TENDER SPECIFICATION
YTPS: PUR: 202302-89

"Supply of NAOH for DM & PT Plant at
5X800 MW BHEL YADADRI SITE"

VOLUME – I

BHARAT HEAVY ELECTRICALS LIMITED
(A Government of India Undertaking)
Power Sector – Southern Region

BHEL Site Office
5x800MW Yadadri TPS
Damarcherla (M), Nalgonda (D)
PIN – 508355
Telangana

2023

NOTICE INVITING TENDER

Bharat Heavy Electricals Limited

Ref: YTPS: PUR: 202302-89 Date: 22.02.2023

NOTICE INVITING TENDER (NIT)

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To,

The Bidders

Sub: NOTICE INVITING TENDER

Sealed offers in two-part bid system {National competitive bidding (NCB)} are invited from reputed & experienced bidders (meeting PRE QUALIFICATION CRITERIA as mentioned in Annexure-B) for the subject ITEM by the undersigned on the behalf of BHARAT HEAVY ELECTRICALS LIMITED as per the tender document.

Following points relevant to the tender may please be noted and complied with Salient Features of NIT

1.0

-	ISSUE	DESCRIPTION	
i	**TENDER NUMBER**	*YTPS: PUR: 202302-89*	
ii	**BROAD SCOPE OF JOB**	*Supply of NAOH for DM & PT Plant at 5X800 MW BHEL YADADRI SITE*	
iii	**DETAILS OF TENDER DOCUMENT**		
a	Volume-IA	*Technical Conditions of Contract (TCC) consisting of Scope of work, Technical Specification, Procedures, Terms of payment, etc.*	Applicable
b	Volume-IB	General Conditions of Contract (GCC) modified	Applicable
c	Volume-II	*Price Schedule (Absolute value).*	Applicable
iv	**ISSUE OF TENDER DOCUMENTS**	*Tender documents will uploaded in BHEL and CPP Portal*	Applicable
v	**DUE DATE & TIME OF OFFER SUBMISSION**	***Date – 09.03.2023, Time - 15:00 Hrs*** *Bid shall be submitted through E-mail at* tender.yadadri@bhel.in *or hard copy at tender box at BHEL yadadri site. Mail size not to exceed 20 Mb*	Applicable
vi	**OPENING OF TENDER**	***Date : 09.03.2023, , Time – 17:00 Hrs***	Applicable
vii	**EMD AMOUNT**	-	Not Applicable
viii	**COST OF TENDER**	**-**	Not Applicable
ix	**LAST DATE FOR SEEKING CLARIFICATION**	*04.03.2023*	Applicable

x	**SCHEDULE OF Pre Bid Discussion (PBD)**	-	Not Applicable
xi	**INTEGRITY PACT & DETAILS OF INDEPENDENT EXTERNAL MONITOR (IEM)**	-	Not Applicable
xii	**Latest updates**	*Latest updates on the important dates, Amendments, Correspondences, Corrigenda, Clarifications, Changes, Errata, Modifications, Revisions, etc. to Tender Specifications will be issued through E-mail only. Bidders to keep themselves updated with all such information.*	Applicable
xiii	**Reverse Auction**	*Relevant documents attached*	Applicable
xiv	**PQR**	*Relevant documents attached*	Applicable

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

3.0 **Procedure for Submission of Tenders:** This is a tender floated through E-mail. The bidder should respond by submitting their offer through E-mail only at following E-mail IDs. Offers are invited in two-part bid.

(i) tender.yadadri@bhel.in with a copy to vineelp@bhel.in

Documents Comprising in the Tender:

The tender shall be submitted through E-mail only as mentioned below:

I. Technical Tender (UN priced Tender):

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

(a) "No Deviation Certificate" as their acceptance to all terms and conditions of the tender.
(b) 'Volume -IA-Technical Bid' duly signed by authorized representative.
(c) 'Volume -IB GCC' duly signed by authorized representative.
(d) Techno-Commercial Compliance cum Checklist (Part of Volume-IA)
(e) Copy of PAN and GST registration.

II. Price Bid:

(a) Prices are to be quoted in exl sheet (attached) then convert in PDF (with password protected mode), sign and stamp and send scanned copy through e-mail. Password for the price bid of techno commercially suitable vendors will be asked at the time of price bid opening through email.

(b) The price should be quoted for the accounting unit indicated in the tender document.

(c) N**ote:** It is the responsibility of tenderer to go through the Tender document to ensure furnishing all required documents in addition to above, if any. Any deviation would result in REJECTION of tender and would not be considered at a later stage at any cost by BHEL.

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

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

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

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

6.0 Bidders must visit site/ work area and study the job content, facilities available, availability of materials, prevailing site conditions including law & order situation, applicable wage structure, wage rules, etc. before quoting for this tender. They may also consult this office before submitting their offers, for any clarifications regarding scope of work, facilities available at sites or on terms and conditions.

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

8.0 BHEL may decide holding of pre-bid discussion [PBD] with all intending bidders as per date indicated in the NIT. The bidder shall ensure participation for the same at the appointed time, date and place as may be decided by BHEL. Bidders shall plan their visit accordingly. The outcome of pre-bid discussion (PBD) shall also form part of tender.

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

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

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

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

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

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

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

16.0 The language in the tender documents downloaded by the Bidders shall at no point of time be changed, altered or modified in any manner by the Tenderer. If such changes are made by any tenderer, it shall be considered as tampering with BHEL's terms and the offer shall be summarily rejected, whenever it is noticed by BHEL. Such Bidders would be disqualified from the Bidding Process and their offers would be forfeited / Bank Guarantees invoked. They would also not be allowed to take part in future tenders of BHEL.

17.0 Any Bidder falling under MSE category, shall furnish the following details & submit documentary evidence/ Govt. Certificate etc. in support of the same along with their techno-commercial offer.

Type under MSE	SC/ST owned	Women owned	Others (excluding SC/ ST & Women Owned)
Micro			
Small			

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

a) MSE suppliers can avail the intended benefits in respect of the procurements related to the Goods and Services only (Definition of Goods and Services as enumerated by Govt. of India vide Office Memorandum F. No. 21(8)/2011-MA dtd. 09/11/2016 office of AS & DC, MSME) only if they submit along with the offer, attested copies of either Udyam Registration Certificate or EM-II certificate having deemed validity (five years from the date of issue of acknowledgement in EM-II) or valid NSIC certificate or Udyog Aadhar Memorandum (UAM) & Acknowledgement or EM-II Certificate along with attested copy of a CA certificate (format enclosed as Annexure – 3) where deemed validity of EM-II certificate of five years has expired applicable for the relevant financial year (latest audited). Date to be reckoned for determining the deemed validity will be the last date of Technical Bid submission. Non submission of such documents will lead to consideration of their bids at par with other bidders. No benefits shall be applicable for this enquiry if the above required documents are not submitted before price bid opening. If the tender is to be submitted through e- procurement portal, then the above required documents are to be uploaded on the portal. Documents should be notarized or attested by a Gazetted officer. Documents submitted by the bidder may be verified by BHEL for rendering the applicable benefits.

- MSEs quoting price within price band L-1 + 15%, when L1 is from someone other than MSE, shall be allowed to supply 100% of tendered value at L-1 subject to lowering of price by MSEs to L-1.

18.0 PREFERENCE TO MAKE IN INDIA:

- Class 1 supplier quoting within price band L-1+20%, when L1 is from someone other than Class 1, shall be allowed to supply 100% of tendered value at L-1 in case of price match.

For this procurement, the local content to categorize a supplier as a Class I local supplier/ Class II local Supplier/Non-Local Supplier and purchase preferences to Class I local supplier, is as defined I Public Procurement (Preference to Make in India), Order 2017 dated 04.06.2020 issued by DPIIT. In case of subsequent orders issued by the nodal ministry, changing the definition of local content for the items of the NIT, the same shall be applicable even if issued after issue of this NIT, but before opening of Part-II bids against this NIT.

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

I. Any bidder from a country which shares a land border with India will be eligible to bid in this tender only if the bidder is registered with the Competent Authority. The Competent Authority for the purpose of this Clause shall be the Registration Committee constituted by the Department for Promotion of Industry and Internal Trade (DPIIT).

II. "Bidder" (including the term 'tenderer', 'consultant' or 'service provider' in certain contexts) means any person or firm or company, including any member of a consortium or joint venture (that is an association of several persons, or firms or companies), every artificial juridical person not falling in any of the descriptions of bidders stated hereinbefore, including any agency branch or office controlled by such person, participating in a procurement process.

III. "Bidder from a country which shares a land border with India" for the purpose of this Clause means: -

a. An entity incorporated established or registered in such a country; or

b. A subsidiary of an entity incorporated established or registered in such a country; or

c. An entity substantially controlled through entities incorporated, established or registered in such a country; or

d. An entity whose beneficial owner is situated in such a country; or

e. An Indian (or other) agent of such an entity; or

f. A natural person who is a citizen of such a country; or

g. A consortium or joint venture where any member of the consortium or joint venture falls under any of the above

IV. The beneficial owner for the purpose of (III) above will be as under:

1. In case of a company or Limited Liability Partnership, the beneficial owner is the natural person(s), who, whether acting alone or together or through one or more juridical person, has a controlling ownership interest or who exercises control through other means.

Explanation

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

b. "Control" shall include the right to appoint majority of the directors or to control the management or policy decisions including by virtue of their shareholding or management rights or shareholders agreements or voting agreements.

2. In case of a partnership firm, the beneficial owner is the natural person(s) who, whether acting alone or together, or through one or more juridical person, has ownership of entitlement to more than fifteen percent of capital or profits of the partnership.

3. In case of an unincorporated association or body of individuals, the beneficial owner is the natural person(s), who, whether acting alone or together, or through one or more juridical person has ownership of or entitlement to more than fifteen percent of the property or capital or profits of the such association or body of individuals.

4. Where no natural person is identified under (1) or (2) or (3) above, the beneficial owner is the relevant natural person who holds the position of senior managing official;

5. In case of a trust, the identification of beneficial owner(s) shall include identification of the author of the trust, the trustee, the beneficiaries with fifteen percent or more interest in the trust and any other natural person exercising ultimate effective control over the trust through a chain of control or ownership.

V. An Agent is a person employed to do any act for another, or to represent another in dealings with third person.

VI. The successful bidder shall not be allowed to sub-contract works to any contractor from a country which shares a land border with India unless such contractor is registered with the Competent Authority.

Note:

(i) The bidder shall provide undertaking for their compliance to this Clause, in the Format provided in Annexure-11.

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

19.0 Order of Precedence:

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

a. Amendments/Clarifications/Corrigenda/Errata etc. issued in respect of the tender documents by BHEL
b. Notice Inviting Tender (NIT)
c. Price Bid – Volume-II
d. Technical Conditions of Contract (TCC) - Volume-1A
e. General Conditions of Contract (GCC) - Volume-1B

It may please be noted that guidelines/ circulars/ amendments/ govt. directives issued from time to time shall also be applicable.

19.0 BHEL shall be resorting to Reverse Auction (RA) (Guidelines as available on www.bhel.com on "supplier registration page".) for this tender. RA shall be conducted among all the techno-commercially qualified bidders. Price Bids of all the techno-commercially qualified bidders shall be opened and same shall be considered as initial bids of bidders in RA. In case any bidder(s) do(es) not participate in online Reverse Auction, their sealed envelope price bid along with applicable loading, if any, shall be considered for ranking.

for BHARAT HEAVY ELECTRICALS LTD
(SCT & PUR)

Enclosure:

(i) Annexure-1: Techno-commercial Compliant Check-list
(ii) Annexure-2: Check List.
(iii) Annexure-3: Certificate by Chartered Accountant
(iv) Annexure-4: Reverse Auction Process Compliance Form
(v) Annexure-5: Authorization of representative who will participate in the online Reverse Auction Process
(vi) Annexure-6: RA Price Confirmation and Breakup
(vii) Annexure-7: Integrity Pact –**NOT APPLICABLE**
(viii) Annexure-8: Undertaking as per C4 of Annexure-B i.e. PQR
(ix) Annexure-9: Declaration regarding Details of related firms and their area of activities
(x) Annexure-10: Declaration regarding Minimum Local Content in Line With Revised Public Procurement (Preference To Make In India), Order 2017 Dated 04th June, 2020) And Subsequent Order(s)
(xi) Annexure-11: Declaration Regarding Compliance to Restrictions Under Rule 144 (xi) of GFR 2017
(xii) Other Tender documents as per this NIT.

