractor may use the roads formed by BHAVINI in the vicinity of the works for transport and haulage of materials subject to the approval of Engineer-in-charge for such use. Additional haulage roads as are required by the Contractor, shall be constructed by him at his own cost. Location of such roads and specification of such roads shall however be subject to the prior approval of the Engineer-in-charge. All roads of the work site, including any road formed by the Contractor will be made use of by the project, other contractors and agencies at site and the Contractor shall not be entitled to any payment or compensation on this account

The contractor may use the existing roads already formed by BHAVINI, to the extent, as permitted by the Engineer-in-charge. However at the end of his work, the damage(s), if any, to the road shall be made good at his own cost to the satisfaction of the Engineer-in-charge.

(10) MAINTENANCE OF CLEAN SITE CONDITIONS

During the execution of work, the Contractor shall keep the entire site in neat and tidy condition and shall remove the water in the building area and maintain the site in hygienic and dry condition. No payment shall be made for removal of accumulated curing water. Accumulation and piling of materials / debris shall not be permitted except only at the locations approved from time to time for this purpose. A separate house keeping team shall be engaged for day to day cleaning.

(11) CONTRACTOR TO PROVIDE LABOUR AND ASSISTANCE

The Contractor shall provide necessary labour and assistance to the Engineer-in-charge, BHAVINI QA personnel for checking equipments and works done connected with execution of work and also for taking measurement for finished works at no extra cost to BHAVINI, whenever called for by Engineer-In-Charge or his authorised representative.

(12) MODE OF MEASUREMENT

Mode of measurement when not specified in the tender shall be in accordance with the relevant Indian Standard Specifications (IS) and where not spelt out in IS, Engineer-in-charge's decision shall be final and binding on the Contractor.

(13) TENDER RATES

The tenderer shall note that the validity of the offer and the rates quoted by him shall be for a period of **120 days** from the date of opening price bid of the tender.

The rates quoted by the tenderer in the schedule shall be inclusive of sales tax on all materials, sales tax on contract turnover as levied by the local / State Government Authorities, Octroi duty and/or other duties levied by the Government or other public bodies excluding Service Tax. Unless otherwise stated in the schedule of quantities, rates for all items shall be for the complete work including supplying and fixing of all materials, etc.

The tenderer, when called for by BHAVINI, shall furnish detailed analysis indicating breakup of price for material, labour, other expenses on machinery, equipment etc., in support of the rates quoted by him against each item of the tender. The applicable sales tax on material, sales tax on contract turn-over, Octroi and other duties considered at the time of offering bid should be clearly brought out. BHAVINI reserves the right to utilize the analysis thus supplied in settling any deviations or claims arising on this contract.

Service Tax if any applicable will be reimbursed on submission of documentary proof for payment made towards Service Tax. Service Tax registration number shall be submitted to Accounts department of BHAVINI. Income Tax at applicable rates will be deducted while making payment.

(14) LAND FOR CONTRACTOR

Land for contractor's office, stores, Workshop shall be governed by relevant clause of Section IV (GCC). In addition, the following clause shall be applicable. BHAVINI shall allot suitable and limited land within the fenced area of the project site area for Contractors workshop, office, godowns and for erection of equipment. The contractor should submit a detailed drawing indicating the area required for the use indicated above and BHAVINI will allot the area to the contractor suitably after taking into account various other requirements.

The above land will be within the security fence and 1.5 km(Approx.) from the centre of the plant-site. Primarily the land is in the custody of BHAVINI and it is essential for the contractor to take all efforts to preserve the environment. It shall be contractor's responsibility to ensure the prevention of cutting/felling of plantation by the workers employed by them. The contractor will be penalized as decided by the Engineer-in-Charge if it is found that he is responsible for cutting/felling of plantations. Therefore only bare minimum land required for the above use will be allotted to the contractor. The contractor should store/stack all his materials without giving any hindrance to the other contractors working nearby for other works. It shall be the contractor's responsibility to ensure the safety and security of the construction site and area allotted for construction facility around.

(15) LAND FOR LABOUR CAMP AND ESTABLISHMENT

(a) BHAVINI **shall not provide** area of land for housing establishment and labour camp. All the allied facilities like temporary housing for Contractors' establishment, and labour force, street lighting, treatment, storage and distribution of water supply, sanitation, access roads, electrification and general cleanliness of his camps will be made by Contractor at his own cost and all these arrangements will be subject to the approval of Engineer-in-Charge prior to construction of camps.

(b) Contractor shall be solely responsible for security and safe storage of all his materials/including the materials issued to him by BHAVINI and all his establishments.

(c) The Contractor shall arrange adequate facilities for medical aid and treatment for his staff and workers engaged on the project as and when required.

(16) WATER SUPPLY

The contractor shall make his own arrangements to provide the water for plant site and labour colony at his own cost. The lay-out of pipelines and the cable routing shall be got approved by the Engineer-in-charge. The Contractor shall ensure availability of potable quality of water as specified in the specifications required for all his construction activities at all times. Necessary chemical analysis may be carried out to ensure potable water supply for the construction site as well as the labour camps. The Contractor must carry out required sample analysis and yield of

supply, and indicate both for his camp as well as site establishment, the average and peak requirement of water per day. He may install bore wells as standby arrangements after carrying out necessary analysis and subject to the approval of the Engineer-in-charge. To ensure uninterrupted water supply, in the event of power failure, Contractor is directed to install diesel pumps as a stand-by measure.

(17) FIRE FIGHTING

The contractor shall make his own arrangements for fire fighting and fire prevention both at the construction site and at his camp in line with the Industrial safety requirement. He shall construct storage tanks of adequate capacity dedicated to meet the fire fighting and fire prevention requirement, both at the construction site and labour camp at his own cost. The equipment and piping required for this purpose shall be installed and maintained by the contractor during the entire construction period till the works are handed over to BHAVINI.

In order to meet the requirements during power failure, the contractor shall have adequate number of stand-by diesel pumps to meet the requirement of fire fighting at all height above the highest elevation of the structure at all times. Notwithstanding this, the Contractor shall be entirely responsible for the consequences arising due to fire, if it occurs during the period of construction and no payment will be made or claim will be entertained on any account by BHAVINI. Fire fighting lines shall not be used for any other purpose. **The contractor shall furnish along with the tender the details of the measures he proposes to adopt for fire fighting / fire preventive works.** The Contractor shall also incorporate any additions/alterations in his fire fighting/fire preventing system as may be demanded by the Engineer-in-charge based on the exigencies of the work. The quoted rates against the items in Section VIII, Schedule of quantities, shall be deemed to have taken into account these measures for fire fighting/fire prevention. The contractor shall prepare a detailed drawing/scheme about the fire fighting lines, location of pumps etc. and get prior approval.

In case of any emergency, the Contractor shall permit the Engineer-in-charge to use the Contractor's fire fighting system for protecting equipment, work and materials of BHAVINI or other Agencies working at Site at no extra cost.

(18) CONSTRUCTION POWER SUPPLY

Construction power supply shall be made available for use by the contractors at charges as given below. This supply will be made available at two central points namely BSS1 & BSS2 at 1600 & 1100 KVA respectively. (11 kV/ 433 V Transformers) located at PFBR site at the Southern end of the excavated Nuclear island pit. The source fault level is about 50KA at 415 V level. In case power supply is taken at 11kV(fault level 250MVA), the complete HT installation of the contractor shall be got approved by the contractor from the Central Electricity Authority (CEA). The HT installation shall be operated, maintained by CEA authorized /licensed qualified contractor staff. The source for tapping 11KV supply is NCSS which is approximately 450meters from Construction power substation. The contractor shall furnish, install, operate and maintain at his cost the power HT/LT lines / cables / transformers / switchboards / control gear etc and any other electrical receptacles, apparatus or equipment from the central point (CPSS/NCSS/ other source) to his

work area including office, warehouse, storeroom, canteen, labour rest room, welding fabrication shed, dewatering, lodging area for labour, etc. After completion of work, the contractor shall promptly dismantle the distribution and other facilities made by him at his own cost. Department supplied material if any shall be handed over to the department stores in good condition.

The tenderer shall furnish along with the tender the estimated requirement of Construction power supply at PFBR site for the execution of the work, in terms of maximum KVA demand of every quarter. The contractor shall also furnish complete list of expected connected & operating loads.

In case of any dispute regarding Construction power supply arises, BHAVINI Ltd/ TNEB terms and conditions shall be final and binding on the contractor.

Charges for the construction power will be levied on number of units actually consumed per month at Prevailing rates (Present rate is Rs 5.00/kw/hr . BHAVINI shall meter the power supply to the contractor at which the supply is given. Recoveries for the month wise power consumed shall be made from the RA Bills of the contractor. For this purpose the contractor shall have a suitable tested and calibrated meter (calibration certificate in original has to be submitted) in his main receiving switchboard. If any dispute is raised by the contractor / BHAVINI on the accuracy of the meter, the meter in dispute shall be checked, rectified and recalibrated (calibration Certificate in original has to be submitted at contractors cost, from a reputed laboratory. The meter shall be replaced if required with a new tested and calibrated meter. No request for the rebate on past consumption will be entertained nor any refund will be made on account of excess / faulty meter.

The EIC may at his discretion ask for replacement of any meter suspected to be defective at the cost of contractor. The meter shall never be tampered. In case it is found that the meter is tampered, the power supply shall be immediately disconnected and penal rate of TNEB/BHAVINI shall be charged and recovered with retrospective effect. In case the meter is found not working, charges will be recovered on the basis of average consumption for the preceding 6 months or at the rate of 30 units per KVA per month of demand, which ever is higher. The Construction power supply at PFBR site is quite reliable till date without frequent interruptions. It may please be noted that the above substations do not have any back up emergency Diesel generator sets. Hence the contractor is advised to make his own arrangements of DG set of required capacity during interruption of power supply for his emergency and critical loads. BHAVINI shall not be held responsible for quality of power supply, frequent interruption of power supply, breakdown/ non-availability of CPPS / NCSS / BSS1 / BSS2 equipment and damage to contractor's equipment as a result of variation in the construction power supply. The contractor shall install all protective and safety devices for such purposes as per the established practice. Non-availability of regular Construction power supply shall not be claimed as a reason for extension of time or extra payment. The power supply arranged by the contractor shall be used for the bonafide construction purpose limited to the extent required for the job.

The power supply shall be subjected to all restrictions and regulations as are in existence now and as may be enforced by BHAVINI/TNEB /Govt./IGCAR/MAPP or any other competent authority from time to time for which the contractor will not have any claim whatsoever.

All lighting and power loads shall be separately metered. This is applicable both for class IV and class III supply.

As far as lighting is concerned it is the responsibility of the contractor to maintain adequate illumination level at different places as stipulated in AERB manual.

(19) GENERAL CONDITIONS RELATING TO SUPPLY AND USE OF ENERGY (EXTRACTS OF IE RULE 1956)

A. Testing of contractor installation:

(1) Upon receipt of an application for a new or additional supply of energy and before connecting the supply or reconnecting the same after a period of six months, the BHAVINI shall inspect and test the **contractor's installation**.

Contractor shall maintain a record of test results obtained at each supply point to a contractor, in a form to be approved by the BHAVINI

(2) If as a result of such inspection and test, the BHAVINI/ Inspector (CEA) is satisfied that the installation is likely to constitute danger, he shall serve on the Contractor a notice in writing requiring him to make such modifications as are necessary to render the installation safe. BHAVINI may refuse to connect or reconnect the supply until the required modifications have been completed and he has been notified by the Contractor.

B. Leakage on consumer's premises:

(1) If the Inspector (CEA) or any officer appointed to assist the Inspector and authorized under IE Rules 1956 sub-rule (2) of rule 4A or the BHAVINI has reason to believe that there is in the system of a Contractor leakage which is likely to affect injuriously the use of energy by the Contractor or by other persons, or which is likely to cause danger, BHAVINI/ Inspector (CEA) may give the Contractor reasonable notice in writing that he desires to inspect and test the consumer's installation

(2) If on such notice being given

(a) The Contractor does not give all reasonable facilities for inspection and testing of his installation, or When an insulation resistance at the Contractor's installation is so low as to prevent safe use of energy' BHAVINI may, and if directed so to do by the Inspector shall discontinue the supply of energy to the installation but only after giving to the consumer 48 hours notice in writing of disconnection of supply and shall not recommence the supply until he or the Inspector (CEA) is satisfied that the cause of the leakage has been removed.

C. Supply and use of energy:

(1) The energy shall not be supplied, transformed, converted or used or continued to be supplied, transformed, converted or used unless provisions as set out below are observed:

(a) The following controls of requisite capacity to carry and break the current are placed after the point of commencement of supply as defined in IE Rules 1956 rule 58 so as to be readily accessible and capable of being easily operated to completely isolate the supply to the installation such equipment being in addition to any equipment installed for controlling individual circuits or apparatus:

(i) A linked switch with fuse(s) or a circuit breaker by low and medium voltage consumer/ Contractor.

(ii) A linked switch with fuse(s) or a circuit breaker by HV consumers having aggregate installed transformer/apparatus capacity up to 1000 KVA to be supplied at voltage up to 11KV and 25000 KVA at higher voltages (above 11 KV and not exceeding 33 KV).

(iii) A circuit breaker by HV consumer/Contractor having an aggregate installed transformer/apparatus capacity above 1000 KVA and supplied at 11KV and above 2500KVA supplied at higher voltages (above 11 KV and not exceeding 33 KV).

(iv) A circuit breaker by EHV consumer/ Contractor:

(B) All insulating materials are chosen with special regard to the circumstances of its proposed use and their mechanical strength is sufficient for its purpose and so far as is practicable of such a character or so protected as to maintain adequately its insulating property under all working conditions in respect of temperature and moisture

(20) CONTRACTOR'S SITE ORGANISATION

(a) In view of the quantum and nature of work involved and time frame, it is essential that the site organization is necessarily headed by a senior executive of the Company. The site-in-charge will have to be senior enough to liaise with the management directly and shall be vested with powers to take prompt decision. In addition to posting of a senior engineer with sufficient field experience/background to head the site organization, it is also incumbent upon the Contractor that the progress of the project is reviewed once in ten days with the project authorities. In addition to the above, periodical reviews at higher level shall also be conducted at least once in a month with BHAVINI authorities with appropriate senior level representation from the contractor so that necessary prompt improvements/corrective action could be initiated.

(b) It is to be noted that the time is essence of the contract and in order to achieve the schedule and to meet the targets the Contractor has to plan to work properly. Necessary supervisory staff and labour force shall have to be deployed during contract to ensure that the schedules are met with.

(C) The Construction manpower shall be planned taking into consideration the commencement and completion of various activities as detailed in the Annexure-I to this section.

(D) **The Contractor shall furnish along with the tender a detailed site organization he proposes to deploy on the works.** The organization shall indicate the number and category of personnel of different grades for supervisory works upto the grade of Technician / Wireman. (The distribution of staff and personnel shall be location wise/building wise/schedule wise/activity wise).

(E) **The Contractor will also submit along with the tender his assessed phase-wise induction of skilled, semi-skilled, unskilled work force of all categories for the satisfactory and timely completion of the contract.** The skilled/semi skilled categories are electricians, licensed wiremen, attendants, and operators for transport vehicles etc.

(F) The contractor shall identify one of his personnel as safety co-ordinator who is well experienced in field work and himself strictly adheres to site safety instructions and pass on the same to his associates. The person identified as Safety Coordinator shall specifically look into the implementation of different safety requirements of the contract work. The person thus designated will in general coordinate with the Departmental Engineer-in-Charge/Head, Industrial Safety on matters of safety and in particular ensure that the Safety Code is complied fully. His name shall be displayed on the notice Board at a prominent place at the work site.

Within a week of award of contract, the contractor shall submit a safety manual containing details of and the methodology he proposes to adopt at site to ensure that safe industrial practices are followed as per tender specification and job hazard analysis report.

(21) LIABILITY FOR LOSS, DAMAGE, ACCIDENT, etc.

During the execution of the contract and until completion certificate is issued the Contractor will be fully liable to compensate all concerned, for any loss, damage or destruction of “works”, structures, plant & machinery, persons, property etc. including third party risk arising due to causes attributable to the Contractor as may be decided by the Engineer-in-charge whose decision in this regard shall be final. No claim shall be made against BHAVINI on this account. The contractor shall immediately on award of work take out at his own cost a “Contractor’s All Risk Insurance Policy” with an insurer acceptable to BHAVINI for an appropriate amount, which shall include interalia the value of all material issued to him free of charge by the project under terms of the contract wherein BHAVINI shall be named as the “Co-assured”. The taking out of such policy shall not in anyway limit or diminish the responsibility of the Contractor for any loss or damage.

The unit rates quoted for all the items in the Bill of quantities shall include the cost of above insurance premium amount and will not be reimbursed separately.

(22) PLANT & MACHINERY

- (a) **The tenderer shall submit along with his bid the quantum and type of equipment like welding sets, drilling machines, inspection tools and equipment both for his own operation and maintenance which he proposes to deploy.** In arriving at the above he shall take into account the quantum of fabrication and erection of the structural steel, embedded parts and other miscellaneous erection works that he would be required to complete. His own day-to-day operation and

maintenance requirements shall also be taken into account while arriving at the figures.

- (c) Notwithstanding the approval for equipment listed by the tenderer in his deployment chart, to enable timely completion of work, the tenderer should also bring and deploy additional plants and equipment, at no extra cost of BHAVINI as may be deemed necessary by Engineer-in-charge.

(23) MATERIALS SUPPLIED BY THE CONTRACTOR

The contractor shall supply free samples of materials to be used on his works whenever asked for. Failure of any sample to pass the specified requirements for a particular use will be sufficient cause for rejection. Any materials not found meeting the requirements shall be rejected and such rejected material shall be removed from the site immediately at the contractor's cost.

The Contractor shall supply all materials required for the work from approved source. Pre-dispatch inspection of the materials at the source of supply shall be carried out by the Engineer-in-Charge or his authorized representative of BHAVINI and it shall be arranged by the contractor.

The Engineer-in-charge shall have the right to test random samples to prove authenticity of the test certificates produced by the Contractor at no extra cost to BHAVINI. Any material not found meeting the requirements shall be rejected and such rejected material shall be removed from the site.

(24) USE OF STORAGE AREAS AND LAND

The contractor shall construct storage areas and yard facilities he may require for the performance of the work at his own expenses. Location of the areas shall be subjected to the approval of the Engineer-in-charge. The specialization, method, size shall be got approved by the Engineer-in-Charge.

(25) USE OF AREA PENDING COMPLETION

The Engineer-in-charge shall be at liberty at any time to put into beneficial use whole or any part of the work, he may desire to use, pending full completion and taking over of the same. The decision of the Engineer-in-charge shall be final and binding on both the parties as to whether the pending items of work are minor or important and if the Engineer-in-charge certifies that the items to be completed are important, notwithstanding anything contained in this, the taking over certificate shall not be issued unless all works have been fully completed to the satisfaction of the Engineer-in-charge. Such possession or use shall not be deemed to be an acceptance of any part of the contract.

(26) REMOVAL OF TEMPORARY WORKS, PLANT AND SURPLUS MATERIALS

Prior to final acceptance of the completed work but excepting as otherwise expressly directed or permitted in writing, the Contractor shall at his own expenses, remove from the site and dispose of the temporary structure, including

all false work and scaffolding, crib work, all plant and material and debris to the satisfaction of the Engineer-in-charge. The Contractor shall further remove all his machinery, equipments, sheds and hand over the area in clean condition.

(27) RIGHTS OF OTHER AGENCIES

The Contractor shall note that several other agencies may also be simultaneously working within and around the structures covered under the present contract.

The Contractor shall permit as directed by the Engineer-in-charge from time to time, such works to be carried out, without any hindrance and shall fully cooperate with the other agencies working therein. In case of dispute in such coordination, the Engineer-in-charge's decision shall be final and binding on the Contractor.

(28) EMD / SECURITY / BID GUARANTEE DEPOSIT AND REFUND THEREOF

Tenderer is advised to note that if he withdraws his tender within the validity period or makes any modifications in the terms and conditions of the tender which are not acceptable to BHAVINI shall without prejudice to any other right or remedy, be at liberty to forfeit the earnest/ bid- guaranteed money absolutely.

Earnest Money deposit furnished by contractor along with the offer in the form of Bank Guarantee will be adjusted towards the Security Deposit. The balance amount of Security Deposit shall be recovered from the progressive bills as specified in relevant Clause of

Section-IV – “General Conditions of the Contract” so as to make the total amount of security deposit indicated in Section II of this tender.

The Bank Guarantee held by BHAVINI shall be kept valid during the entire period of the contract including extension(s) if any and also during the defect liability period specified in the contract. The mode of refund of Security Deposit shall be as per relevant Clauses of Section-IV “General Conditions of the Contract”.

(29) FAIR WAGES

The wage paid to the labourers shall not be less than the fair/minimum wages as fixed under any law, statutory rule or order from time to time.

The tenderer is advised to confirm the latest rate of basic wages and special allowances of an skilled/semiskilled/unskilled **labour** as declared by TamilNadu State Government on the date of submission of the tender. The same shall also form the basis for future escalation payment, if any, as per conditions of contract.

(30) CONSTRUCTION SCHEDULE – PLANNING AND REPORT

The work shall commence and complete in accordance with the area-release schedule approved by BHAVINI. Monsoon and other inclement weather will not be considered as a reason for extension of time or any overstay compensation. Contractor shall prepare an overall and area wise networks showing the details by

which released schedule given under are taken care of. These networks shall be part of the Part – 1 document of the bid.

On award of contract, the contractor shall prepare an overall revised activity network within the release schedule detailed below. Further to the above, contractor shall prepare area wise detailed activity network showing all the activities to be completed to meet the released schedule required. The network shall contain the resource deployment plan of each activity and the invoicing pattern.

*constraints report, daily execution and resource deployment report will be used for recording constraints in “**Hindrance Register**” after mutual acceptance in the enclosed **hindrance format**.*

The contractor shall furnish the information in the requisite format at the respective periodicity as detailed below. The Engineer-in-charge and contractor shall modify the formats in a mutually agreed format containing all the information sought for.

Sl	Report/Information	Reporting period	Remarks
1	Overall Network	Weekly	Accepted by BHAVINI within 3 days of submission
2	Building wise time and progress chart prepared based on GCC clause 13.2	20 days once	Accepted by BHAVINI within 7 days of submission. While revising the chart and network, the constraints report and hindrance register entries made in respect of activities in the path are primarily considered.
3	Overall Contract time & progress chart prepared based on GCC clause 13.2	Monthly	Accepted by BHAVINI within 7 days of submission.
4	Resource deployment status	Daily	To be recorded only. However, it is used for justifying future
5	Daily Plan and Execution report	Daily	To be recorded only. However, it is used for justifying future
6	Constraints report	Fortnightly	To be recorded only. However, it is used for justifying future reports.

(31) DEDUCTION OF INCOME TAX

As per Income-Tax Act, as amended by Ministry of Finance from time to time, Income-Tax at the applicable rate as notified will be recovered on the gross value of work done from the R.A. bills. A certificate for the amount so recovered will be issued by BHAVINI to the contractor on demand.

(32) GOVERNMENT LABOUR ACTS/LAWS

The contractor shall strictly follow the Government Labour Acts which are in forces at present and introduce from time to time, such as, Acts enforced by Regional Provident Fund Commissioner, Directorate of ESIS and Enforcement Officer of Contractor Labour Act, and all necessary arrangements for Labour Security Insurance will have to be made by the Contractor at his own cost.

(33) SALES TAX ON CONTRACT TURNOVER: WORKS CONTRACTS TAX

The rates quoted by the tenderers shall be inclusive of 'Sales-Tax on Contract Turnover' as levied by the State Government of TamilNadu under provisions of the TamilNadu Sales -Tax Act on the transfer of the property in goods involved in the execution of Works Contracts (Re-enacted) Act, 1989, or any other taxes that may be liable under statutory rules from time to time. At present the works Contract Tax in TamilNadu is 4 % of the contract value.

Increase or decrease in statutory rates over that prevalent on the date of submission of the tender will be paid/recovered by BHAVINI. The contractor should furnish the percentage of the statutory taxes already included in his offer at the time of submission of the tender. Necessary documentary evidence related to payment of such tax will also have to be submitted by the Contractor.

All taxes applicable on the day of submission of the tender other than service tax shall be included in the unit rates of the items given in Sec VIII.

(34) MEGA POWER PROJECT CONCESSIONS:

Nuclear Power Project of capacity 440 Mwe or more has been notified as 'Mega Power Project'. As such goods required for setting up these projects are subject to 'NIL' Customs duty as per the extant policy of Government of India vide Customs Notification No. 83/2002-customs dated 14-8-2002 in List 43 at Sr.no.401. Similarly, as per the Import – Export Policy (1997-2002) of Government of India, Domestic Contractors supplying goods for these projects under the procedures of competitive bidding shall be eligible for benefits of 'Deemed Export' which include refund of terminal excise duty vide notification N.42.(RE-2001) 1997-2002 dated 21.12.2001 and Notification No.57 (RE-01/1997-2002 dated 21.12.2001) issued by the Director General of Foreign Trade, Department of commerce, Ministry of Commerce and Industry, Government of India. Hence, no customs duty and/or excise duty on goods shall, therefore, be payable / reimbursable by BHAVINI Ltd. to the Contractor wherever such a concession is applicable. BHAVINI Ltd., shall however, make available the requisite documents or certifications as per the extant rules and procedures for availing the above exemptions/concessions by the Contractor.

The bidder may like to ascertain the availability of Deemed Export Benefits mentioned as above. They shall be solely responsible for obtaining such benefits which they have considered in their bid and in case of failure to receive such benefits, BHAVINI Ltd. will not compensate the bidder. However, the bidder must give all information required for issue of project authority/payment certificate in

terms of Export -Import Policy of the Government of India along with the bid. The Project Authority/Payment certificate will be issued on this basis only and no subsequent change will be permitted. In this regard Chapter 8– Deemed Export in the Export and Import Policy and Hand Book Procedures shall be referred to for ascertaining the above.

The bidder shall furnish to BHAVINI import components covered in the tender & shall provide list of all such items, their quantities as required & CIF value that are proposed to be imported.

These details are to be given along with price bid. This includes items, unit, quantity, rate and cost. Bidders have to furnish to BHAVINI import components as per mega power project concession clause in the following format.

Sl. No	Item Description	Unit	Quantity	Rate	CIF value in Rs. (Only)

The bidders should ensure that all items which are likely to be imported for the work are given in the prescribed table along with its CIF values. PAC will be issued up to actual limited to CIF value given in the tender. In case nothing is specified against this requirement, no PAC will be issued.

(34) EMPLOYMENT OF UNSKILLED PERSONS FROM AMONG THE DISPOSESED FAMILIES

The contractor is advised to give preference in employment to project affected persons and their families/persons whose lands/houses have been acquired for setting up the project. The bonafide persons shall apply to the tenderer and shall be certified by BHAVINI, if required.

(35) MOBILISATION OF PLANT AND MACHINERY ADVANCE

Mobilisation advance shall be granted to the contractor as per relevant Clause of General conditions of contract.

(36) NUMBER OF R.A. BILLS TO BE PAID PER MONTH

Contractor shall submit bills in computerized format with detailed measurements and abstract. Payment will be made every month.

(37) LICENCE TO EMPLOY LABOUR

The contractor shall get a license from the competent authority of the area where the work is undertaken under sub section 12(i) of the contract labour (Regulation & Abolition) Act, 1970 and the rules and orders there under from time to time, in case twenty or more workmen are employed by him directly or through one or more sub-contractors or agents or any other person, before he undertake execution of the job. This should strictly adhered as per General Conditions of Contract Sec IV relevant clause with latest amendments and annexures.

(38) SECURITY PASSES AND REGULATIONS.

The Contactor and his personnel shall abide by all security measures imposed by the engineer-in-charge or his duly authorized representative from time to time. The contractors may please note that the identity cards of all the employees and the labours of all the contractor s and sub-contractors shall have the photo of the personnel concerned, which is being issued by the security authorities. All the necessary clearances, certificates etc. are to be obtained by the contractor to enable the authorities to issue necessary photo passes and control of entry of personnel and all similar matters.

It should be ensured that all the employee and workers employed by the contractor and also by the sub_contractor are law abiding citizens, with clean record. Anti-social elements, rowdies and person with adverse police records not be employed on the works at PFBR site at Kalpakkam. It is the responsibility of the contactor to adhere to all the security clearances and rules and regulations.

(39) MATERIAL TO BE SUPPLIED BY THE DEPARTMENT

No material supply by BHAVINI is envisaged in this contract under section VII.

(40) SECURED ADVANCES

Non-interest bearing Secured advance for the materials brought to site shall be paid to the Contractor. Advance shall be paid for the non-perishable items at the discretion of the Engineer in Charge. At the time of payment of advance, the rates derived from the item or the purchase cost (on production of proof of purchase) whichever is less shall be considered. Advance upto to an amount not exceeding 75% of the value as calculated above shall be paid.

Advance shall be recovered once the material is consumed in the works. Quantity of material against which advance is being paid shall be for the consumption during the subsequent three months only and which shall be at the discretion of the Engineer. Secured advanced shall be considered as a value of work done and escalation shall be payable as per relevant Clause of Section-IV of General Conditions of Contract for work. Contractor shall ensure safety of the materials for which secured advance is granted. Bank Guarantee (B.G.) may not be required against the secured advances. However contractor is required to sign an indenture for each secured advance as per clause 54 of GCC.

(41) CONSTRUCTION COMPLETION CERTIFICATE

The Contractor shall maintain completion details for the entire works in line with QA document. A list of completion certificate to be prepared by the contractor shall be finalized in consultation with Engineer-In-Charge and accordingly all completion certificates shall be furnished to BHAVINI in approved formats as and when such works are completed.

(42) SPECIAL SAFETY PENALTY CLAUSE:

In case of fatal accident or total disability (refer IS3786) a penalty of Rs.10 lakhs per incident will be levied (this is in addition to the compensation to be paid to the employee by the contractor, as per existing statutory rules).

The contractor has to procure all necessary safety appliances to their job before mobilizing the site. It is applicable to the sub contractor also, whom they are engaging.

The contractor has to arrange for insurance to the work force and the certificate of insurance has to be submitted to the purchaser. It should be valid till the end of the contract period.

The contractor has to submit a monthly safety report including reportable accidents to the client and client's safety section. The contractor has to prepare a safety manual and submit to the client.

(43) ESCALATION

Escalation clause not applicable to this contract.

(44) QA MANUAL AND QA PLAN

Quality assurance manual and quality assurance plan shall be submitted along with the bid. The QA manual and QA plan submitted during tender stage is not final. The QA plan of successful bidder will be checked, reviewed and approved by BHAVINI

(45) HINDRANCE FORMAT WITH REFERENCE TO CLAUSE 30

Sl. No .	Nature of Hindrance	Date of occurrence	Date of removal	Period of hindrance	Over lapping period, if any	Net extension	Signature of contractor	Signature of Engineer	Re-mark

(46) CONTRACTOR'S SENIOR EXECUTIVES AT PFBR SITE

BHAVINI insists that bidder shall post adequately senior executives at PFBR site as in charge of the works. He shall have adequate power to purchase construction materials in the scope of contract and machinery of large values and take decisions by himself at site without depending on contractor's head quarter so that works at site progress smoothly.

(47) ROLE OF CONTRACTORS' HEADQUARTER ON QA

QA is primary responsibility of contractor. Regarding quality assurance, the bidder shall very clearly spell out roll of their head quarters as well as roll of site organization.

(48) PAYMENT TERMS

1.1 In respect of all the items in the schedule of quantities and rates of work order, the payments shall be made on submission of bills along with the joint measurements, through monthly RA bills:

1.2. The payment against all the items will be made as specified below:

1.2.1 For supply items (i.e. for items which are supplied by the contractor and supply & installation of item is covered **together** in the schedule) (SECTION VIII)

1.2.1.1. Payment of supply part

1.2.1.2. Payment of 75% against supply of the materials with Test certificates duly received and accepted by the corporation.

1.2.1.3. Balance 15% after installation,testing, pre-commissioning/commissioning of the system/equipment.

1.2.1.4. Balance 10% after commissioning

1.2.2. Payment of erection part of supplied items/materials (by contract)

1.2.2.1. 75% after installation

1.2.2.2. 15% after testing, pre-commissioning/commissioning of the system/equipment

1.2.2.3. Balance 10% of erection part at the end of the contract and after the contractor has settled all cost and claims by third parties with respect to operation of this contract.

49. Recovery of Advance Payments in case of breach of contract

In case the Contractor fails to execute the contract due to reasons not attributable to the Purchaser and which do not fall under force majeure as per the tender conditions. The outstanding advance payments made are recoverable, along with the interest on them at the prevailing borrowing rates. This shall be without prejudice to the other remedies available to the Purchaser under the Terms and Conditions of the Contract.

SECTION: III A

SAFETY CODE FOR CONTRACT WORKS

1.0GENERAL SAFETY PROVISIONS

- 1.The contractor shall take all safety precautions during the construction and shall leave the site safe at all times. At the end of each working day and at all times when the work is temporarily suspended, he shall ensure that all construction materials, equipment and facilities will not cause damage to existing property or interfere with the operation of the project. The contractor shall comply with all applicable provisions of the safety regulations; clean up programme and other measures that are in force at the site.
- 2.The Contractor shall provide and maintain at his own cost all lights, guards, fencing, warning signs, caution boards and other safety measures and provide for vigilance when and where necessary or as required by the Department Engineer-in-Charge or by any duly constituted authority for the protection of workers or for the safety of others. The caution boards shall also have appropriate symbols.
- 3.Adequate lighting facilities such as floodlights, hand lights and area lighting shall be provided by the Contractor at the site of work, storage area of materials and equipment, and temporary access roads within his working area. The Contractor shall obtain approval of the Department Engineer-in-Charge to the lighting scheme prior to its installation.
- 4.The contractor shall plan his operations so as to avoid interference with the other Departmental works, other Contractors, or sub contractors at the site. In case of any interference, necessary coordination shall be sought by the contractor from the departmental Engineer-in-Charge for safe and smooth working.
- 5.The Contractor and his sub contractors, if any, shall comply with the instructions given by the Safety Engineer or his authorized nominee regarding safety precautions, protective measures, housekeeping requirements, etc. The Safety Engineer with due intimation to Engineer-in-charge shall have the right to stop the work of contractor, if in his opinion proceeding with the work will lead to an unsafe and dangerous condition. Engineer-in-charge shall get the unsafe condition removed or provide protective equipment at the contractors cost. The contractor can employ his own safety Engineer or nominate one of his officers for liaison with Departmental safety Engineer for ensuring compliance of all safety Rules. Contractors shall ensure that all his workmen are aware about the nature of risks involved in their work and have adequate training for carrying out their work safely.
- 6.The contractor shall be held responsible for non-compliance of any of the safety measures and delays, implications, injuries, fatalities and compensation arising out of such situations or incidents.

2.0VEHICLES-TRAFFIC

- 1.The Contractor shall conduct his operation so as to interfere as little as possible with the use of existing roads at or near locations where the work is being performed.
- 2.When interference to traffic is inevitable notice of such interference shall be given to the Engineer in-charge well in advance (at least 48 hours) with the details of start of the work and time required, storage of materials, and details of the proposed methods of

providing the required facilities for safe and continuous use of roads and obtain his clearance.

3. The Contractor shall, at his own expense, make such approved temporary provisions as are required to maintain at least one lane of traffic by bridging the excavation, providing ramps over surface obstructions or providing suitable temporary by-pass around the obstructions. The contractor shall exercise full care to ensure that no damage is caused by him or his workmen during the operation, to the existing water supply, sewage, power or telecommunication lines or any other services or works. The contractor shall be required to provide and erect before construction, substantial barricades, guards rails, and warning signs. He shall furnish, place and maintain adequate warning lights, signals, etc. as required Engineer in-charge.
4. Guarding of pits, sumps, trenches, manholes, etc are to be adequately covered or guarded. These shall be periodically checked and maintained.
5. A cleaner/assistant must be available for each heavy vehicle.
6. All vehicles, both heavy and light, operating at site shall be equipped with reverse horns that are audible and reverse lights to ward off people coming in the path of the anticipated vehicle movement in those areas.
7. Provide separate paths for movement of people

3.0 PERSONAL PROTECTIVE EQUIPMENT

All necessary personal protective equipment as considered adequate by the Departmental Engineer-in-Charge shall be kept available for the use of the persons employed on the site and maintained in a condition suitable for immediate use, and the Contractor shall take adequate steps to ensure proper use of equipment by those concerned. The personal protective equipments are to be provided by the contractor.

All persons employed at the construction site shall use safety helmets. For other types of work, persons working in that area shall also use safety helmets, if advised by Safety Engineer / Engineer-in-charge.

Violation on wearing of helmet will attract penalty on the Contractor.

Workers employed on mixing asphaltic materials, cement and lime mortars shall be provided with protective foot wear and hand gloves, protective foot wear and hand gloves. Use of proper respirators shall be an advantage.

Persons engaged in welding and gas-cutting works shall be provided with suitable welding face shields. The persons who assist the welders shall be provided with suitable goggles. Protective goggles shall be worn while chipping and grinding.

Stonebreakers shall be provided with protective goggles. They shall be seated at sufficiently safe intervals of distance.

Persons engaged in or assisting in shot blasting operations and cleaning the blasting chamber shall be provided with suitable gauntlets, overalls, dust-proof goggles, boots and protective hood supplied with fresh air at the minimum rate of 150 liters per minute.

All persons working at heights more than 4.5 m above ground or platform and exposed to risk of falling down shall be provided with safety belts, unless otherwise protected by cages, guard railings, etc. In places where the use of safety belts is impractical, suitable net of adequate strength fastened to substantial supports shall be employed.

All motorcycle and scooter drivers and their pillion riders shall wear crash helmets inside the Project/Plant Sites.

When workers are employed in sewers and inside manholes which are in use, the Contractor shall ensure that the manholes are opened and are adequately ventilated at least for an hour. After it has been well ventilated, the atmosphere inside the space shall be tested for the presence of any toxic gas or for oxygen deficiency before the workers are allowed to get into the manholes. The manholes opened shall be cordoned off with suitable railing and provided with warning signals or caution boards to prevent accidents. There shall be proper illumination in the night.

Persons engaged on pickling jobs(Acid/Alkali area) should be provided with Acid/Alkali proof hand gloves, aprons, face shield, suit, gum boots etc. as required. Pickling area shall be provided with eyewash cum shower with continuous supply of fresh water.

All Khalasis / Riggers and other personnel engaged in material handling should be provided with safety shoes with steel/fiber toecaps.

All personnel engaged in work where the hand is continuously exposed to dust, oil, grease etc. barrier cream should be provided.

Compressor operators and other persons constantly exposed to high noise levels should be provided with ear protection.

4.0 PAINTING

The contractor shall not employ women on the work of painting with products containing lead in any form. Only men above the age of 18 years shall be employed on the work with lead paint. The following precautions shall be taken during the work.

- a) No paint containing lead or lead products shall be used except in the form of paste or ready mixed paint.
- b) Supplied air respirators shall be provided for use by the workers when paint is dry rubbed or scraped.
- c) Overalls shall be supplied by the Contractors to the workmen and adequate facilities shall be provided to enable the painters to wash at the cessation of work.
- d) All painting jobs, especially those in which lead paints are used shall be kept under industrial hygiene surveillance.

Smoking, open flames or sources of ignition shall not be allowed in places where paints and other flammable substances are stored, mixed or used. A caution board, with the instructions written in national/regional language, **“SMOKING STRICTLY PROHIBITED”** shall be displaced in the vicinity where painting is in progress or where paints are stored, handled or used. Symbols shall also be used for caution boards.

Suitable fire extinguishers/sand buckets shall be kept available at places where flammable paints are stored, handled or used.

When painting work is done in a closed room or in a confined space, adequate ventilation shall be provided. If adequate ventilation can not be provided, workers shall wear suitable respirators.

Epoxy resins and their formulations used for painting shall not be allowed to come in contact with the skin. The workers shall be protected with PVC gloves and/or suitable barrier creams.

Adequate ventilation shall be provided especially when working with hot resin mixes.

Increased personal hygiene shall be practiced to control inadvertent contact with the resin and eliminate its effects.

Workers shall thoroughly wash before leaving the work. Work clothes shall be changed and laundered frequently.

5.0 HOIST, LIFTING MACHINES AND CONVEYORS

1. Use of lifting machines and tackles including their attachments, anchorage and supports shall conform to the following standard or conditions.

- a) Lifting machines and tackles shall be of good mechanical construction, sound material and adequate strength and free from patent defects and shall be kept in good repair and in good working order.
- b) Every rope used in hoisting or lowering materials or as a means of suspension shall be of good quality and adequate strength and free from patent defect. Each lifting machines/tackles should have a visible identification mark on it on arrival at site and such equipments should be immediately entered in the test record register with the identification mark reference.
- c) Every crane operator or lifting appliance operator shall be properly qualified. No person under the age of 21 years shall be in charge of any hoisting machine or give signal to operator of such machine.
- d) In case of every lifting machine and of every chain, ring, hook, shackle, swivel and pulley block used in hoisting or as means of suspension, the safe working load, each safe working load and the conditions under which it is applicable shall be clearly indicated. No part of any machine or any gear referred to above in this paragraph shall be loaded beyond the safe working load except for the purpose of testing. This shall be approved by the competent person.
- e) In case of departmental machines, the safe working load shall be notified by the Departmental Engineer-in-Charge. As regards to Contractor's machines, the Contractor shall notify the safe working load of the machine to the Departmental Engineer-in-Charge whenever he brings any machinery to site of work and get it verified by the Departmental Engineer-in-Charge, supported by a valid test certificate by the competent person.
- f) Thorough inspection and load testing of hoisting machines and tackles shall be done by a competent person at least once in every 12 months and the records of such inspection and testing shall be maintained.
- g) Cranes shall be operated only by authorized persons who are well trained and experienced, operators shall ensure that all safety devices are functioning are properly before crane is put into operation.
- h) Mobile crane shall be operated so that none of its parts can approach live electrical lines closer than 3 m. While lifting loads such a crane shall be located on level ground.
- i) Standard signal shall be used and operators shall recognize signals from only one person during crane operation.
- j) No person shall be permitted to work or walk under a suspended load.
- k) While using multi-legged slings, each sling or leg shall be loaded evenly and the slings shall be of sufficient length to avoid wide angle between the legs.

2. Motors, gearing transmission, couplings, belts, chain drives and other dangerous moving parts of hoisting, appliances shall be provided with efficient safe guards. Hoisting appliances shall be provided with such means as will reduce to the minimum the risk of any part of a suspended load becoming accidentally displaced or lowered.

- 3.A register for Hoist shall be maintained to record particulars of examinations of hoist and lifts as shown in form and shall be complied with all safety requirements.

6.0 WELDING AND GAS CUTTING

- 1.Welding and gas cutting operations shall be done only by qualified and authorized persons and as per specifications and code of practice.
- 2.Welding and gas cutting shall not be carried out in places where flammable or combustible materials are kept and where there is danger of explosion due to presence of gaseous mixtures.
- 3.Welding and gas cutting equipment including hoses and cables shall be maintained in good condition.
- 4.Barriers shall be erected to protect other persons from harmful rays from the work. When welding or gas cutting is done in elevated positions, precautions shall be taken to prevent sparks or hot metal falling on to persons or flammable materials.
- 5.Suitable type of protective clothing consisting of fire resistant gauntlet gloves, leggings, boots, and aprons shall be provided to workers as protection from heat and hot metal splashes. Welding shields with filter lenses of appropriate shade shall be worn as face protection.
- 6.Adequate ventilation shall be provided while welding in confined space or while brazing, cutting, or welding zinc, brass, bronze, galvanized or lead coated materials.
- 7.Welding and gas cutting shall not be done on drums, barrels, tanks or other containers unless they have been emptied cleaned thoroughly and it is made certain that no flammable material is present. Gas cutting/welding on an empty closed drum shall not be permitted without a safety clearance.
- 8.Fire extinguisher shall be available near the location of welding operations. Fire safety permit shall be obtained for working at vulnerable areas and operating areas before flame cutting /welding is taken up.
- 9.Provisions of Gas Cylinder Rules, 1981 shall be complied with.
- 10.For Electric (Arc) welding the following additional safety precautions shall be taken:
 - a) When electric welding is undertaken near pipelines carrying flammables, such pipelines shall not be used as part of earth conductor but a separate earth conductor shall be connected to the machine directly from the job.
 - b) Personnel contact with the electrode or other live parts of electric welding equipment shall be avoided.
 - c) Extreme caution shall be exercised to prevent accidental contact of electrodes with ground.
 - d) The welding cables shall not be allowed to get entangled with power cables. It shall be ensured that the cables are not damaged by movement of materials
 - e) The return lead of electric arc welding shall be of insulated type and connected directly with the work with a work clamp. Connecting the return lead to nearby structure and making the building structure/equipments in the return path of the welding circuit shall not be permitted.
 - f) For flame cutting/welding, the following precautions shall be followed.
 - g) While doing welding/flame cutting (overhead locations), the sparks and hot slags should be shielded from falling below.
 - h) Non combustible packing should be provided on wall openings/slab opening to prevent sparks slags from entering other areas and to contain the slag.
 - i) Enough quantity of fire buckets with water/sand should be provided at the area of welding/cutting and at the area below/adjacent where spark may fall.
 - j) Fire watch should be provided by the Contractor.

- k) After cutting/welding, fire watch should be continued for at least 30 minutes to ensure that no spark/hot surface exist in the area and vicinity.
- l) Welding machines shall be kept at a dry place and materials shall not be kept around it. Cables connected to the welding machines are to be in good conditions and without joints. The cables shall not lie on wet surface.
- m) For welding work on overhead equipment such as crane, etc a separate earth cable shall be run upto the work place and shall be connected to the work piece.
- n) All the welding work shall be started only after obtaining welding permit-precautions including the fire fighting details.

7.0 GRINDING

- 1.All portable grinders shall be used only with their wheel guards in position to reduce the danger from flying fragments should the wheel break during the use.
- 2.Grinding wheels of specified diameter only shall be used on all grinders – portable or pedestal – in order not to exceed the prescribed peripheral speed. Inter changing of grinding wheels between AG-7 and GO-4 or similar other machines with local improving shall not be permitted.
- 3.In case of pedestal grinding machines, glass shield, wheel guard and tool rest shall be in position all the times and the gap between the wheel and the tool rest shall always be maintained to 3 mm.
- 4.Grinding machines without earth provision as supplied by some manufacturers shall not be permitted.
- 5.Goggles shall be used during grinding operation

8.0 ELECTRICITY

Guidelines for providing temporary power supply at the site and general safety procedures for using electricity are given in the enclosed **Annexure-1**.

9.0 HOUSE KEEPING

- 1.The contractor shall at all times keep his work spot, site office and surroundings clean and tidy from rubbish, scrap, surplus materials and unwanted tools and equipment.
- 2.Welding and other electrical cables shall be so routed as to allow safe traffic by all concerned.
- 3.No materials on any of the sites of work shall be so stacked or placed as to cause danger or inconvenience to any person or the public. The Departmental Engineer-in-Charge may require the contractor to remove any materials which are considered to be of danger or cause inconvenience to the public. If necessary, the Departmental Engineer-in-Charge may cause them to be removed at the Contractor's cost.
- 4.At the completion of the work, the Contractor shall have to remove from the work premises all scaffoldings, surplus materials, rubbish and all huts and sanitary arrangements required for his workmen on the site.
- 5.The Departmental Engineer-in-Charge reserves the right to stop work if the Contractor fails to improve upon the house keeping after having been notified.
- 6.The Contractor should mark and maintain an aisle space in his shop floor and other areas of continuous activity to improve the house keeping.
- 7.Approaches to switches, PDB' s, fire points, etc. should always be kept free without any blockage.

11. FIRE SAFETY

1. All necessary precautions shall be taken to prevent out break of fires at the construction site. Adequate provisions shall be made to extinguish fires should they still break out.
 - a) Quantities of combustible materials like timber, bamboos, coal, paints, etc. shall be the minimum required in order to avoid unnecessary accumulation of combustibles at site .
 - b) Containers of paints, thinners and allied materials shall be stored in a separate room which is well ventilated and free from excessive heat, sparks, flame or direct rays of the sun. The containers of paint shall be kept covered or properly fitted with lid and shall not be kept open except while using.
 - c) Fire extinguishers as approved by the Departmental Engineer-in-Charge shall be located at the construction site at appropriate places.
 - d) Adequate number of employees shall be given education and training in fire fighting and extinguishing methods.
 - e) For major construction work like Reactor Building, Turbine Building, etc. the Contractor should arrange fire hydrant points on each floor. Required number of fire delivery hoses to cover the area with a branch at each hydrant point should be provided. The contractor should arrange fire water pumps both electrical and standby diesel with booster pumps as required.
 - f) In front of all main PDB 's CO2/DCP type portable fire extinguisher should be provided.
 - g) Protection against lightening shall be provided for buildings in which explosives or highly flammable substances are handled/ stored and storage tanks containing oils, paints or other flammable materials and tall chimneys, substations buildings and transformers or switch yards. Where there is a danger of fire or explosion from flammable materials or explosive substances in air workers shall wear shoes without iron, steel nails which may cause sparks by friction. No men shall be allowed smoking, carrying matches, lighters or any other smoking materials.

11.0 SAFETY WORK PERMIT

1. In order to ensure safety of work for hazardous operation (such as work at heights, entry into confined spaces, welding/cutting on equipments/pipes where explosion hazard is present, works on high voltage and medium voltage lines, blasting etc.,) special safety work permit (SWP) shall be raised. The SWP 's shall also to be obtained for any other work as recommended by Safety Engineer.
2. The contractor shall strictly ensure all the safety conditions and requirements stipulated in the safety work permit. The decision of the safety Engineer shall be final in this regard.

12.0 WORK IN RADIATION AREA

1. Rule for handling of Radioactive substances are covered under
 - a) Radiation Protection Rules, 1971 and
 - b) Atomic Energy (Working of the Mines, Minerals and Handling of Prescribe substances) Rules, 1984.
2. These and any other notifications issued from time to time by the Chairman, AERB shall be followed.
3. The contractor shall follow the stipulated procedure regarding work in the radiation area. The decision of the local Health Physicists shall be final in this regard.

13.0 WORK IN AND AROUND WATER BODIES-DROWNING

When the work is done near any place where there is risk of drowning, all necessary rescue equipment shall be provided and kept ready for use and all necessary steps taken for prompt rescue of any person in danger and adequate provision shall be made for prompt first-aid treatment of all injuries likely to be sustained during the course of the work. Persons who do not know swimming shall not be engaged alone for any work where risk of drowning exists. Sufficient number of life buoys or life jackets shall be provided.

14.0 MEDICAL FACILITIES

- 1.The contractor shall arrange adequate facilities for medical aid and treatment for his staff and workers engaged on the work site including the first-aid facilities if they are not available at the Project site.
- 2.First-aid appliances including sterilized dressing, cotton wool and antiseptic cream shall be made available in a readily accessible place at every work site. They shall be maintained in good order under the charge of a responsible person.
- 3.At large work places where hospital facilities are not available within easy reach of the works, First-aid posts shall be established and be manned by a trained male nurse and a compounder.
- 4.At work place a vehicle/ambulance manned by driver should be available during the entire period of work for attending to injury cases.
- 5.A notice containing the names of the persons working within the precincts of the construction site who are trained in first aid and who are in-charge of the first aid boxes shall be displayed a conspicuous places and near the box. The notice shall also indicate work place where the said person shall be available. The telephone numbers of the first aid centers and hospital shall also prominently mentioned ion the display.

15.0 SAFETY MANAGEMENT

- 1.A copy of safety manual of the contractor including safety organisation should be submitted before commencement of the work (related to award of contract).
- 2.All the provisions of the Factories Act, 1948 and the Atomic Energy (Factories) Rules, 1996, are to be followed in all the construction and erection sites of the Department (under the purview of AERB). The contractor shall have a minimum number of officers and supervisors as below. These persons should be working exclusively for industrial safety.
- 3.The contractor shall have a Safety Officer or a supervisor to be designated as a Safety Coordinator in order to specifically look into the implementation of different safety requirements of the contract work. The person thus designated will in general coordinate with the Departmental Engineer-in-Charge on matters of safety and in particular ensure that the Safety Code is complied with fully. His name shall be displayed on the notice Board at a prominent place at the work site.

Head Industrial Safety: Qualification: Degree in Engineering with Diploma in Industrial safety- Minimum No. 1

Safety Officers: Qualification: Same as Head Industrial safety - Minimum No. 1 in each shift (If number of workers in a shift including contractor's workers exceeds 1000 additionally 1 Safety Officer shall be appointed for every 1000 workers)

Safety Supervisors: Qualification: Diploma in engineering and a Diploma in Industrial safety or 6 years experience-Minimum No. 2 in each shift (If number of workers in a shift including contractor's workers exceeds 1000 additionally 1 safety supervisor shall be appointed for every 500 workers)

16.0 REPORTING OF ACCIDENT

1. All accidents leading to property damage and/or personal injuries shall be reported to the Departmental Engineer-in-Charge immediately as per the procedures laid down for informing SARCOP/AERB, to be followed up with detailed accident reports in prescribed form.
2. Contractor shall also submit a monthly statement of accidents by 4th of every month showing details of accidents, nature of injury including disability, days lost, treatment required, etc. and the extent of property damage.
3. All cases of accidents where the period of disability is more than 20 days/fatal accident cases/serious injury cases shall be reported to the commissioner for Workmen's Compensation, of the area by the Contractor with copies to Departmental Engineer-in-Charge and Safety Engineer. The Contractor will be responsible for the payment of compensation/medical expenses and other connected expenses in case of any accident involving person/persons employed by him/by their subcontractors etc.

