

NATIONAL FERTILIZERS LTD
VIJAIPUR GUNA (MP)

NOTICE INVITING BID

ENERGY AUDIT FOR VIJAIPUR UNIT OF NFL

Ref: NFL/VIJAIPUR/TS/ENERGYAUDIT/2014/01

Date: 10.11.2014

Sub: - Comprehensive Energy Audit of Ammonia, Urea and offsite facilities including Boilers and captive power Generation facilities at NFL Vijaipur

Dear Sir,

In line with notification dated 27.05.2014 from Ministry of Power, National Fertilizers Limited (NFL), one of the largest manufacturers of urea in India, intends to get Energy audit of its manufacturing Unit located at Vijaipur, Guna (MP) in accordance with Bureau of Energy Efficiency (Manner and Intervals of Time for Conduct of Energy Audit Regulations 2010).

Sealed Bids are invited for the work as detailed below:

1. **Name of Work:** Comprehensive Energy Audit of Ammonia, Urea and offsite facilities including Boilers and captive power Generation facilities.
2. **Bid Enquiry No.** * NFL/VIJAIPUR/TS/ENRGYAUDIT/2014/01
*Pl. quote this no. for any correspondence on the subject.
3. **Bid Fee:** Rs. 500/- (Rupees Five hundred Only).
4. **Time of Completion:** 4 Months from issue of LOI for submission of draft report as per format in FORM 4 of notification dated 28.04.2010. Final report shall be submitted within fifteen days from date of receipt of comments from NFL, if any.
5. **Last date and time of submission of Bids:** 15:00 hrs on 31/01/2015
6. **Date and Time of opening of Bids:** 15:30hrs on 31.01.2015 (EM & "ELIGIBILITY & TC")
7. **Place of receipt and opening of Bids:** Office of DGM (TS and R&D) NFL Vijaipur
8. **Earnest Money Deposit:** Rs. 25,000/- (Rupees Twenty Five Thousand only)
9. All request for interpretation, clarification & queries in connection with Bid shall be addressed in writing to Issuing Authority i.e., Deputy General Manager (TS and R&D) NFL Vijaipur at least 7 (SEVEN) days prior to the closing date of the Bid.
10. The Bid shall be submitted duly super scribed (Bid Enquiry NO NFL/VIJAIPUR/TS/ENRGYAUDIT/2014/01)

11. The rate should be quoted in the Units given in the Schedule of Rates. The rates should be quoted in words and figures. The rates quoted shall remain valid for 120 days from date of opening of Technical Unpriced Bids for the acceptance.

12. National Fertilizers Limited reserves the right to reject any or all Bids without assigning any reason whatsoever and also does not bind to accept the lowest Bid.

13. **Bid shall be submitted in THREE SEPARATE SEALED Envelopes as under:**

Envelope No.1:

Will be super scribed “EM” (Earnest Money) and shall contain Rupees Twenty Five Thousand only as earnest money deposit and Rupees Five Hundred only as tender Fees in the form of a crossed demand draft (separate for both amount) issued by any scheduled bank except rural and cooperative bank in favor of National Fertilizers Ltd, Vijaipur payable at State Bank of India Bavarikhera Branch (Branch Code 8455)

Envelope No.2:

Will be superscribed “ELIGIBILITY & TC” (Eligibility documents and Terms and Conditions) and shall contain

- i) documents as per point no 2.0 of Special terms and conditions (Annexure I) in support of its eligibility to quote
- ii) Terms and conditions set for the Bid by BIDDER for his offer (in duplicate) and which are at variance from the terms and conditions of the Bid documents issued by NFL and the.
- iii) DECLARATION FORM I and II as per Annexure III

Envelope 3:

Will be super scribed “PB” (Price Bid) and shall contain the rates and amount quoted in the prescribed schedule of rates as per Annexure IV of NIT.

All the three sealed envelopes shall be submitted in a separate sealed envelope super scribed “(Bid Enquiry No **NFL/VIJAIPUR/TS/ENRGYAUDIT/2014/01**)”

14. Opening of Bids

Envelope No.1:

Marked “EM” containing Earnest Money and Bid Fees will be opened first, on the schedule date of opening of Bid in presence of those BIDDERS who wish to be present at the time of Bid Opening. It may be noted that Tenders without EMD and tender fees **will not be accepted** and further envelopes of tenderer will not be opened.

Envelope No.2:

Marked “ELIGIBILITY & TC” will then be opened and discussion will be carried on with the respective BIDDERS for clarification, if any at a date notified later. In case documents as

listed in Point no 2 of Special terms and conditions (Annexure I) and Declaration forms (Annexure III) are not enclosed, the Bid will be liable for rejection.

Envelope No.3:

Marked "PB" will be opened subsequently at a later date, which will be intimated to eligible BIDDER.

15. The BIDDER shall quote single rate against each item and not the multiple rates in the Schedule of Rates. Any Bid with the multiple rates quoted will be summarily rejected. Price should be quoted strictly as per the Performa enclosed for Schedule of Price. Prices shall be written in both Words and Figures. In the event of difference, the prices in words shall be valid and binding
16. This letter along with all attachments/Annexures of this NIT shall form part of the contract document and shall be signed and returned along with the Bid documents.
17. All pages shall be initialed at the lower right hand corner and signed wherever required in the Bid papers by the BIDDERS or by a person holding power of attorney authorizing him to sign on behalf of the BIDDER before submission of Bid. All corrections and alterations in the entries of Bid paper will be signed in full by the BIDDER with date. No eraser or overwriting is permissible.
18. No condition or deviation should be mentioned by BIDDER in Price Bid. Offers where the BIDDER has mentioned any condition or deviation in Price Bid shall be out rightly rejected.
19. While submitting the offer, BIDDERS may ensure that Bid document/ offer has been signed by authorized signatory of the company. Subsequent withdrawal of offer/ non-acceptance of orders placed based on the offer submitted by them will not be entertained on the ground that the offer was not signed by the authorized person.
20. **Safety Measure:** BIDDER shall not undertake any work within the Battery Limits of the plants, unless proper and valid safety permit is obtained. BIDDER shall have to observe all the safety practices as required and shall provide safety wear for his workmen. BIDDER and his employees should observe all safety regulations within factory area as directed by owner's safety department from time to time.
21. The Bid shall be addressed to DGM (TS and R&D) National Fertilizers Ltd. Vijaipur-473111 Guna (MP)

Thanking you,

Yours Sincerely,

for National Fertilizers Limited

S. N. Sinha
DGM (TS and R&D)

ANNEXURE- I

SPECIAL TERMS and CONDITIONS

NOTICE INVITING BID (NIT) FOR CARRYING OUT ENERGY AUDIT

SPECIAL TERMS and CONDITIONS

1.0 BACKGROUND:

National Fertilizers Limited (NFL) is operating and maintaining gas based Nitrogenous Fertilizer Plants at four locations viz. Nangal, Bathinda, Panipat and Vijaipur as per following details:

S. No.	<u>Location</u>	<u>Capacities in MT / annum</u>		<u>Other Products</u>
		<u>Ammonia</u>	<u>Urea</u>	
(i)	Nangal	3,13,500	4,78,500	Nitric Acid, Sodium Nitrate, Sodium Nitrite & Ammonium Nitrate
(ii)	Bathinda	2,97,000	5,11,500	
(iii)	Panipat	2,97,000	5,11,500	
(iv)	Vijaipur-I	5,01,600	8,64,600	
(v)	Vijaipur-II	5,01,600	8,64,600	-

*Revamp for capacity augmentation has been completed at Vijaipur in 2012-13. Capacity after revamp is as under:

VP-I	577500	999900
VP-II	615120	1066230

In line with GOI notification dated 27.05.2014 directing every designated consumer to get an energy audit conducted by an accredited energy AUDITOR within 18 months of notification, NFL intends to carry out ENERGY Audit of Vijaipur Unit as per scope of work enumerated in the following paragraphs

2.0 ELIGIBILITY CRITERIA:

- 2.1. The BIDDER must have successfully completed at least one comprehensive Energy Audit of Ammonia-Urea fertilizer complex or refinery/ petrochemical industry in India during the last 7 years ending 30.09.14.
The BIDDER should submit completion certificate for successful execution of above as a proof of the same.
- 2.2. The BIDDER shall be a firm registered by Bureau of Energy Efficiency (BEE) for conducting Energy Audit as on 30.09.2014. Names of ACCREDITED ENERGY AUDITOR/s proposed to take up the present task shall be indicated in BID. The Bidding firm shall submit copy of its registration certificate along with copy of accreditation certificate of proposed accredited Energy auditors who shall take up the task. The experience of the energy auditors will be as indicated in 2.1 above. Supporting document of Energy auditors to this effect shall be provided.

- 2.3 The BIDDER shall submit its audited balance sheet of last three years, ending 31st March of the previous financial year valuing average of minimum Rs. 3 lacs for Nangal, Panipat, Bathinda Units and Rs 4.5 lakhs for Vijaipur Units .
- 2.4 The BIDDER shall submit documents related to income tax returns of last three years ending 31st March 2014.
- 2.5 Required Documentation: The BIDDER shall be required to submit following documentation in support of the above eligibility criteria:
- 2.5.1 Name and address of the organization with Telephone, Fax Nos., Email Address And Contact Persons, PAN No., VAT certificate, Excise, Service Tax Registration No.
- 2.5.2 Copies of Work Orders and completion Certificates with full technical details of the Energy Audit carried out as reference of job done.
- 2.5.3 Copy of Registration certificate of Bidder from BEE.
- 2.5.4 Number and Name of BEE accredited energy AUDITORS with copy of their certificates indicating validity of the accreditation.
- 2.5.5 A declaration to the effect that accredited energy auditor/s provided during the term of the audit will be as per the experience indicated in eligibility criteria.

3.0 SCOPE OF WORK

The energy audit shall be carried out in accordance with BEE notification (Manner and Intervals of time for conduct of Energy Audit) dated 28.04.2010- ATTACHMENT III.

Broad details of scope of work are as follows:

- Verify data of energy usage based on data submitted by NFL to State Designated Agency (SDA) for year 2012-13 and 2013-14.
- Prepare report in FORM 1 of Gazette Notification dated 28.04.2010 for year 2013-14.
- Energy Audit/Performance evaluation for energy efficiency of all the major identified equipment/machinery under each plant (NFL UNITS to elaborate and append the list of items in NIT as ATTACHMENT – V)
- Monitor and analyse use of energy data for energy audit.
- Analyse material and energy balance in individual plants and complex.
- Prepare recommendations on energy saving measures with their cost benefit analysis including sensitivity analysis.
- Prioritise and prepare action plan for such recommended measures which in the opinion of NFL are technically viable.
- Based on activities undertaken , the Energy AUDITOR shall submit a report in FORM 2 of Gazette Notification dated 28.04.2010, to the NFL management
- The Energy AUDITOR shall finally submit an Energy Audit report as per FORMAT indicated in FORM 4 of Gazette Notification dated 28.04.2010.

