

**Government of India
Department of atomic energy
Nuclear Fuel Complex
Electrical projects
Hyderabad – 500 062**

**NOTICE INVITING e-TENDER (NIT)
Tender No E/525/2017**

1.0 Introduction:

1.1 On line item rate tenders (**e-tendering**) in **TWO ENVELOPE SYSTEM** are invited on behalf of the President of India from approved and eligible contractors of DAE, e-registered and those of appropriate list of CPWD, Department of Telecommunications, M.E.S., Railways and State PWD and / or having experience in similar works for the work of:

**“Providing Standby Blowers catering to NUOFP (O), CFFP(P),
Metallography section along with ducting, etc.”at NFC Hyderabad”**

1.2 The estimated cost of the work is approximately **Rs 83 Lakhs.**

1.3 Earnest Money Deposit (EMD) of **Rs. 1,66,000/- (Rupees One lakh Sixty Six Thousand only)**

2.0 Detailed Scope Of Work:

Detailed Scope of work shall be briefly but not limited to the scope of work as mentioned in **Appendix-II to this Detailed NIT**. The scope of work shall include all specifications, terms and conditions, schedule of rates and its preamble etc. as included in the bidding document and its subsequent Amendment, if any.

3.0 Time Schedule: The time schedule for completion of work in all respects shall be 08 (Eight) calendar months to be reckoned from the 15th day after the date of written orders to commence the work.

4.0 Fees Payable by the bidder:

4.1 Cost of Tender Document: Nil

4.2 Transaction fee for Tender processing:Rs. 4773/- (Rupees Four thousand seven hundred and seventy three only), non refundable drawn in favour of "ITI Limited", payable at New Delhi in the form of Demand Draft/Pay Orders/Banker’s cheque from a Scheduled Bank. The payment can also be made through Internet Banking/ Credit Card/ Debit card.

4.3 Earnest Money Deposit (EMD) of Rs. 1,66,000/- (Rupees One lakh Sixty Six Thousand only) shall be submitted in the form of Demand Draft/ Pay Order/ Banker’s Cheque / Deposit at Call receipt/ FDR of a Scheduled Bank issued in favour of “ Pay & Accounts Officer), NFC,” payable at Hyderabad. A part of EMD is acceptable in the form of bank

guarantee also. In such cases 50% of earnest money will have to be deposited in the shape prescribed above and balance can be accepted in the form of bank guarantee issued by a scheduled bank.

4.4 In case the contractor fails to commence the work specified in the tender document as per the time schedule mentioned, then the Government shall, without prejudice to any other right or remedy be at liberty to forfeit whole EMD absolutely.

5.0 If any Tenderer fails to submit any fee (Tender processing fee/EMD) repeatedly, then Tender Inviting Authority (TIA) will debar the Tenderer for a minimum period of one year

6.0 No pre bid meeting for this tender. Any queries on the tender may be sent to krao@nfc.gov.in or crk@nfc.gov.in for clarification

7.0 Important dates:

Tender Document available on website www.tenderwizard.com/DAE for free view & download :	From 06/07/2017 to 22/07/2017 upto 14:00hrs
Last Date and time of online submission/ uploading of Bid including Bidder's credentials, attested copies, and all fees / EMD :	10/08/2017 upto 14:00hrs
Last date for submission of Hard Copies to NFC Office :	18/08/2017 upto 14:00hrs
Place of Submission of hard copies of Bid Fees, EMD :	Dy. Chief Engineer (CED,PD & EP) , Civil Engineering Division-Electrical Projects, 2 nd Floor, Sarathi Building, Nuclear Fuel Complex, Hyderabad-500062, India To be handed over in the Office
Date and time of online opening of Part -I (Eligibility & Technical bid) :	18/08/2017 at 15:00hrs
Date and time of on line opening of Part-II (Financial Bid) :	Will be intimated to the qualified bidders later on.
Bid Validity :	The Bid shall be valid for a period of 120 (One hundred and twenty) days from the date of submission

Contact Person of NFC for clarification/ information :	Shri B S V S Kameswara Rao, Dy. Chief Engineer (CED,PD & EP) Ph: 040-27184025, Fax: 040 -27122532.
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8.0 Registration in website & downloading the tender document

a) Agencies registered in Tender wizard only can purchase / download & submit / upload tenders.

b) Agencies interested to participate shall have class-III valid Digital Signature Certificate (DSC) and register themselves under tender wizard only, and subsequently can download and submit/upload bid. Details of registration for e-tendering will be available on website www.tenderwizard.com/DAE under icon “enrolment”. For assistance/clarifications if any contact Sri Vijay Kumar 7207042074 or 9666515154, DAE helpdesk.

The registration process will take about 4 days. Advance action for registration is advised.

c) However, Bidder can view the tender document without registration and DSC but can't upload / download schedules for participation.

d) Bidders may get class-III Digital signature from any reputed IT organization like e-mudra, TCS, MTNL, GNFC etc. Subsequently, User ID and password shall be obtained for participation in tendering by registering in website www.tenderwizard.com/DAE under icon “enrolment”.

9.0 Bidder's Eligibility Criteria (BEC)

9.1 Experience Criteria

(A) Bidder should have satisfactorily completed during **last 7 years** ending 1.4.2017

One similar completed work not less than **80%** of Estimated cost i.e. **Rs. 66 Lakhs**

‘OR’

Two similar completed works **each** costing not less than **60%** of Estimated cost i.e. **Rs. 49.8 Lakhs**

‘OR’

Three similar completed works **each** costing not less than **40%** of Estimated cost i.e. **Rs. 33 Lakhs.**

Attested copies of experience certificates as proof of evidence as stated above are to be uploaded and to be submitted.

(B) The value of executed work will be brought to the current costing level by enhancing the actual value of work at simple rate of 7% per annum to be calculated from the date of completion to the last date of receipt of tender as mentioned in NIT. The cost of materials supplied free of cost by the Client, shall be excluded in value of order.

(C) For the purpose of this clause, 'similar work' means “ **Supply, Installation, Testing & Commissioning of Blowers along with required electrical, piping, ducting, dampers, grilles & associated supporting structure etc.**

9.2 Financial Criteria (Eligibility criteria for participation in tendering)

(A) Turnover

(I) The **average annual financial turn over on works contracts** should be at least **100% of the estimated cost** during the immediate last 3 consecutive financial years.

(II) The Bidder should **not have incurred any loss in more than two years during last 5 years period ending with last financial year.**

(III) **Copy of Auditor's Balance sheet and duly filled in FORM-C** included in the Tender document **should be uploaded and submitted by bidders in support of the Annual Turnover criteria.** The full audited financial statement with all schedules and profit and loss account shall be uploaded in website by the bidder.

The **turnover** shall be a certificate from the **Chartered Accountant** for the **last five years** as mentioned in the Tender Document should also be uploaded.

(B) Solvency:

Bidder should have the solvency equal to **40%** of the estimated cost of the work i.e. **Rs. 33 Lakhs.**

Copy of **Fresh Solvency Certificate** issued by any scheduled Bank after 01.04..2017 (as per **Appendix-III to detailed NIT**) and **FORM-D of this Tender document** are required to be uploaded and submitted.

(C) Bidding Capacity:

The bidding capacity of the bidder should be equal to or more than the estimated cost of this Tender work. The bidding capacity shall be worked out by the following formula:

$$\text{Bidding Capacity} = [A \times N \times 2] - B$$

Where,

A = Maximum value of turnover in any one year during the last five financial years taking into account the completed as well as works in progress with current costing level by enhancing the actual value of work at simple interest of **7% per annum**, calculated from the date of completion to last date of tender as mentioned in NIT.

N = Number of years prescribed for completion of work for which bids has been invited.

B = Value of existing commitments and ongoing works to be completed during the period of completion of work of this tender.

The Auditor's certificate to the information given by the bidder and bidding capacity of the bidder shall be uploaded and submitted.

(D) Copy of Registration of VAT(TIN) and PAN

9.3 Technical and Administrative Personnel: List of Technical Staff and administrative personnel possessed by bidder is to be indicated. The requirement of Technical Staff and administrative personnel for the work proposed to be deployed by the bidder for completion of work in all respects are as per **FORM-F to this Detailed NIT**.

The period of absence of technical manpower will be charged and deducted from your bills as per **Schedule – F** included in the tender document

9.4 Plant, Equipment and Machinery: Plant, minimum equipment and machinery required for completion of work in all respects within the time schedule **proposed to be deployed or to be hired** for the work shall be as per **FORM-E to this Detailed NIT**.

10.0 The bid of consortium/ unincorporated joint venture and foreign bidders shall not be taken into consideration.

11. SSI/MSME/PSU (Central & State) are not exempted from submission of EMD, Bid document fee and transaction fee for tender processing. Purchase preference for **SSI/MSME/PSU** shall not be provided for this tender.

12. Zero deviation basis: Bidders are requested to submit their bids on **Zero deviation basis** in total compliance to Tender Document without any deviation / stipulation / clarification / assumption. Accordingly, Bidder must submit format for **“Compliance to Bid requirement”** as per attached format **‘Appendix-IV to Notice Inviting e-Tender’**, duly filled in along with Techno-Commercial Bid. **Bidders taking deviations to the provisions of Tender Document shall be summarily rejected.**

13. Certificates to be uploaded (after scanning) and hard copy to be submitted
(Contractor can upload documents in the form of JPG format / PDF format and also in zip)

1. Experience /performance certificates of works completed and works in hand
2. Audited balance sheets indicating annual turnover
3. Latest solvency certificate (Appendix-III)
4. VAT (TIN) and PAN registration.
5. Transaction/process fee, EMD in original
6. Class of registration of appropriate organization
7. Compliance to Bid requirement by the bidder duly signed (Appendix –IV)
8. Declaration by the bidder duly signed (as per Appendix-V)
9. Confirmation of Time Schedule in the form of Bar Chart for completion of work (as per Appendix-VI)
10. Appendix VII to NIT

14. Tender document available on website

Tender document consists of Two Parts. **Part -I (Technical bid), and Part -II (Financial Bid)**. Entire tender document along with drawings if any can be viewed/seen and downloaded from website www.tenderwizard.com/DAE free of cost for reference only

14.1 Part -I (Technical Bid)

This consists of NIT and Detailed Notice Inviting Tender, eligibility criteria, Tender and contract, General rules and directions, Conditions of contract, clauses of contract, safety code, model rules, contractor's labour regulations, Proforma of registers, special instructions to tenderers, Proforma of annexure and performance security bank guarantee, sketches of safety, standard specifications, and Schedule A to F, except **Schedule B**.