17.0 PUBLIC PROTECTION

The Contractor shall make all necessary provisions to protect the public from accident, and shall be bound to bear the expenses for defense of every action or other proceedings at law that may be brought by any persons for injury sustained owing to neglect of any precaution to protect the public from accident and to pay any damage and cost which may be awarded in any suit, action or proceedings to any such person or which may be with the consent of the Contractor be paid to compromise any claim by any such person.

18.0 OTHER STATUTORY PROVISION

Notwithstanding the above clauses from 1 to 21 there is nothing in these to exempt the Contractor from the provisions of any other Act or Rules in force in the Republic of India. In particular all operations involving the transport, handling and storage and use of explosives shall be as per the standing instructions and conform to the Indian Explosives Act, 1884 and the Explosives Rules, 1983. Handling, transport, storage and use of compressed gas cylinders and pressure vessels shall conform to the Gas Cylinder Rules, 1981. In addition, the Atomic Energy Act, 1962 the Radiation Protection Rules 1971, Radiation Protection Manual of Nuclear Facilities and the Atomic Energy (Factories) Rules, 1996 and as amended from time to time shall also be strictly complied with and various Acts and Rules related to mining shall also be strictly complied with when excavation, etc are carried out.

19.0 GENERAL REQUIREMENT

1. Restrictions should be put for the employment of women labourers on high rise jobs like that of Cooling Tower, Stack, Reactor Building, etc.
2. At the end of work, Contractor should make arrangement for the attendance by distributing the attendance card/token. Collection of attendance card/token on behalf some one shall not be permitted.

3. The Contractor shall ensure that his employees do not enter un -authorised areas/take short cuts. Necessary instructions in writing should be given to the employees on this.
4. Only skilled Riggers should be employed for material handling work, operation of Winches, chain pulley blocks, ordinary pulley with manila rope and other similar works. Such operation should be supervised by a skilled Rigging Foreman.
5. Gas Cylinder-handling/storage/use should conform to the following:
 - a) Gas cylinder shall be received, returned, transported and stored with valve caps – “ON”.
 - b) Gas cylinder shall not be transported/shifted by rolling.
 - c) Gas cylinders like LPG, acetylene and other liquefied gases shall be stored up-right only.
 - d) Gas cylinder shall be carried locally on proper hand trolleys/other similar means.
 - e) Gas cylinders shall be stored category-wise protecting them from, direct rays of sun, rain and weather. Empty and full cylinders should be kept separately.
 - f) Gas cylinders Rules, 1981 shall be complied with, in storage, transportation, handling and use.
6. All workers/employees of Contractor shall be covered under insurance by the Contractor at their cost. Contractor shall also have third party insurance cover.
7. All types of Mobile cranes, fork lifts, and other similar material handling equipment shall have fitness certificate, Road license, Registration numbers and other equipments as per Motor Vehicles Act and as directed by R.T.O.
8. Work in or near Radiation sources/area shall comply with the requirements of Radiation Safety/Station Health physicist.
9. Radiography work, X-rays storage of sources etc. shall comply with the Radiation safety requirements issued by IGCAR from time to time.
10. All Safety procedures/instructions of the unit will be applicable on the Contractor and they shall be binding on them strictly.
11. All Motor Vehicles of the contractors/cranes and other Mobile equipments run on fuels shall comply with the pollution control equipments of the state.
12. Tall structures like Stack, Cooling Tower, tall cranes (more than 50 meters in height) etc. shall have aviation lighting arrangements and lightening protection.
13. Department will reserve the right to issue safety appliance and other items to the Contractor in case of violation and back charge the amount to the Contractor at standard rate (This is subject to the availability).

20.0 CANTEEN

The following requirements must be ensured.

- i) Separate platform should be provided for Gas Stoves and Kerosene stoves.
 - ii) Cooking by keeping the stoves/burner/heater etc. on the floor shall not be permitted.
 - iii) Unauthorized persons shall not be allowed in the kitchen for any purpose including short time supervision of cooking.
1. The doors and windows of a canteen building shall be of fly proof construction and shall allow adequate ventilation. The canteen shall be sufficiently lighted at all times when any person has access to it. The precincts of the canteen shall be maintained in a clean and sanitary condition. Waste water shall be carried away in suitable covered drains and shall not be allowed to accumulate so as to cause a nuisance. Suitable arrangements shall be made for the collection and disposal of garbage.

21.0 DRINKING WATER

Quantity of drinking water of 5 liters per worker employed in the construction site shall be readily available at all times during the working hours.

22.0 LATRINES AND URINALS

1. Sufficient number of latrine and urinal accommodation shall be provided for the use of male and female workers as per the requirement of Atomic Energy (Factories) Rules.
2. Latrines, urinals and wash places shall be maintained in clean and sanitary condition by employing adequate number of sanitary staff.

23.0 WASHING FACILITIES

Washing facilities shall be provided and maintained, in the construction sites for the use of employed persons and shall be conveniently accessible and kept in a clean and orderly condition

24.0 HAND TOOLS AND POWER TOOLS

1. Hand tools shall be of good quality materials, conforming to relevant BIS standards and shall be used only for the job it is designed for. Workers shall be trained and instructed for proper use of tools such as hammers, hacksaws, spanners, etc.
2. Proper tool bags shall be provided to workers to carry the tools and not leaving them on floors, passages, etc.
3. Protective equipments such as gloves and goggles, etc. shall be provided to and worn by the workers. The tools shall be inspected regularly, repaired and maintained.
4. Portable power tools shall be of good quality materials, conforming to relevant BIS standards and shall be used only for the job it is designed for. Electrically operated tools shall be used only with three-core cable with proper earthing.
5. Proper guards shall be provided for tools such as saws, grinders, etc. an operator shall be provided with personal protective equipment wherever required.

25.0 STACKING AND STORING OF MATERIALS

No materials or equipments shall be stacked or stored in such a manner as to cause risk of bodily injury.

26.0 PENALTY

Violation on safety procedures, requirements, and accidents will attract fine as applicable and as mentioned in the relevant statutory Acts and Rules.

Annexure – 1

GUIDELINES AND GENERAL PROCEDURES FOR USING ELECTRICITY AT SITE

1.0 General

Following safety requirements shall be complied with before the Contractor uses the power supply.

- 1.1. The contractor shall submit a list of licensed electrical staff to be posted at site.
- 1.2 It shall be the responsibility of the Contractor to provide and maintain complete installation on the load side of the supply point with regard to the safety requirements at Site. All cabling and installation shall comply with the appropriate statutory requirements given below and shall be subject to approval of the Departmental Engineer-in-Charge/Electrical Engineer.

Indian Electricity Act, 1910.

Electricity(Supply) Act, 1948

Indian Electricity Rules, 1956.

National electrical code 1985

Other relevant rules of Local Bodies and Electricity Boards.

After installation of the electrical power wiring works by the contractor, form of completion certificate as per IS 732 (for SGW-1) shall be submitted by the contractor duly signed by the authorized valid licensed electrical contractor and / or supervisor along with one copy of the contractors license and or competency certificate of supervisor issued by the Electricity Board / Government Electricity organizations as per the enclosure.

The power supply shall be regulated as per the terms and conditions of the supply of the respective electricity boards.

- a) For purposes of electrical load and power planning by the electrical section, the contractor shall furnish along with the tender, the estimated load requirement of electric power for the execution of the contract works in terms of maximum Kilo watt or KVA demand during various periods/months of the contract period along with the details of the construction electrical equipment/machinery with their individual load details and location/locations of power supply required for availing temporary electric power supply in the standard pro forma enclosed (Form SGW-2)
- b)The electric power supply will be generally made available at one point in the works site of the contractor by the department
- c)Where distribution boards are located at different places the contractor shall submit schematic drawing indicating all details like size of wires, overhead or cable feeders, earthing etc. The position and location of all equipment and switches shall be given. No temporary cables shall be laid on the floor. it shall be properly supported to avoid cable insulation damage.
- d) The power distribution boards (PDB) of the Contractor for any connection shall be metallic construction with proper earthing such as PDB's on outdoors shall have sufficient rain protection measures.

e) For any load more than 5 kW an earth leakage circuit breaker (ELCB) shall be installed by the Contractor as a statutory requirement. Such loads should also have capacitor provided for power factor improvement.

- 1.3 The Contractor shall make his own arrangements for main earth electrode and tappings thereof. The existing earth points available at site can be used at the discretion of the Departmental Electrical Engineer with prior permission. Method of earthing, installation and earth testing results shall conform to relevant IS. Specifications (IS 3043).
- 1.4 All three-phase equipment shall be provided with double earthing. All light fixtures and portable equipment shall be effectively earthed to main earthing.
- 1.5 All earth terminals shall be visible. No gas pipes and water pipes shall be used for earth connection. Neutral conductor shall not be treated as earth wire.
- 1.6 The contractor shall not connect any additional load without prior permission of Departmental Electrical -in-charge. For obtaining additional power required, test reports of the tests mentioned in(d) of Form SGCW-1 shall be submitted.
- 1.7 Joints in earthing conductors shall be avoided. Loop earthing of equipment shall not be allowed. However, tappings from an earth bus may be done.
- 1.8 The entire installation shall be subjected to the following tests before energisation of installation including portable equipment.
 - (a) Insulation Resistance test
 - (b) Polarity test of switches.
 - (c) Earth Continuity test.
 - (d) Earth Electrode resistance.The test procedures and their results shall conform to relevant I.S. Specifications. The Contractor shall submit a test report for his complete installation every 2 months or after rectifying any faulty section in the specimen test report. One such test report for the complete installation shall be submitted before onset of monsoon.
- 1.9 Portable electric equipments/tools without earth provisions operating on voltages above 110 volts shall not be permitted. (Machines from some manufacturers come with plastic body having metallic switches etc. without earth provisions). Wherever electrical equipment/power tools come wholly with plastic body, switches etc. earthing provisions can be exempted provided the test certificate on IR value of the machine body and exposed parts are available and the machine bears an I.S.I. mark.
- 1.10 Pedestal fans without earth provisions shall not be permitted in the work areas as well as in offices.
- 1.11 Hand lamps to be used inside confined areas, big pipe lines, tanks, condenser, calandria, inner vessels and other similar work areas shall strictly be of 24 Volts only. Also wherever the bulb guards are to be removed for checking inside small diameter pipe lines shall be of 24 Volts. All other hand lamps shall be with insulated handle, metallic bulb guard with earthing.
- 1.12 Power supply to the heating elements on pipe lines for heat treatment etc. should be of low voltage using a step down transformer. Such values of low voltage should be around 80 Volts.
- 1.13 Wherever portable electric tools or other equipments are used either with an extension board or otherwise, the control switch points should be available within the working area itself – easily approachable for emergency operation. While working on multistoried buildings a sub-distribution board should be available on earth elevation/floor.
- 1.14 While shifting portable equipments/power tools from one location to another, such equipments/power tools shall first be unplugged and then lifted without applying tension on the cable.
- 1.15 Tapping power supply by inserting bare wires (without plug top) is strictly prohibited.

2.0 GUIDELINES

The followings are provided for general guidance of the contractor and should be read as specific requirement, in addition to complying with Indian Electricity Act, Indian Electricity Rules and I.S. specifications.

2.1. Installation

- a) Only persons having valid wireman's license/competency certificate shall be employed for carrying out electrical work and repair of electrical work and repair of electrical equipment, installation and maintenance at site. The job shall be supervised by a qualified licensed Supervisor.
- b) Electrical equipment and installation shall be so designed, installed and maintained as to prevent danger from contact with live conductors and/or from electrically originated fire. Installation shall not cause any hindrance to movement of men and materials.
- c) Materials for all electrical equipment shall be selected with regard to working voltage, lead and working environment. Such equipment shall conform to the relevant standards.
- d) The minimum clearance to be maintained for all overhead lines (High Voltage) shall be 5.8 m along roads and 6.1 m across roads.
- e) Grounding conductor of wiring system shall be of copper or other corrosion resistant material. An extra grounding connection shall be made in appliances/equipment where chances of electric shock is high.
- f) Electric fuses and/or circuit breakers installed in equipment circuits for circuit protection shall be of proper rating. It is also recommended that high rupture capacity (HRC) fuses shall be used in circuits carrying currents more than 15 Amps.
- g) Wherever cables or wires are laid on poles, a guard wire of adequate size shall be run along the cables/wires and earthed effectively. Metallic poles as a general rule should be avoided and if used shall be earthed individually.
- h) Wires and cables shall be properly supported and an approved method of fixing shall be adopted.
- i) Reinforcement rods or any metallic part of structure shall not be used for supporting wires and cables, fixtures, equipment etc.
- j) All cables and wires shall be adequately protected mechanically against damages. In case the cable is required to be laid underground, it shall be adequately protected by covering the same with bricks, plain cement concrete (PCC) tiles or any other approved means.
- k) All armoured cables shall be properly terminated by using suitable cable glands. Stranded conductor cables shall be connected by using cable lugs/sockets. Cable lugs shall preferably be crimped. They shall be of proper size and should correspond to the current rating and size of the cable. Twisted connections will not be allowed.
- l) All cable glands, armouring and sheathing of electric cables, metal circuits and their fittings, metallic fittings and other non-current carrying parts of electrical equipment and apparatus shall be effectively grounded.
- m) All the Distribution Boards, Switch Fuse units, Bus bar chambers etc. shall be dust and vermin proof. The Distribution Boards, Switches etc. shall be so fixed that they shall be easily accessible. Changes shall be done only after the approval of the Departmental Electrical Engineer.
- n) The Contractor shall provide proper enclosures/covers of approved size and shape for protection of all the switch board, equipment etc. against rain. Exposed live parts of all electrical circuits and equipment shall be enclosed permanently. Crane

trolley wires and other conductors which can not be completely insulated should be placed such that they are inaccessible under normal working conditions.

- o) Iron clad industrial type plug outlets are preferred for an additional safety.
- p) Open type Distribution Boards shall be placed only in dry and ventilated rooms, they shall not be placed in the vicinity of storage batteries or otherwise exposed to chemical fumes.
- q) Isolating switches shall be provided close to equipment for easy disconnection of electrical equipment or conductors from the source of supply when repair or maintenance work has to be done on them.
- r) In front of distribution boards a clear space of 90 cm shall be maintained in order to have easy access during an emergency. (Section 51 (c) of I.E. Rules, 1956)
- s) Adequate working space shall be provided around electrical equipment, which requires adjustment or examination during operation.
- t) As far as possible electrical switches shall be excluded from a place where there is danger of explosion. All electrical equipment such as motors, switches and lighting fittings installed in work room where there is possibility of explosion hazard shall be of explosion proof type.
- u) All connections to lighting fixtures, starters or other power supplies shall be provided with PVC insulated, PVC sheathed twin core wires to have better mechanical protection for preventing possible damage to equipment or injury to personnel. Taped joints shall not be allowed and the connections may be made in looping system.
- v) All the lighting fixtures and lamp holders shall be of good quality and in good condition. Badly repaired or broken holders, etc. shall not be used.
- w) Only PVC insulated and PVC sheathed wires or armoured PVC insulated and sheathed cables shall be used for external power supply connections of temporary nature. Weather proof rubber wires shall not be used for any temporary power supply connections. Taped joints in the wires shall not be used.
- x) The bulbs/lamps used or illumination and testing purpose shall have cover or guard to protect them from accidental breakage.
- y) After installation of new electric system and or other extensive alternations to existing installations, thorough inspection shall be made by an electrical Engineer before the new system or new extension is put in use.
- z) Contractor shall ensure that power factor for their loads shall be maintained at 0.85. In case the power factor falls below 0.85, necessary capacitor units shall be provided by the contractor.

2.2 Operation and Maintenance

- a) All persons who work with electric installation/equipment shall be aware of the electrical hazards, use of protective devices and safe operational procedures. They shall be given training in fire fighting, first aid and artificial resuscitation techniques.
- b) The supervisor shall instruct in the proper procedure, specify and enforce the use of necessary protective equipment such as adequately insulated pliers, screw drivers, fuse pullers, testing lamps and similar hand tools. Only wooden ladders shall be used to reach the height in electrical work.
- c) No material or earth work shall be allowed to be dumped below or in the vicinity of the bare overhead line conductors.
- d) Separate work permits shall be issued for individual group leaders working on the same system which shall be returned after the completion of the work to Safety Supervisor and no system shall be energized without the clearance of Safety Supervisor

- e) Before any maintenance work is commenced on electrical installations/equipment the circuits shall be de-energized and ascertained to be dead by positive test with an approved voltage-testing device. Switches shall be tagged and the fuse holders withdrawn before starting the work. Adequate precautions shall be taken in two important aspects viz.
 - i) That there shall be no danger from any adjacent live parts and
 - ii) That there shall be no chances of re-energisation of the equipment on which the persons are working.
- f) While working on or near a circuit, whenever possible the use of only one hand shall be practiced even though the circuit is supposed to be dead. The other hand may preferably be kept in pocket.
- g) When it is necessary to touch electrical equipment (for example when checking for overload of motors) back of the hand may be used. Thus, if accidental shock were to cause muscular contractions, one would not “freeze” to the conductor.
- h) Operation of electrical equipment shall be avoided when standing on wet floor or when hands are wet.
- i) Before blown fuses are replaced, the circuit shall be locked out and an investigation shall be made for the cause of the short circuit or overload.
- j) When two persons are working within reach of each other, they shall never work on different phases of the supply.
- k) When structural repairs, modification or painting work are to be undertaken, appropriate measures shall be taken for the protection of persons whose work may bring them into the proximity of live equipment/circuit.
- l) It shall be ensured that the insulation and wire size of extension cords are adequate for the voltage and current to be carried.
- m) While tapping electricity from the socket, plug top must be used. It shall be ensured that no extension boards are overloaded while tapping. Only standard three pin plugs shall be used for tapping electricity. Broken sockets/plugs shall be replaced immediately with good ones. Only joint free cables shall be used for connecting equipment/ apparatus.
- n) Floors shall be kept free from trailing electrical cables to avoid tripping hazard.
- o) Power supply to all the machines and lighting fixture shall be switched off when not in use.
- p) Temporary electrical connections shall be removed as soon as the stipulated work is over. After completion of the works the Contractor shall dismantle the distribution boards and the other facilities he may have erected.
- q) Unauthorized tapping of power by others from distribution boards under the controller of contractor shall be prohibited at all circumstances
- r) No flammable materials shall be stored in any working area near the switch boards
- s) Safety work permit shall be used for switching off the main feeder and equipment by the contractor
- t) **“MEN ON LINE” “DO NOT SWITCH ON” “DANGER” or “CAUTION”** board as applicable shall be used during maintenance works on the electrical equipment

2.3 Portable Electrical Equipment

- a) Portable electrical equipment shall be regularly examined, tested and maintained to ensure that the equipment and its leads are in good order. Register shall be maintained for inspection recording the testing dates and result of the equipments
- b) All portable appliances shall be provided with three pin plug. The third pin of the plug shall invariably be earthed. It should be ensured that the metal part of the equipment should be effectively earthed. It shall be ensured that the metal part of the equipment shall be effectively earthed

- c) All connections to portable equipment or machines from the panel/distribution board/extension board shall be taken using three core double insulated PVC flexible copper wire in one length. No joints shall be allowed in this flexible wire. In case single length of wire is not sufficient for a particular location then the supply can be tapped by providing another extension board comprising of switch and socket.
- d) Flexible cables for portable lamps, tools, and apparatus shall be regularly examined, tested and maintained to ensure safety.

2.4 Electrical Acts

The following Electrical Acts are to be followed, observed with latest amendments, addenda etc. if any.

- a) Atomic Energy (Legal Provisions) factories act 1984,1988
- b) The following Electrical act 1910,
- c) Indian Electric supply act 1948
- d) Indian Electricity Rules 1956
- e) Indian explosives act 1854
- f) Indian water act (prevention and control of pollution) 1974
- g) Air(Prevention and control of pollution) act 1981 for air quality
- h) Environment act 1986
- i) Standard of effluent discharge rules.

GENERAL SAFETY (REQUIREMENTS)

Construction, installation, protection, operation and maintenance of electric lines and apparatus shall be Conforming to IE rules 1956, the relevant code of practice of the (Bureau of Indian Standards) (including National Electrical Code) if any may be followed to carry out the purposes of this rule and in the event of any inconsistency, the provision of IE rules 1956 shall prevail.

The material and apparatus used shall conform to the relevant specifications of the (Bureau of Indian Standards) where such specifications have already been laid down.

1. Identification of earthed and earthed neutral conductors and position of switches and cutouts therein. Where the conductors include an earthed conductor of a two-wire system or an earthed neutral conductor of a multi-wire system or a conductor, which is to be connected thereto, the following conditions shall be complied with:

An indication of a permanent nature shall be provided by the owner of the earthed neutral conductor, or the conductor, which is to be connected thereto, to enable such conductor to be distinguished from any live conductor. Such indication shall be provided---

- (a) Where the earthed or earthed neutral conductor is the property of the supplier, at or near the point of commencement of supply:
- (b) Where a conductor forming part of a consumer's system is to be connected to the supplier's earthed or earthed neutral conductor, at the point where such connection is to be made;

(c) In all other cases, at a point corresponding to the point of commencement of supply or at such other points as may be approved by an Inspector or any officer appointed to assist the Inspector and authorized under sub-rule (2) of rule 4A.

No cut-out, link or switch other than a linked switch arranged to operate simultaneously on the earthed or earthed neutral conductor and live conditions shall be inserted or remain inserted in any earthed or earthed neutral conductor of a two wire system or in any earthed or earthed neutral conductor of a multi-wire system or in any conductor connected thereto with the following exceptions: -

- (a) A line for testing purposes, or
- (b) A switch for use in controlling a generator or transformer.

Earthed terminal on Contractor's premises. (1) The Contractor shall provide and maintain on the Contractor's premises for the Contractor's use a suitable earthed terminal in an accessible position at or near the point of commencement of supply as defined under rule 58;

Provided that in the case of medium, high or extra-high voltage installation the Contractor shall, in addition to the aforementioned earthing arrangement, provide his own earthing system with an independent electrode:

Provided further that the BHAVINI Ltd. may not provide any earthed terminal in the case of installations already connected to his system on or before the date to be specified by the State Government in this behalf if he is satisfied that the Contractor's earthing arrangement is efficient.

The Contractor shall take all reasonable precautions to prevent mechanical damage to the earthed terminal and its lead belonging to BHAVINI Ltd.

BHAVINI Ltd. may recover from the Contractor the cost of installation on the basis of schedule of charges notified in advance and where such schedule of charges is not notified, the procedure prescribed

Accessibility of bare conductors: Where bare conductors are used in a building the owner of such conductors shall

- (a) Ensure that they are inaccessible;
- (b) Provide in readily accessible position switches for rendering them dead whenever necessary; and
- (c) Take such other safety measures as are considered necessary by the Inspector.

2. Danger Notices: — The owner (Contractor) of every medium, high and extra-high voltage installation shall affix permanently in a conspicuous position a danger notice in Hindi or English and the local language of the district, with a sign of skull and bones of a design as per the relevant ISS No.2551

(a) Every motor, generator, transformer and other electrical plant and equipment together with apparatus used for controlling or regulating the same:

(b) All supports of high and extra-high voltage overhead lines which can be easily climbed upon without the aid of ladder or special appliances:

Explanation: — Rails, tubular poles, wooden supports, reinforced cement concrete poles without steps, sections and channels, shall be deemed as supports which cannot be easily climbed upon for the purposes of this clause.

Provided that where it is not possible to affix such notices on any generator, motor transformer or other apparatus, they shall be affixed as near as possible thereto: or the word 'danger' and the voltage of the apparatus concerned shall be permanently painted on it:

Provided further that where the generator, motor, transformer or other apparatus is within an enclosure one notice affixed to the said enclosure shall be sufficient for the purposes of the rule.

3. Handling of electric supply lines and apparatus: --(1) Before any conductor or apparatus is handled adequate precautions shall be taken, by earthing or other suitable means, to discharge electrically such conductor or apparatus, and adjacent conductor or apparatus if there is danger there from, and to prevent any conductor or apparatus from being accidentally or inadvertently electrically charged when persons are working thereon.

Every person who is working on an electric supply line or apparatus or both shall be provided with tools and devices such as gloves, rubber shoes, safety belts, ladders, earthing devices, helmets, line testers, hand lines and the like for protecting him from mechanical and electrical injury. Such tools and devices shall always be maintained in sound and efficient working conditions:

No person shall work on any live electric supply line or apparatus and no person shall assist such person on such work, unless he is authorized in that behalf, and takes the safety measures approved by the BHAVINI Ltd./CEA.

Every telecommunication line on support carrying a high or extra-high voltage line shall, for the purpose of working thereon, be deemed to be a high voltage line

4. Supply to vehicles, cranes, etc: Every person owning a vehicle, traveling crane or the like to which energy is supplied from an external source shall ensure that it is efficiently controlled by a suitable switch enabling all voltage to be cut off in one operation and, where such vehicle, traveling crane or the like runs on metal rails, the owner shall ensure that the rails are electrically continuous and, where such vehicle, traveling crane or the like runs on metal rails, the owner shall ensure that the rails are electrically continuous and earthed.

5. Cable for portable or transportable apparatus (1) Flexible cable shall not be used for portable or transportable motors, generators, transformer rectifiers, electric drills, electric sprayers, welding sets or any other portable or transportable apparatus unless they are heavily insulated and adequately protected from mechanical injury.

Where the protection is by means of metallic covering, the covering shall be in metallic connection with the frame of any such apparatus and earth.

The cables shall be three core type and four-core type for portable and transportable apparatus working on single phase and three phases supply respectively and the wire meant to be used for ground connection shall be easily identifiable.

6. Cables protected by bituminous materials :--(a) Where the Contractor has brought into use an electric supply line (other than an overhead line) which is not completely enclosed in a continuous metallic covering connected with earth and is insulated or protected insitu by composition or material of a bituminous character : -

- (i) Any pipe, conduit or the like into which such electric supply line may have been drawn or placed shall, unless other arrangements are approved by the Inspector (CEA)/ BHAVINI Ltd. in any particular case, be effectively sealed at its point of entry into any street box so as to prevent any flow of gas to or from the street box; and
- (ii) Such electric supply line shall be periodically inspected and tested where accessible; BHAVINI Ltd. or the Contractor shall duly record the result of each such inspection and test.

It shall not be permissible for the Contractor to bring into use any further electric supply line as aforesaid which is insulated or protected insitu by any composition or material known to be liable to produce noxious or explosive gases on excessive heating.

7. Street boxes: —(1) Street boxes shall not contain gas pipes, and precautions shall be taken to prevent, as far as reasonably possible, any influx of water or gas.

Where electric supply lines forming part of different systems pass through the same street box, they shall be readily distinguishable from one another and all electric supply lines at high to extra-high voltage in street boxes shall be adequately supported and protected so as to prevent risk of damage to or danger from adjacent electric supply lines

All street boxes shall be regularly inspected for the purpose of detecting the presence of gas and if any influx or accumulation is discovered, the owner shall give immediate notice to any authority or company who have gas mains in the neighborhood of the street box and in cases where a street box is large enough to admit the entrance of a person after the electric supply lines or apparatus therein have been placed in position, ample provision shall be made.

- (a) To ensure that any gas which may by accident have obtained access to the box shall escape before a person is allowed to enter; and
- (b) For the prevention of danger from sparking.

The owners of all street boxes or pillars containing circuits or apparatus shall ensure that their covers and doors are so provided that they can be opened only by means of a key or a special appliance.

8. Distinction of different circuits :— The Contractor of every generating station, sub-station, junction-box or pillar in which there are any circuits or apparatus, whether intended for operational at different voltages or at the same voltage, shall ensure by means of indication of a permanent nature that the respective circuits are readily distinguishable from one another.

9. Distinction of the installations having more than one feed.— The Contractor of the every installation including sub-station, double pole structure, four pole structure or any other structure having more than one feed, shall ensure by means of indication of a permanent nature, that the installation is readily distinguishable from other installations

10. Accidental charge: The owners (Contractor) of all circuits and apparatus shall so arrange them that there shall be no danger of any part thereof becoming accidentally charged to any voltage beyond the limits of voltage for which they are intended. Where A.C. and D.C. circuits are installed on the same support they shall be so arranged and protected that they shall not come into contact with each other when live.

11. Provisions applicable to protective equipment:

(1) Fire buckets filled with clean dry sand and ready for immediate use for extinguishing fires, in addition to fire extinguishers suitable for dealing with electric fires, shall be conspicuously marked and kept in all generating stations, enclosed sub-stations and switch stations in convenient situation. The fire extinguishers shall be tested for satisfactory operation at least once a year and record of such tests shall be maintained.

(2) First-aid boxes or cupboards, conspicuously marked and equipped with such contents as the State Government may specify, shall be provided and maintained in every generating station, enclosed sub-station and enclosed switch station so as to be readily accessible during all working hours. All such boxes and cupboards shall, except in the case of unattended sub-stations and switch stations, be kept in charge of responsible persons who are trained in first-aid treatment and one of such person shall be available during working hours.

Two or more gas masks shall be provided conspicuously and installed and maintained at accessible places in every generating station with capacity of 5MW and above and enclosed sub-station with transformation capacity of 5 MVA and above for use in the event of fire or smoke:

Provided that where more than one generator with capacity of 5 MW and above is installed in a power station, each generator would be provided with at least two separate gas masks in accessible and conspicuous position.

Provided further that adequate number of gas masks would be provided by Contractor of every generating station and enclosed sub-station with capacity less than 5 MW and 5 MVA respectively, if so desired by CEA

12. Instructions for restoration of persons suffering from electric shock:

(1) Instructions, in English or Hindi and the local language of the district and where Hindi is the local language, in English and Hindi for the restoration of persons suffering from electric shock, shall be affixed by the Contractor in a conspicuous place in every generating station, enclosed sub-station, enclosed switch-station and in every factory as defined in clause (iii) of section 2 of the Factories Act, 1948 (63 of 1948) in which electricity is used and in such other premises where electricity is used as the Inspector or any officers appointed to assist the Inspector may, by notice in writing served on the owner, direct.

(2) Copies of the instructions shall be supplied on demand by an officer or officers appointed by the Central or the State Government in this behalf at a price to be fixed by the Central or the State Government.

(3) The owner (Contractor) of every generating station, enclosed sub-station, enclosed switch-station and every factory or other premises to which this rule applies, shall ensure that all authorized persons employed by him are acquainted with and are competent to apply the instructions referred to above.

(4) In every manned high voltage or extra-high voltage generating station, sub-station or switch station, an artificial respirator shall be provided and kept in good working condition.

13 Intimation of Accident: If any accident occurs in connection with the generation, transmission, supply or use of energy in or in connection with, any part of the electric supply lines or other works of any person and the accident results in or is likely to have resulted in loss of human or animal life or in any injury to a human being or an animal, such person or any authorized person of the BHAVINI Ltd./ Contractor, not below the rank of a Junior Engineer or equivalent shall send to the Inspector (CEA) and AERB a telegraphic report within 24 hours of the knowledge of the occurrence of the fatal accident and a written report in the form set out in Annexure XIII of IE Rule 1956 within 48 hours of the knowledge of occurrence of fatal and all other accidents. Where practicable a telephonic message should also be given to the Inspector immediately the accident comes to the knowledge of the authorized officer of the BHAVINI Ltd./ Contractor or other person concerned.

14. Precautions to be adopted by consumers, owners, occupiers, electrical contractors, electrical workmen and suppliers.

(1) No electrical installation work, including additions, alterations, repairs and adjustments to existing installations, except such replacement of lamps, fans, fuses, switches, low voltage domestic appliances and fittings as in no way alters its capacity or character, shall be carried out upon the premises of or on behalf of any consumer, owner except by an electrical contractor licensed in this behalf by the State Government and under the direct supervision of a person holding a certificate of competency and by a person holding a permit issued or recognized by the State Government.

Provided that in the case of works executed for or on behalf of the Central Government and in the case of installations in mines, oil fields and railways, the Central Government and in other cases the State Government may, by notification in the Official Gazette, exempt, on such conditions as it may impose, any such work described therein either generally or in the case of ¹ of any specified class of consumers, suppliers, owners or occupiers from so much of this sub-rule as requires such work to be carried out by an electrical contract licensed by the State Government in this behalf.

No electrical installation work which has been carried out in contravention of sub-rule (1) IE Rules 1956 shall either be energized or connected to the works of Contractor.

15. Periodical inspections and testing of consumer's installation:

(1) (a) Where an installation is already connected to the supply system of the BHAVINI Ltd./ Contractor, every such installation shall be periodically inspected and tested at intervals not exceeding five years either by the Inspector (CEA) or any officer appointed to assist the Inspector or by the BHAVINI Ltd. as may be directed by the State Government in this behalf or in the case of installations belonging to, or under the control of the Central Government, and in the case of installation in mines, oilfields and railways by the Central Government.

(b) Where the Contractor is directed by the Central or the State Government as the case may be to inspect and test the installation he shall report on the condition of the installation to the BHAVINI Ltd. in a form approved by the Inspector and shall submit a

copy of such report to the BHAVINI Ltd. or to any officer appointed to BHAVINI Ltd. and authorized.

(c) Subject to the approval of the Inspector (CEA), the forms of inspection report contained in Annexure IX-A of IE Rule 1956 may, with such variations as the circumstances of each case require, be used for the purposes of this sub-rule.

(2) (a) The fees for such inspection and test shall be determined by the Central or the State Government, as the case may be, in the case of each class of Contractor and shall be payable by the Contractor.

(b) In the event of the failure of any Contractor to pay the fees on or before the date specified in the fee-notice, supply to the installation of such Contractor shall be liable to be disconnected under the direction of the Inspector (CEA). Such disconnection, however shall not be made by the BHAVINI Ltd. without giving to the consumer seven clear days'

(c) In the event of the failure of the Contractor of any installation to rectify the defects in his installation pointed out by the Inspector or by any officer appointed to assist him and authorized under sub-rule (2) of rule 4A in the form set out in Annexure IX and within the time indicated therein, such installation shall be liable to be disconnected under the directions of the Inspector (CEA)/ BHAVINI Ltd. after serving the Contractor of such installation with a notice:

Provided that the installation shall not be disconnected in case an appeal is made under rule 6 and the appellate authority has stayed the orders of disconnection. Provided further that the time indicated in the notice shall not be less than 48 hours in any case. Provided also that nothing contained in this clause shall have any effect on the application of rule 49 of IE Rule 1956.

(3) Notwithstanding the provisions of this rule, the Contractor shall at all times be solely responsible for the maintenance of his installation in such condition as to be free from danger from time to time require to be notified to him, and such notice shall be sent by the earliest practicable post after the failure occurs or after the failure becomes known to the BHAVINI Ltd. and shall be in such form and contain such particulars as BHAVINI Ltd./ Inspector (CEA) may from time to time specify.

(4) For the purpose of testing or for any other purpose connected with the efficient working of the undertaking, the supply of energy may be discontinued by BHAVINI Ltd. for such period as may be necessary, subject (except in cases of emergency) to not less than 24 hours notice being given by BHAVINI Ltd. to all Contractors likely to be affected by such discontinuance:

Provided that the supply of energy shall be discontinued during such hours as are likely to interfere the least with the use of energy by Contractors and the energy shall not be discontinued if the Inspector (CEA) / BHAVINI Ltd. so directs

The contractor shall maintain a power factor of not less than 0.8 by installing suitable corrective devices. The contractor failure in this regard within a period as stipulated by the EIC may entail installation of the necessary corrective device at the risk and cost of contractor. The single-phase loads shall be suitably distributed in the three phases, so that three-phase system is always balanced.

Electrical equipment and installation shall be so designed, installed and maintained as to prevent danger from contact with live conductors and/or from electrically originated fire. Installation shall not cause any hindrance to movement of men and materials. The contractor will allow free access to departmental safety engineers for inspection of electrical connections and distribution system and abide by their decisions. In the interest of the safety of contractor personnel, the contractor shall avail the industrial safety and related training being provided by the department free of cost and ensure that most of the field staff is trained adequately.

Materials for all electrical equipment shall be selected with regard to working voltage, load and working environment. Such equipment shall conform to the relevant standards. Every circuit shall be protected with ELCB/CBCT and MCCB combination, as directed by EIC.

The contractor shall submit a list of licensed electrical staff; he will be posting at site. Only persons having valid wireman's license/competency certificate shall be employed for carrying out electrical work, installation, maintenance and repair of electrical equipment. A qualified licensed Supervisor shall supervise the job.

It shall be the responsibility of the Contractor to provide and maintain complete installation on the load side of the supply point (from the controlling switch/ breaker of CPSS / NCSS) including the safety requirements at Site. All cabling and installation shall comply with the appropriate statutory requirements given below and shall be subject to approval of the Departmental Engineer-in-Charge/Electrical Engineer. Approval of the EIC does not absolve the contractor from complying with any or all other conditions laid down in this section and their latest amendments.

- (a) Indian Electricity Act, 2003.
- (b) Electricity (Supply) Act, 1948
- (c) Indian Electricity Rules, 1956.
- (d) Atomic Energy factories act 1984,1988
- (e) BIS
- (f) The Central electricity authority regulations, 1979

All persons who work with electric installation/equipment shall be aware of the electrical hazards, use of protective devices and safe operational procedures. They shall be given training in fire fighting, first aid and artificial resuscitation techniques. The contractor shall make necessary first aid equipment available.

The supervisor shall instruct in the proper procedure, specify and enforce the use of necessary protective equipment such as adequately insulated pliers, screw drivers, fuse pullers, testing lamps and similar hand tools. Only wooden/FRP ladders shall be used to reach the height in electrical work.

Before any maintenance work is commenced on electrical installations/equipment proper line clear/ work permit in specified format from an authorized person different from maintenance staff is to be obtained. The circuits shall be de-energized, ascertained to be dead by positive test with an approved voltage testing device and. Switches/breaker shall be tagged and the fuse holders withdrawn before starting the work. Adequate precautions shall be taken in two important aspects.

- (i) That there shall be no danger from any adjacent live parts and

(ii) That there shall be no chances of re-energisation of the equipment on which the persons are working.

While working on or near a circuit, whenever possible the use of only one hand shall be practiced even though the circuit is supposed to be dead. The other hand may preferably be kept in pocket.

(a) When it is necessary to touch electrical equipment (for example when checking for overload of motors) back of the hand may be used. Thus, if accidental shock were to cause muscular contractions, one would not “freeze” to the conductor.

(b) Operation of electrical equipment shall be avoided when standing on wet floor or when hands are wet.

(c) Before blown fuses are replaced, the circuit shall be locked out and an investigation shall be made for the cause of the short circuit or overload.

(d) When two persons are working within reach of each other, they shall never work on different phases of the supply.

(e) When structural repairs, modification or painting work are to be undertaken, appropriate measures shall be taken for the protection of persons whose work may bring them into the proximity of live equipment/circuit.

(f) It shall be ensured that the insulation and wire size of extension cords are adequate for the voltage and current to be carried.

(g) While tapping electricity plug top must be used. It shall be ensured that no extension boards are overloaded while tapping. Only standard three pin plugs shall be used for tapping electricity. Broken sockets/plugs shall be replaced immediately with good ones.

(h) Floors shall be kept free from trailing electrical cables to avoid tripping hazard.

(i) Power supply to all the machines and lighting fixture shall be switched off when not in use.

(j) Temporary electrical connections shall be removed as soon as the stipulated work is over.

(k) For welding activities earth return wire shall be extended up to the work spot using insulated cables.

Where distribution boards are located at different places the contractor shall submit schematic drawing indicating all details like size of wires, overhead or cable feeders, earthing etc. The position and location of all equipment and switches shall be given in the drawing.

The power distribution boards (PDB) and extension boards of the Contractor for any connection shall be metallic construction with proper earthing. PDB on outdoors shall have sufficient rain protection measures.

All the Distribution Boards, Switch Fuse units, Bus bar chambers etc. shall be dust and vermin proof. The Distribution Boards, Switches etc. shall be so fixed that they shall be easily accessible. Changes shall be done only after the approval of the Departmental Electrical Engineer.

The Contractor shall provide proper enclosures/covers of approved size and shape for protection of the entire switchboard, equipment etc. against rain. Exposed live parts of all electrical circuits and equipment shall be enclosed permanently. Crane trolley wires and other conductors that cannot be completely insulated should be placed such that they are inaccessible under normal working conditions.

Ironclad industrial type plug outlets are preferred for an additional safety.

Open type metallic Distribution Boards shall be placed only in dry and ventilated rooms; they shall not be placed in the vicinity of storage batteries or otherwise exposed to chemical fumes.

Isolating switches shall be provided close to equipment for easy disconnection of electrical equipment or conductors from the source of supply when repair or maintenance work has to be done on them.

In front of distribution boards a clear space of 90 cm shall be maintained in order to have easy access during an emergency. (Section 51 (c) of I.E. Rules, 1956)

Adequate working space shall be provided around electrical equipment, which requires adjustment or examination during operation.

As far as possible electrical switches shall be excluded from a place where there is danger of explosion. All electrical equipment such as motors, switches and lighting fittings installed in work room where there is possibility of explosion hazard shall be of explosion proof type.

For Service connection (load) an earth leakage circuit breaker (ELCB) shall be installed by the Contractor as a statutory requirement.

The Contractor shall make his own arrangements for main earth electrode and tapings thereof. The existing earth points available at site can be used at the discretion of the Departmental Electrical Engineer with prior permission. Method of earthing, installation and earth testing results shall conform to relevant IS Specifications.

All three-phase equipment shall be provided with double earthing. All light fixtures and portable equipment shall be effectively earthed to main earthing.

Joints in earthing conductors shall be avoided. Loop earthing of equipment shall not be allowed. However, tapings from an earth-bus may be done.

The entire installation shall be subjected to the following tests before energisation of installation including portable equipment.

- (a) Insulation Resistance tests.
- (b) Polarity test of switches.
- (c) Earth Continuity test.
- (d) Earth Electrode resistance.
- (e) Hi – pot test

The test procedures and their results shall conform to relevant I.S. Specifications. The Contractor shall submit a test report for his complete installation every 2 months or after rectifying any faulty section in the specimen test report. One such test report for the complete installation shall be submitted before onset of monsoon.

The Contractor shall not connect any additional load without prior permission of Departmental Electrical Engineer. For obtaining additional power required, prior permission of Departmental Electrical Engineer shall be obtained

Portable electric equipments/tools without earth provisions operating on voltages above 110 volts shall not be permitted. (Machines from some manufacturers come with plastic body having metallic switches etc. without earth provisions). Wherever electrical equipment/power tools come wholly with plastic body, switches etc. earthing provisions can be exempted provided the test certificate on IR value of the machine body and exposed parts are available and the machine bears an I.S.I. mark.

Pedestal fans without earth provisions shall not be permitted in the work areas as well as in offices.

Hand lamps to be used inside confined areas, big pipelines, tanks, vessels and other similar work areas shall strictly be of 24 Volts only.

Wherever portable electric tools or other equipments are used either with an extension board or otherwise, the control switch points should be available within the working area itself – easily approachable for emergency operation. While working on multistoried buildings a sub-distribution board should be available on each elevation/floor.

While shifting portable equipments/power tools from one location to another, such equipments/power tools shall first be unplugged and then lifted without applying tension on the cable.

(a) Portable electrical equipment shall be regularly examined once a month tested and maintained to ensure that the equipment and its leads are in good order. A record of test should be maintained

(b) All portable appliances shall be provided with three-pin plug. The third pin of the plug shall invariably be earthed. It should be ensured that the metal part of the equipment should be effectively earthed.

(c) All connections to portable equipment or machines from the panel/distribution board/extension board shall be taken using three core double insulated PVC flexible copper wire in one length. Minimum no joints shall be allowed in this flexible wire. In case single length of wire is not sufficient for a particular location then the supply can be tapped by providing another extension board comprising of switch and socket.

(d) Those persons using portable electrical equipment shall invariably use chrome leather/canvas hand gloves for protection.

(e) Flexible cables for portable lamps, tools, and apparatus shall be regularly examined, tested and maintained to ensure safety.

Tapping power supply by inserting bare wires (without plug top) is strictly prohibited.

All overhead lines shall be generally avoided unless otherwise permitted by EIC . They shall be preferably buried system. All cables and wires shall be adequately protected mechanically against damages. The cable is required to be adequately protected by covering the same with bricks, plain cement concrete (PCC) tiles or any other approved means.

All armoured cables shall properly be terminated using suitable cable glands. Stranded conductor cables shall be connected using cable lugs/sockets. Cable lugs shall preferably

be crimped. They shall be of proper size and should correspond to the current rating and size of the cable. Twisted connections will not be allowed.

All cable glands, armouring and sheathing of electric cables, metal circuits and their fittings, metallic fittings and other non-current carrying parts of electrical equipment and apparatus shall be effectively grounded.

Grounding conductor of wiring system shall be of copper or other corrosion resistant material. An extra grounding connection shall be made in appliances/equipment where chances of electric shock are high.

Electric fuses/circuit breakers installed in equipment circuits for circuit protection shall be of proper rating. It is also recommended that high rupture capacity (HRC) fuses shall be used in circuits carrying currents more than 15 A and for lower rating circuit MCB shall be provided. Rewire able fuses are not allowed

Wherever cables or wires are laid on poles, a guard wire of adequate size shall be run along the cables/wires and earthed effectively. Metallic poles as a general rule should be avoided and if used shall be earthed individually.

Wires and cables shall be properly supported and an approved method of fixing shall be adopted.

Reinforcement rods or any metallic part of structure shall not be used for supporting wires and cables, fixtures, equipment etc.

All connections to lighting fixtures, starters or other power supplies shall be provided with PVC insulated, PVC sheathed twin core wires to have better mechanical protection for preventing possible damage to equipment or injury to personnel. Taped joints shall not be allowed and the connections may be made in looping system.

All the lighting fixtures and lamp holders shall be of good quality and in good condition. Badly repaired or broken holders, etc. shall not be used.

Only PVC insulated and PVC sheathed wires or armoured PVC insulated and sheathed cables shall be used for external power supply connections of temporary nature. Weatherproof rubber wires shall not be used for any temporary power supply connections. Taped joints in the wires shall be used only with prior permissions of EIC and as per the directions of EIC.

The bulbs/lamps used for illumination and testing purpose shall have cover or guard to protect them from accidental breakage.

After installation of new electric system and or other extensive alternations to existing installations, thorough inspection shall be made by a departmental electrical Engineer before the new system or new extension is put in use.

FORM NO. SGCW - 1

FORM FOR COMPLETION CERTIFICATE

(Prescribed under Cl.1.2 of Annexure)

I/We certify that the installation detailed below has been installed by me/us and tested and that to the best of my/our knowledge and belief, it complies with Indian Electricity Rules, 1956 as well as Is: 732-1963 code of practice for Electrical Wiring Installations.(System voltage not exceeding 650 Volts (Revised).

Work completed at

Voltage and system of supply.....

a)

Particulars of work	Number	Total load	Type of system of wiring
i) Light points			
ii) Fan points			
iii) Plug points (3 pin)			
iv) Motors			

b) If the work involves installation of overhead lines and/or underground cable

c) Earthing:

Description of earthing electrode, size of earth wire and number of electrodes provided:

d) Test results:

- Insulation resistance for the whole installation:
 - Between conductors
 - Between each conductor and earth
- Resistance of earthing electrode or earthing system.
- Maximum earthing resistance of installation

Signature of Supervisor
Name and address of Supervisor.

Signature of Contractor
Name and address of Contractor.

FORM NO. SGCW-2

‘A’ APPLICATION FOR SERVICE CONNECTION BY CONTRACTOR

(Prescribed under Cl.1.3 of Annexure) (to be filled in triplicate)

1. Name & Address of Contractor :
2. Reference to Tender & Work Order :
3. Completion period :
4. Connected load details (pleas attach details in a separate sheet) :
5. Max. demand anticipated :
6. Nature of service connection required (whether single or three phase) :
7. Place where service required :
Works :
Colony :
8. If supply of electricity is free or chargeable (Please enclose extract of conditions from the tender) :
9. Details of meter provided :
 - a. If meter required from the Department, whether SD is paid :
 - b. Details of SD (Security Deposit) :
 - c. Whether meter is tested or not, if tested, attach test report, if not, details of testing fee deposited :
10. Name of Supervisor/Electrician in charge of installation and maintenance :
11. Electrical licence No of person: mentioned against col. 10 :
12. Electrical safety appliances: available for use
13. Fire extinguishers available for use :
14. First Aid facility/box available for use, if any. :

(Signature of the Contractor)

Date:

Name:

'B' CERTIFICATE BY THE CONTRACTOR

Certified that my/our installations have been carried out in accordance with I.E. Rules and that I/We have employed competent persons to handle the installations.

I/we am/are agreeable to the bills, in respect of this service connections being raised on the basis the connected load furnished above, in case the actual consumption falls below the one stipulated by the tender conditions.

**(Signature of the
contractor)**

Name:

Date Address

'C' CERTIFICATE BY THE CONTRACT CONTROL ENGINEER

Verified the particulars and forwarded to the Engineer In charge.

**(Signature of Contract control
Engineer)**

Name:

Section:

'D' CERTIFICATE BY THE ENGINEER IN CHARGE

Certified that the particulars furnished by the Contractor are true to the best of my knowledge and belief and that I have satisfied myself as to the safe conditions of electrical installations for which the service connection is applied for.

Signature:

Name:

Date:

Designation with section:

'E' CERTIFICATE BY THE SAFETY ENGINEER

Certified that I have inspected the electrical installations referred herein and after satisfying myself about the safe conditions of the installation, I hereby recommend that the service connection be given to the Contractor.

**Signature of Safety
Engineer.**

Date

Name

'F' AUTHORISATION BY THE ELECTRICAL ENGINEER

Service connection may be/may not be given for the reasons noted hereunder.

Date:
Engineer. Name:

Signature of Electrical

Designation:

'G' ' REPORT OF COMPLIANCE'
Service connection is given by me on

a. Meter nos. **1.**

2.

3.

b. Initial readings **1.**

2.

3.

c. Locations **1.**

2.

3.

d. Meter sealings

Signature of Electrical Engineer
(Metering and billing)

Name:

Date: Designation:

Note:

Ist copy to Contract Control Engineer
completed

2nd copy to Safety Engineer
and 3rd copy to Electrical Engineer
Engineer

after power supply is given

After all the formalities are

and Report of Compliance (G) are
filled up by the Electrical

Annexure-III B
Suggested structure of Contractor's QA manual
(A) QUALITY POLICY

1.0 INTRODUCTION

- 1.1. General
- 1.2. Application Area
- 1.3. Responsibility
- 1.4. Licenses

2.0 QUALITY ASSURANCE PROGRAM

- 2.1 General
- 2.2 Procedures, Instructions, Drawings
- 2.3 Revision of QA program
- 2.4 Resolution of conflicts
- 2.5 Human Factors

3.0 ORGANISATION

- 3.1 Responsibilities, Authorities & Communications
- 3.2 Organizational interfaces
- 3.3 Selection and Training of personnel

4.0 DOCUMENT CONTROL

- 4.1 Objective
- 4.2 Preparation, Consideration & Approval
- 4.3 Document issue & Distribution control
- 4.4 Document change control

5.0 DESIGN CONTROL – (IF APPLICABLE)

- 5.1 General
- 5.2 Distribution of responsibilities & interfaces
- 5.3 Design process control
- 5.4 Design verification
- 5.5 Design validation
- 5.6 Design change control

6.0 PROCUREMENT CONTROL

- 6.1 General
- 6.2 Suppliers evaluation & selection
- 6.3 Control of procured items

7.0 CONTROL OF ITEMS

- 7.1 Identification & control of materials components & units
- 7.2 Items handling, storage & transportation
- 7.3 Maintenance

8.0 PROCESS CONTROL

- 8.1 Objective
- 7.2 List of processes & special processes subject to control
- 7.3 Responsibility for QA for processes execution

9.0 INSPECTION & TEST PROGRAM

- 9.1 Inspection & Test program
- 9.2 Calibration & control of inspection & test equipment (metrological control)
- 9.3 Status inspection results

10.0 NON CONFORMANCE CONTROL

- 10.1 General
- 9.2 Non-conformance review & disposition

11.0 CORRECTIVE/PREVENTIVE ACTION

12.0 QUALITY RECORDS

- 12.1 QA records system
- 12.2 QA documents acquisition & storage

13.0 AUDITS

- 13.1 General
- 13.2 Audit planning
- 13.3 Internal Audit
- 13.4 External Audit
- 13.5 Audit report
- 13.6 Audit follow up

APPENDICES

1. DEFINITIONS
2. LIST OF CODES, STANDARDS & PRACTICES
3. OVERALL ORGANISATIONAL CHART INDICATING INTERFACES
4. QA GROUP ORGANISATIONAL CHART
5. LIST OF SUB-CONTRACTORS & THEIR INTERFACES

SECTION – III B

QUALITY MANAGEMENT REQUIREMENTS

1 Scope

This chapter specifies requirements to be incorporated in the Contractor's quality assurance programme for construction. The Contractor is responsible for planning and developing a programme that assures that all his management, design and technical responsibilities for quality and safety are incorporated and executed effectively. The programme is aimed primarily at ensuring an efficient quality management in construction and taking corrective actions when necessary for continuous improvement. When formulating quality assurance programme goals, special attention shall be paid to achieve the quality structures and construction which ensure BHAVINI Ltd. safety and reliable operation and that its design construction schedule are met an economic efficiency is achieved.

Planning and detailed written procedures are essential for specifying how such activities as the following, which affect quality, are to be performed and controlled.