Notwithstanding anything detailed above, the audit report shall be complete in all respects and shall be sufficient to comply with provisions of Energy Conservation Act-2001 and subsequent notifications of BEE for the said work. It is further mentioned that the Energy Audit Report as per FORM 4 of notification shall be initially submitted in draft form which will be approved by NFL. Final report shall be submitted within 15 days from receipt of comments from NFL.

4.0 METHODOLOGY

The following is the tentative methodology, which may be adopted for carrying out the ENERGY audit

- i) The accredited energy AUDITOR of the BIDDER jointly with Energy Manager/ nominated energy manager of the NFL's manufacturing Unit shall develop scope of work for the conduct of energy audit required under the act with a view to ensure adequate coverage in terms of share of total energy use that is covered in the energy audit. Data available with NFL, required for carrying out the job will be provided to the AUDITOR.
- ii) AUDITOR may collect other required data by taking physical measurements themselves.
- iii) AUDITOR has to arrange all required meters, portable instruments and manpower for data collections. All meters and instruments shall be calibrated from competent authority and necessary test certificate shall be furnished, if requested by NFL. BIDDER shall furnish list of tools and instruments required to carry out energy audit at the time of Bidding. It is further clarified that all tools and instruments will be brought by the BIDDER himself.
- iv) Submit reports as per Gazette Notification dated 28.04.2010 in FORM 1, FORM 2, FORM 3 and FORM 4.
- v) Initially draft report shall be submitted which will be finalized after taking into account the comments of NFL.
- vi) All reports shall be submitted in triplicate hard bound copies and three reproducible in electronic format in CD.

5.0 SECURITY DEPOSIT:

The successful BIDDER shall furnish, within ten days after issue of LOI/ award of work to him, whichever is earlier, a security deposit in the form of bank guarantee on prescribed proforma enclosed with the General Terms & Conditions as Attachment -III, issued by the Nationalized Bank in India, in favour of the OWNER for an amount equivalent to 10 (ten)% of the Total lumpsum Fee (inclusive of taxes and duties) payable to the AUDITOR on non-judicial stamp paper of appropriate value. The bank guarantee shall be kept valid initially for a period of 9 (nine) months inclusive of a claim period of 3 months, which shall be extended further as may be required & asked for by the OWNER from time to time.

6.0 EVALUATION CRITERIA: Un-priced technical bids shall be opened first on tender opening date for adjudging the Technical eligibility of the bidder. Price bids of those bidders shall be opened who are found to be technically eligible. Order shall be placed on BIDDER with lowest evaluated total price inclusive of all taxes including service tax and duties.

7.0 PAYMENT:

The payment for conducting energy audit of the NFL plants shall be based on the quoted value and shall be released within 30 days from the date of receipt of invoice by NFL as follows:

- a) 20% of the amount as interim payment against invoice, on submission of report in FORM 1 of Gazette Notification dated 28.04.2010 for year 2013-14, after verification of data of energy usage based on data submitted by NFL to State Designated Agency (SDA) for year 2012-13 and 2013-14
- b) 60% of the amount against invoice, shall be released on submission of draft report as per FORMAT in FORM 4 of Gazette Notification dated 28.04.2010.
- c) 20% against invoice, shall be released on submission of final report as per FORM 4 of notification dated 28.04.2010.

Service tax and any other taxes and duties shall be mentioned in the respective invoice for payment. Service Tax shall be reimbursed on submission of documentary proof.

Income tax shall be deducted at source from the payment as per Income Tax Act, 1961.

Payments shall be processed and released within 30 days from the date of receipt of invoices and all other completed documents as required.

Party has to indicate PAN No. & Service tax number on invoice.

8.0 PENALTY/ PRICE REDUCTION :

If there is delay in completion of job as per clause no.4 of covering letter, Penalty/ Price Reduction @ 0.5% per week subject to a maximum to 5% of the total contract price will be deducted from the payments.

9.0 Earnest Money Deposit (EMD):

The EMD shall be refunded to the unsuccessful BIDDERS after issue of Work Order to the successful bidder as well as to the successful BIDDER after submission of PBG (SD). The EMD of the BIDDER, who fails to accept LOI/Work Order or fails to enter into CONTRACT after acceptance of his bid by NFL or changes prices or terms & conditions of the bid within the validity period, would be forfeited. EMD would not carry any interest.

10.0 Price to be Firm:

The fee/charges quoted by the AUDITOR shall remain firm till the execution of the CONTRACT. No escalation on the quoted rates shall be allowed till the completion of work.

11.0 Charges/Fee for carrying out subject studies:

The BIDDERS shall furnish their lump sum charges/ fee in Envelope III (Price Bid) for carrying out ENERGY Audit Studies as per scope of work mentioned in this NIT. The BIDDER shall quote lump sum charges for carrying out the subject study. These charges shall remain firm and fixed till execution and completion of the assignment.

All taxes and duties including service tax shall be indicated separately by the BIDDERS. All expenses towards transport of their personnel to all sites of NFL, boarding and lodging of the AUDITOR's engineers/workmen at site, insurance of personnel visiting the site, the cost of the deploying testing equipment at site if any, their transportation etc. shall be borne by the successful BIDDER. No other charges shall be admissible / reimbursable.

12. Deviation to NIT:

No deviation to scope of work, general terms & conditions & other requirements of NIT shall be acceptable. BIDDERS shall confirm to all conditions of NIT to facilitate opening of price bid immediately to avoid loss of time. However, if any, BIDDER desired to deviate from the terms and conditions of NIT, the BIDDER shall enclose a separate list of deviations in Envelope II of the offer.

13.0 Manpower deployment

The BIDDER shall mention in Envelope II, the estimated manpower required to be deployed for site visits, testing if any and preparation of reports and the total man-hours required for the assignment.

14.0 Field testing equipment:

The BIDDER in his offer under Envelope II shall categorically mention and certify that they have all the equipment required for various tests at site, if required only.

15.0 Owner's decision final:

OWNER reserves the right to reject or accept any bid without assigning any reason whatsoever.

ANNEXURE – II

GENERAL TERMS & CONDITIONS

GENERAL TERMS & CONDITIONS

1.0 DEFINITIONS

In the NIT/CONTRACT, the following words and expressions are used in the following senses, unless a contrary intention appears from the context:

- 1.1.1 'OWNER' shall mean National Fertilizers Ltd. (NFL) incorporated in India, having its registered office at Core-III, Scope Building, 7-Institutional area, Lodhi Road, New Delhi 110 003 and corporate office at A-11, Sector -24, Noida 201 301, Distt. Gautam Budh Nagar (UP).
- 1.2 'NOTICE INVITING BID' (NIT) shall mean and include the present NIT document together with such supplements and addendum which may be issued by the OWNER from time to time, detailing therein the scope of job/tasks to be undertaken and executed by the BIDDER/AUDITOR/s for the proposed ENERGY Audit Studies for Vijaipur Unit of NFL
- 1.3 'BIDDER' shall mean the firm/AUDITOR who is submitting quotes in response to the NIT issued by the OWNER.
- 1.4 'BID' shall mean offer/ proposal/document that the BIDDER submits in the required and specified form in accordance with the provisions of NIT duly signed by the BIDDER's legally authorized signatory under seal of his firm/company.
- 1.5 'CONTRACT' shall mean an indenture/agreement executed on non-judicial stamp paper of appropriate value between OWNER and successful BIDDER and shall include Offer of the BIDDER/LOI/WORK ORDER/Formal Agreement/NIT document/ Accepted schedule of rates, drawings and other Annexure hereto, General terms & conditions of CONTRACT, Special conditions of CONTRACT, correspondence between OWNER and the BIDDER etc. All these documents taken together shall form one document and shall be deemed to form one CONTRACT. The CONTRACT shall be signed by the authorized officers of both AUDITOR and the OWNER in the presence of witnesses as per format enclosed at Annexure-III.
- 1.6 'AUDITOR' shall mean the firm on whom the Letter Of Intent/Work order is issued for faithful execution of the work mentioned here in and a CONTRACT is signed with the successful BIDDER and shall include his/her/their heirs, legal representatives, successors and permitted assigns.

- 1.7 'ENGINEER-IN-CHARGE' shall mean the person designated as such by the OWNER and shall include those who are expressly authorized to act for and on his behalf for operation of the 'CONTRACT'.
- 1.8 'SITE/UNIT' shall mean the site/Unit of proposed work i.e. Nangal, Bathinda, Panipat and Vijaipur Units of NFL (located in the states of Punjab, Haryana & Madhya Pradesh), for which work is to be performed.
- 1.9 'WORK' or 'WORKS' shall mean all the services/tasks/jobs undertaken and to be executed by the AUDITOR pursuant to/under the CONTRACT from time to time.
- 1.10 'AGREED FEE/CHARGES' shall mean the lump sum amount as agreed between the 'OWNER' and the 'AUDITOR' to be paid to the 'AUDITOR' for carrying out the work under the WORK ORDER/CONTRACT.
- 1.11 'CONTRACT VALUE' shall mean the sum total 'AGREED FEE' to be paid to the AUDITOR and duties and taxes as applicable including service tax.
- 1.12 LETTER OF ACCEPTANCE OF BID, LETTER OF INTENT (LOI) and/or LETTER OF AWARD OF WORK ORDER shall mean a letter in writing sent by the OWNER (unless delivered personally or otherwise proved to have been received) by registered post and/or confirmed by a concurrent telex or telecopy transmission, to the last known private or business address or the registered office of the AUDITOR informing/notifying the AUDITOR that his Bid/Offer has been accepted, subject to conditions as stated therein.
- 1.13 'FINAL ACCEPTANCE' shall mean the OWNER'S written acceptance of the satisfactory execution of the work by the AUDITOR under WORK ORDER/CONTRACT.
- 1.14 'COMPLETION PERIOD' shall mean the period by/during which the WORK shall be completed as agreed herein between the OWNER and the AUDITOR.
- 1.15 'DATE OF CONTRACT' shall mean the calendar date on which the OWNER and the AUDITOR sign the 'CONTRACT'.
- 1.16 'ZERO DATE' shall mean the date of issue of LETTER OF INTENT (LOI) or issue of WORK ORDER or date of signing of CONTRACT whichever is earliest and shall be considered as 'Effective date of the Contract'.
- 1.17 'DRAWINGS' 'PLANS' shall mean:

- a) All drawings/sketches/single line diagram etc. furnished by the OWNER as a basis for preparation of proposal/offer.
- b) Supplementary drawings furnished by the OWNER to clarify and to define in greater detail the intent of the NIT and/or CONTRACT.
- c) Drawings if any submitted by the AUDITOR with his proposal, provided such drawings are acceptable to the OWNER.
- d) Drawings furnished by the OWNER to the AUDITOR during the progress of the works and
- e) Engineering data and drawings submitted by the AUDITOR during the progress of the work provided such drawings are acceptable to the OWNER.