PRE QUALIFYING CRITERIA

JOB	**Supply of Chemicals for DM Plant & PT Plant – Sodium Hydroxide**		
Tender/Indent No.	**YTPS: PSSR : PUR : 202302 89**		
Sl. No.	PRE QUALIFICATION CRITERIA	Bidders claim in respect of fulfilling the PQR Criteria: Name and Description of qualifying criteria	Bidders claim in respect of fulfilling the PQR Criteria: Page no of supporting Document. Bidder must fill up this column as per applicability
A	Submission of Integrity Pact duly signed (if applicable) (Note: To be submitted by Prime Bidder & Consortium/Technical Tie up partner jointly in case Consortium bidding is permitted, otherwise by the sole bidder)	Not Applicable	
B	Technical		
B.1	Bidder should have executed Order Supply of chemicals any one of the following in last five year from the latest date of bid submission. Copy of PO to be submitted along with offer. Line Item: 1 — Description: Sodium Hydroxide liquid (Lye) 48%	Applicable	
C C-1	FINANCIAL Turnover Bidders must have achieved a minimum of average annual financial turnover (Audited) for as given below over last three Financial Years 2019-20, 2020-21 & 2021-22.	Applicable	

	Line Item: 1 — Description: Sodium Hydroxide — Minimum Average Turnover over last three Financial Years 2019-20, 2020-21 & 2021-22: 366600		
C-2	**Net worth (only in case of Companies)** Net worth of the Bidder based on the latest Audited Accounts as furnished for C-1 above should be positive	Not Applicable	
C-3	**Profit** Bidder must have earned profit in any one of the three Financial Years as applicable in the last three Financial Years as per C -1 above.	Not Applicable	
C-4	**Bidder must not be under Bankruptcy Code** Proceedings (IBC) by NCLT or under Liquidation / BIFR, which will render him ineligible for participation in this tender, and shall submit undertaking to this effect.	Applicable	
D	Assessment of Capacity of Bidder to execute the work as per Sl. No 9 of NIT (if applicable)	Not Applicable	
E	**Approval of Customer (if applicable)** Note: Names of bidders who stand technically qualified after compliance of criteria A to D shall be forwarded to customer for their approval. (All the credentials shall be sent along with offer by vendor)	Not Applicable	By BHEL
F	**Price Bid Opening** Note: Price Bids of only those bidders shall be opened who stand technically qualified after compliance of criteria A to E and are approved by our customer	Applicable	BY BHEL
G	Consortium criteria (if applicable)	Not Applicable	

Explanatory Notes for the PQR (unless otherwise specified in the PQR):

1. For evaluation of PQR, in case of bidder alone does not meet the pre-qualifying technical criteria B.1 above, bidder may utilize the experience of its parent / subsidiary company along with its own experience, subject to following:
   a) The parent company shall have a controlling stack of ≥ 50% in the subsidiary company **(as per Format-1).**
   b) The Parent Company/ Subsidiary Company of which experience is being utilized for bidding shall submit Security Deposit (SD) equivalent to 1% of the total contract value.
   c) The parent /subsidiary company and bidder shall provide an undertaking that they are jointly or severally responsible for successful performance of the contract **(as per Format-2).**
   d) In case bidder is submitting bid as a consortium partner, option of utilizing experience of parent / subsidiary company can be

availed by prime bidder only.

e) Parent Company/Subsidiary Company of which experience is being used for bidding, cannot participate as a 'Standalone Bidder'.

2. "Completion date for achievement of the technical criteria should be in the last seven years ending on the 'latest date of Bid Submission' of tender irrespective of date of the start of work. Completion date shall be reckoned from the "FY quarter of bid submission". (for e.g. - Work completed on 01.01.2014 shall be considered even if the latest date of bid submission is 20.03.2021)".
3. 'EXECUTED' means the bidder should have achieved the criteria specified in the Technical criteria of PQR (as in 'B' above) even if the Contract has not been completed or closed.
4. **Not Applicable.**
5. Consortium is not permitted for this tender. However, after successful execution of one work with a consortium partner under direct orders of BHEL, the Prime Bidder shall be eligible for becoming a 'standalone' bidder for works similar to that for which consortium partner was engaged, for subsequent tenders.
6. Wherever the credential submitted for satisfying the Technical PQR is from direct order of BHEL, bidders to ensure that relevant certificate issued by respective contracting department of BHEL is provided as part of the offer. Certificates can be obtained from BHEL by submitting request through online portal i.e. **https://siddhi.bhel.in.**

Evaluation of financial PQR:

7. Bidder to submit Audited Balance Sheet and Profit and Loss Account for the respective years as indicated against C-1 above along with all annexures.
8. In case audited financial statements have not been submitted for all the three years as indicated against C-1 above, then the applicable audited statements submitted by the bidders against the requisite three years, will be averaged for three years i.e. total divided by three.
9. If Financial Statements are not required to be audited statutorily, then instead of audited financial statements, financial statements are required to be certified by Chartered Accountant.
10. C-2: - NETWORTH: Shall be calculated based on the latest Audited Accounts as furnished for C-1 above. Net worth = Paid up share capital + Reserves. (Net worth is required to be evaluated in case of companies).
11. C-3: - PROFIT: shall be NET profit (PBT) earned during any one of the three financial years as in C-1 above.

Explanatory Notes for QR 'B1'

- For QR 'B1' above, actual executed value shall be considered.
- For QR 'B1' above, Value of work is to be updated with indices for "All India Avg. Consumer Price index for industrial workers" and "Monthly Whole Sale Price Index for All Commodities" with base month as per last month of work execution and indexed up to three (3) months prior to the month of latest due date of bid submission as per following formula-

$$P = \left\{ R + 0.425 \times R \times \frac{(X_N - X_O)}{X_O} + 0.425 \times R \times \frac{(Y_N - Y_O)}{Y_O} \right\}$$

Where;
P = Updated value of work
R = Value of executed work
X_N = All India Avg. Consumer Price index for industrial workers for three months prior to the month of latest due date of bid submission (e.g. If latest bid submission date is 02-Mar-17, then bid submission month shall be reckoned as March'17 and index for Dec'2016 shall be considered).
X_O = All India Avg. Consumer Price index for industrial workers for last month of work execution.
Y_N = Monthly Whole Sale Price Index for All Commodities for three months prior to the month of latest due date of bid submission (e.g. If latest bid submission date is 02-Mar-17, then bid submission month shall be reckoned as March'17 and index for Dec'2016 shall be considered).
Y_O = Monthly Whole Sale Price Index for All Commodities for last month of work execution.

- Relevant documents, meeting above requirements at C & D, shall be submitted by bidders.
- The evaluation currency for this tender shall be INR.

BIDDER SHALL SUBMIT ABOVE PRE-QUALIFICATION CRITERIA FORMAT, DULY FILLED-IN, SPECIFYING RESPECTIVE ANNEXURE NUMBER AGAINST EACH CRITERIA AND FURNISH RELEVANT DOCUMENT INCLUSIVE OF WORK ORDER AND WORK COMPLETION CERTIFICATE ETC IN THE RESPECTIVE ANNEXURES IN THEIR OFFER.Credentials submitted by the bidder against "PRE QUALIFYING CRITERIAS" shall be verified for its authenticity. In case, any credential (s) is/are found unauthentic, offer of the bidder is liable to the rejection. BHEL reserves the right to initiate any further action as per extant guidelines for Suspension of Business Dealings.

TENDER SPECIFICATION
YTPS: PUR: 202302-89

Supply of Chemicals for DM Plant & PT Plant - NAOH

VOLUME – I

BHARAT HEAVY ELECTRICALS LIMITED
(A Government of India Undertaking)
Power Sector – Southern Region

BHEL Site Office
5x800MW Yadadri TPS
Damarcherla (M), Nalgonda (D)
PIN – 508355
Telangana

TECHNOCOMMERCIAL BID:

Book - I Consists of

- **Formats and Annexures**
- **Volume-IA: Technical Conditions of Contract**
- **Technical Specifications**
- **Unpriced Bid**
- **Price breakup format**

Format-1

OFFER FORWARDING LETTER / TENDER SUBMISSION LETTER

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

Offer Reference No:…….
Date:……

To,

(Write Name & Address of Officer of BHEL inviting the Tender)

Dear Sir,

Sub: Submission of Offer against Tender Specification No: ……

I/We hereby offer to carry out the work detailed in the Tender Specification issued by Bharat Heavy Electricals Limited, Power Sector - Southern Region Yadadri, in accordance with the terms and conditions thereof.

I/We have carefully perused the following listed documents connected with the above work and agree to abide by the same.

1. Amendments/Clarifications/Corrigenda/Errata/etc. issued in respect of the Tender documents by BHEL
2. Notice Inviting Tender (NIT)
3. Price Bid
4. Technical Conditions of Contract

Should our Offer be accepted by BHEL for Award, I/we further agree to furnish 'Security Deposit' for the work as provided for in the Tender Conditions within the stipulated time as may be indicated by BHEL.

I / We further agree to execute all the works referred to in the said Tender documents upon the terms and conditions contained or referred to therein and as detailed in the appendices annexed thereto.

I/We have deposited/depositing herewith the requisite Earnest Money Deposit (EMD) as per details furnished.

Authorized Representative of Bidder

Signature:
Name:
Address:

Place:
Date:

Format-2

NO DEVIATION CERTIFICATE

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

To,

(Write Name & Address of Officer of BHEL inviting the Tender)

Dear Sir,

Sub : No Deviation Certificate

Ref :
1) NIT/Tender Specification No: ……,
2) All other pertinent issues till date

We hereby confirm that we have not changed/ modified/materially altered any of the tender documents as downloaded from the website/ issued by BHEL and in case of such observance at any stage, it shall be treated as null and void.

We also hereby confirm that we have neither set any Terms and Conditions and nor have we taken any deviation from the Tender conditions together with other references applicable for the above referred NIT/Tender Specification.

We further confirm our unqualified acceptance to all Terms and Conditions, unqualified compliance to Tender Conditions.

We confirm to have submitted offer in accordance with tender instructions and as per aforesaid references.

Thanking you,

Yours faithfully,

(Signature, date & seal of authorized representative of the bidder)

Format-8

NON DISCLOSURE CERTIFICATE

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

I / We understand that BHEL PSSR is committed to Information Security Management System as per their Information Security Policy.

Hence, I / We M/s…… who are submitting offer for providing services to BHEL PSSR against Tender Specification No:_____, hereby undertake to comply with the following in line with Information Security Policy of BHEL PSSR, Chennai-35.

- To maintain confidentiality of documents & information which shall be used during the execution of the Contract.
- The documents & information shall not be revealed to or shared with third party which shall not be in the business interest of BHEL PSSR.

(Signature, date & seal of Authorized Signatory of the bidder)

Date:

Format-9

MANDATE FORM

ELECTRONIC CLEARING SERVICE (CREDIT CLEARING)/ REAL TIME GROSS SETTLEMENT (RTGS) FACILITY FOR RECEIVING PAYMENTS

A. DETAILS OF BANK ACCOUNT HOLDER:-

NAME OF THE ACCOUNT HOLDER	
COMPLETE CONTACT ADDRESS	
TELEPHONE NUMBER/FAX/MAIL	

B. BANK ACCOUNT DETAILS

BANK NAME	
BRANCH NAME WITH COMPLETE ADDRESS, TELEPHONE NUMBER AND EMAIL	
WHETHER THE BANK IS COMPUTERISED?	
WHETHER THE BANK IS **RTGS** ENABLED? IF YES, THEN WHAT IS THE BRANCH'S **IFSC** CODE IS THE BRANCH IS ALSO NEFT ENABLED?	
TYPE OF BANK ACCOUNT (SB/CURRENT/CASH CREDIT)	
COMPLETE BANK ACCOUNT NUMBER (LATEST)	
MICR CODE OF BANK	

DATE OF EFFECT:-

I hereby declare that the particulars given above are correct and complete. If the transaction is delayed or not effected at all for reasons of incomplete or incorrect I would not hold the user Institution responsible. I have read the option invitation letter and agree to discharge responsibility expected of me as a participant under the scheme.

( )

Date:

Signature of Customer

Certified that the particulars furnished above are correct as per our records.

(Bank's Stamp) ( )

Date Signature of Bank Manager

Please attach a photocopy of cheque along with the verification obtained from the bank.

In case your Bank is presently not "RTGS Enabled", then upon its up gradation to "RTGS Enabled" branch, please submit the information again in the above proforma to the Department at earliest.

ANNEXURE – 8

UNDERTAKING

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

To,

(Write Name & Address of Officer of BHEL inviting the Tender)

Dear Sir/Madam,

Sub: DECLARATION REGARDING INSOLVENCY/ LIQUIDATION/ BANKRUPTCY PROCEEDINGS

Ref: NIT/Tender Specification No:

I/We, _____

declare that, I/We am/are not under insolvency resolution process or liquidation or Bankruptcy Code Proceedings (IBC) as on date, by NCLT or any adjudicating authority/authorities, which will render us ineligible for participation in this tender.