- a) Design management whenever applicable
- b) Procurement
- c) Construction
- d) Special processes
- e) Measuring and testing equipment
- f) Inspection and test
- g) Handling, storing, preservation, packaging and shipping
- h) Item identification and traceability
- i) Documentation and quality records
- j) Disposition of non-conformances and corrective/preventive actions.
- k) Audit

Q.A Programme, Facilities and Physical Resources

Prior to the award of this contract and to the performance of the activity, the Engineer-in-charge will evaluate the Contractor's quality assurance programme, manufacturing facilities and resources to determine whether the requirements of this section can be met. If the Contractor is found deficient in meeting any of the requirements, then he shall take appropriate steps in fulfilling these items before award of contract.

BHAVINI Ltd. will be represented by a Quality Surveyor designated by the Engineer-in-charge. The Quality Surveyor and his designated staff will be responsible for checking the quality of work to the extent necessary to assess compliance with the provisions of the specifications. His surveillance shall not be limited only to examination of the end product but he shall have complete access

to the work and the right to intervene where bad practice is detected. He shall also have the right to conduct or require the contractor to perform, any additional inspection or testing he deems necessary. Any unacceptable defects are noted by such tests the contractor shall repair the defects without any charge to the Engineer-in-charge. The Surveillance provided by the Engineer-in-charge or the approval by the Quality Surveyor of finished work shall not relieve the contractor of any of his responsibilities under this specification. The rejection of any work not meeting this specifications is possible at any time.

2 Applicability

The requirements of this chapter apply to the construction activities specified in this contract.

3 Contractor's Responsibilities

- a) To develop and implement the controls and quality assurance procedures specified herein, that will promptly detect and dispose off, or prevent non-conformances.
- b) To comply with the requirements of BHAVINI as specified in the contract.
- c) To prepare a QA manual which shall be submitted for the concurrence of Department Engineer-in-charge (hereinafter called Engineer-in-charge) before the contract is awarded or at the latest One month before the commencement of the work.
- d) To prepare a QA plan which will be submitted to the Engineer-in-charge at least Two weeks before the start of the work.
- e) To review or update and resubmit the QA manual and QA plan to reflect current practices when significant changes occur in the Contractor's programme or organization in order to improve its effectiveness or to prevent recurrence of non-conformances.
- f) To initiate corrective and preventive measures promptly when the quality assurance representative notifies the Contractor of deviations from established requirements.
- g) Any changes to QA manual or QA plan after initial approval shall be re-submitted to Engineer-in-charge of BHAVINI for approval.

4 Quality Assurance Programme

The Contractor shall plan, establish, implement and maintain a quality assurance programme in the form of QA manual that complies with the requirements of this chapter for the work for which they are responsible.

The Contractor shall submit a QA programme addressing the requirements of the following clauses as a minimum.

- 1 Quality policy
- 2 Introduction
- 3 Quality Assurance Programme
- 4 Organisation

- 5 Document Control
- 6 Design Control
- 7 Procurement Control
- 8 Control of Items
- 9 Technological process control
- 10 Inspection and test control
- 11 Non conformance control
- 12 Corrective actions
- 13 Quality Records
- 14 Audits

In case contractor's QA programme is a different format, a matrix showing how the above requirements are met shall be submitted.

Quality plans showing control points shall be submitted for approval by BHAVINI

All personnel carrying out activities affecting quality shall be trained, qualified, certified and authorized for specific activities. Authorization shall be submitted to BHAVINI for verification. Access shall be made available to BHAVINI at all responsible terms to areas where activities are being carried out.

Graded approach shall be adopted based on the importance to nuclear safety in construction/installation/erection activities.

5 Organisation

The Contractor shall:

- a) Clearly define management policies, objectives and responsibilities for quality assurance, including the responsibility of each division within a multi-divisional organisation. The policy statement shall include a commitment that the top priority in construction and installation activity is safety of BHAVINI Ltd.. An organisation chart shall be submitted indicating responsibility and authority of each individual at different levels with respect to performance of work and assurance of quality.
- b) Define the scope of various works, which he intends to subcontract. A separate interface chart of Contractor/his Sub Contractors and BHAVINI Ltd. shall be prepared and submitted for approval of Engineer-in-charge.
- c) Provide for the review by management of the status and adequacy of the adopted quality assurance programme.
- d) The head of the Contractor's quality assurance group shall be at a sufficiently higher level so as to ensure that quality assurance requirements are not subordinated to design, manufacturing, construction or delivery. He shall directly report to the head of the site management.

The organisation chart of quality assurance division shall be submitted which shall clearly indicate specialised subdivisions such as civil laboratories, NDE laboratories/mechanical testing laboratories.

e) The personnel who are responsible for quality control shall have organisational independence to:

- Identify and record quality problems.
- Initiate or recommend or provide solutions through designated channels.
- Verify the implementation of non-conformance dispositions.
- Control further processing, delivery or installation of a non-conforming item or service until the deficiency or unsatisfactory condition has been resolved.
- Stop the activity in cases of non-compliance of QA requirements specified.

The personnel responsible for quality control and audit shall not be directly responsible for performance and progress of the work.

The examinations being a part of the whole inspections are performed and documented by works personnel. However QC Inspectors shall verify the conformance to the specifications and drawings. In cases of problems or difficulties they shall seek clarification from the design or other competent organisations and initiate appropriate measures.

6 Quality Assurance Documents

a) Quality Assurance Manual

(i) The Contractor shall:

- To prepare a QA manual which shall be submitted for the BHAVINI Ltd.'s Engineer-in-charge's (hereinafter called Engineer-in-charge) concurrence before the contract is awarded or at the latest One month before the commencement of the work.
- To review or update and resubmit the QA manual and QA plan to reflect current practices when significant changes occur in the Contractor's programme or organization in order to improve its effectiveness or to prevent recurrence of non-conformances.
- Implement the programme according to the provisions specified in the manual.
- The quality assurance manual shall deal as appropriate with the following:
- Organization: This shall define the organisational set up, authorities and responsibilities of individuals.
- Quality plan: The QA manual shall give detailed QA plan for the work and identify the group responsible for the performance and verification.

- Quality assurance procedures: List of QA procedures shall be included or shall be outlined and cross-referred. These procedures shall be got approved by Engineer-in-charge before start of work.
- The manual shall address about handover and transfer of responsibilities between the Contractor and his Sub Contractor on completion of work along with Construction Completion Certificates (CCC) in the format approved by BHAVINI Ltd.. The Contractor shall consolidate and hand over CCCs to BHAVINI Ltd.
- Audits: Manual shall outline the audits during the performance of the work for verification of compliance and effectiveness of the quality assurance programme. Both internal and external audits shall be carried out. Details such as periodicity of audits, auditing organization, compliance with the recommendations of audit report etc. shall be clearly brought out.
- Manual review: A statement shall be incorporated for review and updating the manual indicating periodicity and other details.

A suggested structure of QA manual to be prepared by the Contractor is given in Annexure-III B-I to this section. If any other structure is used a matrix showing fulfilment of the clauses mention in the suggested structure shall be included in the QA manual

b) QA Plan

i) The Contractor shall:

- Plan the inspection and test activities
- Identify in the quality plan the inspections and tests to be performed for the items listed in the contract, in compliance with contractual and technical requirements.
- Submit the plan for the Engineer-in-charge's approval following the award of contract at least before the work starts. Referenced inspection and specification and/or procedures shall be made available to quality assurance representative during the implementation of the plan.
- Update the plan during the life of the contract to reflect current condition of manufacturing, construction, inspection and testing and resubmit them to the Engineer-in-charge.

ii) The QA plan shall deal with:

- Identification of the characteristics or items to be inspected and tested.
- Identification of required inspection, testing and special process operation and their timing in the construction cycle. Check points shall be clearly indicated. The Contractor may include additional in-process inspection points for his own evaluation of quality. The QA plan shall clearly identify the critical path in the activity, if

- any, the type of check, extent of check, category for the item, type of record, executing agency etc.
 - Reference to inspection, testing and special process procedural standards, acceptance criteria and sampling plan, if any.
 - Indication of control points – Review(WR), Witness(W) and hold(H) points beyond which the activity shall not proceed until the required inspection or tests have shown satisfactory results and have been documented.
 - Provisions for BHAVINI Ltd. to specify control points.
 - Provision for post execution inspection.
- iii) The QA plan for subcontracted items shall be in line with that of the main Contractor. This shall be concurred by the Contractor and submitted for approval of Engineer-in-charge.

c) Quality Assurance Procedures

The Contractor shall prepare procedures for the following:

- Qualification or certification of personnel
- Document control
- Procurement control
- Control of measuring and testing equipments
- Inspection and tests for various stages of work
- Fabrication/installation/assembly
- Work execution procedures for activities of construction work
- Post execution inspection such as post concreting, post installation inspection
- Identification and traceability of items of materials/work
- Control of items
- Preservation, handling and storage of materials, equipment and documents
- Special processes
- Quality records: generation and preservation
- Non-conformance control
- Corrective actions
- Quality audit

Each QA procedure shall define responsibility of individuals, materials, and equipment and documentation system.

The QA procedures shall include necessary formats to be used for the records during execution and inspection.

All the QA procedures shall be submitted to the Engineer-in-charge for his approval at least two weeks before the start of the particular activity.

The approved QA procedures shall clearly indicate the title, document no., revision no., date of issue and distribution list.

QA procedures shall be updated as and when necessary for continuous improvement.

8. Procurement Control

The Contractor shall develop a procurement control procedure and shall ensure that all the materials/equipments used in the construction of BHAVINI Ltd. are tested and qualified. In case of procurement of items/materials the necessary procurement requirements, quality requirement, acceptance requirement and documents to be supplied shall form part of the procurement document. Necessary document control procedure shall be developed for any change in the procurement documents.

9. Document Control

The Contractor shall:

- Establish measures to ensure that all essential documents are reviewed for adequacy and approved for release by those authorised.
- Establish distribution lists for all documents; update and maintain them in the current form to assure that the proper personnel are issued with the right documents necessary to perform the work (controlled and uncontrolled copies).
- Make the necessary documents available at areas where these activities are performed.
- Establish and update the list of applicable documents for construction and distribute them systematically.
- Maintain list of codes, guides, procedures, instructions etc. used for construction activities.
- Ensure that changes to documents receive the authorizations by the same organizations as the initial documents unless other organizations are specially designated. Maintain a record of changes as they are made. Documents shall be revised and re-issued after a number of changes have been issued. Document change control procedure shall be established.
- Obsolete documents shall be retrieved from all the places where it is issued and revised documents shall be issued. Record of all issues and retrievals shall be maintained.

10 Sub Contractor's Works

The Contractor shall define clearly the interfaces (both organisational and technical) between him and his Sub Contractors indicating work boundaries in a graphic form. Following shall be considered.

a) Selection of Sub Contractors

The Contractor shall identify the items to be subcontracted, with the approval of the Engineer-in-charge. He shall undertake the following:

- Determine for these Sub Contractor, the applicable quality management requirements. Classification of these quality

management requirements shall be in such a way that the overall quality is not impaired.

- Evaluate and select Sub Contractors in accordance with the applicable quality management requirements with regard to their ability to execute the work and satisfy quality requirements.

Approval of the Engineer-in-charge is essential for the final selection of sub Contractor.

b) Subcontract Requirements:

The Contractor shall include in subcontracts the following requirements.

- A clear description of the items or services to be procured/executed including technical data and inspection and test requirements, acceptance criteria, technical specifications, drawings, etc.
- A designation of the applicable quality management requirements to be applied to the items/works.
- A designation of the Contractor's QA procedures to be implemented by the Sub Contractor, if applicable.
- Instructions for the submission, retention and disposition of quality records.
- Requirements for packaging and shipping, where applicable.
- A statement related to the right of access to the Sub Contractor's premises and records for audit and/or surveillance by the Contractor and/or the Engineer-in-charge.
- Instructions for notification of control points of QA plan.
- Requirements for the Sub Contractor to report non-conformances.
- The Sub Contractor shall submit his QA programme for the items of work executed by him, which shall be in line with overall QA Programme of the main Contractor. The QA Programme of the Sub Contractor shall be reviewed and approved by the main Contractor and submitted to the Engineer-in-charge for BHAVINI Ltd. approval.

The Contractor shall:

- i) Identify and inspect items/materials on receipt at site to ascertain that they comply with contractual requirements. Inspection shall cover as a minimum verification of deterioration or damage during transport, identification control, and review of requirement/ documentation.
- ii) Initiate corrective action with Sub Contractors when non-conforming items/materials are received.
- iii) Hold incoming items/materials until the required inspection and/or test have been completed or the necessary inspection and/or test reports have been received and verified.

11 Control of Measuring and Testing Equipment

All measuring and testing equipments/devices used to verify characteristics that can affect item quality shall be controlled and maintained. At prescribed intervals, or prior to use, they shall be calibrated and adjusted against certified equipment having a known valid relationship to nationally recognized standards. Where no national standards exist, the basis employed for calibration shall be concurred with the Engineer-in-charge and documented.

The Contractor shall:

- a) Include in the calibration procedures, equipment type, frequency of checks, description of check method, acceptance criteria and action to be taken when results are unsatisfactory. List of all equipments shall be made.
- b) Identify all measuring and testing equipments with a tag, sticker, or other suitable indicator to show the calibration status-date of calibration, date when re-calibration is due.
- c) Maintain calibration records for measuring and testing equipment.
- d) Assess the validity of previous inspection and test results when measuring and testing equipment are found to be out of calibration.

The above mentioned requirements are applicable to all equipment and instruments.

11. Inspection and Test for Various Stages of Work

- a) The Contractor shall provide for the performance of inspections examinations and tests as specified in the QA plan. These inspections examinations and tests shall be carried out in accordance with written procedures that define the method, materials, personnel qualification, instruments or equipment to be used, regulating documents, inspection schedule, inspection result record format, flow chart of inspection activity and acceptance/rejection criteria. The Contractor may amend the selected inspection methods in concurrence with Engineer-in-charge in cases where their unsuitability is demonstrated.
- b) Inspections and tests shall be documented on inspection and test reports that identify as a minimum the item inspected or tested, applicable drawings, specifications or procedures, the date of inspection or test, the inspector, tester or data recorder, the type of observation, the results, the acceptability/or not and the action taken in connection with any deficiencies identified.

12. Inspection During Execution

The Contractor shall:

- a) Ensure that the work is executed as per QA procedure.

- b) Identify, inspect and/or test items as required by the QA plan.
- c) Monitor execution methods, where inspection is not feasible.
- d) Hold items until the required inspections and/or tests have been completed or necessary reports have been received and verified.
- e) Observe all the control points as specified in QA plan.

13. Post Execution Inspection

- a) Contractor shall Identify, inspect and/or test the completed item as required by the quality plan. Suitable formats for the post execution inspection shall be developed for recording the inspection findings.
- b) Contractor shall verify that the item has been inspected at all control points shown in the quality plan and that the records are adequate and complete.

14. Inspection Requirements

The Contractor shall:

- a) Provide means for assuring that required inspections and tests are performed and that the acceptability of items with regard to inspection and tests performed is known throughout manufacturing and construction. He shall provide all the necessary support to the QA personnel of BHAVINI Ltd. to carry out verification/inspection during the work.
- b) Establish and maintain a system for identifying the inspection/acceptance status by means of tags, stamped impressions, or other physical means to be affixed to the item or its container or by means of inspection records.
- c) Identify non-conforming items.

15. Control of Items Identification and Traceability of Items of Material/Work

The Contractor shall develop and implement system to:

- a) Identify all incoming materials with respect to their batch/lot numbers and test certificates, which shall be identifiable throughout the whole construction process.
- b) Identify each item (lot, component or part) to the applicable drawing, specification or other technical document, throughout the whole construction process.
- c) Assign to each item a unique identification/markings.
- d) Record this identification on all process, inspection and test records.
- e) List the items that require traceability.
- f) Segregate conforming/non-conforming items.

16 Preservation, Handling and Storage

The Contractor shall:

- a) Establish, maintain and document a system for the preservation and re-preservation, storage and handling of all items from the time of receipt through the entire construction process and subsequent storage to prevent abuse, misuse, damage, deterioration or loss.
- b) Periodically inspect stored items for conditions and shelf life expiry.
- c) Inspect and test-special handling tools and equipment at specific times to verify that the tools and equipment are adequately maintained
- d) Use specific written procedures for lifting of critical or high value items.
- e) Define conditions of storage (outdoor, indoor, air-conditioned), order of loading/reloading and transportation.
- f) Appoint a qualified, responsible person to manage the above.

17 Construction

- a) The Contractor shall clearly define the responsibilities for the documented procedure of works.

The written procedures shall consist of instructions or work assignments, which shall be established in accordance with the construction schedules, and be available to the works and inspection personnel prior to commencement of work.

This work procedure consist of the following

- a. Work methods
 - b. Sequence of operations:
 - c. Workmanship criteria
 - d. Type of equipment needed
 - e. Special working environment, if any
 - f. Measures for quality assurance/Inspection requirements.
 - g. Documents to be generated before, during and after execution.
- b) The Contractor shall ensure that prior to release for construction all jigs and fixtures, tools templates, and patterns used for verifying quality are controlled The extent and frequency of inspection control of the above shall be defined.

18 Special Processes Execution

The Contractor shall:

- a) Identify all special processes, which require specialised methods of construction. Special processes shall include prestressing, epoxy painting, reinforcement splicing, water proofing, grouting, fire protection, heat and sound insulation, welding and non-destructive examination preservation/re-preservation etc. as applicable.
- b) Establish documented procedures to assure that these processes are accomplished under controlled conditions by qualified personnel using

qualified documented procedures and suitable equipment in accordance with applicable codes, standards, specifications, criteria and contractual requirements.

- c) Maintain documentation for personnel qualification and approval of Engineer-in-charge for the scheme of construction according to the requirement of referenced codes and standards.
- d) Define the necessary qualifications of personnel and procedures for special processes not covered by existing codes or standards.

19 Quality Records

The Contractor shall:

- a) Maintain quality records as evidence that:
 - The QA programme meets the quality management requirements (manual, procedures, and quality plan)
 - The item or services meet contractual or other applicable technical requirements (specifications, drawings, calculations and manufacturing, inspection and test procedures)
 - Procedures for special processes and persons to execute special process are qualified.
 - The personnel are qualified/trained/re-trained.
 - Measuring and testing equipment is calibrated.
 - The procured items meet the requirements.
 - Corrective action is being taken and is effective as required.
 - Audits are performed as required.
- b) Maintain final performance quality records, which include.
 - As built records such as, as-built construction drawings,
 - Material test reports or certificates.
 - Non-destructive examination reports.
 - Inspection and test reports including:
 - 1. Non-conformance reports.
 - 2. Specific records of work execution (such as batching plant records of concrete, prestressing records etc.)
- c) Identify, list, index and preserve quality records for easy retrieval.
- d) Retain quality records for the time specified in the contract.

The documents shall be classified as permanent and temporary. All the quality records shall be listed under appropriate category depending upon their importance to safety. They shall be stored properly depending upon their specified period of storage with identification marks for easy retrievability.

- e) Provide a suitable environment for storing of records to minimize deterioration or damage and to prevent loss.

20 Non-Conformances

The Contractor is responsible for the identification and disposition of all non-conforming items, including those of Sub Contractors. Final acceptance of the Contractor's disposition of those items that violate contractual requirements is the prerogative of the Engineer-in-charge. The Contractor shall:

- a) Establish and maintain measures for controlling non-conforming items as follows:
 - Define the responsibility and authority of those that dispose-off non-conforming items. This shall include provision for a technical review that involves those who are responsible for design, manufacturing, construction and quality functions, if these functions are concerned.
 - Detect and record the non-conformances and promptly bring to the notice of Engineer-in-charge.
 - Identify and hold non-conforming items from being processed further.
 - Develop a non-conformance disposition and corrective /preventive action implementation procedure.
 - Implement accepted dispositions. This shall include requirements for re-inspecting and re testing of repaired and reworked items, with proper documentation.
 - Verify the implementation of accepted disposition.
 - Bring immediately to the notice of the Engineer-in-charge the safety related non-conformances for review by Engineer-in-charge.
- b) Provide holding areas or methods for segregating non-conforming items to prevent unauthorized use, shipment, or mixing with conforming items. However, where physical segregation is not practical or the non-conformance is not clearly visible from storage, marking or other positive means of identification is acceptable.
- c) Maintain records that identify non-conforming items, the nature and extent of non-conformance, its disposition and objective evidence that repaired and reworked items have been re-inspected or re tested as per approved procedure.
- d) Prepare consolidated list of all non-conformances and corrective actions and shall submit the same to BHAVINI Ltd. on a quarterly basis.

21 Corrective Actions

The Contractor shall:

- a) Investigate the causes of significant or recurring non-conformances and take appropriate action to prevent repetition.
- b) Document and have reported to appropriate levels of the Contractor's management causes of significant conditions that adversely affect quality and the corrective action taken.

22. BHAVINI Supplied Items

The BHAVINI Ltd. is responsible for the quality of its materials supplied to the Contractor. However, the Contractor shall:

- a) Examine BHAVINI Ltd. supplied items on receipt for completeness and proper type and to detect transit damage. The materials shall be identified with reference to the test certificates supplied. Examination may be deferred until further processing is scheduled if items are in sealed containers or have specific preservation or packing.
- b) Preserve and store the BHAVINI Ltd. supplied items from receipt onwards according to the requirements of this contract.
- c) Report promptly in writing to the quality assurance representative, if any BHAVINI Ltd. supplied items found damaged, lost, non-conforming or otherwise unsuitable for use either on receipt or while in the Contractor's custody.

23. Audits

The Contractor shall carry out internal audits at regular interval on the works being executed by him and his Sub Contractors as per the approved audit procedure. The audit findings shall be reported to BHAVINI Ltd..

BHAVINI Ltd. or its authorised representative will carry out external audits on the Contractor's and Sub Contractor's work as per the audit schedule.

24. Access

The Contractor shall provide all necessary help to the QA personnel of BHAVINI Ltd./its representatives in carrying out their responsibility. Free access of BHAVINI Ltd. and its representatives to his premises, items, facilities and records for audit and surveillance purpose shall be provided by the Contractor.

SECTION III C

SECURITY GUIDELINES FOR CONTRACTORS

Considering the present security scenario around the world and in India, all the Contractors dealing with BHAVINI is requested to adhere to the following security Guidelines:

- For the initial entry of the contractors' officials / workforce into BHAVINI , a temporary entry permit will be issued for a period of THREE days, on due recommendation of the contractor and approval of Engineer in Charge. The format for application of three day pass is given in annexure I. This three day pass is ONLY for completing the official formalities of appointment at site and attending Safety Induction Training. Before the expiry of the three day pass. Photo pass have to be obtained, since the three day pass is non renewable.
- The photo passes issued will be valid for a period of Three months. The photo passes issued are not TRANSFERABLE. In case the work is extending beyond three months, the contractor shall get the passes renewed at a reasonable time before the period of expiry with the approval of concerned Engineer in- Charge. The format for Three month pass is given in annexure - II.
- For obtaining photo pass with permission for accessing BHAVINI west gate (IGCAR gate) Police Verification Certificate of the individual shall accompany with the Photo pass application form. These passes will be identified with yellow color.
- The three month photo passes issued are biometric cards. The contractor shall ensure that all his workforce are punching during entry and exit from BHAVINI plant site so as to have proper head count of the personnel Inside the plant site.
- Display of identity card is mandatory within BHAVINI site. The contractor is advised to instruct all the personnel working under him to always keep the identity card with him and display the same. It should be ensured that the workforce is not leaving his / her identity card at site rest room / change room.
- The contractor is advised to instruct his work force to restrict their movement within their allotted place of work. It should be ensured at all times that the workforce working under him is not entering other work areas.
- Any loss of the identity card has to be brought to the notice of the HR section through engineer in charge. FIR has to be made for the loss of identity card by the contractor. For any loss of photo passes/card , a penalty of Rs.200/- will be levied and the same will be deducted from the contractor s bill
- Vehicles engaged by Contractors will be allowed inside BHAVINI Plant Site only after obtaining Vehicle pass. The vehicle pass issued have to be pasted on the left side of front windshield of the vehicle. RC book, valid insurance certificate and valid driving license of the driver should accompany with the vehicle pass application form. The format for vehicle pass is given in annexure - III.

- Mobile phones are prohibited inside BHAVINI Plant site. However top officials of contractors may be permitted after obtaining written approval from the Competent Authority. In any case, mobile phones with CAMF.RA will not be allowed.
- The Contract personnel should not bring any electronic item or other equipments unless otherwise specific authorization for the same is given by the engineer in charge, in view of work exigencies.
- The drawings issued to the contractor (if any) shall never be taken out of the plant site. The contractor is advised to keep an inward / outward register for the drawings received from BHAVINI. Immediately after the completion of the work, the drawings related to the finished work shall be returned to the engineer in charge without fail.
- The Contractor is not allowed to take any material outside the plant site. If in case any material has to be taken out (for testing etc), it can be done with a valid pass indicating the name of the person carrying the material, purpose of movement etc with due authorization of the engineer in charge.
- For the movement of electronic items, specific mention should be made in the gate pass that they do not contain any classified documents and this has to be verified by engineer in charge.
- All contractors shall adhere to the Information Security Policy of BHAVINI, should ensure integrity and confidentiality of BHAVINI's intellectual information and should not indulge in violation of intellectual property rights.
- The contractor is advised to give prior intimation to the security office (or loading of materials at plant site so that security person will be witnessing the loading before the materials are taken out with due authorization.
- One month before the completion of the contract, the contractor is advised to take necessary action for disposing his pass and passes of his casual laborers to the security officer immediately after the contract period. The contractors have to get No Objection Certificate from HR for fulfilling the security instructions. Then only work completion certificate will be issued by the engineer in charge.
- The Contractor is advised to instruct his workforce to follow all the safety and security rules of the plant site.

In addition to the above, the contractor is advised to strictly follow the instructions issued to them (through circulars) on security related issues time to time.

ANNEXURE I



BHARATIYA NABHIKIYA VIDYUT NIGAM LIMITED
(A Government of India Enterprise)
Kalpakkam, Kancheepuram District, Tamil Nadu, PIN - 603 102

From Date

To

The Engineer In charge,
BHAVINI, KALPAKKAM - 603 102.

Sub: Requesting for Temporary Gate Passes

Dear Sir,

Kindly issue the Temporary gate passes of the following persons for period of 3 Days W.E.F

Sl. No.	Name	Father Name	Designation	Age	Identification Mark
1.					
2.					
3.					
4.					
5.					
6.					
7.					
8.					
9.					
10.					

Thanking you,

Yours
faithfully,

Note: Not more than 10 Names in single application.

Signature and Seal of Contractor	Signature and Seal of Engineer in Charge	Signature and Seal (HR) BHAVINI

ANNEXURE -II



BHARATIYA NABHIKIYA VIDYUT NIGAM LIMITED
(A Government of India Enterprise)
Kalpakkam, Kancheepuram District, Tamil Nadu, PIN 603102

PHOTO

PHOTO PASS TO ENTER BHAVINI (FOR CONTRACTOR/LABOURS/FTA)

PASS NO:	FOR OFFICE USE	
NAME		
S/O, D/O, W/O		
DATE OF BIRTH		
DESIGNATION		
PLACE OF WORK		
IDENTIFICATION MARKS	I.	
	2.	
PRESENT ADDRESS		Signature of Pass Holder
Signature and Seal of Safety Section (Bhavini)	Training Attended Date:	
Signature and Seal of Contractor	Signature and Seal of Bhavini Official	Signature and Seal of HR
FOR SECURITY SECTION USE:		
Valid From:	To	Signature of A.S.O.
		TEXCO

ANNEXURE -III



BHARATIYA NABHIKIYA VIDYUT NIGAM LIMITED
(A Government of India Enterprise)
Kalpakkam, Kancheepuram District, Tamil Nadu, PIN 603102

APPLICATION FOR VEHICLE ENTRY PERMIT

DEPARTMENT AND NON DEPARTMENTAL

1.	Name (In Block Letters)		
2.	Father's Name		
3.	ID card number		
4.	Designation		
5.	Age and Sex		
6.	Residential Address		
7.	Unit and & sec in which working		
8.	Identification Marks	1. A.	
9.	Vehicle Registration Number		
10.	Name and Make of the vehicle		
11.	Driving LIC no. & Valid Up to		
12.	RC book no		
13.	Previous vehicle Permit no		
14.	Vehicle Insurance Number paid up to		
15.	Road tax paid Up to		
16. Particulars of additional members traveling with the vehicle permit holder (for Departmental applicants only) for the purpose of pass through Main Gate) - BHAVINI			
Sl.No.	Name	Age	Relationship
1.			
2.			
3.			

Signature of the Applicant Signature of the Applicant
(Department)(Non-Department)
Recommended and forwarded to issues security vehicle permit:

Signature & Seal of Engineer In Charge

FOR SECURITY SECTION USE:
Vehicle Permit No: Date:
Valid Up to:
A.S.O (TEXCO Control Room)

Note: Driving License & RC book may be submitted to the TEXCO Control room.

SECTION IV

GENERAL CONDITIONS OF CONTRACT

**BHARATIYA NABHIKIYA VIDYUT NIGAM LIMITED
(BHAVINI LTD.)**

GENERAL CONDITIONS OF CONTRACT FOR WORKS

Registered Office:

Bharatiya Nabhikiya Vidyut Nigam Limited,
51, Ist Floor,
Montieth Road,
Egmore,
CHENNAI – 600008.

GENERAL CONDITIONS OF CONTRACT FOR WORKS

I N D E X

SL.NO.	CLAUSE	DESCRIPTION
I.		NOTICE INVITING TENDER
II.		INTERPRETATION AND DEFINITIONS
	1.	Singular and Plural
	2.	Headings & Marginal Notes
	3.	Definitions
III.		SCOPE & PERFORMANCE
	4.	Contract Documents
	5.	Works to be carried out
	6.	Inspection of Site
	7.	Sufficiency of Tender
	8.	Discrepancies and Adjustment of errors
	9.	Security Deposit
	10.	Deviations/Variations Extent & Pricing
	11.	Determination of rates
	12.	Suspension of works
	13.	Time & Extension for Delay
	14.	Tools, Plant & Equipment
	15.	Materials
	16.	Labour
	17.	Possession of Site
	18.	Setting out the works
	19.	Site Drainage
	20.	Nuisance
	21.	Materials obtained from Excavation
	22.	Treasure, Trove, Fossils etc.
	23.	Protection of Trees
	24.	Watch & Ward and Lighting
	25.	Contractor's Supervision
	26.	Inspection and Approval
	27.	Duties and Powers of Engineer-in-charge's Representative
	28.	Removal of Workmen
	29.	Uncovering and making good
	30.	Work during Night or on Sundays and Holidays
	31.	Quality Assurance
	32.	Construction Co-ordination
	33.	Field Office Records
	34.	Completion Certificate
	35.	Compensation for Delay
	36.	Defects Liability Period
	37.	Contractor's Liability and Insurance
	38.	Facilities to other Contractors
	39.	Notice to Local Bodies
	40.	Sub-Contracts
	41.	Instructions and Notices
	42.	Foreclosure of Contract
	43.	Termination of Contract on Death
	44.	Determination/Cancellation of Contract
	45.	Liability for Damage, Defects or Imperfections and Rectifications thereof

SL.NO.	CLAUSE	DESCRIPTION
	46.	Urgent Works
	47.	Changes in Constitution
	48.	Training of Apprentices
	49.	Water Supply
	50.	Power Supply
	51.	Land
IV.		VALUATION AND PAYMENT
	52.	Records and Measurement
	53.	Method of Measurement
	54.	Payment on Account
	55.	Time Limit for Payment of final bill
	56.	Contract Price Adjustment
	57.	Advances
	58.	Over payments & Under payments
V.		ARBITRATION LAW, ETC.
	59.	Arbitration
	60.	Laws governing the Contract
	61.	Relations working in BHAVINI
VI.		CONTRACTOR'S LABOUR REGULATIONS AND FORMS
		Forms
	(1)	Register of Workmen (Appendix I)
	(2)	Employment Card (Appendix II)
	(3)	Register of Wages-cum-Muster Roll (Appendix III)
	(4)	Register of Fines (Appendix IV)
	(5)	Register of Deductions for Damages or Loss to the Corporation by the neglect or default of Employed persons. (Appendix V)
	(6)	Wage slip (Appendix VI)
	(7)	List of Acts and Omissions for which fine can be imposed (Appendix VII)
VII		MODEL RULES FOR LABOUR WELFARE
VIII		SAFETY CODE
IX		TENDER FORMS
		Tender
		Schedule 'A'
		Schedule 'B'
		Schedule 'C'
X.		FORMS OF DIFFERENT DEEDS
	(1)	Proforma Bank Guarantee in lieu of Earnest Money
	(2)	Proforma of Bank Guarantee in lieu of Security Deposit in Individual Contract.
	(3)	Proforma of Bank Guarantee to Secure a Lumpsum Advance
	(4)	Form of Bank Guarantee for removal of plant and equipment from the site.
	(5)	Form of Hypothecation Deed

BHARATIYA NABHIKIYA VIDYUT NIGAM LIMITED

(A Govt. of India Enterprise)

FAST BREEDER REACTOR PROJECT

TENDER NO.....

ITEM RATE/LUMPSUM TENDER

FOR

(HERE INSERT THE NAME OF WORK)

To be submitted by hours on

Tenders shall be opened in the presence of tenderers who may be present at
hours On(date) in the office of :

- Issued to M/s
.....

Signature of Officer issuing the documents

Name & Designation

Date

* Fill the name of the Contractor.

I. NOTICE INVITING TENDER

BHARATIYA NABHIKIYA VIDYUT NIGAM LIMITED

(A Govt. of India Enterprise)

PROTOTYPE FAST BREEDER REACTOR

NOTICE INVITING TENDER

TENDER NO.

1. Sealed Tenders are invited on behalf of the Bharatiya Nabhikiya Vidyut Nigam Limited, (BHAVINI LTD.,) (PROTOTYPE FAST BREEDER REACTOR) by

.....
from Contractors who have executed similar works costing Rs..
. . . . lakhs during last five years (Indicate average annual turnover expected) and who are on approved list of the appropriate class of CPWD, State PWDs, MES, Railways, PSUs etc. for
.....
.....
..... (Name of work).

The work is estimated to cost Rs.. This estimate however, is given merely as a rough guide.

2. Completion time (in months)
(including monsoon period).

3.
.....
..... of the BHAVINI LTD., shall be the “ Accepting Authority “ hereinafter referred to as such for the purpose of this Contract.

4. The tender shall be submitted in the original tender document superscribed the name of work.

In the case of two parts tender, separate sealed covers superscribed as Part I and Part II shall be submitted.

5. Application for issue of tender documents shall be submitted to
.....
..... along with Income Tax clearance certificate and tender document shall be issued after approval of the competent authority.

6. Tender document will be issued on payment of Rs.. The tender document will be sold during the period from to

7. Copies of other documents and drawings pertaining to the work will be open for inspection by tenderers at the following office(s) during working hours between the dates mentioned in clause 6 above.

(a) b)
.....

8. The tenderers are advised to inspect and survey the Site and its surroundings and satisfy themselves before submitting their tenders as to the form and nature of the Site, the means of access to the Site, the accommodation they may require, etc. In general, tenderers shall themselves obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect their tender. A tenderer shall be deemed to have full knowledge of the Site, whether he inspects it or not and no extra claims due to any misunderstanding or otherwise shall be allowed.
9. Submission of a tender by a tenderer implies that he has read this notice and all other contract documents and has made himself aware of the scope and specifications of the work to be done and of conditions and rates at which stores, tools and plant, etc., will be issued to him by the BHAVINI LTD., and local conditions and other factors bearing on the execution of the works.
10. The tenderer should quote his rates in figures as well as in words. The amount for each item should be worked out and the requisite totals given. The total amount shall be written both in figures and in words.
11. In the case of item rate tenders, only rates quoted shall be considered. In case of lumpsum tender, only quoted amount shall be considered.
1. Tenders shall be received by upto 1400 hours on (date) and shall be opened at 1500 hours on the same day in the presence of those tenderers who may be present (in case that day becomes a non-working day tenders shall be opened on next working day).
13. The tender shall be accompanied by earnest money of Rs. The earnest money may be paid in any one of the following forms:-
 - (a) Deposit at call receipt of a Scheduled Bank duly pledged in favour of the Bharatiya Nabhikiya Vidyut Nigam Limited.
 - (b) Demand Draft of any Scheduled Bank drawn in favour of the Bharatiya Nabhikiya Vidyut Nigam Limited payable at Bank at (Place).
 - (c) Bank Guarantee from a Scheduled Bank, irrevocable and operative 30 days after the validity of the offer (as per standard proforma attached).

(a) Fixed Deposit Receipt issued by Scheduled Banks endorsed in favour of the Bharatiya Nabhikiya Vidyut Nigam Limited.

14. On acceptance of tender, earnest money will be treated as part of Security deposit.
15. The tenderer shall submit the tender which satisfies each and every condition laid down in the tender documents, failing which, the tender is liable to be rejected.
16. The BHAVINI LTD., do not bind themselves to accept the lowest or any tender or to give any reasons for their decision.
17. The BHAVINI LTD., reserve to themselves right of accepting the whole or any part of the tender and the tenderer shall be bound to perform the same at his quoted rates.
18. This Notice Inviting Tender shall form part of the Contract document.
19. Sales Tax or any other tax on materials in respect of this Contract shall be payable by the Contractor and the BHAVINI LTD., will not entertain any claim whatsoever in this respect.
20. The tenders submitted shall remain valid for acceptance for a period of days from the date set for opening of the tender. The tenderer shall not be entitled during the said period of validity, to revoke or cancel his tender or vary the tender given or any item thereof. In case of tenderer revoking or canceling his tender, varying any terms in regard thereof, the earnest money paid by the tenderer along with the tender shall be forfeited by BHAVINI LTD.,

For and on behalf of The Bharatiya Nabhikiya Vidyut
Nigam Limited.

Designation
Date

II. INTERPRETATION AND DEFINITIONS

CLAUSE 1:

1.Singular and Plural

Where the context so requires, words imparting the singular only also include the plural and vice versa.

CLAUSE 2:

2. Headings and Marginal Notes to Clauses:

Headings and marginal notes to these General Conditions shall not be deemed to form part thereof or be taken into consideration in the interpretation or construction thereof or of the contract.

CLAUSE 3:

3. Definitions:

- (a) The Owner/BHAVINI LTD., shall mean the Bharatiya Nabhikiya Vidyut Nigam Limited having its Registered Office at 51, IInd Floor, Montieth Road, Egmore, Chennai- and include their legal representatives, successors and permitted assigns.
- (b) The “Accepting Authority” shall mean the authority mentioned in Schedule “A”
- (c) The “Contract” shall mean an agreement where a proposal has been accepted and shall include the notice inviting the tender, the tender and acceptance thereof and the formal agreement, if any, executed between the Bharatiya Nabhikiya Vidyut Nigam Limited and the Contractor together with the documents referred to therein including these conditions with appendices and any special conditions; the specifications, designs, drawings, schedule of quantities with rates and amounts. All these documents taken together shall be deemed to form one contract and shall be complementary to one another.
- (b) The “Contractor” shall mean the individual or registered firm or incorporated company undertaking the works and shall include legal heir of such individual or persons composing such firm or company or successors of such firm or company as the case may be and permitted assigns of such individual or firm or company.
- (e) The “Contract Sum” shall mean:-
 - (i) in the case of “Lumpsum Contracts” the sum for which the tender is accepted.
 - (ii) In the case of “Item Rate Contracts” the cost of the works arrived at after extension of the quantities shown in Schedule of Quantities by the item rates quoted by the tenderer for the various items.
- (f) A “Day” shall mean a day of 24 hours from mid-night to mid-night irrespective of the number of hours worked in that day.
- (g) “Engineer-in-Charge” shall mean the Engineering Officer appointed by the BHAVINI LTD., or his duly authorized representative who shall direct, supervise and be in-charge of the works for purposes of this Contract.
- (h) “Excepted Risks”, are risks due to riots (other than that among Contractor’s employees) and civil commotion (in so far as both these are uninsurable), war (whether declared or not), invasion, act of foreign enemies, hostilities, civil war, rebellion, revolution, insurrection, military or usurped power, any acts of Government, damage from aircrafts, acts of God such as earthquake, lightning and unprecedented floods and other causes over

which the Contractor has no control and accepted as such by the Accepting Authority or causes solely due to use or occupation by the "BHAVINI LTD.," of the part of Works in respect of which a certificate of completion has been issued.

- (i) "Market Rate" shall be the rate as decided by the Engineer-In-Charge on the basis of the cost of materials and labour at the Site where the work is to be executed, plus the percentage mentioned in Schedule A to cover all overheads and profit. For material issued by the BHAVINI LTD., the overheads and profit percentage shall be allowed @ 2.5%.
- (j) Schedule(s) referred to in these conditions shall mean the relevant schedule(s) annexed to the tender papers issued by the BHAVINI LTD., or the Standard Schedule of Rates prescribed by the BHAVINI LTD., and the amendments thereto issued from time to time.
- (k) The "Site" shall mean the lands and/or other places on, under, in or through which the work is to be executed under the Contract including any other lands or places which may be allotted by the BHAVINI LTD., or used for the purposes of the Contract.
- (l) "Temporary Works" shall mean all temporary works of every kind required in or about the execution, completion or maintenance of the works.
- (m) "Urgent Works" shall mean any urgent measures which, in the opinion of the Engineer-in-Charge, become necessary during the process of the work to obviate any risk of accident or failure or which become necessary for security.
- (n) A "Week" shall mean seven days without regard to the number of hours worked in any day in that week.
- (o) The "Works" shall mean the works to be executed in accordance with the Contract or part(s) thereof as the case may be and shall include all extra or additional, altered or substituted works as required for performance of the Contract.

III. SCOPE AND PERFORMANCE

CLAUSE 4:

4. Contract Documents:

- 4.1 The Contractor shall be furnished, free of charge, two certified true copies of the Contract Documents and the schedule of quantities and rates and of all further drawings which may be issued during the progress of the works. He shall keep one copy of these Documents on the Site in good order, and the same shall at all reasonable times be available for inspection and use by the Engineer-in-Charge, his representative or by other Inspecting Officers.
- 4.2 None of these Documents shall be used by the Contractor for any purpose other than that of this Contract.
- 4.3 The Contractor shall take necessary steps to ensure that all persons employed on any work in connection with this Contract have noticed that the Indian Official Secrets Act 1923. (XIX of 1923) applies to them and shall continue to apply even after the execution of such works under the Contract.

CLAUSE 5:

5.Works to be carried out:

5.1 General:

(a)The Contractor shall execute the whole and every part of the work in the most substantial and workman like manner both as regards materials and otherwise in every respect in strict accordance with the specifications. The Contractor shall also conform exactly, fully and faithfully to the design, drawings and instructions in writing in respect of the work signed by the Engineer-in-Charge.

The works to be carried out under the Contract shall, except as otherwise provided in these conditions, include all labour, materials, tools, plant and equipment, and transport which may be required in preparation of and for and in the full and entire execution and completion of the works. The descriptions given in the Schedule of Quantities shall, under otherwise stated, be held to include waste on materials, carriage and cartage, carrying in return of empties, hoisting, setting, fitting and fixing in position and all other labour necessary in and for the full and entire execution and completion as aforesaid in accordance with good engineering practice and recognized principles.

In the case of any class of work for which there is no such specifications as referred to above, such work shall be carried out in accordance with Bureau of Indian Standards Specifications. In case there is no such specifications in Bureau of Indian Standards, the work shall be carried out as per manufacturers' specifications. In case there are no such specifications as referred to the above the work shall be carried out in all respects in accordance with the instructions and requirements of the Engineer-in-Charge.

5.2Engineering Data:

The furnishing of engineering data by the Contractor shall be in accordance with the Schedule as specified in the technical specifications. The review of these data by the Engineer will cover only general conformance of the data to the specifications and documents. This review and/or approval by the Engineer shall not be construed by the Contractor, as limiting any of his responsibilities and liabilities for mistakes and deviations from the requirements specified under these specifications and documents.

CLAUSE 6:

6. Inspection of Site

The Contractor shall inspect and survey the Site and its surrounding and shall satisfy himself before submitting his tender as to the form and nature of the Site, the quantities and nature of work and material necessary for the completion of the works and the means of access to the Site, the accommodation he may require and in general shall himself obtain all necessary information as to risks, contingencies and other circumstances which may influence or affect his tender. No extra charges consequent on any misunderstanding or otherwise shall be allowed.

CLAUSE 7:

7. Sufficiency of Tender

The Contractor shall be deemed to have satisfied himself before tendering as to the correctness and sufficiency of his tender for the works and of the rates and prices quoted in the Schedule of Quantities, which rates and prices shall, except as otherwise provided, cover all his obligations under the Contract and all matters and things necessary for the proper completion and maintenance (upto defect liability period) of the works.

CLAUSE 8:

8. Discrepancies and Adjustment of Errors

The several documents forming the Contract are to be taken as mutually explanatory of one another, detailed drawing being followed in preference to small scale drawing and figured dimensions in preference to scale and Special Conditions in preference to General Conditions.

In the case of discrepancy between Schedule of Quantities, the Specifications and/or the Drawings, the following order of preference shall be observed:

- (a) Description in Schedule of Quantities
- (b) Particular Specification and Special Conditions, if any.
- (c) Drawings
- (d) General Specifications.

If there are varying or conflicting provisions made in any one document forming part of the Contract, the Accepting Authority shall be the deciding authority with regard to the intention of the document.

Any error in description, quantity or rate in Schedule of Quantities or any omission therefrom shall not vitiate the Contract or release the Contractor from the execution of the whole or any part of the works comprised therein according to drawings and specifications or from any of his obligations under the Contract.

If on check there are found to be differences between the rates given by the Contractor in words and figures or in the amount worked out by him in the Schedule of Quantities and general summary, the same shall be adjusted in accordance with the following:-

- (a) In the event of a discrepancy between description in words and figures quoted by a tenderer, the description in words shall prevail.
- (b) In the event of an error occurring in the amount column of Schedule of Quantities as a result of wrong extension of the unit rate and quantity, the unit rate shall be regarded as firm and extension shall be amended on the basis of the rate.
- (c) All errors in totaling in the amount column and in carrying forward totals shall be corrected.

- (d) The totals of various sections of Schedule of Quantities amended shall be carried over to the General Summary and the tendered sum amended accordingly. The tendered sum so altered shall, for the purpose of tender, be substituted for the sum originally tendered and considered for acceptance instead of the original sum quoted by the tenderer. Any rounding off of the Quantities or in sections of Schedule of Quantities or in General Summary by the tenderer, shall be ignored.

CLAUSE 9:

9. Security Deposit

The Person/Persons whose tender(s) may be accepted (hereinafter called the Contractor) shall permit the BHAVINI LTD., at the time of making any payment to him for work done under the Contract, to deduct towards the security deposit at the rate of 10 percent of gross amount of each on account payment for contracts of value upto Rs.80 lakhs and at the rate of 5 percent for contracts of value greater than Rs.80 lakhs until the security deposit so deducted reaches the values mentioned in 9.1 (c) of Schedule A in cash or in the form of Government Securities or Fixed Deposit Receipts or Bank Guarantees furnished by any of the Scheduled Bank.

When the Security deposit reaches a limit of Rs.1 lakh, the Contractor, if he so desires, may convert the amount into one of the Government securities or Bank Guarantees as aforesaid.

The Contract value for purpose of this clause shall be taken as the value of Contract awarded.

- 9.4 In case a Fixed Deposit Receipt of any bank is furnished by the Contractor to the BHAVINI LTD., as part of the Security Deposit and the bank goes into liquidation or for any other reasons is unable to make payment against the said Fixed Deposit Receipt, the loss caused thereby shall be borne by the Contractor and the Contractor shall forthwith or on demand furnish additional security to the BHAVINI LTD., to make good the deficit.

- 9.5 All compensation or other sums of money payable by the Contractor under the terms of this Contract or any other Contract or any other account whatsoever may be deducted from or paid by the sale of a sufficient part of his security deposit or from the interest arising therefrom or from any sums which may be due or may become due to the Contractor by the BHAVINI LTD., on any account whatsoever and in the event of his security deposit being reduced by reasons of such deduction or sale as aforesaid, the Contractor shall within fourteen days of receipt of notice of demand from the Engineer-in-Charge make good the deficit.

- 9.6 Government papers tendered as security shall be taken at 5% (five percent) below the market price or at their face value, whichever is less.

- 9.7 Refund of Security Deposit:

One half of the security deposit refundable to the Contractor worked out on the basis of the value of work completed shall be refunded to the Contractor on the Engineer-in-Charge certifying in writing that the work has been completed as per Clause 34 hereof etc. and the remaining amount of Security Deposit will be sufficient to adjust the outstanding demand.

- 9.8 On expiry of the Defects Liability Period (referred to in Clause 36 hereof) or on payment of the amount of the Final Bill payable in accordance with Clause 55, whichever is later, the Engineer-in-Charge shall initiate action to refund to the Contractor the remaining portion of the security deposit provided the Engineer-in-Charge is satisfied that there is no demand outstanding against the Contractor.
- 9.9 No interest shall be payable to the Contractor on the Security Deposit furnished/recovered from the Contractor by the BHAVINI LTD.,.

CLAUSE 10:

10. Deviations/Variations Extent & Pricing

10.1. The Engineer-in-Charge shall have power

- (i) to make alteration in, omission from, additions to, or substitutions for the original specifications, drawings, designs and instructions that may appear to him to be necessary or advisable during the progress of the work, and
- (ii) to omit a part of the Works in case of non-availability of a portion of the Site or for any other reasons, and

the Contractor shall be bound to carry out the Works in accordance with any instructions given to him in writing signed by the Engineer-in-Charge and such alterations, omissions, additions or substitutions, shall form part of the Contract as if originally provided therein and any altered, additional or substituted work which the Contractor may be directed to do in the manner above specified as part of the works, shall be carried out by the Contractor on the same conditions in all respects including price on which he agreed to do the main work.

Any alterations, omissions, additions or substitutions which radically change the original nature of the Contract shall be ordered by the Engineer-in-Charge as a deviation and in the event of any deviation being ordered, which in the opinion of the Contractor changes the original nature of the Contract, he shall nevertheless carry it out and the disagreement, if any, as to the nature of work and the rate to be paid therefore shall be resolved in accordance with Clause-59.

10.2 The time for completion of the works shall, in the event of any deviations resulting in additional cost over the Contract Sum being ordered, be extended as follows, if requested by the Contractor.

- (a) in the proportion which the additional cost of the altered, additional or substituted work, bears to the original Contract Sum; plus
- (b) 25% of the time calculated in (a) above or such further additional time as may be considered reasonable by the Engineer-in-Charge.

10.3 Rates for such altered, additional or substituted work shall be determined by the Engineer-in-Charge as follows:-

- 10.3.1. If the rate for altered, additional or substituted item of work is specified in the Schedule of Quantities, the Contractor shall carry out the altered, additional or substituted item at the same rate. In the case of composite tenders, where two or

more Schedule of Quantities may form part of the Contract, the applicable rate shall be taken from the Schedule of Quantities of that particular part in which the deviation is involved; failing that at the lowest applicable rate for same item of work in the other Schedule of Quantities.

10.3.2. If the rate for any altered, additional or substituted item or work is not specified in the Schedule of Quantities, the rate for that item shall be derived from the rate for the nearest similar item specified therein. In case of composite tenders where two or more Schedule of Quantities form part of the Contract, the rate shall be derived from the nearest similar item in the Schedules of Quantities of the particular part of works in which the deviation is involved; failing that from the lowest of the nearest similar items in other Schedule of Quantities.

10.3.3. If the rate for any altered, additional or substituted item of work cannot be determined in the manner specified in sub-paras 10.3.1 and 10.3.2 above, then such item of work shall be carried out at the rate entered in the Schedule of Rates available with Engineer-in-Charge, plus/minus the percentage by which the tendered amount of the works actually awarded is higher or lower than the estimated amount of the works actually awarded.

10.3.4. If the rate for any altered, additional or substituted item of work cannot be determined in the manner specified in sub paras 10.3.1 to 10.3.3 above, then the rate for such item of work shall be derived from the Schedule of Rates specified in sub-para 10.3.3 above plus/minus the percentage mentioned in that sub-para. In the case of materials issued by the BHAVINI LTD., issue rates of materials, with storage charges recovered, enhanced by 2.5% for profits and overheads shall be adopted in place of schedule rate plus percentage specified in sub para 10.3.3. Provided always that if rate(s) for part(s) of the item(s) is/are not available in the Schedule of Rates specified above, the rate(s) for parts of such items shall be determined on the basis of market rate(s) prevailing during the fortnight following the date of the order plus 10% for profit and overheads.

10.3.5. If the rate for any altered, additional or substituted item of work cannot be determined in the manner specified in sub-paras 10.3.1 to 10.3.4 above, the Contractor shall within 14 days, of the date of receipt of the order to carry out the said work, inform the Engineer-in-Charge the rate which he proposes to claim for such item of work, supported by analysis of the rate claimed, and the Engineer-in-Charge shall, within 90 days thereafter, after giving due consideration to the rate claimed by the Contractor, determine the rate on the basis of market rate(s). In the event of the Contractor failing to inform the Engineer-in-Charge within the stipulated period of time, the rate which he proposes to claim, the rate for such item shall be determined by the Engineer-in-Charge on the basis of market rate(s).

10.3.6.(a) Except in case of items of work below ground surface, as it exists at the time of commencement of work (See 10.3.6 (b) below), provisions contained in sub-clause 10.3.1 to 10.3.5 above shall not apply to contract, altered or substituted items as individually exceed the deviation limit specified in Schedule 'A' subject to the following:

(i) Deviation limit shall apply to individual items.