14.2 Part -II (Financial Bid):

This consists of Empty **un editable/ PDF** copy of Schedule B (Schedule of quantities)
Schedule B is the financial bid i.e. price only. No other conditions, deviations, clarifications etc. shall be considered in this part.

14.3 Bid Documents:

e-format of 1.Technical evaluation sheets 2.Schedule of quantities.

14.4 For participation in the bid, documents are to be downloaded by uploading the "transaction fee for tender processing".

15. Mode of submission of offer:

Offer consists 1) Online submission of Bid-documents. 2) Submission of Hard copies of certificates as per para 13.0

15.1 Online submission of bid documents:

a) Forms of Technical evaluation sheets (form A to G) should invariably filled and documents related to additional information given in Part-I (Technical bid) shall be scanned and uploaded.

FORM-A: Similar works completed during last 7 years

FORM-B: Projects under execution or awarded

FORM-C: Turnover for last 5 years

FORM-D: Data of Solvency certificate

FORM-E: Construction Plant and Equipment likely to be used in the work

FORM-F: List Technical and Administrative Personnel for the work,

FORM-G: General Data

b) Financial Bid: This Consists of various items to be carried out for the work and to be read in conjunction with the drawings and specifications for filling the rates.

c) Contractor shall make ready the details of fees for Tender processing fee and EMD as indicated in 4.1, 4.2 &4.3 of this section. **Contractor has to download the Technical evaluation sheets and schedule of quantities within the time and date indicated in the NIT**, after log on to web site www.tenderwizard.com/DAE using Digital signature, User id and password and as also giving details of fees (tender form cost and tender processing fee).

d) Contractor has to download the bid documents as above and save on the system (Technical evaluation sheets/ forms A to G and Schedule of Quantities) on the desk top **without changing file names**. The files so downloaded shall be filled-in in all respects and then to be uploaded with input of EMD details.

e) Mode of filling for Financial Bid (Part-II)

Bidder/contractor must ensure to quote rate of each item. The column meant for quoting rate in figures appears in **YELLOW** colour and the moment rate is entered, it turns **SKY BLUE**.

However, while selecting if any cell is left blank/filled vacant, the value for that cell will be taken as "0" by software which indicates that the item is being considered free of cost. A warning will be available for such unfilled cells. Hence, bidder should ensure that the rates of all items shall be filled properly before uploading/ submission.

After submission of bid, bidder can resubmit revised bid any number of times but before last date and time of submission of bid as notified.

While submitting revised bid, bidder can revise the rate of one or more item(s) any number of times but before last date and time of submission of bid as notified.

Bidder shall not disclose rates quoted in Part –II (Financial Bid) nor shall enclose/submit any hard copy along the documents in Part-I

f) No hard copies of Filled-up Technical evaluation sheets forms A to G of Technical Bid and Schedule of Financial Bid are required to be submitted.

g) Vendor manual may be referred which is available on www.nfc.gov.in for steps involved in e- tendering participation i.e., down loading and up loading of Bid documents-Technical evaluation sheets forms A to G of Technical Bid and Schedule of Quantities. For help contact M/s ITI personnel as given above.

h) For further assistance, contact personnel indicated in para 7.0 of this section.

15.2 Submission of Hard copies:

a) These original documents of fees and EMD shall be placed in single sealed envelope superscribed as "Earnest Money and Transaction Fee for Tender Processing".

b) Copy of Enlistment Order and certificate of work experience and other documents as specified in the detailed tender notice under para 13.0 shall be scanned and uploaded to the e-Tendering website within the period of bid submission and certified copy of each shall be deposited in a separate envelop marked as "Other Documents".

c) Document Certification: All pages of Techno-Commercial documents for pre-qualification/ qualification are to be self attested. However, NFC reserves its right to verify authenticity of any such documentation/ certification at their own discretion directly from the concerned certificate issuing authority/ offices.

d) Both the envelopes (Fee and other documents) shall be placed in another envelope with due mention of Name of work, date & time of opening of bids addressed to **Dy.Chief Engineer (CED,PD & EP), 2nd Floor, Sarathi Building, Nuclear Fuel Complex, Hyderabad-500 062 and to be handed over in the above office on or before last date and time of submission as given in this NIT**

16.0 The Delayed or late offers will be summarily rejected. Department will not be responsible for Postal delays.

17.0 Online bid documents submitted by intending bidders shall be opened only of those bidders, whose Earnest Money Deposit and e-Tendering Processing Fee and other documents placed in the envelope are found in order. Consequently Part-I (technical bids) will be opened.

18.0 Part-II (Financial Bid): shall be opened only of those bidders who qualify eligibility criteria and Technical Bid evaluation. The date of opening of Part-II (Financial Bid) will be communicated to the qualified bidders only. Therefore, bidders are required to submit the requisite data with documents in Part -I (Technical Bid) itself.

19.0 The EMD of bidders who are not qualified during qualification and Technical bid evaluation stage will be returned along with the letter indicating the reasons of their disqualification.

20.0 The bid submitted shall become invalid and Transaction Fee for Tender processing shall not be refunded if:

- The bidder is found ineligible.
- The bidder does not upload all the documents (including service tax registration/VAT registration/ Sales Tax registration) as stipulated in the bid document.

If any discrepancy is noticed between the documents as uploaded at the time of submission of bid and hard copies as submitted in the envelopes (Fee & other documents) physically in the office of tender opening authority.

21.0 Performance Guarantee (PG): The bidder whose offer is accepted is required to submit **Performance Guarantee within a period of 15 days from the date of award of work. Performance Guarantee shall be 5% of tendered and accepted value.** It can also be in the form of Demand Draft/Pay Order/Banker's cheque/Deposit at Call receipt/FDR of a Scheduled Bank issued in favour of Pay & Accounts Officer, NFC payable at Hyderabad or Bank Guarantee from any scheduled Bank **valid up to stipulated date of completion plus 60 days** beyond that along with an additional claim period of six months accepted by Engineer-in-charge or as mentioned in LOA or Order issued by the Department.

22.0 Security Deposit (SD): During execution of work, **Security Deposit (SD)** will be deducted from Running Bills @ **2.5% of tendered and accepted value.** The EMD submitted along with the Tender will be returned after receipt of performance guarantee.. If so desired by the contractor, the total SD amount can be deposited in the form of Demand Draft or Pay Order or Banker's Cheque or Deposit at call Receipt or FDR in favour of Pay & Accounts Officer, NFC payable at Hyderabad.

Performance Guarantee will be refunded to contractor without any interest only on successful completion of contract and on production of work completion certificate from concerned officer-in-charge. Security deposit will be returned after completion of guarantee period of 12 months or after payment of final bill whichever is later.

23.0 Income Tax and VAT on Works contract as applicable will be recovered from the bills payable to the contractor.

24.0 Bid Validity: The tender for the works shall remain open for acceptance **for a period as specified in NIT clause no. 7.0** If any bidder withdraws his tender before the said period or makes any modifications in the terms and conditions of the tender which are not acceptable to the department, then the Government shall, without prejudice to any other right or remedy, be at liberty **to forfeit 50% of the said earnest money** as aforesaid. The bidder shall extend the validity period on written request from NFC

25.0 Other Conditions:

Site Visit: Bidders who are interested to participate in the tender are advised to inspect and examine the site before submission of their tender.

Bidders who are apparently meeting the eligibility qualification criteria as mentioned in this NIT shall only be allowed to visit site. For this purpose, bidder to submit copies of qualification documents directly to the contact person of NFC as mentioned in 7.0 above through email for verification and getting confirmation letter from NFC for visiting the site as scheduled by NFC.

The bidder shall be responsible for arranging and maintaining at his own cost all materials, tools & equipments, water, electricity access, facilities for workers and all other services required for executing the work unless otherwise specifically provided for in the contract documents. Submission of a tender by a tenderer implies that he has read this notice and all other contract documents and has made himself aware of the scope and specifications of the work to be done and of conditions and rates at which stores, tools and plant, etc., will be issued to him by the Government and local conditions and other factors having a bearing on the execution of the work.

Police Verification for Labourers: Police verification certificate (PVC) of all labour engaged at site shall be obtained by the bidder for issuance of entry pass at site. All stipulations and instruction given by security personnel, CISF from time to time shall be scrupulously be followed for entry/ exit of men and materials and as also during execution of work for security purpose. **The rates quoted shall be inclusive of PVC charges** and no extra payment will be paid from department in this regard.

26. The contractor shall quote his rates considering all required material, men, equipment/ plant/ machinery for satisfactory completion of item in all respects. The rates quoted shall be INCLUSIVE of all the taxes such as Sales Tax/VAT on material, Purchase Tax, Turn over Tax, Excise Duty, Work Contract Tax or any other tax except ESI, EPF & service tax. on materials/work as applicable..Bills will be released on submission of documentary proof towards payment of ESI, EPF, service tax and other applicable taxes.

27.0 On bid opening date, the bidders can login in the website so that the position of bidders as per opening and their quoted total amount can be seen.

28.0 Ambiguities in rates quoted:

If there are differences between the rates given by the bidder and the amount worked out by him, the following procedure shall be followed.

The bidder shall quote rates in figures only. Amount of each item and total are generated automatically. Therefore, the rate quoted by the bidder in figures shall be taken as correct.

29.0 Bidder shall sign the declaration and to be submitted /uploaded in **PART-I** (Technical Bid)

30.0 The competent authority on behalf of President of India does not bind himself to accept the lowest or any other tender, and reserves to himself the authority to reject any or all of the tenders received without assigning any reason. **All tenders in which any of the prescribed conditions are not fulfilled or any condition including that of conditional rebate is put forth by the tenderer shall be summarily rejected.**

31.0 Canvassing whether directly or indirectly, in connection with tenders is strictly prohibited and the tenders submitted by the bidders who resort to canvassing will be liable to rejection.

32.0 The competent authority on behalf of President of India reserves to himself the right of accepting the whole or any part of the tender and the bidder shall be bound to perform the same at the rates quoted.