Sign. of the AUTHORISED SIGNATORY
(With Name, Designation and Company seal)

Place:
Date:

Annexure 10

DECLARATION REGARDING MINIMUM LOCAL CONTENT IN LINE WITH REVISED PUBLIC PROCUREMENT (PREFERENCE TO MAKE IN INDIA), ORDER 2017 DATED 04TH JUNE, 2020) AND SUBSEQUENT ORDER(S)

(To be typed and submitted in the Letter Head of the Entity/Firm providing certificate as applicable)

To,
(Write Name & Address of Officer of BHEL inviting the Tender)

Dear Sir,

Sub: Declaration reg. minimum local content in line with Public Procurement (Preference to Make in India), Order 2017-Revision, dated 04th June, 2020 and subsequent Orders)

Ref : 1) NIT/Tender Specification No: ……,
2) All other pertinent issues till date

We hereby certify that the items/works/services offered by ***(SPECIFY ORGANIZATION NAME HERE)*** has a local content of _____ % and this meets the local content requirement for **'Class-I local supplier' / 'Class II local supplier' **** as defined in Public Procurement (Preference to Make in India), Order 2017-Revision dated 04.06.2020 issued by DPIIT and subsequent order(s).

The details of the location(s) at which the local value addition is made are as follows:

1. _____ 2. _____
3. _____ 4. _____
…
…

Thanking you,
Yours faithfully,

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

****** - *Strike out whichever is not applicable.*

Note:

1. Bidders to note that above format Duly filled & signed by authorized signatory, shall be submitted along with the techno-commercial offer.
2. In case the bidder's quoted value is in excess of Rs. 10 crores, the authorized signatory for this declaration shall necessarily be the statutory auditor or cost auditor of the company (in the case of companies) or a practising cost accountant or practicing chartered accountant (in respect of suppliers other than companies).
3. In the event of false declaration, actions as per the above order and as per BHEL Guidelines shall be initiated against the bidder.

Annexure 11

DECLARATION REGARDING COMPLIANCE TO RESTRICTIONS UNDER RULE 144 (xi) OF GFR 2017

(To be typed and submitted in the Letter Head of the Entity/Firm providing certificate as applicable)

To,
(Write Name & Address of Officer of BHEL inviting the Tender)

Dear Sir,

Sub: Declaration regarding compliance to Restrictions under Rule 144 (xi) of GFR 2017

Ref : 1) NIT/Tender Specification No: ……,
2) All other pertinent issues till date

I have read the clause regarding restrictions on procurement from a bidder of a country which shares a land border with India and on sub-contracting to contractors from such countries. I certify that _____ (**specify the name of the organization here**), is not from such a country / has been registered with the Competent Authority (attach valid registration by the Competent Authority, i.e., the Registration Committee constituted by the Dept. for Promotion of Industry and Internal Trade (DPIIT)); and will not sub-contract any work to a contractor from such countries unless such contractor is registered with the Competent Authority. (attach relevant valid registration, if applicable)

I hereby certify that we fulfil all requirements in this regard and is eligible to be considered.

Thanking you,
Yours faithfully,

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

Note:

Bidders to note that if the above certification given by a bidder, whose bid is accepted, is found to be false, then this would be a ground for immediate termination and further action in accordance with law and as per BHEL guidelines.

ANNEXURE – 4

Reverse Auction Process Compliance Form

(The bidders are required to print this on their company's letterhead and sign, stamp before RA)

To

- M/s. {*Service provider*
- *Postal address}*

Sub: Agreement to the Process related Terms and Conditions

Dear Sir,

This has reference to the Terms & Conditions for the Reverse Auction mentioned in the RFQ document for {Items} against BHEL enquiry/ RFQ no.{…….} dt. {…….}
This letter is to confirm that:

1) The undersigned is authorized official/ representative of the company to participate in RA and to sign the related documents.
2) We have studied the Reverse Auction guidelines (as available on www.bhel.com), and the Business rules governing the Reverse Auction as mentioned in your letter and confirm our agreement to them.
3) We also confirm that we have taken the training on the auction tool and have understood the functionality of the same thoroughly.
4) We also confirm that, in case we become L1 bidder, we will FAX/ email the price confirmation & break up of our quoted price as per *Annexure - 6* within **two** working days (of BHEL) after completion of RA event, besides sending the same by registered post/ courier both to M/s. BHEL and M/s. {*Service provider.}*

We, hereby confirm that we will honor the Bids placed by us during the auction process.

With regards

Signature with company seal

Name:
Company / Organization:
Designation within Company / Organization:
Address of Company / Organization:

Sign this document and FAX/ email it to M/s *{Service provider}* at *{……..}* prior to start of the Event.

ANNEXURE – 5

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

1	NAME OF THE BIDDER	
2	NAME & DESIGNATION OF OFFICIAL	
3	POSTAL ADDRESS (COMPLETE)	
4	TELEPHONE NOS. (LAND LINE & MOBILE BOTH)	
5	E-MAIL ADDRESS	
6	NAME OF PLACE/ STATE/ COUNTRY, WHEREFROM S/HE WILL PARTICIPATE IN THE REVERSE AUCTION	

ANNEXURE – 6

RA price confirmation and breakup
(To be submitted by L1 bidder after completion of RA)

To
- M/s. *Service provider*
- *Postal address*

CC: M/s BHEL
{Unit-
Address-}
Sub: **Final price quoted during Reverse Auction and price breakup**

Dear Sir,

We confirm that we have quoted.

Rs.{____in value & in words_____} for item(s) covered under tender enquiry No. {...} dt.{…}

Total price of the items covered under above cited enquiries is inclusive of {*Packing & forwarding, GST, E.D., C.S.T., freight and insurance charges up to {……} District,{……..} State and Type Test Charges etc., (exclusive of service tax*), *other as per NIT*}

as our final landed prices as quoted during the Reverse Auction conducted today {*date*} which will be valid for a period of {___ **in nos. & in words** ___} days.

The price break-up is as given below.

========
Total - Rs. **in value & in words**
========

Yours sincerely,

For _____

Name:
Company:
Date:
Seal:

2022

Volume-IA:
TECHNICAL CONDITIONS OF CONTRACT

Bharat Heavy Electricals Limited

1.1 Project Information:

Sl. No.	Description	Details
1	**Project Title**	5x800 MW Yadadri Thermal Power Station
2	**Customer**	Telangana State Power Generation Corporation Limited (TSGENCO)
3	**Location**	Site is located 7Km from the NH-565 (SH2) Veerlapalem Village, Damarcherla Mandal, Nalgonda District, Telangana State
4	**Nearest Railway Station**	Damarcherla about 6.5Km
5	**Nearest Airport**	Vijayawada about 130Km
6	**Nearest Town**	Miryalaguda about 30Km
7	**Site Conditions**	
7a	**Average Min. Ambient Temperature**	10°C
7b	**Average Max. Ambient Temperature**	47°C
7c	**Annual Rainfall**	600mm
7d	**Mean Wind Speed**	8Km/h
7e	**Plant Elevation above MSL**	85m

1.2 Scope of Work:

1.2.1 Supply of Chemicals for DM Plant & PT Plant as per BHEL specification (Specification are attached), BHEL, Yadadri TPS...

NAOH -- – Refer specification -- DM/CHEM/02

Unloading is in scope of vendor.

1.3 Not Applicable

1.4 T&Ps and MMEs to be deployed by BHEL on sharing basis: Not applicable.

1.5 Time Schedule:

1.5.1 Contract Period / Delivery period:

The Delivery to be completed by **30 Days** from date of PO.

.

1.6 Terms of Payment:

1.6.1 100% of the quoted/ accepted price shall be released within

Micro & Small Enterprises (MSEs) - 45 days,

Medium Enterprises - 60 days,

Non MSME - 90days,

Upon submission of invoices duly certified by Engineer-in-Charge on successful supply of items.

1.6.2 The bills and relevant documents shall be submitted at the following address for payment.

General Manager/Yadadri
Bharat Heavy Electricals Limited
5x800 MW Yadadri TPS Project Site
Power Sector-Southern Region
Village - Veerlapalem, Mandal - Damarcherla,
District - Nalgonda
Telangana– 508 355

GST Number: 36AAACB4146P1ZG

1.7 Taxes and other Duties

1.7.1 Goods and service Tax (GST) & Cess:

- The successful bidder shall furnish proof of GST registration with GSTN Portal in the State in which the Project is being executed, covering the services under this contract. Registration should also bear endorsement for the premises from where the billing shall be done by the successful bidder on BHEL for this project/ work. If the Successful Bidder submits Invoice from a GST No. from outside the state where the project is being executed, then the Bidder shall furnish a declaration for the same in their Letter head, for the single supply of services/short term supply of services.
- Contractor's price/rates shall be exclusive of GST & Cess (if applicable) (herein after termed as GST). Contractor shall submit to BHEL the GST compliant tax invoice/debit note/revised tax invoice on the basis of which BHEL will claim the input tax credit in its return. Since this is a works contract, the applicable rate shall be @ 18% GST, as applicable presently.
- Bidder shall note that the GST Tax Invoice complying with GST Invoice Rules wherein the 'Bill to' details will be as below:

  BHEL GSTN - 36AAACB4146P1ZG
  NAME - BHARAT HEAVY ELECTRICALS LIMITED
  ADDRESS:
  BHEL SITE OFFICE, YADADRI THERMAL POWER
  STATION (5X800 MW), VEERLAPALEM VILLAGE
  DAMERACHERLA MANDAL
  NALGONDA DISTRICT - 508355

- GST charged in the tax invoice/debit note/revised tax invoice by the contractor shall be released separately to the contractor only after contractor files the outward supply details in GSTR-1 on GSTN portal and input tax credit of such invoice is matched with corresponding details of outward supply of the contractor and has paid the GST at the time of filing the monthly return.
- In case BHEL has to incur any liability (like interest / penalty etc.) due to denial/reversal / delay of input tax credit in respect of the invoice submitted by the contractor, for the reasons attributable to the contractor, the same shall be recovered from the contractor.
- Further, in case BHEL is deprived of the Input tax credit due to any reason attributable to contractor, the same shall not be paid or Recovered if already paid to the contractor.
- Tax invoice/debit Note/revised tax invoice shall contain all such particulars as prescribed in GST law and comply to the timelines for issue of the same. Invoices shall be submitted on time to the concerned BHEL Engineer In Charge.
- TDS under GST (if/ as & when applicable) shall be deducted at prevailing rates on gross invoice value from the running bills.
- E-way bills / Transit passes / Road Permits, if required for materials / T&P etc., bought into the project

site is to be arranged by the Contractor only.

- BHEL shall not reimburse any amounts towards any interest / penalty etc., incurred by contractor. Any additional claim at a later date due to issues such as wrong rates / wrong classification by contractor shall not be paid by BHEL.
- Bidder Shall submit E-Invoice as per the GST Rules, if E-Invoicing has been enabled against their GSTIN No. Otherwise a Declaration may be submitted along with Invoice certifying that E-Invoicing is not enabled against their GSTIN No.
- Bidder shall note that if the service which they are going to provide to BHEL is covered under RCM, then BHEL shall discharge the liability on RCM basis and no GST Payment will be released to the Bidder in any circumstances.

1.7.2 All taxes and duty other than GST & Cess:

The contractor shall pay all (except the specific exclusion viz GST & Cess) taxes, fees, license charges, deposits, duties, tools, royalty, commissions, Stamp Duties, or other charges / levies, which may be levied on the input goods & services consumed and output goods & services delivered in course of his operations in executing the contract and the same shall not be reimbursed by BHEL. In case BHEL is forced to pay any of such taxes, BHEL shall have the right to recover the same from his bills or otherwise as deemed fit.

1.7.3 Statutory Variations:

Statutory variations are applicable under the GST Acts, against production of proof. The changes implemented by the Central / State Government during the tenure of the contract viz. increase / decrease in the rate of taxes, applicability, etc. and its impact on upward revision / downward revision are to be suitably paid/ adjusted from the date of respective variation. The bidder shall give the benefit of downward revision in favour of BHEL. No other variations shall be allowed during the tenure of the contract.

1.7.4 New Taxes/Levies:

In case Government imposes any new levy / tax after submission of bid during the tenure of the contract, BHEL shall reimburse the same at actual on submission of documentary proof of payment subject to the satisfaction of BHEL that such new levy / tax is applicable to this contract.

1.7.5 Direct Tax:

BHEL shall not be liable towards Income Tax of whatever nature including variations thereof arising out of this contract as well as tax liability of the bidder and their personnel. Deduction of tax at source at the prevailing rates shall be effected by BHEL before release of payment as a statutory obligation, unless exemption certificate is produced by the bidder. TDS certificate will be issued by BHEL as per the provisions of Income Tax Act.