- (ii) The value of additions of items, of any individual trade not already included in the Contract, shall not exceed 10% of the tendered value of work, subject to overall deviation limit as provided in 10.3.6 (a) above.

Provided further that in case where the original item is substituted, the Substituted Item shall be deemed to have replaced the original item in the contract itself to that extent and above provisions pertaining to the deviation shall apply with respect to such Substituted Item and not the original item.

- (b) In case of items of work below ground surface as it exists at the time of commencement of work, quantities of which may change due to site conditions, provisions contained in sub-clause 10.3.1 to 10.3.5 above shall not apply to;
 - (i) the value of any item of any individual trade which exceed by more than the percentage mentioned in Schedule 'A' of the value of that trade, included in the Contract, as a whole, unless the Contractor and the Engineer-in-Charge agree to a higher percentage for any particular item.
 - (ii) The value of item not included in the Contract in excess of 10% of the tendered value.

Note:- Individual trade means sub-heads into which the Schedule of Quantities as provided in the Contract has been divided and in the absence of any such provision in the Contract, the Sub-heads as given in the Schedule of Rates.

CLAUSE 11:

11. Determination of Rates:

- 11.1. In the case of contract items, substituted items, contract-cum-substituted items, or additional items which exceed the limits laid down in sub-para 10.3.6 above, the Contractor may, within fourteen days of receipt of order or occurrence of the excess, claim revision of the rates, supported by proper analysis, for the work in excess of the above mentioned limits, provided that if the rates so claimed are in excess of the rates specified in the Schedule of Quantities or of those derived in accordance with the provisions of sub-para 10.3.1 to 10.3.4 by more than five percent, inform the Engineer-in-Charge and the Engineer-in-Charge shall within ninety days of receipt of claim supported by analysis, after giving consideration to the analysis of the rates submitted by the Contractor, determine the rates on the basis of market rates and if the rates so determined exceed the rates specified in the Schedule of Quantities or those derived in accordance with the provisions of sub-paras 10.3.1 to 10.3.4 by more than five percent, the Contractor shall be paid in accordance with the rates so determined. In the event of the Contractor failing to claim revision of rates within the stipulated period, or if the rates determined by the Engineer-in-Charge within a period of ninety days of receipt of the claim supported by analysis are within five percent of the rates specified in the Schedule of Quantities or of those determined in accordance with the provisions of sub-paras 10.3.1 to 10.3.4., the Engineer-in-Charge shall make payment at the rates as specified in the Schedule of Quantities or those already determined under sub-paras 10.3.1 to 10.3.4 for the quantities in excess of the limits laid down in sub-para 10.3.6.

- 11.2. The provisions of the preceding paragraph shall also apply to the decrease in the rates of item for quantities in excess of the limits laid down in sub-para 10.3.6 provided that such decrease is more than five percent of rates specified in the Schedule of Quantities or of those derived in accordance with the provisions of sub-para 10.3.1 to 10.3.4 and the Engineer-in-Charge may after giving notice to the Contractor within 60 days of receipt of order by the Contractor or occurrence of the excess and after taking into consideration any reply received from him within fourteen days of receipt of the notice, revise the rates for the work in question within 60 days of expiry of the said period of 14 days having regard to the market rates.

CLAUSE 12:

12. Suspension of Works:

- (a) The Contractor shall, on receipt of the order in writing of the Engineer-in-Charge, suspend the progress of the works or any part thereof for such time and in such manner as the Engineer-in-Charge may consider necessary for any of the following reasons:
 - (i) on account of any default of the Contractor, or
 - (ii) for proper execution of the Works or part thereof for reasons other than the default of the Contractor; or
 - (iii) for safety of the works or part thereof,

The Contractor shall, during such suspension, properly protect and secure the Works to the extent necessary and carry out the instructions given in that behalf by the Engineer-in-Charge.

- (b) If the suspension is ordered for reasons (ii) and (iii) in Sub para (a) above,
 - (i) The Contractor shall be entitled to an extension of the time equal to the period of every such suspension plus 25%.
 - (ii) If the total period of all such suspension exceeds thirty days, the Contractor shall, in addition, be entitled to compensation, as the Engineer-in-Charge may consider reasonable, in respect of salaries and/or wages paid by the Contractor to his employees and labour at Site remaining idle during the period of suspension, adding thereto the percentage mentioned in Schedule 'A' to cover indirect expenses of the Contractor, provided the Contractor submits his claim supported by details to the Engineer-in-Charge within 14 days of the expiry of the period of 30 days.
 - (c) If the works or part thereof is suspended on the orders of the Engineer-in-Charge for more than 90 days at a time, except when suspension is ordered for reason (a) (i) above, the Contractor may after receipt of such order serve a written notice on the Engineer-in-Charge requiring permission within 15 days from receipt by the Engineer-in-Charge of the said notice, to proceed with the works or part thereof in regard to which progress has been suspended and if such permission is not granted within that time, the Contractor, if he intends to treat the suspension, where it

affects only a part of the works as an omission of such part by the BHAVINI LTD., under clause 10 & 11 or where it affects the whole of the Works, as an abandonment of the works by the BHAVINI LTD., shall within 10 days of expiry of such period of 15 days give notice in writing of his intention to Engineer-in-Charge. In the event of the Contractor treating the suspension as an abandonment of the Contract by the BHAVINI LTD., he shall have no claim to payment of any compensation on account of any profit or advantage which he may have derived from the execution of the work in full but which he could not derive in consequence of the abandonment. He shall, however, be entitled to compensation, as the Engineer-in-Charge may consider reasonable, in respect of salaries and/or wages paid by him to his employees and labour at Site, remaining idle in consequence and of materials collected which could not be utilized on the works, adding to the total thereof the percentage mentioned in Schedule 'A' to cover indirect expenses of the Contractor, provided the Contractor submits his claim supported by the details to the Engineer-in-Charge within 28 days of the expiry of the period of 90 days.

CLAUSE 13:

13. Time and Extension for Delay:

- 13.1. The time allowed for execution of the works as specified in the Schedule 'A' or the extended time in accordance with these conditions shall be the essence of the Contract. The execution of the works shall commence from the 15th day after the date on which the BHAVINI LTD., issues written orders to commence the work or such time period as mentioned in the Letter of Award or from the date of handing over of site whichever is later. If the Contractor commits default in commencing the execution of the work as aforesaid; the BHAVINI LTD., shall without prejudice to any other right or remedy be at liberty to forfeit the earnest money absolutely.
- 13.2 As soon as possible after the Contract is concluded the Engineer-in-Charge and the Contractor shall agree upon a Time and Progress Chart. The Chart shall be prepared in direct relation to the time stated in the Contract document for completion of items of the works. It shall indicate the forecast of the dates of commencement and completion of various trades or sections of the work and may be amended as necessary by agreement between the Engineer-in-Charge and the Contractor within the limitations of time imposed in the Contract documents. Such defined intermediate milestones will form the basis for monitoring the progress and to initiate such corrective/penal measures as may be decided by the Engineer-in-Charge which shall be final binding. Further to ensure good progress during the execution of the work, the Contractor shall in all cases in which the time allowed for any work exceeds 30 days (save for special jobs) complete 1/8th of the whole of the work before 1/4th of the whole time allowed in the Contract has elapsed: 3/8th of the work before one half of such time has elapsed and 3/4th before 3/4th of such time has elapsed.
- 13.3. If the work(s) be delayed by:
- (a) force majeure, or
 - (b) abnormally bad weather, or
 - (c) serious loss or damage by fire, or

- (d) civil commotion, local commotion of workmen, strike or lockout, affecting any of the trades employed on the work, or
- (e) delay on the part of other contractors or tradesmen engaged by the BHAVINI LTD., in executing work not forming part of the Contract, or
- (f) non-availability of stores, which are the responsibility of the BHAVINI LTD., to supply or
- (g) any other cause which, in the absolute discretion of the authority mentioned in Schedule 'A', is beyond the Contractor's control;

Then, upon the happening of any such event causing delay, the Contractor shall immediately give notice thereof in writing to the Engineer-in-Charge but shall nevertheless use constantly his best endeavours to prevent or make good the delay and shall do all that may be reasonably required to the satisfaction of the Engineer-in-Charge to proceed with the works.

13.4 Request for extension of time, to be eligible for consideration shall be made by the Contractor in writing within 14 days of the happening of the event causing delay. The Contractor may also, if practicable, indicate in such a request the period for which extension is desired.

13.5 In any such case the authority mentioned in Schedule 'A' may give a fair and reasonable extension of time for completion of the work. Such extension shall be communicated to the Contractor by the Engineer-in-Charge in writing, within 90 days of the date of receipt of such request by the Engineer-in-Charge.

CLAUSE 14:

14 Tools, Plant and Equipment

14.1. The Contractor shall arrange at his own expense all tools, plant and equipment (hereinafter referred to as T&P) required for execution of the work, except the item listed in Schedule 'C' which will be given to him on hire (if the same can be spared) by the BHAVINI LTD., at rates shown in that Schedule. In case the Contractor does not require some or all items of T&P listed in Schedule 'C', he shall indicate his requirements at the time of submitting his tender. The BHAVINI LTD., T&P hired to the Contractor shall be conveyed by him at his expense from the place of issue to the Site and back.

14.2. If the Contractor requires any item of T&P on hire from the BHAVINI LTD., over and above the requirements indicated by him at the time of submitting his tender, the BHAVINI LTD., will, if such item is available, hire it to the Contractor at a rate to be fixed by the Engineer-in-Charge.

14.3. When T&P is hired on daily rates, the period of hire will be reckoned from the commencement of the day of issue upto the end of the day of return (including all holidays) irrespective of the actual hour of issue and return. Daily hire charges will be based on eight working hours or part thereof per day and for any additional use of T&P at rates fixed for the purpose. The Contractor will be exempted from levy of any charges for the number of days he is called upon in writing by the Engineer-in-Charge to suspend execution of the work, provided the BHAVINI LTD., T&P in question has, in fact remained idle with the Contractor due to suspension.

- 14.4. The Contractor shall be responsible for care and custody of the BHAVINI LTD., T&P (including employment of chowkidars) during the period the BHAVINI LTD., T&P remain with him and any damage (fair wear and tear excepted) to any of the equipment (except for Excepted Risks, provided always that the Contractor has taken precautions necessary to protect it from such risks) shall be made good at the Contractor's expense to the satisfaction of the Engineer-in-Charge unless such damage is caused because of negligence of crew provided by the BHAVINI LTD.,.
- 14.5. The BHAVINI LTD., gives no guarantee in respect of output of its T&P hired to the Contractor and no reduction in rates or any compensation shall be allowed on the ground that out turn or performance of the BHAVINI LTD., T&P was not to the Contractor's expectation.
- 14.6 The BHAVINI LTD., T&P hired to the Contractor shall be returned at the place of issue (unless otherwise directed) by the Contractor to the Engineer-in-Charge on completion of the work or section of the work or on termination of work or earlier on termination of the hire by the BHAVINI LTD., as hereinafter provided on written notice by the Engineer-in-Charge. The BHAVINI LTD., shall be entitled to terminate the hire on two days notice without assigning any reason whatsoever and the Contractor shall have no claim to any payment of compensation or otherwise whatsoever on account of termination of hire of the BHAVINI LTD., T&P by the BHAVINI LTD.,.
- 14.7. When the T & P is hired on hourly rates, a Log Book for recording hours during which every item of the BHAVINI LTD., T&P issued to the Contractor has worked each day shall be maintained by the member of the crew in-charge thereof or any representative of the Engineer-in-Charge appointed on that behalf and shall be daily attested by the Contractor or his authorized representative. In case the Contractor contests correctness of any entry and/or fails to sign the Log Book, the decision of the Engineer-in-Charge shall be final and binding on him. Hire charges shall be calculated in accordance with entries in the Log Book. Hourly rate specified shall be charged for every hour or part thereof.
- 14.8. The hire charges payable by the Contractor shall be recovered from the Contractor's Bills.

CLAUSE 15:

14 Materials :

15.1. Materials to be supplied by the Contractor_:

The Contractor shall, at his own expense, provide all materials required for the works other than those which are to be supplied by the BHAVINI LTD.,.

- (a) All materials to be provided by the Contractor shall be in conformity with the specifications laid down in the Contract and the Contractor shall, if requested by the Engineer-in-Charge, furnish proof to the satisfaction of Engineer-in-Charge that the materials so comply.

- (b) The Contractor shall, at his own expense and without delay, supply to the Engineer-in-Charge samples of materials proposed to be used in the works. The Engineer-in-Charge shall, within seven days of supply of samples or within such further period as he may require, intimate to the Contractor in writing, whether samples are approved by him or not. If samples are not approved the Contractor shall forthwith arrange to supply to the Engineer-in-Charge for his approval fresh samples complying with the specifications laid down in the Contract.
- (c) The Engineer-in-Charge shall have full powers to require removal of any or all of the materials brought to Site by the Contractor which are not in accordance with the Contract specifications or do not conform in character or quality to samples approved by him. In case of default on the part of the Contractor in removing rejected materials, the Engineer-in-Charge shall be at liberty to have them removed by other means. The Engineer-in-Charge shall have full powers to procure other proper materials to be substituted for rejected materials and in the event of the Contractor refusing to comply, he may cause the same to be supplied by other means. All costs, which may attend upon such removal and/or substitution shall be borne by the Contractor.
- (d) The Contractor shall indemnify the BHAVINI LTD., or its employee or agent against any action, claim or proceeding relating to infringement or use of any patent or design or any alleged patent or design rights and shall pay any royalties or other charges which may be payable in respect of any article or materials or part thereof included in the Contract. In the event of any claim being made or action being brought against the BHAVINI LTD., or its employees or agent in respect of any such matters as aforesaid, the Contractor shall be notified thereof.

Provided that such indemnity shall not apply when such infringement has taken place in complying with the specific directions issued by the BHAVINI LTD.; but the Contractor shall pay any royalties or other charges payable in respect of any such use, the amount so paid being reimbursed to the Contractor only if the use was the result of any drawings and/or specifications issued after submission of the tender.

- (e) Subject as hereinafter provided in clause 56, all charges on account of octroi, royalty, terminal or sales tax and other duties on materials obtained for the works from any source (excluding materials supplied by the BHAVINI LTD.,) shall be borne by the Contractor. If pursuant to or under any law, notification or order any royalty, cess or the like becomes payable by the BHAVINI LTD., and does not any time become payable by the Contractor to the Government/Local authorities in respect of any material used by the Contractor in the works then in such a case, it shall be lawful to the BHAVINI LTD., and it will have the right and be entitled to recover the amount paid in the circumstances as aforesaid from dues of the Contractor.

15.2. Materials to be supplied by the BHAVINI LTD.,

Materials to be supplied by the BHAVINI LTD., are shown in Schedule 'B' which also stipulates quantum, place of issue and rate(s) to be charged in respect thereof.

- (a) If, after acceptance of the tender, the Contractor desires the BHAVINI LTD., to supply any other materials, such materials may be supplied by the BHAVINI

LTD., if available, at rates to be fixed by the Engineer-in-Charge. The BHAVINI LTD., reserve the right not to issue any such materials. The non-issue of such materials will not entitle the Contractor to any compensation whatsoever either in time or in cost.

- (b) (i) The BHAVINI LTD., may issue all the materials to be issued to the Contractor under the Contract, at its Site stores, or nearest railhead. In case the materials are issued at the nearest rail head the cost of transportation only from such rail head to the Site will be borne by the BHAVINI LTD., subject to the reasonableness of such transportation cost being certified by the Engineer-in-Charge. All other costs such as loading, unloading, transportation to Contractor's godown, storage etc. till the materials are incorporated in the works or returned to the BHAVINI LTD., shall be to the account of the Contractor.
- (ii) For the materials listed in Schedule 'B' which the BHAVINI LTD., has agreed to supply to the Contractor, he shall give a reasonable notice in writing of his requirements to the Engineer-in-Charge in accordance with the agreed phased programme. Such materials shall be supplied for the purposes of the Contract only and the value of materials so supplied at the rates specified in the aforesaid schedule shall be set off or deducted, as the when materials are consumed in items of work for which payment is being made to the Contractor, from any sums then due or which may thereafter become due to the Contractor. At the time of submission of bills the Contractor shall properly account for the materials issued to him to the satisfaction of the Engineer-in-Charge, certify that balance of materials supplied is available at Site.
- (c) The Contractor shall bear the cost of loading, transporting to Site, unloading, storing under cover as required, assembling and joining the several parts together as necessary and incorporating or fixing materials in the works including all preparatory work of whatever description as may be required.
- (d) After completion of the work and also at any intermediate stage in the event of non reconciliation of materials issued, consumed and in balance, theoretical quantity of materials issued by the BHAVINI LTD., for use in the work shall be calculated on the basis and method given hereunder:
 - (i) Quantity of cement & bitumen shall be calculated on the basis of quantity of cement & bitumen required for different items of work on the basis of standard formula to be laid down by the Engineer-in-Charge.
 - (ii) Theoretical quantity of steel reinforcement or structural steel sections shall be taken as the quantity required as per design or as authorized by Engineer-in-Charge, including authorized lappages, chairs etc. plus 3% wastage (Returnable in case of free issue) due to cutting into pieces, such theoretical quantity being determined and compared with the actual issues each diameter-wise, section-wise and category wise separately.
 - (iii) Theoretical quantity of G.I. & C.I. or other pipes, conduits, wires and cables, pit lead and GI/MS sheets shall be taken as quantity actually required and measured plus 5% for wastage (Returnable in case of free issue) due to cutting into pieces (except in the case of GI/MS sheets, it shall

be 10% also returnable in case of free issue) such determination and comparison being made diameterwise and category wise.

- (iv) For any other material as per actual requirements.
- (e) Over the theoretical quantities of materials so computed a variation shall be allowed as specified in Schedule 'A'. The difference in the net quantities of material actually issued to the contractor and the theoretical quantities including such authorized variation, if not returned by the Contractor or if not fully reconciled to the satisfaction of the Engineer-in-Charge within 15 days of the issue of written notice by the Engineer-in-Charge to this effect shall be recovered at twice the prevailing market rate landing at BHAVINI LTD., Stores irrespective of the fact that the material is free issue or at issue rates as indicated in Schedule 'B'. The recovery rate shall be applicable for the quantities beyond permissible variation either or plus or minus; without prejudice to the provision of the relevant conditions regarding return of materials governing the contract. Decision of Engineer-in-Charge in regard to theoretical quantities of materials, which should have been actually used and recovery at rates specified in Schedule 'A' shall be final and binding on the Contractor. For non scheduled items the decision of the Engineer-in-Charge regarding theoretical quantities of materials which should have been actually used shall be final and binding on the Contractor.
- (f) Surplus materials returned by the Contractor shall be credited to him by the Engineer-in-Charge at rates not exceeding those at which these were originally issued to him less handling and storage charges, if any, and also after taking into consideration any deterioration or damage which may have been caused to the said materials whilst in the custody of the Contractor.
- (g) The said action under this clause is without prejudice to the right of the BHAVINI LTD., to take action against the Contractor under any other conditions of contract for not doing the work according to the prescribed specifications.

15.3 General

- (a) Materials required for the works, whether brought by the Contractor or supplied by the BHAVINI LTD., shall be stored by the Contractor only at places approved by the Engineer-in-Charge. Storage and safe custody of material shall be the responsibility of the Contractor.
- (b) (i) The Engineer-in-Charge shall be entitled to have tests carried out as specified in the Contract for any materials supplied by the Contractor other than those for which, as stated above, satisfactory proof has already been furnished, at the cost of the Contractor and the Contractor shall provide at his expense all facilities which the Engineer-in-Charge may require for the purpose. If no tests are specified in the Contract and such tests are required by Engineer-in-Charge, the Contractor shall provide all facilities required for the purpose and the BHAVINI LTD., shall bear the cost of material and test charges, only where the tests disclose that the said materials are in accordance with the provisions of the Contract.

- (ii) In addition, the Contractor shall perform/submit at his own cost such test/samples as may be required by the Engineer-in-Charge out of materials issued by the BHAVINI LTD., except for the cost of materials used in such tests/samples.
- (c) The BHAVINI LTD., officials concerned with the Contract shall be entitled at any time to inspect and examine any materials intended to be used in or on the works, either on the Site or at factory or workshop or other place(s) where such materials are assembled, fabricated, manufactured or at any place(s) where these are lying or from which these are being obtained and the Contractor shall give such facilities as may be required for such inspection and examination.
- (d) All materials brought to the Site shall become and remain the property of the BHAVINI LTD., and shall not be removed off the Site without the prior written approval of the Engineer-in-Charge. But, whenever the works are finally completed and advance, if any, in respect of any such material is fully recovered, the Contractor shall at his own expense forthwith remove from the Site all surplus material originally supplied by him and upon such removal, the same shall revert in and become the property of the Contractor.

CLAUSE 16:

16. Labour :

- 16.1. The Contractor shall employ labour in sufficient numbers to maintain the required rate of progress and of quality to ensure workmanship of the degree specified in the Contract and to the satisfaction of the Engineer-in-Charge. The Contractor shall not employ in connection with the works any person who has not completed eighteen years of age.

- 16.2 The Contractor shall furnish to the Engineer-in-Charge, fortnightly, a distribution return of the number and description by trades of the workers employed on the works.

The Contractor shall also submit on the 4th and 19th of every month to the Engineer-in-Charge a true statement showing in respect of the preceding fortnight, (i) the accidents that occurred during the said fortnight showing the circumstances under which they happened and the extent of damage and injury caused by them and (ii) the number of female workers who have been allowed maternity benefit as provided in the Maternity Benefit Act, 1961 or Rules made there under and the amount paid to them.

- 16.3 The Contractor shall pay to labour employed by him either directly or through sub-contractors wages in accordance with the rules, regulations and the law in force relating to the payment of wages for the workers.

- 16.4 The Contractor shall comply with the provisions of The Payment or Wages Act, 1936, The Minimum Wages Act, 1948, The Employer's Liability Act, 1938, The Workmen's Compensation Act, 1923, The Industrial Disputes Act, 1947, The Maternity Benefit Act, 1961, The Mines Act, 1952, The Contract Labour (Regulation & Abolition) Act, 1970, or any modifications thereof or any other law relating thereto and rules framed thereunder from time to time.

- 16.5 The Contractor shall be liable to pay his contribution and the employees contribution to the State Insurance Scheme in respect of all labour employed by him for the execution of the Contract, in accordance with the provisions of “The Employees State Insurance Act, 1948” as amended from time to time. In case the Contractor fails to submit full details of his account of labour employed and the contribution payable, the Engineer-in-Charge shall recover from the running bills of Contractor an amount of contribution as assessed by him. The amount so recovered shall be adjusted against the actual contribution payable for Employees State Insurance.
- 16.6 The Engineer-in-Charge shall, on a report having been made by an Inspecting Officer as defined in the Contractor’s Labour Regulations, have the power to deduct from the moneys due to the Contractor any sum required or estimated to be required for making good the loss suffered by the worker(s) by reason of non-fulfillment of the conditions of the Contract for the benefit or worker(s), non-payment of wages or of deductions made from his or their wages which are not justified by the terms, of the Contract or non-observance of the said Contractors Labour Regulations.
- 16.7 In every case in which by virtue of the provisions sub-section(1) of Section 12, of the Workmen’s Compensation Act, 1923, the BHAVINI LTD., is obliged to pay compensation to a workman employed by the Contractor, in execution of the works, the BHAVINI LTD., will recover from the Contractor the amount of the compensation so paid, and, without prejudice to the rights of the BHAVINI LTD., under sub-section (2) of Section 12, of the said Act, The BHAVINI LTD., shall be at liberty to recover such amount or any part thereof by deducting it from the security deposit or from any sum due by the BHAVINI LTD., to the Contractor whether under this contract or otherwise. The BHAVINI LTD., shall not be bound to contest any claim made against it under sub-section (1) of Section 12 of the said Act, except on the written request of the Contractor and upon his giving to the BHAVINI LTD., full security for all costs for which the BHAVINI LTD., might become liable in consequence of contesting such claim.
- 16.8 Compliance and Default :
- 16.8.1. In the event of the Contractor committing a default or breach of any of the provisions of the aforesaid Contractor’s Labor Regulations as amended from time to time or furnishing any information or submitting or filling any Form/Register/Slip under the provisions of these Regulations which is materially incorrect, then on the Report of the Inspecting Officer as defined in the Contractor’s Labor Regulations, the Contractor shall without prejudice to any other liability pay to the BHAVINI LTD., a sum not exceeding Rs.200/- for every default, breach or furnishing, making, submitting, filling, such materially incorrect statement and in the event of the Contractor’s default continuing in this respect, the penalty may be enhanced to Rs.200/- per day for each day of default subject to a maximum of five percent of the estimated cost of the works put to tender. The Engineer-in-Charge shall deduct such amount from bills or security deposit of the Contractor. The decision of the Engineer-in-Charge in this respect shall be final and binding.
- 16.8.2. The Contractor shall at his own expense comply with or cause to be complied with Model Rules for Labor Welfare as appended to these conditions or rules framed by the Government from time to time for the protection of health and for making sanitary arrangements for workers employed directly or indirectly on the works. In case the

Contractor fails to make arrangements as aforesaid, the Engineer-in-Charge shall be entitled to do so and recover the cost thereof from the Contractor.

16.8.3. The Contractor shall at his own expense arrange for the safety provisions as appended to these conditions (Safety Code) or as required by the Engineer-in-Charge in respect of all labour directly or indirectly employed for performance of the works and shall provide all facilities in connection therewith. In case the Contractor fails to make arrangements and provide necessary facilities as aforesaid, the Engineer-in-Charge shall be entitled to do so and recover the cost thereof from the Contractor.

- i) Failure to comply with Model Rules for Labor Welfare, Safety Code on the provisions relating to report on accidents and to grant of maternity benefits to female workers shall make the Contractor liable to pay to the BHAVINI LTD., as the penalty an amount not exceeding Rs.200/- for each default or materially incorrect statement.
- ii) The decision of the Engineer-in-Charge in such matters based on reports from the Inspecting Officers as defined in the Contractor's Labor Regulation as appended to these conditions shall be final and binding and deduction(s) for recovery of such penalty may be made from any amount payable to the Contractor.

CLAUSE 17:

17. Possession of Site :

17.1. The Contractor shall not be permitted to enter on (other than for inspection purposes) or take possession of the site until instructed to do so by the Engineer-in-Charge in writing. The portion of the Site to be occupied by the Contractor shall be defined and / or marked on the Site Plan, failing which these shall be indicated by the Engineer-in-Charge at site and the Contractor shall on no account be allowed to extend his operations beyond these areas.

17.2 The Contractor shall provide, if necessary or if required on the Site, all temporary access thereto and shall alter, adapt and maintain the same as required from time to time and shall take up and clear them away as and when no longer required and as and when ordered by the Engineer-in-Charge and make good all damage done to the Site.

CLAUSE 18 :

18. Setting out the works :

The Engineer-in-Charge shall supply dimensioned drawings, levels and other information necessary to enable the Contractor to set out the works and the Contractor shall set out the works and be responsible for accuracy of the same. He shall amend at his own cost and to the satisfaction of the Engineer-in-Charge any error found at any stage which may arise through inaccurate setting out unless such error is based on incorrect data furnished in writing by the Engineer-in-Charge, in which case the cost of rectification shall be borne by the BHAVINI LTD.,. The Contractor shall protect and preserve all bench marks used in setting out the works till end of the Defects Liability Period unless the Engineer-in-Charge directs their earlier removal.

CLAUSE 19 :

19. Site Drainage :

All water which may accumulate on the Site during the progress of the works, or in trenches and excavations, from other than the Excepted Risks shall be removed from the Site to the satisfaction of the Engineer-in-Charge and at the Contractor's expense.

CLAUSE 20:

20. Nuisance :

The Contractor shall not at any time do, cause or permit any nuisance on Site or do anything which shall cause unnecessary disturbance or inconvenience to owners, tenants or occupants of other properties near the Site and to the general public.

CLAUSE 21:

21. Materials obtained from Excavation :

Materials of any kind obtained from dismantling of a structure, excavation on the Site etc. shall remain the property of the BHAVINI LTD., and shall be disposed off as the Engineer-in-Charge may direct.

CLAUSE 22:

22. Treasure, Trove, Fossils etc. :

All fossils, coins, articles of value or antiquity and structures and other remains or things of geological or archaeological interest discovered on the Site shall be absolute property of the BHAVINI LTD., and the Contractor shall take reasonable precautions to prevent his workmen or any other person from removing or damaging any such article or thing. He shall, immediately upon discovery thereof and before removal, acquaint the Engineer-in-Charge with such discovery and carry out Engineer-in-Charge's directions as to the disposal of the same at the expense of the BHAVINI LTD.,.

CLAUSE 23:

23. Protection of Trees :

Trees designated by the Engineer-in-Charge shall be protected from damage during the course of the works and earth level within 1 metre of each such tree shall not be changed. Where necessary, such trees shall be protected by providing temporary fencing. Where tree cutting is involved, procedures as directed by the Engineer-in-Charge shall be strictly complied with

CLAUSE 24:

24. Watch and Ward and Lighting :

The Contractor shall provide and maintain at his own expense all lights, guards, fencing and watching when and where necessary or required by the Engineer-in-Charge for protection of the works or for the safety and convenience of those employed on the Works or the public.

CLAUSE 25:

25. Contractor's Supervision :

The Contractor shall either himself supervise the execution of the Works or shall appoint a competent agent approved by the Engineer-in-Charge. If the Contractor has himself not sufficient knowledge and experience to be capable of receiving instructions or cannot give his full attention to the works, the Contractor shall at his own expense, employ as his accredited agent an engineer approved by the Engineer-in-Charge. Orders given to the Contractor's agent shall be considered to have the same force as if these had been given to the Contractor himself. If the Contractor fails to appoint a suitable agent as directed by the Engineer-in-Charge, the Engineer-in-Charge shall have full powers to suspend the execution of the works until such date as a suitable agent is appointed and the Contractor shall be held responsible for the delay so caused to the works.

CLAUSE 26:

26. Inspection and Approval :

- 26.1. All works embracing more than one process shall be subject to examination and approval at each stage thereof and the Contractor shall give due notice to the Engineer-in-Charge or his authorized representative when such stage is ready. In default of such notice, the Engineer-in-Charge shall be entitled to appraise the quality and extent thereof.
- 26.2. No work shall be covered up or put out of view without the approval of the Engineer-in-Charge or his authorized representative and the Contractor shall afford full opportunity for examination and measurement of any work which is about to be covered up or put out of view and for examination of foundations before permanent work is placed there on. The Contractor shall give due notice to the Engineer-in-Charge or his authorized representative whenever any such work or foundation is ready for examination and the Engineer-in-Charge or his representative shall without unreasonable delay, unless he considers it unnecessary and advises the Contractor accordingly, attend for the purpose of examining and measuring such work or of examining such foundations. In the event of the failure of the Contractor to give such notice, he shall, if required by the Engineer-in-Charge, uncover such work at the Contractor's expense.
- 26.3. The Engineer-in-Charge or his representative shall have powers at any time to inspect and examine any part of the Works and the Contractor shall give such facilities as may be required for such inspection and examination.

CLAUSE 27:

27. Duties and Powers of Engineer-in-Charge's Representative :

- 27.1. The duties of the representative of the Engineer-in-Charge are to watch and supervise the works and to test and examine any materials to be used or workmanship employed in connection with works
- 27.2. The Engineer-in-Charge may from time to time, in writing, delegate to his Representative any of the powers and authorities vested in the Engineer-in-Charge and shall furnish to the Contractor a copy of all such written delegation of powers and authorities. Any written instruction or written approval given by the Representative of the Engineer-in-Charge to the Contractor shall be taken as if same is issued by the Engineer-in-Charge himself.

CLAUSE 28:

28. Removal of Workmen :

The Contractor shall employ in and about the execution of the Works only such persons as are skilled and experienced in their several trades and the Engineer-in-Charge shall be at liberty to object to and require the Contractor to remove from the works any person employed by the Contractor in or about the execution of the Works who, in the opinion of the Engineer-in-Charge, misconducts himself or is incompetent or negligent in the proper performance of his duties and such person shall not be again employed upon the Works without permission of the Engineer-in-Charge.

CLAUSE 29:

29. Uncovering and making good :

The Contractor shall uncover any part of the Works and/or make openings in or through the same as the Engineer-in-Charge may from time to time direct for his verification and shall reinstate and make good such part to the satisfaction of the Engineer-in-Charge. If any such part has been covered up or put out of view after being approved by the Engineer-in-Charge and is subsequently found on uncovering to be executed in accordance with the Contract, the expenses of uncovering and/or making opening in or through, reinstating and making good the same shall be borne by the BHAVINI LTD.,. In any other case all such expenses shall be borne by the Contractor.

CLAUSE 30:

30. Work during Night or on Sundays and Holidays :

Prior written permission of the Engineer-in-Charge shall be taken whenever permanent works are proposed to be carried out during night or on Sundays or on authorized Holidays except when the work is unavoidable or absolutely necessary for safety or life or property of works, in which case the Contractor shall immediately advise the Engineer-in-Charge accordingly.

CLAUSE 31:

31. Quality Assurance :

31.1. Q.A. Programme :

To ensure that the construction/fabrication and erection of works under the scope of this Contract whether performed within the Contractor's works or at any other place of work are in accordance with the specifications, the Contractor shall adopt suitable quality assurance programme commensurate with BHAVINI LTD., QA programme to control such activities at all stages necessary. Such programme shall be outlined by the Contractor in a QA Manual and shall be finally accepted by the Engineer-in-Charge after discussions before commencement of work. A quality assurance programme of the Contractor shall generally cover but not limited to the following:

- (a) his organization structure for the management and implementation of the proposed quality assurance programme including interfaces.
- (b) documentation control system.
- (c) qualification data for Contractor's key personnel.
- (d) the procedure for purchase of materials, parts, components and selection of sub-contractor's services including vendor analysis, source inspection, incoming raw material inspection, verification of materials purchased etc.
- (e) system for construction/fabrication and site erection controls through QA plans.
- (f) Control of non-conforming items and system for corrective and preventive actions.
- (g) inspection and test procedures both for construction and erection.
- (h) control of calibration and testing of inspection, measuring and testing equipment.
- (i) system of indication and appraisal of inspection status.
- (j) system of quality audits.
- (k) system of intimation by the Contractor and approval by the Engineer-in-Charge of stages of completion.
- (l) system for maintenance of records.
- (m) system for handling, storage, preservation and delivery of items; and
- (n) a quality plan detailing out the specific quality control procedure to be adopted for controlling the quality characteristics relevant to each item of work.

31.2 Q.A. Document

The Contractor shall be required to submit the relevant Quality Assurance Document within **three weeks** of completion of works which shall include relevant test reports connected with all engineering controls adopted by him during the construction. The Engineer-in-Charge or his duly authorized representative reserves the right to carry out Quality Audit and Quality Surveillance of the systems and procedures of the Quality Management and Control Activities of the Contractor/his vendor.

CLAUSE 32:

32. Construction Co-ordination :

- 32.1. The field activities of the contractors working at Site will be co-coordinated by the Engineer-in-Charge and his decision shall be final in resolving any disputes or conflicts between the Contractor and other contractors regarding scheduling and co-ordination of work. His decision shall not be a cause for extra compensation or extension of time for the Contractor.
- 32.2. Engineer-in-Charge shall hold periodic meetings with the contractors working at Site, at a time and a place to be designated by him. The Contractor shall attend such meetings and shall strictly adhere to the decisions taken during the meeting in performing his works.

CLAUSE 33 :

33. Field Office Records :

The Contractor shall maintain at his Site Office all drawings, specifications and other Contract documents and any other supplementary data complete with all the latest revisions thereto. The Contractor shall also maintain, in addition, the continuous record of all changes to the above Contract documents, drawings, specifications, supplementary data, etc. effected at the Site and on completion of his total assignment under the Contract shall incorporate all such changes on the drawings and other engineering data to indicate actual construction/fabrication and erection carried out under the Contract. Such drawings and engineering data shall be submitted to the Engineer-in-Charge in 4 copies.

CLAUSE 34 :

34. Completion Certificate :

- 34.1. As soon as the work is completed, the Contractor shall give notice of such completion to the Engineer-in-Charge and within thirty days of receipt of such notice the Engineer-in-Charge shall inspect the work and shall furnish the Contractor with a certificate of completion indicating (a) date of completion (b) defects to be rectified by the Contractor and/or (c) items for which payment shall be made at reduced rates. When separate periods of completion have been specified for items or groups of items, the Engineer-in-Charge shall issue separate completion certificates for such item or groups of items. No certificate of completion shall be issued not shall the work be considered to be complete till the Contractor shall have removed from the

premises on which the work has been executed all scaffolding, sheds and surplus materials except such as are required for rectification of defects, rubbish and all huts and sanitary arrangements required for his workmen on the Site in connection with the execution of the work, as shall have been erected by the Contractor or the workmen and cleaned all dirt from the parts of building(s) in, upon or about which the work has been executed or of which he may have had possession for the purpose of the execution thereof and cleaned floors, gutters and drains, eased doors and sashes, oiled locks and fastenings, labeled keys clearly and handed them over to the Engineer-in-Charge and made the whole premises fit for immediate occupation or use to the satisfaction of the Engineer-in-Charge. If the Contractor shall fail to comply with any of the requirements of these conditions as aforesaid, on or before the date fixed for completion of the works, the Engineer-in-Charge may, at the expense of the Contractor, fulfill such requirements and dispose of the scaffoldings, surplus materials and rubbish etc., as he thinks fit and the Contractor shall have no claim in respect of any such scaffoldings or surplus materials except for any sum actually realized through the sale thereof less the cost of fulfilling the requirements and any other amount that may be due from the Contractor. If the expense of fulfilling such requirements is more than the amount realized on such disposal as aforesaid, the Contractor shall forthwith on demand pay such excess.

34.2 If at any time before completion of the entire work, items or groups of items for which separate periods of completion have been specified, have been completed, the Engineer-in-Charge can take possession of any part or parts of the same (any such part(s) being hereinafter in this clause referred to as the relevant part) then, notwithstanding any thing expressed or implied else-where in this Contract;

(a) within thirty days of the date of completion of such items or groups of items or of possession of the relevant parts, the Engineer-in-Charge shall issue completion certificate for the relevant part as in Clause 34.1 above, provided the Contractor fulfills his obligations under that clause for the relevant part.

(b) the Defects Liability Period in respect of such items and the relevant part shall be deemed to have commenced from the certified date of completion of such items or the relevant part as the case may be.

(c) the Contractor may reduce the value insured under Clause 37 by the full value of the completed items or relevant part as estimated by the Engineer-in-Charge for this purpose. This estimate shall be applicable for this purpose only and for no other.

(d) for the purposes of ascertaining compensation for delay under Clause 35 in respect of any period during which the works are not complete the relevant part will be deemed to form a separate item or group, with date of completion as given in the Contract or as extended under Clause 13 and actual date of completion as certified by the Engineer-in-Charge under this Clause.

34.3 It shall be the responsibility of the Contractor to see that the building under construction is not occupied by any body unauthorisedly during construction, and is handed over to the Engineer-in-Charge with vacant possession of complete building. If such building though completed is occupied illegally, then the Engineer-in-Charge shall have the option to refuse to accept the said building/buildings in that position. Any delay in acceptance on this account will be treated as the delay in completion and

for such delay a levy up to 5% of tendered value of work may be imposed by the Accepting Authority as mentioned in Schedule 'A' whose decision shall be final both with regard to the justification and quantum and be binding on the Contractor. However, the Engineer-in-Charge through a notice, may require the Contractor to remove the illegal occupation any time on or before construction and delivery.

CLAUSE 35 :

35. Compensation for Delay :

- 35.1. If the Contractor fails to maintain the required progress in terms of Clause 13 or to complete the work and clear the site on or before the Contract or extended date of completion, the Contractor shall, without prejudice to any other right or remedy of the BHAVINI LTD., on account of such breach, pay as agreed compensation amount calculated as stipulated below or such smaller amount as be fixed by the authority mentioned in Schedule 'A' on the Contract Value of the work for every week that the progress remains below that specified in Clause 13 or that the work remains incomplete.

This will also apply to items or groups of items for which separate period of completion has been specified.

For this purpose the term 'Contract Value' shall be the value at contract rates of the work as ordered.

- (a) Completion period (as originally @ 1% per week stipulated) not exceeding 1 year.
 - (b) Completion period (as originally @ ½% per week stipulated) exceeding 1 year and not exceeding 3 years.
 - (c) Completion period (as originally @ 1/4% per week stipulated) exceeding 3 years.
- 35.2 Provided always that the total amount of compensation for delay to be paid under this clause shall not exceed 5% of the total value of the Contract Value or of the Contract Value of the item or group of items of work for which a separate period of completion is specified.
- 35.3 The amount of compensation may be adjusted or set off against any sum payable to the Contractor under this or any other contract(s) with same unit or any other unit(s) of the BHAVINI LTD.,. For the purpose of such adjustment/set off, it shall be deemed that the Contractor has given its free consent.

CLAUSE 36:

36. Defects Liability Period :

The Contractor shall be responsible to make good and remedy at his own expense within such period as may be stipulated by the Engineer-in-Charge, any defect which may develop or may be noticed before the expiry of the period mentioned in Schedule 'A' hereto from the certified date of completion and intimation of which has been sent to the Contractor within seven days of the expiry of the said period by a letter sent by hand delivery or by registered post.

CLAUSE 37:

37. Contractor's Liability, Insurance and Indemnity :

Contractor's Liability & Insurance.

- 37.1. From commencement to completion of the works, the Contractor shall take full responsibility for the care thereof and for taking precautions to prevent loss or damage and to minimize loss or damage to the greatest extent possible and shall be liable for any damage or loss that may happen to the Works or any part thereof and all BHAVINI LTD.'s T&P from any cause whatsoever (save and except the Excepted Risks) and shall at his own cost repair and make good the same so that at completion, the Works and all the BHAVINI LTD., T&P shall be in good order and condition and in conformity in every respect with the requirements of the Contract and instructions of the Engineer-in-Charge.
- 37.2. Before commencing execution of the work, the Contractor shall, without in any way limiting his obligations and responsibilities under this Clause, insure against any damage, loss or injury which may occur to any property (Excluding that of the BHAVINI LTD., but including the BHAVINI LTD.'s building rented by the Contractor wholly or in a part and any part of which is used by him for storing combustible materials), or to any person (including any employee of the BHAVINI LTD.,) by or arising out of carrying out of the Contract.
- 37.3. In the event of any loss or damage to the works or any part thereof or to any T&P or to any material or articles at the Site from any of the Excepted Risks the following provisions shall have effect:
- (a) The Contractor shall, as may be directed in writing by the Engineer-in-Charge, remove from the Site any debris and so much of the Works as shall have been damaged, taking to BHAVINI LTD.'s store such BHAVINI LTD.'s T&P, articles and/or materials as may be directed;
 - (b) The Contractor shall, as may be directed in writing by the Engineer-in-Charge, proceed with the erection and completion of the Works under and in accordance with the provisions and conditions of the Contract; and
 - (c) There will be added to the Contract Sum, the net amount due, ascertained in the same manner, as for deviations, or as prescribed for payment, in respect of the re-execution of the Works lost or damaged, the replacement of any T&P and of any materials and articles lost or damaged but not incorporated in the Works on the day when the loss or damage occurred and the removal by the Contractor as provided above of BHAVINI LTD.'s T&P, articles and/or materials to the BHAVINI LTD.'s store and of debris and damaged works referred to therein and the compensation paid by him, under any law for time being in force, to any workman employed by him for any injury caused to him, or to the workman's legal successors for loss of the workman's life.

Provided always that the Contractor shall not be entitled to payment under the above provisions in respect of so much loss or damage as has been occasioned by

any failure on his part to perform his obligations under the Contract or not taking precautions to prevent loss or damage or minimize the amount of such loss or damage.

- 37.4. Without limiting the obligations and responsibilities under this clause, the Contractor shall insure the Works (from commencement to completion), the BHAVINI LTD.'s T&P hired by the Contractor and all materials at Site, to their full value (as to BHAVINI LTD.'s T&P according to the value indicated in Schedule 'C') against the risk of loss or damage from whatever cause arising other than the Excepted Risks. The said insurance shall be in the joint names of BHAVINI LTD., and the Contractor and the Contractor shall deposit with the Engineer-in-Charge the said policy or policies in original. All money payable by the insurers under such policy or policies shall be recovered by the BHAVINI LTD., and shall be paid to the Contractor in installments by the Engineer-in-Charge for the purpose of rebuilding or replacement or repair of the Works and/or goods destroyed or damaged as the case may be. Provided however, if the amount payable by the insurers in respect of any claim under such a policy is not in excess of the amount mentioned in Schedule 'A', the same may be recovered by the Contractor directly from the insurers and shall be utilized by him for the purpose of rebuilding or replacement or repair of the works and/or goods destroyed or damaged as the case may be.
- 37.5 If the Contractor has a blanket insurance policy for all his works and this policy covers all the items to be insured under this Clause, the said policy shall be assigned by the Contractor in favour of the BHAVINI LTD., provided however if any amount is payable under the policy by the insurers in respect of Works other than the work under this Contract the same may be recovered by the Contractor directly from the insurers.
- 37.6 Where the BHAVINI LTD., building or a part thereof is rented by the Contractor, he shall insure the entire building if the building or any part thereof is used by him for the purpose of storing or using materials of combustible nature, as to which the decision of the Engineer-in-Charge shall be final and binding.
- 37.7 The Contractor shall prove to the Engineer-in-Charge from time to time that he has taken out all the insurance policies referred to above and has paid the necessary premiums for keeping the policies alive till expiry of the Defects Liability Period.
- 37.8 The Contractor shall ensure that similar insurance policies are taken out by his sub-contractors (if any) and shall be responsible for any claims or losses to the BHAVINI LTD., resulting from their failure to obtain adequate insurance protection in connection thereof.

The Contractor shall produce or cause to be produced by his sub-contractors (if any) as the case may be, the relevant policy or policies and premium receipts as and when required by the Engineer-in-Charge.

- 37.9. If the Contractor and/or his sub-contractors (if any) shall fail to effect and keep in force the insurance referred to above or any other insurance which he/they may be required to effect under the terms of the Contract, then and in any such case the BHAVINI LTD., may, without being bound to, effect and keep in force any such insurance and pay such premium or premiums as may be necessary for that purpose and from time to time deduct the amount so paid by the BHAVINI LTD., from any

moneys due or which may become due to the Contractor or recover the same as a debt due from the Contractor.

- 37.10. The aforesaid insurance policy/policies shall provide that they shall not be cancelled till the Engineer-in-Charge has agreed to their cancellation.

Contractor's Liability and Indemnity :

- 37.11. The Contractor shall indemnify and keep indemnified the BHAVINI LTD., against all losses and claims for injuries or damage to any person or any property whatsoever which may arise out or in consequence of the construction and maintenance of works and against all claims, demands, proceedings, damages, costs, charges and expenses whatsoever in respect of or in relation thereto. Provided always that nothing herein contained shall be deemed to render the Contractor liable for or in respect of or to indemnify the BHAVINI LTD., against any compensation or damage caused by the Excepted Risks/Third Party Liability/Risks.
- 37.12. The Contractor shall at all times indemnify the BHAVINI LTD., against all claims, damages or compensation under the provisions of The Payment of The Wages Act, 1936, The Minimum Wages Act, 1948. The Employer's Liability Act, 1938, The Workmen's Compensation Act, 1923, The Industrial Disputes Act, 1947 and The Maternity Benefit Act, 1961 or any modifications thereof or any other law relating thereto and rules made thereunder from time to time or as a consequence of any accident or injury to any workman or other persons in or about the works, whether in the employment of the Contractor or not, save and except where such accident or injury has resulted from any act of the BHAVINI LTD., his agents or servants, and also against all costs, charges and expenses of any suit, action or proceedings arising out of such accident or injury and against all sum or sums which may with the consent of the Contractor be paid to compromise or compound any claim. Without limiting his obligations and liabilities as above provided, the Contractor shall insure against all claims, damages or compensation payable under The Workmen's Compensation Act, 1923 or any modification thereof or any other law relating thereto.

CLAUSE 38:

38. Facilities to other Contractors :

The Contractor shall, in accordance with the requirements of the Engineer-in-Charge, afford all reasonable facilities to other contractors engaged contemporaneously or separate contracts in connection with the Works and for departmental labour and labour of any other authorized agency or statutory body which may be employed at the Site on execution of any work not included in the Contract or of any contract which the BHAVINI LTD., may enter into in connection with or ancillary to the works.

CLAUSE 39:

39. Notice to Local Bodies :

- 39.1. Contractor shall comply with and give all notices required under any Governmental authority, instrument, rule or order made under any Act or Parliament, State Laws or

any regulation or bye-laws of any local authority relating to the works. Hence, before making any variation from the Contract drawings, he shall give to the Engineer-in-Charge, a written notice giving reasons for the proposed variation and obtain the Engineer-in-Charge's instructions thereon.

- 39.2. The Contractor shall pay and indemnify the BHAVINI LTD., against any liability in respect of any fees or charges payable under any Act of Parliament, State Laws or any Government instrument, rule or order and any regulations or bye-laws of any local authority in respect of the Works prevailing on the date of submission of tender.

CLAUSE 40:

40. Sub-Contracts :

The Contractor shall not sub-contract the work for any portion of the work without the prior written approval of the Engineer-in-Charge. Employment of piece-rate workers shall not be deemed as sub-contracting.

CLAUSE 41:

41. Instructions and Notices :

- 41.1. Subject as otherwise provided in this Contract, all notices to be given on behalf of the BHAVINI LTD., and all other actions to be taken on its behalf may be given or taken by the Engineer-in-Charge or any Officer for the time being entrusted with the functions, duties and powers of the Engineer-in-Charge.
- 41.2. All instructions, notices and communications, etc. under the Contract shall be given in writing and if sent by registered post to the last known place of abode or business of the Contractor, shall be deemed to have been served.
- 41.3. The Contractor or his Agent shall be in attendance at the Site(s) during all working hours and shall superintend the execution of the Works with such additional assistance in each trade as the Engineer-in-Charge may consider necessary. Orders given to the Contractor's Agent shall be considered to have the same force as if they have been given to the Contractor himself.

CLAUSE 42:

42. Foreclosure of Contract :

- 42.1. If at any time after acceptance of the tender / during execution of work the BHAVINI LTD., shall decide to abandon or reduce the scope of the works for any reason whatsoever and hence not require the whole or any part of the works to be carried out, the Engineer-in-Charge shall give notice in writing to that effect to the Contractor and the Contractor shall have no claim to any payment of compensation or otherwise whatsoever, on account of any profit or advantage which he might have derived from the execution of the works in full but which he did not derive in consequence of the foreclosure of the whole or part of the works.

42.2. The Contractor shall be paid at contract rates full amount for works executed at Site and, in addition, a reasonable amount as certified by the Engineer-in-Charge, but not more than the amount proportionate to the value of balance work, for the items hereunder mentioned which could not be utilized on the work to the full extent because of the foreclosure:

- (a) Any expenditure incurred on preliminary site work, e.g. temporary access roads, temporary labour huts, staff quarters and site offices; storage accommodation and water storage tanks.
- (b) (i) The BHAVINI LTD., shall have the option to take over Contractor's materials or any part thereof either brought to Site or of which the Contractor is legally bound to accept delivery from suppliers (for incorporation in or incidental to the work) provided, however, the BHAVINI LTD., shall be bound to take over the materials or such portions thereof as the Contractor does not desire to retain. For materials taken over or to be taken over by the BHAVINI LTD., cost of such materials as detailed by Engineer-in-Charge shall be paid. The cost shall, however, take into account purchase price, cost of transportation and deterioration or damage which may have been caused to materials whilst in the custody of the Contractor, provided that the value so arrived should not be more than the proportionate rate of item of the Contract.

(ii) For Contractor's materials not retained by the BHAVINI LTD., reasonable cost of transporting such materials from Site to Contractor's permanent stores or to his other works, whichever is less. If materials are not transported to either of the said places, no cost of transportation shall be payable.
- (c) If any materials supplied by the BHAVINI LTD., are rendered surplus, the same except normal wastage shall be returned by the Contractor to the BHAVINI LTD., at rates not exceeding those at which these were originally issued less storage charges, if any and allowance for any deterioration or damage which may have been caused whilst the materials were in the custody of the Contractor. In addition, cost of transportation of such materials from Site to the BHAVINI LTD., stores, if so required by the BHAVINI LTD., shall be paid.
- (d) Reasonable compensation for transfer of T&P from Site to Contractor's permanent stores or to his other works, whichever is less. If T&P are not transported to either of the said places, no cost of transportation shall payable.
- (e) Reasonable compensation for repatriation of the Contractor's site staff and labour to the extent necessary.

The compensation amount of item (a) & (d) & (e) above, shall not be in excess of 2% of the cost of works remaining incomplete on the date of closure.

The Contractor shall, as required by the Engineer-in-Charge, furnish to him books of account, wage books, time sheets and other relevant documents as may be necessary to enable him to certify the reasonable amount payable under this clause.

- (f) The amount Security Deposit shall be worked out based on redefined value of contract in case of such foreclosure.

NOTE:- Provisions of Clause 42 shall not apply to cases when work is determined/cancelled under provisions of Clause 44.