33.0 The bidder shall not be permitted to tender for works in NFC (responsible for award and execution of contracts) in which his **near relative** is posted as Assistant Accounts Officer or as an officer in any capacity between the grades of Chief Engineer and Assistant Engineers (both inclusive). He shall also intimate the names of persons who are working with him in any capacity or are subsequently employed by him and who are near relatives to any gazetted officer in NFC or in the DAE. Any breach of this condition by the bidder/contractor would render him liable to be removed from the approved list of contractors of this Department.

34.0 No Engineer of gazetted rank or other Gazetted officer employed in Engineering or Administrative duties in an Engineering Department of the Government of India is allowed to work as a contractor for a period of two years after his retirement from Government service, without the previous permission of the Government of India in writing. This contract is liable to be cancelled if either the contractor or any of his employees is found any time to be such a person who had not obtained the permission of the Government of India as aforesaid before submission of the tender or engagement in the contractors service.

35.0 This Notice Inviting Tender shall form a part of the contract document. The successful bidder/contractor, on acceptance of his tender by the Accepting Authority, shall, within **15 days** from the stipulated date of start of the work on signing the contract consisting of:-

Part-I (Technical Bid) consist of the notice inviting tender, all the documents including Tender of contract, General rules and directions, clauses of contract, proforma of schedules, safety code, Model rules, contractors labour regulations, proforma of registers, special instructions to tenderers, specifications, **Schedule A to F (except Schedule-B) and drawings**, if any, forming the tender as issued at the time of initiation of tender and acceptance thereof and **Part-II** (Financial Bid) consisting of Schedule of Quantities(**Schedule-B**) together with any correspondence leading thereto.

The uploaded document of this work and subsequent corresponded documents/ amendments will be considered as a part of agreement.

Dy. Chief Engineer (CED,PD,EP)
For and on behalf of the President of India

NFC IS COMMITTED TO A CORRUPTION FREE WORK ENVIRONMENT. “All the purchase and contracts commitments of NFC will be honoured without the citizen having to pay any bribe. In case any person demands any bribe, it is the duty of a responsible citizen to inform the matter to the vigilance officer, NFC, Hyderabad. Telephone numbers are: (O): 040 – 27120218, 27184949

ITEM RATE TENDER & CONTRACT FOR WORKS

Name of work: "Providing Standby Blowers catering to NUOFP(O), CFFP(P), Metallograpy section along with ducting, etc."at NFC Hyderabad"

Part-I (Technical Bid): consists of **two covers** which contains as mentioned below:

First Cover in sealed condition superscribed as "**Earnest Money and Transaction Fee for Tender Processing**" and shall contain Transaction Fee for Tender Processing & EMD in separate envelopes as mentioned in NIT. This envelope shall be opened first and original documents shall be verified with the scanned copy of these instruments uploaded.

Second Cover: in sealed condition superscribed as "**Other Documents**" shall contain all documents related to **Eligibility Criteria** as mentioned in NIT for pre-qualification and Technical documents as given in Para No.13 of Notice inviting e-tendering, and shall be opened after opening and verification of documents in First cover.

Both the covers are to be placed in a single third cover

The hard copies are to be submitted in 2 sets marked "ORIGINAL "and "COPY", and are to be submitted within the cut off time and date in the office of Dy. Chief Engineer, (CED,PD,EP), Civil Engineering Division, 2nd Floor, Saarathi Building, Nuclear Fuel Complex, Hyderabad-500062, India.

Part -II(Financial/Price Bid):

Bid document should be uploaded after filling rates. No hard copy is required to be submitted

Issued to : _____

(Contractor)

Signature of officer issuing the documents _____

Designation: _____

Date of Issue: _____

TENDER

I / We have read and examined the Notice Inviting Tender, Salient Governing Features of the Tender /Work including Schedules A, B, C, D, E & F, Drawings and Designs, General Rules & Directions, General Clauses of Contract, Special Clauses of Contract & other documents and rules referred to in the Conditions and Clauses of Contract and all other contents in the tender documents for the work.

I / We, hereby tender for the execution of the work specified for the President of India within the time specified in Schedule "F", viz., Schedule of Quantities and in accordance in all respects with the specifications, designs, drawings and instructions in writing referred to in Rule 1 of General Rules & Directions and in Clause - 11 of the General Clauses of Contract and with such materials as are provided for, by, and in respects in accordance with, such conditions so far as applicable.

I/We agree to keep the tender open for **one hundred twenty (120) days** from the last date of its submission of tenders and not to make any modifications in its terms and conditions.

A sum of **1,66,000/- (Rupees One lakh Sixty Six Thousand only)** has been deposited in cash/receipt treasury challan/deposit at call receipt of scheduled bank/ fixed deposit receipt of scheduled bank/ demand draft of scheduled bank issued by a scheduled bank as earnest money. If I/we, fail to furnish the prescribed performance guarantee within prescribed period, I / we agree that the said President of India or his successors in office shall without prejudice to any other right or remedy, be at liberty to forfeit the said earnest money absolutely. Further, if I / we fail to commence work as specified, I / we agree that President of India or his successors in office shall without prejudice to any other right or remedy available in law, be at liberty to forfeit the said performance guarantee. I agree to carry out such deviations as may be ordered, up to maximum of the percentage mentioned in Schedule "F" and those in excess of that limit at the rates to be determined in accordance with the provision contained in Clause 12.2 and 12.3 of the tender form. Further, I / We agree that in case of forfeiture of earnest money or Performance Guarantee as aforesaid, I / We shall be debarred for participation in the re-tendering process of the work.

I / We undertake and confirm that eligible similar work(s) has/ have not been got executed through another contractor on back to back basis. Further that, if such a violation comes to the notice of Department, then I/we shall be debarred for tendering in **Nuclear Fuel Complex & its units** in future forever. Also, if such a violation comes to the notice of Department before date of start of work, the Engineer-in-Charge shall be free to forfeit the entire amount of Earnest Money Deposit / Performance Guarantee.

I / We hereby declare that I / We shall treat the tender documents, drawings and other records connected with the work as secret / confidential documents and shall not communicate information derived there from to any person other than a person to whom I / We am / are authorized to communicate the same or use the information in any manner prejudicial to the safety of the State.

Signature of Contractor

Postal Address

Dated _____

Witness:

Address:

Occupation:

DETAILED TENDER SPECIFICATIONS

F O R

"Providing Stand-by Blowers pertaining to process areas of NUOFP(O) , CFFP-P and Metallography in NFC along with related ducting and fittings ".

1.0 General

1.1 These specifications cover supply, installation, testing & commissioning of Centrifugal Blowers of various types and capacities as mentioned in the list below under point no. 7.4.5.6 , related ducting made out of SS/PVC/FRP/GI ducting, dampers, grills etc. with allied works suitable to work in a hot, humid, dusty/highly corrosive environment at different production plants and other facilities of NFC, Hyderabad.

1.2 All items mentioned in these specifications shall be complete in all respects and any component or, equipment not covered here but essential for proper design, operation and maintenance shall be brought to the notice and included by the tenderer. The successful tenderer shall take full responsibility for the guaranteed operation of the system, as regards performance/reliability etc.

1.3 No foreign exchange or, import license for importing equipments, components, spares or, raw materials against these specifications will be arranged or, provided by the department. It shall be the responsibility of the tenderer for the supply of materials from Indian and foreign sources as the case may be, and execute the contract within the agreed time schedule. In case, the offer involves expenditure in foreign exchange this fact shall be clearly indicated by the tenderer together with a statement as to how this will be arranged by the tenderer.

1.4 Where found necessary, the department reserves the right to select reputed manufacturers for any of the items, in the interest of the standardization, and therefore, the successful tenderer shall supply the same of the particular make, if so required. It may be noted that the items of supply included in the scope of this tender shall be of standard make, or from reputed manufacturers subject to approval of the department.

1.5 The location and climatic conditions etc., of the site are indicated under clause (1) of "Special Instructions to Tenderers" (enclosed within this tender).

1.6 The Nuclear Fuel Complex area slopes from the ridge of hills on the west towards the east, the levels dropping by about 11 M in distance of 400 M. The altitude above MSL is around 538 M.

2.0 Standards

2.1 Unless otherwise specified, the equipments/components shall be designed, assembled, erected and tested in accordance with the relevant IS codes published by the Bureau of Indian Standards, wherever available, in order that specific aspects under Indian conditions are taken care of. In case, where suitable Indian standards are not available, the item(s) shall conform to the generally accepted codes and practices.

2.2 The electrical equipments & installation shall also conform to the latest Indian Electricity Rules, as regards safety, earthing and essential provisions specified therein for installation and operation of electrical equipments.

2.3 All the items included in the scope of this tender shall comply with the statutory requirements (if any) of the Government of India as well as the Government of Andhra Pradesh. The entire equipment & installation shall also conform to the provisions of statutory and other regulations in force, such as the Indian Factories Act, Indian Explosives Regulations etc., whichever may be relevant to the items of works called for in this tender. The successful tenderer at no extra cost, if so required, shall arrange approval on drawings and/or, installation by the statutory authorities.

2.4 In case, where the offer deviates from the specified standards, the tenderer shall indicate clearly in his offer the standards proposed to be adopted by him along with the details thereof.

3.0 Workmanship

3.1 All items covered in the specifications shall be manufactured from the best materials under first class workmanship.

4.0 Lubrication

4.1 All equipments shall be provided with efficient lubrication arrangement so that bearings and other parts are not subjected to under wear and tear. Sufficient lubrication point shall be provided, wherever necessary and all such points shall be easily accessible. The tenderer shall indicate the name of the lubricant and quantity required thereof for a period of one (1) year.

5.0 Safety

5.1 All moving and exposed parts shall be adequately guarded to prevent accidents to the operators and other working in the vicinity.

5.2 The successful tenderer (i.e., the contractor) shall undertake to bear the primary responsibility for the safety of the contract labourers and others who shall accompany them (including children). The contractor shall have to make necessary arrangements to ensure their safety. The successful tenderer, immediately after awarding the contract shall, therefore, furnish a written undertaken to the department to that effect.

5.3 The contractor shall ensure completion of the entire work under safe working conditions, as per "SAFETY CODE" prevailing at NFC.

6.0 Utilities

Power Supply: Three phase, 415/240 V, AC 50 Hz power supply will be available.

7.0 Design guidelines and technical specifications of various equipments/materials:

7.1 As the proposed works are at highly corrosive Environment, all exposed metallic surfaces shall be suitably protected with anti-corrosion treatment where-ever applicable, which also falls in the scope of contractor.