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BHARAT HEAVY ELECTRICALS LIMITED

YADADRI SITE, PSSR

TECHNICAL SPECIFICATION

FOR

SODIUM HYDROXIDE, NaOH (LYE)

00	**26.09.2022**	**RJ**	**MSK**	**MSK**	**Fresh issue**
Rev No.	**Date**	**Prepared**	**Checked**	**Approved**	**Remarks**

1. Name of Chemical : Sodium Hydroxide Liquid (Lye) 48%

2. Applicable Standard : Pure grade as per IS 252: 1991, reaffirmed 2010

3. Documents required along with Offer :
   a. Shelf Life of Chemical
   b. Material Safety Data Sheet (MSDS)

4. Documents required after order :
   a. Test Certificate (Analysis Certificate) : Each batch should be accompanied with test certificate (certificate of analysis) issued by Government approved laboratory/ NABL accredited laboratory containing test parameter as highlighted in IS copy attached along with Batch no. and date

5. Inspection and Sampling : By BHEL / BHEL Nominated Agency(TPI) before Despatch. Bidder to raise the inspection call after receipt of PO.

6. Despatch Clearance : Bidder to submit the test report within 10 days from the date of sampling. Clearance for material despatch shall be given only after acceptance of test report by BHEL. Material to be despatched within 10 days after giving despatch clearance by BHEL.

7. Packing and Forwarding : Material shall be despatched in clean tanker lorry without any leakage and suitable for unloading at site.

IS : 252 - 1991
(Reaffirmed 2010)

भारतीय मानक

कास्टिक सोडा, शुद्ध और तकनीकी — विशिष्टि

(तीसरा पुनरीक्षण)

Indian Standard

CAUSTIC SODA, PURE AND TECHNICAL — SPECIFICATION

(*Third Revision*)

Third Reprint MAY 2007
(Including Amendment 1)

UDC 661.322.1

BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

***October* 1991** **Price Group 6**

FOREWORD

This Indian Standard (Third Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Acids, Alkalies and Halides Sectional Committee had been approved by the Chemical Division Council.

The specifications for caustic soda, technical (IS 252) and caustic soda, pure (IS 1021) were first issued in 1950 and 1956, respectively. These specifications were later revised in 1962 and 1964, respectively modifying the limits for iron, chlorides, sulphates, silicates and manganese. During the second revision in 1973, IS 1021 was amalgamated with IS 252 and requirements for caustic soda lye and caustic soda solid were also included. The method of sampling and tests were also modified during the course of the second revision.

In the present revision, requirements for chlorates, perchlorates and matter insoluble in water along with the relevant test methods have been incorporated for pure grade of caustic soda. Methods of test for determination of silica, carbonates, sodium hydroxide, chlorides, iron and copper have been suitably modified.

For the purpose of deciding whether a particular requirement of this standard is complied with the final value, observed or calculated expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 1960, 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

AMENDMENT NO. 1 FEBRUARY 1995
TO
IS 252 : 1991 CAUSTIC SODA, PURE AND TECHNICAL — SPECIFICATION

(Third Revision)

[*Page* 2, *Table* 1, *Sl No.* (*x*). *col* 5 *and* 6] — Substitute '0.2' *for* '0.02'.

(CHD 002)

Indian Standard

CAUSTIC SODA, PURE AND TECHNICAL — SPECIFICATION

(Third Revision)

1 SCOPE

1.1 This standard prescribes the requirements and the methods of sampling and test for caustic soda, pure and technical.

1.1.1 It covers the material in the solid and lye form.

2 REFERENCES

The Indian Standards listed below are the necessary adjuncts to this standard:

IS No.	*Title*
265 : 1987	Hydrochloric acid *(third revision)*
296 : 1986	Sodium carbonate, anhydrous *(third revision)*
323 : 1959	Rectified spirit *(revised)*
1070 : 1977	Water for general laboratory use *(second revision)*
1260 (Part1) : 1973	Pictorial marking for handling and labelling of goods : Part 1 Dangerous goods *(first revision)*
4264 : 1967	Code of safety for caustic soda

3 GRADES

There shall be two grades of the material, namely:

a) Pure — suitable for use in rayon and cosmetic industries, and

b) Technical — suitable for use in textile, soap, vegetable oil refining paper and other industries.

4 REQUIREMENTS

4.1 Form and Description

The material shall be supplied in the form of lye or solid (including flakes, blocks, sticks and pellets).

4.1.1 The material shall be free from foreign matter, dirt or other visible impurities.

4.2 Relative Density of Canstic Soda Lye

The relative density of caustic soda lye shall be subject to an agreement between the purchaser and the supplier.

4.3 The material shall comply on dry basis with the requirements given in Table 1, when tested according to the methods prescribed in Annex A. Reference to the relevant clauses of Annex A is given in col 7 of the table.

4.4 For Technical Grade

Chlorides (as NaCl) and sulphates (as Na_2SO_4 together shall be 3.5 percent. The value for sulphate content shall also be reported.

4.5 Calculation of Results on Dry Basis

In **A-3** to **A-12**, results have been calculated on the basis of the material as received. To calculate the results on the dry basis as specified in Table 1, the method given in **A-13** shall be adopted.

5 PRECAUTION IN HANDLING AND STORING

The precautions in handling and storing as given in IS 4264 : 1967 shall be observed.

6 PACKING AND MARKING

6.1 Packing

The material shall be packed in polyethylene bags or polyethylene lined gunny bags or steel drums, or as agreed to between the purchaser and the supplier. The solution shall be supplied in tankers or tank cars.

6.2 Marking

Each container shall be securely closed and shall bear legibly and indelibly the following information:

a) Name and grade of the material;

b) Indication of the source of manufacture;

c) Net mass of the material; and

d) Lot or batch number, in code or otherwise.

Table 1 Requirements for Caustic Soda, Pure and Technical

(Clause **4.3** *)*

Sl No.	Characteristic	Requirenent on Dry Basis				Method of Test Ref To Cl. No. In Annex A
		Pure		Technical		
		Lye	Solid	Lye	Solid	
1	2	3	4	5	6	7
i)	Sodium carbonate (as Na_2CO_3), percent by mass. *Max*	0.40	0.40	2.00	2.00	A-3
ii)	Sodium hydroxide (as NaOH), percent by mass, *Min*	99 50	99 50	95 00	95.00	A-4
iii)	Chlorides (as NaCl), percent by mass, *Max*	0 10	0.10	3.50	3.50	A-5
iv)	Sulphates (as Na_2SO_4), percent by mass, *Max*	0 10	0.10			A-6
v)	Silicates (as SiO_2), percent by mass, *Max*	0.02	0.02	—	—	A-7
vi)	Iron (as Fe), ppm, *Max*	20	20	350	350	A-8
vii)	Copper (as Cu), ppm, *Max*	2	2	—	—	A-9
viii)	Manganese (as Mn), ppm, *Max*	1	1	—	—	A-10
ix)	Chlorates and per-chlorates (as $NaClO_3$), ppm, *Max*	10	10	—	—	A-11
x)	Matter insoluble in water, percent by mass, *Max*	0.05	0.05	0.02	0.02	A-12

6.2.1 The containers shall be marked with the following caution note:

'CORROSIVE - HANDLE WITH CARE'

and appropriate label to indicate the possible corrosion hazards [*see* IS 1260 (Part 1) : 1973].

7 SAMPLING

The procedure for drawing representative samples of the material and their criteria for conformity shall be as prescribed in Annex B.

ANNEX A

(Clauses 4.3, 4.4, 4.5 *and Table* 1)

METHODS OF TEST FOR CAUSTIC SODA

A-1 QUALITY OF REAGENTS

A-1.1 Unless specified otherwise, pure chemicals and distilled water (*see* IS 1070 : 1977) shall be used in tests.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the results of analysis.

A-2 PREPARED SAMPLE SOLUTION

A-2.1 In a weighing bottle with a ground-glass stopper, weigh to the nearest 0.01 g, of the material (solid or liquid), equivalent to a little less than 50 g,. of caustic soda.

A-2.1.1 *Solid Material*

Dissolve the material (*see* **A-2.1**) in approximately 200 ml of water and cool it to room temperature; transfer the solution quantitatively to a 500-ml one-mark volumetric flask and dilute nearly to the mark, recool, then dilute to the mark and mix thoroughly. The solution thus prepared shall be used for the subsequent tests.

A-2.12 *Liquid Material*

Transfer the material (*see* **A-2.1**) directly to a 500-ml one-mark volumetric flask and dilute nearly to the mark; cool to room temperature, then dilute to the mark and mix thoroughly.

A-3 DETERMINATION OF CARBONATES

A-3.0 Two methods, namely, Method *A* Double Indicator Method and Method *B* Gaseometric Method have been prescribed. Method *A* shall be used for routine analysis and Method *B* shall be used as a referee method.

A-3.1 Method *A* (Double Indicator Method)

A-3.1.1 *Reagents*

A-3.1.1.1 *Standard hydrochloric acid* — 1 *N.*

A-3.1.1.2 *Standard hydrochloric acid — 0.1 N.*

A-3.1.1.3 *Methyl orange indicator solution* — Dissolve 0.1 g of methyl orange in 100 ml of water.

A-3.1.1.4 *Phenolphthalein indicator solution* — Dissolve 0.1 g of phenolphthalein powder in 60 ml of rectified spirit (*see* IS 323 : 1959) and dilute with water to 100 ml.

A-3.1.2 *Procedure*

Pipette out 25 ml of the prepared sample solution (*see* **A-2**) into a conical flask and add 2 to 3 drops of phenolphthalcin indicator. Titrate it against standard hydrochloric acid solution (1 *N*) up to a little before the end point. Take this reading as *A*. Further titrate it against standard hydrochloric acid (0.1 *N*) till the pink colour just disappears. Take this reading as *B*. Then add 2 to 3 drops of methyl orange indicator and continue titration against standard hydrochloric acid (0.1 *N*) to a reddish orange colour. Take this reading as *C*.

A-3.1.3 *Calculation*

Carbonates (as Na_2CO_3),

$$\text{Percent by mass, } A = \frac{212\,(C-B)\times N}{M}$$

where

N = normality of standard hydrochloric acid (0.1*N*) and,

M = mass of the material taken for test.

A-3.2 Method B (Gaseometric Method)

A-3.2.0 *Principle*

Measurement of the volume of carbon dioxide evolved from a portion of the test sample by reaction with a hydrochloric acid.

A-3.2.1 *Reagents*

A-3.2.1.1 *Distilled water, or water of equivalent purity*—Free from carbon dioxide at room temperature. Eliminate any carbon dioxide present in water either by boiling for 10 minutes and cooling it in the absence of atmospheric carbon dioxide or, more simply, by bubbling air free from carbon dioxide through it for 15 minutes. The air is freed from carbon dioxide by passing it through a column containing pellets of sodium hydroxide. Store it in the absence of atmospheric carbon dioxide.

A-3.2.1.2 *Hydrochloric acid* — 12 *N.*

A-3.2.1.3 *Sodium chloride, coloured acid solution*

Dissolve 26 g of sodium chloride in water. Add 5 ml of sulphuric acid solution (d=1.83). Dilute it to 1 000 ml, add a small amount of 0.05 percent methyl orange indicator solution and mix thoroughly.

A-3.2.1.4 *Sodium hydroxide solution* — 6 *N.*

A-3.2.2 *Apparatus* — Apparatus as assembled is shown in Fig. 1.

A-3.2.3 *Procedure*

A-3.2.3.1 Weigh, to the nearest 0.01 g, the test sample (solid or lye) corresponding to approximately 10 g of caustic soda.

A-3.2.3.2 *Assembly of the apparatus*

Fill burette *B* of the apparatus with the coloured acid solution through leveling bottle *F*. Pour into absorber *C* some of the sodium hydroxide solution. (Renew this solution after 100 determination.) With burette *B* and absorber *C* filled up to cock R_1 and graduation mark *a*, respectively, and cocks R_1 and R_2 closed, place the test portion in flask *A* and, in the case of solid material, dissolve it in approximately 30 ml of water. Dilute to approximately 40 ml so as to reduce the dead space to a volume slightly greater than 100 ml (volume above the level of the liquid in flask *A* plus the volume of condenser tube *D* up to cock *R*). Place in the flask three porcelain or glass balls, about 2 mm in diameter, and a few pieces of pumice having a total volume approximately equal to that of the balls. Stopper the flask and close cock *R*. Connect flask *A* with burette *B* through cock R_1 and lower the leveling bottle *F*. Check the tightness of the apparatus by appropriately handling the cocks and the leveling bottle.