CLAUSE 43:

43. Termination of Contract on Death :

If the Contractor is an individual or a proprietary concern and the individual or the proprietor dies and if the Contractor is a partnership concern and one of the partners dies, then, unless the Engineer-in-Charge is satisfied that the legal representatives of the individual Contractor or of the proprietor of the proprietary concern and in the case of partnership, the surviving partners, are capable of carrying out and completing the Contract, the Engineer-in-Charge shall be entitled to cancel the Contract as to its incomplete part without the BHAVINI LTD., being in any way liable to payment of any compensation to the estate of the deceased Contractor and / or to the surviving partners of the Contractor's firm on account of the cancellation of the contract. The decision of the Engineer-in-Charge that the legal representatives of the deceased Contractor or the surviving partners of the Contractor's firm cannot carry out the complete the Contract shall be final and binding on the parties. In the event of such cancellation, the BHAVINI LTD., shall not hold the estate of the deceased Contractor and/or the surviving partners of the Contractor's firm liable for damages for not completing the Contract.

CLAUSE 44:

44. Determination/cancellation of contract in full or part:

44.1. If the Contractor:

- (a) at any time makes default in proceeding with the works with due diligence and continues to do so after a notice in writing of 7 days from the Engineer-in-Charge; or
- (b) commits default in complying with any of the terms and conditions of the Contract and does not remedy it or take effective steps to remedy it within 7 days after a notice in writing is given to him in that behalf by the Engineer-in-Charge; or
- (c) fails to complete the works or items of work with individual dates or completion, on or before the date(s) of completion, and does not complete them within the period specified in a notice given in writing in that behalf by the Engineer-in-Charge; or
- (d) shall offer, or give or agree to give to any person in the BHAVINI LTD.'s service or to any other person on his behalf any gift or consideration of any kind as an inducement or reward for doing or forbearing to do or having done or forborne to do any act in relation to the obtaining or execution of this or any other Contract for the BHAVINI LTD., or
- (e) shall enter into a contract with the BHAVINI LTD., in connection with which commission has been paid or agreed to be paid by him or to his knowledge, unless the particulars of any such commission and the terms of payment thereof have previously been disclosed in writing to the Accepting Authority/ Engineer-in-Charge; or

- (f) shall obtain a Contract with the BHAVINI LTD., as a result of wrong tendering or other non-bonafide methods of competitive tendering; or
- (g) Being an individual, or if a firm, any partner thereof, shall at any time be adjudged insolvent or have a receiving order or order for administration of his estate made against him or shall take any proceedings for liquidation or composition (other than a voluntary liquidation for purpose of amalgamation or reconstruction) under any insolvency Act for the time being in force or make any conveyance or assignment of his effects or composition or arrangement for the benefit of his creditors or purport so to do, or if any application be made under any insolvency Act for the time being in force for the sequestration of his estate or if a trust deed be executed by him for benefit of his creditors; or
- (h) Being a company, shall pass a resolution or the Court shall make an order for the liquidation of its affairs, or a receiver or manager on behalf of the debenture holders shall be appointed or circumstances shall arise which entitle the Court or debenture holders to appoint a receiver or manager; or
- (i) Shall suffer an execution being levied on his goods and allow it to be continued for a period of 21 days; or
- (j) Assigns, transfers, sublets (engagement of labour on a piece-work basis or of labour with materials not to be incorporated in the work shall not be deemed to be subletting) or attempts to assign, transfer or sublet the entire works or any portion thereof without the prior written approval of the Engineer-in-Charge;

The Accepting Authority may, without prejudice to any other right to remedy which shall have accrued or shall accrue thereafter to the BHAVINI LTD., by written notice determine/cancel the Contract as a whole or only such items of work in default from the Contract.

44.2. The Accepting Authority shall on such determination/cancellation have powers to:

- (a) take possession of the Site and any materials, constructional plant, implements, stores, etc. thereof; and/or
- (b) carry out the incomplete work by any means at the risk and cost of the Contractor.

44.3. In the event of the Engineer-in-Charge putting in force all or any of the powers vested in him under the preceding clause he may, if he so desires after giving a notice in writing to the Contractor, take possession of (or at the sole discretion of the Engineer-in-Charge which shall be final and binding on the Contractor) use as on hire (the amount of the hire money being also in the final determination of the Engineer-in-Charge) all or any tools, plant, materials and stores, in or upon the works, or the Site thereof belonging to the Contractor, or procured by the Contractor and intended to be used for the execution of the work/or any part thereof, paying or allowing for the same in account at the contract rates, or in the case of these not being applicable, at current market rates to be certified by the Engineer-in-Charge, whose certificate thereof shall be final, and binding on the Contractor, otherwise the Engineer-in-Charge by notice in writing may order the Contractor or his clerk of the works, foreman or other authorized agent to remove such tools, plant, materials or stores

from the premises (within a time to be specified in such notice) in the event of the Contractor failing to comply with any such requisition, the Engineer-in-Charge may remove them at the Contractor's expense or sell them by auction or private sale on account of the Contractor and his risk in all respects and the certificate of the Engineer-in-Charge as to the expenses of any such removal and the amount of the proceeds and expense of any such sale shall be final and conclusive against the Contractor.

- 44.4. On determination/cancellation of the Contract in full or in part, the Accepting Authority shall determine what amount, if any, is recoverable from the Contractor for completion of works or part of the works or in case the works or part of the works is not completed, the loss or damage suffered by the BHAVINI LTD.,. In determining the amount, credit shall be given to the Contractor for the value of the work executed by him up to the time of cancellation, the value of Contractor's material taken over and incorporated in the work, and use of tools, tackles and machinery belonging to the Contractor.
- 44.5. Any excess expenditure incurred or to be incurred by the BHAVINI LTD., in completing the works or part of the works or the loss or damage suffered or may be suffered by the BHAVINI LTD., as aforesaid after allowing such credit shall be recovered from any money due to the Contractor on any account, and if such money is not sufficient the Contractor shall be called upon in writing to pay the same within 30 days.
- 44.6. If the Contractor shall fail to pay the required sum within the aforesaid period of 30 days, the Engineer-in-Charge shall have the right to retain any or all of the Contractor's unused materials, construction plant, implements, temporary buildings etc. till the balance outstanding from the Contractor is recovered in accordance with the provisions of the Contract.
- 44.7. In the event of any one or more of the above courses being adopted by the Engineer-in-Charge, the Contractor shall have no claim to compensation for any loss sustained by him by reasons of his having purchased or procured any materials or entered into any engagements or made any advances on account or with a view to the execution of the work or the performance of the Contract. And in case action is taken under any of the provision aforesaid the Contractor shall not be entitled to recover or be paid any sum for any work thereof or actually performed under this Contract unless and until the Engineer-in-Charge had certified in writing the performance of such work and the value payable in respect thereof and he shall only be entitled to be paid so certified.
- 44.8. Any sums in excess of the amounts due to the BHAVINI LTD., and unsold materials, construction plant, etc., shall be returned to the Contractor, provided always that the cost or anticipated cost of completion by the BHAVINI LTD., of the works or part of the works is less than the amount which the Contractor would have been paid had he completed the works or part of the works, such benefit shall not accrue to the Contractor.
- 44.9. In any case in which any of the powers conferred upon the Engineer-in-Charge by this clause, shall have become exercisable and the same are not exercised, the non-exercise thereof shall not constitute a waiver of any of the conditions hereof and such powers shall notwithstanding be exercisable in the event of any future case of default

by the Contractor and the liability of the Contractor for compensation shall remain unaffected.

CLAUSE 45:

45. Liability for Damage, Defects or Imperfections and Rectifications thereof :

- 45.1. If the Contractor or his workman or employees shall injure or destroy any part of the building in which they may be working or any building, road, fence, etc., contiguous to the premises on which the work or any part of it is being executed, or if any damage shall happen to the work while in progress, the Contractor shall, upon receipt of a notice in writing in that behalf make the same good at his own expense. If it shall appear to the Engineer-in-Charge or his Representative at any time during construction or re-construction or prior to the expiration of the Defects Liability Period, that any work has been executed with unsound, imperfect or unskilled workmanship or that any materials or articles provided by the Contractor for execution of the work are unsound or of a quality inferior to that contracted for, or otherwise not in accordance with the Contract, or that any defect, shrinkage or other faults have appeared in the work arising out of defective or improper materials or workmanship, the Contractor shall, upon receipt of a notice in writing in that behalf from the Engineer-in-Charge, forthwith rectify or remove and re-construct the work so specified in whole or in part, as the case may require or as the case may be and/or remove the materials or articles so specified and provide other proper and suitable materials or articles at his own expense, notwithstanding that the same may have been inadvertently passed, certified and paid for and in the event of his failing to do so within the period to be specified by the Engineer-in-Charge in his notice aforesaid, the Engineer-in-Charge may rectify or remove and re-execute the work and/or remove and replace with others the materials or articles complained of, as the case may be, by other means at the risk and expense of the Contractor.

In such case the Engineer-in-Charge may not accept the item of work at the rates applicable under the contract but may accept such items at reduced rates as the competent authority may consider reasonable during the preparation of on account bills or final bill if the item is so acceptable without detriment to the safety and utility of the item and the structure or he may reject the work outright without any payment.

- 45.2. In case of repairs and maintenance works, splashes and droppings from white washing, painting etc; shall be removed and surfaces cleaned simultaneously with completion of these items of work in individual rooms, quarters or premises, etc., where the work is done, without waiting for completion of all other items of work in the Contract. In case the Contractor fails to comply with the requirements of this clause, the Engineer-in-Charge shall have the right to get the work done by other means at the cost of the Contractor. Before taking such action however, the Engineer-in-Charge shall give three days notice in writing to the Contractor.

CLAUSE 46:

46. Urgent works :

If any urgent work (in respect whereof the decision of the Engineer-in-Charge shall be final and binding) becomes necessary and the Contractor is unable or unwilling at once to carry it out, the Engineer-in-Charge may by his own or other workmen carry it

out as he may consider necessary. If the urgent work shall be such as the Contractor is liable under the Contract to carry out at his cost, all expenses incurred on it by the BHAVINI LTD., then shall be recoverable from the Contractor and be adjusted or set off against any sum payable to him.

CLAUSE 47:

47. Changes in Constitution :

Where the Contractor is a partnership firm, prior approval in writing of the Accepting Authority shall be obtained before any change is made in the constitution of the firm. Where the Contractor is an individual or a Hindu Undivided Family business concern such approval as aforesaid shall likewise be obtained before the Contractor enters into any partnership firm which would have the right to carry out the work hereby undertaken by the Contractor. If prior approval as aforesaid is not obtained, the Contract shall be deemed to have been assigned in contravention of Clause 44 hereof and the same action may be taken and the same consequences shall ensue as provided for in the said Clause 44.

CLAUSE 48:

48. Training of Apprentices :

The Contractor shall, during the currency of the Contract, when called upon by the Engineer-in-Charge engage and also ensure engagement by Sub-contractors and others employed by the Contractor in connection with the Works, such number of Apprentices and for such periods as may be required by the Engineer-in-Charge. The Contractor shall train them as required under The Apprentices Act, 1961 and shall be responsible for all obligations of the employer under the Act including the liability to make payment to apprentices as required under the Act.

CLAUSE 49:

49. Water Supply :

49.1. Unfiltered Water Supply :

The Contractor shall make his own arrangements for water required for the work and nothing extra will be paid for the same. This will be subject to the following conditions:

- (i) That the water used by the Contractor shall be fit for construction purposes to the satisfaction of the Engineer-in-Charge.
- (ii) The Engineer-in-Charge shall make alternative arrangements for supply of water at the risk and cost of the Contractor if the arrangements made by the Contractor for procurement of water are in the opinion of the Engineer-in-Charge, unsatisfactory.

49.2. Departmental Water Supply :

Water, if available, may be supplied to the Contractor by the BHAVINI LTD., subject to the following conditions:

- (i) The water charges as stipulated in Schedule 'A' shall be recovered from the Contractor.
- (ii) The Contractor shall make his own arrangement of water connection and laying or pipelines from existing mains of source of supply and metering.
- (iii) The BHAVINI LTD., do not guarantee to maintain uninterrupted supply of water and it will be incumbent on the Contractor to make alternative arrangements for water at his own cost in the event of any temporary breakdown in the Corporation's water mains so that the progress of his work is not held up for want of water. No claim of damage or refund of water charges will be entertained on account of such breakdown.

CLAUSE 50:

50. Power Supply :

Electric power, if available, will be provided at one point. All distribution system and metering unit should be arranged for by the Contractor himself at his own cost, complying with all relevant regulations. Charges for energy consumed shall be indicated by Engineer-in-Charge in Schedule 'A'. For the purpose of planning, the tenderer shall furnish along with his tender, the estimated requirement of electric power for execution of work in terms of maximum demand and also daily energy in kwh.

Disruption in supply or non-availability of electricity shall not entitle the Contractor for any claim for compensation either in time or money. He shall make prior arrangements for such contingency to carry on with the work without interruption.

CLAUSE 51:

51. Land :

51.1. Land for Contractor's Office, Stores, Workshop etc.

The Engineer-in-Charge shall, at his discretion and for the duration of the Contract, make available at site, land for construction of Contractor's field office, workshop, stores, magazine for explosives in isolated locations, assembling yard, etc., required for execution of the Contract. Leveling and dressing of Site, any construction of temporary roads, offices, workshops, etc., as per plan approved by the Engineer-in-Charge shall be done by the Contractor at his own cost.

51.2 Land for Contractor's Colony:

Land will be given, if available by the BHAVINI LTD., for the Contractor's colony. The Contractor may indicate the requirement of land for the colony along with his

tender. Land will be made available at for the period of Contract. The Contractor shall make his own arrangement for water supply, electric supply, sanitation, access road and general cleanliness of his colony. All these amenities shall be got approved by the Engineer-in-Charge prior to construction of the camp.

51.3 GENERAL

In respect of any land allotted to the Contractor for purposes of or in connection with the Contract, the Contractor shall be a licensee subject to the following and such other terms and conditions as may be imposed by licenser:

- (i) that he shall pay a nominal license fee of Re.1 (one) per year or part of a year for use and occupation, in respect of each and every separate area of land allotted to him.
- (ii) that such use or occupation shall not confer any right of tenancy of the land to the Contractor.
- (iii) the Contractor shall be liable to vacate the land on demand by the Engineer-in-Charge.
- (iv) that the Contractor shall have no right to any construction over this land without the written permission of the Engineer-in-Charge. In case, he is allowed to construct any structure he shall have to demolish and clear the same before handing over the completed work unless agreed to the contrary.

On completion of work, the Contractor shall handover the land duly cleaned to the Engineer-in-Charge. Until and unless the Contractor has handed over the vacant possession of land allotted to him for the above purposes, the payment of his final bill shall not be made. The Contractor shall be made liable to pay for the use and occupation at the rates to be determined by the Engineer-in-Charge, if the Contractor overstay in the land after the Contract is closed.

IV.VALUATION AND PAYMENT.

CLAUSE 52:

52. Records and Measurement :

- 52.1. Engineer-in-Charge shall, except as otherwise stated, ascertain and determine by measurement the value of work done in accordance with the Contract.
- 52.2 All items having a financial value shall be entered in Measurement Book, Level Book etc. prescribed by the BHAVINI LTD., so that a complete record is obtained of all work performed under the Contract.
- 52.3 Measurement shall be taken jointly by the Engineer-in-Charge or his authorized representative and by the Contractor or his authorized representative from time to time.
- 52.4 Before taking measurements of any work, the Engineer-in-Charge or his authorized representative shall give a reasonable notice to the Contractor. If the Contractor fails to attend or send his authorized representative for measurement after such a notice or fails to counter-sign or to record his objections within a week from the date of measurement, then in any such event, measurements taken by the Engineer-in-Charge or by his authorized representative shall be taken to be the correct measurement of the work.
- 52.5 The Contractor, shall without extra charge, provide all assistance with every appliance, labour and other things necessary for measurements.
- 52.6 Measurements shall be signed and dated by both parties from time to time on the Site during the progress of the Work. If the Contractor objects to any of the measurements recorded on behalf of the BHAVINI LTD., a note to that effect shall be made with reasons and such note shall be signed and dated by both parties engaged in taking the measurements. The decision of Engineer-in-Charge on such dispute or difference or interpretation shall be final and binding on both the parties and shall be beyond the scope of the settlement of dispute by Arbitration in respect of all contract items, substituted items, extra items and deviations.
- 52.7 When the estimate on which a tender is made includes lumpsums in respect of parts of the work the Contractor shall be entitled to payment in respect of the items of work involved or the part of the work in question at the same rates as are payable under this contract for such items, or if the part of the work in question is not, in the opinion of the Engineer-in-Charge payable of measurement, the Engineer-in-Charge may at his discretion pay the lumpsum amount entered in the estimate, and the certificate in writing of the Engineer-in-Charge shall be final and conclusive against the Contractor with regard to any sum or sums payable to him under the provisions of the clause.

CLAUSE 53

53. Method of Measurement :

Except where any general or detailed description of the work in quantities expressly shows to the contrary, Schedule of Quantities shall be deemed to have been prepared and measurements shall be taken in accordance with the procedure set forth in Schedule of Rates/Specification, notwithstanding any provision in the relevant Standard Method of Measurement or any general or local custom. In the case of items which are not covered by the Schedule or Rates/Specification, measurement shall be taken in accordance with relevant Standard Method of Measurement issued by the Bureau of Indian Standards and if for any item no such standard is available, then a mutually agreed method shall be followed

CLAUSE 54:

54. Payment on Account :

- 54.1. Interim bills shall be submitted by the Contractor for the work executed on the basis of such recorded measurement on the format of the BHAVINI LTD., at intervals mentioned in Schedule 'A' on or before the date fixed by the Engineer-in-Charge. The Engineer-in-Charge shall then arrange to have the bill verified.
- 54.2. Payment "On Account" for amount admissible shall be made upon the Engineer-in-Charge certifying the sum to which the Contractor is considered entitled by way of interim payment for the following:
- (a) For works: All work executed, after deducting therefrom the amounts already paid, the security deposit and such other amounts as may be deductible or recoverable in terms of the Contract.
 - (b) For Materials: The Contractor on signing an indenture in the form to be specified by the Engineer, 75% of the cost (as assessed by the Engineer-in-Charge) of any materials which are in the opinion of the Engineer-in-Charge reasonably required in accordance with the Contract and have been brought to Site for incorporation in the Works and are safeguarded against loss due to any cause whatsoever to the satisfaction of the Engineer-in-Charge but have not been so incorporated. However, in case of perishable materials the Contractor shall provide an insurance cover for the full cost. No secured advance shall be payable on high risk material such as ordinary glass, sand, petrol, diesel etc.
- 54.3 The advance payments under (b) above shall be adjusted as and when materials are utilized in the Works.
- 54.4 Payment of the Contractor's on account bill shall be made by the BHAVINI LTD., within 10 days from the date of submission of the bill subject to the acceptance of the same by the Engineer-in-Charge. Where it is likely to take more time for acceptance of the bill, an advance payment of 75% of the bill amount shall be released to the Contractor within 3 working days and balance payment shall be released within 21 days of submission of bill.

- 54.5 Any interim bill paid, relating to work done or materials delivered, may be modified or corrected by any subsequent interim bills or by the final bill. No Certificate of the Engineer-in-Charge supporting an interim payment shall itself be conclusive evidence that any work or materials to which it relates is/are in accordance with the Contract.
- 54.6 Pending consideration or extension of date of completion, interim payments shall continue to be made as herein provided, without prejudice to the right of the BHAVINI LTD., to take action under the terms of the contract for delay in the completion of work, if the extension of date of completion is not granted by the competent authority.
- 54.7 Engineer-in-Charge may certify to the effect that the work has been completed upto level in question and make interim advance payment without detailed measurements for the work done (other than foundations, items to be covered under finishing items) upto lintel level (including sunshades etc.) and slab level, for each floor working out at 75% of the assessed value. The advance payment so allowed shall be adjusted in the subsequent interim bill by taking detailed measurement thereof.

CLAUSE 55:

55. Time Limit for Payment of Final Bill :

- 55.1. The final bill shall be submitted by the Contractor within 90 days of physical completion of the work. No further claims shall be made by the Contractor after submission of the final bill and these shall be deemed to have been waived and extinguished. Payment of those items of the bill in respect of which there is no dispute and of items in dispute, for quantities and at rates as approved by the Engineer-in-Charge, shall be made within the period specified hereunder. The period shall be reckoned from the date of receipt of the bill by the Engineer-in-Charge.
- (i) If the tendered value of work is upto Rs.50 lakhs : 3 months
- (ii) If the tendered value of work exceeds Rs.50 lakhs : 6 months
- 55.2. After payment of the amount of the final bill as aforesaid has been made, the Contractor may, if he so desires, reconsider his position in respect of the disputed portion of the final bill and if he fails to do so within 90 days, his disputed claim shall be dealt with as provided in the Contract.

CLAUSE: 56

56. Contract Price Adjustment:

- 56.1. The rates quoted by the tenderer shall be the Base Price, which will be subjected to PRICE ADJUSTMENTS in accordance with the conditions and formula prescribed herein and further subject to satisfying the requirements specified in this clause only.
- 56.2. The "Contract Price" (for definition please refer Clause No. 3 (e) of G.C.C. "Definitions") as awarded shall be the Base Price, unless other wise specified.

A certain fixed percentage of the base price shall not be subject to any price adjustment. The balance percentage to be specified shall be of Identified Components

towards Labour, Material(s) (Not being material supplied/or services rendered at fixed prices by the BHAVINI LTD., in accordance with Clauses 14, 15, 49 and 50 thereof) and P.O.L. and shall be subjected to Price Adjustment.

The fixed component and the identified components shall vary from contract to contract depending upon the scope of work(s) and shall be furnished in the Special Conditions to Contract, which will be attached to the tender documents.

- 56.3. The actual amount of price adjustment shall be determined by satisfying the conditions specified herein.
- 56.4. The price adjustment formula for the various components of the Contract Price, shall be construed as stipulated hereinafter. The formula designed for governing and calculating the price adjustment to be applied to the contract price shall be as follows:

$$ACV1 = CV \left[F + \frac{l.L1}{Lo} + \frac{m.M1}{Mo} + \frac{d.D1}{Do} \right]$$

Where :

ACV1 – adjusted contract price i.e., value of work done after application of above price adjustment formula.

CV – base contract price, subject to price adjustment, i.e. the value of the work done in the given period for which the Price Adjustment is to be calculated. (Excluding cost of material supplied or services rendered at fixed prices by the BHAVINI LTD., under clauses 14, 15, 49 and 50, cost of extra items, rates for which have been worked out based on market rates).

F – Fixed component portion of contract price which will not be subjected to any adjustment under this formula or otherwise (and will be quantified from contract to contract in the Schedule 'A').

l – Labour component of the contract price which will be subjected to adjustment, (to be quantified from contract to contract in the Schedule 'A').

m – Material component (excluding Owner issue materials at fixed rates) of the contract price which will be subject to adjustment, (and will be quantified from contract to contract, in the Schedule 'A').

d – P.O.L. component of the contract price which will be subject to adjustment; (and will be quantified from contract to contract, in the Schedule 'A'). The variation in this component will be available to contract(s) as defined in 56.6.

L – Minimum wages in Rupees of an unskilled adult mazdoor, fixed under any law, statutory rule or order as applicable on the last date of the month previous to the one under consideration.

M- Average All India Wholesale Price Index for “All commodities” as published by the Economic Adviser to Government of India, Ministry of Industry and Commerce for the period under consideration.

D – Average Index Number of Wholesale Price for group (fuel, power, light and lubricant) as published by Economic Adviser to Government of India, Ministry of Industry and Commerce for the period under consideration.

SUBSCRIPT:

‘O’ – refers to the values of the above mentioned Minimum Wages/Material, POL Indices as on 7 days prior to the date of opening of tenders.

‘I’ – refers to the values of corresponding Minimum Wages/Material, POL Indices as applicable for the month prior to the month in which the work is executed for which adjustment is applicable, respectively.

56.5 The value of ‘F’ as specified in Bid Documents/Special Conditions of Contract will remain unchanged and fixed and shall not be disputed.

56.6 For contract(s) where completion period as stipulated in NIT/or work order is less than and upto 12 (twelve) months only price variations due to POL component is permitted and no Contract price adjustment due to labour or material(s) component will be allowed in any circumstances.

56.7 Price Adjustment(s) shall be calculated for the quantum of works executed for the month or the period of the bill as per agreed work schedule. For the purposes of payment/recovery or price variation provisions, the Contractor would be eligible for such claims or shall be liable for refund on the quantum of work scheduled to have been executed in the month or period as per the agreed work schedule or the actual quantum of work done provided always that such quantum of work done is more than or equal to the scheduled quantum of work as per the agreed work schedule. In other words the Contractor shall neither be eligible for these claims nor liable for payment/refund under these provisions if the work has been delayed beyond the scheduled date(s) for reason attributable to Contractor. However, the Contractor would be eligible for claim or liable for refund for Price Adjustment(s) for quantities of work executed beyond the schedule dates based on the value of indices as applicable to the scheduled dates of execution for such delayed work provided that if the indices during the extended period are lower than the indices during scheduled dates of execution, then lower indices shall be applicable.

56.8 Additional, altered or substituted items of work, derived from the agreed Schedule of Rate (attached in Award letter) will also attract price adjustment as per this clause. No variation adjustment is payable for the rate/amount of the additional, altered or substituted items of work when derived from or based on Market Rates as per Clause 10.3.4 and 10.3.5. No price adjustment for the cost of Owner issue material (viz.) steel and cement or any other item(s) issued from Owner’s store’s and/or services provided shall be applicable, which are issued at fixed rates to the Contractor. In the case of materials brought to site for which any secured advance is included in the bill, the value of such advance shall be added to the cost of work shown in the bill for operation of this Clause. Similarly, when such materials are incorporated in the work

and secured advance is deducted from the bill, this amount should be deducted from the cost of the work shown in the bill, running or final.

- 56.9 Every month after the award of Contract, the Contractor shall submit to the Engineer-in-Charge, a written notice of the changes, if any, that have occurred in the specified indices of Material/POL and in minimum wages for labour during the previous reporting period containing the effective date of such change, the amount of change for the claim of the amount of contract price adjustment with authenticated documentary evidence of the relevant published indices/minimum wages to substantiate the price adjustment.
- 56.10 Provided further that such payment/refund shall not be operative and payable after the Schedule expiry of the contract period or authorized extended contract period.
- 56.11 In case, the works or items of work, or group of items of work, are delayed beyond the schedule date for the work, for reasons attributable to the Contractor, the price adjustment provisions shall not be applicable for the period of time between the schedule date and the actual date, but for as provided above in sub-clause 56.7.
- 56.12 For this purpose, the schedule date of works shall be as identified in line with provisions of clause entitled "Time and Extension for Delay" and/or "The Bar Chart" (which will be discussed and finalized before Award of Work) wherein the separate period of completion has been specified/agreed to for items, or groups of items or works.
- 56.13 Total Adjusted Contract Price:
- The total adjusted contract price shall be:
- (Sigma) ACV1 + Other elements of Contract Price, if any.
- 56.14 Except as provided herein, no other expenditure incurred by the Contractor, due to levy of additional/increase in taxes, duties, octroi, royalty, levies, insurance premium(s), benefits to Workers/Labours or any other Clause(s)/item(s) due to any reason whatsoever, shall be payable to the Contractor.
- 56.15 Tenders specifying provisions other than those specified above run the risk of rejection.

CLAUSE 57:

57. Mobilisation Advance (For Contracts Valued at over Rs.100 lakhs):

Mobilisation Advance shall be granted to the Contractor, if required by him, with the following conditions being fulfilled.

- a) Advance shall be granted where the estimated cost of work put to tender is Rs.100 lakhs or more.
- b) The amount of mobilization advance shall be limited to percentage specified in Schedule 'A' and shall be granted under following two categories:

- i) Lumpsum Advance against a non-revocable Bank guarantee acceptable to the BHAVINI LTD.,.
- ii) Advance at 75% of the purchase price of New Plant and Equipment acquired for the work and brought to Site, against production of documents in support thereof and that such plant and equipment are hypothecated in favour of the BHAVINI LTD., in the form required by the BHAVINI LTD.,. Further this new plant and equipment for which mobilization advance applied for are not in excess of requirement and price there of considered to be reasonable by the Engineer-in-Charge.
- c) When advance granted is more than Rs.50 lakhs, it shall be released in two or more equal installments as deemed necessary. The subsequent installments shall be released only on submission of proof of bonafied utilization of earlier installments by the Contractor and satisfaction of Engineer-in-Charge thereof.
- d) The recovery of advance shall be regulated in suitable installments commencing from 2nd RA bill or after 10% of the work is completed, whichever is earlier.
- e) The payment of mobilization advance by itself shall not be considered as one RA bill for this purpose.
- f) The entire amount of advance with interest shall be recovered before 80% of the work is completed.
- g) Rate of interest to be charged on mobilization advance shall be as mentioned in Schedule 'A'. Recovery shall be based on compound interest on yearly rest basis.
- h) Interest on the advance shall be calculated on each installment of recovery from the date of its payment as Mobilisation Advance till the preceding day of recovery from Bill.
- i) Where advance payment to Contractor against "On Account Bill" is to be made after effecting the recovery of Mobilisation Advance installment from the bill, the interest shall be calculated till the preceding day of passing the bill for advance payment.
- j) If the amount payable under any interim bill is not sufficient to cover all deduction to be made for sums advanced and other sums deductible therefrom, the balance outstanding shall be deducted from subsequent interim bills as may be necessary, failing that, as otherwise provided for in the Contract.
- a) If for any reason except a default of the Contractor, the work under the contract is suspended or is to be suspended for more than 15 days, the Contractor shall be at liberty to remove the plant and equipment or any part thereof hypothecated to the BHAVINI LTD., under this clause to any other works Site of the Contractor for carrying on his other works, on his furnishing prior to such removal a bank guarantee acceptable to the BHAVINI LTD., for the amount of the outstanding advance granted under this clause with interest and undertaking to bring back to the Site, before expiry or the period of suspension the plant and equipment as may be necessary for completion of the works. If such plant and equipment are not

brought back, the Contractor shall forthwith repay the amount of the loan outstanding with interest.

CLAUSE 58:

58. Over Payments & Under Payments:

- 58.1. Wherever any claim for the payment of a sum of money to the BHAVINI LTD., arises out of or under this Contract against the Contractor, the same may be deducted by the BHAVINI LTD., from any sum then due or which at any time thereafter may become due to the Contractor under this Contract and failing that under any other Contract with the BHAVINI LTD., or from any other sum due to the Contractor from the BHAVINI LTD., which may be available with the BHAVINI LTD., or from his security deposit; or he shall pay the claim on demand.
- 58.2. The BHAVINI LTD., reserves the right to carry out post payment audit and technical examination of the final bill including all supporting vouchers, abstracts etc. The BHAVINI LTD., further reserves the right to enforce recovery of any overpayment when detected, notwithstanding the fact that the amount of the final bill may be included by one of the parties as an item of dispute before an arbitrator appointed under Clause 59 of this Contract and notwithstanding the fact that the amount of the final bill figures in the arbitration award.
- 58.3. If as a result of such audit and technical examination any overpayment is discovered in respect of any work done by the Contractor or alleged to have been done by him under the Contract, it shall be recovered by the BHAVINI LTD., from the Contractor by any or all of the methods prescribed above. If any under-payment is discovered, the amount shall be duly paid to the Contractor by the BHAVINI LTD.,.
- 58.4. Provided that the aforesaid right of the BHAVINI LTD., to adjust over payments against amounts due to the Contractor under any other Contract with the BHAVINI LTD., shall not extend beyond the period of two years from the date of payment of the final bill or in case the final bill is a MINUS bill, from the date the amount payable by the Contractor under the MINUS final bill is communicated to the Contractor.
- 58.5. Any amount due to the Contractor under this Contract for under-payment may be adjusted against any amount then due or which may at any time thereafter become due before payment is made to the Contractor, from him to the BHAVINI LTD., on any other Contract or account whatsoever.
- 58.6. The Contractor shall be deemed to have given its consent for adjustment of the dues payable to the Contractor in other Contracts either at the same Power Project/Power Station of BHAVINI LTD., against the liability or outstanding dues in respect of this Contract. Similarly, the Contractor gives its consent to adjust/set off the dues payable in this contract against the outstanding dues recoverable by BHAVINI LTD., from the Contractor either in other Contract at the same Power Project/Power Station or any other Power Project/Power Station of BHAVINI LTD.,.
- 58.7. All sums payable by way of compensation under any of these conditions shall be considered as reasonable compensation to be applied to the use of the BHAVINI LTD., without reference to the actual loss or damage sustained and whether or not any damage shall have been sustained.

V. ARBITRATION AND LAW, ETC.,

CLAUSE 59:

59. Arbitration :

Except where otherwise provided for in the Contract, all questions and disputes relating to the meaning of the specifications, designs, drawings and instructions herein before contained in this Contract or as to the quality of the workmanship or materials used on the work or arising out of the terms and conditions of the Contract whether during the progress of the work or after the completion or abandonment thereof, at the request of the aggrieved party in writing, shall be referred to the sole arbitration of the person nominated and appointed by the Chairman and Managing Director, Bharatiya Nabhikiya Vidyut Nigam Limited, in respect of the Contracts entered for and on behalf of the BHAVINI LTD., by any Officer/Authority of the BHAVINI LTD.,.

The parties of the Contract agree that it will be no objection to any such appointment that the sole arbitrator so appointed is a BHAVINI LTD., Employee. The Sole Arbitrator to whom the matter is originally referred being transferred or having vacated his office or being unable to act for any reason whatsoever, the Chairman and Managing Director, Bharatiya Nabhikiya Vidyut Nigam Limited, as aforesaid at the time of such transfer, vacation of office or inability to act, shall appoint another person to act as arbitrator in accordance with the terms of the Contract. Such person as and when appointed shall proceed with the reference from the stage at which it was left by his predecessor in accordance with the rules, regulations and the law of the land. It is also a term of this Contract that no person other than a person appointed by the Chairman and Managing Director, Bharatiya Nabhikiya Vidyut Nigam Limited, as aforesaid should act as Arbitrator and if for any reason that is not possible, the matter is not to be referred to arbitration at all.

It is also the term of the Contract that the party invoking the arbitration clause shall specify the dispute(s) or difference(s) to be referred to the arbitration under this Contract together with the amount(s) claimed in respect of each such dispute(s) or difference(s). In an arbitration invoked at the instance of either party to the Contract, the Arbitrator would be free to consider the counterclaims of the other party or even though they are not mentioned in the reference to arbitration.

Subject as aforesaid, the provisions of the Arbitration and Conciliation Act, 1996 (No.26 of 1996) or any statutory modification or re-enactment thereof and rules made thereunder and for the time being in force shall apply to the arbitration proceeding under this Clause.

CLAUSE 60:

60. Laws Governing the Contract :

This Contract shall be governed by the Indian Laws for the time being in force.

CLAUSE 61:

61. Relations working in BHAVINI LTD:

The Contractor shall not be permitted to tender for works in the BHAVINI LTD., units (Responsible for award and execution of work) in which his near relative is posted as an officer in any capacity. He shall also intimate the names of persons who are working with him in any capacity or are subsequently employed by him and who are near relatives of any officer in the BHAVINI LTD.,. Any breach of this condition by the Contractor would render him liable to be removed from the approved list of Contractors of the BHAVINI LTD.,.

NOTE:- By term “Near Relatives” is meant wife, husband, parents and grant parents, children and grant children, brothers and sisters, uncles and aunts, cousins and their corresponding in-laws.

VI. CONTRACTORS' LABOUR REGULATIONS AND FORMS

(See Clause 16)

1. Definitions:

In these regulations, unless otherwise expressed or indicated, the following words and expression shall have the meaning hereby assigned to them:

- (a) "Labour means workers employed by Contractor directly, or indirectly through a sub-contractor or by an agent on his behalf on a payment not exceeding Rs.1000/- per month.
- (b) "Fair Wage" mean wages, which shall include wages for weekly day of rest and other allowances, whether for time or piece work, after taking into consideration prevailing market rates for similar employments in the neighbourhood but shall not be less than the minimum rates or wages fixed under The Minimum Wages Act.
- (c) "Contractor" for the purpose of these regulations shall include an agent or sub-contractor employing labour on the work taken on Contract.
- (d) "Inspecting Officer" means any Labour Enforcement Officer, or Assistant Labour Commissioner of the Chief Labour Commissioner's Organisation.
- (e) "Form" means a form appended to these Regulations.

2. Notice of commencement:

The Contractor shall, within SEVEN days of commencement of the work, furnish in writing to the Inspecting Officer of the area concerned the following information:

- (a) Name and situation of the work
- (b) Contractor's Name and Address
- (c) Particulars of the Department for which the work is undertaken.
- (d) Name and address of sub-contractors as and when they are appointed.
- (e) Commencement and probable duration of the work.
- (f) Number of workers employed and likely to be employed.
- (g) "Fair Wages" for different categories of workers.

3. (i) Number of hours of work which shall constitute a normal working day:-

The number of hours which shall constitute a normal working day for an adult shall be NINE hours. The working day of an adult worker shall be so arranged that inclusive of intervals, if any, for rest, it shall not spread over more than twelve hours on any day; when an adult worker is made to work for more than nine hours on any day or for more than FORTY EIGHT hours in any week, he shall, in respect of overtime work, be paid wages at double at ordinary rate of wages.

(ii) Weekly day of rest:

Every worker shall be given a weekly day of rest which shall be fixed and notified at least TEN days in advance. A worker shall not be required or allowed to work on the weekly rest day unless he has or will have a substituted rest day, on one of the FIVE day immediately before or after the rest day. Provided that no substitution shall be

made which will result in the worker working for more than TEN days consecutively without a rest day for a whole day.

Where in accordance with foregoing provisions a worker works on the rest day and has been given a substituted rest day he shall be paid wages for the work done on the weekly rest day at the overtime rate of wages.

NOTE: - The expression “Ordinary Rate of Wages” means the fair wage the worker is entitled to.

4. Display of notice regarding Wages, Weekly Day of Rest etc:

The Contractor shall, before he commences his work on Contract, display and correctly maintain and continue to display and correctly maintain in a clean and legible condition in conspicuous places on the works, notice in English and in the local Indian Language spoken by majority of workers, giving the rate of fair wages, the hours of work for which such wages are payable, the weekly rest days workers are entitled to and name and address of the Inspecting Officer. The Contractor shall send a copy each of such notices to the Inspecting Officers.

5. Fixation of Wage Periods:

The Contractor shall fix wage periods in respect of which wages shall be payable. No wage period shall normally exceed one week.

6. Payment of Wage.

- (i) Wages due to every worker shall be paid to him direct. All wages shall be paid in current coins or currency or in both.
- (ii) Wages of every worker employed on the Contract shall be paid where the wage period is one week, within THREE days from the end of the Wage period; and in any other case before the expiry of the SEVENTH day or TENTH day from the end of the wage period according as the number of workers does not exceed 1,000 or exceeds 1,000.
- (iii) When employment of any worker is terminated by or on behalf of the Contractor, the wages earned by him shall be paid before expiry of the day succeeding the one on which his employment is terminated.
- (iv) Payment of wages shall be made at the work site on a working day except when the work is completed before expiry of the wage period, in which case final payment shall be made at the work site within 48 hours of the last working day and during normal time.

NOTE: - The term “Working Day” means a day on which the work on which labour is employed, is in progress.

7. Register of Workmen:

A register of workmen shall be maintained in the Form appended to these regulations and kept at the work Site or as near to it as possible and relevant particulars of every workman shall be entered therein within THREE days of his employment.(Ref. Appendix. I).

8. Employment Card:

The Contractor shall issue an employment card in the Form appended to these regulations to each worker on the day of work or entry into his employment. If a worker already has any such card with him issued by the previous employer, the Contractor shall merely endorse that Employment Card with relevant entries. On termination of employment the Employment Card shall again be endorsed by the Contractor and returned to the worker. (Appendix.II).

9. Register of Wages etc:

(i) A Register of Wages-Cum-Muster Roll in the Form appended to these regulations shall be maintained and kept at the work Site or as near to it as possible. (Appendix.III).

(ii) A wage slip in the Form appended to these regulations shall be issued to every worker employed by the Contractor at least a day prior to disbursement of wages. (Appendix.IV).

10. Fines and deductions which may be made from Wages:

(i) Wages of a worker shall be paid to him without any deduction of any kind except the following:

(a) Fines;

(b) deductions for absence from duty; i.e. from the place of his employment he is required to work. The amount of deduction shall be in proportion to the period for which he was absent;

(c) deduction for damage to or loss of goods expressly entrusted to the employed person for custody, or for loss of money which he is required to account for, where such damage or loss is directly attributable to his neglect or default;

(d) deductions for recovery of advances or for adjustment or overpayment of wages; Advance granted shall be entered in a register; and

(e) any other deduction which the BHAVINI LTD., may from time to time allows.

(ii) No fines shall be imposed on any worker say in respect of such acts and omissions on his part as has been approved by the Chief Labour Commissioner.

(iii) No fine shall be imposed on a worker and no deductions for damage or loss shall be made from his wages until the worker has been given an opportunity of showing causes against such fines or deductions.

(iv) The total amount of fines which may be imposed in any one wage period on a worker shall not exceed an amount equal to three paise in a rupee of the wages payable to him in respect of that wage period.

(v) No fine imposed on a worker shall be recovered from him in installments, or after expiry of SIXTY days from the date on which it was imposed. Every fine shall be deemed to have been imposed on the day of the act or omission in respect of which it was imposed.

- (vi) The Contractor shall maintain both in English and the local Indian language a list, approved by the Chief Labour Commissioner, clearly stating the acts and omissions for which penalty or fine may be imposed on a workman and display it in a good condition in a conspicuous place on the work Site. (Appendix.V).
- (vii) The Contractor shall maintain a register of fines and the register of deductions for damage or loss in the Forms appended to these regulations which should be kept at the place of work. (Appendix.VI & VII).

11.Register of Accidents:

The Contractor shall maintain a register of accidents in such form as may be convenient at the work place but the same shall include the following particulars:

- (a) Full particulars of the labourers who met with accident.
- (b) Rate of Wages.
- (c) Sex.
- (d) Age.
- (e) Nature of accident and cause of accident.
- (f) Time and date of accident.
- (g) Date and time when admitted in hospital.
- (h) Date of discharge from the hospital.
- (i) Period of treatment and result of treatment .
- (j) Percentage of loss of earning capacity and disability as assessed by Medical Officer.
- (k) Claim required to be paid under Workmen's Compensation Act.
- (l) Date of payment of compensation.
- (m) Amount paid with details of the person to whom the same was paid.
- (n) Authority by whom the compensation was assessed.
- (o) Remarks.

12.Preservation of Registers:

The Register of workmen and the Register of Wages-Cum-Muster Roll required to be maintained under these Regulations shall be preserved for 3 years after the date on which the last entry is made therein.

13. Enforcement:

The Inspecting Officer shall either on his own motion or on a complaint received by him carry out investigations, and send a report to the Engineer-in-Charge specifying the amounts representing Workers' dues and amount of penalty to be imposed on the Contractor for breach of these Regulations, that have to be recovered from the Contractor, indicating full details of the recoveries proposed and the reasons therefore. It shall be obligatory on the part of the Engineer-in-Charge on receipt of such a report to deduct such amounts from payment due to the Contractor.

14. Disposal of amounts recovered from the Contractor:

The Engineer-in-Charge shall arrange payment to workers concerned within FORTY FIVE days from receipt of a report from the Inspecting Officer except in cases where the Contractor had made an appeal under Regulation 16 of these Regulations. In cases where there is an appeal, payment of workers dues would be arranged by the

Engineer-in-Charge, wherever such payments arise, within THIRTY days from the date of receipt of the decision of the Regional Labour Commissioner (RLC).

15. Welfare Fund:

All moneys that are recovered by the Engineer-in-Charge by way of workers dues, which could not be disbursed to workers within the time limit prescribed above, due to reasons such as whereabouts of workers not being known, death of workers, etc., and also amounts recovered as penalty, shall be credited to a Fund to be kept under the custody of the BHAVINI LTD., for such benefit and welfare of workmen employed by Contractors.

16. Appeal against decision of Inspecting Officer:

Any person aggrieved by a decision of the Inspecting Officer may appeal against such decision to the Regional Labour Commissioner concerned within THIRTY days from the date of the decision, forwarding simultaneously a copy of his appeal to the Engineer-in-Charge. The decision of the Regional Labour Commissioner shall be final and binding upon the Contractor and the workmen.

17. Representation of parties:

(i) A workman shall be entitled to be represented in any investigation or enquiry under these Regulations by an Officer of a registered trade union of which he is a member or by an Officer of a Federation of Trade Unions to which the said trade union is affiliated or where the workman is not a member of any registered trade union, by an official of a registered trade union, connected with, or by any other workman employed in, the industry in which the worker is employed.

(ii) A Contractor shall be entitled to be represented in any investigation enquiry under these Regulations by an officer of an association of Contractors of which he is a member or by an Officer of a Federation associations of contractors to which the said association is affiliated where the contractor is not a member of any association of contractors, by an officer of association of employers, connected with, or by any other employer engaged in, the industry in which the contractor is engaged.

(iii) No party shall be entitled to be represented by a legal practitioner in investigation or enquiry under these Regulations.

18. Inspection of Books and other Documents:

The Contractor shall allow inspection of the Registers and other documents prescribed under these Regulations by Inspecting Officers and the Engineer-in-Charge or his authorized representative at any time and by the worker or his agent on receipt of due notice at convenient time.

19. Interpretation etc:

On any question as to the application, interpretation or effect of these Regulations, the decision of the Chief Labour Commissioner or Deputy Chief Labour Commissioner (Central) shall be final and binding.

20. Amendments:

Central Government may from time to time, add to or amend these Regulations and issue such directions as it may consider necessary for the proper implementation of these Regulations or for the purpose of removing any difficulty which may arise in the administration thereof.

6. WAGE SLIP

(Regulation 9)

(i) Name of the Contractor

(ii) Place

1. Name of the Workers with father's/husband's name :

2. Nature of Employment :

3. Wage period :

4. Rate of Wages Payable :

5. Total attendance/Unit of work done :

6. Date on which overtime worked :

7. Overtime Wages :

8. Gross Wages Payable :

9. Total Deductions (indicating nature of deductions) :

10. Net Wages Payable :

Contractor's Signature/
Thumb Impression

Employees' Signature/
Thumb Impression

LIST OF ACTS AND OMISSIONS FOR WHICH FINES CAN BE IMPOSED

(Regulation No.10 VI)

In accordance with Rule 10 (VI) Contractor's Labour Regulations to be displayed prominently at the Site of work both in English and Local Language.

1. Wilful insubordination or disobedience, whether alone or in combination with other.
2. Theft, fraud or dishonesty in connection with the Contractors beside a business or property of BHAVINI LTD.
3. Taking or giving bribes or any illegal gratifications.
4. Habitual late attendance.
5. Drunkenness, fighting, riotous or disorderly or indifferent behavior.
6. Habitual negligence.
7. Smoking near or around the area where combustible or other materials are locked.
8. Habitual indiscipline.
9. Causing damage to work in the progress or to property of the BHAVINI LTD., or of the Contractor.
10. Sleeping on duty.
11. Malingering or slowing down work.
12. Giving of false information regarding name, age, father's name etc.,
13. Habitual loss of wage cards supplied by the employers.
14. Unauthorized use of employer's property for manufacturing or making of unauthorized articles at the work place.
15. Bad workmanship in construction and maintenance by skilled workers which is not approved by the BHAVINI LTD., and for which the Contractors are compelled to undertake rectifications.
16. Making false complaints and/or misleading statements.
17. Engaging on trade within the premises of the establishments.
18. Any unauthorized divulgence of business affairs of the employees.
19. Collection or canvassing for the collection of any money within the premises of an establishment unless authorized by the employer.
20. Holding meeting inside the premises without previous sanction of the employers.
21. Threatening or intimidating any workman or employer during the working hours within the premises.
22. Not following safety instructions and practices.

VII. MODEL RULES FOR LABOUR WELFARE

(See Condition 16)

1. Definitions:

- (a) "Work Place" means a place at which, on a average, twenty or more workers are employed.
- (b) "Large work Place" means a place at which, on an average 500 or more workers are employed.

2.First Aid:

At every workplace, there shall be maintained in a readily accessible place first aid appliances including an adequate supply of sterilized dressings and sterilized cotton wool as prescribed in the Factory Rules of the State in which the work is carried on. The appliances shall be kept in good order and in large work-places, they shall be placed under the charge of a responsible person who shall be readily available during working hours.

At large workplaces, where hospital facilities are not available within easy distance of the works First Aid Posts shall be established and be run by trained compounders.

Where large work places are remotely situated and far away from regular hospitals, an indoor ward shall be provided with one bed for every 260 employees.

Where large workplaces are situated in cities, towns or in their suburbs and no beds are considered necessary owing to proximity of city or town hospitals, suitable transport shall be provided to facilitate removal of urgent cases to these hospitals. At other workplaces, some conveyance facilities shall be kept readily available to take injured person or person suddenly taken seriously ill, to the nearest hospital.

At large workplaces these shall be provided and maintained an ambulance room of the prescribed sizes, containing the prescribed equipment and in the charge of such medical and nursing staff as may be prescribed. For the purpose the relevant provisions of the Factory Rules of the State Government of the area where the work is carried on may be taken as the prescribed standard.

3.Accommodation for Labour:

The Contractor shall during the progress of the works provide, erect and maintain necessary temporary living accommodation and ancillary facilities for labour at his own expense and to standards and scales as approved by the Engineer-in-Charge.

4. Drinking Water:

In every workplace, there shall be provided and maintained at suitable places easily accessible to labour, a sufficient supply of cold water fit for drinking.

Where drinking water is obtained from an intermittent public water supply each workplace shall be provided with storage where drinking water shall be stored. Every water supply storage shall be at a distance of not less than 15 meters from any latrine drain or other source of pollution. Where water has to be drawn from an existing well, which is within such proximity of latrine, drain or any other source of pollution, the well shall be properly chlorinated before water is drawn from it for

drinking. All such wells shall be entirely closed in and be provided with a trap door which shall be dust and water-proof.

A reliable pump shall be fitted to each covered well, the trap door shall be kept locked and opened only for cleaning or inspection which shall be done at least once a month.

5. **Washing and Bathing Places:**

Adequate washing and bathing places shall be provided separately for men & women. Such places shall be kept in clean and drained condition.

6. Scale of Accommodation in Latrines and Urinals:

There shall be provided within the precincts of every workplace latrines and urinals in an accessible place, and the accommodation, separately for each of these, shall not be less than at the following scale:

	<u>No. of Seats</u>
(a) Where number of persons does not exceed 50	2
(b) Where number of persons exceeds 50 but does not exceed 100	3
(c) For additional persons per 100 or part thereof	3

In particular cases, the Engineer-in-Charge shall have the power to increase the requirement, where necessary.

7. Latrines and Urinals:

Except in workplaces provided with water flushed latrines connected with a water-borne sewage system. All latrines shall be provided with receptacles or dry-earth system which shall be cleaned atleast four time daily and atleast twice during working hours and kept in a strictly sanitary condition. Receptacles shall be tarred inside and outside at least once a year. If women are employed, separate latrine and urinals screened from those for men and marked in the vernacular in conspicuous letters "For Women Only" shall be provided on the scale laid down in Rule 6. Those for men shall be similarly marked "For Men Only". A poster showing the figures of a man and of a woman shall also be exhibited at the entrance to latrines for each sex. There shall be adequate supply of water close to latrines and urinals.

8. Construction of Latrines:

Inside walls shall be constructed of masonry or some suitable heat resisting non-absorbent materials and shall be cement washed inside and outside at least once a year. The dates of cement washing shall be noted in a register maintained for the purpose and kept available for inspection. Latrines shall have at least thatched roof.

9. Disposal of Excreta:

Unless otherwise arranged for by the local-sanitary authority, arrangements for proper disposal of excreta by incineration at the workplace shall be made by means of a suitable incinerator approved by the local medical health and municipal or cantonment authorities. Alternatively excreta may be disposed off by putting a layer of night soils at the Bottom of pucca tank prepared for the purpose and covering it

with a 15 cm layer of waste or refuse and then covering it with a layer of earth for a fortnight (when it will turn into manure).

The Contractor shall, at his own expense, carry out all instructions issued to him by the Engineer-in-Charge to effect proper disposal of soil and other conservancy work in respect of Contractor's work people or employees on the Site. The Contractor shall be responsible for payment of any charges which may be levied by municipal or cantonment authority for execution of such work on his behalf.

10.Provision of shelters during rest:

At every work place there shall be provided free of cost, four suitable sheds, two for meals and two others for rest, separately for use of men and women Labour. Height of each shelter shall not be less than 3 meters from floor-level to lowest part of roof. Sheds shall be kept clean and the space provided shall be on the basis of at least 0.5 sq.m. per head.

11. Creches:

At a place at which 20 or more women workers are ordinarily employed, there shall be provided at least one hut for use of children under the age of 6 years belonging to such women, Huts shall not be constructed to a standard lower than that of thatched roof, mud floor and wall with wooden plants spread over mud floor and covered with matting.

Huts shall provided with suitable and sufficient openings for light and ventilation. There shall be adequate provision of sweepers to keep the places clean. There shall be two dais in attendance. Sanitary utensils shall be provided to the satisfaction of local medical health and municipal or cantonment authorities. Use of huts shall be restricted to children, their attendance and mothers of children.

Where the number of women workers is more than 25 but less than 50, the Contractor shall provide at least one hut and one dai to look after children of women workers.

Size of crèche(s) shall vary according to the number of women workers employed.

Creche(s) shall be properly maintained and necessary equipment like toys etc., provided.