7.2 Ventilation related minor civil works, as may be required for erection of ducting etc. Shall be carried out by the contractor, e.g., drilling, cutting of MS mezzanine sheet, chipping/grouting and making good, etc.

7.3 **FRP/PVC Ducting**

- i) The ducting shall be of PVC material laminated with FRP as per the thickness mentioned in schedule of quantities
- ii) Please note the nomenclature "FRP" wherever used in Schedule 'A' means fiber glass (FRP) using BISPHENOL resin.
- iii) Elbows shall have a minimum centre line radius of 1-1/2 times diameter unless field conditions make it impossible. 90° elbows shall have 5 gores and 45° elbows 3 gores.
- iv) Branches shall enter main at not more than 45° (30° preferred) to direction of flow and wherever practical to enter on an enlarging taper section. Branches should not enter opposite each other.

- v) Taper selections – 1 inch change in dia to every 5 inch in length unless field conditions make it impossible.
- vi) Rectangular duct construction (if applicable): All straight lengths should have formed corner construction for maximum strength. This includes taper sections where practical. Elbows to have welded construction.
- vii) Transition piece shall preferably be so made as to have an included angle of not more than 10° unless field conditions make it impossible.
- viii) Supporting structure/hangers etc. – Duct support (MS) shall be spaced such that maximum unsupported span remains generally not more than 2 meters or, as per site conditions subject to approval by the Engineer-in-charge.
- ix) The successful tenderer shall, immediately after receiving the work order, furnish the detailed duct layout drawing along with the design details of ducts and accessories, and suction hoods etc., to the department for perusal and only after departmental clearance of the layout, he shall take up the works relating to fabrication of the said items. At this juncture, it is once again emphasised that the design performance guarantee of the individual items as well as the system as a whole shall be contractor's responsibility. The tenderer is requested to visit the site, if it is so desired, for a clear and better conception of the site, before submitting the offer. The ducts & fittings shall be so designed to have minimum pressure loss. Related minor civil works such as grouting of MS duct-supports, making/closing of duct-openings in the walls (if required), etc., shall be carried out by the contractor.
- x) Details of PVC/FRP Material and construction for ducting

PVC: PVC welding shall be of double V bolt type with welding material having the same composition as that of basic material.
PVC shall be industrial grade rigid PVC of approved make only.

FRP: Bisphenol Resin should be used for construction of laminates. The resin shall be suitably treated to ensure the following properties in the laminate.

- a) Protection from U-V rays
- b) Fire retardancy in the outer layers of the FRP laminate.

Laminate Reinforcement The reinforcement shall be constituted of borosilicate glass in chopped strand mats, surfacing mats, of minimum 2.56 gm/cc Woven cloth or woven ring form.

Nut/bolts/ SS 304 only of minimum Size 10 mm

Construction: The following means of construction shall be used.

- a) Hand lay up
- b) Positive means shall be employed to ensure uniform total thickness of the laminated and uniform glass to resin ratio without surplus resin or unsaturated glass.
- c) The outer surface shall be of smooth appearance and no glass fiber shall be exposed.

7.4. SS/MS/GI DUCTING

7.4.1 SCOPE

This specification covers the general design, materials, construction features, manufacture, shop inspection and testing at manufacturer's works, delivery at site, handling at site, installation, testing, commissioning and carrying out performance test at site of Air Distribution System.

7.4. 2. CODES AND STANDARDS

The design, materials, construction features, manufacture, inspection, testing and performance of air distribution system shall comply with all currently applicable statutes, regulations, codes and standards in the locality where the system is to be installed. Nothing in this specification shall be construed to relieve the CONTRACTOR of this responsibility.

IS 277	Galvanized Steel Sheets (Plain and Corrugated)
IS 655	Metal Air Ducts
ASHRAE	Duct design method

7.4. 3 MATERIAL REQUIREMENT

7.4. 3.1 Ducting shall be fabricated from Galvanized Iron (GI) / SS/MS sheet as specified in SOQ .

7.4. 3.2 GI shall be of lock-forming grade, zinc coated conforming to IS 277 coating grade 200.

7.4.3.3 SS sheets shall be of SS 304 as per ASTM A167. MS sheets shall confirm to IS 2062.

7.4.4 CONSTRUCTION FEATURES

Fabrication details shall be generally in accordance with the details given hereunder.

7.4.4.1 RECTANGULAR DUCT (G.I/MS/SS)
For Low Pressure & High Pressure System

LARGER SIDE OF DUCT mm	THICKNESS OF SHEET mm/G		TYPE OF TRANSVERSE JOINT	TYPE OF REINFORCEMENT
	GI	SS/MS		
Up to 250	22 G	1.5 mm	25×25×3mm CS/SS angle flanged joint	--
251 to 750	22 G	1.5 mm	25×25×3mm CS/SS angle flanged joint	25×25×3 mm CS/SS angle @ 1,250 mm c/c
751 to 1,000	22 G	1.5 mm	25×25×3mm CS/SS angle flanged joint	40×40×3 mm CS/SS angle @ 1,250 mm c/c
1,001 to 1,500	22 G	1.5 mm	40×40×3mm CS/SS angle flanged joint	40×40×6 mm CS/SS angle @ 750 to 800 mm c/c
1,501 to 2,100	18 G	1.5 mm	40×40×6mm CS/SS angle flanged joint	50×50×6 mm CS/SS angle @ 750 to 800 mm c/c
2,101 to 2,400	18 G	1.5 mm	65×65×6mm CS/SS angle flanged joint	65×65×6 mm CS/SS angle @ 750 to 800 mm c/c
2,401 and above	18 G	1.5 mm	50×50×3mm CS/SS angle flanged joint with tie rods of 10 mm diameter	50×50×3 mm CS/SS angle @ 750 to 800 mm c/c with tie rods of 10 mm diameter, evenly spaced along reinforcing angle, spacing not exceeding 1,500 mm

7.4.4.2 Longitudinal seams shall be Pittsburgh lock type at corners. Longitudinal joints shall not be provided for rectangular ducting at locations other than corners, except where larger side of duct exceeds 2500 mm. Longitudinal joints of ducting having side larger than 2500 mm other than corner shall be grooved or standing seam.

7.4.4.3 Flanges used for transverse joints shall be joined with each other with Galvanized Steel (GS) bolts/SS bolts, washers and nuts. The bolts shall be of minimum M8 size and the spacing between bolts shall be maximum 150 mm for low-pressure system and 100 mm for high-pressure system.

- 7.4.4.4 For transverse angle flanged joints, neoprene gasket (3 mm uncompressed thickness and width equal to flange face) adhered to the flange face shall be used. The boltholes in gasket shall be the same as bolt diameter and shall be punched prior to insertion of gaskets.
- 7.4.4.5 Angles shall have welded corners and shall be riveted to the ducts at 300 mm centers (maximum).
- 7.4.4.6 For SS ducts all related appurtenances such as transverse joint angles, reinforcement angles, fasteners, turning vanes, access doors, etc. shall be of the same material as of duct.
- 7.4.4.7 Ducts shall be fabricated using lock-forming machine or continuous TIG welding only as per the requirement specified by EIC.

7.4.5 DUCT SUPPORTS

7.4.5.1 Rectangular duct shall be supported from ceiling using trapeze hangers. Ducts shall rest on supporting angle or channel and this supporting angle or channel shall be supported by CS rods or angles or channels on both sides of ducts with weld or bolts.

7.4.5.2 Supporting details shall be as given below:

LARGER SIDE OF DUCT	SUPPORTING ANGLE	VERTICAL ROD DIAMETER	MAXIMUM SPACING BETWEEN SUPPORTS
mm	mm	mm	mm
Up to 900	40×40×6	10	3,000
901 to 1,500	50×50×6	10	3,000
1,501 to 2,400	50×50×6	10	2,000
2,401 and above	65×65×6	12	1,600

7.4.5.3 Zinc coated anchor fasteners or embedded plates shall be provided for upper attachments to the building. The CONTRACTOR shall provide anchor fasteners & embedded plates. The CONTRACTOR shall provide duct supports from angle cleats welded to the embedded plates. Anchor fasteners shall be loaded to maximum 20% of the maximum rated capacity specified by the manufacturer. The PURCHASER shall approve all anchor fasteners used for supporting duct.

7.4.5.4 Duct supports shall be qualified and sized for seismic forces.

7.4.5.5 Ducting shall be made in circular or square shape as per the site requirement. For providing duct supports, above table given for rectangular ducts shall be considered by taking diameter of circular duct as longer side of rectangular duct. 6mm thickness CS/SS round flange shall be welded to circular ducts at a span of 6 meters maximum or as per site condition.

7.4.5.6 **Detailed Specifications of Blowers:**

CENTRIFUGAL FAN made of SS304L

1. SCOPE:

This section covers the technical requirements for manufacturing, testing at works, delivery at site, testing after installation and commissioning of centrifugal fan made of SS304L for fumes, gases and solid pollutants. The duty of each fan is given in the schedule of quantities Technical Details table.