A-3.2.3.3 *Evolution and measurement of carbon dioxide*

By means of a separating funnel, pour 35 ml of hydrochloric acid into flask *A* taking care to avoid loss of gas. The acidity of the solution in the flask is thus approximately 2 *N* after the evolution of carbon dioxide. Heat the flask and maintain the solution at boiling point for

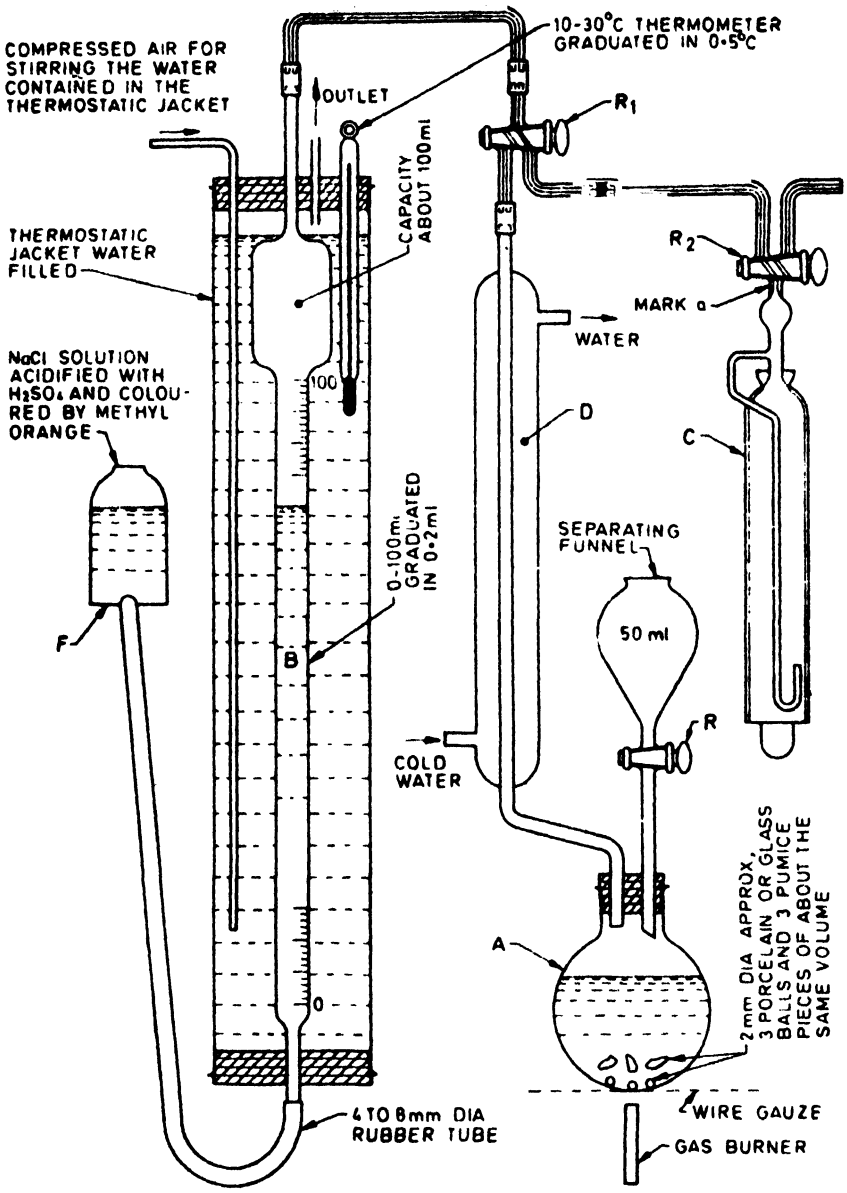

FIG 1 ASSEMBLY OF APPARATUS FOR DETERMINATION OF CARBONATES

5 minutes while running cold water through the condenser. Then stop heating and add more of the coloured acid solution by means of the separating funnel, lowering the leveling bottle *F* still further to make the solution in the flask *A* rise in the condenser tube up to cock R_1. Then close the latter and wait for 5 minutes to allow the gas to reach the temperature of the water jacket. Measure the volume of gas *V* at atmosphcric pressure *P* and at the temperature *t* of the water in the jacket. For this purpose move the leveling bottle *F* to bring the coloured acid solution to the same level both in the flask and in the burette *B*; read the volume of the latter. Adjust the cocks R_1 and R_2 so that burette *B* and absorber C are connected, then raise the leveling bottle *F* so that the gas is transferred to the absorber where the carbon dioxide is absorbed. Then transfer the non-absorbed gas back to burette *B* by lowering the leveling bottle *F* and, after adjusting the level of the hydroxide solution to the gauge mark *a* on absorber *C*, close cock R_2 and read the volume of the residual gas. Repeat these operations until a constant volume V_1 is obtained. The difference in the volume, $V - V_1$, represents

the carbon dioxide contained in the test portion, measured at atmospheric pressure and at the temperature of the water jacket.

A-3.2.4 *Calculation*

Carbonates (as Na_2CO_3), percent by mass, $A = 0170 \frac{P-p}{273+t} \times \frac{V-V_1}{M}$

where

P = atmospheric pressure in mm, Hg at the time of determination,

p = vapour pressure, in mm, Hg of the coloured acid solution at the temperature of the water contained in the jacket,

t = temperature in degrees centigrade of the water contained in the water jacket,

V = volume, in ml, of gas before absorption of carbon dioxide,

V_1 : = volume, in ml, of gas after absorption of carbon dioxide, and

M = mass, in g of the material taken for the test.

A-4 DETERMINATION OF SODIUM HYDROXIDE

A-4.1 Reagents

A-4.1.1 *Standard Hydrochloric Acid* — 1 *N.*

A-4.1.2 *Methyl Orange Indicator Solution* — Dissolve 0.1 g of methyl orange in 100 ml of water.

A-4.2 Procedure

Transfer exactly 20 ml of the sample solution (*see* **A-2**) to a 500-ml conical flask. Add approximately 80 ml of water and 5 drops of methyl orange indicator solution and titrate it against standard hydrochloric acid until the colour of the indicator changes from yellow to orange.

A-4.3 Calculation

Total alkalinity (as NaOH), percent by mass $B = \frac{V \times N}{M} \times 99.992\ 5$

where

V = volume in ml of standard hydrochloric acid used for titration,

N = normality of standard hydrochloric acid, and

M = mass in g of the material taken for the test.

Sodium hydroxide (as NaOH), percent by mass = $B-(A \times 40/53)$

where

B = total alkalinity (as NaOH), and

A = carbonate content (as Na_2CO_3) as calculated in **A-3.3** or **A-3.2.4.**

A-5 DETERMINATION OF CHLORIDES

A-5.1 Reagents

A-5.1.1 *Concentrated Nitric Acid*

A.5.1.2 *Standard Silver Nitrate Solution* — 0.1.

A-5.1.3 *Nitrobenzene*

A-5.1.4 *Standard Ammonium Thiocyanate Solution* — 0.1 *N.*

A-5.1.5 *Ferric Ammonium Sulphate Indicator* — saturated solution.

A-5.1.6 *Diluted Sample for Testing Chlorides in Technical Grade*

Pipette out 50 ml of the sample solution (*see* **A-2.1.1**) to a 250-ml standard measuring flask and make up the volume to 250 ml mark with water. This solution shall also be used for the determination of iron content.

A-5.2 Procedure

A.5.2.1 *For Caustic Soda, Solid*

Transfer exactly 50 ml of the sample (*see* **A-5.1.6**) solution to a conical flask, neutralize it with concentrated nitric acid and then add 5 ml of the acid in excess. Add 5 ml of nitrobenzene and shake vigorously; pipette out into this 20 ml of standard silver nitrate solution. Titrate it against standard ammonium thiocyanate solution using ferric ammonium sulphate indicator.

A-5.2.2 *For Caustic Soda, Lye*

Weigh accurately a quantity of the material containing not more than 0.05 g of chlorides (as NaCl) and carry out the test as prescribed in **A-5.2.1**.

A-5.2.3 *For Caustic Soda, Pure Grade*

Weigh accurately about IS g of the material, dissolve it in about 50 ml distilled water and carry out the test as prescribed in **A-5.2.1**.

A-5.3 Calculation

A-5.3.1 *For Caustic Soda,* (*Solid Technical*)

Chlorides (as NaCl), percent by mass $= \frac{292 \cdot 3\ (20\ N_1 - V\ N_2)}{M}$

where

N_1 = normality of standard silver nitrate solution,

V = volume in ml of standard ammonium thiocyanate solution used in **A-5.2.1**,

N_2 = normality of standard ammonium thiocyanate solution, and

M = mass in **g** of the material taken in **A.2.1.**

A-5.3.2 *For Caustic Soda, Lye*

Chlorides (as NaCl),

$$\text{percent by mass} = \frac{5{\cdot}845\ (20\ N_1 - V\ N_2)}{M}$$

where

N_1 and N_2 are the same as specified in **A.5.3.1.**

V = volume in ml of standard ammonium thiocyanate solution used in **A.5.2.2**, and

M = mass in g of the material taken for the test in **A-5.2.2**.

A-5.3.3 *For Caustic Soda, Pure Grade*

Chlorides (as NaCl).

$$\text{percent by mass} = \frac{5.845\ (20\ N_1 - V_1\ N_2)}{M}$$

where

N_1 and N_2, are the same as specified in **A.5.3.1**

V_1 = volume in ml of standard ammonium thiocyanate solution used in **A-5.2.3**, and

M = mass in g of the material taken for the test in **A-5.2.3**.

A-6 DETERMINATION OF SULPHATES

A-6.1 Reagents

A-6.1.1 *Concentrated Hydrochloric Acid — see* IS 265 : 1987.

A-6.1.2 *Barium Chloride Solution* — 10 percent.

A-6.2 Procedure

Weigh accurately about 10 g of the material and dissolve it in 100 ml of water. Add sufficient quantity of concentrated hydrochloric acid to neutralize and leave an excess of acid in the solution. Boil it to decompose the carbonates. Filter the resulting solution through a folded filter paper thoroughly, collecting both the filtrate and washing in a 500-ml beaker. Dilute it to 250 ml, boil and add 10 ml of hot barium chloride solution to the boiling solution. Boil it again for 2 minutes; let it stand for 4 hours, and then filter through a tared sintered glass crucible (G No. 4) or a tared Gooch crucible. Wash the precipitate to free it from chlorides, and dry to constant mass at 105 to 110°C.

A-6.2.1 Excess barium chloride is necessary to reduce the solubility of barium sulphate. Precipitation in hot solution by the addition of barium chloride in a slow stream with stirring minimizes the mechanical occlusion of barium chloride and gives a coarse precipitate which is less soluble in acids.

A-6.3 Calculation

Sulphates (as Na_2So_4),

$$\text{percent by mass} = \frac{60{\cdot}86\ M_1}{M}$$

where

M_1 = mass in g of the precipitate, and

M = mass in g of the material taken for the test.

A-7 DETERMINATION OF SILICATES

A-7.0 Outline of the Method

Silica is determined colorimetrically by visual comparison or by spectrophotometer as molybdenum blue.

A-7.1 Apparatus

A-7.1.1 *Nessler Cylinders* — 100-ml capacity.

A-7.2 Reagents

A-7.2.1 *Dilute Sulphuric Acid* — approximately

A-7.2.2 *Ammonium Molybdate Solution* — Dissolve 10 g of ammonium molybdate in 100 ml of dilute sulphuric acid (1 N).

A-7.2.3 *Sodium Citrate Solution* — Dissolve 8 g of sodium citrate (as $Na_3C_6H_5O_7$, $2H_2O$) in 100 ml of water.

A-7.2.4 *Reducing Solution* — Dissolve 7 g of anhydrous sodium sulphite in 100 ml of water and add 1.5 g of l-amino-2-naphthol-4-sulphonic acid. When this is dissolved, add to this solution, a solution containing 90 g of sodium bisulphite in 800 ml of water, and dilute to 1 000 ml.

A-7.2.5 *Sodium Carbonate, Anhydrous — see* IS 296 : 1986

A-7.2.6 *Standard Silicate Solution* — Fuse 0.1 g of pure precipitated silica with anhydrous sodium carbonate in a platinum crucible and leach the melt with water, neutralise with dilute sulphuric acid and dilute to 1 000 ml. Dilute 10 ml of this solution to 100 ml. One ml of the diluted solution contains 0.01 mg of silica (as SiO_2). Store the solution in a polyethylene bottle.

A-7.3 Procedure

Dissolve 5 g of the sample (10 g in case of caustic soda in lye form) in water in a polyethylene beaker and make upto 250 ml in a standard flask. Transfer 10 ml of the solution into a polyethylene beaker, neutralise with dilute sulphuric acid and add excess of acid to bring the *pH* of the solution to 1.5 to 1.6. Transfer to a 100-ml Nessler cylinder, add 2 ml of ammonium molybdale solution and allow to stand for 5 minutes. Then add 5 ml of sodium citrate solution, followed by 2 ml of reducing solution (*see* **A-7.2.4**). Dilute to 100 ml and stir well.