12. Canteen:

A cooked food canteen on a moderate scale shall be provided for the benefit of workers wherever it is considered necessary.

13. Planning:

Setting and erection of the above mentioned structures shall be approved by the Engineer-in-Charge, and the whole of such temporary accommodation shall at all times during the progress of the works be kept tidy and in a clean and sanitary condition to the satisfaction of the Engineer-in-Charge and at the Contractor's expenses. The Contractor shall conform generally to sanitary requirements of local

medical, health and municipal or cantonment authorities and at all times adopt such precautions as may be necessary to prevent soil pollution of the Site.

On completion of the Works the whole of such temporary structures shall be cleared away, all rubbish burnt, excreta or other disposal pits or trenches filled in and effectively sealed off and the whole of Site left clean and tidy to the entire satisfaction of the Engineer-in-Charge and at the Contractor's expenses.

14. Anti-malarial precautions:

The Contractor shall, at his own expense, conform to all anti-malarial instructions given to him by the Engineer-in-Charge, including filling up any borrow pits which may have been dug by him.

15. Enforcement:

The Inspecting Officer mentioned in the Contractors Labour Regulations or any other officer nominated in his behalf by the Engineer-in-Charge shall report to the Engineer-in-Charge all cases of failure on the part of the Contractor and or his sub-contractors to comply with the provisions of these Rules either wholly or in part and the Engineer-in-Charge shall impose such fines and other penalties as are prescribed in the conditions.

16. Interpretations etc.:

On any question as to the application, interpretation or effect of these Rules, the decision of the Chief Labour Commissioner or Deputy Chief Labour Commissioner (Central) shall be final and binding.

17. Amendments:

Government may, from time to time add to or amend these Rules and issue such directions as it may consider necessary for the proper implementation of these Rules or for the purpose of removing any difficulty which may arise in the administration thereof.

VIII SAFETY CODE

(See Clause 16)

1. Suitable scaffolds shall be provided for workmen for all work that cannot safely be done from the ground, or from solid construction except such short period work as can be done safely from ladders. When a ladder is used an extra mazdoor shall be engaged for holding the ladder and if the ladder is used for carrying materials as well, suitable footholds and hand-holds shall be provided on the ladder and the ladder shall be given an inclination not steeper than $\frac{1}{4}$ to 1 (1/4 horizontal and 1 vertical).
2. Scaffolding or staging more than 3.25 m. above the ground or floor, swing or suspended from an overhead support or erected with stationary support, shall have a guard rail properly attached, bolted, braced and otherwise secured at least 1 meter high above the floor or platform or such scaffolding or staging and extending along the entire length of the outside and ends thereof with only such openings as may be necessary for the delivery or materials, such scaffolding or staging shall be so fastened as to prevent it from swaying from the building or structure.
3. Working platform, gangway, and strairways shall be so constructed that they do not sag unduly or unequally, and if a height of a platform or gangway or stairway is more than 3.25 m. above ground level or floor level, it shall be closely boarded, have adequate width and be suitably fenced, as described in 2 above.
4. Every opening in floor of a building or in a working platform shall be provided with suitable means to to prevent fall of persons or materials by providing suitable fencing or railing with a minimum height of 1 m.
5. Safe means of access shall be provided to all working platforms and other working places. Every ladder shall be securely fixed. No portable single ladder shall be over 9 m. in length. Width between side rails in a rung ladder shall in no case be less than 30 cm for ladders upto and including 3 m. in length. For longer ladders this width shall be increased at least 6 mm for each additional 30 cm. of length. Uniform step spacing shall not exceed 30 cm.

Adequate precautions shall be taken to prevent danger from electrical equipment. No materials on any of the Sites shall be so stacked or placed as to cause danger or inconvenience to any person or the public. The Contractor shall provide all necessary fencing and lights to protect public from accident and shall be bound to bear expenses of defense of every suit action or 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 or proceedings to any such person or which may with the consent of the Contractor be paid to compromise any claim by any such person.

6.Excavation and Trenching:

All trenches, 1.5 m. or more in depth, shall at all times be supplied with at least one ladder for each 30 m. in length of fraction thereof. Ladder shall be extended from bottom of trench to at least 1 m. above surface of the ground. Sides of a trench which is 1.5 m or more in depth shall be stepped back to give suitable slope or securely held by timber bracing, so as to avoid the danger of sides collapsing., Excavated materials shall not be placed with 1.5 m. of edge of trench or half of depth of trench whichever is more. Cutting shall be done from top to bottom. Under no circumstances shall undermining or undercutting be done.

7.Demolition:

Before any demolition work is commenced and also during the process of the work:

- (a) All roads and open areas adjacent to the work Site shall either be closed or suitably protected;
 - (b) No electric cable or apparatus which is liable to be a source or danger over a cable or apparatus used by operator shall remain electrically charged;
 - (c) All practical steps shall be taken to prevent danger to persons employed, from risk or fire or explosion, or flooding. No floor, roof, or other part of a building shall be so overloaded with debris or materials so as to render it unsafe.
8. All necessary personal safety equipment as considered adequate by the Engineer-in-Charge shall be available for use of persons employed on the Site and maintained in a condition suitable for immediate use; and the Contractor shall take adequate steps to ensure proper use of equipment by those concerned.

Following safety equipment shall invariably be provided:

- (a) Workers employed on mixing asphaltic materials, cement and lime mortars/concrete shall be provided with protective footwear and protective goggles.
- (b) Those engaged in white washing and mixing or stacking of cement banks or any material which is injurious to eyes shall be provided with protective goggles.
- (c) Those engaged in welding works shall be provided with welder's protective eye-shields.

- (d) Stone breakers shall be provided with protective goggles and protective clothing and seated at sufficiently safe intervals.
 - (e) When workers are employed in sewers and manholes, which are in use the Contractor shall ensure that manhole covers are opened and manholes are ventilated at least for an hour before workers are allowed to get into them. Manholes so opened shall be cordoned off with suitable railing and provided with warning signals or boards to prevent accident to public.
 - (f) The Contractor shall not employ men below the age of 18 and women on the work of painting with products containing lead in any form. Whenever men above the age of 18 are employed on the work of lead painting, the following precautions shall be taken:
 - (i) No paint containing lead or lead products shall be used except in the form of paste or ready made paint.
 - (ii) Suitable face masks shall be supplied for use by workers when paint is supplied in the form of spray or a surface having lead paint dry rubbed and scrapped.
 - (iii) Overalls shall be supplied by the Contractor to workmen and adequate facilities shall be provided to enable working painters to wash during and on cessation of work.
9. When work is done near any place where there is risk of drowning, all necessary equipment shall be provided and kept ready for use and all necessary steps taken for prompt rescue of any person in danger and adequate provision made for prompt first aid treatment of all injuries likely to be sustained during the course of the work.
10. Use of hoisting machines and tackle including their attachments, anchorage and supports shall conform to the following:
- (a) (i) These shall be of good mechanical construction, sound material and adequate strength and free from patent defects and shall be kept in good working order and properly maintained.
 - (ii) Every rope used in hoisting or lowering materials or as a means of suspension shall be of a durable quality and have adequate strength and be free from patent defects.
 - (b) Every crane driver or hoisting appliance operator shall be properly qualified and no person under the age of 21 years shall be incharge of any hoisting machine including any scaffold or give signals to operator.
 - (c) In case of every hoisting machine and of every chain ring hook, shackle swivel and pulley block used in hoisting or lowering or as means of suspension safe working load shall be ascertained by adequate means. Every hosting machine and all gear referred to above shall be

painted/marked with safe working load. In case of a hoisting machine a variable safe working load, each safe working load and the conditions under which it is applicable shall be clearly indicated. No part of any machine or of any gear referred to above in this paragraph shall be loaded beyond safe working load except for the purpose of testing.

- (d) In case of a BHAVINI LTD.'s machine, safe working load shall be notified by the Engineer-in-Charge. As regards Contractor's machines the Contractor shall notify safe working load of each machine to Engineer-in-Charge whenever he brings it to Site of work and get it verified by the Engineer-in-Charge.

11. Motors, gearing, transmission, electric wiring and other dangerous parts of hoisting appliance shall be provided with efficient safeguards; hoisting appliances shall be provided with such means as will reduce to the minimum risk or accidental descent of load. Adequate precautions shall be taken to reduce to the minimum risk of any part of suspended load becoming accidentally displaced. When workers are employed on electrical installations which are already energized, insulating mats, working apparel such as gloves, sleeves and boots, as may be necessary, shall be provided. Workers shall not wear any rings, watches and carry keys or other materials which are good conductors of electricity.

12. All scaffolds, ladders and other safety devices mentioned or described herein shall be maintained in a safe condition and no scaffold, ladder or equipment shall be altered or removed while it is in use. Adequate washing facilities shall be provided at or near place of work.

13. These safety provisions shall be brought to the notice of all concerned by display on a notice board at a prominent place at the workspot. Persons responsible for ensuring compliance with the Safety Code shall be named therein by the Contractor.

- 14. To ensure effective enforcement of the rules and regulations relating to safety precautions arrangements made by Contractor shall be open to inspection by the Engineer-in-Charge or his representative and the Inspecting Officers as defined in the Contractor's Labour Regulation.
- 15. Notwithstanding the above conditions 1 to 14, there is nothing in these to exempt the Contractor from the operation of any other Act or Rule in force including the Safety Guide for works contract issued by Atomic Energy Regulatory Board (AERB Guide No. AERB/SG/IS-1) for different works.

IX TENDER FORMS

TENDER

To

Bharatiya Nabhikiya Vidyut Nigam Limited,
(Hereinafter referred to as the BHAVINI LTD.,)

I/We have read and examined the following documents relating to

(Name of the Works)

(a) Notice Inviting Tender.

(b) Schedules A, B & C.

(c) Technical Specifications.

(d) Drawings

(e) General Conditions of Contract including Contractors Labour Regulations, Model Rules for Labour Welfare and Safety Code appended to these conditions together with the amendments hereto Nos. 1 to _____ if any.

(f) Special Conditions of Contracts.

(g) Schedule of quantities and Rates (referred to in the General Conditions of Contract as Schedule or Rates) together with Amendment Nos. 1 to _____ .

I/We hereby tender for execution of the works referred to in the aforesaid documents upon the terms and conditions contained or referred to therein and in accordance in all respects with the specifications, designs, drawings and other relevant details at the rates contained in Schedule of Quantities and Rates and within the period(s) of completion as stipulated in Schedule 'A'.

In consideration of I/We being invited to tender. I/We agree to keep the tender open for acceptance for _____ days from the due date of submission thereof and not to make any modifications in its terms and conditions which are not acceptable to the BHAVINI Limited.

A sum of Rs. _____ is hereby forwarded in Cash/Demand Draft payable at _____/Deposit at Call Receipt of State Bank of India or a Nationalised Bank or any Scheduled Bank as earnest money. If I/We fail to keep the tender open as aforesaid or make any modifications in the terms and conditions of the tender which are not acceptable to the BHAVINI Limited, I/We agree that the BHAVINI Limited shall without prejudice to any other right or remedy, be at liberty to forfeit the said earnest money absolutely. Should this tender be accepted. I/We hereby agree to abide by and fulfill all the terms, conditions and provisions of the aforesaid documents.

If, after the tender is accepted, I/We fail to commence the execution of the works as provided in the conditions, I/We agree that the BHAVINI Limited shall without prejudice to any other right or remedy be at liberty forfeit the said earnest money absolutely.

Signature of the capacity of _____

Duly authorized to sign the tender
on behalf of the (In block Capitals)

Dated _____

Postal Address _____

Telegraph Address _____

Telephone No./Fax/Telex No. _____
Seal of the Company/Firm

Witness _____

Date _____

Address _____

SCHEDULE “B”**MATERIAL FOR ISSUE TO THE CONTRACTOR**

(See Clause No.15)

Sl. No.	Particulars	Unit	Rate at which material will be issued	Quantity (Approx.)
1	2	3	4	5
1.			-	-
2.			- - -	- - -
3.			-	-
4.			-	-
5.		-	-	-

Signature of Issuing Officer

Signature of Contractor

Date :

Date :

SCHEDULE “C”

TOOLS AND PLANT TO BE HIRED TO THE CONTRACTOR

(See Clause 14 & 37)

Sl No.	Particulars	Number available	Hire charges per Unit per working day Rs.	Frequency of Maintenance	Value per Unit	Place of Issue	Number Reqd. by the Contractor
1	2	3	4	5	6	7	8

Tools and Plants are not expected to be hired out to the Contractor. If, however, any tools and plants are available at the time of performing the work the same may be hired out at rates to be decided by the Engineer-in-Charge. The BHAVINI LIMITED reserves the right not to hire out any T&P and to withdraw at any time such T&P hired out.

The Contractor shall ask the Engineer-in-Charge the value of tools & plants for which these have to be insured and carry out the insurance accordingly in case insurance not available with BHAVINI LIMITED.

Signature of the Issuing Officer.

Signature of Contractor

Date :

Date :

X FORMS OF DIFFERENT DEEDS

1. PROFORMA OF BANK GUARANTEE IN LIEU OF EARNEST MONEY
DEPOSIT IN INDIVIDUAL CONTRACT

**(On Non Judicial Stamp paper to be stamped in accordance with stamp
act, the stamp paper to be in name of Executing Bank).**

Ref:Date

No.BankGuarantee

To

BHARATIYA NABHIKIYA VIDYUT NIGHAM LIMITED

.....
.....
.....

Dear Sir,

In accordance with your Notice Inviting Tenders for.....
under your tender No..... datedM/s.....
(hereinafter called the Tenderer) with following directors on their Board of
Directors/Particulars of the firm.

1.....	2.....
3.....	4.....
5.....	6.....
7.....	8.....
9.....	10.....

Wish to participate in the said tender for the following :

1.....
2.....
3.....

Whereas it is a condition in the tender documents that the tenderer has to deposit Earnest Money with respect to the tender, with Bharatiya Nabhikiya Vidyut Nigham Limited (hereinafter referred to as "BHAVINI Ltd." amounting to Rs.....or alternatively the tenderer is required to submit "Bank Guarantee" from a Nationalised Bank irrevocable and operative till 30 days after the validity of the offer.(i.e. 210 days from the date of opening of tender), for the like amount which amount is likely to be forfeited on the happening of contingencies mentioned in the tender documents. And whereas the tenderer desires to secure exemption from deposit of Earnest Money and has offered to furnish a Bank Guarantee for a sum of Rs.....to the BHAVINI Ltd for the purpose of securing exemption from the deposit of earnest money.

1. NOW THEREFORE, we the.....Bank, a body corporate constituted under the Banking Companies (Acquisition and Transfer of undertakings) Act 1969 and having a branch office at.....(hereinafter referred to as the Bank") do hereby undertake and agree to pay on demand in writing by the BHAVINI Ltd, the amount of Rs.....(Rupees.....) to the Bharatiya Nabhikiya Vidyut Nigham Limited without any demur, reservation or recourse.
2. We, the aforesaid Bank, further agree that the BHAVINI Ltd shall be the sole judge of and as to whether the tenderer has committed any breach or breaches of any of the terms and conditions of the tender and the extent of loss, damage, costs, charges and expenses caused to or suffered by or that may be caused to or suffered by the BHAVINI Ltd on account thereof the extent of the Earnest Money required to be deposited by the Tenderer in respect of the said Tender document and the decision of the BHAVINI Ltd that the Tenderer has committed such breach or breaches and as to the amount or amounts of loss, damage, costs, charges and expenses caused to or suffered by or that may be caused to or suffered by the BHAVINI Ltd shall be final and binding on us.
3. We, the said Bank further agree that the Guarantee herein contained shall remain in full force and effect until it is released by the BHAVINI Ltd and change in the constitution, liquidation or dissolution of the Tenderer, shall not discharge our liability guaranteed herein.
4. It is further declared that it shall not be necessary for the BHAVINI Ltd to proceed against the Contractor before proceeding against the Bank and the Guarantee herein contained shall be enforceable against the Bank notwithstanding any security which the BHAVINI Ltd may have obtained or shall obtain from the Contractor at the time when proceedings are taken against the Bank for whatever amount may be outstanding under the Guarantee.
5. The right of the BHAVINI Ltd to recover the said amount of Rs.....(Rupees.....) from us in manner aforesaid will not be affected or suspended by reason of the fact that any dispute or disputes have been raised by the said M/s..... (Tenderer) and/or that any dispute or disputes are pending before any authority, officer, tribunal or arbitrator(s), etc.

6. Notwithstanding anything stated above, our liability under this guarantee shall be restricted to Rs..... (Rupees) and our guarantee shall remain in force upto..... and unless a demand or claim under the guarantee is made on us in writing within three months after the aforesaid date i.e. on or before theall your rights under the guarantee shall be forfeited and we shall be relieved and discharged from all liabilities thereunder.

Date:

Place:

(Signature).....

(Printed Name).....

(Designation).....

(Bank's common seal).....

(Authorisation No)

In the presence of
Witness

1).....

2).....

Accepted

(Signature of the Officer)
For and on behalf of the
Bharatiya Nabhikiya Vidyut
Nigam Limited

2. PROFORMA OF BANK GUARANTEE IN LIEU OF SECURITY
DEPOSIT IN INDIVIDUAL CONTRACT

(ON NON JUDICIAL STAMP PAPER)

(CLAUSE No.9)

To

Bharatiya Nabhikiya Vidyut Nigam Limited (BHAVINI LTD.),

In consideration of the Bharatiya Nabhikiya Vidyut Nigam Limited
(_____) having its registered
Office at _____ (hereinafter
called the "BHAVINI LTD." Which expression shall unless repugnant to
the subject or context include its administrators, successors and assigns)
having agreed under the terms and conditions of the Award Letter bearing
No. _____ dated _____ issued by the
BHAVINI LTD., which has been unequivocally accepted by the Contractor
M/s *

_____ work of _____ (hereinafter
called the said Contract) to accept a Deed of Guarantee as herein provided
for Rs. _____ (Rupees
_____ only) from a Nationalised Bank in
lieu of the security deposit to be made by the Contractor or in lieu of the
deduction to be made from the Contractor's bills, for the due fulfillment by
the said Contractor of the terms and conditions contained in the said
Contract.

1. We, the _____ Bank (hereinafter referred to
as "the said Bank" and having our registered Office at
_____ do hereby undertake and
agree to indemnify and keep indemnified the BHAVINI LTD., from time to
time to the extent of Rs. _____ (Rupees
_____ only) against any loss or damage, costs, charges and
expenses caused to or suffered by or that may be caused to or suffered by
the BHAVINI LTD by reason of any breach or breaches by the said
Contractor of any of the terms and conditions contained in the said
Contract and to unconditionally pay the amount claimed by the BHAVINI
LTD., on demand and without demur to the extent aforesaid.

2. We, the _____ Bank, further agree that
the BHAVINI LTD., shall be the sole judge of and as to whether the said
Contractor has committed any breach or breaches of any of the terms and
conditions of the said Contract and the extent of loss, damage, costs,

charges and expenses caused to or suffered by or that may be caused to or suffered by the

* Refer note at the end of the proforma.

BHAVINI LTD., on account thereof and the decision of the BHAVINI LTD., that the said Contractor has committed such breach or breaches and as to the amount or amounts of loss, damage, costs, charges and expenses caused to or suffered by or that may be caused to or suffered by the BHAVINI LTD., from time to time shall be final and binding on us.

3. We, the said Bank further agree that the Guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Contract and till all the dues of the BHAVINI LTD., under the said Contract or by virtue of any of the terms and conditions governing the said Contract have been fully paid and its claims satisfied or discharged and till the owner certifies that the terms and conditions of the said Contract have been fully and properly carried out by the said Contractor and accordingly discharges this Guarantee subject, however, that the BHAVINI LTD., shall have no claim under the Guarantee after 90 days from the date expiry of the Defects Liability Period as provided in the said Contract, i.e. _____ (date) or from the date of cancellation of the said contract as the case may be, unless a notice of the claim under this Guarantee has been served on the Bank before the expiry of the said period in which case the same shall be enforceable against the Bank notwithstanding the fact, that the same is enforced after the expiry of the said period.

4. The BHAVINI LTD., shall have the fullest liberty without affecting in any way the liability of the Bank under this Guarantee or Indemnity, from time to time, to vary any of the terms and conditions of the said Contract or to extend time of performance by the said Contractor or to postpone for any time from time to time any of the powers exercisable by it against the said Contractor and either to enforce or forbear from enforcing any of the terms and conditions governing the said Contract or securities available to the BHAVINI LTD., and the said Bank shall not be released from its liability under these presents by any exercise by the BHAVINI LTD., of the liberty with reference to the matters aforesaid or by reason of time being given to the said Contractor or any other forbearance act or omission on the part of the BHAVINI LTD., or any indulgence by the BHAVINI LTD., to the said Contractor or any other matter or thing whatsoever which under the law relating to sureties would, but for this provision, have the effect of so releasing the Bank from its such liability.

5. It shall not be necessary for the BHAVINI LTD., to proceed against the Contractor before proceeding against the Bank and the Guarantee herein contained shall be enforceable against the Bank, notwithstanding any security which the BHAVINI LTD., may have obtained or obtain from the Contractor shall at the time when proceedings are taken against the Bank hereunder, be outstanding or unrealized.

6. We, the said Bank, lastly undertake not to revoke this Guarantee during its currency except with the previous consent of the BHAVINI LTD., in writing and agree that any change in the Constitution of the said Contractor or the said Bank shall not discharge our liability hereunder. If any further extension of this Guarantee is required the same shall be extended to such required periods on receiving instructions from M/s _____ on whose behalf this guarantee is issued.

In the presence of

For and on behalf of (the Bank)

WITNESS:

1. _____ Signature

. _____ Name & Designation

2. _____ Signature

_____ Name & Designation

Authorisation No. _____

Date and Place : _____

Bank Seal _____

Accepted

(Signature of the Officer)
For and on behalf of the
Bharatiya Nabhikiya Vidyut Nigam Limited

NOTES

*** For Proprietary Concerns**

Shri _____ son of
_____ resident of

_____ carrying on business under the name and style of _____ at _____ (hereinafter called “the said Contractor” which expression shall unless the context requires otherwise include his heirs, executors, administrators and legal representatives.

*** For Partnership Concerns**

M/s _____ a partnership firm with its Office _____ (hereinafter called “the said Contractor” which expression shall unless the context requires otherwise include their heirs, executors, administrators and legal representative); the names of their partners being :

(i) Shri _____

S/o _____

(ii) Shri _____

S/o _____

*** For Companies**

M/s _____ a company registered under the Companies Act, 1956 and having its registered Office at _____ in the State of _____ (hereinafter called “the said Contractor” which expression shall unless the context requires otherwise include its administrators, successors and assigns).

3. PROFORMA OF BANK GUARANTEE TO SECURE A LUMP SUM ADVANCE
(On Non-Judicial Stamp Paper of Appropriate Value)

To

Bharatiya Nabhikiya Vidyut Nigam Limited (BHAVINI LTD.),

In consideration of the Bharatiya Nabhikiya Vidyut Nigam Limited
(_____) having its registered Office at
_____ (hereinafter called "the Owner" which expression shall unless
repugnant to the subject or context include its successors and assigns) having agreed
under the terms and conditions of Award Letter No.
_____ dated _____ issued by
Owner which has been unequivocally accepted by *
_____ in connection with the work of "
_____ Tender
No. _____ (hereinafter called "the said
Contract") to make at the request of the Contractor a lumpsum advance of
Rs. _____ (Rupees
_____ only) for
utilizing it for the purpose of the Contract on his furnishing a guarantee acceptable
to the Owner. We, _____
Bank incorporated under _____ and having one of
our branches at _____ (hereinafter referred
to as "the said Bank") do hereby guarantee the due recovery by the Owner of this
said advance with interest thereon as provided according to the terms and conditions
of the Contract. If the said Contractor fails to utilize the said advance for the
purpose of the Contract and/or the said advance together with interest thereon as
aforesaid is not fully recovered by the Owner, We,
_____ Bank hereby unconditionally and irrevocably
undertake to pay to the Owner on demand and without demur to the extent of the
said sum of Rs. _____ (Rupees
_____ only) on any claim made by the
Owner on us for the loss or damage caused to or suffered by the Owner by reason of
the Owner not being able to recover in full the said sum of Rs. _____ (Rupees
_____ only) with
interest as aforesaid.

2. We, _____ Bank, further agree that the Owner
shall be the sole judge of and as to whether the said Contractor has not utilized the
said advance or any part thereof for the purpose of the contract and the extent of loss
or damage caused to or suffered by the Owner on account of the said advance
together with Interest not being recovered in full and the decision of the
Owner that the said

* Refer note at the end of the proforma.

Contractor has not utilized the said advance or any part thereof for the purpose of the Contract and as to the amount or amounts of loss or damage caused to or suffered by the Owner shall be final and binding on us.

3. We, the said Bank further agree that the Guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said Contract and till all the said advance with interest has been fully recovered from the said Contractor, and accordingly shall have no claim under this guarantee after 30 (Thirty) days from the date of satisfactory completion of the said Contract (as per the mutually agreed work schedule) i.e. upto and inclusive of _____ (date) unless a notice of the claim under this guarantee has been served on the Bank before the expiry of the said period i.e. _____ (date) in which case the same shall be enforceable against the Bank notwithstanding the fact, that the same is enforced after the expiry of the said period.
4. The Owner shall have the fullest liberty without effecting in any way the liability of the Bank under this Guarantee or Indemnity, from time to time, to vary any of the terms and conditions of the said Contract or the advance or to extend time of performance by the said Contractor or to postpone for any time from time to time any of the power exercisable by it against the said Contractor and either to enforce or forbear from enforcing any of the terms and conditions governing the said contract or the advance available to the Owner and this said Bank shall not be released from its liability under these presents by any exercise by the Owner of the liberty with reference to the matters aforesaid or by reasons of time being given to the said Contractor or any other forbearance act or omission on the part of the Owner or any indulgence by the Owner to the said Contractor on of any other matter or thing whatsoever which under the law relating to sureties would, but for this provision, have the effect of so releasing the Bank from its such liability.
5. It shall not be necessary for the Owner to proceed against the Contractor before proceeding against the Bank and the Guarantee herein contained shall be enforceable against the Bank notwithstanding any security, which the Owner may have obtained or obtain from the Contractor shall at the time when proceedings are taken against the Bank hereunder, be outstanding or unrealised.
6. We, the said Bank, lastly undertake not to revoke this Guarantee during its currency except with the previous consent of the Owner in writing and agree that any change in the Constitution of the said Contractor or the said Bank shall not discharge our liability hereunder.

If any further extension of this Guarantee is required the same shall be extended to such required periods on receiving instructions from M/s _____ on whose behalf this Guarantee is issued.

Notwithstanding anything contained herein before our liability under this Guarantee is restricted to Rs. _____ (Rupees _____ only) together with interest. Our undertaking shall commence from the date of execution and shall remain in force upto _____ .

Dated this _____ day of _____ 200

In presence of

For and on behalf of (the Bank)

WITNESS :

1. _____ Signature

_____ Name & Designation

2. _____ Signature

_____ Name & Designation

Authorisation No. _____

Date and Place : _____

Banks Seal _____

Accepted

(Signature of the Officer)
For and on behalf of the
Bharatiya Nabhikiya Vidyut Nigam Limited

NOTES

*** For Proprietary Concerns**

Shri _____ son of
_____ resident of

_____ carrying on business under the name and style of _____ at _____ (hereinafter called “the said Contractor” which expression shall unless the context requires otherwise include his heirs, executors, administrators and legal representatives).

*** For Partnership Concerns**

M/s _____ a partnership firm with its Office _____ (hereinafter called “the said Contractor” which expression shall unless the context requires otherwise include their heirs, executors, administrators and legal representative); the names of their partners being :

(i) Shri _____
S/o _____

(ii) Shri _____
S/o _____

*** For Companies**

M/s _____ a company registered under the Companies Act, 1956 and having its registered Office at _____ in the State of _____ (hereinafter called “the said Contractor” which expression shall unless the context requires otherwise include its administrators, successors and assigns).

**4. FORM BANK GUARANTEE FOR REMOVAL OF PLANT AND EQUIPMENT
FROM THE SITE**

(ON NON JUDICIAL STAMP PAPER)

(Clause No.57)

To

Bharatiya Nabhikiya Vidyut Nigam Limited (BHAVINI LTD.),

In consideration of the Bharatiya Nabhikiya Vidyut Nigam Limited (_____) having its registered Office at _____ (hereinafter called "the Owner" which expression shall unless repugnant to the subject or context include its successors and assigns) having agreed under the terms and conditions of Contract No. _____ dated _____ made between _____ and the Owner in connection with _____ (thereinafter called "the said Contract") to permit the Contractor to remove the plant and equipment mentioned in the Schedule hereto hypothecated to the Owner as security against a loan of Rs. _____ with interest as provided in the Contract granted to the Contractor by the Owner from the Site to any other works of the Contractor on his furnishing an acceptable Bank Guarantee, we the _____ Bank (hereinafter referred to as "the said Bank") and having registered Office at _____ do hereby undertake and agree to indemnify and keep indemnified the Owner from time to time to the extent of Rs. _____ (Rupees _____ only) against any loss or damage, costs, charges and expenses caused to or suffered by or that may be caused to or suffered by the Owner by reason of the Contractor failing to bring back to the Site the said plant and equipment or any part thereof and to unconditionally pay the amount claimed by the Owner on demand and without demur to the extent aforesaid.

We, _____ Bank further agree that the Owner shall be the sole judge of and as to whether the said Contractor has failed to bring the said plant and equipment or any part thereof back to the Site and the extent of loss, damage, costs, charges and expenses caused to or suffered by the Owner on account thereof and the decision of the Owner that the said Contractor has so failed and as to the amount or amounts of loss or damage caused to or suffered by the Owner shall be final and binding on us.

We, the said Bank, further agree that the Guarantee herein contained shall remain in full force and effect till the Owner certifies that the said plant and equipment have been brought back to the Site or the said loan of Rs. _____ with interest has been repaid to the Owner in full,

and accordingly, discharged this Guarantee subject, however, that the Owner shall have no claim under this Guarantee after _____ years of the date of completion of the Contract or from the date of cancellation of the said Contract, as the case may be unless a notice of the claim under this Guarantee has been served on the Bank before the expiry of the said period of _____ years in which case the same shall be enforceable against the Bank notwithstanding the fact that the same is enforced after the expiry of the said period of _____ years.

The Owner shall have the fullest liberty without effecting in any way the liability of the Bank under this Guarantee or Indemnity, from time to time, to vary any of the terms and conditions of the said Contract or the advance or to extend time of performance by the said Contractor or to postpone for any time from time to time any of the powers exercisable by it against the said Contractor and either to enforce or forbear from enforcing any of the terms and conditions overrunning the said not be released from its liability under these presents by any exercise by the Owner of the liberty with reference to the matters aforesaid or by reasons of time being given to the said Contractor or any other forbearance act or omission on the part of the Owner or any indulgence by the Owner to the said Contractor on of any other matter or thing whatsoever which under the law relating to sureties would, but for this provision, have the effect of so releasing the Bank from its such liability.

It shall not be necessary for the Owner to proceed against the Contractor before proceeding against the Bank and the Guarantee herein contained shall be enforceable against the Bank notwithstanding any security, which the Owner may have obtained or obtain from the Contractor shall at the time when proceedings are taken against the Bank hereunder, be outstanding or unrealised.

We, the said Bank, lastly undertake not to revoke this Guarantee during its currency except with the previous consent of the Owner in writing and agree that any change in the Constitution of the said Contractor or the said Bank shall not discharge our liability hereunder.

Dated this _____ day of _____ 200

In presence of

For and on behalf of (the Bank)

Common seal of the Bank.

WITNESS :

1. _____ Signature _____

2. _____ Name _____

3. _____ Designation _____

Authorisation No. _____

The above Guarantee is accepted by Bharatiya Nabhikiya Vidyut Nigam Ltd.,
(_____) For and on behalf of the
(Bharatiya Nabhikiya Vidyut Nigam Limited)
Dated _____

(Name & Designation)

*** NOTES**

*** For Proprietary Concerns**

Shri _____ son of _____
resident of _____ carrying on
business under the name and style of _____ at _____
(hereinafter called "the said Contractor" which expression shall unless the context
requires otherwise include his heirs, executors, administrators and legal
representatives).

*** For Partnership Concerns**

M/s _____ a partnership firm
with its Office _____ (hereinafter called "the said
Contractor" which expression shall unless the context requires otherwise include their
beirs, executors, administrators and legal representative); the names of their partners
being :

(i) Shri _____ S/o _____

(ii) Shri _____ S/o _____

*** For Companies**

M/s _____ a company registered under the
Companies Act, 1956 and having its registered Office at _____
in the State of _____
(hereinafter called "the said Contractor" which expression shall unless the context
requires otherwise include its administrators, successors and assigns).

5. FORM OF HYPOTHECATION DEED
(ON NON-JUDICIAL STAMP PAPER ON APPROPRIATE VALUE)
(Clause No.57)

THE INDENTURE made this _____ day of _____ 200_____
_____ between _____ of
the one part (hereinafter called 'Contractor') and Bharatiya Nabhikiya Vidyut Nigam Limited
(_____) hereinafter called "the BHAVINI LIMITED"
which expression shall unless the context requires otherwise include his successors and
assigns of the other part:

WHEREAS under Condition 57 of the General Conditions of Contract relating to the terms
and conditions of its Award letter No. _____ dated
_____ which have been unequivocally accepted by the Contractor, the
Contractor has applied to the BHAVINI LTD., for a loan of Rs. _____
(Rupees _____ only) for
plant and equipment described in the Schedule hereto specifically acquired by the Contractor
for the works and brought to Site.

AND WHEREAS one of the conditions on which the said loan of Rs. _____ /- granted
by the BHAVINI LTD., to the Contractor is that the Contractor shall hypothecate the plant
and equipment described in the Schedule hereto in favour of the BHAVINI LTD., as security
for the due repayment of the said loan.

AND WHEREAS the Contractor has represented that he is the Owner of the plant and
equipment described in the Schedule hereto and the same is free from encumbrances.

NOW THIS INDENTURE WITNESTH THAT in pursuance of the said agreement and in
consideration of the premises the Contractor doth hereby hypothecate, assign and transfer to
the BHAVINI LTD., the Plant and equipment described in the Schedule hereto the intent that
the same shall remain and form security for repayment to the BHAVINI LTD., of the said
loan of Rs. _____ together with the interest thereon at _____ % per annum.

1. The Contractor hereby agrees, declares and covenants with the BHAVINI LTD., as
follows:

- (a) The Contractor shall repay to the BHAVINI LTD., the said loan of Rs. _____
(Rupees _____ only) together with
interest thereon as aforesaid by and agrees that the said loan be recovered by the
BHAVINI LTD., by making deductions in the manner provided in Condition 57 of
the General Conditions of Contract and other conditions of the Award letter from the
claims made by the Contractor against the BHAVINI LTD., of "on account
payment".
- (b) The Contractor has paid in full the purchase price of the Plant & Equipment described
in the Schedule hereto and each and every one of them and that the same are the
absolute property of the Contractor and that the same have not been sold, pledged,
mortgaged or transferred or in any way dealt with by the Contractor.

- (c) So long as any amount remains payable to the BHAVINI LTD., by the Contractor in respect of the said loan of Rs. _____ the Contractor shall not sell, pledge, hypothecate, transfer, part with or in any way deal with the Plant and Equipment described in the Schedule hereto.
- (d) If the said loan of Rs. _____ shall not be repaid by the Contractor or recovered in the manner described above by the said _____ day of _____ due to any reasons whatsoever or the said Contract has been determined earlier or cancelled or if the Contractor shall sell, pledge, mortgage, transfer, part with or in any way deal with the said Plant and Equipment or any part thereof or the Contractor or any of the partners is adjudged insolvent or the Contractor is to be wound up or makes any composition or arrangement with its creditors or the Contractor shall commit breach of any of the terms and conditions or covenants as herein contained or if any of the said Plant and Equipment or if any other property whatsoever belonging to the Contractor has been sold or attached for a period of not less than 21 days in execution of the decree of any court for payment of money, the whole of the said loan of Rs. _____ or such part thereof as may remain unpaid or unrecovered together with interest thereon shall forthwith become due and payable.
- (e) The BHAVINI LTD., may on the happening of any of the events mentioned in the preceding Clause (d) or in the event of the said loan or any part thereof becoming due and payable and has not been paid or recovered or cannot be recovered as provided in the said conditions, seize and take possession of the said Plant and Equipment (and either remain in possession thereof without removing the same or else may remove the same) and sell the said Plant and Equipment or any of them either by public auction or private contract and may out of the sale proceeds retain the balance of the said loan and interest thereon remaining unpaid and unrecovered and all costs, charges and expenses and payments incurred or made in maintaining, defending or protecting the rights of the BHAVINI LTD., hereunder and shall pay over the surplus, if any, to the Contractor.
- (f) The Contractor shall at all times during the continuance of the security and at the expense of the Contractor insure and keep insured and Plant and Equipment described in the Schedule hereto for the value thereof in the joint names of the Contractor and the BHAVINI LTD., with the insurance company to be approved by the Engineer-in-Charge against the risk of loss or damage from whatever cause arising other than the Excepted Risks. During the continuance of the security the Contractor shall pay all premia and sums of money necessary for keeping such insurance on foot and the insurance policy and receipts in original for premia paid shall be deposited with the Engineer-in-Charge. The Contractor shall assign all his rights, title and interest in the policy to the BHAVINI LIMITED.
- (g) The Contractor shall not permit or suffer the said Plant and Equipment or any part thereof to be destroyed or damaged or to be used or to deteriorate in a greater degree than it would deteriorate by reasonable wear and tear thereof in the performance of the Contract.
- (h) In the event of any damage or loss happening to the said Plant and Equipment or any part thereof from whatever cause other than the Excepted Risks the Contractor shall forthwith have the same repaired or replaced as the case may be or arrange for payment of the entire amount recovered or to be recovered from the insurance

company to the BHAVINI LTD., towards the payment of the said loan of Rs._____ .

2.Upon repayment or recovery in full of the amount secured on account of this hypothecation deed the said Plant and Equipment secured hereunder shall stand released from hypothecation but this is without prejudice to the right of the BHAVINI LTD., under any other conditions of the Contract.

SCHEDULE ABOVE REFERRED TO

Sl. No.	Particulars of Plant and Equipment	Nos.	Purchase price/price considered reasonable by Engr.-in-Charge	Total Price	Advance (75% of Col5)
1	2	3	4	5	6

IN WITNESS WHEREOF the parties hereto have executed these presents on the day and your first above written.

Signed and delivered
By the within named

Signed by Shri _____
(Name & Designation)
Bharatiya Nabhikiya Vidyut Nigam Limited

(_____)

In the presence of

(1) _____ (1)

(2) _____ (2)

* **NOTES**

* For Proprietary Concerns

Shri _____ son of _____
resident of _____ carrying on
business under the name and style of _____ at _____
(hereinafter called “the said Contractor” which expression shall unless the context requires
otherwise include his heirs, executors, administrators and legal representatives).

* For Partnership Concerns

M/s _____ a partnership firm
with its Office _____ (hereinafter called “the said
Contractor” which expression shall unless the context requires otherwise include their heirs,
executors, administrators and legal representative); the names of their partners being :

(i) Shri _____ S/o _____

(ii) Shri _____ S/o _____

* For Companies

M/s _____ a company registered under the
Companies Act, 1956 and having its registered Office at _____ in
the State of _____ (hereinafter called “the said Contractor”
which expression shall unless the context requires otherwise include its administrators,
successors and assigns).

Appendix-I

1. REGISTER OF WORKMEN (Regulation 7)

- (i) Name and address of the Contractor

- (ii) Number and date of Contract

- (iii) Name and address of the Department awarding the Contract

- (iv) Nature of the Contract and location of the work

- (v) **Duration of the Contract**

[illegible]

2. EMPLOYMENT CARD (Regulation 8)

(i) Name and Sex of the Worker

(ii) Father's/Husband's Name

(iii) Address

(iv) Age or Date of Birth

(v) Identification Marks

Particulars of next of kin (wife/husband and children, if any, or of dependent next of kin in case the worker has no wife/husband or child)
Name

Full Address of Dependents

(Specify Village, District and State)

Sl. No.	Name & Address of employer (specify whether a Contractor of a Sub-contractor)	Particulars of location of work site and description of work done	Total period for which the worker is employed (from..... to	Actual number of days worked	Leave taken (No. of days should be specified)	Nature of work done by the worker	Wage period	Wage rate with particulars of unit in case of piece work	Total Wage earned by the worker during the period shown under Col.5	Remarks	Signature of the employer
1	2	3	4	5	6	7	8	9	10	11	12

N.B. For a worker employed at one time on piece work basis and at another on daily wages, relevant entries in respect of each type of employment should be made separately.

3. REGISTER OF WAGES-CUM-MUSTER ROLL (Regulation 9)

(i) Name and address of the Contractor

(ii) Number and date of Contract

(iii) Name and address of the Department awarding the Contract

(iv) Nature of the Contract and location of the work

(v) Duration of the Contract

(vi) Wage Period

Sl. No.	Name & Surname of the worker	Father's/ Husband's Name	Sex	Designation/ Nature of work	Daily attendance (No. of Units 1,2,3,4,5,6,7)	Fair wages Payable			Wages Paid		Overtime worked			Total Wages Paid	Deduction from Wages						Date of Payment	Signature or Thumb impression of worker	Remarks
						Total Attendance Units	Basic	D.A. and other allowance	Basic	D.A. and other allowance	Date	No. of Hrs.	OT Wages earned		Fine	Deduction for damage or loss	House Rent	Recovery of advances	Other Deductions	Net Wage Payable			
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24

* Reasons to be recorded in Col.24

Appendix-IV

4. REGISTER OF FINES (Regulation No.10 (vii))

[illegible]

Appendix-V

5. REGISTER OF DEDUCTIONS FOR DAMAGES OR LOSS
CAUSED TO THE BHAVINI LIMITED BY THE NEGLIGENCE
OR DEFAULT OF THE EMPLOYED PERSONS

(Regulation No.10 (vii))

[illegible]

SCOPE OF WORK

Scope

The scope includes the **Design, material, construction features, engineering, manufacture, packing, transportation, delivery, unloading, safe storage, installation, testing, commissioning, training, documentation & guarantee of Public Address system for 500MWe Prototype Fast Breeder Reactor(PFBR) BHAVINI, Kalpakkam, Kancheepuram District, Tamil Nadu, PIN-603 102** listed in Para 1.1.1. below with all accessories, complete in all respects as per subsequent clauses in this section V.

Whether called for specifically or not all accessories required for normal operation of equipment are deemed to be considered as a part of the CONTRACTOR's scope of supply. It is not the intent to specify completely herein, all details of design and construction of the equipment. However, the equipment shall conform in all respects to high standard of engineering, design and workmanship and be capable guarantees in a manner acceptable to the PURCHASER, who will interpret the meaning of drawings and specifications and shall be entitled to reject any work or material which, in his judgement, is not in full accordance therewith.

1.1.1 Scope of supply/works:

The following materials shall be supplied in line with subsequent clauses of this specification.

A. Public Address System

S.No	Description	Quantity
1	Public Address (PA) centralized amplifier rack rated for 6400W rms, (32 No Amplifiers with 200 watts each) complete with cabinet, Rack, Centralised Paging Control and all other accessories required.	For quantity details refer 'Annexure' (Price schedule). The quantities indicated are on estimation basis only.
2	Master Control Station Console.	
3	Loud speakers	
3.1.	15Watts (RMS) horn type Outdoor loudspeakers, (IP65) with driver unit and line matching transformer. Indoor loud speakers.	
3.2.	6Watts(RMS), flush-ceiling ring mounted	
3.3	4Watts (RMS), Box type, wall mounted, Indoor loud speakers with volume control.	
4	Junction boxes	
4.1.	4 way six terminal	
4.2.	30 terminal	
5	Cables and Wires	
6	Conduits with accessories like bends, tees etc,	
6.1	19mm dia flexible GI conduit	
6.2	25mm dia heavy duty GI ERW conduit	
6.3	Rigid GI conduit pull boxes	
7	Tools and tackles	
7.1	Maintenance and troubleshooting software	
8	Earthing of entire PA System , junction boxes and conduits.	

NOTES:

- a) Shop Inspection and testing shall be as per clause 1.9.
- b) Packing, shipping and delivery at site as per clause 1.17.
- c) Supervision services for erection, site testing and commissioning shall be as per clause 1.15.1.

1.1.2. Exclusions / items related to scope but not included

NIL (the scope shall not be limited to items mentioned in above and price schedule. All the items required to make the system complete shall be in vendor's scope)

1.1.3. Terminal points

240V AC, one phase, 50Hz Class II power supply shall be given to Amplifier racks by BHAVINI for PA System.

1.1.4 Free issue material

Nil

1.1.5 Option for placement of order

1.1.5.1 The Purchaser reserves the right to place order for all items/services listed in this specification or for a part thereof at his discretion.

1.1.5.2 The purchaser reserves the right to accept or reject the lowest or any other tender without assigning any reason for the same.

1.2 PROJECT DATA / SITE CONDITIONS

1.2.1	Purchaser	: BHAVINI
1.2.2	Project Title	: 500 MWe Prototype fast Breeder Reactor Project (PFBR)
1.2.3	Location	: Kalpakkam, 68km South of Chennai on the Coast of Bay of Bengal Latitude 12° 33' North & Longitude 80° 11' East.
1.2.4	Elevation above	: 6.904m Above MSL (Mean Sea Level)
1.2.5	Nearest Sea Port	: Chennai – 68km from Kalpakkam.
1.2.6	Nearest Air Port	: Chennai (Domestic&International) 47km from Kalpakkam.
1.2.7	Nearest Rail head	: Chengalpattu 32km from Kalpakkam.
1.2.8	Nearest National Highway	: NH 45 – Passing Through Chengalpattu.

- 1.2.9 Transport : By Road, Rail and Sea.
- 1.2.10 Ambient Temperature
- (i) Maximum dry Bulb Temperature : 316.6K (43.6°C)
- (ii) Minimum dry Bulb Temperature : 290.6K (17.6°C)
- (iii) Design Ambient Temperature for
- Electrical Equipment/Devices : 318.6K (55°C)
- 1.2.11 Relative Humidity(RH) (condensations) : Max. RH = 100%,
Min. RH = 15%.
- 1.2.12 Air Quality : Air is Salt laden, free from chemical pollution
- 1.2.13 Rain Fall : Average annual
Rainfall = 1312mm
Highest = 2112mm,
Min.= 567mm.
- 1.2.14 Tropicalisation : Required.
- 1.2.15 Seismology : The design basis Peak Ground Accelerations for safety structures are as follows:

Peak Ground Acceleration (g)			
	Horizontal		Vertical
	Comp.1	Comp.2	
SSE	0.156	0.156	0.104
OBE	0.066	0.066	0.044

For non safety structures IS-1853-2002 shall be followed.

- 1.2.16 Wind Pressure & Wind Speed : The Design basis 3 S gust
wind Speeds at 10m level in
terrain category 2 for specific
mean return periods are as
below:

	Mean return period	Design basis 3 s Gust wind	
	Years	speed	km/h (m/s)
(a)	50	223.2	(62)
(b)	1000	306	(85)

Item (a) to be used for non safety structures Item (b) to be used for safety structures.

The design basis 3 S gust wind speed has to be used in line with IS:875 (Part – 1) – 1987 along with appropriate factors for height of structure, terrain roughness (K2) and topography (K3). The probability factor K1 is already included in the values.

- 1.2.17 Auxiliary Power supply :
- (a) For AC Motors below 200kW : 415V, 3 Phase, 3 wire, 50Hz, AC, Effectively earthed
 - (b) Construction Power Supply : 415V, 3 Phase, 4 wire, 50Hz AC.
 - (c) Panel Lighting Fixtures, Space heaters : 230V, 50Hz AC, Single Phase, 2 wire Neutral earthed
 - (d) Instrumentation & Controls and Annunciation : (i) 230V AC, 50Hz Single Uninterrupted Power Supply.
(ii) 220V DC, 2 wire, Ungrounded system.
(iii) 48V DC, 2 wire, Ungrounded system.
 - (e) Supply variations of AC System
 - (i) Variation of Supply Voltage. : - 15%, + 10%
 - (ii) Variation of Supply Frequency. : - 5%, + 3%
 - (iii) Combined Voltage & Frequency Variation. : - 15% + 10%
 - (iv) Variation in 48V DC Supply. : -15%, + 10%
 - (v) Variation in 220V DC Supply. : -15%, + 10%

- Note:**
1. 240V AC single phase and 48V DC supplies are to be used for all remote controls.
 2. 220V DC to be used for switchgear and local control board applications.

1.3 LIST OF APPLICABLE DOCUMENTS:

The design, material, construction, manufacture, inspection, testing and performance of Public Address (PA) System and associated equipment supplied shall comply with the latest editions (including amendments thereto) of all currently applicable standards, statutes, regulations and safety codes in the locality where the equipment will be installed.

1.3.1 Bureau of Indian Standards & other standards

- i) IS 10426 : Specification for Public Address Amplifiers
- ii) IS 1881 : Code of practice for installation of indoor public address system
- iii) IS 1882 : Code of practice for installation of outdoor public address system
- iv) IS 9302 : Characteristics and methods of measurement for sound system equipment
- v) IS 7741 : Specification for loudspeakers
- vi) IS 1031 : Method of measurement on loudspeaker system
- vii) IS 1033 : General requirements and tests for direct radial moving coil loudspeakers.
- viii) IS 1301 : Code of safety for electric mains operated audio amplifiers.
- ix) IS 1819 : Recommendation for general requirements for public address amplifier.
- x) IS 2382 : Mounting dimensions of loudspeakers.
- xi) IS 2748 : Method of measurement on microphone.
- xii) IS 3202 : Climate proofing of Electrical equipment.
- xiii) IEEE:344 Recommended practice for seismic qualification of Class – 1E equipment for Nuclear Power Generating Stations.
- xiv) IEC 60849

1.3.2. Drawings

Tender drawings:

Given below is the list of drawings forming part of Tender and the drawings are separately attached to this tender document.

SI No	Title	Drawing No
1.	Plant Communication System Main Distribution schematics for PA System.	PFBR/60200/SD/2101
2.	Reactor containment building Plant Communication System Layout at EL 12000,17000&18400	PFBR/60200/GA/2103
3.	Reactor containment building Plant Communication System Layout at EL 24600,30000	PFBR/60200/GA/2104
4.	Reactor containment building Plant Communication System Layout at EL 34100,38000	PFBR/60200/GA/2105

5.	Reactor containment building Plant Communication System Layout at EL 46500&52000	PFBR/60200/GA/2106
6.	Reactor contained building Plant Communication System Layout at EL 55800,60800	PFBR/60200/GA/2107
7.	Stream generator building - 1 Plant Communication System Layout at EL 12000,16500&22500	PFBR/60200/GA/2111
8.	Stream generator building - 1 Plant Communication System Layout at EL 30000,37500	PFBR/60200/GA/2112
9.	Stream generator building - 1 Plant Communication System Layout at EL 45000,49300,55000&60000	PFBR/60200/GA/2113
10.	Stream generator building – 2 Plant Communication System Layout at EL 12000,16500&22500	PFBR/60200/GA/2121
11.	Stream generator building - 2 Plant Communication System Layout at EL 30000,37500	PFBR/60200/GA/2122
12.	Stream generator building - 2 Plant Communication System Layout at EL 45000,49300,55000&60000	PFBR/60200/GA/2123
13.	Fuel building Plant Communication System Layout at EL 14000,19000,21000,22000&26000	PFBR/60200/GA/2131
14.	Fuel building Plant Communication System Layout at EL 27000,28000,30000&36000	PFBR/60200/GA/2132
15.	Service building Plant Communication System Layout at EL 23600, 30000	PFBR/60200/GA/2141
16.	Service building Plant Communication System Layout at EL 34500, 37500	PFBR/60200/GA/2142
17.	Rad waste building Plant Communication System Layout at EL 14000,22500	PFBR/60200/GA/2151
18.	Rad waste building Plant Communication System layout at EL 30000, 37500&45000	PFBR/60200/GA/2152
19.	Electrical building -1 Plant communication System Layout at EL 14000,18000, 20.200 & 25000	PFBR/60200/GA/2161
20.	Electrical building -1 Plant communication System Layout at EL 30000, 34500 & 38000	PFBR/60200/GA/2162
21.	Electrical building -1 Plant communication System Layout at EL 43000,47000,51000 & 57000	PFBR/60200/GA/2163
22.	Electrical building - 2 Plant communication System Layout at EL 14000, 18000,20250 & 25000	PFBR/60200/GA/2171
23.	Electrical building - 2 Plant communication System Layout at EL 30000, 34500 & 38000	PFBR/60200/GA/2172

24.	Electrical building - 2 Plant communication System Layout at EL 43000, 47000, 51000 & 57000	PFBR/60200/GA/2173
25.	Control building Plant communication System layout at EL 14000,18000,20250 &25000	PFBR/60200/GA/2181
26.	Control building Plant communication System layout at EL 30000,34500 & 38000	PFBR/60200/GA/2182
27.	Control building Plant communication System layout at EL 43000,47000&51000	PFBR/60200/GA/2183
28.	Diesel generator building - 1 Plant Communication System Layout at EL 30000	PFBR/60200/GA/2191
29.	Diesel generator building - 2 Plant Communication System Layout at EL 30000	PFBR/60200/GA/2192
30.	Service water pump house Plant Communication System Layout at EL 26000,30000,35500	PFBR/60200/GA/2193
31.	System Schematic of Plant Inter Communication System	PFBR/60200/SC/2601
32.	Turbine building Plant Communication System Layout at EL 27500	PFBR/60200/GA/2601
33.	Turbine building Plant Communication System Layout at EL 23500,32500&41000	PFBR/60200/GA/2602
34.	Turbine building Plant Communication System Layout at EL 36000	PFBR/60200/GA/2603
35.	Turbine building Plant Communication System Layout at EL 44500	PFBR/60200/GA/2604
36.	Turbine building Plant Communication System Layout at EL 51000,63500	PFBR/60200/GA/2605
37.	Layout Drawing of Plant communication System Raw water & Fire water Pump House.	PFBR/60200/GA/2611
38.	Layout Drawing of Plant communication system DM water plant	PFBR/60200/GA/2612
39.	Layout Drawing of Plant communication System 230kv indoor switch yard	PFBR/60200/GA/2613
40.	Layout Drawing of Plant communication System 230kv indoor switch yard at EL 27500,33000	PFBR/60200/GA/2614
41.	Layout drawing of Plant Communication System Transformer yard.	PFBR/60200/GA/2615
42.	Layout Drawing of Plant communication System Sea water Pump house	PFBR/60200/GA/2616

43.	Layout Drawing of Plant Communication System Layout Electro chlorination Plant.	PFBR/60200/GA/2617
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1.3.3. Standard supplementary specification - Nil

1.4. System Description

1.4.1. Bharatiya Nabhikiya Vidyut Nigam Limited, Kalpakkam is planned to carry out Public Address system. This specification is for the work mentioned for the complex comprising of the following buildings.