The fans shall be complete with all accessories, consisting mainly of the following

- a) Suction and discharge side flanges and counter flanges suitably drilled, complete with SS304 bolts, nuts, washers and gaskets
- b) Driving electric motor
- c) Driving & driven pulleys along with belts
- d) Slide rails for motor and rigid common structural base
- e) Foundation bolts
- f) Vibration isolators
- g) Inlet bell manufactured by spinning process
- h) Any structural steel & hardware required for assembly, installation, supporting of fan and accessories.
- i) 3 mm thick & 100mm long flexible PVC connection along with 6mm thick SS304L flanges at suction and discharge end of SISW fans including SS 304L nut bolts.
- j) Bearings with pillow block.
- k) Belt guard
- l) Inlet/outlet flange

2. APPLICABLE SPECIFICATION STANDARDS AND CODES

The equipment shall be manufactured and tested in accordance with the following standards and codes

AMCA-210: Test code for testing performance of fan

AMCA 320: Sound testing of fans

ISS-823,826: For welding

IS-1079: For SS.plates

ASA-B3.11section 1.1.2: load rating for ball & roller bearings

SAE-1035 or 1040 f: For shafts

SAE- B33.1:Square and hexagonal bolts and nuts
ISO 1940 Balancing
AMCA 204 Vibration isolation

3. DESIGN AND MANUFACTURING

- a) The fan shall be designed to handle the quantity of the air/gas against the static pressure and at conditions indicated in the technical data. The fan shall have optimum efficiency at operating conditions and shall have performance characteristic to match the approved performance curves.
- b) The unit shall be factory built to the highest standards to ensure rigidity, quiet and vibration free operation at the prescribed conditions of flow and speed. The noise level should not be more than 80 decibels at a distance of 1.5 M from fan. The acceptable noise-level for various centrifugal fans shall be measured at a distance of 1.5 M from centre of the respective fans when connected to the ducting system (while running single individual fan only).
- c) Machine cutting, machine bending and spinning or die forming etc. shall be resorted to, wherever applicable..
- d) The fan shall have inlet bell manufactured by spinning process. The material of the shaft shall be SS304, machined to an accuracy of h7 & 1.0 micron finish. The distance between the two bearings shall be as minimum as possible.
- e) The bearings shall be Tapered bore bearing Double row, self-aligned of SKF/FAG /NTN/NBC. The bearing should be procured directly from the manufacturers preferably. Bearing housing shall be supported on separate pedestal and support shall not be taken from Scroll /casing of fan. Bearings shall be housed in split type pillow block.
- f) The casing shall be fabricated from minimum thickness of 3mm SS 304L sheet or as per fan class whichever is high and shall be multi split type. The Bracings and base frame shall be heavy structural stainless steel angles. The casing shall be provided with inspection door of size adequate size with handle. The drain point at the bottom of casing shall be provided.
- g) The aerodynamic design of fan shall be such that the maximum power absorbed by the impeller occurs within the normal working range i.e. it has non overloading characteristic. Fan shall not be selected in stall/surge range of performance curves.

4. IMPELLER& SHAFT

The impeller shall be of limit load type having backward curved type blade and manufactured from SS304 of required thickness. The impeller along with the shaft and pulleys shall be statically and dynamically balanced confirming to Quality grade G 6.3 of ISO 1940. The engineer of our department shall witness the dynamic balancing. The assembly of entire fan & motor shall not give rise to any of vibrations. The maximum permissible vibration level shall not exceed 40 microns in terms of amplitude measured at shaft from peak to peak horizontally and vertically.

5. DRIVE PACKAGE

- a) The drive package shall be capable of efficient and smooth transmission of power to fan. It shall comprise electric driving motor V--groove pulleys, belts, belt guard, slide rail etc.
- b) The motor shall be TEFC squirrel cage induction motor. The motor shall conform to all relevant IS specifications
- c) The belt guard and other parts of drive package shall be installed on common structure steel base frame. The base frame shall be isolated from the civil structure of foundation by means of vibration mountings having an isolation efficiency of 90% conforming to AMCA 204.

6. PERFORMANCE OF THE FAN

The fan shall have optimum efficiency for the operating conditions mentioned in the schedule of quantities. The fan shall be tested for its performance at the manufacturer's works as per the standard in the presence of our representative. The supplier shall furnish the performance characteristics. The fan should be designed to handle the rated quantity of air against the static pressure at conditions as indicated above. The fan shall have optimum efficiency at the operating condition and shall have performance characteristic to match the approved performance curve.

7. DRAWINGS

- a) The firm shall supply foundation drawings for the fan with motors; foundation bolts location, anti-vibration mountings.
- b) Detailed drawings of the fan along with QAP shall be sent for approval before fabrication of fans.

8. PACKING

The fans and motors shall be dispatched in packed condition to avoid damage during transit and delivery. Transit insurance for the fans shall be included in the offer.

9. INSPECTION AND TESTING

A) Fan shall be subjected to inspection and test. The contractor shall be responsible for providing all inspection facilities and for conducting all tests at works and at site after erection. Procedure and schedule of inspection (QAP) and tests shall be prepared by contractor for prior approval of engineer. Sufficient notice shall be given to the engineer to enable him to depute his representative.

B) Results of inspection and tests shall be properly documented and made available as and when called for. In the event of failure of the product to fully meet any inspection or test requirement shall be intimated to the engineer. Engineer's permission shall be obtained before replacement, redesign or repair of the component. If the

repairs/redesign are likely to affect the results of tests previously completed, appropriate retesting shall be conducted.

C) Two-stage inspection, one during fabrication of main components like impeller, casing etc. (if required) and the other during balancing process, assembling etc. shall be arranged by the contractor.

D) Static & dynamic balancing of all rotating parts like motor rotors, impeller and pulleys shall be conducted independently to conform that their mass centralizes at the axes of rotation.

E) The performance of the fan motor unit shall be tested by operating at design conditions to establish that the units are in first class operating conditions. The following parameters will be tested vis-à-vis the approved performance curves and the approved characteristics.

- a) Air flow capacity
- b) Static head developed
- c) BHP requirement
- d) Vibration and noise

Technical details of Fans / Blowers :

Sl.No.	1	2	3	4	5	6	7	8	9
Capacity	6000 CMH	5000 CMH	600 CMH	2000 CMH	3000 CMH	30000 CMH	10000 CMH	75000 CMH	40000 CMH
Static press	400 mm WC	300 mm WC	100 mm WC	100 mm WC	400 mm WC	100 mmWC	450 mmWC	100mmWC	250 mm WC
Quantity	1 No.	2 nos	1 No.	2 No.	1 No.	2 nos	02 Nos	01 No.	1 No
Tag	E 9B NUOFP-O	E- 6 (C & D) NUOFP-O	Comb. Air Supply NUOFP-O	Fresh Air for Spray Drier NUOFP-O & Meltshop	Exh. Blower for Spray Drier NUOFP-O	New WASS CFFP-P	Diss. Exh. Blower NUOFP-O	Sint. Fur.5 & 6 Shed, Standby for WASS CFFP-P	Sint. Fur. 5 & 6 Shed CFFP-P
Type	SISW backward curved, Split casing								SISW backward curved, Split casing
Service Temp	40 degree C								40 degree C
Material of Construction-casing/scroll	SS304L								MS
Material of Construction-Impeller	SS304L								MS
Shaft	SS316, machined to appropriate standards								SAE-1040 or EN-8 carbon steel
Inlet cone	SS304 L								MS
Mounting frame	IS SS304 channels and angles along with motor rail								MS
Altitude	Consider for Hyderabad								
Construction	class III								
Belt	V-Belt of FENNER make only								
Pulley	Tapered bore pulley of FENNER make only								
Bearings	Tapered bore bearing Double row, self aligned of SKF/FAG/NTN/NBC								
Vibration Isolator mountings	Cushy foot of DUNLOP make only								
Bearing housing	Plummer block type on separate pedestal without taking support of scroll.								
Accessories	shaft guard, belt guard, Inspection window, drain plug, inlet and outlet, flexible connection								
Sound level	Max 80 dB at a distance of 1.5 meter								

MOTOR:

Type	Three-phase 440 Volts 50HZ TEFC Sq. Cage induction motor
RPM	1440
Space heater	To be included
Shaft Power	15 % more than designed capacity
Mounting frame	As per IS -
Performance & Testing	Shall conform to the relevant IS Specification
Protection	IP 55
Insulation	Class F
Operating Temperature	Class B
Drive Pulley	Tapered bore pulley of FENNER make only
Motor Torque	Stall with stand time is less than the Accelerating time

7.5 MS Supporting structure:

Ducting supports shall be designed to carry weight of ducts. The drg. shall be submitted for approval for its load carrying capacity. For the duct supports trusses shall have to be provided. It may please be noted that the duct support for road crossing shall be erected at a ht of approx 6 mts. Necessary safety appliances and safety permit shall be taken by the contractor. The painting shall be done as per the clause under painting.

7.6 DAMPERS(FRP) :

Dampers shall be manufactured using the same materials as the ductwork. Round dampers shall be single butterfly blade type, rectangular dampers shall be parallel blade type. All dampers shall be designed for 30 inches WC pressure differential. Blade shaft shall be designed to provide a 10:1 safety factor for operating torque requirements. The shaft shall be glassed into the damper blade, such that the center portion of the blade is significantly thicker than the outer perimeter with a smooth, even taper from the center to perimeter. The axle shall be protruded fiberglass or 316 stainless steel, as required to meet corrosion resistance requirements Manual dampers to be equipped with manual stainless steel adjustable locking handles.

Damper frame shall be of one piece construction with a resin rich interior corrosion barrier minimum of 100 mils. A structural lay-up shall consist of alternate layers of chopped strand mat and woven roving to conform to ASME/ANSI RTP-1 and PS15-69. The glass to resin ratio shall be a minimum of 35% glass to 65% resin. Wall thickness, flange thickness, drilling pattern and width shall conform to PS15-69. Exterior surface of the damper shall contain UV inhibitors and a gel- coat, color to match duct system.

The damper blade shall be constructed of the same material as the damper frame and shall have a resin rich surfacing veil on both sides. Blade stiffeners shall be FRP or FRP encapsulated as required for stiffness.

Leakage shall not exceed 3 cfm per square foot at 12" wc or 5.25 cfm per square foot at 30" wc as required in this specification for isolation. Damper shall be provided with stainless steel hand locking quadrant, gear operators, chain wheel operators, or other actuation devices as required in this specification. All interior metal shall be 316 stainless steel. Gaskets shall be EPDM. Other gasket materials shall be available upon request.

All FRP fabrication shall meet or exceed quality requirements of PS15-69 and ASME/ANSI RTP-1.

7.7 VOLUME CONTROL DAMPERS (VCDs)

7.7.1 VCDs shall be fabricated of minimum thickness specified and shall be of robust construction. VCDs shall be of single blade type for round duct and opposed blade

type for rectangular duct. VCDs shall have a locking device mounted outside the duct to hold the VCDs in a fixed position without vibration. Fully open and fully closed position shall be marked for easier operation of VCDs.

7.7.2 VCDs shall be provided with Teflon or brass bushing for blade shaft

7.7.3 For SS duct, all splitter dampers and VCDs shall be fabricated from SS 304 sheet.

7.8 DIFFUSERS AND GRILLES

7.8.1 The type and quantity of diffusers and grilles shall be provided, as specified. The CONTRACTOR shall ensure that the diffusers and grilles offered are of requisite capacity, throw and terminal velocity. Diffusers and grilles shall be fabricated from SS/FRP, factory coated with rust resistant primer or extruded aluminium section with powder coating.

7.8.2 Whenever VCD is provided with diffusers or grilles it shall be located within the duct collar. Diffusers and grilles shall be of flush or stepped pattern.

7.8.3 Ceiling diffuser shall be equipped with fixed air distribution grids, removable key operated volume control dampers and anti-smudge rings. The extruded aluminium or SS 304 diffusers shall be provided with removable central core and concealed key operation for volume control damper.

7.8.4 Grilles with VCD shall be single acting or double acting, as specified in data sheet A. Grilles without VCD shall have fixed blades or adjustable blades, as specified.

8.0 MEASUREMENTS

8.1 **Blowers : Unit wise as per SOQ**

8.2 **DUCTING**

Measurement for ducting shall be carried out on the basis of centre-line measurements as described in following paras.

8.1.1 Duct work shall be measured on basis of external surface area of ducts. Duct measurement shall be taken before the application of insulation if any. The external surface area of duct shall be calculated by measuring the perimeter comprising of width and depth, in the centre of each duct section and multiplying it with overall length from flange face to flange face of each duct section and adding up areas of all duct sections.

- 8.1.2 Surface area of the supply air plenums for linear and slot diffusers shall be added to the duct quantities.
- 8.1.3 For tapered rectangular ducts, the average width and depth shall be used to measure perimeter, whereas for tapered circular ducts, the diameter of section midway between large and small diameters shall be adopted. The length of tapered duct section shall be the centre-line distance between the flanges of the duct section.
- 8.1.4 For special pieces like transformations, bends, offsets and branch connections, mode of measurement shall be identical to that described above using the length along the centre-line. End cover or closure shall be measured as per end duct cross-section area (width × height).
- 8.1.5 The quoted unit prices for ducts shall include all wastage allowances, reinforcement angles or flats, duct supports, flanges and gaskets for joints, nuts and bolts, anchor fasteners, angles, channels, flexible connections at equipment inlet and outlet, splitter dampers, access doors, turning vanes and straightening vanes. These accessories shall neither be separately measured nor paid for.

8.2 DIFFUSERS/DAMPERS

Areas shall be calculated by measuring cross-section area for air flow at discharge or capture area excluding flanges. In case of supply air diffusers, VCDs shall form part of unit prices quoted and shall not be separately measured or accounted. Frame work for diffusers shall also be included in unit prices quoted.

8.5 **PAINTING**

Painting shall not be separately measured or paid for. Various quoted unit prices shall include painting wherever specified or required.

9.0 INSPECTION AND TESTING

- 9.1 The Blowers, ducts, branches, bends etc. shall be inspected and the joints and connection shall be checked before these are assembled in position. After assembly the system shall be checked for Flowrates, Shutoff pressure, duty point parameters, tightness, vibration and noise.
- 9.2 During start-up phase, The CONTRACTOR shall make all arrangement for drilling or plugging of all test opening or holes, adjustment of VCDs, adjusting of fan speed to

obtain specified flows, obtaining actual motor ampere readings, and all related functions to ensure the proper operation of all systems.

- 9.3 Test holes for system commissioning shall be minimum 20 mm diameter to accept a standard pitot tube of 8 mm diameter and each hole shall be fitted with an effective removable type seal. The CONTRACTOR, in consultation with the PURCHASER, shall decide location of test holes.
- 9.4 The CONTRACTOR shall provide all instruments required for testing and balancing of air distribution system.
- 9.5 Complete air balance report shall be submitted for scrutiny and approval. Four copies of the approved balance report shall be provided with completion documents.
- 9.6 Splitter damper and VCD adjustments shall be permanently marked after air balancing is complete so that these can be restored to their correct position if disturbed at any time.

10. DATA TO BE FURNISHED BY THE CONTRACTOR AFTER THE AWARD OF CONTRACT

1. List of drawings and documents to be submitted for review, approval and information with scheduled submission dates
2. Quality Assurance Plan (QAP)
3. Fabrication drawings of supply Blowers.
4. Cross-sectional drawings of volume control dampers, with part list, materials of construction and installation details

11.0 Information to be furnished with the tender

11.1 The tenderer shall submit the relevant literature/leaflets/catalogues in respect of the material etc., offered for enabling the purchaser to assess the offers.

12.0 Scope of supply by successful tenderer

12.1 The successful tenderer shall supply all equipment and materials described in this tender with such modifications and additions/deletions etc., as are mutually agreed upon.

13.0 Drawings & instruction manuals

After getting approval of the drawings by the Department, three sets of the following shall be supplied by the contractor before commencement of the work at site

- i) Approved drawings.
- ii) Certified test-certificates in respect of various materials.

14.0 Pre-dispatch Inspection

14.1 Routine and type tests or, any other relevant test(s) in respect of the various items of equipment/materials shall be conducted/performed at the contractors/suppliers' works before effecting dispatch to NFC site. The tests shall be conducted in presence of the departmental representative, if so desired by the department. The contractor shall, therefore, be required to give prior intimation well in advance to the department of his intention of carrying out such tests. The contractor shall deliver no material without getting inspected by the departmental representative or, without obtaining approval for waive of inspection from the department.

14.2 Inspection details for individual items:

The following parameters shall be tested vis-à-vis the ducts etc. at manufacturers work and shall confirm to the relevant standards.

- i) Dimensional details as per approved drawing
- ii) Material Testing/test certificate
- iii) Blowers duty points, Discharge / Suction flow rates and Static Pressures
- iv) Sheet thickness
- v) Flanges details
- vi) Physical inspection
- vii) Wt per unit area

15.0 Installation, testing & commissionin

15.1 The successful tenderer will be responsible for providing all necessary tools, tackles and instruments required for execution and testing of the plant and equipment.

15.2 Trial-run/performance tests, etc., for the system shall be conducted by the contractor after completion of erection work. In case, the work does not meet the intent of the specification, the same will be made good by the contractor so as to meet the specified duty.

16.0 Validity

16.1 The tender should be kept valid for acceptance for a minimum period of 90 (ninety) days from the date of tender opening.

17.0 Guarantee

17.1 The entire installation shall be guaranteed by the contractor for a period of twelve (12) months from the date of completion & handing over in all respects against any defect in design, manufacture/workmanship.

18.0 Special Notes

18.1 All security and safety rules applicable time to time in NFC shall be strictly followed by the contractor without fail. Violations of safety and security rules shall be viewed seriously and penalty will be imposed for such violations.

18.2. Proposed job/contract is **"Providing Stand-by Blowers pertaining to process areas of NUOFP(O), CFFP-P and Metallography in NFC along with related ducting and fittings "**.

18.3 Areas to be worked under this contract is prone for chemical fumes and corrosive atmosphere. This job have to be done at height up to 8 meters. So necessary scaffolding for safe working is required to carry out the work. Providing necessary scaffolding is also in the scope of the contractor. As the job involves working at height in this areas, persons engaged shall be healthy and fit to work at height. Medical certificate to this extent shall be furnished before commencement of work.

18.4 As the plant is in continuous operation, job as to be done by taking necessary shut downs from user section.

18.5 Generally work has to be done in general shifts by engaging required manpower. But to meet target of completion, contractor can work in holidays and beyond general shift hours with prior written permission.

18.6 Continuous supervising from contractor side is required for this work. So contractor is required to depute one qualified supervisor exclusively for this job.

18.7 All works required for successful completion of job such as bending/folding/welding/civil works etc. are also in the scope of the contractor.

18.8 Contractor shall consider all above points while quoting.

19.0 Prices and delivery

19.1 The prices for supply and erection shall be separately quoted as unit prices for equipment/materials supplied and lumpsum prices for services rendered (where applicable) strictly on the prescribed proforma under "Schedule of Quantities". The prices should be F.O.R. site and 'firm' (inclusive of all taxes/duties & levies etc.). The materials shall be securely packed for transport up to destination at site.

19.2 The purchaser (Department) may increase or, decrease the quantity of any item or, delete the item altogether and final order value will be on the basis of the unit price quotation.

19.3 In case of variation in quantities of any item(s) of the work order, the payment shall be made on the actual measurement basis.

20.0. Painting:

20.1 As mentioned earlier, all exposed metallic surfaces are to be treated/protected with appropriate anti-corrosion treatment.

20.2 Wherever 2 coats epoxy paint is called, it always means 2 coats of epoxy finish paint only. At all places, 2 coats epoxy finish paint shall be coated over 2 coats of epoxy red oxide zinc-chromate primer, using appropriate thinner (including surface preparation & cleaning). Epoxy paint shall be of standard make with the consent/approval of the department.

21.0 Approved list of 'makes' of various equipments & components and materials:
TENDERERS SHOULD QUOTE USING ANY OF THE APPROVED MAKE ONLY.

1.	Centrifugal fans	:	NADI/ / Flakt / Accel/ Twin city fans, Kruger, Nicotra, Chicago fans, Comfri, Maico, Greenheck, Reitz, TLT turbo, TLT bobcock, Virantis, Wolter, Ziehl-Abegg, Equivalent
4	Motors	:	Kirloskar / Crompton / ABB / Siemens.
5	MCB DBs	:	MDS/HAGER(L&T)/GE Power /SIEMENS/ HAVELL'S
6	Power/control cables	:	CCI / RPG / ICC / UNIVERSAL
7	Starters/Switches/ Contactors/MCBs	:	L & T / Siemens / GEC Alstom / ABB / GE Power
8	Electrical Panel (M.C.C.)	:	Standard or, reputed vendor/ manufacturer, subject to approval of the Dept.
9	sheets for SS ducting		SAIL, Jindal, TATA

10	Pumps		Grunfos/ Kirloskar/ Armstrong/ ITT Bell&Gossett/ WORTHINGTON/ MATHER & PLATT/ BEACON WEIR/ JYOTI/ Process Pumps Bangalore/
11	Pump Accessories		AUDCO/ADVANCE/CASTLE/CRAWLEY & RAY/ KITZ/EMERALD/ LEADER/FLOWCON/VENUS
12	Dampers(isolation, gravity dampers) for SS & MS dampers		DTL, DEMCH,FOURESS, BDK, Bobcock, Bachman, Burgman, Flextor Effox, Keld, Pathway Flextronics, Stejasa, WES

PREAMBLE TO SCHEDULE OF QUANTITIES

- 1.0 The scope of work involved: Providing centralized Air conditioning system in wing -1 and removing old AC system in control lab” in NFC, Hyderabad. which includes supply, erection, testing and commissioning of air conditioning system.

- 2.0 The tenderers shall note that drawings attached to the tender are preliminary only and site visit may be done in the interest of contractor, which is meant to give an idea of the nature of work involved. The tenderers are advised in their own interest to visit the proposed site of work to acquaint themselves with the site and the working conditions. Successful tenderer shall submit clear engineering drawings containing specifications, design details, material MOC, elevation and dimension details etc. for all items and works for approval of Engineer-In-Charge. Work/fabrication shall be started only after getting approval of drawings/specification from Engineer-In-Charge.

- 3.0 The tenderers shall carefully go through the clauses in the notice inviting tenders, Tender and contract, General Rules and directions, conditions of contract, clauses of contract, safety code, model rules for Labour Regulations, etc. and special instructions to the tenderers as also specifications and shall include, in their rates, any sum they consider necessary for the fulfillment of the various clauses contained therein. The items of work and unit rates quoted in the schedule of quantities shall be inclusive of everything necessary to complete the said items of work within the contemplation of the contract and the rates may be quoted accordingly. No extra payment beyond the quoted unit rates shall be allowed for incidental or contingent work, labour, materials or plant unless the exclusions are specifically brought out in schedule of quantities.

- 4.0 The rates quoted by the tenderer shall also include for the following:

- 4.1 Necessary care and precaution against damage/theft to equipment/materials, if any.
- 4.2 Safe custody and storage of materials at site.
- 4.3 Transportation of all required material to site, transit insurance, unloading and protection of materials including complying with all safety & security requirements for storing the materials if any.
- 4.4 Accommodation of contractor's staff.
- 4.5 Protecting of all supplied/ installed equipments in the area of work falling within the scope of the contract.
- 4.6 Providing approaches required for conveying and spreading the excavated materials, disposing of spoils etc., including crossing over the existing drains, nullahs etc., if required.
- 4.7 Providing scaffolding for height jobs.
- 4.8 The payment of minimum wages as notified by the State/Central Government and implementation of all regulations under contract Labour (Regulations and Abolitions) Act 1970 (Central) and Central Rules 1971 and the rules and orders issued there under from time to time as amended up to date. Necessary books of account and other document for the purpose of these conditions as may be necessary and shall allow inspection the same allowed by a duly authorized representative of Government and further such other information/document as the Engineer-in-charge may require.
- 4.9 For enforcement of the building and other construction workers (Regulations Employment & Conditions of Service) Act 1996 and building and other Construction Workers (RE & CS) Central Rules 1998.
- 4.10 All wastages and taxes including seigniorage tax, WCT, VAT, turnover tax, Service tax, ESI, EPF, labour welfare cess etc., as applicable time to time.

- 4.11 Double handling of construction materials and machinery, if any, due to non-availability of space near the site.
- 4.12 Cost of construction power and water required for the work as stipulated elsewhere.
- 5.0 Following all the safety and security rules and regulations as required by the Department including deploying supervisor exclusively for safety.
- (i) While execution of job/any activities, if there is any deficiency in safety/lack of safety or inadequate supervision is found, contractor is liable to penalize as per discretion of Engineer-in-charge. Any accident, if takes place, will attract heavy penalty.
 - (ii) Non deployment of safety supervisor at site will be charged as per rules.
 - (iii) Minimum quantity of PPE proposed to be brought to site for use for implementation at site.
 - (iv) Delay in progress of work/completion of work in the effort of complying of safety whatsoever pertaining to it will not be considered as a genuine reason/cause for extent of time/or any other financial implications.
 - (v) Record of safety compliance to maintained.
 - (vi) Contractor shall follow best engineering practices and shall deploy well experienced rigger at the time of erection of air handling units, condensing units, ducting etc.
- 6.0 Police verification certificate regarding character and antecedents shall be taken for all labors engaged in the work from the police station where the person resides. Entry passes will be issued only on submission of police verification certificate.
- 7.0 Contractor shall submit medical fitness certificate for all laborers engaged in the work from a recognized/registered M.B.B.S doctor. Prescribed charges for obtaining police verification certificate and medical fitness certificate shall pay by the contractor.
- 8.0 Contractor shall follow and plan the works to meet the policies of NFC in line with ISO 9001, ISO 14001 & 18001.
- 9.0 Contractor shall follow all safety & security rules applicable to NFC time to time. No relaxation will be permitted.

- 10.0 Procurement source and makes for the all required equipment/material materials shall be got approved from the Department well in advance before initiating procurement along with relevant drawings and other records.
- 11.0 Provided that where any provision of the specification is repugnant to or at variance unless a different intension appears, the provision of the schedule of quantities shall be deemed to override the provision of the specifications and shall to the extent of such repugnance or variation prevail.
- 12.0 Agency and methodology for executing the specialized items shall be got approved from the Department before fixing the agency for such items.
- 13.0 The installation/equipment supplied and erected by contractor shall be guaranteed for 12 (Twelve) months from the date of completion and handing over against any manufacturing defects or bad workmanship. Security deposit will be released to the contractor only after successful completion of guarantee period.
- 14.0 The terms of payment will be as per Departmental payment terms and conditions as indicated below.

A. For supply:

- (i) 75% of supply value will be paid after completion of delivery and inspection at site.
- (ii) 15% of supply value will be paid after completion of erection of the material.
- (iii) 10% of supply value will paid after commissioning of the supplied material.

B. For erection:

- (i) 90% of the erection value will be paid after completion of erection.
- (ii) 10% of the erection value will be paid after commissioning.

- C. Due to site conditions/constraints as per the decision of Engineer-In-Charge, if any item is not erected, which is supplied after PDI, then, 100% of supply cost of said item will be paid in final bill after successful completion of work.

15.0 NFC Policy – Quality, Environment and Occupational Health & Safety Policy

We manufacture and supply:

Fuel assemblies, core structural components and sub-assemblies for nuclear power reactors.

Stainless steel & special alloy seamless tubes and high purity materials for high tech applications in strategic industries.

We are committed to:

Meet the Quality requirements of customers,

Prevention of pollution

Prevention of injury and ill health and comply with the applicable statutory requirements

We strive to continually improve Quality, Environmental and Occupational Health & Safety performance through technological & administrative measures and by enhancing awareness among employees.

NOTE: Rates quoted shall be inclusive of all taxes applicable time-to-time and firm throughout the contract period. No escalation clause is applicable to this contract.

Part -II(Financial/Price Bid):

Schedule B

SCHEDULE: B		(SCHEDULE QUANTITIES & RATES)				NFC/EP/AC-163	
NAME OF THE WORK: " Providing Stand-by Blowers at NUOFP(O) process plant,Metallography section and at CFFP-P Air Wash Systems along with connecting ducting and complete electricals ".							
S.No	Item Description	Qty	Unit	Supply (Rs)	Erection (Rs)	Amount (Rs)	
1	Supply, Installation, testing and commissioning of all the Centrifugal Blowers at Block- A & Block B plants . Capacity.,Static Pressure &MOC						
1a	6000 CMH, 400 mmwc, SS	01	Nos				
1b	5000 CMH, 300 mmwc, SS	02	Nos.				
1c	600 CMH, 100 mmwc, SS	01	Nos.				
1d	2000 CMH, 100 mmwc, SS	02	Nos.				
1e	3000 CMH, 400 mmwc, SS	01	Nos.				
1f	30000CMH, 100 mmwc, SS	02	Nos.				
1g	10000CMH, 450 mmwc, SS	02	Nos.				
1h	75000CMH, 100 mmwc, SS	01	Nos.				
1i	40000CMH, 250 mmwc, MS	01	Nos.				
2	MCC panels						
2a	Supply, Installation, Testing & Commissioning of star delta starter panel/MCBDB with	2	Nos				

SCHEDULE: B (SCHEDULE QUANTITIES & RATES)

NFC/EP/AC-163

NAME OF THE WORK: " Providing Stand-by Blowers at NUOFP(O) process plant,Metallography section and at CFFP-P Air Wash Systems along with connecting ducting and complete electricals ".

S.No	Item Description	Qty	Unit	Supply (Rs)	Erection (Rs)	Amount (Rs)
	required rating of SFU for isolation, relays, contactors, on off push buttons, internal wiring, single phase preventer, ON/OFF/TRIP indication lamps suitable for all drives of Blowers above at S.No:1h & 1i. Complete unit shall be assembled in a cabinet as per industry standard. Cost shall include the supporting angle frame for mounting on wall/floor.					
2b	Supply, Installation, Testing & Commissioning of individual/separate star delta starter panel/MCBDB with required rating of SFU for isolation, relays, contactors, on off push buttons, internal wiring, single phase preventer, ON/OFF/TRIP indication lamps suitable for drives of Blowers above at S.No:1a,1b,1c,1d,1e,1g. Complete unit shall be assembled in a cabinet as per industry standard. Cost shall include the supporting angle frame for mounting on wall/floor.	9	Nos			
3	Supply, Installation, Testing & Commissioning of BIS Certified FRLS, PVC insulated Armoured Copper Power Cable					
3a	Suitable rated/size power cable for Blowers at S.No: 1h & 1i	300	RMT			
3b	Suitable rated/size power cable for Blowers at S.No:1f.	150	RMT			
3c	Suitable rated/size power cable for Blowers at S.No:1a,1b,1c,1d,1e,1g.	350	RMT			

SCHEDULE: B

(SCHEDULE QUANTITIES & RATES)

NFC/EP/AC-163

NAME OF THE WORK: " Providing Stand-by Blowers at NUOFP(O) process plant, Metallography section and at CFFP-P Air Wash Systems along with connecting ducting and complete electricals ".

S.No	Item Description	Qty	Unit	Supply (Rs)	Erection (Rs)	Amount (Rs)
4	Supply, Installation and Testing of BIS certified PVC insulated Armoured FRLS copper <i>control cable</i> of suitable rating/size interconnecting the control panel and fan.	1000	RMT			
5	Supply & Installation of cable terminations including lugs, crimping and terminations identifying labels duly clamped etc. for Control panel, motors of Blowers above at S.No:1.					
5a	Suitable size for Blower motors and starter panels at S.No: 1f, 1h & 1i	3	Lot			
5b	Suitable size for Blower motors and starter panels at S.No: 1a,1b,1c,1d, 1e,1g.	10	Lot			
6	Supply and installation of cable trays and support, perforated type 14G thick cable tray made out of sheet steel folded to required shape with adequate number of supports of 150 mm width with support structure for entire cable laying.	350	RMT			
7	Supply & Installation of earthing : 25 x 3 mm GI flat for drives	500	RMT			
8	GI EARTH WIRE : Supply, Installation and Testing fo earthing wire of 8 SWG Gi Wire	300	RMT			
9	RCC: Design and providing of RCC foundation for centrifugal fans, centrifugal pumps, pedestal for the scrubbers, tanks etc. The RCC specifications are as follows. RCC of grade M 20 including and using	3	CuM			

SCHEDULE: B (SCHEDULE QUANTITIES & RATES)

NFC/EP/AC-163

NAME OF THE WORK: " Providing Stand-by Blowers at NUOFP(O) process plant,Metallography section and at CFFP-P Air Wash Systems along with connecting ducting and complete electricals ".

S.No	Item Description	Qty	Unit	Supply (Rs)	Erection (Rs)	Amount (Rs)
	20 mm maximum size graded aggregate using river sand and 43/53 grade cement, shuttering, scaffolding as required, with steel bars of TMT of FE 415, fabrication and tying of Bars not less than 80 Kg/cum with 18 gage binding wire, earth work excavation of required size in all types of soil including soft and hard rocks if any, refilling the excavated earth after foundation is casted consolidation finishing curing disposing unserviceable material, finishing, mud mat concrete of 1:4:8 of 100 mm thick complete providing necessary pockets and grouting using non shrink grouts after equipment grouting wherever necessary, and complete the job in all respect.					
10	SITC. OF GI DUCTING: Supply, Fabrication, Erection and testing of GI ducting of minimum 20 guage as per IS 655 and IS 277 for supply and exhaust air systems as per the specifications given in the tender document. The flanges and supporting shall be as per IS 655. All the GI ducting should be hanged from walls/ beams/roof with the help of MS angles/ tie rods as mentioned in the tender document. The cost of duct	150	SqM			

SCHEDULE: B (SCHEDULE QUANTITIES & RATES)

NFC/EP/AC-163

NAME OF THE WORK: " Providing Stand-by Blowers at NUOFP(O) process plant,Metallography section and at CFFP-P Air Wash Systems along with connecting ducting and complete electricals ".

S.No	Item Description	Qty	Unit	Supply (Rs)	Erection (Rs)	Amount (Rs)
	<p>supports shall be included in the cost indicated for ducts. All the duct supports should have two coats of primer and black enamel paint after necessary anti rust treatment. Necessary gasket is also in the scope of contractor. Leakages in the ducts shall be as per standards. The necessary MS support & civil grouting for the support is included in the scope of work. Ducting shall be made in circular or square shape as per the site requirement.</p>					
11	<p>S,I,T,C OF S.S DUCTING : Supply, fabrication, erection and testing of SS 304 duct of minimum thickness 1.5mm as per the specifications given in the tender document for air/gas system in different plants as per the requirement. The flanges and supports etc should confirm the relevant Indian Standards. The cost of the duct supporting system should be included in the cost indicated for SS ducting. All the SS ducting should be hanged from walls/ beams/roof with the help of MS angles/ tie rods as mentioned in the tender document. The entire support should be finally painted with special anti corrosive painting.</p>	100	Sqmt			

NAME OF THE WORK: " Providing Stand-by Blowers at NUOFP(O) process plant,Metallography section and at CFFP-P Air Wash Systems along with connecting ducting and complete electricals ".

S.No	Item Description	Qty	Unit	Supply (Rs)	Erection (Rs)	Amount (Rs)
	<p>SS sheets shall be of SS 304 as per ASTM A167. Duct fabrication and erection shall confirm to IS 655. Necessary gasket is also in the scope of contractor. Leakages in the ducts shall be as per standards. The necessary MS support & civil grouting for the support is included in the scope of work. Ducting shall be made in circular or square shape as per the site requirement.</p>					
12	<p>S,I,T,C OF PVC/FRP DUCTING: Supply, installation, testing and commissioning of PVC reinforced with FRP ducting as per the detailed specifications given in the tender document. The ducts all along the length except at the flanged interconnections shall be provided with flanged top covers intermittently as shown in the drawing enclosed to enable easy cleaning of ducts. Flanges at every 6 mts and at every branch connection & bend shall be provided. The flange shall be 3mm PVC laminated with 6mm FRP. All the nuts and bolts and washers used should be SS only. The gasket between the flanges should be single pieces of 3 mm-flexible PVC for duct up to 500mm dia and in 2</p>	200	SqMt			

SCHEDULE: B (SCHEDULE QUANTITIES & RATES) NFC/EP/AC-163

NAME OF THE WORK: " Providing Stand-by Blowers at NUOFP(O) process plant,Metallography section and at CFFP-P Air Wash Systems along with connecting ducting and complete electricals ".

S.No	Item Description	Qty	Unit	Supply (Rs)	Erection (Rs)	Amount (Rs)
	pieces for ducts above 500mm. The necessary civil grouting for the support is included in the scope of work. Duct manufacturing shall be as per NBS standards. The thickness of duct is 3mm PVC laminated with 3mm FRP.					
13	<p>THERMAL INSULATION OF DUCTS (EXPOSED) :</p> <p>Supply , fabrication and Application of Thermal Insulation for the Supply and Return Air ducting coming outside with FRP sheet cladding incudes laying of 50 mm thick thermocole insulation, thermal barrier (jute sheet cladded with polyethene) wire mesh and 2 mm thick FRP sheet cladding along with all hardware, complete in all respects..</p>	100	SqMt			

NAME OF THE WORK: " Providing Stand-by Blowers at NUOFP(O) process plant,Metallography section and at CFFP-P Air Wash Systems along with connecting ducting and complete electricals ".

S.No	Item Description	Qty	Unit	Supply (Rs)	Erection (Rs)	Amount (Rs)
14	<p>ACOUSTIC INSULATION OF DUCTS: Supply and application of Acoustic insulation for the initial portion of supply air ducting. Material of construction shall be 15 mm thick fibre-free elastomeric nitrile rubber foam with open cell structure. The density of the same shall be within 140-180 Kg/m³. The material should have a thermal conductivity not exceeding 0.050 W/mK. The maximum surface temperature the material should withstand is 105°C and minimum temperature should be -20°C. The material should conform to Class -1 rating for surface spread of Flame as per BS 476 Part 7. The insulation material shall be struck to the</p> <p>cleaned duct surface by factory prefixed clod adhesive. The material and installation methodology should be in accordance with the specifications.</p>	200	SqMt			

SCHEDULE: B (SCHEDULE QUANTITIES & RATES)

NFC/EP/AC-163

NAME OF THE WORK: " Providing Stand-by Blowers at NUOFP(O) process plant, Metallography section and at CFFP-P Air Wash Systems along with connecting ducting and complete electricals ".

S.No	Item Description	Qty	Unit	Supply (Rs)	Erection (Rs)	Amount (Rs)
15	DISMANTLING OF DAMAGED DUCTING: Dismantling of existing corroded GI/SS/MS/PVC/FRP ducting & its supporting structure. The ducting and other items has to be dismantled after cutting with cutting torch or a suitable safety device and dismantling of flanges. The ducts are erected in a radioactive plant for last 15 years and hence it contains traces of radioactive dust. The duct has to be brought down with complete safety procedure specified by NFC. Removed ducting shall be stored at the place shown by NFC.	100	SqMt			
16	S,I,T,C OF S.S DAMPER: Supply, installation, testing and commissioning of SS dampers/Valves of thickness not less than 1.5mm in header/branch ducting to control air flow within 3% as per the detailed specifications given in the tender document.	20	SqMt			
17	S,I,T,C OF PVC/FRP DAMPER: Supply, installation, testing and commissioning of dampers of 3mm/3mm (6mm thick) to control air flow within 3% and/or Gravity dampers to avoid reverse flow as per the detailed specifications given in	10	SqMt			

SCHEDULE: B (SCHEDULE QUANTITIES & RATES)

NFC/EP/AC-163

NAME OF THE WORK: " Providing Stand-by Blowers at NUOFP(O) process plant,Metallography section and at CFFP-P Air Wash Systems along with connecting ducting and complete electricals ".

S.No	Item Description	Qty	Unit	Supply (Rs)	Erection (Rs)	Amount (Rs)
	the tender document.					
18	S,I,T,C OF M.S DAMPER: Design, Fabrication, Supply, installation, testing and commissioning of MS gravity dampers/Volume control dampers of thickness not less than 1.5mm in ducting as per the detailed specifications given in the tender document.	2	SqMt			
19	S,I,T,C OF ALUMINIUM S.A GRILLES/DIFUSERS: Supply, Erection and testing of Aluminum SA grills/diffusers along with volume control damper, Powder coated, not less than 0.8 mm thick along with all necessary hardware complete in all respect as per the specifications given in the tender document.	5	SqMt			
20	Supply and erection of canvass cloth for flexible jointing as per the specifications given in the tender document.	5	SqMt			
21	M.S STRUCTURE : Supply, Fabrication, Cutting, Welding, Erection at site and painting of MS Structural steel work for platforms, stands, etc., based on the approved drawings. Structural steel required shall be MS Angles, beams, channels, pipes, plates, etc.,. The work	400	Kgs			

SCHEDULE: B (SCHEDULE QUANTITIES & RATES)

NFC/EP/AC-163

NAME OF THE WORK: " Providing Stand-by Blowers at NUOFP(O) process plant,Metallography section and at CFFP-P Air Wash Systems along with connecting ducting and complete electricals ".

S.No	Item Description	Qty	Unit	Supply (Rs)	Erection (Rs)	Amount (Rs)
	should be carried out as per good manufacturing and installation practices in concurrence with approved drawing. The structural steel materials should confirm to IS: 2062 (;atest version) as per drawings. All welding electrodes to confirm to relevant IS codes. Fabrication and erection of the structural steel works shall be as per IS: 800 and welding work as per IS:816 and 822. Finally all steel work to be painted with one coat of zinc chromate primer and two coats of synthetic enamel paint.					
22	Fabrication, Supply, fixing and testing of FRP Blower Impellor, along with its shaft to the existing blower . The impellor dimensions may be taken visiting site. The blower rating is around 5000 CMH & 150 mmwc Static Pressure.	01	No.			
Total in Figures:						