Carry out a control test in another Nessler cylinder, using 4 ml of standard silica solution in place of the sample and the same quantities of other reagents in the same total volume of reaction mixture. Allow the two Nessler cylinders to stand for 30 minutes and compare the colour developed in the two cylinders.

A-7.3.1 The limit prescribed for silicates shall be taken as not having been exceeded if any blue colour produced in the test with the material is not deeper than that produced in the control test.

A-7.4 The colour produced can also be measured on a spectrophotometer by measuring the absorbancc at 820 nm and compared with a standard graph drawn as given below:

A standard graph is drawn by measuring the absorbancc of 2 ml, 4 ml, 6 ml, 8ml and 10 ml of standard silica solution treated with the above reagents in the same way and plotting the absorbance against the silica content.

AS DETERMINATION OF IRON

A-8.1 Apparatus

A-8.1.1 *Nessler Cylinders* — 100-ml capacity.

A-8.2 Reagents

A-8.2.1 *Concentrated Hydrochloric Acid* — *see* IS 265 : 1987.

A-8.2.2 *Ammonium Persulphate*

A-8.2.3 *Potassium Thiocyanate Solution* — approximately 5 percent.

OR

Ammonium Thiocyanate Solution — approximately 5 percent.

A-8.2.4 *Standard Iron Solution*

Dissolve 0.702 g of ferrous ammonium sulphate [$FeSo_4$. (NH_4)$_2So_4$ $6H_2o$] in 100 ml of distilled water and 10 ml of concentrated sulphuric acid, add dilute potassium permanganate solution dropwise (0.2 percent, *m/v*) until a slight pink colour persists after stirring, and then dilute with water to 1 000-ml mark. Transfer 100 ml of this solution to 1 000-ml volumetric flask and dilute again to 1 000-m1 mark. One millilitre of this solution is equivalent to 0.01 mg of iron (as Fe).

A-8.3 Procedure

A-8.3.1 *For Caustic Soda, Solid*

Transfer by means of a pipette 25 ml of the sample solution (*see* **A-2.1**) for pure grade, or 10 ml of the diluted sample solution (*see* **A-5.1.6**) for technical grade, dilute to 50 ml and make acidic with concentrated hydrochloric acid. Add 30 mg of ammonium persulphate and boil to oxidize the iron. Cool and transfer to a Nessler cylinder, add 2 ml of potassium thiocyanate solution (or ammonium thicoyanate solution) and dilute to 100-ml mark with water. In another Nesslcr cylinder, take the same amount of concentrated hydrochloric acid, ammonium persulphate and potassium thiocyanate solution (ammonium thiocyanate solution), as used with the material and dilute to about 85 ml. Prom a burette add standard iron solution in small portions at a time so that after dilution to 100 ml, the colour obtained matches with that obtained with the material.

A-8.3.2 *For Caustic Soda, Lye*

Weigh accurately an amount of the material containing not more than 0.035 mg of iron (as Pe) and carry out the test as in **A-8.3.1.**

A-8.4 Calculation

A-8.4.1 *For Caustic Soda, Solid (Technical)*

$$\text{Iron (as Pe), ppm} = \frac{2\,500\,V}{M}$$

A-8.4.2 *For Caustic Soda (pure)*

$$\text{Iron (as Pe). ppm} = \frac{200\,V}{M}$$

where

V = volume in ml of standard iron solution used in **A-8.3.1,** and

M = mass, in g of the material taken for the test (*see* **A-2.1** and **A-5.1.6**).

A-8.4.3 *For Caustic Soda, Lye*

$$\text{Iron (as Fc), ppm} = \frac{10\,V}{M}$$

where

V = volume, in ml, of standard iron solution used in **A-8.3.2,** and

M = mass in g of the material taken for the test in **A-8.3.2**.

A.9 DETERMINATION OF COPPER

A-9.1 Apparatus

A-9.1.1 *Nessler Cylinders* — 100-ml capacity.

A-9.2 Reagents

A-9.2.1 *Concentrated Sulphuric Acid*

A-9.2.2 *Litmus Paper*

A-9.2.3 *Ammonium Chloride*

A-9.2.4 *Concentrated Ammonium Hydroxide* — sp gr 0.92.

A-9.2.5 *Citric Acid Solution* — Dissolve 100 g of citric acid (monohydrate) crystals in 100 ml of water.

A-9.2.6 *Dilute Ammonium Hydroxide* — approximately 3 *N*.

A-9.2.7 *Gum Acacia Suspension* — Dissolve 1.0 g of gum acacia in 100 ml of boiling water, filter and dilute to 200 ml. (This solution shall be prepared fresh.)

A-9.2.8 *Tetrasodium Pyrophosphate Solution* — Dissolve 4 g of tetrasodium pyrophosphate in 100 ml of water.

A-9-2.9 *Sodium Diethyl Dithoicarbamate Solution* — Dissolve 0.2 g sodium diethyl dithoicarbamate in water and make up the volume to 100 ml.

A-9.2.10 *Standard Copper Solution* — Dissolve 0.392 8 g of copper sulphate pentahydrate ($CuSO_4.SH_2O$) in slightly acidulated water and make up the volume to 1 000 ml in a volumetric flask. Pipette out exactly 10 ml of the solution in a 100-ml volumetric flask and make up the volume to 100-ml mark. One millilitre of this solution is equivalent to 0.01 mg of copper.

A-9.2.11 *pH-Meter*

A-9 3 Procedure

A-9.3.1 Weigh about 10 g of material, to the nearest 01 g, and transfer it into a 400-ml beaker. Dissolve it in about 20 ml of water and then neutralize with concentrated sulphuric acid using litmus paper. To the neutralized solution add ammonium chloride and concentrated ammonium hydroxide to precipitate out iron. Heal the solution to coagulate the precipitate. Filter the precipitate through a Gooch crucible with an asbestos mat and wash the residue twice with water. Collect the filtrate and the washing in a beaker. Cover the beaker with a watch glass and then evaporate to a volume of about 70 ml. Transfer the solution to 100-ml Nessler cylinder. To this add 2 ml citric acid solution and add dilute ammonium hydroxide (till *p*H 8.5). Mix the solution thoroughly and then add 10 ml of gum acacia suspension, 5 ml of tetrasodium pyrophosphate solution and 10 ml of the sodium diethyl dithiocarbamatc solution and dilute to 100-ml mark with distilled water. To another Nessler cylinder add 2 ml of citric acid solution dilute ammonium hydroxide (till *p*H 8.5), 10 ml gum acacia suspension, 5 ml of tetrasodium pyrophosphate solution, 10 ml of sodium diethyl dithiocarbamatc solution and then 2 ml of standard copper solution. Make up to 100-ml mark with distilled water and mix well. Compare the colour produced in the two cylinders after 10 minutes.

A-9.3.1.1 The limit prescribed shall be taken as not having exceeded if the intensity of colour produced in the test with the material is not greater than that in the control test.

A-10 DETERMINATION OF MANGANESE

A-10.1 Apparatus — Nessler cylinder, 100-ml capacity.

A-10.2 Reagents

A-10.2.1 *Phosphoric Acid* — 85 percent (manganese free).

A-10.2.2 *Potassium Periodate*

A-10.2.3 *Standard Manganese Solution—Dissolve* 0.307 7 g of manganese sulphate, monohydrate ($MnSO_4.H_2O$) in water, add 1 ml of concentrated sulphuric acid and make up the volume to 1 000-ml in a volumetric flask. Pipette out 10 ml of this solution in a 100-ml volumetric flask and dilute to the mark. One ml of this solution is equivalent to 0.01 mg of manganese.

A-10.3 Procedure

A-10.3.4 Weigh about 10 g of the material to the nearest 0.1 g and transfer it to a 400 ml beaker and dissolve in about 40 ml water. To this solution, add 10 to 15 ml of phosphoric acid and 0.6 to 0.8 g potassium periodate. Heat the solution to boiling. Boil for 20 minutes. Cool the solution to room temperature. Transfer the solution to a 100 ml Nessler cylinder. Make up to the mark with distilled water and mix well. Compare the colour with that in the other Nessler cylinder containing 1 ml of standard manganese solution in place of the test solution treated similarly under similar conditions with the same amounts of reagents for the same time as in the test solution, and make up to 100 ml mark.

A-10.3.2 The limit prescribed shall be taken as not having exceeded if the intensity of colour produced in the test with the material is not greater than that in the control test.

A-11 DETERMINATION OF CHLORATES AND PERCHLORATES (AS SODIUM CHLORATE)

A-11.0 Two methods, namely. Method A and Method B have been prescribed.

A-11.1 Method A

A-11.1.0 *Outline of the Method*

A little excess of ferrous ammonium sulphate added to the slightly acidified solution of caustic soda is oxidized quantitatively by the chlorate present in caustic soda. The chlorate is estimated by back titrating the excess ferrous ammonium sulphate with potassium permanganate.

A-11.1.1 *Reagents*

A-11 1.1.1 *Ferrous ammonium sulphate solution* — 0.02 N Dissolve 3.92 g of ferrous ammonium sulphate crystals in 300 ml of water. Add 1 ml of concentrated sulphuric acid and make up to 500 ml.

A-11.1.1.2 *Sulphunc acid* — 1:1 (*v/v*).

A-11.1.1.3 *Potassium permanganate solution* — 0.1 *N* Weigh about 3.0—3.25 g of potassium permanganate into a beaker, add a little of water and boil it gently for 15 minutes. After cooling, filter the solution through funnel with a plug of glass wool and dilute to 1 000 ml. Collect the filtrate in a brown-coloured bottle and standardize with sodium oxalate solution.

A-11.1.1.4 *Potassium permanganate solution* — 0 02 *N* Dilute 50 ml of 0.1 *N* potassium permanganate solution (*see* **A-11.1.1.3**) to 250 ml in a volumetric flask.

A-11.1.2 Procedure

A-11.1.2.1 Weigh accurately about 50 g of caustic soda sample in a beaker and neutralize it with sulphuric acid carefully after placing the beaker in cold water. Add 5 ml of the acid in excess and dilute to 250 ml. Transfer the contents of the beaker to a 500 ml-conical flask add 25 ml of ferrous ammonium sulphate solution, close the flask with a bunsen valve and boil the contents gently for 15 minutes. Allow the flask to cool to room temperature. After cooling, titrate the contents of the flask with 0.02 *N* potassium permanganate, solution slowly with stirring till a pink colour persists. Note the volume V_2.

A-11.1.2.2 Run a blank by titrating 25 ml of ferrous ammonium sulphate containing 5 ml of sulphuric acid and 200 ml of water against 0.02 *N* potassium permanganate, proceeding in the same way as that of test. Note the volume as $V1$.

A-11.1.3 *Calculation*

Chlorates (as $NaClO_3$,),

$$\text{ppm} = \frac{(V_1 - V_2) \times N \times 17{\cdot}74 \times 10^3}{M}$$

where

V_1 = volume, in ml, of standard potassium permanganate solution used in the blank;

V_3 = volume, in ml, of standard potassium permanganate solution used in the test;

N = normality of standard potassium permanganate solution; and

M = mass, in g, of the material taken for the test.

A-11.2 Method B

A-11.2.0 *Outline of the Method*

A little excess of ferrous sulphate added to a slightly acidified solution of caustic soda is oxidized quantitatively by the chlorate in caustic soda. The chlorate is estimated by back titrating the excess ferrous ammonium sulphate with standard potassium dichromate solution.

A-11.2.1 *Reagents*

A-11.2.1.1 *Ferrous ammonium sulphate* — 0.02 *N* Dissolve 3.92 g of ferrous ammonium sulphate crystals in 300 ml of water. Add 1 ml of concentrated sulphuric acid and dilute to 500 ml.

A-11.2.1.2 *Dilute sulphuric acid* — 1:1 (*v/v*).

A-11.2.1.3 *Phosphoric acid* — 1:1 (*v/v*).

A-11.2.1.4 *Sodium diphenyl amine sulphonate solution* — Dissolve 0.2 g of sodium diphenyl amine sulphonate in 100 ml of water.

A-11.2.1.5 *Potassium dichromate solution* — 0.02*N*. Powder finely about 2 g of potassium dichromate (AR grade) and dry in an air oven at 140-150 C for one hour and cool in a desiccator. Accurately weigh 0.98 g of the dried potassium dichromate and dissolve in 1 000 ml of water in a volumetric flask.