- Reactor containment building(RCB)
- Control Building (CB)
- Fuel Building (FB)
- Electrical Building 1(EB1)
- Electrical building 2 (EB2)
- Steam Generator Buildings 1&2 (SG 1,2)
- Radioactive Waste Building (RWB)
- Service Building (SB)
- Diesel Generator Buildings 1&2 (DGB 1,2)
- Service Water Pump House (SH)
- Turbine building (TB)
- Sea Water Pump House (SWPH)
- Raw Water and Fire Water Pump House
- DM Water Plant
- Transformer Yard
- Electro Chlorination Plant
- Switchyard Area

For internal communication within the complex, the following system shall be provided by bidder.

a) Public Address (PA) System for general purpose paging and announcements.

Enclosed Main Distribution Schematics **PFBR/60200/SD/2101** & **PFBR/60200/SC/2601** shows the distribution agreements for public address system in the complex.

The PA system shall be used for paging and common announcements including instructions and evacuation messages. It shall provide an efficient means of contacting plant personnel on the move, who cannot initially be contacted on telephone. The PA system shall consist of a centralized amplifier system and groups of loudspeakers shall be connected radially to the amplifiers by cables.

For PA system Class-II Uninterruptable Power Supply (UPS) 240V $\pm 10\%$, 50Hz $\pm 5\%$ will be provided by BHAVINI. In case any other voltage is required for the system, then the bidder shall consider provision for deriving the same from the above UPS supply. Bidder to indicate wattage & current requirement for the UPS supply.

1.4.2. SYSTEM OPERATION

Normal operation

For calling a person on the move in indoor areas or making announcements using PA system, plant personnel shall be able to get access to PA system from extensions by dialing a pre-selected code number or alternatively by requesting telephone operator.

For calling external subscribers of public network, if a caller's extension line is programmed for this facility he will dial an access code or he can avail of the attendant's assistance to setup the call.

Operating under abnormal conditions

The attendant console for PA system and selected extension shall have the facility for broadcasting a wailing siren tone on the loudspeakers for indicating an emergency.

For plant emergency, there are three types of emergency conditions, '**Stay in**', '**Evacuate**' and '**All Clear**'. Frequency and duration of sound signals for these conditions are as follows:

For '**Stay in**' : 10 seconds 'ON' and 20 seconds 'OFF' for a duration of 3 minutes.

For '**Evacuate**' : 20 seconds 'ON' and 10 seconds 'OFF' for a duration of 3 minutes.

For '**All Clear**' : Continuous 'ON' for a duration of 3 minutes.

During site / off-site emergency, air siren is 'ON' for 15 sec and is 'OFF' for 5 sec for a duration of 5 min. Once the emergency situation ceases, the 'All Clear Signal' switch is to be pressed. Now the sound signal is continuously 'ON' for 5 min. Sound signal of these frequencies is transmitted through PA also.

Separate sets of switches are provided in both Control Room and Back-up Control Room for transmitting sound signals for 'Stay in', 'Evacuate' and 'All clear' during plant emergency and for 'Stay in' and 'All clear' during site / off-site emergency.

1.5. GENERAL REQUIREMENT

- 1.5.1 The TENDERER shall be deemed to have carefully examined all the sections of the specification in its complete form and to have been fully informed and satisfied himself as to the details, nature, character and qualities of the items to be supplied, site conditions and seismic requirements and other pertinent matters and details.
- 1.5.2 It is the intent of the PURCHASER to incorporate these specification documents in the final Contract or purchase order for the supply of material, equipment and services. The TENDERER is required to review these documents and clearly state in their proposals their acceptance of the same. Exceptions, if any, shall be clearly stated in the appropriate tendering schedule. The final contract between the PURCHASER and the CONTRACTOR shall be subject to changes, mutually agreed upon between the PURCHASER and the CONTRACTOR. However, during the execution of Contract, any variation in the scope of supply to reflect the intent of this specification and to be in line with good engineering practice shall not be subject to price variation.
- 1.5.3 The TENDERER shall specify all deviations with respect to this specification in the appropriate schedule. The deviations other than those indicated in the Schedule of deviations shall not be considered.
- 1.5.4 The TENDERER shall furnish all the data called for in the schedules in the standard proforma to facilitate correct evaluation of his tender in a most expeditious manner. It is in the interest of the TENDERER to submit the Tender in the above manner failing which it is likely that his tender may not be considered.

- 1.5.5 The TENDERER shall submit all supporting information, technical data, catalogues, drawings and quality assurance to enable the PURCHASER to make a detailed comparison and evaluation of TENDERS without the need for further information from the TENDERERS. The TENDERER shall also submit all information/price schedules.
- 1.5.6 In case of conflict between/within various sections of this 'SPECIFICATION' or in case of any doubt, the interpretation/decision as given by the PURCHASER shall be final.

1.6 DESIGN AND MANUFACTURING REQUIREMENTS

This section covers the construction and design details of Public Address System.

1.6.1 PUBLIC ADDRESS SYSTEM (PAS)

PA system consists of central paging control with amplifier rack & master control station. 2 Nos of master control station consoles are envisaged. The PA system amplifier shall be modular in units of 200rms watts each. The modules shall be housed in CRCA steel cabinets or panel to give some minimum physical protection. The enclosure shall have removable cable gland plates at the bottom. The amplifier units shall be packaged in steel enclosures with louvers. However, for stacking of units vertically above each other, the design shall provide for adequate air movement and air changes in the cabinet. For good appearance, the enclosure housing the stacked units shall be provided with a front door. The System shall have a stand by amplifier with changeover circuitry. System shall be suitable for interconnecting telephone system through coupler. System shall conform to IS 1882 for speech intelligibility. It shall be class "B" with frequency response of 175 to 4000Hz with negligible distortion within ± 5 db response.

Protection against following shall be provided:

- a) Short circuit (electronic protection)
- b) Open circuit (electronic protection)
- c) High temperature of mains transformer.

The PA system amplifier shall withstand mismatched loads for at least 5 minutes.

The PA system amplifier shall be provided which will give local alarms and a group alarm contact for remote annunciation. A signal shall be generated for remote alarm for condition of non-availability of PA system / amplifier.

P.A Master Control Station (MCS) consoles shall be located one each in Control Room & Backup Control Room.

The PA amplifier system shall incorporate pre-amplifiers with input sensitivity control and mixing capability, as necessary.

The system shall have built in steady tone generator for testing & calibration.

The amplifiers and loudspeakers shall have multiple ratio line matching transformers with 4, 8 & 16 ohm impedance taps, as well as 70 & 100V constant voltage taps.

Three types of loudspeakers with line matching multiple ratio transformers shall be provided by the bidder.

- a) 4 watts (rms) wall mounting loudspeaker with acrylic wrapped particle board / multiply hard wood enclosure with volume control for use in small rooms or for distributing sound by multiple units in a hall.
- b) 6 watts (rms) loudspeaker with enclosure suitable for flush-mounting in false ceiling.

- c) 15 watts (rms) weatherproof aluminium horn type speaker for outdoor use or column type for indoor use, mounted on swiveling bracket.

All speakers shall be designed to withstand operating at their power for 100 hrs in accordance with IEC 268-5 standards. The PA system shall have provision for broadcasting a wailing sound (for emergency), a steady tone (for testing) and a pleasant musical chime (for calling attention prior to an announcement) and automated voice signal for Fire Alarm announcement.

All PA System components should be approved for IEC 60849 Standards for EVAC Compliance. The systems viz., amplifiers, controllers, speakers, etc., which are compliant to EVAC requirements only will be accepted. Bidders should provide necessary approvals and compliance certificates in this regard while submitting the tender.

The loudspeaker shall be provided in following areas:

- a) Reactor Containment Building (RCB)
- b) Control Building (CB)
- c) Fuel Building (FB)
- d) Electrical Buildings 1 and 2 (EB-1,2)
- e) Steam Generator Buildings 1 and 2 (SG-1,2)
- f) Radioactive Waste Building (RWB)
- g) Service Building (SB)
- h) Diesel Generator Buildings 1 and 2 (DGB-1,2)
- i) Service Water Pump House (SWPH)
- j) Turbine Building (TB)
- k) Sea Water Pump House (SWPH)
- l) Raw Water & Fire Water Pump House
- m) DM Water Plant
- n) Transformer Yard
- o) Electro chlorination Plant
- p) Switchyard Area

A minimum capacity of 6400 W rms (6.4kW rms) Public Address System shall be offered by bidder.

Each amplifier module shall have a level meter to measure output power.

The PA system shall have a facility to take input either from a subscriber of the EPABX or from MCS consoles in the Control Room (CR) and Backup Control Room (BCR). The console shall be used for announcement to selected groups of loudspeakers and for transmitting special tones whenever required. The console shall also enable selective PA system operation to be independent of EPABX.

Necessary hardware shall be provided for EPABX interface and zoning by EPABX subscriber, Control Room and Backup Control Room.

The system is **seismically** categorized as **category-1**.

Class-II 240V AC 1Ø, 50Hz UPS power supply will be provided to PA system.

1.6.2 CABLES FOR P.A. SYSTEM

- 1.6.2.1. The main cables from amplifier to main PA junction boxes in buildings shall be 5C x 1.5 Sq.mm ATC, PVC insulated, FRLS PVC outer sheathed. These cables shall be unarmoured and shall be routed on cable trays in peripheral space. However, for RCB, CB the main cables shall be unarmoured and shall be routed through GI conduits and pipe sleeves in brick walls and penetration (in case of RCB).
- 1.6.2.2 The distribution cable from main PA JB to various sub junction boxes shall be same cable as above but will be unarmoured. This shall be laid in 25mm dia GI conduit.

- 1.6.2.3 The loudspeakers shall be connected to sub junction boxes by using 24/0.2mm, ATC, 2C, PVC insulated. FRLS PVC outer sheathed, unarmoured cable laid in 19mm dia flexible GI conduit.

1.6.3 JUNCTION BOXES

- 1.6.3.1 The main multi terminal junction boxes for PA system shall be 30 terminal based on requirements. These shall be of G.I & shall be pilfer proof.
- 1.6.3.2 The sub junction boxes for PA system shall be 4 way six terminal G.I.Boxes. These shall be used for connecting loudspeaker to amplifier.

1.6.4. EQUIPMENT EARTHING

- 1.6.4.1 For safety earthing, earthing pads will be provided on nearby wall/column. CONTRACTOR shall provide at least two (2) connecting earthing leads from each of the metal encased equipment connecting this system to the nearest earthing pads. Each earthing lead shall be connected to different earthing pad.
- 1.6.4.2. For overall earthing system refer clause 1.6.21
- 1.6.4.3. The junction boxes shall be earthed with 8 SWG copper wire / 25X6 Sq.mm copper earthing bus bar.

1.6.5. CABLING SYSTEM

- 1.6.5.1 The cabling system shall include supply, storing and drawing cables, laying, fixing, jointing/termination and any other work items necessary for completing the job. The **Contractor** and **Purchaser** shall jointly inspect the cables before supply by **Contractor**.
- 1.6.5.2 The CONTRACTOR shall furnish all supervision, labor, tools, welding equipment and testing equipment as required for installation work. All incidental hardware and miscellaneous items such as saddles, spacers, nuts/bolts/washers, anchor fasteners, cable identification tags and ferrules, nylon cord/GI wire, earthing as required for the cabling installation shall be deemed to be included by the CONTRACTOR as part of the installation work.
- 1.6.5.3 Civil works for construction of built-up cable trenches/tunnels/duct banks, provision of embedded conduit/pipes in RCC / masonry structures and across roads is excluded from the CONTRACTOR's scope. However, minor civil works such as patching up in an approved manner any holes made in the walls by the CONTRACTOR, embedment of short lengths of conduits in floors, walls, etc., (if not already done by Civil Contractor) shall be deemed to be included in the CONTRACTOR's scope. Cable trays and raceways are excluded from CONTRACTOR's scope. The CONTRACTOR shall work in co-ordination with the electrical, civil, air-conditioning, piping and equipment installation contractors at site.
- 1.6.5.4 The MANUFACTURER'S/PURCHASER'S drawings, cable schedule, instructions and recommendation shall be correctly followed by the CONTRACTOR in handling, laying, testing and commissioning of the cabling system.
- 1.6.5.5 In case of any doubt/misunderstanding as to correct interpretation of instructions/drawing, necessary clarification shall be obtained by the CONTRACTOR from the PURCHASER.

1.6.6. CABLE LAYING

- 1.6.6.1. The CONTRACTOR shall lay, test and commission all cables under his scope of supply. The quantities, sizes and types of cables are indicated Schedule of quantities
- 1.6.6.2. The cables shall be laid in built-up trenches, directly buried on ground, on cable trays, vertical raceways, clamped on structures/walls/ceiling, pulled through pipes and conduits etc., as per the relevant cable installation practice notes and typical project drawings.
- 1.6.6.3. The scope of cable laying shall include laying, pulling cables as above, proper dressing of cable on cable trays, racks, vertical raceways and supply and installation or cable fixing saddles, spacing clamps and nylon cord for tying as required.

1.6.7. CABLE TERMINATION

All cables that will be laid by the CONTRACTOR shall be connected at both end to equipment or junction boxes terminals and shall be carried out with lug termination for power cables and loud speakers and directly for telephone cables on krone type connectors.

- 1.6.7.1. The scope of termination at each end shall include dressing and connection of all cores of the cables.
- 1.6.7.2. Making the requisite holes in the bottom/gland plate of the panels and junction boxes for cable glands, fixing the cable glands, earthing the cable armour crimping the cable lugs on each core neatly clamping the cables inside panels cable alleys wiring throughs and connecting to correct terminals as per the wiring diagrams and cable schedule. The cable identifying ferrules shall be supplied and installed by the CONTRACTOR as part of the cable termination work.
- 1.6.7.3. All cable terminations of PA system shall be solderless crimping type. Proper crimping tools of Dowell or equivalent shall be subject to the PURCHASERS approval.
- 1.6.7.4. Spare cores of cables shall be connected to spare terminal blocks, where available, with appropriate ferrules. If there are no spare terminal blocks, the spare cores shall be bunched together neatly and shall be kept inside the panel.

1.6.8. STRUCTURAL SUPPORTS AND STRUCTURAL STEEL

- 1.6.8.1. The CONTRACTOR shall fabricate, install and paint the following as per relevant enclosed drawings / general notes.
 - a) mounting arrangement of loudspeaker.
 - b) Supporting brackets for speaker, junction boxes, conduits, etc.
 - c) The above mounting structures shall be fabricated from standard structural steel members as per IS:226, IS:808, IS:1051 (channels, plates, angels and flats).

1.6.9. UNDERGROUND CABLES, CONDUITS AND PIPES

- 1.6.9.1. Cabling in between physically separate building shall be through available trenches/tunnels. If not available contractor shall prepare the same and lay the cables.

1.6.10. CABLE JOINTS

Cable jointing wherever necessary and approved by the PURCHASER shall be carried out by the CONTRACTOR using cable joining kit. The work shall be carried out as per Manufacturer's instructions furnished to the CONTRACTOR.

1.6.11. CONDUITS, PIPES AND DUCTS

- 1.6.11.1. The CONTRACTOR shall install conduits, pipes and ducts in walls as specified. All accessories / fittings required for making the installation complete, including but not limited to ordinary and inspection tees and elbows, check nuts, brass or galvanized steel *end caps*, PVC / brass bell mouths for water - proof / fire - proof sealing, pull boxes, saddles, spacers and required steel supporting work shall be supplied by the CONTRACTOR. Conduit fittings shall be of the same materials as conduits.
- 1.6.11.2. Conduits / pipes running horizontally above false ceiling and other exposed conduit running along the walls / structural members wherever necessary will be under CONTRACTOR'S scope. All conduits / pipes shall have their ends closed by caps until cables are pulled.
- 1.6.11.3. Each conduit run shall be marked with its designation. Identification shall be by means of painting so located that each run of conduit is readily identified at each end. Where conduits terminate at flush mounted boxes, cabinets or other enclosures, the designations shall also be painted on the inside of the enclosure adjacent to the conduits.
- 1.6.11.4. The CONTRACTOR shall have facility available at site for threading pipe for conduit of diameters and threads corresponding to the standards. He shall thread or cut off and rethread pipe / conduit and shall install adapters or reducers when required to connect sections conforming to different standards or specifications. He shall ream out threads and weld conduit to join the system together, if necessary. When cutting a conduit, it shall be firmly held in a vice or by other suitable means, and shall be cut square, preferably using cold cut-off saw, power hacksaw or other approved tool for cutting conduit, without leaving larger inside burrs or otherwise leaving damaged end. Cut ends shall be reamed and all burrs and sharp edges removed. Ends requiring threading shall have field run threads cut clean and true with sharp, unworn dies to conform with pipe thread standards for thread dimensions, length of threads, depth of thread and taper. All field threaded ends of metallic conduits / pipes shall be reamed after threading and anticorrosive paint applied.
- 1.6.11.5. Exposed conduit (if any) shall be adequately supported by racks, clamps, straps or by other approved means. Conduit supports shall be erected square and true to line and grade with an average spacing of 1.2m. Conduit support shall be erected with Nominal Bore (dia) of 16mm to 25mm.
- 1.6.11.6. The fabrication and installation of supports and the clamping or fastening of conduits to racks and supports shall be included in the scope of work by CONTRACTOR. Drilled and tapped holes for screw fastening for conduits on galvanized or painted steel shall be touched up with red lead and same finishing paint before making up the connections.
- 1.6.11.7. Conduit shall be entered into terminal boxes at locations provided by equipment MANUFACTURER's designs unless otherwise shown on the drawings, or unless otherwise directed by the PURCHASER. In general, all equipment enclosures, cabinets and housings requiring conduit or cable entry shall be provided with terminal boxes designed for terminating and sealing the ends of paper insulated

cable with compound or will have conduit terminating above level of emergence from floor concrete, with a wiped joint required between lead sheath and wiping sleeve on terminal box. However, a reasonable amount of drilling cutting, reaming and relocating holes shall be considered as normal part of the work. Pull boxes, junction boxes, outlet boxes and terminal boxes other than standard items and standard pull sleeves and floor plates, plates terminating conduit runs at cable trays and other plates in the path of conduit runs should be initially furnished ungalvanized and without conduit or cable entry holes. The CONTRACTOR will later be required to cut entry holes located to meet actual conduit locations as installed after which boxes and plates shall be hot dip galvanized / painted as required.

- 1.6.11.8. Where and if thin wall conduit is specifically permitted, conduit systems shall be made up in a neat manner, using compression type fittings, which do not require threading of the tubing. Fittings shall be made up with full thread engagement between nuts and expansion sleeves and where thin wall conduits enter boxes, shoulder or fitting shall bear tightly against box, with locknut inside drawn up tightly. If difficulty in attaining clamping action from both inside and outside of entry hole is encountered in bringing shoulder of fittings to bear, locknuts shall be used on the fitting both inside and outside of the box at the entry hole. All joints shall have structural rigidity and low electrical resistance across joints.

1.6.12. JUNCTION BOXES

- 1.6.12.1. The junction boxes shall be weather, dust and vermin proof and shall be fabricated from 14 gauge galvanized steel and shall be complete with removable cover plate with gaskets, two earthing terminals each with nut, bolt and washer.
- 1.6.12.2. The boxes shall have provision for wall, column, pole or structure mounting and shall be provided with cable / conduit entry knock outs, terminal block.
- 1.6.12.3. The Terminal blocks with specified number of terminals, shall be mounted securely on brackets welded to the back sheet of box. The terminals shall be 650V grade, one piece construction complete with terminals, insulation barriers, galvanized nuts, bolts and washers and provided with identification strips of PVC. The terminals shall be made of copper alloy and shall be of box clamp type.
- 1.6.12.4. The boxes shall be painted with one shop coat of red oxide zinc chromate primer followed by a finishing coat of Aluminium alkyd paint.

1.6.13. CABLE SEALING AT THE CONTAINMENT WALLS OF REACTOR CONTAINMENT BUILDING

This will be done by the CONTRACTOR.

1.6.14. TELEPHONE AND SPEAKER CABLE SEALING AGAINST RADIO-ACTIVITY WITHIN THE REACTOR CONTAINMENT BUILDING, AND OTHER ACTIVE BUILDINGS / CELLS

- 1.6.14.1 This will be done by IGCAR.

1.6.15. WIRING

- 1.6.15.1. Wiring shall be carried out in heavy duty rigid G. I. conduits and size of conduit will be 20/25/32mm. Wiring shall be capable of easy inspection. Due consideration shall be given for neatness and good appearance. 19mm flexible GI Conduits shall be used for PA System.

- 1.6.15.2. For long conduit wiring runs, inspection / pull boxes shall be provided at intervals not exceeding 10 m. Such facilities shall also be provided at conduit bends.

1.6.16. HAZARDOUS AREA WIRING

- 1.6.16.1. Wiring in hazardous areas shall conform to specified applicable standards.
- 1.6.16.2. The method of wiring used in hazardous area i.e. either in screwed rigid heavy gauge steel conduits or unarmored cable, shall be continued upon a distance as indicated below the boundaries of the demarcated area considered a hazardous:
- a) Where processes or operations necessitating the use of flame proof equipment and fittings are carried out in open up to 6 m horizontally in any direction from the boundary line and 3 m vertically above the highest source of hazard.
 - b) Where processes or operations necessitating the use of flame proof equipment and fitting is carried out in enclosed equipment up to 6 m horizontally of open face or door opening of such equipment and 3 m vertically above the roof of such equipment.
 - c) Joint / junction boxes shall be avoided in hazardous area. If necessary, boxes of approved flameproof design shall be used.
 - d) Bakelite material shall not be used in hazardous areas.

1.6.17. CONDUIT EARTHING

- 1.6.17.1. Conduits and fittings shall be earthed by 8 SWG GI wires run along the length of the conduit and secured by means of suitable clamps efficiently fastened to conduit pipe. To achieve perfect electrical continuity, the conduits shall be bonded effectively on either end of a coupling and other joints.
- 1.6.17.2. Conduits shall be grounded at the commencement of the run, by a earthing conductor connected at an earth clip, clamp or gland

1.6.18 SUPPLY OF CONDUIT AND ACCESSORIES

- All conduits used shall be ERW Galvanized steel heavy duty conduit free from burrs, dents, etc., The size shall be 20/25/32mm (coated tubes are acceptable).
- All conduit fittings i.e., tees, bends, elbows, saddles, clips, bush and lock nuts etc., shall be heavy duty galvanized steel with proper inspection covers and screwed type conduit entries. They shall conform to the standard IS 2667 and IS3837. The materials shall be of good quality and workmanship.
- All conduits shall be run on hospital or other type of approved saddles and clamped at an interval of 1000mm in both vertical and horizontal direction. In addition saddles shall be located on either side of bends, joints and fittings/accessories. In such case saddles shall be located at a distance not exceeding 300mm from the fitting or accessory.
- In order to minimize condensation or sweating inside the conduit, all outlets shall be properly drained and ventilated but in such a manner as to prevent the entry of insects as far as possible.
- Suitable sleeves shall be used when conduits are passed in wall /floors. At one end of the wall/floor a pull box shall be installed to break the continuity of the conduit. The ends of the sleeves and conduit openings of the box shall be sealed with fire barrier material like wool and gypsum cement etc.,
- Conduits up to and including 32mm dia shall be of 1.8mm thick.
- All conduit accessories shall be of threaded type and under no circumstances pin grip or clamp type accessories be used.

- The conduit pipes shall be fixed to the wall or roof slab by means of die cast aluminium hospital saddles and galvanized conduit clips.
- The conduits shall conform to the standards IS 9537 (Part I and II)
- Pull boxes shall be of 2mm thick sheet steel hot-dip galvanized, dust and damp proof with cover of mild steel plate of same thickness. The cover shall be fixed to the box by means of counter sunk head nickel or chromium plated brass screws and cup washers. Neoprene rubber gasket shall be provided for the cover of boxes making them water tight.
- The minimum size of pull boxes shall be of 75x75mm and the minimum depth shall be of 65mm.
- The pull boxes shall be given one coat of primer and two coats of enamel painting of approved colour.

1.6.19. EARTHING SYSTEM

- 1.6.19.1. The Plant Communication System shall be connected to the Safety Earthing Grid (G1) of the Complex. Contractor shall install copper conductors, braids, etc., required for earthing system and individual equipment earthing. All works such as cutting, bending, supporting, painting / coating, drilling, brazing / soldering / welding, clamping. Bolting and connecting on to structures, equipment frames, terminals, rails or other devices shall be in the CONTRACTOR's scope of work. All incidental hardware and consumables such as fixing cleats/clamps, anchor fasteners, lugs, bolts, nuts, washers, bitumast compound, and anti-corrosive paint as required for the complete work shall be deemed to be included by the CONTRACTOR as part of the installation of work.
- 1.6.19.2. The tap connections (earthing leads) from the floor embedded earthing pad to the equipment of more than 500mm long shall be embedded in floor by the contractor where required, together with associated civil works, connection between earth leads and equipments shall be of bolted type.
- 1.6.19.3. The earth connection leads to equipment and risers on steel structures/walls shall include laying the conductors, welding / cleating at specified intervals, welding/brazing/bolting the main earth grids/pads, risers, bolting the equipment terminals and coating welded/brazed joints by bitumastic paint. Galvanized conductors shall be touched up with zinc rich paint where holes are drilled at site for bolting to equipment/structure.

1.6.20. TESTING OF EARTHING SYSTEM

- 1.6.20.1 The contractor shall test the complete PA System and shall ensure the continuity of all conductors and joints. The purchaser may ask for earth continuity tests, earth resistance measurement and other tests which in this opinion are necessary to prove that the system is in accordance with the design, specification, code of practice and Electricity Rules. The contractor shall quote the prices for the testing of complete earthing system also.

1.6.21. CONTRACTOR'S LICENSE

- 1.6.21.1. It shall be the responsibility of the CONTRACTOR to obtain necessary License/ Authorization / permit for work from the Licensing Board of the locality/State where the work is to be carried out. The person deputed by the CONTRACTOR's firm should also hold valid permits issued or recognized by the Licensing Board of the locality / State where the work is to be carried out.

1.6.22. WORKMANSHIP

- 1.6.22.1. The CONTRACTOR shall ensure workmanship of good quality and shall assign qualified Supervisors / Engineers and competent labor who are skilled, careful and experienced in their several trades in similar works. The PURCHASER shall reserve the rights to reject non - competent persons employed by the CONTRACTOR, if the workmanship is not of good order.

1.7. OPERATING CONDITION AND REQUIREMENTS

Public Address System(PAS)

- 1.7.1. The PA system is designed for zone wise announcement which is more effective in locating a person in the field rather than individual loudspeaker paging. The zoning is flexible and can be designed to meet the geographical layout.
- 1.7.2. The PAS is equipped with
- a) Central control equipment comprising of central Paging Control and Amplifier Rack and Master Control Stations.
 - b) Field equipment comprising of paging loudspeaker, junction boxes and cabling.
- 1.7.3. The system can be configured and designed to meet all type of needs. The system permits the use of various models of central control equipment. The central equipment is in modular construction, offering the flexibility of building the system capacity to meet the present requirements with the provision for future expansion.
- 1.7.4. The central paging control is equipped with additional amplifier in stand by mode. On failure of particular main amplifier, the stand by amplifier is brought in the system to support the load. This ensures a complete fault tolerant system.

1.8. IDENTIFICATION OF EQUIPMENTS/COMPONENTS

➤ TAG Nos.

- a) The Tag Nos. for loudspeakers, Junction boxes and Pull Boxes, shall be as per the tag numbers given in the enclosed drawings.
- b) All panels shall have tag number and the same shall appear on the front and rear.

➤ Name Plate

Each item shall be provided with a name plate or label designating the service of the particular equipment. The shape and size of the plate and inscriptions shall be approved by PURCHASER. Such name plates shall be anodized aluminum plates having engraved black lettering or the plate shall be of multi layered laminated plastic material with black lettering engraved on a white background. The name plates shall be screwed to the body of the equipment.

➤ Danger boards

Danger boards material written in English/Hindi/applicable vernacular language shall be provided on all electrical equipments with a voltage of 415V and above. The board shall have skull and cross bones danger sign together with inscription 'DANGER ----VOLTS' and the corresponding translations inscribed in white letters on a red background. The danger boards shall conform to IS:2551 and Indian Electricity rules.

1.9. INSPECTION AND TESTING

- 1.9.1 The equipment covered by this Contract shall be subjected to inspection and testing. The CONTRACTOR shall provide all services to establish and maintain quality of workmanship in his works and that of his SUB-CONTRACTORS to ensure the mechanical/electrical performance of components, compliance with drawings, identification and acceptability of all materials, parts and equipment.
- 1.9.2 The CONTRACTOR shall perform his internal inspection/testing before offering the equipment for PURCHASER's inspection. Only after ensuring that his inspection/test results are satisfactory, CONTRACTOR shall offer the equipment for PURCHASER's inspection. However in case of such tests which are required to be done only once in the life time of the equipment, the test shall be carried out in the presence of PURCHASER's representative. Distracting testing shall be done on the items supplied to purchaser.
- 1.9.3 The minimum inspection requirements for all components/equipment shall conform to the design and fabrication requirements as defined in the Codes and Standards referred to in the Specification document. The type of inspection shall be as prescribed in Quality Control plan and as agreed upon by the PURCHASER, and shall include, if applicable, inspection procedures prescribed by Codes and Regulations recognized by the Governmental Authority having jurisdiction over the installed goods.
- 1.9.4 Wherever required, getting approval of Government bodies under jurisdiction is the sole responsibility of contractor for his design, drawings, manufacturing, testing and inspection by such bodies. In such cases approval by Government bodies under jurisdiction will not relieve the contractor from his responsibility of making good of defective material/equipment/system. However, contractor shall keep the purchaser/his representatives informed in writing of any approval or otherwise any comments of such Government bodies, contractor shall take the concurrence of purchaser or his representative before proceeding with rectification procedures as called by the Government bodies.
- 1.9.5 Approval or passing of any such inspection by the PURCHASER or his authorised representative shall not, however, prejudice the right of the PURCHASER to reject the equipment if it does not comply with the Specification when erected or give complete satisfaction in service.
- 1.9.6. The contractor shall intimate to the purchaser well in advance of any material being ready for testing. Such tests shall be to the contractor's account except for the purchaser's expenses. The purchaser or his representative, unless the inspection of the tests is virtually waived, shall witness such tests on a mutually agreed date.
- 1.9.7. The PURCHASER shall give notice in writing to the contractor of any objection to any drawings and, all or any equipment and workmanship which in his opinion is not in accordance with the 'contract'. The contractor shall give due consideration to such objections and shall either make the modifications that may be necessary to meet the said objections or shall confirm in writing to the PURCHASER giving reasons therein that no modification is necessary to comply with the 'contract'. However, the PURCHASER has the final authority to accept or reject the contractor's views. The equipment/material after rectification by the contractor shall be offered to the PURCHASER for his final inspection and acceptance without any additional cost to PURCHASER.
- 1.9.8. When the factory tests have been completed to the satisfaction of the PURCHASER, the PURCHASER shall issue a certificate to this effect within fifteen (15) days after completion of tests, but if the tests are not witnessed by the PURCHASER's representative, the certificate shall be issued within fifteen (15) days of the receipt of the CONTRACTOR's test certificate by the PURCHASER provided the test results are satisfactory and conform to the specified parameters. The completion of these tests, or

the issue of the certificate shall not bind the PURCHASER to accept the equipment should it, on further tests after erection, be found not to comply with the 'Contract'.

1.9.9. In all cases where the 'Contract' provides for tests whether at the premises or Works of the CONTRACTOR or of any SUB-CONTRACTOR, the CONTRACTOR, except where otherwise specified shall provide free of charge such items as labour, materials, electricity, fuel, water, stores, apparatus and instruments as may be reasonably demanded by the PURCHASER or his authorised representative to carry out effectively, such tests of the equipment in accordance with the 'Contract' and shall give facilities to the PURCHASER or to his authorised representative to accomplish testing.

1.9.10. The inspection by the PURCHASER and issue of Inspection Certificate thereon shall in no way limit the liabilities and responsibilities of the CONTRACTOR in respect of agreed quality assurance programme forming a part of the 'Contract'.

1.9.11. In the case of stage inspection, whenever purchaser's hold points are specified, the contractor shall proceed from one stage to another only after the component is inspected by the PURCHASER or his representative and permission given to proceed further. The same procedure shall be adopted for any rectifications/repairs suggested by the PURCHASER or his representative. At all customer hold points the contractor shall compulsorily offer for inspection to PURCHASER and, if any waiver by PURCHASER shall be obtained in writing for record purposes.

1.9.12. None of the equipment to be furnished or used in connection with the Contract shall be dispatched until shop inspection, satisfactory to the PURCHASER or his representative has been made and specific shipping release for the equipment is issued by the PURCHASER. However, such shop inspection shall not relieve the CONTRACTOR of his responsibility for furnishing the equipment conforming to the requirement of the Contract nor prejudice any claim, right or privilege which the PURCHASER or his representative may have because of the use of defective or unsatisfactory items of the equipment. Should the PURCHASER or his representative waive the right to inspect any item of the equipment, such waiver shall not relieve the CONTRACTOR in any way from his obligation under the Contract. In the event of the PURCHASER on inspection revealing poor quality of goods, the PURCHASER or his representative shall be at liberty to specify additional inspection procedures, if required, to ascertain the CONTRACTOR's compliance with the equipment Specifications.

1.9.13. All principal mill test reports, test certificates and test curves shall be supplied for all tests carried out including other records such as stress relieving charts, radiographic charts and other non-destructive testing records in accordance with the provisions of the Contract. The PURCHASER or his representative shall reserve the right to call for certificates of origin and test certificates for all raw material and equipment at any stage of manufacture.

1.9.14. Sub-orders

(a) To ensure getting good quality product from SUB-CONTRACTOR, the main CONTRACTOR shall get the approval of PURCHASER by furnishing details of capability, experience, manpower, manufacturing facility, quality control facilities etc. of the SUB-CONTRACTORS before placement of order. The PURCHASER may visit the SUB-CONTRACTOR's works to evaluate their capacity and capability to do quality job to meet specification requirements. The sub-orders should highlight the inspection and quality control requirements stipulated in the main Specification and all required quality checks and tests shall be conducted as per the Specification.

(b) In order to facilitate the inspection of bought-out materials and equipment, the CONTRACTOR shall submit for approval, three (3) copies of all sub-orders placed by him as soon as they are issued. Copies of any drawings referred to in the sub-order shall also be submitted, unless otherwise agreed by the PURCHASER or his representative.

(c) The sub-orders and drawings referred to above shall cover all components which are subjected to electrical and mechanical pressure or stress when the plant is in operation, and also auxiliaries and spares which are to be directly dispatched to Site from the SUB- CONTRACTOR's Works.

(d) All sub orders shall include a statement advising the SUB-CONTRACTOR that items being ordered shall also be subject to inspection and test by the PURCHASER or his representative.

(e) It is important that all copies of sub-orders be clearly marked with the main CONTRACTOR's name and the name of the PURCHASER and 'Contract' reference.

1.9.15. MATERIAL TESTS

a) In the event of the PURCHASER or his representative being supplied with the particulars of tests which have been carried out by the suppliers of material, he may, at his own discretion, accept the same as proper evidence of compliance with the requirements of appropriate specifications for the materials.

b) In case correlating test certificates are not available the CONTRACTOR, at no extra cost to the PURCHASER shall get all the tests done to establish conformity of the material to its relevant code/specification.

1.9.16. TESTS AT MANUFACTURER'S WORKS

The tests at Works shall include electrical, hydraulic & mechanical tests in accordance with the appropriate clauses of Statutory Regulation, relevant Codes and Standards and in addition any test called for by the PURCHASER or his representative to ensure that the equipment being supplied fulfills the requirements of the specification. The CONTRACTOR shall carry out all the shop tests and inspections specified in the following clauses in addition to those normally carried out by him. For equipment not covered by any code or specifically mentioned in this specification, the tests are to be agreed with the PURCHASER. If considered necessary by the PURCHASER or his representative, multipart assemblies shall be fully erected and tested in the works prior to packing and dispatch to the site.

TYPE TESTS

Full type tests in accordance with relevant IS, IEEE and IEC standards type test certificates shall be provided by the CONTRACTOR showing satisfactory test results on identical equipment manufactured by him. If type test certificates are not submitted by the contractor or not satisfactory to the purchaser, he shall carry out full type tests in reputed institutes like ETDC, SAMEER etc. for all the associated equipment/components mounted on the PA System panels at his own cost. The equipment for type test shall be selected at random. Type tests shall be carried out with all associated equipment/components mounted on the PA System panels. The test to be carried out by CONTRACTOR shall be as per relevant standards, IS, IEEE, BS & AERB guide.

1.9.17. ROUTINE TESTS

All routine tests shall be carried out on all equipment as per latest IS and IEEE standards. Routine tests shall be conducted on the fully assembled components / equipment in the presence of PURCHASER's representative. The routine tests to be conducted by the contractor shall include but not be limited to the tests listed below.

P.A. Amplifier System Tests

- a) Functional test.
- b) Tests as per standard.

1.9.17.1. Tests at site

- 1.9.17.2. The system shall pass the following tests which are carried out at site before putting it in normal service.
- 1.9.17.3. These tests, are however, not intended to form a comprehensive commissioning check list, as it shall be the CONTRACTOR's responsibility to draw up and carry out such a program duly approved by the PURCHASER.
- 1.9.17.4. The CONTRACTOR shall give a detailed program of site testing in his offer and the standards followed for PURCHASER's approval

1.9.18. TESTS AND VERIFICATIONS AFTER ERECTION

1.9.18.1. After erection, the system shall be tested to check its correct operation

- 1. Check for power supply connections
- 2. Measure output power of PA amplifier modules
- 3. Check for transmit power level and transformer tap voltages
- 4. Check for features of PA system amplifier and console as described in 1.6.3.
- 5. Check for audibility, intelligibility, echoes, etc. Adjust voltages and speaker orientation as necessary.

1.9.18.2. FUNCTIONAL TEST ON POWER SUPPLY SYSTEM

MECHANICAL COMPLETION CHECKS

- 1. Name plate details according to specification
- 2. Check for physical damage
- 3. Check connections

COMMISSIONING TESTS

- 1. Functional check of auxiliary devices, such as alarms, indicating lamps, etc.,
- 2. Measurement of voltage regulation

1.9.19.3. Pre-commissioning checklist and tests for installation

- 1. Earthing
 - a) Measure resistance of each earth electrode by isolating the same from station grid and other electrodes.
 - b) Check continuity of grid connectors and wires
- 2. All cables to be tested for insulation, continuity and other parameters by line tester.
- 3. In addition to the above, any other tests specified by the Manufacturer shall be carried out as per Manufacturer's instruction.

1.10. QUALITY ASSURANCE / QUALITY REQUIREMENT

- The CONTRACTOR shall submit a detailed Quality Assurance Manual to ensure that the equipment and service under the scope of this contract, are in accordance with the specified requirements, whether manufactured or performed within his works, or at his SUB-CONTRACTOR'S works, or at PURCHASER'S Site or at any other place of work.

The Quality Assurance Manual shall cover the aspects as indicated in various Standard Specifications of this Section.

The Quality Assurance Manual shall provide :

- a) Organisation Chart of Quality Assurance Department.
 - b) Qualification and experience details of the personnel of Quality Assurance Department.
 - c) In-house Quality Control Plan.
 - d) Procedures and Standards adopted for designing, manufacturing, inspection/testing.
 - e) Facilities available for inspection and testing including NDT.
 - f) Quality check points including the Customer Hold Points normally adopted by him starting from raw material, procurement till final tests to be conducted at shop and Site.
 - g) Mock-up test procedures
 - h) Defect rectification or deviation acceptance procedure with regard to approval by Design Department, by PURCHASER, by Quality Assurance Department and by Collaborators including the information flow scheme upto erection and commissioning Department wherever applicable.
 - i) On-line statistical quality control methods adopted to prevent defects in mass produced items (such as coils and other breaker components).
 - j) Administrative procedure for corrective action (re-work) on defects.
- The PURCHASER and/or his duly authorised representative shall have at all reasonable times access to the CONTRACTOR's and SUB-CONTRACTOR's premises or Works and shall have the power, at all reasonable times to inspect and examine the materials and workmanship during manufacture. If part of the equipment is being manufactured or assembled on other premises or Works, the CONTRACTOR shall obtain for the PURCHASER and/or his duly authorised representative, necessary permission to inspect as if the equipment were manufactured or assembled on the CONTRACTOR's own premises or Works.
- The PURCHASER or his representative shall have the right to inspect any machinery, material, structures, equipment or workmanship furnished or used by the CONTRACTOR of SUB-CONTRACTORS and may reject any which is defective or unsuitable for the use and purpose intended, or which is not in accordance with the intent of the Contract. The CONTRACTOR, upon demand by the PURCHASER or his representative, shall remedy or replace at the CONTRACTOR'S expense such defective or unsuitable items of the plant, or the PURCHASER may, at the expense of the CONTRACTOR, remedy or replace such defective or unsuitable items of the plant.
- The PURCHASER or his representative shall be provided with all reasonable inspection facilities by the CONTRACTOR. The inspection facilities shall include all necessary tools, instruments, equipment and qualified operators to facilitate inspection. A set of latest prints of the relevant approved drawings shall be made available by the CONTRACTOR to the PURCHASER or his representative for reference during inspection.
- For the purpose of this clause, interworks orders are to be treated as sub-orders. It is obligatory on the CONTRACTOR that he advises his SUB-CONTRACTOR of the pertinent clauses in this Specification when ordering bought-out equipment or materials. In particular, the CONTRACTOR is to advise each SUB-CONTRACTOR that he is required to supply design calculations, drawings, inspection reports and test certificates strictly in accordance with this Specification and technical information for inclusion in the

Instruction Manual as specified in Section-C. The CONTRACTOR shall make available test report on incoming material inspection, for verification by PURCHASER'S representative.

- The CONTRACTOR is to provide test pieces as required by the PURCHASER's representative to enable him to determine the quality of material supplied under this Contract. If any test piece fails to comply with the requirements, the PURCHASER's representative may reject the whole material represented by the test piece. The PURCHASER or his representative shall have the right to select particular test piece of his choice from the lot in case of sample testing. In case the results are found to be not satisfactory the PURCHASER's representative shall have the right to test more number of pieces or each piece additionally from the lot for testing or reject whole lot.
- After award of contract a more detailed QA plan shall be prepared and submitted by the contractor for purchasers approval.

1. 11.SPECIAL REQUIREMENTS

1.11.1. Seismic Qualification

The PA System and is categorized as category-I.

1.11.1 SEISMIC TESTING CO – ORDINATION

1.11.2.1 The seismic qualification of Public Address System equipment shall be carried out by conducting shake table testing at a reputed testing authority. The testing shall be carried out in accordance with IEEE – 344. TENDERER shall obtain the testing charges and indicate the same in their offer. The CONTRACTOR shall be responsible for co – ordination with the testing agency for successful and timely completion of seismic testing.

1.11.2.2 Safe transportation of the equipment to and from the supplier's works to the testing laboratory, engineering and supply of materials required for mounting the equipment on shake table and required man – power are to be provided by the CONTRACTOR. The CONTRACTOR shall also arrange for the various testing instruments required for this test. A lumpsum price for the above shall be quoted under the heading of ‘ Seismic Engineering Charges’.

1.11.2.3 SEISMIC SPECIFICATIONS

- (a) The P.A system equipment shall operate satisfactorily during and after seismic condition as per the limits indicated. Testing of system panels shall be done according to Floor Response Spectra for control room. The detectors shall be tested for enveloping floor response spectra. (group & value)
- (b) All housings shall be analysed for seismic requirements. All types of modules, control units, power supply units, etc. shall be tested for seismic requirements. If any sub units cannot be tested for seismic requirements, the data may be obtained from the manufacturers or analysis may be carried out and test reports shall be submitted to the purchaser.

1.12. DRAWINGS, DATA AND MANUALS

1.12.1. To be submitted with the bid

As part of the proposal the tenderer shall furnish the following drawing for preliminary study.

- General outline drawings showing dimensions, net and shipping weights, etc.
- Internal and system block diagrams to facilitate understanding of how the entire system works.
- Overall layout of equipments in the equipment room.
- GA Drawing of panels incorporating details of PA System cabinet , console etc
- Bill of material listing equipment designation, make, type, ratings etc of the various equipment.
- Detailed literature / catalogues / instruction manuals for all equipment being offered under this contract.
- Any other drawing necessary for the correct and complete understanding of the proposal.

Note: All drawing and data shall be annotated in English.

1.12.2. To be submitted after the award of contract

The schedule of activity covering submission and approval of QP, Procurement of materials, type testing, submission of test reports. O&M Manuals and transportation. The CONTRACTOR shall furnish the following drawings/document within the time indicated after the issue of letter of intent.

- a) Engineering schedule indicating a detailed list of all drawing, documents, data, performance curves, test certificates, manuals, etc. to be submitted by the CONTRACTOR together with dates of submission and category of approval i.e., for approval or for reference.
- b) As-built Layout drawings and General Arrangement drawings for Telecom Room layout, layout showing locations and installation details of consoles, etc. P.A system cabinet, Consoles, Loudspeakers, Junction boxes, including all dimensional details, layout and maintenance requirements, details of supports required for cables and other accessories, conduit and cable routing, cable entry details, earthing requirement, etc.
- c) Detailed cross-sectional drawings showing all relevant internal details of all equipment/accessories listed in item 'b' above.
- d) Bill of material including make, technical specification, etc. for all equipment/accessories covered under item 'b' above.
- e) Foundation or wall-mounting drawings for all equipment/accessories indicating the grounding details, static and dynamic loading data and any insert details for supporting structures and other equipment being supplied by the CONTRACTOR.
- f) Circuit diagrams of the public address system showing the power distribution to the amplifier units, audio output circuit and switching diagram, EPABX – P.A. interfacing details.
- g) Detailed schematic drawing for all equipment/accessories covered under item 'b' above.

- h) Interconnection Schedules (ICS) with terminal number indicating the details of cable connections to be made between all equipment being supplied under this CONTRACT and also for interconnections between equipment supplied under this CONTRACT and equipment covered by other CONTRACTs. The format of ICS shall be subjected to PURCHASER's approval.
- i) Detailed internal wiring diagrams indicating terminal numbers, ferrule numbers, etc, for all equipment/accessories listed in item 'b' above.
- j) Manufacturing plan.
- k) Detailed quality assurance plan
- l) Design calculation (wherever necessary) to prove the adequacy of the equipment offered.
- m) Final test procedures (at shop as well as at site).
- n) Any other drawings/document considered necessary.
- o) All final technical details, parameters, characteristics and performance curves and any other data required.
- p) Manufacturers test certificates for all the bought out equipments.
- q) Maximum dimensions and weight of various packages for shipment under this CONTRACT.
- r) Type test certificates for all equipment being supplied under this CONTRACT.
- s) Routine test certificates for all equipment being supplied under this CONTRACT.
- t) Specified number of copies of the compiled and approved test certificates.

Note:

1. The purchaser reserves the right to include additional documents under approval category. The final list & documents to be approved will be decided at the time of approval of the Engineering schedule mentioned against item 'a' above.
2. Equipment shall not be dispatched unless the test certificates are duly approved by Purchaser.

1.12.3. Instruction manuals

The Contractor shall furnish specified number of copies of the instruction manual which would contain detailed instructions for all erection, testing, operation and maintenance requirements. The manual shall be furnished at the time of dispatch of the equipment and shall include the following aspects.

1. Outline dimension drawing showing relevant cross sectional views, earthing details and constructional features.
2. Catalogue numbers of all the components which are liable to be replaced during the life of the equipment
3. Unpacking
4. Handling at site
5. Storage for prolonged duration
6. Erection drawing with written assembly instructions that would enable the purchaser to carry out erection with his own personnel, if required.
7. Detailed constructions for the installation, operation and maintenance
8. Pre-commissioning tests
9. Maintenance procedure
10. Precautions to be taken during operation and maintenance work
11. All detailed catalogues and literature of equipment supplied.

1.13. SPARES

The TENDERER shall include in his scope of supply, all the necessary (i) Start-up spares (ii) Essential spares and (iii) Recommended spares, as described below. The spares, ordered by the PURCHASER, shall be delivered at site along with the main equipment/plant. The requirement of 'Essential' and 'Recommended' spares shall be for a period of five (5) years of satisfactory operation of equipment/plant/system. The PURCHASER reserves the right to finalize the exact quantities of the spare parts and effect price adjustment on the basis of the unit rates quoted by the TENDERER.

1.13.1 START-UP SPARES

- (a) Start-up spares are those spares which may be required during start-up and commissioning of the equipment/ plant/system. All spares used until the equipment/ plant/system is finally handed over by the CONTRACTOR to the PURCHASER, shall come under this category.
- (b) Based on his experience and judgement, he shall send to site all the 'Start-up spares' for erection, testing and commissioning of the equipment/ plant/system. The CONTRACTOR shall be responsible for ready and timely availability of all the necessary and required start-up spares.
- (c) In spite of all care taken by the CONTRACTOR, if certain spare part is not available with him and it is required for start-up/commissioning, the same, as a special case, may be taken from PURCHASER'S stock of Essential Spares, if available. However, it shall be the responsibility of the CONTRACTOR, to replenish the same, at the earliest, without additional cost to the PURCHASER. No payment shall be made to the CONTRACTOR for any start-up spares. The cost of all start-up spares & other aux. Divides shall be deemed to be included in the quoted prices of main equipment. The minimum startup spares are listed in clause **1.19.2.1**.

1.13.2 ESSENTIAL SPARES

- a) Essential spares are those spares which are considered necessary by the PURCHASER for five (5) years of normal plant operation. Such essential spares are listed in clause 1.19.2.2.
- b) The TENDERER shall quote unit rates for each Essential spare. The total price of all Essential spares, as enlisted in the tender document, shall be considered for tender evaluation. The PURCHASER reserves the right to alter the items and/or quantities of spares while placing the order.
- c) In case any Essential spare part is considered as not applicable for the equipment offered by the TENDERER, the same shall be indicated as 'Not Applicable'. However, the TENDERER shall still indicate the prices for each and every Essential spare item specified in the tender document in the Schedule of Prices, whether he considers it necessary or not to have such spares. If the TENDERER fails to quote the price of any essential spare item, the highest price quoted by other TENDERERS for that particular item shall be considered for loading his TENDER.

1.13.3

RECOMMENDED SPARES

- a) Recommended spares are those spares which the TENDERER considers necessary for five (5) years of normal plant operation and which are in addition to the Essential spares. The TENDERER shall indicate his recommended list of spares. Their unit prices shall be indicated in the Schedule of Prices. The PURCHASER reserves the right to buy any or all of the Recommended Spare Parts. The total price of Recommended Spares shall be considered, while evaluating the tender after normalizing the items and quantities for the recommended spares.
- b) The TENDERER shall take into consideration the shelf life of spares offered when deciding on the list and quantity of spares. The TENDERER shall also indicate the service expectancy period for the spare parts under normal operating conditions before replacement shall be necessary.

1.13.4

All spares supplied under this Contract shall be strictly interchangeable with the parts for which they are intended to be replacements. The spares shall be treated and packed for long storage under the climatic conditions prevailing at the Site, e.g. small items shall be packed in sealed transparent plastic bags with dessiccator packs as necessary.

1.13.5

Each spare shall be clearly marked or labeled on the outside of its packing with its description and purpose. When more than one spare part is packed in a single case, a general description of the contents shall be shown on the outside of such case and a detailed list enclosed. All cases, containers and other packages must be suitably marked and numbered for the purposes of identification. A spare parts list with identification tag nos. for each spare part shall be furnished.

1.13.6

The CONTRACTOR shall guarantee the PURCHASER that before going out of production of spare parts, for the equipment furnished, he shall give at least 12 months advance notice, so that the PURCHASER may order his requirement of spares in one lot, if he so desires.

1.13.7

All spare items shall undergo the same extent of inspection and testing as of the original component.

1.14

SPECIAL TOOLS AND TACKLES.

1.14.1

For all major equipment, the CONTRACTOR shall provide appropriate structural steel members for mounting various handling devices which are necessary for the dismantling and reassembly of equipment components during erection and maintenance.

1.14.2

The TENDERER shall indicate and include in his scope of supply all the necessary tools and tackles required for erection, maintenance and servicing of the equipment and components. The PURCHASER reserves the right to exclude any of the above items from the TENDERER's scope of supply and effect price adjustments on the basis of the unit rates quoted by the TENDERER. Maintenance tools and tackles supplied shall be new and unused. The despatch of tools, tackles and lifting devices shall be synchronised with the despatch of the related system/equipment.

1.14.3

The CONTRACTOR shall supply all tools and tackles clearly marked with its size and/or purpose. They shall not be used for erection purpose.

- 1.14.4 Each set of tools and tackles shall be suitably arranged in fitted boxes of mild steel construction. The number of boxes being determined in relation to the layout of the plant in question. The taps, stocks and dies shall be kept in approved mild steel boxes with compartments for individual items. If the weight of any box and its contents is such that it cannot be conveniently carried it shall be supplied on steerable rubber tyred wheels.
- 1.14.5 Each tool box shall be fitted with a lock and two keys and shall be painted navy blue and clearly marked in white letters, with the name of the system/equipment for which the tools and tackles are intended.
- 1.14.6 The tools and tackles with the appropriate boxes are to be handed over to the PURCHASER at the time of issue of the taking over.
- 1.14.7 The list of minimum erection and maintenance tools is given in clause **1.19.2.3**.

1.15 SERVICES

1.15.1 Supervision of erection, testing and commissioning.

- a) The equipment covered by this specification viz., Public Address System will be erected at site, tested and commissioned by the Contractor.
- b) The successful CONTRACTOR shall provide complete bio-data of supervising personnel to be deputed to site for approval by Purchaser.
- c) The Contractor's supervising personnel shall smoothly co-ordinate with the other erection Contractor for satisfactory progress of erection, testing and commissioning activities.
- d) The Purchaser reserves the right to ask withdrawal of any or such personnel immediately from site, incase he finds them non co-operative or incompetent for the intended services. In such event the Contractor shall expeditiously furnish suitable replacement acceptable to the Purchaser.

1.15.2 TRAINING

- 1.15.2.1 The CONTRACTOR shall train the PURCHASER's engineering personnel in the shops, where the Equipment shall be manufactured and or in their collaborator's works and where possible, in any other plant/site where Equipment manufactured by the CONTRACTOR or his collaborator is under installation or test to enable those personnel to become familiar with the Equipment being furnished by the CONTRACTOR. The period of training shall be adequate and mutually agreed upon by the OWNER/PURCHASER and the VENDOR/CONTRACTOR.
- 1.15.2.2 The training shall be so oriented as to make the OWNER'S/PURCHASER'S personnel proficient in operating the Equipment.
- 1.15.2.3 The PURCHASER'S personnel shall also be trained for routine maintenance work and lubrication, overhauling, adjustments, testing and replacement procedures to be adopted for the Equipment offered.
- 1.15.2.4 The CONTRACTOR shall train the PURCHASER'S personnel in carrying out minor repairs, during the operation of the Equipment.
- 1.15.2.5 The charges for training the PURCHASER'S personnel, if any, shall be included in the price for supply of erection, testing and commissioning.

- 1.15.2.6 The Charges for training the PURCHASER's personnel and the cost of training material, if any shall be included in the price for supply erection, testing and commissioning. PURCHASER shall bear the boarding, lodging and traveling expenses of PURCHASER's personnel.
- 1.15.2.7 The CONTRACTOR shall provide all necessary instruction material for training which shall include manuals, booklets, pamphlets, drawings, sketches, models, pictures, photo, color slides, films etc. The training and instruction material shall become the property of the purchaser.
- 1.15.2.8 The CONTRACTOR shall provide at no extra cost to the PURCHASER all necessary facilities and reasonable assistance as deemed necessary for the training. The travelling and living expenses of such personnel shall be borne by the Purchaser.

1.16. GUARANTEE

- 1.16.1. The CONTRACTOR shall guarantee that material and workmanship of all components and operation of the equipment shall meet the requirements of the specification.
- 1.16.2. The item of performance as stated in "Schedule of performance Guarantee in section III shall be guaranteed either under penalty or under rejection. The tolerance limits applicable, if any, shall be in accordance with the standards to which the offered equipment conforms and the tolerance limits shall be clearly indicated in the TENDER.
- 1.16.3. Should the test results deviate from the guaranteed values including the specified tolerances, the CONTRACTOR shall correct his equipment at no extra cost to the PURCHASER and repeat the test within a reasonable period as agreed to by the PURCHASER.
- 1.16.4. With respect to the goods covered in the specifications the CONTRACTOR shall provide to the PURCHASER guarantees:
- a) Of Title:

The CONTRACTOR warrants that the goods are not subject to any security interest, lien or other encumbrance.
 - b) Against Patent Infringements:

Except when the PURCHASER furnishes design specifications to the CONTRACTOR, the CONTRACTOR shall at his own expense, defend and save the PURCHASER harmless from the expenses and consequences of any suit or procedure brought against the PURCHASER, so far as said suit or procedure is based on a claim that the goods furnished constitute an infringement of any patent in Existence on the date of the order. In addition, the CONTRACTOR shall secure at his own expense a fully paid up license or licenses that shall permit the PURCHASER to continue use of the goods furnished free of further claim for infringement.
 - c) Of Performance:

The CONTRACTOR shall guarantee that the goods furnished by him shall be in full accordance with the requirements of this specification.

d) Of Quality:

The CONTRACTOR warrants that the goods are new and of high quality and that the goods shall be free of defects in design, materials or workmanship for a period of twelve (12) months from the date of commissioning of the corresponding equipment.

- 1.16.5. If within the expiry of the stipulated guarantee period, the subject goods or any parts thereof are found defective because of design, workmanship or materials, the CONTRACTOR at his own expense, repair or furnish and install replacement parts. Design, workmanship and material of such repairs / replacements shall be approved by the PURCHASER. The guarantee period for replaced parts or repair work shall be the same as above.
- 1.16.6. The guarantee period shall be extended by the length of time required to make any adjustments, changes or repairs necessary to fulfill the guarantee.
- 1.16.7. The CONTRACTOR shall obtain similar guarantee from each one of his SUB-CONTRACTORS. However, the overall responsibility shall lie with the CONTRACTOR.

1.17 PACKING AND SHIPPING

The responsibility for properly packing the equipment shall be that of the CONTRACTOR. The requirements of packing and marking of equipment are as follows:-

1.17.1 PACKING

- a) All Equipment/material shall be protected for ocean shipment/inland transport as the case may be, to Site and outdoor storage during transit and at the Site, strictly according to the instructions given in this Specification.
- b) The CONTRACTOR shall be responsible for any damage to the Equipment during transit due to improper and inadequate packing. Only packages constructed out of sound material and of dimensions proportional to the size and weight of contents shall be used.
- c) Bundled materials shall be strapped rigidly with steel band over the protective covering. Fragile materials shall be securely braced within the containers or otherwise amply fastened and packed to prevent shifting or rattling. Soft non-hygroscopic packing materials shall be placed between the hard packing materials and the fragile Equipment. Articles which do not completely fill the selected container must be cushioned, braced, fastened or blocked to prevent damage to the article itself or destruction of the container. Inner bracing or blocking must be such that the content's weight is distributed uniformly over the entire interior surfaces rather than concentrate on one or two critical points. Loose material, e.g. bolts, nuts, etc. shall be packed in gunny bags sealed in polythene bags with proper tagging. Components containing glass shall be careful covered with shock absorbing protective material such as expanded polystyrene (Thermocole).
- d) All flanges and similar surfaces which are prone to scratching shall be provided with either metal or wooden caps bolted in place. Metal caps should have a minimum thickness of 3 mm and wooden caps should be made from two layers of wood, each of 10 mm thickness, nailed together with the grain of each layer located at right angles to the other.
- e) All openings in the Equipment shall be tightly covered, plugged or capped to prevent foreign material from entering.

- f) In the case of large and bulky Equipment, the CONTRACTOR shall be responsible for ascertaining transport limitations and supply the Equipment in the minimum number of components or sub-assemblies, within the framework of transport limitations.
- g) Wherever necessary, proper arrangements for attaching slings for lifting shall be provided.
- h) The contents of the packages shall be sealed in thick polythene sheets and all the inside walls of the packages shall be lined with water proof paper to protect the Equipment from damage due to dust and moisture. Adequate precaution shall be taken to protect all insulating materials used in the equipment during shipment to ensure that they remain in a totally dry environment.
- i) All Equipment shall be protected for the entire period of despatch, long time storage and erection, against corrosion, incidental damage due to vermin, sunlight, rain, high temperature, humid saline atmosphere, rough handling in transit, and storage in the open including possible delays in transit. Material and Equipment shipped across the sea shall be packed to withstand without damage, the effects of salt spray. All machined and plated parts shall be protected with anti-rust grease. Precautions shall be taken to protect shafts and journals where they rest on wooden or other supports likely to contain moisture. At such points, wrappings impregnated with antirust composition or vapour phase inhibitors shall be used. These shall have sufficient strength to resist chafing and indentation due to the movement which is likely to occur in transit. The protective wrappings and impregnation shall last for a minimum period of three months.
- j) Instrument connections shall be plugged with suitable caps to avoid ingress of dust and moisture during shipment and storage. Silica gel or approved equivalent moisture absorbing material in small cotton bags shall be placed and tied at various points on the Equipment, in package wherever necessary.
- k) Adequate provision of skids or pallets shall be made to keep the packages above the collecting drainage. Crates and other large containers should have drain holes in the bottom to prevent collection of water within the packing. This is especially important where the cargo itself is subject to condensation (cargo sweat).
- l) All cases, where applicable, shall be provided with suitable cutouts, closed by bolted wooden planks to facilitate inspection by customs authorities. Water proof transparent papers shall be provided at the cutout locations to prevent water ingress into the casing through the cutout.
- m) Each crate or package shall contain a packing list in a water proof envelope. The packing list shall contain the following. "Each package shall contain a packing note specifying the name and address of the CONTRACTOR, the number and date of the Contract/Purchase order, name and address of consignee, description of the material, and the quantity contained in such package". Copies of the packing list, in triplicate, shall be forwarded to the PURCHASER prior to despatch. All items of materials shall be clearly marked for easy identification against the packing list.
- n) All spare parts shall be packed and treated for long storage conditions at Site.

- o) The PURCHASER may require to inspect and approve the packing before the items are despatched. However, the CONTRACTOR shall be entirely responsible for ensuring that the packing is suitable for the mode of shipment and such inspection shall not exonerate the CONTRACTOR from any loss or damage due to faulty packing.
- p) Any material found short inside the intact packing cases shall be supplied by the CONTRACTOR at no extra cost to the PURCHASER.
- q) All packing cover and packing material shall become the property of the PURCHASER.
- r) All points terminating in a flanged connection exposed to atmosphere shall be fitted with gasketed blanking plates, for the purpose of transport.
- s) All semi-flush/flush mounted relays/meters with their operating mechanism temporarily arrested from movement for transport purposes, shall be packed in their original packing and shipped separately.

1.17.2 MARKING

All packages shall be clearly, legibly and durably marked with uniform block letters with water proof paint on atleast three sides with:

- a) Destination address as communicated
- b) Contract No. and Date
- c) Dimensions of crate
- d) Net and gross weights
- e) Sign showing 'side up'
- f) Sign showing 'fragile' marks in case of delicate Equipment
- g) Sign showing slinging and sling position
- h) Any handling and unpacking instructions, if considered necessary
- i) Identification mark relating them to the appropriate shipping documents
- j) In case of spare parts, each spare part shall be clearly marked and labelled on the outside of its packing with its description and catalogue/part number .
- k) The contents of the package shall be punched of non- corrosive metal plate and nailed to the package on a prominently visible place. If the number of items in the package is too many, a typed list in transparent waterproof bag shall be kept inside a galvanised steel sheet pocket nailed on to the outside of package in prominently visible location.

1.17.3 Manufacturer shall give procedures for long term storage at site.

1.17.4 ERECTION MARKS

All Equipment comprising multipart assemblies, e.g. steel frame works, piping, etc. shall be marked with identifying numbers, and/or letters corresponding to those of the approved drawings or material lists. These erection marks shall be clearly readable. Colour banding to an approved code shall be employed to identify members of similar shape or type but of different strengths or grades.

1.17.5

SHIPPING

- a) No material shall be despatched without prior consent in writing (shipping release approval) of the PURCHASER or his authorised representative.

The CONTRACTOR shall intimate the PURCHASER in writing the probable date when the Equipment shall be ready for despatch, atleast within seven (7) days for foreign supply and three (3) days for domestic supply in advance. Copies of the packing list shall also be sent along with the advance intimation.

- b) In the event of the CONTRACTOR proposing to deliver the Equipment in component or sub-assembly form, he shall furnish full particulars of the quantity and approximate size of each item. All sub-assemblies shall be match-marked to facilitate assembly at site

- c) The CONTRACTOR shall be responsible for obtaining a clear receipt from the transport authorities specifying the goods despatched. It is the responsibility of the CONTRACTOR to take the transit insurance during the transportation of equipment. All risks in transit being exclusively by the CONTRACTOR. the PURCHASER shall pay for only such equipment as are actually received by him in acceptable condition in accordance with the Contract.

- d) The CONTRACTOR shall quote separately for freight charges for transporting the equipment to the place of delivery.

- e) Transportation by Rail

In the case of F.O.R. station of despatch the equipment shall be booked at full wagon rates wherever available.

- f) Transportation by Road

In case of road transport it has to be full truck load. There should not be any transshipment. Road transport should be only by transport agencies approved by the PURCHASER. Before the transportation is made, the CONTRACTOR shall send an advance "Advice of Transportation" to the PURCHASER. This advice shall state the value of consignment, the truck number, any agents involved, probable date of departure from CONTRACTOR's work place and probable date of arrival at site.

- g) Mode of Transport

If feasible, equipment shall be transported from factory to project site by container, by road-cum- rail or by road only, as may be applicable, on door to door delivery basis. In case container transport is not feasible, the equipment is to be transported by full-truck loads.

While quoting the price the CONTRACTOR shall indicate the mode of transport.

- h) Receipt of Inspection

The Purchaser shall make arrangements for receiving and unloading the equipment. The equipment may either unloaded at the stores or directly its final locations in the Electrical building. The Purchaser shall unpack and inspect the equipment. In case of damage or short supply, he shall promptly inform the Contractor who shall do the necessary rectifications/replacement and make good shortly supply items.

1.18

HANDLING AND STORAGE

In contractor's sope

1.19. DATA SHEETS/SCHEDULES

1.19.1. Data sheet

As per various clauses of this specification

1.19.2. Schedule of spares

1.19.2.1 Start up Spares

- 10% percent of all consumable type components (fuses, filament and neon lamps, lamp covers, terminal blocks, gas discharge tube, miniature relays, etc.,)
- One of each type of power supply module of PA System
- Five public address system amplifier units
- Five line output transformers
- Twenty five 4 W box type speakers
- Twenty five 6 W ceiling type speaker
- Twenty five 15 W horn speakers
- Five P.A. junction boxes

1.19.2.2 Essential Spares

- 20 percent of all consumables
- Two set power supply modules (P.A. system).
- Two of each type of input / output modules, similar to the list of I/O modules in startup spares.
- One public address system interface module
- One maintenance console interface module
- Two PA system Amplifier modules
- One set of entire control modules and cards
- Two set of tone generation modules
- Twenty five 4 W box type speakers
- Twenty five 6 W ceiling type speaker
- Twenty five 15 W horn speakers
- Five P.A. junction boxes (30 terminals)
- Twenty five nos. of 4-way 6 terminal junction boxes

1.19.2.3 Erection & Maintenance Tools

a. For PA system:

Micro-voltmeter (wide-band)]	1 No.
Decibel Meter	1 No.

Note : Tenderer to list out any & all additional required tools.

SECTION VI

SCHEDULE OF DRAWINGS AND DATA SHEETS

Tender drawings:

Given below is the list of drawings forming part of Tender and the drawings are separately attached to this tender document.

SI No	Title	Drawing No
1.	Plant Communication System Main Distribution schematics for PA System.	PFBR/60200/SD/2101
2.	Reactor containment building Plant Communication System Layout at EL 12000,17000&18400	PFBR/60200/GA/2103
3.	Reactor containment building Plant Communication System Layout at EL 24600,30000	PFBR/60200/GA/2104
4.	Reactor containment building Plant Communication System Layout at EL 34100,38000	PFBR/60200/GA/2105
5.	Reactor containment building Plant Communication System Layout at EL 46500&52000	PFBR/60200/GA/2106
6.	Reactor contained building Plant Communication System Layout at EL 55800,60800	PFBR/60200/GA/2107
7.	Stream generator building - 1 Plant Communication System Layout at EL 12000,16500&22500	PFBR/60200/GA/2111
8.	Stream generator building - 1 Plant Communication System Layout at EL 30000,37500	PFBR/60200/GA/2112
9.	Stream generator building - 1 Plant Communication System Layout at EL 45000,49300,55000&60000	PFBR/60200/GA/2113
10.	Stream generator building – 2 Plant Communication System Layout at EL 12000,16500&22500	PFBR/60200/GA/2121
11.	Stream generator building - 2 Plant Communication System Layout at EL 30000,37500	PFBR/60200/GA/2122
12.	Stream generator building - 2 Plant Communication System Layout at EL 45000,49300,55000&60000	PFBR/60200/GA/2123
13.	Fuel building Plant Communication System Layout at EL 14000,19000,21000,22000&26000	PFBR/60200/GA/2131
14.	Fuel building Plant Communication System Layout at EL 27000,28000,30000&36000	PFBR/60200/GA/2132
15.	Service building Plant Communication System Layout at EL 23600, 30000	PFBR/60200/GA/2141
16.	Service building Plant Communication System Layout at EL 34500, 37500	PFBR/60200/GA/2142

17.	Rad waste building Plant Communication System Layout at EL 14000,22500	PFBR/60200/GA/2151
18.	Rad waste building Plant Communication System layout at EL 30000, 37500&45000	PFBR/60200/GA/2152
19.	Electrical building -1 Plant communication System Layout at EL 14000,18000, 20.200 & 25000	PFBR/60200/GA/2161
20.	Electrical building -1 Plant communication System Layout at EL 30000, 34500 & 38000	PFBR/60200/GA/2162
21.	Electrical building -1 Plant communication System Layout at EL 43000,47000,51000 & 57000	PFBR/60200/GA/2163
22.	Electrical building - 2 Plant communication System Layout at EL 14000, 18000,20250 & 25000	PFBR/60200/GA/2171
23.	Electrical building - 2 Plant communication System Layout at EL 30000, 34500 & 38000	PFBR/60200/GA/2172
24.	Electrical building - 2 Plant communication System Layout at EL 43000, 47000, 51000 & 57000	PFBR/60200/GA/2173
25.	Control building Plant communication System layout at EL 14000,18000,20250 &25000	PFBR/60200/GA/2181
26.	Control building Plant communication System layout at EL 30000,34500 & 38000	PFBR/60200/GA/2182
27.	Control building Plant communication System layout at EL 43000,47000&51000	PFBR/60200/GA/2183
28.	Diesel generator building - 1 Plant Communication System Layout at EL 30000	PFBR/60200/GA/2191
29.	Diesel generator building - 2 Plant Communication System Layout at EL 30000	PFBR/60200/GA/2192
30.	Service water pump house Plant Communication System Layout at EL 26000,30000,35500	PFBR/60200/GA/2193
31.	System Schematic of Plant Inter Communication System	PFBR/60200/SC/2601
32.	Turbine building Plant Communication System Layout at EL 27500	PFBR/60200/GA/2601
33.	Turbine building Plant Communication System Layout at EL 23500,32500&41000	PFBR/60200/GA/2602
34.	Turbine building Plant Communication System Layout at EL 36000	PFBR/60200/GA/2603
35.	Turbine building Plant Communication System Layout at EL 44500	PFBR/60200/GA/2604

36.	Turbine building Plant Communication System Layout at EL 51000,63500	PFBR/60200/GA/2605
37.	Layout Drawing of Plant communication System Raw water & Fire water Pump House.	PFBR/60200/GA/2611
38.	Layout Drawing of Plant communication system DM water plant	PFBR/60200/GA/2612
39.	Layout Drawing of Plant communication System 230kv indoor switch yard	PFBR/60200/GA/2613
40.	Layout Drawing of Plant communication System 230kv indoor switch yard at EL 27500,33000	PFBR/60200/GA/2614
41.	Layout drawing of Plant Communication System Transformer yard.	PFBR/60200/GA/2615
42.	Layout Drawing of Plant communication System Sea water Pump house	PFBR/60200/GA/2616
43.	Layout Drawing of Plant Communication System Layout Electro chlorination Plant.	PFBR/60200/GA/2617

TECHNICAL DETAILS

The tender shall furnish technical parameters of telephone cable offered in the format given below.

TECHNICAL DATA SHEET – PUBLIC ADDRESS SYSTEM

The tenderer shall furnish technical parameters of various components offered in the format of Data sheet enclosed for equipment given below.

a. Loudspeaker	<u>Indoor</u>		<u>Outdoor</u>
	4W Wall Mounting	6W Ceiling mounting	15W Horn Type
a1 Loudspeaker diameter :	-----	-----	-----
a2 Power handling capacity :	-----	-----	-----
a3 Normal Impedance :	-----	-----	-----
a4 Flux density in air gap :	-----	-----	-----
a5 Resonant frequency :	-----	-----	-----
a6 Frequency response :	-----	-----	-----
a7 Line voltage :	-----	-----	-----
a8 Maximum sound pressure level at nominal output :	-----	-----	-----
a9 Frequency range :	-----	-----	-----
a9 Catalogue/literature enclosed :	Yes / No	Yes / No	Yes / No

b. Microphone	
b1 Frequency response :	_____
b2 Sensitivity at 1000Hz :	_____
b3 Polar pattern :	_____
b4 Nominal impedance / output impedance :	_____
b5 Catalogue / literature enclosed :	Yes / No

c. Amplifier	
c1 No. of input channels :	_____
c2 Input sensitivity :	_____
c3 (a) Microphones :	_____
c4 (b) Music input :	_____
c5 Input impedance :	_____
c6 Frequency response :	_____

- c7 Distortion at maximum power output : _____
- c8 Output voltage / impedance : _____
- c9 Output power : _____
- c10 Tone control range : _____
- c11 Protection provided : _____
- c12 Catalogue / literature enclosed : Yes / No
- c13 Class of operation : _____
- c14 Efficiency : _____

d. Amplifier Cabinet

- d1 Sheet material : _____
- d2 Sheet thickness : _____
- d3 Painting thickness : _____
- d4 Overall dimensions of each cabinet : _____
- d5 No. of cabinets for specified capacity : _____
- d6 Power supply termination details
- (a) Material of conductor : _____
- (b) Size of conductor : _____
- (c) Type of insulation : _____
- (d) Voltage grade : _____
- (e) Whether stranded conductor Provided : Yes / No

e. DATA TO BE FURNISHED BY THE VENDOR FOR P.A.SYSTEM CABLE

- e1 Name of the manufacturer : _____
- e2 Conductor : _____
- e2.1 Form-circular/segmented : _____
- e2.2 Nominal diameter in mm : _____
- e2.3 Effective cross sectional area sq.mm : _____
- e3 Whether incremental running lengths are marked on cable : Yes / No
- e4 Overall diameter in mm : _____
- e5 Cable drums : _____
- e5.1 Whether cable drums conform to IS 10418 : Yes / No
- e5.2 Length of cable in cable drum : _____

and tolerance

e5.3 Weight of cable drum without cables : _____

e5.4 Weight of cable drum with cable : _____

e5.5 Type of end sealing : _____

f. Conduits and accessories

1. Rigid conduit

a) Make : _____

b) Type/material : Hot dip galvanized rigid steel

c) Thickness up to 32 mm dia : 1.8mm

d) Saddles material : Die cast aluminium

e) Clips material : Galvanized steel

f) Lock nut material : Mild steel

g) Bush nut : Mild steel

2. Flexible conduit

*-Make : _____

Type /Material : hot dip Galvanized steel strip

g. Pull box

1. Material : Hot dip galvanized sheet steel

2. Thickness : 2mm

3. Mounting : Wall/column

h. Junction box

1. Material : Hot dip galvanized sheet steel

2. Thickness : 2mm

DELIVERY SCHEDULE.

The TENDERER shall indicate the times for manufacture, delivery and other activities of each equipment as shown below:

Sl. No.	Equipment	Time from date of order to works test	Time for works test, dismantling, packing and ready for despatch from works.	Time required for shipment to site.	Total time from date of order to receipt at site
		(Months)	(Months)	(Months)	(Months)
1.	Centralised Amplifier system				
2.	Master control station				
3	Loud speakers				
4	Tools and tackles				
5	Software, if any				
6	Conduits				
7	Cables				
8	Pull boxes				
9	Accessories				
10	Junction boxes				
Note: The associated marshalling panels are to be included.					

We, the undersigned hereby undertake to meet the above time schedule from the date of order.

SEAL OF COMPANY	SIGNATURE	_____
	DESIGNATION	_____
	COMPANY	_____
	DATE	_____

2.2. DRAWINGS, DATA & MANUALS SUBMISSION SCHEDULE

Sl.No	Description	Period from LOI
a)	The contractor shall submit the schuedle of activity after the issue of letter of intent covering submission of drawings, approval of drawings, submission and approval QP, procurement of material, manufacture, type testing, submission of test reports, O&M manuals, end documentation, transportation, erection, testing and commissioning	2 months
b)	Submission of following drawings To be submitted after the award of contract The schedule of activity covering submission and approval of QP, Procurement of materials, type testing, submission of test reports. O&M Manuals and transportation. The CONTRACTOR shall furnish the following drawings/document within the time indicated after the issue of letter of intent. a) Engineering schedule indicating a detailed list of all drawing, documents, data, performance curves, test certificates, manuals, etc. to be submitted by the CONTRACTOR together with dates of submission and category of approval i.e., for approval or for reference. b) General Arrangement drawings for PCS room layout, layout showing locations and installation details of consoles, P.A system cabinet, Consoles, Loudspeakers, Junction boxes, layout and maintenance requirements, details of supports required for cables and other accessories, cable entry details, earthing requirement, etc. c) Detailed cross-sectional drawings showing all relevant internal details of all equipment/accessories listed in item 'b' above. d) Bill of material including make, technical specification, etc. for all equipment/accessories covered under item 'b' above. e) Foundation or wall-mounting drawings for all equipment/accessories indicating the grounding details, static and dynamic loading data and any insert details for supporting structures and other equipment being supplied by the CONTRACTOR. f) Circuit diagrams of the public address system showing the power distribution to the amplifier units, audio output circuit and switching diagram, EPABX – P.A. interfacing details. g) Detailed schematic drawing for all equipment/accessories covered under item 'b' above.	02 months 03 months 01 month 02 months 02 months 02 months 02 months

	h) Interconnection Schedules(ICS) with terminal number indicating the details of cable connections to be made between all equipment being supplied under this CONTRACT and also for interconnections between equipment supplied under this CONTRACT and equipment covered by other CONTRACTs. The format of ICS shall be subjected to PURCHASER's approval. i) Detailed internal wiring diagrams indicating terminal numbers, ferrule numbers, etc, for all equipment/accessories listed in item 'b' above. j) Manufacturing plan. k) Detailed quality assurance plan l) Design calculation (wherever necessary) to prove the adequacy of the equipment offered. m)Final test procedures(at shop as well as at site). n) Any other drawings/document considered necessary. o) All final technical details, parameters, characteristics and performance curves and any other data required. p) Manufacturers test certificates for all the bought out equipments. q) Maximum dimensions and weight of various packages for shipment under this CONTRACT. r) Type test certificates for all equipment being supplied under this CONTRACT. s) Routine test certificates for all equipment being supplied under this CONTRACT. t) Specified number of copies of the compiled and approved test certificates.	03 months 03 months 03 months 03 months 03 months 03 months 03 months 03 months 03 months 03 months 03 months 03 months
--	---	---

2.4**TOOLS AND TACKLES**

The TENDERER shall give below the list of special erection and maintenance tools and tackles offered by him.

Sr. No.	Particulars	Quantity

SIGNATURE _____

DESIGNATION _____

COMPANY _____

DATE _____

SEAL OF COMPANY

2.5 LIST OF SPARES.

The TENDERER shall indicate hereunder the quantities of spare parts required for all equipment.

Sl.No	Description	Part No.	Manufacturer	Qty. of spares recommended	If set. Nos. per set	Delivery period (weeks)	Remarks
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
a)	Essential spares						
b)	Recommended Spares (Discounting quantity of essential spares above)						

SIGNATURE _____
DESIGNATION _____
COMPANY _____
DATE _____

SEAL OF COMPANY

2.6**PROOF OF ABILITY.**

- a) The TENDERER shall furnish here a list of all similar jobs and letter of appreciation from them executed by him to whom a reference may be made by the PURCHASER in case the PURCHASER considers such a reference necessary.
- b) These list of experiences shall cover qualifications requirements such as IS 9001-2000 version etc stipulated in Part II – section 2.5 – General requirements.

SL.No	Description of work including quantity of items	Work Order or P.O.N. and Date	Value of Work	Delivery Date as per P.O.	Actual Date of Delivery	Contact Address of Purchaser

SIGNATURE _____

DESIGNATION _____

COMPANY _____

DATE _____

SEAL OF COMPANY

2.7 LIST OF DEVIATIONS.

2.7.1 All deviations from the technical specification shall be filled in by the TENDERER clause by clause in this schedule.

SECTION	CLAUSE No.	DEVIATION

The TENDERER hereby certifies that the above mentioned are the only deviations from the technical specification of the enquiry.

SIGNATURE _____

DESIGNATION _____

COMPANY _____

DATE _____

SEAL OF COMPANY

2.7.2 All deviations from the contract conditions shall be filled in by the TENDERER clause by clause in this schedule.

SECTION	CLAUSE No.	DEVIATION

The TENDERER hereby certifies that the above mentioned are the only deviations from the General Conditions of the Contract.

SIGNATURE _____

DESIGNATION _____

COMPANY _____

DATE _____

SEAL OF COMPANY

2.8 GUARANTEE.

TENDERER shall indicate tolerances applicable to each of the guaranteed parameters above and the reference standards.

- 2.8.1 The Contractor warrants that the goods supplied under this Contracts shall be new, of high quality and free from defects in design, materials or workmanship and shall perform satisfactorily during the guarantee period.
- 2.8.2 The Contractor guarantees that the goods furnished by him shall be in full accordance with the Contract.
- 2.8.3 If during the stipulated guarantee period, the subject goods are found defective of design, materials and workmanship, the Contractor, shall (at his own expense), repair or furnish and install replacement parts/equipment approved by Purchaser. The guarantee for the replaced part or repaired work shall also be as per the original equipment supplied under this Contract,

SIGNATURE _____

DESIGNATION _____

COMPANY _____

DATE _____

SEAL OF COMPANY

2.9 LIST OF ADDITIONAL ENCLOSURES TO TENDER.

-NIL –

Sl. No	Item description	CB													EB 1											
		CB EL14	CB EL18	CB EL20.2 5	CB EL25	CB EL30	CB EL34.5	CB EL38	CB EL43	CB EL47	CB EL48	CB EL51	CB EL53	CB EL59	EB-1 EL14	EB-1 EL18	EB-1 EL20.2 5	EB-1 EL25	EB-1 EL30	EB-1 EL34.5	EB-1 EL38	EB-1 EL43	EB-1 EL47	EB-1 EL51	EB-1 EL57	
1	SYSTEM																									
1.1	Horn type loud speaker - 15W	2					3						3		1									3		
1.2	Box type Loud speaker - 4W	2	2	15	9	12	10	5	8	5	3	2	4	2	9	2	9	9	11	8	10	7	11	4	2	
1.3	Ceiling ring type LS - 6 W				8	9		7	11	6	13		8													
1.4	4 -way, 6 - terminal GI box	2		17	17	18	12	12	18	11	15		15	1	8	1	7	7	10	8	10	7	10	5	1	
1.5	Main PA System JB				4																3					
1.6	GI conduit pull boxes																									
2	CABLES / WIRES																									
2.1	1 PR,24/0.2 mm Cu, FRLS PVC cable	50	10	30	45	45	60	60	60	55	20	35	15	2	95	35	85	65	100	70	80	55	95	40	15	
2.2	5 core 1.5mm Cu,FRLS PVC cable (UNARMOURED)	60		100	215	125	100	90	100	80	105		150	18	50	10	35	50	50	45	150	40	70	40	20	
2.3	1 PR ,24/0.2mm cu mineral insulated																									
3	GI CONDUIT																									
3.1	19 mmø (Strip type) FLEXIBLE	50	10	30	45	45	60	60	60	55	20	35	15	2	95	35	85	65	100	70	80	55	95	40	15	
3.2	25 mmø GI Conduit	60		145	335	155	120	90	120	110	130		168	18	50	10	35	50	60	50	150	40	75	40	20	

Sl. No	Item description	EB 2											RCB												
		EB-2 EL14	EB-2 EL18	EB-2 EL20.2 5	EB-2 EL25	EB-2 EL30	EB-2 EL34.5	EB-2 EL38	EB-2 EL43	EB-2 EL47	EB-2 EL51	EB-2 EL57	RCB EL12	RCB EL17	RCB EL18.4	RCB EL24.6	RCB EL30	RCB EL34.1	RCB EL38	RCB EL43.5	RCB EL46.5	RCB EL52	RCB EL55.8	RCB EL60.8	RCB EL66.6
1	SYSTEM																								
1.1	Horn type loud speaker - 15W	1									3		3		4	3	5		2					2	
1.2	Box type Loud speaker - 4W	9	2	9	9	11	8	10	7	11	4	2	7		9	7	10	3	5		3		5	4	
1.3	Ceiling ring type LS - 6 W																	6	1	5	3	1			
1.4	4 -way, 6 - terminal GI box	8	1	7	7	10	8	10	7	10	5	1	9		11	9	13		13		10	1	6	4	
1.5	Main PA System JB							3									2		2						
1.6	GI conduit pull boxes																								
2	CABLES / WIRES																								
2.1	1 PR,24/0.2 mm Cu, FRLS PVC cable	95	35	85	65	100	70	80	55	95	40	15	93		111	68	69		58	16	80	16	50	65	1
2.2	5 core 1.5mm Cu,FRLS PVC cable (UNARMOURED)	50	10	35	50	50	45	150	40	70	40	20	125		110	88	186		76		98	113	89		90
2.3	1 PR ,24/0.2mm cu mineral insulated												20		25	10	20		5				5	5	
3	GI CONDUIT																								
3.1	19 mmø (Strip type) FLEXIBLE (PA system)	95	35	85	65	100	70	80	55	95	40	15	93		111	68	69		58	16	80	16	50	65	1
3.2	25 mmø GI Conduit	50	10	35	50	60	50	150	40	75	40	20	125		110	88	186		76		98	113	89		90

Sl. No	Item description	SGB-2									SGB 1									FB							
		SGB-2 EL12	SGB-2 EL16.5	SGB-2 EL22.5	SGB-2 EL30	SGB-2 EL37.5	SGB-2 EL45	SGB-2 EL49.3	SGB-2 EL55	SGB-2 EL60	SGB-1 EL12	SGB-1 EL16.5	SGB-1 EL22.5	SGB-1 EL30	SGB-1 EL37.5	SGB-1 EL45	SGB-1 EL49.3	SGB-1 EL55	SGB-1 EL60	FB EL14	FB EL19	FB EL21	FB EL22& 26	FB EL27	FB EL28	FB EL30	FB EL36
1	SYSTEM																										
1.1	Horn type loud speaker - 15W			2	3	1	2		1				2	3	1	2		1		3	1			1		4	
1.2	Box type Loud speaker - 4W	10	3	8	9	7	6	2	1	3	10	3	8	9	7	6	2	1	3	8	9	2	6	1	4	7	7
1.3	Ceiling ring type LS - 6 W																										
1.4	4 -way, 6 - terminal GI box	9	2	9	9	7	6	1	1	2	9	2	9	9	7	5	1	1	2	10	8	2	11	2	3	10	5
1.5	Main PA System JB			1		1							1		1						1					1	
1.6	GI conduit pull boxes																										
2	CABLES / WIRES																										
2.1	1 PR,24/0.2 mm Cu, FRLS PVC cable	9	2	9	75	65	150	25	25	25	9	2	9	75	65	150	25	25	25	30	40		30	125			40
2.2	5 core 1.5mm Cu,FRLS PVC cable (UNARMOURED)	130	18	100	200	150	250	75	50	100	130	18	100	200	150	250	75	50	100	225	200		200	300			100
2.3	1 PR ,24/0.2mm cu mineral insulated																										
3	GI CONDUIT																										
3.1	19 mmø (Strip type) FLEXIBLE (PA system)	9	2	9	75	65	150	25	25	25	9	2	9	75	65	150	25	25	25	30	40		30	125			40
3.2	25 mmø GI Conduit	140	18	100	200	150	250	75	50	25	140	18	200	200	150	250	75	50	25	250	225		225	325			125

Sl. No	Item description	RWB							MISC			SB								TB MISC					DG	
		RWB EL14	RWB EL22.5	RWB EL30	RWB EL37.5	RWB EL45	RWB EL45	RWB EL52.5	Transfo rmer Yard	Electro Chlorin ation	DM Water Plant	SB EL17.5	SB EL22.5	SB EL30	SB EL35.5	SB EL40	SB EL43	SB EL48	SB EL60.5	TB - MISC EL51	TB EL53.5	TB EL60	TB - misc EL63.5	TB - misc EL66	DG -1 EL30	DG -2 EL30
1	SYSTEM																									
1.1	Horn type loud speaker - 15W	3	3	3	3	3	3	1	5	1	5	2	1		1		2	1				2	2	2	5	5
1.2	Box type Loud speaker - 4W	6	7	9	3	4	5	4		5	5	3	4	6	4	1	4	2	1	6	6			1	2	2
1.3	Ceiling ring type LS - 6 W										1						2									
1.4	4 -way, 6 - terminal GI box	6	6	8	9	6	7	4	4	6	10	4	5	5	4		8	3		5	5	1	1		6	6
1.5	Main PA System JB			1	1					1	1			1			1								1	1
1.6	GI conduit pull boxes																									
2	CABLES / WIRES																									
2.1	1 PR,24/0.2 mm Cu, FRLS PVC cable	80	60	45	60	7	70	5	10	10	15	3	3	3	3	30	12	45	25	15	15	5	5	5	90	90
2.2	5 core 1.5mm Cu,FRLS PVC cable (UNARMOURED)	60	115	45	40	90	75	55	160	600	560						105	70		95	95	85	85	85	35	35
2.3	1 PR ,24/0.2mm cu mineral insulated											REFER	REFER	REFER	REFER											
3	GI CONDUIT																									
3.1	19 mmø (Strip type) FLEXIBLE (PA system)	80	60	45	60	7	70	5	8	12	12						12	45		10	10	3	3	3	90	90
3.2	25 mmø GI Conduit	60	115	45	40	90	75	55	160	100	160	70	40	65	60	30	125	180	55	90	90	55	55	55	35	35

Sl. No	Item description	TB												Indoor Switch Yard					SWPH					
		TB EL23.5	TB EL26	TB EL27.5	TB EL30	TB EL32.5	TB EL35	TB EL36	TB EL38.5	TB EL41.0	TB EL43.5	TB EL44.5	TB EL47	220KV Indoor Switch Yard EL30	220KV Indoor Switch Yard EL35.5	230KV Indoor Switch Yard Rev 4	230KV Indoor Switch Yard EL27.5	230KV Indoor Switch Yard EL33	SWPH OFF-SHORE EL21.5	SWPH OFF-SHORE EL30&33.5	SWPH OFF-SHORE EL37.5	SWPH OFF-SHORE EL41	SWPH-On shore	SWPH
1	SYSTEM																							
1.1	Horn type loud speaker - 15W																		2	5			3	4
1.2	Box type Loud speaker - 4W	4	6	21	21	8	8	11	29	4	6	11	11	5	1	11	5	1			2	2	2	2
1.3	Ceiling ring type LS - 6 W														4		4							
1.4	4 -way, 6 - terminal GI box	4	5	19	20	7	7	12	27	3	5	12	11	4	4	10	4	4	1	5	3	1	4	5
1.5	Main PA System JB			1	1			1				1	1	1			1							
1.6	GI conduit pull boxes															13		1						
2	CABLES / WIRES																							
2.1	1 PR,24/0.2 mm Cu, FRLS PVC cable	15	15	35	35	15	15	50	50	15	15	15	15	7	8	25	7	8	5	10	5	5	10	10
2.2	5 core 1.5mm Cu,FRLS PVC cable (UNARMOURED)	85	85	650	650	140	140	570	570	120	120	580	580	400		500	400		60	110	45	50	70	70
2.3	1 PR ,24/0.2mm cu mineral insulated																							
3	GI CONDUIT																							
3.1	19 mmø (Strip type) FLEXIBLE (PA system)	10	10	35	35	12	12	45	45	10	10	11	11	7	8	18	7	8	3	8	3	3	8	8
3.2	25 mmø	80	80	425	425	130	130	325	325	110	110	330	330	50	65	485	50	65	55	100	40	45	70	70

Sl. No	Item description	RAW Water					for external	Total
		Raw Water EL27.5	Raw Water EL30	Raw Water EL30.5	Raw Water EL33	plant IC sys EL36		
1	SYSTEM							
1.1	Horn type loud speaker - 15W	5	5			22		161
1.2	Box type Loud speaker - 4W	3	3	1	1	98		805
1.3	Ceiling ring type LS - 6 W					5		94
1.4	4 -way, 6 - terminal GI box	7	7	1	1	113		929
1.5	Main PA System JB			1		7		42
1.6	GI conduit pull boxes						300	314
2	CABLES / WIRES							
2.1	1 PR,24/0.2 mm Cu, FRLS PVC cable	15	15	5	5			4760
2.2	5 core 1.5mm Cu,FRLS PVC cable (UNARMOURED)	620	620	10	10		4000	20154
2.3	1 PR ,24/0.2mm cu mineral insulated							90
3	GI CONDUIT							
3.1	19 mmø (Strip type) FLEXIBLE)	12	12	3	3			4601
3.2	25 mmø GI Conduit	170	170	10	10		3000	16047

SECTION VII

SUPPLY OF MATERIALS

SECTION VII

SCHEDULE OF SUPPLY OF MATERIALS

No material is envisaged to be supplied by the Corporation to the contractor for carrying out of the work. The contractor should arrange himself all the materials required as per the specifications and drawings for the successful completion of the work.

SECTION VIII

SCHEDULE OF QUANTITIES

SECTION VIII

SCHEDULE OF QUANTITIES

Name of Work: Design, material, construction features, engineering, manufacture, packing, transportation, delivery, unloading, safe storage, installation, testing, commissioning, training, documentation & guarantee of Public Address system, for 500MWe Prototype Fast Breeder Reactor(PFBR) BHAVINI, Kalpakkam, Kancheepuram District, Tamil Nadu, PIN-603 102

Tender No:BHAVINI/IT/08/111/10

INSTRUCTION TO TENDERERS

1. The Quoted amount shall include for provision of all necessary equipment, power temporary work, levies taxes, duties, insurance, royalties, establishments, contingencies, overheads and profits as well as qualified and experienced personnel for satisfactory completion of work and all incidental items not specifically mentioned but reasonably implied for completion of work according to the contract.
2. Rates shall be quoted both in figures and in words in clear legible writing, no over writing is allowed. All scoring and cancellations should be countersigned by the tenderer. In case of illegibility, the interpretation of the Engineer-In-Charge shall be final.
3. Every page of this schedule shall be signed by the tenderer.
4. Quantities indicated in the cost Estimate are estimated quantities and for bidding purpose only. The final contract value will be arrived at and paid for only on the basis of actual measurements of work as evaluated and certified by BHAVINI.
5. The decision of the Engineer-In-Charge shall be final and bidding on the contractor regarding clarification of items in this schedule with respect to other sections of contract/specifications.

6. Items of work provided in this schedule but not covered in the specification shall be executed strictly as per instructions of the Engineer-In-Charge.

GENERAL INFORMATION FOR GUIDANCE OF TENDERES

1. The schedule of quantities is to be read for the purpose of pricing in conjunction with the special conditions general rules for the guidance of contractors, conditions of contract, specifications, drawings, schedule of supply of materials and the appendices.
2. The prices quoted in the schedule of quantities shall be inclusive value of the work described including all cost and expenses which may be required in and for the construction of the work described together with all general risks, liabilities and obligations set forth or implied in the documents on which the tender is to be based.
3. The quantities stated are to be considered approximate only and the unit prices entered in the schedule of quantities and prices shall apply only to the actual quantities measured in the completed work in accordance with the specifications.
4. All the materials other than those shown in schedule of supply of materials in Section VII are to be arranged by the contractor and his rates should account for the same.
5. Rates quoted for all items in this tender shall include cost of all materials including cement. Department will not supply any materials other than materials stipulated in Part VII of the tender and as such the rates quoted must be all inclusive.
6. Contractor shall make his own arrangements for construction water supply to carryout this work.
7. If contractors need any clarification they are required to contact **Shri. S. Narasimhan, Project Engineer (IT), BHAVINI, PFBR SITE, Kalpakkam – 603 102, Kancheepuram District, Tamil Nadu.**

SCHEDULE OF QUANTITIES

* Total Amount for Scheduled Quantity shall be written in words in the space provided.

Design, material, construction features, engineering, manufacture, packing, transportation, delivery, unloading, safe storage, installation, testing, commissioning, training, documentation & guarantee of Public Address system, for 500MWe Prototype Fast Breeder Reactor(PFBR) BHAVINI, Kalpakkam, Kancheepuram District, Tamil Nadu, PIN-603 102

[illegible]

SCHEDULE OF QUANTITIES

* Total Amount for Scheduled Quantity shall be written in words in the space provided.

NAME OF THE WORK: PUBLIC ADDRESS SYSTEM FOR PFBR

TENDER NO: BHAVINI/IT/08/111/10

Item No	Description of item	Unit	Qty.	Supply cost for Unit Qty (In Rs.)	Erection Cost for Unit Qty (In Rs.)	Supply cost for Scheduled Qty (In Rs.)	Erection cost for Scheduled Qty (In Rs.)	Total Amount for Scheduled Qty (In Rs.)
A	B	C	D	E	F	G=D*E	H=D*F	I=G+H
TOTAL FROM PREVIOUS PAGE								
2	Master control station							
2.1	Supply and installation of Master Control Station (MCS) with zone selection panels (minimum six zones, expandable up to thirty zones) with attendant / operator console with all accessories and Integration of Master Control Station to item no 1	Nos	2					
	*Rupees in words							
2.2	Supply and Installation of Necessary FRLS cable and complete accessories for interconnecting item no 2.1 to item No 1.	Mts	500					
	*Rupees in words							
3	Supply and installation of Loud speakers with driver unit and line matching transformer etc along with structural steel for fixing the PA boxes, swivel brackets, supporting brackets and all mounting accessories.							
3.1	15Watts (RMS) Horn type outdoor speaker (Aluminium) with all accessories.	Nos	200					
	*Rupees in words							
TOTAL								

SCHEDULE OF QUANTITIES

* Total Amount for Scheduled Quantity shall be written in words in the space provided.

NAME OF THE WORK: PUBLIC ADDRESS SYSTEM FOR PFBR

TENDER NO: BHAVINI/IT/08/111/10

Item No	Description of item	Unit	Qty.	Supply cost for Unit Qty (In Rs.)	Erection Cost for Unit Qty (In Rs.)	Supply cost for Scheduled Qty (In Rs.)	Erection cost for Scheduled Qty (In Rs.)	Total Amount for Scheduled Qty (In Rs.)
A	B	C	D	E	F	G=D*E	H=D*F	I=G+H
TOTAL FROM PREVIOUS PAGE								
3.2	6Watts (RMS) Ceiling ring type Loudspeaker with volume control and all accessories.	Nos	150					
	*Rupees in words							
3.3	4Watts (RMS) Box type loud speaker with built-in volume control and all accessories.	Nos	950					
	*Rupees in words							
4	Supply and installation of junction boxes for the cabling of PA System with supporting brackets and all mounting accessories							
4.1	4 way 6 terminal junction box	Nos	1,000					
	*Rupees in words							
4.2	Main PA Junction Box 30 terminal with earthing of JB to the earthing point with 8 SWG Copper wire	Nos	50					
	*Rupees in words							
TOTAL								

SCHEDULE OF QUANTITIES

* Total Amount for Scheduled Quantity shall be written in words in the space provided.

NAME OF THE WORK: PUBLIC ADDRESS SYSTEM FOR PFBR

TENDER NO: BHAVINI/IT/08/111/10

Item No	Description of item	Unit	Qty.	Supply cost for Unit Qty (In Rs.)	Erection Cost for Unit Qty (In Rs.)	Supply cost for Scheduled Qty (In Rs.)	Erection cost for Scheduled Qty (In Rs.)	Total Amount for Scheduled Qty (In Rs.)
A	B	C	D	E	F	G=D*E	H=D*F	I=G+H
TOTAL FROM PREVIOUS PAGE								
5	Supply and installation of Cables and Wires (including supply of glands, terminations at both ends and joining with cable joining kit as specified in 1.6.10 wherever necessary with mounting accessories.)							
5.1	24/0.2 mm dia ATC 1 pair flexible PA ,FRLS PVC Insulated unarmoured cable.	Mts	9,000					
	*Rupees in words							
5.2	5C/1.5 sq.mm ATC, FRLS PVC unarmoured Cable	Mts	32,000					
	*Rupees in words							
6	Supply and Laying of Heavy duty GI ERW conduits in wall/ceilings including necessary round junction boxes, inspection type bends/elbow, earthing with 8 SWG copper wire and copper clamp along the entire conduit length, bends, tees, reduces, nipples, mounting arrangements etc., as required to complete the conduit routing)							
6.1	19mm dia flexible GI conduit	Mts	9,000					
	*Rupees in words							
TOTAL								

SCHEDULE OF QUANTITIES

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NAME OF THE WORK: PUBLIC ADDRESS SYSTEM FOR PFBR

TENDER NO: BHAVINI/IT/08/111/10

Item No	Description of item	Unit	Qty.	Supply cost for Unit Qty (In Rs.)	Erection Cost for Unit Qty (In Rs.)	Supply cost for Scheduled Qty (In Rs.)	Erection cost for Scheduled Qty (In Rs.)	Total Amount for Scheduled Qty (In Rs.)
A	B	C	D	E	F	G=D*E	H=D*F	I=G+H
TOTAL FROM PREVIOUS PAGE								
6.2	25mm dia heavy duty GI ERW conduit	Mts	32,000					
	*Rupees in words							
6.3	Supply and installation of GI conduit pull boxes (size 75mm x 75mm) with all mounting accessories.	Nos	500					
	*Rupees in words							
7	Tools and tackles as specified in tender clause 1.14							
7.1	Maintenance and Trouble shooting software	Set	1					
	*Rupees in words							
8	Earthing							
8.1	Earthing system consisting of earthing leads etc for PA system with all mounting and fixing accessories	Lot	1					
	*Rupees in words							
TOTAL								

SCHEDULE OF QUANTITIES

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NAME OF THE WORK: PUBLIC ADDRESS SYSTEM FOR PFBR

TENDER NO: BHAVINI/IT/08/111/10

Item No	Description of item	Unit	Qty.	Supply cost for Unit Qty (In Rs.)	Erection Cost for Unit Qty (In Rs.)	Supply cost for Scheduled Qty (In Rs.)	Erection cost for Scheduled Qty (In Rs.)	Total Amount for Scheduled Qty (In Rs.)
A	B	C	D	E	F	G=D*E	H=D*F	I=G+H
TOTAL FROM PREVIOUS PAGE								
9	Essential spares as per tender clause 1.19.2.2	Lot	1					
	*Rupees in words							
10	Supply of special erection and maintenance tools as per clause 1.19.2.3	Lot	1					
	*Rupees in words							
11	Documentation and Training	Lot	1					
	*Rupees in words							
TOTAL								

<u>SCHEDULE OF QUANTITIES</u>								
* Total Amount for Scheduled Quantity shall be written in words in the space provided.								
NAME OF THE WORK: PUBLIC ADDRESS SYSTEM FOR PFBR								
TENDER NO: BHAVINI/IT/08/111/10								
Item No	Description of item	Unit	Qty.	Supply cost for Unit Qty (In Rs.)	Erection Cost for Unit Qty (In Rs.)	Supply cost for Scheduled Qty (In Rs.)	Erection cost for Scheduled Qty (In Rs.)	Total Amount for Scheduled Qty (In Rs.)
A	B	C	D	E	F	G=D*E	H=D*F	I=G+H
TOTAL FROM PREVIOUS PAGE								
12	Seismic test charges	Lot	1					
	*Rupees in words							
GRAND TOTAL Rs								
Grand Total in words Rs								

Note:

1. Rates should be strictly quoted in this format only, failing which the offer will not be accepted.
2. The rates quoted above shall be inclusive of all taxes and duties (excluding service tax), packing, transportation or any other charges as applicable.
3. The quantities indicated are only for estimation purpose. The quotation will be on unit rate basis and the actual will be made on the number of units/lots consumed. The rates quoted by the party shall remain firm throughout the contract period.
4. The bidder shall take into account the variation in quantities to the extent of + 25% and -25% and bidder shall quote for unit rate for all items. So as to facilitate the purchaser to make final payment as per the approved installation in the plant. The rates for installation of each of the item shall also include their installation including the cost of support structures if any.

**SIGNATURE OF THE CONTRACTOR
WITH SEAL AND DATE**