1.18 'ACT'/'CODES' shall mean, but not limited to the following, including the latest amendments, and/or replacements, if any.

- a) Indian Electricity Act, 1905 and Rules and Regulations made thereunder.
- b) Indian Factory Act, 1948, and Rules and Regulations made thereunder.
- c) A.S.M.E. Testing Codes (ASME-PTC).
- d) A.I.E.E. Test Codes.
- e) American Society of Testing of Materials (ASTM Codes).
- f) Code of Practice on occupational ENERGY & Health Audit as per Bureau of Indian Standards code IS 14489-1998.
- g) Arbitration and Conciliation Act, 1996, and Rules made thereunder.
- h) Environment (Protection) Act, 1986 and Rules and thereunder.
- i) OHSAS-18001.
- j) MSIHC rules 1989 and amendments.
- k) Indian Boiler Acts and Rules.
- l) Gas cylinder Rules and SMPV rules.
- m) Petroleum Acts and Rules.

1.19 'DAY shall mean a calendar day.

2.0 GENERAL INSTRUCTIONS AND INFORMATION:

2.1 BIDDER to acquaint himself Fully:

The BIDDER shall acquaint himself fully and thoroughly with the conditions and limitations including scope, requirements and official/statutory regulations, under which, confirming to which and subject to which, services/work are to be performed by him (the AUDITOR). The BIDDERS are advised to inspect and examine the Unit/Sites, the means of access to the Units. The BIDDER shall be deemed to have full knowledge

of sites and NIT, whether he inspects it or not. Failure to comply with aforesaid requirements will not relieve the BIDDER of his obligations in the event of his Bid being accepted nor will any claim whatsoever be entertained on the plea of ignorance of overlooking.

The BIDDER shall give an undertaking in the Techno-Commercial (Cover-1) offer to the effect that the terms and conditions of NIT and other aforesaid conditions are acceptable to him without reservations and no deviations to NIT have been taken while making the offer.

BIDDER shall give and mention in his bid an express acknowledgement that he has examined all documents forming part of the NIT and all addenda and other communications, clarifications, etc. received from OWNER. Unless otherwise specifically stated in his bid, it will be assumed that all terms and conditions of NIT are accepted by the BIDDER without any reservations whatsoever.

2.2 CONTRACT TO BE TREATED AS CONFIDENTIAL:

2.2.1 NIT, BIDDER's Bid and subsequent correspondences, Minutes of Meetings (MOMs), record notes of discussions, etc. shall be kept confidential. The reports prepared for the subject assignment under the CONTRACT shall be the property of OWNER and the contents of these NIT/reports shall not be divulged to any outside AUDITOR without the prior written consents of OWNER.

2.2.2 Any information obtained in the course of the execution of the CONTRACT by the AUDITOR, his employees or agents or any person so employed by him, as to any matter whatsoever, which would or might be directly or indirectly of use of the AUDITOR other than NFL must be treated as 'secret' and shall not at any time be communicated to any person without prior approval/permission of the OWNER.

2.2.3 The terms and conditions of the CONTRACT shall not be disclosed by either AUDITOR to any third AUDITOR without prior written consent of the other AUDITOR. This provision is however not applicable for disclosure to the Government and either AUDITOR's Bankers & Members.

2.2.4 The BIDDER/AUDITOR shall have no objection to the OWNER disclosing information referred to in Clause 2.2.1 at any time to NFL's Management/Board and Government of India.

2.3 CORRESPONDENCE ADDRESS

All requests for clarifications etc. on this NIT shall be submitted at the address given in clause No.17.0 hereinafter.

2.4 INSERTIONS, POST-SCRIPTS ETC.

Insertions, post-scripts, additions & alterations made to the bid shall not be entertained and recognized unless received prior to the closing date and time of the Bid and confirmed by the BIDDER's signatures. All pages of the Bid/NIT document shall be authenticated by the BIDDER.

2.5 SIGNATURES TO BID

The bid/Offer shall be signed by the legally authorized principal officer(s) of the BIDDERS. Power of attorney granted in favour of such officer(s) for the purpose shall accompany the bid.

2.7 GUARANTEES

(i) Time Schedule Guarantee:

The AUDITOR in his bid shall submit time schedule on a bar chart showing all possible activities along with the start and finish dates and total time taken from the date of placement of order by NFL upto the date of preparation and submission of final report to NFL. The AUDITOR shall guarantee the overall time schedule from the date of LOI/Work order whichever is earlier.

Failure to accomplish the Work as per agrees schedules shall invite Penalty/ Price Reduction as per clause 8.0 of Special terms and conditions (Annexure-I)

(ii) Performance Guarantee:

The AUDITOR shall guarantee that he will execute the job as per scope of work and shall be of high quality as per standards laid down.

2.8 AUDITOR TO EXECUTE WORK AS PER CONTRACT

AUDITOR shall execute the Work in strict conformity with the terms and conditions as stipulated and provided for in the LOI/Work Order/CONTRACT, placed on/ entered into with the AUDITOR. The AUDITOR shall not vary or deviate from the said plans and specifications without having first obtained the prior permission in writing from the OWNER.

2.9 PRICES IN WORDS TO PREVAIL

All the prices in the bid shall be given both in words as well as in figures. In case of any discrepancy between the two amounts, those given in words shall prevail.

2.10 ACCEPTANCE OF BID

NFL may not consider any Bid/bid which is incomplete and not prepared in accordance with the provisions set forth in this NIT and may reject the same. Any Bid/bid received after the closing date is liable to be rejected without any further consideration. Further the OWNER reserves the right in his sole and unfettered discretion to reject any or all bids without assigning any reason whatsoever. The OWNER does not bind himself to accept the lowest bid. The Bids/bids, which do not fulfill all or any of the conditions are liable to be rejected.

2.11 PAYMENT FOR PREPARATION OF BID DOCUMENT

The BIDDER shall not be entitled to claim any cost, charges, expenses, losses incidental to the preparation and submission of this Bid even if the OWNER may decide to withdraw the NIT or even otherwise.

2.12 BLOOD RELATIONS WORKING IN NFL

Should the BIDDER or his partner or the director of company has any blood relation working in NFL, the same should be declared by him while submitting the bid. NFL shall have the option to reject the Bid on this ground.

2.13 CONTRACT:

The successful BIDDER shall be required to execute a CONTRACT with the OWNER within 15 (Fifteen) days of the receipt by him of the letter of Intent (LOI) / Work order for carrying out the works according to the NIT documents and / or as per agreed scope of work and terms and conditions. The CONTRACT to be executed will be in the prescribed format enclosed with this NIT at Attachment II on a non-judicial stamp paper of appropriate value which will be arranged by BIDDER.

3.0 CLARIFICATIONS

The OWNER shall furnish clarifications to the BIDDERS as and when required and requested by the BIDDERS but not later than 10 days before the date mentioned above for submission of Bid/Offer. The clarifications shall be furnished to the best of OWNER's knowledge and information and to the extent it is available with the OWNER. All requests for interpretation or clarification shall be submitted to the address given in clause 17.0. Any further data required by the BIDDERS shall be obtained by them from other source and the source of such data shall be indicated by the BIDDER. However, a failure to receive any such addendum or interpretation or clarifications shall not relieve a BIDDER of any of the obligations under the bid as submitted.

4.0 SUSPENSION

OWNER shall have the right to direct the AUDITOR to suspend any part of or whole of the Work at any time after giving written notice to the AUDITOR, provided that any period of suspension exceeding 60 (sixty) days may be treated as termination under clause 5.0 below.

5.0 TERMINATION OF CONTRACT

Notwithstanding anything elsewhere herein provided and in addition to any other right or remedy of NFL under the CONTRACT or otherwise including right of NFL for compensation for delay, the officer-in-charge may without prejudice to his right against AUDITOR in respect of any delay, bad workmanship or otherwise or to any claims for damage in respect of any breach of the CONTRACT and without prejudice to any rights or remedies under any of the provisions of this CONTRACT or otherwise and whether the date of completion has or has not elapsed, may terminate the contract by intimation in writing:

Further, the 'CONTRACT' is liable to be terminated on Default or failure to fulfill any of the obligations by the AUDITOR under the CONTRACT including but not limited to the following,

- 5.1 Auditor Becomes bankrupt or insolvent or goes into liquidation or is ordered to be wound up or has a receiver appointed on its assets or execution or distress is levied upon all or substantially all of its assets.

- 5.2 AUDITOR abandons the work or fails to provide at any of the job sites, sufficient and proper manpower, equipment or facilities required for the proper execution of the work or any part thereof.

Manpower associated with the ENERGY Audit Job will remain the same whose complete bio-data has been given at the time of submitting the bid. Any change in manpower requested by the AUDITOR should fulfill technical qualification and adequate experience. Also such change in manpower is only permitted with the written approval of NFL, failing which the CONTRACT is liable to be terminated and action shall be taken as per provisions under Clause 6.0.

- 5.3 Persistently disregards the instructions of the OWNER or disobedience of any order in contravention to any provision of the CONTRACT or.
- 5.4 Persistently fails to adhere to the agreed programme of work or
- 5.5 Failure to start the work in terms of Work Order placed by NFL within 15 days or
- 5.6 If the AUDITOR miss-conducts with the OWNER in any manner or
- 5.7 If there is any change in constitution of the AUDITOR (if a firm) or in the circumstances or organization of the AUDITOR which is detrimental to the interest of NFL or
- 5.8 If the AUDITOR or any person employed by him shall make or offer any gift, gratitude, royalty, commission, gratification or other inducement (whether money or in any other form) to an employee or agent of NFL or
- 5.9 Sublets the work in whole or in part there of without OWNER's consent in writing or
- 5.10 Performance is not satisfactory or work is abnormally delayed or
- 5.11 Defaults in the performance of any material undertaking under this CONTRACT and fails to correct such default to the reasonable satisfaction of the OWNER within fifteen days after written notice of such default is served on the AUDITOR or
- 5.12 Work is suspended by OWNER due to any reason and the period of suspension exceeds 60 days (as per clause 4.0 above) or
- 5.13 OWNER may terminate the CONTRACT due to any reason including reasons due to Force Majeure and instructions, regulations or ordinance of any Government or any other reason beyond control of OWNER.