A-11.2.2 *Procedure*

A-11.2.2.1 Weigh accurately about 50 g of caustic soda in a 500 ml-beaker. Neutralize it with dilute sulphuric acid (1:1) carefully, keeping the beaker in cold water. Add an excess of 20 ml of dilute sulphuric acid. Transfer the contents of the beaker into a 500 ml conical flask. Pipette out 25 ml of ferrous ammonium sulphate solution into the flask. Close the flask with a Bunsen valve, boil the contents for 15 minutes and allow to cool to room temperature. After cooling, add 20 ml of phosphoric acid (1:1) and 0.5 ml sodium diphenyl amine sulphonate solution into the flask. Titrate the solution with potassium dichromate solution to a violet colour. Note the volume as V_2.

A-11.2.2.2 Run a blank by titrating 25 ml of ferrous ammonium sulphate, 20 ml of dilute sulphuric acid, 20 ml of phosphoric acid and 0.5 ml of sodium diphenyl amine sulphonate against potassium dichromate solution by proceeding in the same way as in the test. Note the volume as V_1.

A-11.2.3 *Calculation*

Chlorates (as $NaClO_3$),

$$\text{ppm} = \frac{(V_1 - V_2) \times N \times 17{\cdot}74 \times 10^3}{M}$$

where

V_1 = volume, in ml, of standard potassium dichromate solution used in the blank;

V_2 = volume, in ml, of standard potassium dichromate solution used in the test;

N = normality of standard potassium dichromate solution; and

M = mass, in g, of the material taken for the test.

A-12 DETERMINATION OF MATTER INSOLUBLE IN WATER

A-12.1 Reagent

A-12.1.1 *Concentrated Hydrochloric Acid — See* IS 265:1987.

A-12.2 Procedure

Weigh accurately about 50 g of the material and transfer it into a 600-ml beaker, add 300 ml of water and stir until dissolved. Add concentrated hydrochloric acid till the solution is just alkaline to phenolphthalein. Bring to boil and allow the solution to settle on the hot-plate for 15 minutes. Filter through a weighed Gooch crucible or tared sintered glass crucible (G No. 4) and wash with hot water to free it from alkali allowing water to drain completely after each washing. Dry it in an oven for one hour at 105 to 110°C. Cool it in a desiccator and weigh.

A-12.3 Calculation

Matter insoluble in water,

$$\text{percent by mass} = 100\ \frac{M_1}{M}$$

where

M_1 = mass, in g, of the insoluble residue, and

M = mass, in g, of the material taken for the test.

A-13 CALCULATION OF RESULTS ON THE DRY BASIS

A-13.1 For the purpose of this standard add the percentage of sodium hydroxide, carbonates (as Na_2CO_3), chlorides (as NaCl), sulphates (as Na_2SO_4) and silicates (as SiO_2) and treat the total as the total dry solid content of the solution. On this basis calculate the content of the different components on the dry basis.

A-13.1.1 *Example*

A-13.1.1.1 If the total percentage of the determined components of a solutionis 50.4 and the percentage of sodium hydroxide content is 50.2, the percentage of sodium hydroxide on dry basis will be

$$\frac{50{\cdot}2 \times 100}{50{\cdot}4} = 99{\cdot}6$$

Again the above example, if the iron content is 10 ppm, the content of iron on dry basis will be

$$\frac{10 \times 100}{50{\cdot}4} = 19{\cdot}8 \text{ ppm.}$$

A-13.1.1.2 If the total percentage of the determined components of the solid is 99.5 and the percentage of sodium hydroxide content is 99.1, the percentage of sodium hydroxide on dry basis will be

$$\frac{99{\cdot}1 \times 100}{99{\cdot}5} = 99{\cdot}6$$

ANNEX B

(*Clause* 7.1)

SAMPLING OF CAUSTIC SODA, PURE AND TECHNICAL

B-1 GENERAL REQUIREMENTS OF SAMPLING

B-1.1 Precautions shall be taken to protect the samples, the material being sampled, the sampling instrument and the containers for samples from adventitious contamination, particularly from absorption of water and carbon dioxide.

B-1.2 To draw a representative sample, the contents of each container selected from sampling shall be mixed thoroughly by suitable means.

B-1.3 The sample shall be placed in clean, dry and air-tight alkali resistant glass containers.

B-1.4 Each sample container shall be sealed air-tight after filling, and marked with full details of sampling, the date of sampling and the batch number.

R-2 SCALE OF SAMPUNG

B-2.1 Lot

All the containers in a single consignment of the material drawn from a single batch of manufacture shall constitute the lot. If a consignment is declared to consist of different batches of manufacture, the batches shall be marked separately and the groups of containers in each batch shall constitute separate lots.

B-2.2 Samples shall be tested from each lot separately for judging the conformity of the material to the specified requirements. The number of container (*n*) to be selected at random from lots of different sizes (*N*) shall be in accordance with Table 2.

B-2.3 The container shall be drawn at random from the lot, and to ensure randomness, the following procedure may be adopted;

Arrange all the containers in the lot in a systematic manner, and starting from any one, count them as 1, 2 . . ., up to r, where r is the integral part of *N/n*. Every rth container thus counted shall be included in the sample till the required number of containers specified in col 2 of Table 2 is taken out.

Table 2 Number of Containers to be Selected for Sampling

(*Clause* B-2.2)

Lot Size	Number of Containers to be Selected
N	*n*
(1)	(2)
3 to 50	3
51 to 200	4
201 to 400	5
401 to 650	6
651 to 1 000	7

B-3 TEST SAMPLES AND REFEREE SAMPLE

B-3.1 Caustic Soda, Solid

B-3.1.1 Scrap off 50 mm of the material from the top centre and then take the sample. The quantity of the material so drawn shall be not less than 200 g and the mass of the total material taken out shall not exceed 1 kg. The number of portions to be collected and the quantity of material taken from each portion may be suitably reduced in case of big containers to keep the size of the material taken out at 1 kg. Mix rapidly the material so collected from any particular container on a clean dry surface after scrapping off the surface carbonate that may be formed during sampling.

B-3.1.2 From each of the portions representing the containers selected, take out 600 g and mix thoroughly the material collected. This shall

constitute the composite sample. Divide this composite sample into three parts, transfer each part to a sample container which shall then be sealed air-tight with well-fitting corks coated with paraffin wax.

B-3.1.3 The portion of the material left (after the quantity for the preparation of the composite sample has been taken out) in respect of each container shall also be divided into three parts. Each such part shall constitute an individual test sample and shall be transferred to a sample container which shall then be closed as in **B-3.1.2** and labeled giving full identification particulars. One of these three sets shall be marked for the purchaser, another for the supplier and the third for the referee.

B-3.2 Caustic Soda Lye

B-3.2J *From Tank Cars or Tank Wagons*

Draw samples from each tank car or tank wagon from different levels by means of a suitable sampling instrument. Mix the material so collected and transfer about 5 litres of it to a clean resistant glass bottle. Divide the material into three parts and transfer each part to a sample container which shall then be closed as in **B-3.1.2** and labelled giving full identification particulars. Each such bottle shall constitute an individual sample; one of these shall he marked for the purchaser, another for the supplier and the third for the referee.

B-3.2.2 *For Containers*

B-3.2.2.1 Draw representative portions from each container selected from sampling after thoroughly mixing the container; take out about 2 litres from each selected container.

B-3.2.2.2 From each of the portions representing the selected containers, take out about 1 200 ml and mix the material so obtained. This shall constitute the composite sample. Divide this composite sample into three parts, one for the purchaser, another for the supplier and the third for the referee. Transfer each part to a sample container which shall then be closed as in **B-3.1.2**.

B-3.2.3 The portion of the material (after the quantity required for the preparation of the composite sample has been taken out) in respect of each container shall also be divided into three parts. Each such part shall constitute an individual sample and shall be transferred to sample container which shall then be closed as in **B-3.1.2** and labelled giving full identification particulars. One of these three sets shall be marked for the purchaser another for the supplier and the third for the referee.

B-3.3 Referee Sample

The referee sample (*see* **B-3.1.2, B.3.1.3, B-3.2.1**, **B-3.2.2.2** and **B-3.2.3**) shall bear the names of the purchaser and the supplier and shall be used in case of a dispute between the two. It shall be kept at a place agreed to between the purchaser and the supplier.

B.4 NUMBER OF TESTS

B.4.1 For Tank Car or Tank Wagons

Tests for all the characteristics prescribed in **4.3** shall be carried out on the individual samples.

B-4.2 For Containers

B-4.2.1 Tests for the delcrmination of iron shall be conducted on each of the individual samples.

B-4.2.2 Tests for the remaining characteristics prescribed in **4.3** shall be conducted on the composite sample.

B-5 CRITERIA FOR CONFORMITY

B-5.1 For Tonk Cars or Tank Wagons

The tank car or tank wagon shall be declared as conforming to the specification if the individual sample satisfies all the requirements prescribed.

B-5.2 For Containers

B-5.2.1 *For Iron*

The lot shall be considered conforming to the requirement for iron if each of the individual samples satisfies the tests in **A-8**.

B-5.2.2 *For Composite Sample*

The test results on the composite sample shall meet the specified requirements.

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Instruction to Bidders/Vendors

1. **PURCHASER:** Purchaser shall mean Bharat Heavy Electricals Ltd, a company registered under Indian Companies Act 1956 with registered office at BHEL House, Siri Fort New Delhi 1100049 or its authorized officers or other employees authorized to deal with the matters concerned and having regional Headquarter at BHEL PSSR, Tek Towers, No.11, Old Mahabalipuram Road, Okkiyam, Thoraipakkam, Chennai-600097.
2. **BIDDER/VENDOR:** means to those to whom enquiries have been sent for any purchase in case of Limited Tender and any bidder in case of Open Tender.
3. **SELLER:** Seller means the successful bidder who is getting the Purchase Order from BHEL.
4. The vendors shall thoroughly read all the specifications before quoting. Vendor to clarify all doubts/ discrepancies in the Tender document with the authority inviting bids for clarifications, before submission of bids.
5. The offers shall be submitted in total compliance of the Terms and Conditions and are to be submitted online before the due date. THE VALIDITY OF THE OFFER SHOULD BE FOR 90 DAYS UNLESS OTHERWISE SPECIFIED.
6. The prices shall be quoted on “F.O.R Destination” basis only unless otherwise specified. The Price shall include all Duties/Taxes as applicable. It also includes Freight and Insurance up to destination. (Consignee). If the bidders prefer to quote only the basic price, then it should be followed by the duties and taxes in percentage as applicable and freight & insurance duly specified. Offers with incomplete information / prices are liable for rejection. NO PRICE ELEMENTS SHALL BE INDICATED AS EXTRA.
7. The rates should be quoted in both words and figures. In case discrepancy found between the rates quoted in words and figures, the least of the two will be treated as valid quoted rate.
8. The basic price shall be kept firm till completion of the order and will not be subjected to variation, unless otherwise agreed upon specifically. However statutory variations on Taxes and Duties on the rates prevailing at the time of delivery shall be applicable.
9. Payment will be effected only after receipt of total quantity of materials as per PO at the destination within the delivery date stipulated unless otherwise specifically agreed in the Purchase Order.
10. No revision of prices whatsoever will be entertained /accepted after the Tender is opened.
11. In case of Tender for supply from abroad involving payment of foreign exchange, the price quoted should separately indicate the foreign exchange components involved and the extent of payment acceptable in Indian currency. The exchange rate variation is not admitted unless otherwise specifically agreed/mentioned in the enquiry. In such cases, the Tenderer also should give the following details without fail.
    a) F.O.B price

b) Ocean freight/ insurance
c) Air freight/insurance
d) Ext gross weight of consignment
e) Indian agency commission payable in Indian rupees as applicable

12. "NO DEVIATION CERTIFICATE" has to be submitted along with the Technical bid conforming to the terms and conditions of the enquiry.
13. **LATE TENDERS/BIDS:** The offers received after Tender opening due date will be liable for rejection and shall not be considered.
14. Products with ISI certificates are preferred.
15. Manufacturer's name, Trade mark or patent number if any, should be clearly specified. Illustrative leaflets giving technical particulars/parameters are to be enclosed to the offers along with list of customers / their purchase orders to whom similar product had been supplied, in the past three years.
16. SSI/NSIC Registered units must highlight the status indicating registration number in their offer without fail for availing MSME benefits.
17. In case of Limited Tender, if the bidder is not interested in /not in a position to quote for this enquiry, the same should be communicated before due date of the Tender submission for consideration in subsequent enquiries.
18. In case of participation by the authorized distributors/dealers on behalf of the vendor, the copy of the legal arrangements/Terms and Conditions agreed between the parties (duly made in stamped paper) should be submitted. Due intimation in advance shall be given on or before the due date for consideration of such offers. The total responsibility for performance of the work/purchase as per specifications will be with the authorized vendor.
19. **QUOTATIONS:** All documentation and correspondence regarding the Contract/Purchase shall be in English language and international numerals only. The rates quoted shall be in figures as well as in words. In case of difference between the words and figures, the least of the two will be treated as valid quoted rate. All entries shall be either be typed or to be written in ink. Erasers and over writing is not permitted and may render such bids be liable for rejection. All the cancellations and insertions shall be duly attested by the bidder. Please refer the conditions in case of Tender for supply from abroad involving payment of foreign exchange (Clause no 11).
20. **SAMPLES:** sample should be submitted along with the offer, if asked for.
21. **INSPECTION & ACCEPTANCE OF GOODS:** It is subject to BHEL inspection at supplier's works before dispatch or on receipt at destination as the case may be, as per the agreed/approved Quality plan. Final / stage inspection will be carried out at the destination/ supplier's works by the authorized inspection official in line with agreed quality plan. Wherever preliminary or stage inspection is to be carried out at supplier's works, the same is subject to final acceptance after receipt of the material at the destination and the decision of the Purchaser shall be final. The property of

goods shall not pass until final acceptance by the purchaser. In case of delay in inspection process for reasons attributable to the seller, the financial loss /liability sustained by the purchaser shall be borne by the supplier. Since delivery period includes the time for pre dispatch inspection by BHEL, the supplier shall intimate the readiness of material for inspection well in advance to expedite the inspection process and to enable the supplier effect delivery in time.