The decision of the Officer(s) as to whether any of the events/contingencies mentioned in the aforesaid clauses entitling NFL to terminate the CONTRACT has occurred shall be final and binding upon the AUDITOR. The reason for the termination stated in the notice of the termination shall be final and binding upon the AUDITOR and shall be non-arbitrable. The jobs left incomplete by the AUDITOR shall be got done at his risk and cost from the other agencies and the CONTRACT shall be determined accordingly.

Such termination will be by 15 (fifteen) days notice in writing and no claims/compensation shall be payable by the OWNER as a result of such termination, except the fees and costs for the meaningful services rendered by the AUDITOR and acceptable to OWNER, up to the date of termination.

6.0 CONSEQUENCES OF TERMINATION

- A.** If the CONTRACT is terminated by the OWNER for reasons attributable to the AUDITOR as detailed under clause 5.1 to 5.12:
- i. The OWNER reserves the right to get the work completed at the risk and cost of the AUDITOR and to recover from him any amount by which the cost of completing the work by any other agency exceeds the value of the CONTRACT, without prejudice to any other remedies/rights/claims etc. that may be available with the OWNER.
 - ii. Security Deposit submitted by the AUDITOR shall stand forfeited.
 - iii. The AUDITOR shall have no right to claim any compensation for any loss sustained by him by reason of his having entered into any commitment or made any advances on account of or with a view to the execution of the works, or on account of loss of expected profits.
 - iv. All the dues payable to the AUDITOR for the work executed by him before and up to termination shall only be released after making adjustments for the expenses, charges, damages and expected losses etc. incurred by the OWNER as a consequence of the termination of the CONTRACT.
- B.** If the CONTRACT is terminated by the OWNER due to reasons mentioned under clauses 5.13 and 5.14, the OWNER shall pay to the AUDITOR, compensation for the meaningful services rendered by the later on furnishing of documents and proof of the services and expenditures incurred by the AUDITOR. No other charges will be admissible.

7.0 RIGHTS OF OWNER

- 7.1 A unilateral stoppage of work by the AUDITOR shall be considered a breach of the CONTRACT and OWNER reserves its right to take necessary and suitable action as it may deem fit, to adequately protect his/its interest; at the risk and cost of the AUDITOR. Any aforesaid action shall be without prejudice to any other action, rights and remedies etc. that may also be available.
- 7.2 In the event the AUDITOR fails to fulfill his obligations under the CONTRACT, the OWNER shall have the right to get the work done by any other agency, at the risk and cost of the AUDITOR.

8.0 WORK TO BE OPEN TO INSPECTION:

All WORK under or in course of execution or executed in pursuance of the CONTRACT shall at all times be open to the inspection and supervision of the officer-in-charge and his authorized subordinates. The AUDITOR shall at all times during the usual working hours or on receipt of notice to visit the WORKS shall be present to receive order and instructions, or appoint a responsible agent duly accredited in writing, for that purpose. Orders given to the AUDITOR's agent shall be considered to have the same force as if they had been given to the AUDITOR.

9.0 SETTLEMENT OF DISPUTES:

All disputes or differences of any kind, whatsoever arising out of or in connection with the CONTRACT, whether during the progress of the work or after its completion and whether before or after termination of the CONTRACT, shall be referred by the AUDITOR to the OWNER and the OWNER shall within a

reasonable time after such representation, make and notify his decision(s), thereon, in writing. Any disputes or differences including those considered as such by any of the parties arising out of or in connection with the CONTRACT shall be tried to settle amicably. The decision, directions and certificates with respect to any matter, as is especially provided for by these conditions, given and made by the OWNER (which matters are hereinafter referred to as Expected matters) shall be final and binding upon the AUDITOR. In case the decision of OWNER is not acceptable to the AUDITOR, he can resort to the remedies under Arbitration as specified in Clause 16.0 of General Terms & Conditions hereunder. However, if the final bill is signed by the AUDITOR as 'Accepted' in full and final settlement thereof, no dispute raised thereafter shall be valid.

10.0 OBSERVANCE & COMPLIANCE OF STATUTORY RULES/LAWS

- 10.1 The rights and obligations of the OWNER and the AUDITOR and provisions of the CONTRACT shall be governed and construed by and in accordance with the laws of India.
- 10.2 The AUDITOR shall be singularly responsible to secure strict compliance with all Central and State laws as well as the rules, regulations, by-laws and orders of the local authorities and statutory bodies as may be in force, from time to time.

11.0 CO-OPERATION

The AUDITOR and the OWNER shall cooperate with each other and make best efforts for smooth execution of the Work and co-operate with and assist all the others who may be performing services for the OWNER in connection with the Work under the CONTRACT.

12.0 SUB-LETTING OF WORK

The AUDITOR shall not assign or sublet the Work under the CONTRACT or any part thereof or any share interest therein without prior written consent/permission of the OWNER.

13.0 MEASUREMENT SYSTEM

Metric system will be adopted for the collection/reporting of data and in the preparation of the reports.

14.0 INDEMNITY OF THE OWNER

- 14.1 The AUDITOR shall at all times indemnify and legally protect the OWNER and/or its employees against all claims, demands, causes of action or suits arising out of and/or consequent to the services provided by the AUDITOR under the CONTRACT.

14.2 The AUDITOR shall at all time indemnify the OWNER against any claim which may be made under Workmen's Compensation Act or any statutory modifications thereof or otherwise for or in respect of any damage or compensation payable in consequence of any accident or injury sustained by any workman or other person whether in the employment of the AUDITOR or not.

15.0 FORCE MAJEURE

The terms and conditions agreed upon under the CONTRACT shall be subject to Force Majeure. Neither the AUDITOR nor the OWNER shall be considered in default in the performance of its obligations contained therein, if such performance is prevented or delayed or restricted or interfered with by reasons of war, hostilities, revolution, civil commotion, strike, epidemic, fire, flood, earthquake, regulation or ordinance or requirement of Government or any sub-division thereof, or any other act whatsoever, whether similar or dissimilar to those enumerated, beyond the reasonable control of the parties hereto or because of any act of GOD. The AUDITOR so affected, shall give a notice of such occurrence to the other AUDITOR in writing within 10 days from the date of occurrence of the Force Majeure condition, furnishing therewith documentary evidence supporting the invoking of the Force Majeure. On cessation of Force Majeure the AUDITOR invoking Force Majeure shall inform thr other AUDITOR of the period for which Force Majeure condition continued and shall also give documentary evidence thereof to this effect. Should one or both parties be prevented from fulfilling their contractual obligation by a state of Force Majeure lasting continuously for a period of three (3) months, both the parties shall meet and decide about the future course of action for implementation of the CONTRACT.

16.0 ARBITRATION

16.1 Except where otherwise provided in the contract, all matters, questions, disputes or differences whatsoever, which shall at any time arise between the parties hereto, touching the construction; meaning, operation or effect of the contract, or out of the matters relating to the contract or breach thereof, or the respective rights or liabilities of the parties, whether during or after completion of works or whether before or after termination shall after written notice by either party to the contract be referred to the arbitration of Designated Unit Head / ED OR Functional Director OR Chairman & Managing Director, National Fertilizers Limited or his / her nominee, depending upon the value of the contract.

The Arbitration & Conciliation Act, 1996 or any statutory modification or re-enactment thereof and the rules made there under shall govern the Arbitration proceedings.

- 16.2 The contractor hereby agrees that he shall have no objection if the arbitrator so appointed is an employee of NFL and he had to deal with the matter to which the contract relates and that in the course of his duties as such he has expressed his views on all or any of the matter in dispute or differences.
- 16.3 If the arbitrator to whom matter is referred, vacates his / her office by any reason whatsoever then the next arbitrator so appointed by the authority referred above may start the proceedings from where his predecessor left or at any such stage he may deem fit.
- 16.4 It is agreed by and between the parties that in case a reference is made to the Arbitrator or the Arbitral Tribunal for the purpose of resolving the disputes / differences arising out of the contract by and between the parties hereto, the Arbitrator or the Arbitral Tribunal shall not award interest on the awarded amount more than the rate SBI PLR / Base Rate as applicable to NFL on the date of award of contract.
- 16.5 In case of Dispute with Public Sector Undertaking Company, the Dispute or difference arising in connection with the agreement, such disputes shall be referred by either party for resolution to arbitration before one of the arbitrator in the Department of Public Enterprises to be nominated by the Secretary of Government of India in charge of Bureau of Public Enterprises. The Arbitration and Conciliation Act 1996 shall not be applicable. The award of arbitrator shall be binding upon the parties, provided however, any party aggrieved by such award may make a further reference for setting aside or revision of the award to the Law Secretary, Department of legal affairs, Ministry of Law and justice Government of India or the Special Secretary/Additional Secretary when so authorized by the Secretary, Law whose decision shall bind the parties finally and conclusively. The parties to the disputes will share equally the cost of arbitration as intimated by the arbitrator.

17.0 NOTICES AND ADDRESSES

Unless another form of notice is specified for a specific purpose under the CONTRACT, any notice or order required or permitted under this CONTRACT shall be in writing and shall be given either personally or by post or telegram or fax. In case of telegram and fax, the messages should be confirmed by concurrent letters (Post Copy Confirmation) and shall be deemed to be sufficiently given if received by the AUDITOR in normal course at the address set forth herein or if and when mailed by registered post, postage pre-paid addressed to such AUDITOR at the address set out below:

In the case of OWNER at:

Dy. General Manager (TS and R&D)
National Fertilizers Limited
Vijapur-473111 Guna (MP)

And in the case of the AUDITOR at:

Each AUDITOR may change the address at which notice is to be received by duly notifying the other AUDITOR well in advance.

18.0 JURISDICTION OF COURTS

Notwithstanding the place where the work under the contract is to be executed, it is mutually understood and agreed by and between the parties hereto that the contract shall be deemed to have been entered into at Vijaipur , Guna and all suits in respect of the contract shall be subject to the jurisdiction of the Courts at Guna only.

19.0 OBLIGATION OF THE OWNER

The obligation of the OWNER for fulfillment of the work shall be as follows:

- 19.1 The OWNER shall nominate Officer/Officers to represent OWNER for the purpose of the work and will notify the AUDITOR accordingly.
- 19.2 The OWNER shall supply to AUDITOR within reasonable time all necessary and relevant data and information in possession of the OWNER as may be required in furtherance of the CONTRACT.
- 19.3 The OWNER shall provide to the AUDITOR one copy of the Technical Operating Data for all Units of NFL for the relevant year for review.
- 19.4 During visit to the respective Units for conducting ENERGY audit, the AUDITOR shall make his own arrangement for boarding and lodging. Whenever Guesthouse accommodation is available, the same shall be provided to the AUDITOR or his officers on chargeable basis as per company's rules.
- 19.5 The OWNER shall review and approve all sketches, drawings, reports, recommendations and other matters referred to him for decision by the AUDITOR. The approval shall be accorded within such reasonable time as not to delay or disrupt the performance of the AUDITOR of their services, without prejudice to the responsibility of the AUDITOR under the CONTRACT.

19.6 The OWNER shall pay to the AUDITOR for the services under the CONTRACT as per agreed terms of payment.

20.0 OBLIGATIONS OF AUDITOR

The obligations of the AUDITOR in fulfillment of the Work under the CONTRACT shall be as follows:

20.1 The AUDITOR shall nominate Officer/Officers to represent him for the purpose of the WORK and will notify the OWNER accordingly.

20.2 The AUDITOR shall exercise all skill, care and diligence in the discharge of the services agreed to be performed by him, under the CONTRACT.

20.3 The AUDITOR shall execute the “Work” provided for and entrusted to him as per the CONTRACT in a thorough and workmanlike manner and with the best resources available with him in a professional manner in accordance with the plans, specification, terms and conditions contained herein. The AUDITOR warrants about the workmanship of the work executed by him and of the soundness of the documentation etc. as required of him under the CONTRACT.

21.0 INSURANCE

21.1 The AUDITOR shall be solely responsible for any loss, damage or injury etc. caused to his personnel deputed by him at the units for the WORK under the CONTRACT. Any compensation whatsoever payable on that account shall be borne and paid by the AUDITOR exclusively. The AUDITOR may arrange for necessary insurance coverage for the same at his own cost.

21.2 The AUDITOR shall indemnify the OWNER and every officer and employee of the OWNER against all actions, proceedings, claims, demands, costs and expenses whatsoever arising out of or in connection with matters referred to in relevant clauses and against all actions, proceedings, claims, demands, costs and expenses which may be made against the OWNER for or in respect of or arising out of any failure by the AUDITOR in the performance of his obligations under the CONTRACT.

21.3 The AUDITOR will indemnify the OWNER from all claims for injury caused to any person, while at the site of the OWNER.

22.0 WORKMEN COMPENSATION ACT:

Workmen Compensation Act and Accidental Insurance for the persons working inside factory on behalf of AUDITOR, while conducting ENERGY Audit is the sole liability of the AUDITOR.

23.0 TITLE OF DOCUMENTS

23.1 TITLE OF TECHNICAL DATA FURNISHED BY OWNER

Title of all technical data and information furnished to the AUDITOR by the OWNER under the CONTRACT shall remain with the OWNER. Such data shall not be used or divulged to others by the AUDITOR without the prior written consent of the OWNER, as the case may be except for the use in connection with the performance of the CONTRACT.

23.2 TITLE TO TECHNICAL DOCUMENT FURNISHED BY THE AUDITOR

Title to all the technical documents prepared and furnished by the AUDITOR to the OWNER under the CONTRACT shall remain with the AUDITOR. However, it is understood that only know-how incorporated in such documents shall remain with such AUDITOR who provides the know-how. Any of the said technical documents, prepared and furnished by the AUDITOR to the OWNER hereunder shall be kept by the OWNER as secret and confidential and the OWNER shall not use them for any purpose other than the intended purpose, nor disclose or divulge whole or part of these to any third AUDITOR without prior written consent of the AUDITOR. The secrecy and confidentiality of the documents mentioned herein shall not apply to the following documents:

- i) which at the time of disclosure, are in the public domain
- ii) which, after disclosure, become part of the public domain
- iii) which the OWNER can show were in the OWNER's possession at the time of the disclosure and were not acquired directly or indirectly from AUDITOR and
- iv) which have been furnished or made known to the OWNER by third AUDITOR as a matter of right and without any restriction on disclosure.

23.3 EXPIRATION OF REGISTRATION

Notwithstanding the fact that the CONTRACT is terminated for any reason, whatsoever and ceases to operate and bind the parties hereto, it is declared that this clause shall

remain operative until the aforesaid technical data, information or documents lose their confidential character for any reason whatsoever.

24.0 AUTHENTICITY OF DATA & CLARIFICATIONS

The AUDITOR shall ensure and declare the reliability and authenticity of the data and their source of compilation in the report on ENERGY audit submitted to the OWNER in pursuance of the work and in furtherance of the CONTRACT The OWNER reserves its right to seek any clarification on the aforesaid report and other documents in part or in whole even after the completion of the work.

25.0 TIME EXTENSION

If the AUDITOR requires any extension of time for completing the Work under the CONTRACT he must apply to be OWNER within seven days from the date of the occurrence of the event on account of which he desires such extension. OWNER shall have sole and unfettered discretion while deciding the request of the AUDITOR for extension of time. The decision of NFL shall be final and binding to the AUDITOR.

26.0 DELAY IN COMPLETION AND PENALTY/ PRICE REDUCTION

The time period for completion of the work as specified and stipulated in the NIT/CONTRACT to be signed between the OWNER and the AUDITOR is deemed to be the essence of the CONTRACT/Work Order. In the event of delay by the AUDITOR in the completion of work beyond agreed time schedule of completion, or within such extended time as may be permitted in accordance with Clause 25.0 above, Penalty/ Price Reduction @ 0.5% of the “ Contract Value excluding taxes and duties” per week (seven days) of delay attributable to the AUDITOR or part thereof will be levied on the AUDITOR subject to a maximum of 5% (five percent) of the Contract Value excluding taxes and duties. The OWNER will deduct said damages from the final payment payable to the AUDITOR and/or any other money due to the AUDITOR under these presents or may recover it otherwise.

27.0 CONTINUED PERFORMANCE

The AUDITOR shall not stop work in case of any dispute pending before arbitration/court/Tribunal in relation to the CONTRACT or otherwise unless further progress of works has been rendered impossible due to non-fulfillment of any reciprocal promise. Unilateral stoppage of work by the AUDITOR shall be considered a breach of

CONTRACT and the OWNER shall be within his rights authorized to take suitable and necessary action as he may deem fit to adequately protect his own interests.

XXXXXXXXXXXXXXXXXXXX

DECLARARTION-FORM-I

Ref. No; **NFL/VIJAIPUR/TS/ENRGYAUDIT/2014/01**

Dated : 10.11.2014

To,

Issuing Authority

National Fertilizers Ltd.

Vijaipur Unit

I/We _____ have read the conditions of Bid attached hereto and agree to abide by such conditions. I/We offer to do the job of _____

_____ at the rates quoted in the attached Schedule of Rates and in accordance with the specifications, standards and instructions in writing of the Engineer-in-charge of M/s. National Fertilizers Limited and hereby bind myself/ourselves to complete the work schedule and progress of work.

I/We also undertake that the terms and conditions of NIT are acceptable to us without reservations and no deviation to NIT have been taken while making the offer.

I/We further agree to abide by the conditions of contract and to carry out all work within the specified time in accordance with instructions referred to in the Notice Inviting Bids.

In case of acceptance of the Bid by National Fertilizers Limited, I/We bind myself/ourselves to execute the contract as per the conditions mentioned in the Bid documents, failing which, I/We shall have no objection to the forfeiture of the Earnest Money lodged with National Fertilizers Limited, Vijaipur

Thanking you

Yours faithfully

For M/s _____

(Signature of BIDDER with SEAL)

Address : _____

DECLARATION FORM-II

The following declaration to be signed by BIDDER and to be submitted along with required documents which would be duly self certified:

Sr. No.	DESCRIPTION			
1	If a Bider has relations whether by blood or otherwise with any of employees of NFL (Owner), the Bidder must disclose the relation at the time of submission of Bid, failing which, NFL shall reserves the right to reject the Bid or rescind the Contract.	YES / NO (If Yes, give the following details)		
		Name and Designation of the Employee	Place of Posting	Relation with the Employee
2.	P.F. Registration No of the BIDDER to be intimated along with Documentary proof thereof.	P.F. Registration Number		
3	PAN No of the BIDDER to be intimated along with Documentary Proof thereof.	PAN No		
4	Service Tax Registration No. with Documentary Proof. Accounting Code No. S.T.Code No.		
			
			
5	Registration Number of BIDDER and ACCREDITED ENERGY AUDITORS along with documentary proof thereof.	EA Regn. No.		
6	The BIDDER shall submit the name and address of the firm/company along with its status such as sole proprietorship/partnership or limited/private firm etc. along with its copies duly attested by Notary Public as evidence.			
7.	ESI Registration number (if applicable)			

Signature of the BIDDER with SEAL

PLACE : _____

Dated : _____

Attachment - I

PROFORMA FOR PERFORMANCE GUARANTEE BY AUDITOR

(To be executed on non-judicial stamp paper of appropriate value)

1. Whereas National Fertilizers Limited (hereinafter referred to as the "OWNER" which expression shall unless repugnant to the context or meaning thereof include their legal representatives, successors and permitted assigns of the one part) having their Registered Office at Core-III, SCOPE Complex, Lodhi Road, New Delhi, have appointed vide LOI/Work Order/entered into a CONTRACT dated _____ with M/s. _____ (hereinafter referred to as "AUDITOR" which expression shall unless repugnant to the context or meaning thereof include their legal representatives, successors and permitted assigns of the other part) having their registered office at _____ for carrying out ENERGY audit studies for the year ----- for ----- Unit of NFL.

AND whereas one of the conditions of the said LOI/CONTRACT is that the AUDITOR shall furnish to the OWNER a Bank Guarantee from Nationalized Bank for 10% (ten percent) of the agree fee as specified in Clause _____ of the said agreement against due and faithful performance by the AUDITOR of his obligations for services to be rendered under the said LOI/CONTRACT.

AND whereas the AUDITOR has approached _____ (name of the Bank with complete address), and at the request of the AUDITOR and in consideration of premises, we _____ (name of the Bank) do hereby agree to give such guarantee as hereunder and undertake to pay to the OWNER an amount not exceeding rupees _____ (being 10% of the agreed fee/charges to be paid under the Contract) against any loss or damage caused to or suffered or would be caused to or suffered by the OWNER by reason of any breach by the said AUDITOR of any of the terms and conditions and the specific guarantees contained in the said LOI/Work Order/CONTRACT.

2. We _____ (name of the Bank) hereby guarantee to the OWNER due observance and fulfilment by the AUDITOR of the terms and conditions of the said LOI/Work Order/CONTRACT and of the performance and other guarantees which are a part of the said CONTRACT and agree and undertake that if the AUDITOR fails to observe and fulfil the terms of the said CONTRACT, then the Bank shall immediately pay to the OWNER on demand such sum or sums of money to the extent of Rs. _____ (Rupees _____ only) being 10% of the agreed lump sum fee payable to the AUDITOR on account of losses and damages as may be claimed by the OWNER by reason of such non observance and non fulfilment by the AUDITOR as aforesaid and shall also indemnify the OWNER against all losses and damages which may be suffered by the OWNER as aforesaid and against all costs, charges, expenses which may be incurred by the OWNER in connection herewith not exceeding Rs. _____ (Rupees _____ only).

3. We _____(name of the Bank with complete address) do hereby undertake to pay the amounts due and payable under this guarantee without any demur, merely on a demand from the OWNER stating that the amount claimed is due by way of loss or damage caused or would to be caused to or suffered by the OWNER by reason of breach by the said CONTRACT of any of the terms or conditions and the specific conditions/guarantees contained in the said CONTRACT or by reason of the AUDITOR's failure to perform the said CONTRACT. Any such demand made on the Bank shall be conclusive as regards the amount due and payable by the Bank under this guarantee. However, our liability under this guarantee shall be restricted to an amount not exceeding Rs._____.

4. We _____(name of the Bank) undertake to pay to the OWNER money so demanded notwithstanding any dispute or disputes raised by the said CONTRACT in any suit or proceeding pending before any court or Tribunal relating thereto our liability under this present being absolute and unequivocal.

The payment so made by us under this bond shall be a valid discharge of our liability for payment there under and the CONTRACT shall have no claim against us for making such payment.

5. This guarantee shall be in addition to and not in substitution of any other guarantee or security to be furnished to the OWNER by the AUDITOR in respect of the said CONTRACT.

6. We _____(name of the Bank) further agree that the guarantee herein contained shall remain in full force and effect during the period that would be taken for the performance of the said CONTRACT and that it shall continue to be enforceable till all the dues of the OWNER under or by virtue of the said CONTRACT have been fully paid and its claims satisfied or discharged or till Chairman & Managing Director, of the OWNER certifies that the terms and conditions and the specific guarantees of the said AUDITOR have been fully and properly carried out by the said AUDITOR and accordingly discharges this guarantee. Unless a demand or claim under this guarantee is made on us in writing on or before the____(six months from the date of this guarantee)____, we shall be discharged from all liability under this guarantee thereafter.

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

8. This guarantee will not be discharged due to the change in the constitution of the Bank or the OWNER or the said AUDITOR.

9. We _____ (name of the Bank) lastly undertake not to revoke this guarantee during its currency except with the previous consent of the OWNER in writing.

10. The Bank hereby declares that it has the power to issue this guarantee and the undersigned have full power to do so.

Notwithstanding anything stated above, our liability under this guarantee is restricted to Rs. _____ (Rupees _____ only) and this guarantee shall expire on _____.

Unless a written demand or claim under this guarantee is filed against us within six months from the date of expiry of this guarantee, all rights of the OWNER under this guarantee shall be forfeited and we shall be relieved and discharged from all liabilities hereunder.

Dated the _____ day of _____

(Signature of a person duly authorised
to sign on behalf of the Bank)

CONTRACT

(To be executed on non-judicial stamp paper of appropriate value to be arranged by AUDITOR at his cost)

THIS "CONTRACT" is made at Delhi on this _____ day of _____ in the Christian Year Two Thousand ____ between M/s. _____ (hereinafter referred to as the AUDITOR), which expression shall unless excluded by or repugnant to the context include its successors and permitted assigns of the one part and National Fertilizers Ltd., a Government of India Undertaking incorporated under the Companies Act 1956, having its manufacturing Unit at ----- and Corporate Office at A-11, Sector-24, Noida (UP) (hereinafter referred to as the OWNER) which expression shall unless repugnant to the context or contrary to the meaning thereof, include its successors and permitted assigns of the other part.

WHEREAS, the OWNER is operating gas based Ammonia - Urea plants at ----- with dedicated off site and utility facilities and desires to carry out ENERGY audit studies for the above mentioned Unit of NFL.

AND WHEREAS the OWNER had vide their letter no. ----- dated _____ desired AUDITOR to carry out ENERGY Audit studies of ----- Unit of NFL.

AND WHEREAS in response to the above said letter, the AUDITOR submitted his offer by complying with the required formalities as stipulated on the letter no. _____ dated _____.

AND WHEREAS, the OWNER has accepted the offer of the AUDITOR for carrying out ENERGY Audit of _____ unit (hereinafter referred to as the "WORKS") on a Lump sum charges of Rs. _____ (Rupee _____) as indicated in Clause _____ of the WORK ORDER titled "Lump-sum charges for carrying out subject studies and upon the terms and subject to the conditions contained in the WORK ORDER issued vide Letter No. ----- dated _____ in terms of Clause _____ of the NIT for performing the "WORKS" as more particularly enumerated or referred in the WORK ORDER,

AUDITOR's offer, subsequent correspondence, special terms and conditions etc. All the said documents are deemed to form part of this CONTRACT (hereinafter referred to as "CONTRACT").

AND WHEREAS on acceptance of the WORK ORDER on _____, the AUDITOR has agreed to perform their obligation under the WORK ORDER/CONTRACT.

AND WHEREAS the OWNER has agreed to make the payments to the AUDITOR in accordance with the terms and conditions of the WORK ORDER.

AND WHEREAS now the parties hereto have agreed to enter into this CONTRACT in terms of Clause _____ of the WORK ORDER.

NOW THIS CONTRACT WITNESSETH AND IT IS HEREBY AGREED AND DECLARED BY AND BETWEEN THE PARTIES HERETO AS UNDER.

2. In consideration of the amount as indicated in Clause ____ of the WORK ORDER, titled "Lump-sum charges agreed to be paid to AUDITOR, in the manner as specifically provided in Clause ____ of WORK ORDER, the AUDITOR has agreed to do perform all works and things mentioned and described in the WORK ORDER or which are implied therein or there from respectively or are reasonably necessary for the completion of the WORKS, within the mutually agreed time schedule, in the manner and subject to terms, conditions and stipulations contained in the WORK ORDER.
3. For due and faithful performance by the AUDITOR of his obligation as specifically set out in the WORK ORDER, the OWNER shall pay to be AUDITOR a lump sum amount as indicated in Clause _____ of the WORK ORDER and in the manner as provided in the Clause ____ of the WORK ORDER.
4. It is hereby agreed and declared that NFL's letter issued to the AUDITOR, the AUDITOR's offer, subsequent correspondence as mentioned in the WORK ORDER & WORK ORDER forming part of CONTRACT shall be binding upon the AUDITOR and the OWNER as if the same have been incorporated herein and shall be read as part of these presents. The parties under the CONTRACT further agreed and declared that they have understood the terms and conditions of all the documents, forming part of this CONTRACT and have agreed to honour all Clauses with all privilege, rights and agreements between the parties are merged herein and are made part of this CONTRACT.

The list of documents, letters exchanged between the OWNER & the AUDITOR are as follows: -

- OWNER's NIT No. NFL/SEPC/CO/_____ dated_____
- AUDITOR's Offer No. _____
- Subsequent correspondence. LOI, Work Order etc.

In witness whereof the parties hereto have set their hands and seals, this _____ day of _____ the year first above written.

Signed, sealed and delivered by

Signed, sealed and delivered by:

For M/s. (AUDITOR)

For M/s. (OWNER)

In the presence of:

In the presence of:

1. _____

1. _____

2. _____

2. _____

PRICE BID**SCHEDULE OF LUMP SUM PRICE**

(All prices are in Indian Rupees)

S.no.	Description of item	Rupees
1	<i>Professional Fee for carrying out the ENERGY AUDIT in line with BEE notification dated 27.05.2014 and in accordance with BEE (Manner and Intervals of Time for conduct of Energy audit) Regulations, 2010 for Vijaipur Unit.</i> Basic Lump sum Price. In figures * In words *	
2	<i>Service Tax</i> - As (%) of Basic Lumpsum fees at 1 above - As Value In figures and words	
3.	<i>Any other - Charges</i> - <i>Taxes</i>	
	<i>Total Contract Value (1 +2 +3)</i>	

* The above-mentioned prices include all the Travelling, Lodging & Boarding expenses.

** Rate of Taxes & Duties and the amount as applicable on date of submission of offer is to be indicated at 2.0 above.

SIGNATURE OF BIDDER WITH STAMP

ANNEXURE-V

Brief Write-Up of National fertilizers Limited, Vijaipur complex

National Fertilizers Limited, a Govt. of India Undertaking, was incorporated on 23rd August 1974. It is the second largest producer of nitrogenous fertilizer in the country and has four operating fertilizer units located at Nangal, Bhatinda, Panipat and Vijaipur with a total installed capacity of 35.65 lakh tones Urea.

The Vijaipur unit, which is an IMS certified unit (ISO 9001:2008, ISO 14001:2004 & OHSAS 18001:2007), comprises of two streams of Ammonia and Urea Plants -Vijaipur-I and Vijaipur-II. Reassessed capacities of Ammonia plants are 1520 MTPD each and that of Urea Plants are 2620 each. Vijaipur unit is the first Natural Gas based fertilizer unit on the cross-country Hazira- Vijaipur- Jagadishpur Natural gas pipeline. Vijaipur-I plants were commissioned in December 1987 and after a decade Vijaipur-II plants were commissioned in March 1997. Both the streams are based on “*Steam reforming process*” of Haldor Topsoe (Denmark) for Ammonia plants with Natural gas feed in Vijaipur-I & NG/Naphtha feed in Vijaipur-II. The Urea plants are based on Snam Progetti (Italy)’s “*Ammonia stripping process*” . However, certain technological developments those had taken place after commissioning of Vijaipur-I, were incorporated in Vijaipur-II Plant.

Vijaipur-I and Vijaipur-II plants have been revamped w.e.f. 24.04.2012 and 31.07.2012 respectively along with CDR (Carbon di-oxide recovery plant) of 450 MTPD.

Post revamped rated capacities of Vijaipur-I and Vijaipur-II plants are tabulated below:

Plant	Pre-revamp rated capacity	Post revamp rated capacity
Ammonia-I	1520 MTPD	1750 MTPD
Urea-I	2620 MTPD	3030 MTPD
Ammonia-II	1520 MTPD	1864 MTPD
Urea-II	2620 MTPD	3231 MTPD
CDR	Not applicable	450 MTPD.

Vijaipur Unit is self reliant in Power. 03 Nos Gas Turbine Generators (GTGs) coupled with HRSGs ensure uninterrupted Power supply as well as efficient use of Gas Turbine exhaust gases for raising steam in HRSGs supported by supplementary firing. In the GTs as well as HRSGs there is provision for use of liquid fuels, viz. Naphtha. Capacities of GTGs and HRSGs are tabulated as follows.

GTG-I	17.225 MW at 46 DegC	HRSG-I	180 Ton/Hr steam of 42 Kg/cm ² g at 382 DegC
GTG-II	17.225 MW at 46 DegC	HRSG-II	180 Ton/Hr steam of 42 Kg/cm ² g at 382 DegC
GTG-III	17.75 MW at 46 DegC	HRSG-III	120 Ton/Hr steam of 110 Kg/cm ² g at 510 DegC

There are other Auxiliaries, viz. Water Treatment Plants; Cooling Towers; Atmospheric Ammonia Storage; Instrument & Service Air System; Effluent Treatment and Management Systems; etc. Elaborate conveying system along with Bagging Plant ensures dispatch the Urea produced.

ANNEXURE-VI

National fertilizers Limited, Vijaipur Guna (MP)

Comprehensive Energy Audit of Ammonia, Urea and offsite facilities including Boilers and captive power Generation facilities at NFL Vijaipur. Besides following major equipment's/machinery has been identified for performance evaluation for energy efficiency for NFL Vijaipur complex.

- 1) Cooling towers of Ammonia-I & II and Urea -I &II plants.
- 2) CO₂ compressor & turbine of Urea-I & II plants
- 3) Synthesis compressor of Ammonia-I & II plants
- 4) Cooling water circulation pumps Vijaipur I&II
- 5) Heat recovery unit of C P & O plants
- 6) Gas turbine generators of CP&O plants
- 7) High pressure Ammonia feed pumps and Carbamate recycle pump of Urea I & II
- 8) Primary reformer including waste heat recovery section of Ammonia I & II plant.
- 9) Secondary reformer of Ammonia I&II plant
- 10) GV section absorber & regenerator of Ammonia I&II plant
- 11) Synthesis convertor of Ammonia I&II plant
- 12) All heat exchangers in the complex.
- 13) ID & FD fan , BFW & GV pumps of Ammonia-I&II
- 14) Gas turbine & process air compressor along with HRSG boiler of Ammonia-II

NATIONAL FERTILIZERS LIMITED, VIJAIPUR-I

(C) BRIEF PROCESS DESCRIPTION OF PLANTS

I. AMMONIA PLANT

Ammonia is produced from mixture of Hydrogen (H₂) & Nitrogen (N₂), where the ratio of H₂ to N₂ shall be approximately 3:1. Besides these two components, the mixture shall contain inert gases, such as argon (Air) & methane (CH₄), to a limited degree.

The source of H₂ is hydrocarbons of the natural gas and the source of N₂ is the atmospheric air.

Process steps necessary are as follows:

(1) DESULPHURIZATION:

Natural gas feedstock, which may contain maximum of 50-ppm (by vol.) sulphur compounds, is desulphurised. Reaction takes place in two stages –

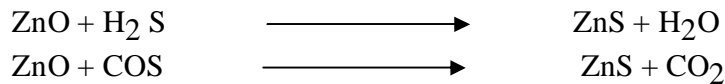
- (i) Hydrogenation (ii) H₂S Absorption

Hydrogenation takes place in the hydrogenator at a temperature of 390°C. H₂S absorption takes place in the two ZnO absorbers connected in series. After desulphurization, content of sulphur is lowered to less than 0.05 ppm (by volume).

The natural gas feed stock is passed to two preheater coils in the waste heat section, where it is preheated to 390°C before entering the HDS reactor. Hydrogen required for the hydrogenation is supplied as synthesis gas from the synthesis gas compressor and added to the natural gas downstream preheater. The HDS reactor is equipped with Ni-Mo based catalyst

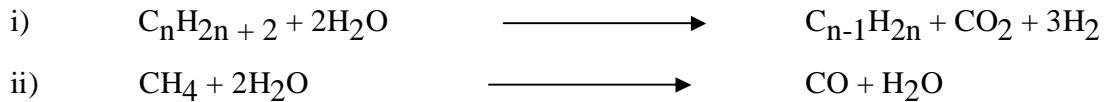
(2) ABSORPTION

From the HDS-reactor, the hydrogenated natural gas is fed to the two ZnO absorbers connected in series, each vessel having one catalyst bed. The normal operating temperature is between 350 - 400°C. The following reactions take place,



(3) REFORMING SECTION:

Desulphurised NG is converted into raw ammonia synthesis gas by catalytic reforming of the hydrocarbon mixture with steam and air. Process can be described by following reactions:



Reaction (i) describes the mechanism of reforming of the higher hydrocarbon, which are reformed in stages lower and lower hydrocarbon, finally resulting in methane, which is reformed according to reaction (ii). The shift reaction requires only little heat, whereas the heat required for (i) & (ii) quite dominates the picture.

Reaction takes place in two steps in the two reformers. In the primary reformer, the necessary heat of reaction is supplied as indirect heat by firing and in secondary reformer the heat is supplied as direct heat of combustion of the gas mixture with air. Introduction of air provides N_2 for ammonia synthesis. Since the H_2/N_2 reaction in the purified synthesis gas must be maintained at a value close to 3.0, the amount of air is fixed. An operating pressure of approximately 35 kg/cm²g in the reforming section gives a reasonable economic comprise.

(3.1) PRIMARY REFORMER

The first step of the steam reforming takes place in the first reformer, where hydrocarbon and steam mixture, preheated to 505 - 520°C is passed downwards through vertical tubes containing catalyst. Primary reformer is fired heater where the sensible heat and the heat of reaction are transferred by radiation from a number of wall burners to the catalyst tubes.

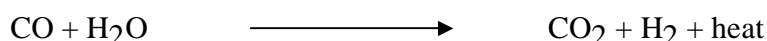
The hydrocarbon in the gas which leaves first reformer, is converted to methane and content of methane is approximately 10 mole % (on dry basis). The exit temperature is 770°, which is also the inlet temp to the second step of the reforming.

(3.2) SECONDARY REFORMER

In this, process gas is mixed with air. The partial combustion takes place in the top part and causes considerable increase in temperature. From this, gas passes down through catalyst bed, where last part of the reforming is carried out with simultaneous cooling of the gas. The temp of process gas is about 990°C and the methane concentration is approximately 0.30mole% (on dry basis). The exit gas contains about 13 mole% CO and 7.3 mole% CO₂. The cooling of the process gas is carried out in waste heat boiler, where the exchanged heat is used for producing main part of the high pressure steam in the ammonia plant.

(4) CO-CONVERSION SECTION

Process gas leaving secondary reformer contains approximately 13 mole % CO which is converted into CO₂ and hydrogen by shift reaction:



After exhaustion of MT shift catalyst, LT shift catalyst has been charged in the MT shift converter because of high cost of MT shift catalyst. While HT catalyst is chromium oxide promoted iron catalyst, LT catalyst is copper & zinc based catalyst.

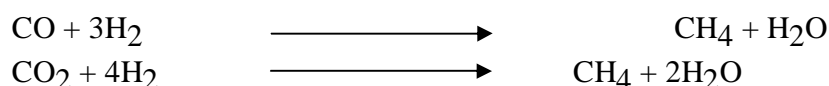
CARBON DIOXIDE (CO₂) REMOVAL (GV)

. Process gas leaving Shift Reactor contains approximately 17 - 18% which is removed in GV section by absorption in hot aqueous potassium carbonate solution with glycine and DEA as activators and V₂O₅ corrosion inhibitor. CO₂ rich gas flows upwards in absorber where CO₂ is absorbed in the hot potassium carbonate solution. The outlet gas contains 0.03 mole % CO₂.

The CO₂ laden solution leaving the absorber is regenerated in two regenerators - 1st regenerator operating at 1.2 kg/cm² and the second at 0.2 kg/cm². The recovered CO₂ is sent to Urea plant.

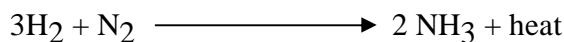
(6) METHANATION

In this, carbon oxides are converted into methane, which acts like an inert gas in ammonia synthesis. The following reactions take place at 300° in two beds of Ni based catalyst:



(7) AMMONIA SYNTHESIS SECTION:

The following reaction takes place,



The ammonia synthesis consists S-200 & S-50 Convertors followed by two waste heat boilers, loop has been designed for a maximum pressure of 245 kg/cm² and the normal operating pressure is 180-200 kg/cm²g. Normal operating temp will be in range of 260 to 525 °C for the first bed and 370 to 460°C for the first bed and 370 to 460°C for the second bed. The basket consists of two catalyst beds and an inter bed heat exchanger, placed in the center of the upper catalyst beds. S-50 consists single bed the inlet and outlet temp. are 341°C and 402 °C Heat liberated by the synthesis reaction is utilised for high pressure steam production in synthesis loop Waste heat boilers and pre-heat of high pressure boiler feed water.

About 30% of the reactants (H₂ and N₂) at the converter synthesis gas is recycled back to synthesis loop after recovery of ammonia. Re-circulation is carried out by means of the recirculator, integral part of the synthesis gas compressor.

Converter effluent gas is cooled stepwise, first in loop waste heat boilers, from 410°C to 338°C and 402°C to 328°C and then in the boiler feed water pre-heater, and then in the hot heat exchanger to 65°C by preheating of converter feed gas. Synthesis gas is then cooled to 39 °C in the water cooler and to 30-31°C in the cold heat exchanger wherein converter feed gas is preheated. Final cooling to 12°C takes place in the ammonia chillers. Condensed ammonia is separated in separator. From the top of separator the recycle gas is re-circulated to the converter through cold heat exchanger, re-circulation and hot heat exchanger.

Make-up synthesis gas is introduced between the two ammonia chillers to remove water and CO₂ in condensed ammonia to avoid catalyst poisoning. Condensed ammonia from separator is sent to let down vessel where liquid Ammonia separated from recycle gas is sent to Urea Plant as product at 24 kg/cm² g pressure.

In the event of ammonia to be sent to Ammonia Storage tank, liquid from let down vessel is flashed in Flash vessel. Vapours from top are sent to refrigeration compressor for compression followed by water cooling in ammonia condenser. Liquid ammonia from Flash vessel is

pumped to Ammonia Storage Tank at 3 kg/cm²g pressure and -32°C temp. Refrigeration is supplied to the synthesis loop by three stage ammonia chiller levels.

TWO STREAMS: 11 & 21 STREAM WITH 1100 TONS/DAY EACH

Raw materials required are ammonia and carbon dioxide. Ammonia is in liquid form while carbon dioxide is in gaseous form. Normal pressure for ammonia is 23 Atmospheric while temperature for ammonia is -33°C min, 12°C normal and 25°C max. While for carbon dioxide normal and maximum pressure are 1.58 Ata/1.68 Ata while temperature is 40°C.

PROCESS DESCRIPTION:

Urea production process takes place through the following four main operations.

(1) UREA SYNTHESIS AND HIGH PRESSURE RECOVERY:

Urea is produced from liquid ammonia and gaseous carbon dioxide. These two react to form ammonium carbamate, a portion of which dehydrates to form urea and water. The reactions are as follows:-



In synthesis condition (T=190°C, P = 160 kg/cm²), first reaction occurs rapidly and is completed, second reaction occurs slowly and determines reactor volume. The Mole ratio of ammonia to carbon dioxide is 3.6 to 1.

The liquid mixture of ammonia and carbamate enters the reactor where it reacts with carbon dioxide. A small amount of air is added at compressor's suction in order to passivate S.S surfaces protecting them from reagents and reaction product. Reaction product goes to the steam heated falling film stripper, operates at the same pressure as the reactor. Mixture is heated as it flows down the falling film exchanger. CO₂ content of solution is reduced by the stripping action of ammonia as it boils out of the solution.

(2) UREA PURIFICATION AND LOW PRESSURE RECOVERY

Urea purification takes place in two stages at decreasing pressure as follows:

1st stage at 18 Ata pressure & 2nd Stage at 4.5 Ata pressure.

(3) UREA CONCENTRATION SECTION

Solution leaving low pressure decomposer bottom with about 72% urea is sent to the first vacuum concentrator operating at a pressure of 0.3 Ata.

Mixed phase coming out of first vacuum concentration enters the gas liquid separator, where from the vapours are extracted by the first vacuum system, while the solution enters 2nd vacuum concentrator operating at a pressure of 0.03 Ata.

(4) UREA PRILLING

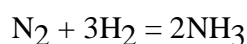
Melted urea leaving second vacuum separator is sent to Prilling bucket. Urea coming out of bucket in the form of drops falls along the prilling tower and encounters a cold air flow which causes its solidification.

The solid prills falling to the bottom of prilling tower are sent to belt conveyor. From there, they are sent to screeners to retain lump only, and then to belt conveyor, which carries the product to automatic weighing machine and to the urea storage section

BRIEF ACCOUNT OF MANUFACTURING PROCESS FOR EACH PRODUCT AT VP-II

1. MANUFACTURING PROCESS FOR AMMONIA (CAPACITY 1520 MTPD)

Ammonia is produced from a mixture of Hydrogen (H₂) and Nitrogen (N₂), where the ratio of (H₂) to (N₂) is approximately 3:1



Ammonia production in NFL, Vijaipur Expansion is based on "Steam Reforming of Hydrocarbons" process of M/s HTAS (Denmark), which uses Natural Gas/Naphtha and water(steam) as source of H₂ and atmospheric air as source of N₂.

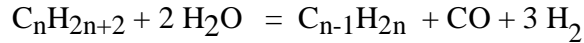
Ammonia is produced in the following process steps: -

i) DESULPHURIZATION

Natural Gas/Naphtha feed stock, which contains sulphur compounds, is desulphurised to prevent sulphur poisoning of reforming catalysts. Desulphurization takes place in two steps-hydrogenation followed by H₂S absorption. In the hydrogenation section, the sulphur containing compounds in the feed are hydrogenated to H₂S. Separate HDS reactors for NG and Naphtha having Ni-Mo and Co-Mo catalysts respectively have been provided. The outlet streams from the HDS reactors are mixed and fed to two nos. ZnO absorbers to remove H₂S is absorbed.

ii) REFORMING

The desulphurised gas is converted into raw ammonia synthesis gas by catalytic reforming of Hydrocarbon mixture with steam and air. Following reactions take place.

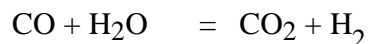


Reactions take place in two steps (Primary Reforming and Secondary Reforming) when Natural Gas is feed stock and in three steps (Adiabatic Pre-reforming, Primary Reforming and Secondary Reforming) with mixed feed. In case of mixed feed (Naphtha along with Natural gas), the desulphurised gas sent to an adiabatic pre-reformer where all higher hydrocarbons are virtually decomposed into methane by steam reforming. The outlet gas from pre-reformer is then sent to primary reformer.

In the Primary reformer, which operates at 35 kg/cm²g pressure, the hydrocarbons and steam mixture passes downwards through vertical tubes containing Ni based catalyst. The exit gas from primary reformer is at 800 °C and contains approx. 10 mole % methane (on dry basis). In the secondary reformer, the process gas is mixed with air. The air is compressed in the Process Air Compressor driven by Gas Turbine. Exothermic reaction takes place inside the reformer containing Ni-based catalyst. The methane content in the Secondary reformer exit gas (at 990 °C) is approx. 0.3 mole %. Cooling of the process gas is carried out in waste heat boiler where superheated high pressure steam is produced.

iii) CO SHIFT CONVERSION

Process gas leaving reformer contains approx. 13 mole % CO which is converted into CO₂ by shift reaction in two Shift Converters (HT and LT) in series.



HT Shift Converter contains Chromium Oxide promoted iron catalyst and LT Shift Converter contains copper based catalyst.

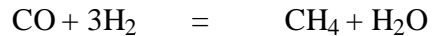
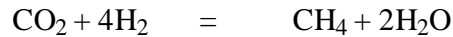
iv) CARBON DIOXIDE (CO₂) REMOVAL (GV)

Process gas leaving Shift Reactor contains approximately 17 - 18% which is removed in GV section by absorption in hot aqueous potassium carbonate solution with glycine and DEA as activators and V₂O₅ corrosion inhibitor. CO₂ rich gas flows upwards in absorber where CO₂ is absorbed in the hot potassium carbonate solution. The outlet gas contains 0.03 mole % CO₂.

The CO₂ laden solution leaving the absorber is regenerated in two regenerators - 1st regenerator operating at 1.2 kg/cm² and the second at 0.2 kg/cm². The recovered CO₂ is sent to Urea plant.

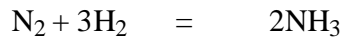
v) METHANATION

The CO₂ and CO content in the GV section exit process gas is converted into methane in order to prevent poisoning of the synthesis catalyst. The following reactions take place at 300 °C in two beds of Ni based catalyst.



vi) AMMONIA SYNTHESIS

Ammonia synthesis takes place in the synthesis converter according to the following reaction.



The synthesis gas after methanation is compressed in the Synthesis Gas Compressor to 210 - 220 kg/cm²g and then fed to radial flow Topsoe Synthesis Converter containing two catalyst beds (promoted iron catalyst) with inter bed heat exchanger. Normal operating temperature is 260 - 525°C for the first bed and 370 - 460 °C for the second bed.

Heat liberated by the synthesis reaction is utilised for producing high pressure steam in the synthesis loop waste heat boiler.

Converter effluent gas is cooled to 12 °C. in various exchangers & chillers. Ammonia is condensed and separated in a separator. The separator outlet gas is recirculated to the converter. Product ammonia is either sent to Urea Plant or to the Atmospheric Storage Tanks.

LATEST FACILITIES IN VIJAIPUR-II (AMMONIA)

i) GT/PAC/HRU

Air is required for secondary reforming of process gas, at a pressure of 34 Kg/Cm². This is accomplished by compressing in a multistage compressor, driven by a Gas turbine. The fuel for the turbine is Natural gas. The exhaust gases from the turbine contain sufficient heat, which is utilised for generating steam in a Heat Recovery Unit (HRU). Supplementary firing is also provided in the HRU (NG or Naphtha or NG+ Naphtha both), to augment steam production. Steam is produced at 107 Kg/CM² & 525 °C, with a maximum rated capacity of 120TPH. However HRU can be operated only when the GT is in operation, as no FD air facility is provided.

The main advantage of usage of GT/PAC/HRU is substantial saving in energy. In Conventional steam turbines, the latent heat of the exhaust steam is wasted in Cooling water. In GT no such loss is there leading to higher efficiency. The heat from the Exhaust is recovered in HRU for generation of Useful steam.

ii) **PRE-REFORMER**

Naphtha contains substantial quantities of Higher hydrocarbons. In case of mixed feed, the process gas contains substantial quantities of hydrocarbons. The primary reformer is not suitable for processing of large quantities of higher hydrocarbons.. The Pre-reformer is installed upstream of the Primary reformer, where the higher Hydrocarbons are cracked down to methane & other lower hydrocarbons which are suitable for primary reformer catalyst, thus eliminating any possibility of damage to the Primary reformer Catalyst.

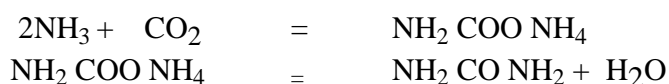
II) **UREA PROCESS**

TWO STREAMS (31/41) 1320 MTPD EACH

Urea production which is based on Snam Progetti's Ammonia stripping process, takes place in the following main process steps.

i) **UREA SYNTHESIS AND HIGH PRESSURE RECOVERY**

Urea is produced from liquid ammonia and gaseous carbon dioxide. These two react to form ammonium carbamate, which dehydrates to form urea and water. The reactions are as under :



Hence, overall reaction is,



At Reactor Condition (Temp =190 °C, Pr = 160 kg/cm²g), the first reaction occurs rapidly and is complete, whereas the second reaction occurs slowly and is incomplete. The mole ratio of ammonia to carbon dioxide in the reactor is maintained at 3.6: 1.

Both the raw materials required for Urea production, i.e. ammonia and carbon dioxide are available from Ammonia Plant. Carbon dioxide is compressed to 160 kg/cm²g by steam turbine driven CO₂ compressor (31/41 K-1). Ammonia is pumped to approx. 250 kg/cm²g by H.P. Ammonia Feed Stock Reciprocating Pumps.

Reaction product goes to the steam heated falling film stripper (E-1), operating at the same pressure as the reactor. In order to prevent corrosion, a small amount of air is introduced at the bottom of the stripper by means of passivation air compressor (K-3 A/B). Mixture is heated as it flows down the falling film exchanger. Unconverted Carbamate is decomposed by the stripping action of ammonia as it boils out of the solution.

ii) **UREA PURIFICATION AND LOW PRESSURE RECOVERY**

Solution containing Urea is purified with further decomposition of Carbamate in two stages at decreasing pressures. The pressure in the 1st stage is maintained at 18 ata and in the 2nd stage at 4.5 ata.

iii) UREA CONCENTRATION SECTION (VACUUM SECTION)

Solution leaving low pressure decomposer (4.5 ata.) bottom with about 72% urea is concentrated to approx. 99.5% in two stage Vacuum concentrators operating at 0.3 ata and 0.03 ata. respectively.

iv) UREA PRILLING

Melted urea leaving second vacuum separator is sent to prilling bucket. Urea coming out of bucket in the form of drops falls in the prilling tower and encounters a cold air flow which causes its solidification. The prilled urea is either directly sent to Bagging Plant or to Silo.

v) WASTE WATER SECTION

Process condensate from Vacuum section, containing approx. 4.5% Ammonia and 1% urea, is sent to hydrolyser where urea is hydrolysed to ammonia and CO₂. Hydrolysed solution (containing ammonia and

CO₂) is sent to a stripper where ammonia and CO₂ recovered from top is recycled to the system. The purified water from stripper bottom is used as makeup water either in Cooling water or DM Plant.