22. **QUALITY PLAN:** BHEL may give the quality plan of their own else may request the vendor to submit the quality plan along with the offer, as applicable, for approval by BHEL. (please refer specifications) The quality plan is expected to cover generally specification of the items, stage inspections to be carried out, guarantee/warrantee /test certificates/inspection reports, sampling plan as per IS. BHEL will also identify the inspection agency including the customer, as applicable. The bidder/vendor shall furnish the details of the inspection facilities available with him in the quality plan, as applicable. The Quality Plan will be finalized before proceeding with execution of PO. The vendor is requested to ensure completion of QP in all aspects before proceeding with PO. The vendor should provide calibrated instruments etc for carrying out the inspection as per the quality plan.

23. **REJECTION:** The seller shall intimate the purchaser in writing within 15 days after receipt of rejection advice regarding the disposal of rejected material and action plan for replacement. If no information is received within this time, the purchaser shall be at liberty to return the material at the cost of risk of the seller after recovering the cost if any, including inward freight and other incidental charges incurred. The purchaser will not be responsible for the rejected material thereafter and no claim will rest on them.

24. **PACKING, MARKING & FORWARDING:**

    PACKING: the supplier shall arrange for secure protective packing of the goods suitable for tropical conditions to avoid loss, damage or atmosphere action during transit by road/train/air. The packing standard shall comply with relevant national standards, where available, carriers' conditions of packing or established trade practice. The seller shall be liable to replace the material or reimburse the value of the loss not withstanding whether insurance is arranged by him or not. The packing materials and cases and packing charges are included in the quoted price unless otherwise agreed.

    MARKING: The following marking shall be made on each package in BLACK BOLD CAPITAL LETTER: (A) BHEL PSSR, (B) CONSIGNOR/CONSIGNEE DETAILS & (C) DIMENSION/WEIGHT

    The above marking should be stencilled or written in bold letters on the package. Should the packages be too small, suitable cards/metal tags giving these details may be tagged or nailed. Copy of the packing slip should be kept in each package without fail.

DESPATCH INTIMATION: Immediately after dispatch, the Seller shall intimate Head/Purchase BHEL PSSR Yadadri the details of the items dispatched, quantity, order reference, LR/RR No and date by telegram/fax/e-mail.

25. **TERMS OF PAYMENT:** Refer Cl 1.6 of TCC.

26. **SECURITY DEPOSIT:** Where required, Security deposit or Bank guarantee shall be submitted for a sum equal to 5% of the total value of the order on receipt of confirmed purchase order from BHEL. (please refer specifications for applicability)

27. **LIQIDATED DAMAGES & RISK PURCHASE:** Seller is to understand that "Time is the essence of the contract". Hence the delivery of the goods s mutually agreed, specified in the purchase order should be adhered to within the time mentioned. Where the seller supplies/dispatches the materials beyond the delivery date, as specified in the order, the Purchaser will have no obligations to accept the goods.

    In case of delay in receipt of materials at the delivery point, for reasons not attributable to BHEL, the
    Purchaser will levy LD, if time extension and PO amendment is not issued. The vendor should request Purchaser for amendment to PO for time extension if reasons are not attributable to him before submission of invoice.

    Based on delivery conditions, following LD clauses shall be operated.

    a) LD shall be 0.5% of the total order value per week of delay or part there of subject to a maximum of 10% of the total order value.

    b) In case of staggered delivery schedule, LD shall be 0.5% of the undelivered portion per week of delay or part thereof subject to a maximum of 10% of the total order value. However, even if a staggered delivery schedule for Capital Machine/ BOPs is agreed, the LD cap will be levied on total order value and not undelivered portion of the order value.

    c) In case of any amendment/revision, the LD shall be linked to the amended/revised PO value.

    In addition to the above, in case the vendor shall fail to complete the supply of the any of the materials within the specified time (either partially or fully), it shall be lawful for BHEL PSSR Yadadri, to procure the same at the risk and cost of the supplier. In such event it will be obligatory on the part of the supplier to pay the additional expenditure incurred to BHEL PSSR for any loss due to such risk purchases.

28. **INSURANCE:** Wherever delivery terms quoted for "F.O.R. Destination" basis specifically agreed to and directed, the supplier shall insure at his cost the goods for all transit risks including 30 days' storage risks from the date of delivery of goods at the final destination. In other cases, supplier must furnish of dispatch of each consignment immediately after dispatch. Failure to do this will make the supplier responsible for making good any loss which might have been recovered from the under –writers.

29. **SUBCONTRACTING:** This order or any part thereof shall not be subcontracted without the consent of the Purchaser. The total responsibility for the supply and performance of purchased items, as per guarantee rests with the seller, even if BHEL accepts the above arrangement.
30. **METRIC SYSTEM:** Seller shall indicate all the measurements only in Metric system.
31. **INDEMNITY:** Seller shall indemnify the Purchaser against any claim due to breach of patent, trademark, negligence, defective material, or injury to seller or his agent
32. **GUARANTEE & WARANTEE:**
    - The items purchased are to be guaranteed for satisfactory performance for a period of 12 months from the date of commissioning i.e. put into use or for 18 months from the date of dispatch, whichever is earlier unless otherwise specified.
    - If any defect is noticed during the above period, the same shall be replaced free of cost on FOR destination basis within a reasonable time. The time for replacement based on the component and urgency will be intimated by BHEL and the vendor should replace the items.
    - To this effect Guarantee / manufacturer's test certificate shall be furnished along with the original documents.
33. Three sets of Operation & maintenance manuals/ technical literature, drawings etc. are to be supplied free of charges along with the items being procured.
34. **DISPUTES, ARBITRATION & JURISDICTION:**
    - All disputes between the Purchaser and the seller arising out of this transaction, other than those for which decision of the BHEL is final, shall after written notice by either part to the PO to other party by referred to sole arbitration of Executive Director or his nominee.
    - The Arbitrations shall be conducted in accordance with provisions of Arbitration and Conciliations Act 1996. The Purchase will be governed by the law for the time being in force in the Republic of India.
    - The civil court having ordinary original Jurisdiction at Chennai, Tamilnadu alone have exclusive jurisdiction in regard to all claims in respect of this transaction/ purchase. No other civil Court have jurisdiction in case of dispute, of this contract.
35. **GENERAL:** All other conditions which might have been quoted by the Seller and are in contravention to the terms prescribed in the order and which have not been specifically accepted in writing by the Purchaser will not be applicable to this order. The Seller should intimate the Consignee in writing regarding the readiness of material, in cases where Purchaser has agreed to arrange collection with a copy to Head/Purchase, BHEL PSSR Chennai.

36. ANY REFERENCE MADE HEREIN (ENQUIRY / PURCHASE ORDER) TO ANY OF THE NATIONAL/INTERNATIONAL STANDARDS IMPLIES IT'S LATEST EDITION.
37. THE VENDORS SHOULD SUBMIT GUARANTEE, SOUNDNESS & BONAFIDE CERIFICATES WHILE SUPPLYING THE ITEMS.
38. The purchaser reserves the right to cancel or split-up the Tender /offer and place order for individual items with different vendors with varying quantities in line with the enquiries.
39. **FORCE MAJEURE:** the following shall amount to force majeure – Acts of God, Acts of government, war, sabotage, riots, civil commotion, police action, revolution, flood, fire, cyclone, earthquake, epidemic and other similar causes over which the vendor is not having any control. If the vendor suffers delay in fulfilling the obligations due to force majeure, as defined above, BHEL will grant only delivery time extension, by a period of time equal to the period of delay provided that on the occurrence of any such contingency, the vendor shall immediately report to BHEL in writing the causes of delay. The vendor is not eligible for any other compensation.
40. **TENDER CONDITIONS FOR MSE SUPPLIER:**

    MSE suppliers can avail the intended benefits only if they submit along with offer, attested copies of either EM II certificate having deemed validity (Two years from the date of issue of acknowledgement in EM-II) or valid NSIC certificate or EM /I certificate along with CA certificate (Format enclosed as per Annexure - I) applicable for the year, certifying quantum of investment in plant and machinery within the permissible limit as per the act for relevant status (Micro or small) where the deemed validity of EM II is over. Date to be reckoned for determining the deemed validity will be the last date of technical bid submission. Non submission of such documents will lead to consideration of their bids at par with other bidders and MSE status of such suppliers shall be shifted to Non MSE supplier till the supplier submits these documents".

    BHEL shall consider any new supplier as MSE vendor provided anyone of the following documents are submitted along with their offer/application

    a) Valid NISC certificate
    b) Entrepreneurs memorandum Part II (EM II) valid based on deemed validity of 5 years)
    c) Valid EM II certificate along with attested copy of CA certificate as per prescribed format Annexure -1 applicable for the relevant financial year (latest audited), where the deemed validity of EM II is over However credentials of all MSE suppliers will be verified before considering the intended benefits for MSE suppliers as per above clause (Public procurement policy 2012 and MSMED act 2006) at time of Tender evaluation.
    d) MSEs are exempted from payment of earnest money (EMD) in addition to free issuance of Tender Documents

Payment Terms: Payment shall be made to Successful Bidders (MSEs) within 45 days from receipt of clear invoice.

BHEL shall take decision on Purchase Preference to MSEs as follows:

a) In tender, participating Micro and Small Enterprises quoting price within price band of L1+15% shall also be followed to supply a portion of requirement by bringing down their price to L1 price

   in a situation where L1 price is from someone other than a Micro and Small Enterprises and such Micro and Small Enterprise shall be allowed to supply up to 25% of total tendered value.

b) In case of more than one such Micro and Small Enterprise, the supply shall be shared proportionately (to tendered quantity).

c) In case of tender item is non-splitable or non-dividable, etc. MSE quoting price within price band L1+15% may be awarded for full/complete supply of total tendered value to MSE.

BHEL shall take decision on Relaxation of norms for Startups MSEs:

a) Start-ups MSEs are relaxed to condition of prior turnover and prior experience subject to meeting of quality and technical specifications in accordance with the relevant provisions of GFR,2005. However, BHEL may not relax the Start-up MSEs, where there is procurement of items related to safety, health, critical security operations and equipment's etc.,

Bharat Heavy Electricals Limited
Power Sector - Southern Region

Project - 5x800 MW Yadadri TPS
Volume-II Unpriced Rate Schedule
Tender No. - YTPS:PUR: 202302-89

Supply of Chemicals for DM Plant & PT Plant - Sodium Hydroxide at BHEL Yadadri TPS.

Bidder's Name				
Sl. No.	**Item Description**	**UOM**	**Quantity**	**Quoted/ Not Quoted**
1	Sodium Hydroxide liquid (Lye) 48%	MT	30	

SIGNATURE & SEAL OF AUTHORISED PERSON

NAME:

Bharat Heavy Electricals Limited
Power Sector - Southern Region

Project - 5x800 MW Yadadri TPS
Volume-II Rate Schedule
Tender No. - YTPS:PUR: 202302-89

Supply of Chemicals for DM Plant & PT Plant - Sodium Hydroxide at BHEL Yadadri TPS.

Bidder's Name				
Sl. No.	**Item Description**	**UOM**	**Quantity**	**Lumpsum price for 30 MT including Transportation**
1	Sodium Hydroxide liquid (Lye) 48%	MT	30	

GST extra.....%

SIGNATURE & SEAL OF AUTHORISED PERSON

NAME: