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<b>SCOPE OF WORK</b>		ANEXURE – I
		Page 01 of 02
<b>JOB :</b>	<b>Job contract for VFD Retrofit for existing BHEL FEED RC Feeder ( 18 Nos.) Stage-III NTPC Rihand (Unit 5 &amp; Unit 6)</b>	
<b>Mandatory Scope of Work</b>		
<b>1.</b>	<b><u>Mobilization of site.</u></b>	
1.	Arranging Gate pass, Insurance, medical fitness certificate, police verification if required &	
2.	Accommodations to the contract personnel.	
3.	Shifting of material and T&Ps at store.	
4.	Shifting of special T&Ps to working area.	
<b>2.</b>	<b><u>SCOPE OF WORK</u></b>	
1.	The scope under this specification is only indicative and not exhaustive. However, any activity covered under the normal course of overhauling / completion of job, but not mentioned in the scope, shall be deemed to be within the scope.	
2.	Also adequate T&P, consumables and inspection/measuring and monitoring devices are to be mobilized at site, along with valid load test / calibration certificates (from local body) for 2-shift operations to avoid any hold up during execution of the work.	
3.	Embossing Permanent nomenclature on equipment erected/ trays/ panels/ wherever required as per site requirement. Necessary arrangements for protecting and safe guarding the Erected equipment from any damages and pilferages.	
4.	Transportation of materials from NTPC store and Unloading at working area.	
<b>3.</b>	<b><u>VFD Modification work shall involve the following: -</u></b>	
1.	Dismantling of Dismantling of existing RC feeder of Eddy Current Clutch based drive (5.5KW, approx. 2300Kg per boiler, 9 nos. per boiler).	
2.	Erection of new VFD drive (7.5KW, approx. 2300Kg per boiler, 9 nos. per boiler) having motor, two tachometer outputs with gear box.	
3.	Erection / Mounting of Gravimetric feeder control system which includes VFD controller & accessories – 18Nos., Current isolators – 108 Nos., Mounting plate – 18 Nos.	
<b>4.</b>	<b><u>Modifications in Remote Control Panel (RCP):</u></b>	
1.	Dismantling of existing 415V/110V Control Transformer & installation of new VFD output choke. Installations of new input choke by relocating the components. Removal of MCM and installation of VFD Controller.	
2.	Routing/installation of 3C X 4 sq.mm shielded cable between power:	
3.	Power input TBs and Input choke	
4.	Input choke to VFD	
5.	VFD to output choke	
6.	Output choke to FMOL	
7.	FMOL to power TBs in RCP	
8.	Routing of 1.5 sq.mm cable for VFD interlocks for forward run & reverse run and for Feeder Run interlock.	
9.	Shifting of 230V power supply filter and its wiring.	
<b>5.</b>	<b><u>Modifications at Gravimetric Feeder end:-</u></b>	
1.	Replacement of existing 5.5 KW Feeder drive motor and ECC with new 7.5 KW drive motor having 2 tachometer output and gear box.	
2.	Disconnecting existing power supply & Tacho terminations in existing ECC Main Drive assembly and terminating back to 7.5 KW main Drive assembly after replacement.	
3.	Internal modification including VFD power circuit, VFD interlocks, Shifting of filters of 230VAC	

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4.	Calibration of Gravimetric Feeder after modification & completion of commissioning of BHELFEED system.
5.	Commissioning of BHELFEED system.
6.	Shifting of dismantled materials to NTPC stores after completion of work.

### 6. BOQ for Erection & Commissioning

S.No.	Description	Unit	Qty per Boiler	Total Qty for 2 Boilers	Remarks
<b>1</b>	<b>Gravimetric Feeder Control System</b>				
1.1	VFD Controller, accessories & consumables	Set	9	18	—
1.2	Current Isolators	No.	54	108	—
<b>2</b>	<b>Internal Cable Modification</b>				<i>As per requirement</i>
2.1	3C x 4 sq.mm shielded cable for VFD system	Mtr	150	300	For VFD power circuit
2.2	1.5 sq.mm copper FRLS cable/wire	Mtr	150	300	Towards VFD interlocks
2.3	2.5 sq.mm copper FRLS cable/wire	Mtr	400	800	Shifting of filters of 230 V AC
2.4	Crimping lugs & wire markers	Set	1	2	1) Crimping lugs – 450 pcs 2) Wire markers – 450 pcs

### 7. Mechanical BOQ: Motor drive having two tachometer output with Gear Box 18 Nos BOQ Item

S.No.	Description	Unit	Qty per Boiler	Total Qty for 2 Boilers	Remarks
<b>1</b>	Main drive motor with Gear Box (Includes motor, gear box, 2 tacho output)	No.	9	<b>18</b>	PGMA-65-736. Weight per boiler: <b>2300 kg approx</b>

### Terminal Points:

1. Mechanical: VFD Motor Drive with Gear Box.
2. Electrical, Controls & Instrumentation
  - a) 415V 3 Phase AC : Terminal Block TBRPA in RCP.
  - b) Supply to field Motor: Terminal Block TBRP in RCP

### Note: -1. Commissioning and Calibration

1. Bidder must abide by all safety rules while execution of contract. This work shall be consistent with modern power plant practices and shall be in compliance with all applicable codes, standards, guides, statutory regulations and safety requirements in force. The System shall be commissioned to control and loading as per the existing design parameters of gravimetric feeder. Retrofitting work should be carried out without disturbing other mechanical or electrical parts of feeder which are not part of replacement and basic feature should not be changed after replacement.
2. All the calibration and testing protocol for each feeder after VFD retrofitting work shall be checked at required design load as applicable. BHEL & bidder will sign all these records jointly.
3. Bidder should ensure minimum wages and safety of the deployed manpower at site if any. Safety clauses will be applicable as per NTPC norms.
4. BIDDER shall abide by all statutory requirement, labour, and safety regulation, promulgated by Central/state/local authority. No separate payment shall be made by BHEL on such **account**
5. Bidder should take care of man and material gate-pass as per NTPC rules.
6. The bidder shall submit progress report to EIC regularly against the contract.
7. Arrangement of Feeder Calibration kit shall be in the scope of vendor.





## BILL OF QUANTITY

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ANNEXURE – III  
(PAGE 1 OF 1)

JOB :

Job contract for VFD Retrofit for existing BHEL FEED RC Feeder ( 18 Nos.) Stage-III NTPC Rihand  
(Unit 5 & Unit 6)

SL. NO.	ITEM DESCRIPTION / AREA OF WORK	UNIT	Qty.	% age allotted is for total 18 items	Remark If any
<b><u>Mandatory Scope of Work</u></b>					
10.1	VFD Retrofit for existing BHEL FEED RC Feeder	Nos	18	100	
*Billing to be done as per individual RC feeders					
20.00	Providing vehicle for site usage			1 vehicle	As per actual (tentative 150 vehicle days per unit)

**\*\* Payment terms for Individual Feeder**

20% on completion of mobilization of site & completion of dismantling of Feeder. Documents like Insurance & Labor License to be submitted along with first bill.

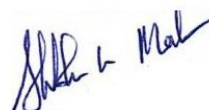
60% on completion of modification work of individual feeder.

10 % after Calibration of individual Gravimetric Feeder.

10% after completion of job in all respect for individual feeder & submission of all the documents like No Dues certificate from Customer, IR, ISF, HR Clearance from Customer, Safety Compliances if any if required, EPF challan, Insurance, Labour License, Labour Payment sheets, proof of payment of GST, Indemnity Bond to be submitted along with this bill etc.

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<b>JOB :</b>	<b>Job contract for VFD Retrofit for existing BHEL FEED RC Feeder ( 18 Nos.) Stage-III NTPC Rihand (Unit 5 &amp; Unit 6)</b>
<b>TERMS &amp; CONDITIONS</b>	
<b>1.</b>	<p><b>JOB COMPLETION PERIOD :</b></p> <p><b>TIME SCHEDULE &amp; MOBILIZATION</b></p> <p><b>INITIAL MOBILIZATION:</b></p> <p>After receipt of fax LOI, Contractor shall discuss with Project Manager / Construction Manager/BHEL Site In charge regarding mobilization. A Full-fledged team with T&amp;P shall be mobilized within 3 days on receipt of LOI or BHEL intimation.</p> <p>Note: - Full strength manpower and T&amp;P should be available at work place in 7 days' advance of unit shutdown so that all the statutory requirement and pre-shutdown activities may be completed before start of work.</p> <p><b>6 MOBILIZATION FOR ERECTION, TESTING, ASSISTANCE FOR COMMISSIONING, OVERHAULING ETC.</b></p> <p>The activities for Overhauling shall be started as per directions of Site In-charge of BHEL. Contractor shall mobilize further resources (in addition to those required for activities under clause as above) as per requirement to commence the work of VFD Retrofit for existing BHEL FEED RC Feeder (18 Nos.) at Stage-III NTPC Rihand and progressively augment the resources to match schedule of the project.</p> <p><b>SUBCONTRACTOR SHOULD COMPLETE ALL WORK WITHIN 6 MONTHS FROM DATE OF COMMENCEMENT OF WORKS AT SITE.</b></p> <p>Note: - Start date shall be confirmed &amp; certified by BHEL Site-In charge.</p> <p>Completion period per unit: - The Erection and commissioning work has to be taken up during the shutdown of the equipment/Overhaul period of the unit as decided by NTPC.</p> <p>a) Initially 1 feeder will be taken for VFD retrofit, after completion of 1st RC feeder control system VFD retrofit, it will be under test run for at least 1-month period to understand its performance and teething problems if any. Only after successful completion of trial period under different loading conditions of the equipment, the other equipment upgradation will be taken up.</p> <p>b) All the works which can be done offline are to be completed before hand by taking proper permit and only the works requiring shutdown of the equipment will be done by taking equipment shutdown that too a maximum of 2 working days. All the works are to be planned with in the period. After successful completion of trial of 1st feeder, work for remaining feeders in unit to be completed within next three months.</p> <p>c) Completion Period: One-month trial after VFD retrofit of 1st feeder, and subsequent five months to complete the total scope of works (Balance 17 feeders). Total period of 6 months from date of commencement of works at site.</p> <p>As informed by NTPC Site, feeder will be taken for VFD retrofit in Jan end 2026.</p> <p>Note: -</p> <ol style="list-style-type: none"> <li>1. As per completion period, site it may be required to close the site temporarily during execution. In this case De-Mobilization &amp; Re mobilization charges shall not be payable.</li> <li>2. Bidder shall engage sufficient manpower &amp; T&amp;P as per clearance for nos. of feeder E&amp;C work.</li> </ol>
<b>2.</b>	<p><b>DEFECT LIABILITY PERIOD :</b></p> <p>The party shall stand warranty against any defect attributed to bad workmanship for the above job for 03 (three) months from the date of Commissioning of Feeder/Handover to Customer(NTPC). The agency shall have to attend to the defects contributed to their faulty workmanship / negligence / omission, occurred during trial run or during the defect liability period of the equipment without any extra cost and put the machine in normal operation. The defect liability period shall be three months from the date of successful completion of executed overhauling (Date of Synchronization of the unit) but the defect if reported can be attended within 1 year subject to availability of shutdown provided that the reporting of defect falls within the defect liability period.</p>



<b>3.</b>	<b>INSURANCE, PROVIDENT FUND &amp; LABOUR LICENCE OF WORKMEN:</b>
	The agency shall compulsorily take Insurance under Workmen Compensation Act for all personnel deployed and the insurance must be valid till defect liability period. The agency must have independent PF Registration No. and they must deposit the prescribed amount to the Statutory Authorities as per the relevant Acts/Rules. The agency should have valid Labour License and they must obtain the Labour License prior to commencement of work as per the relevant Acts/Rules.
<b>4.</b>	<b>GATE PASS &amp; POLICE VERIFICATION OF PERSONNEL:</b>
	The agency shall arrange entry/exit gate pass for Manpower, Materials & Vehicles from concerned Security Agency of the Customer at their own cost as per the prescribed procedures of the customer. The agency must get the character & antecedents of all personnel deployed to site duly verified from the concerned Police.
<b>5.</b>	<b>FACILITIES AT SITE:</b>
	The agency shall have to arrange Accommodation for their Personnel at their own cost. The agency shall have to arrange for the stores and office at site at their own cost, space for the same shall be provided as per the availability at site. The agency shall have to provide, at his own cost, all necessary facilities to the personnel deployed like residential accommodation with proper sanitary facilities, transport, electricity, water, medical, food, safety equipment, personal protective equipment, first aid etc. as required under relevant statutory acts & rules.
<b>6.</b>	<b>MANPOWER :</b>
<b>a)</b>	The agency has to deploy adequate nos. of supervisors and skilled, semi-skilled & un-skilled manpower so as to complete the work in the specified completion period.
<b>b)</b>	In addition to above, the agency has to arrange the Expert for NDT and calibration of feeders with equipment & consumables at their own cost.
<b>c)</b>	The agency shall ensure that no physically unfit/mentally unsound and under-aged person (below 18 years) are employed at any time and shall also maintain the requisite health records of the personnel deployed.
<b>d)</b>	In addition to above, the contractor must provide additional manpower as required at any stage of work for smooth execution & timely completion of work without any extra cost to BHEL. In case the contractor fails to provide additional manpower as required, BHEL reserves the right to arrange additional manpower from other sources and recover the cost incurred with overhead at prevailing rate from the bills of the contractor.
<b>e)</b>	Agency has to deploy one no. safety officer round the clock work.

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<b>7.</b>	<b>T&amp;P, IMTES &amp; CONSUMABLES:</b>
<b>a)</b>	Contractor will have to provide all necessary T&Ps, IMTE's & Consumables required for successful completion of works in schedule time. T&Ps & IMTEs used by the agency duly tested and test certificate from Govt. approved agency must be available at site. However, the contractor may be asked to arrange the additional required T&Ps, IMTE's & Consumables at any stage depending upon the job.
<b>b)</b>	Other T&P viz pliers, hammers & files etc. and consumables viz HSS/carbide rotary cutters, carbide tipped cutting tools, material handling T&Ps, Spanners, hacksaws, Measuring Tapes, Tri Square and other general purpose T&Ps/IMTEs, emery papers of various grades, buffing wheels, high speed rotary stones, grinding/cutting wheels, diamond grinding paste, hold tight, Rust removing sprays for removal of seized fasteners etc. are to be arranged in sufficient quantity as per requirement
<b>c)</b>	All consumables like, welding electrodes, gases, cotton waste, emery, cloth, hacksaw blades, petrol /diesel, anti-rust, fluorescent DPT kits, DPT Kits etc. shall be arranged by the contractor at their own cost.
<b>d)</b>	DA, Oxygen, Argon, Liquid Nitrogen and all Industrial gases must be arranged from approved agencies only and their testing certificates must be submitted. Entry Gate pass of all consumables must be submitted to the site office.
<b>e)</b>	In case the contractor fails to provide such additional T&Ps, MMDs, Consumables & Other Materials as required, BHEL reserves the right to arrange additional T&Ps, MMDs, Consumables & Other Materials from any source and recover the cost incurred with overhead at prevailing rate from the bills of the contractor.
<b>f)</b>	All the Critical Material Handling T&Ps such as Chain Pulley Blocks, Pull & Lifts, Slings etc. and Electrical T&Ps such as Welding Machines, Grinders etc. should have valid Testing Certificates and the same must be checked & tested prior to their use at site. In the event of non-availability of the required T&Ps after start of the work, BHEL shall have the option to provide the T&Ps on chargeable basis subject to availability. In addition, a penalty of R s. 1000/- per item shall also be levied on the contractor.
<b>g)</b>	All the Critical MMDs must be available with valid testing & calibration certificates at site. The contractor shall submit the list of available MMDs along with their calibration certificate. In case of failure to submit the above details or in the event of non-availability of the required MMDs after start of the work, BHEL shall have the option to provide the calibrated MMDs on chargeable basis subject to availability. In addition, a penalty of Rs. 1000/- per item shall also be levied on the contractor.
<b>h)</b>	All the Consumables must be of the best quality and of approved brands only. Only BHEL approved Welding Electrodes & Filler Wires shall be used and their Test Certificates shall be submitted. DA, Oxygen, Argon and all Industrial gases must be arranged from approved agencies only and their testing certificates must be submitted. DPT Consumables shall be of CHECKMATE Make only. Aluminium Silicates shall be arranged by the agency free of cost.
<b>8.</b>	<b>SUBMISSION OF DOCUMENTS:</b>
	The agency shall have to submit the list of Manpower, T&Ps, MMDs, Consumables & Other Materials before commencement of work and they shall also submit copies of Labour License, PF Registration Certification, Workmen Insurance, Gate Passes of Manpower & Materials and other statutory documents after mobilization at site. Agency has to submit quality Plan, Detail Welding Schedule and Day wise activity schedule before starting of job. During execution of the work, Daily Progress Reports and other required Documents shall have to be furnished by the agency.

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<b>9.</b>	<b>JOB PROGRESS &amp; REVIEW :</b>
	Checking of all defects and submission of report to BHEL by the contractor to be done as soon as the machine is opened to facilitate early action for rectification/replacement. Daily work planning, scheduling and reviewing of work will be done by the contractor and Contractor's representative must attend daily review meeting with BHEL every evening in the work control office and submit progress report on daily basis to BHEL. BHEL shall have the option of ensuring completion of the work in time by arranging additional resources and manpower at the risk & cost of the agency in case the job progress is not satisfactory.
<b>10.</b>	<b>MISCELLANEOUS:</b>
<b>a)</b>	Contractor shall depute their representative for necessary co-ordination, follow up and shifting/transportation of materials from and to work spot / workshop /stores etc. Day to day area cleaning and scrap removal & final area cleaning after completion of work to be done as directed by BHEL. Removal of insulation, refractory, cladding, paint as per site requirement is included in the scope. All jobs are to be carried out as per BHEL norms and all measurements/clearances etc. are to be set as per BHEL standards.
<b>b)</b>	Any other work not mentioned but which is required for successful completion of work has to be done by the agency.
<b>c)</b>	No idle labour / over-run / de-mobilization / mobilization charges shall be paid in the event of any stoppage of work or the completion period being extended for any reason.
<b>d)</b>	The successful bidder shall not sub – contract work in part or whole without the written permission of BHEL and the bidder is solely responsible to the work awarded to the bidder.
<b>e)</b>	No interest shall be payable on Earnest Money Deposit, Security Deposit or any other claims. Terms of forfeiture of EMD & SD and Other Terms & Conditions shall be as per GSCC.
<b>f)</b>	Agency has to ensure safety compliance as per BHEL norms.
<b>11.</b>	<b>Important Safety Conditions</b>
	Amount linked towards safety aspects/ compliance to safety rules: 5% of contract value. Amount 5% from each RA bill will be deducted towards compliance of safety provisions by contractor, amount will be released at the work completion (whichever is earlier) after due certification by BHEL and safety in-charge for fulfilment of safety aspects for the reference time period. In case of any deviation or penalty, amount will be deducted as per tender provisions regarding safety compliance.
<b>12.</b>	<b>Third Party Liability Insurance</b>
	Third Party Liability Insurance: - Value to be insured 1. i) The Contractor shall necessarily take Third Party Liability Policy. Value to be insured shall be "Total/ Aggregate amount during the currency of Contract: Rs. 50.00 Lakhs or '110% of Contract value (Excluding GST)' whichever is lower". For any one occurrence: 50% of Total aggregate amount" of value to be insured.

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# **BILL OF QUANTITY**

<b>JOB :</b>	<b>Job contract for VFD Retrofit for existing BHEL FEED RC Feeder ( 18 Nos.) Stage-III NTPC Rihand (Unit 5 &amp; Unit 6)</b>	
<b>SL. NO.</b>	<b>DESCRIPTION OF WORK</b>	
<b>20.30</b>	<b>PROVIDING VEHICLE FOR SITE USAGE</b>	
	Vehicle Scope of Work and Terms and Conditions	
A.	SCOPE: Providing One Vehicle exclusively for BHEL Staff use at, NTPC Rihand from start of work till completion of work. (Tentatively 150 Vehicle days for all units).	
B.	Payment: Payment for providing the vehicle shall be done as per actual usage of vehicle days including running charges, OT & Night Charges as per following rate and Terms & conditions detailed as below.	
C.	Schedule of Rates for (4+1-Seater) Dzire/Indigo/SUV or (6+1-Seater) Bolero/ Scorpio or any equivalent type of Vehicle	
1.	Type of Vehicle	(4+1 Seater) Dzire/Indigo/SUV or (6+1 Seater) Bolero or any equivalent type of Vehicle
2.	Daily Hire charges Rate for 12 hours duty	Rs. 969/- per day
3.	Running charges	Cost of 1 litre fuel for every 10 Km running
4.	Overtime charges per hour (after 12 hours duty)	Rs. 54/- per hour
5.	Night Charges per night for stay beyond 11 PM ** Overtime and night cannot be clubbed together night shall only be paid when vehicle is used away from site due to any reason.	Rs. 216/- per night
<b>D.</b>	<b>TERMS &amp; CONDITIONS FOR VEHICLE USAGES AT SITE</b>	
1.	Type of Vehicle must be (6+1 Seater) Bolero/ Scorpio or any equivalent type of Vehicle and not older than 2020 Model with excellent running conditions or, Type of Vehicle must be (4+1 Seater) Dzire/Indigo/SUV or any equivalent type of Vehicle and not older than 2020 Model with excellent running conditions. BHEL shall inform as per manpower deployed.	
2.	The vehicle should be in the name of bidder or should be duly authorized by the rightful owner for deployment under this contract.	
3.	Distance and time shall be taken into the account from garage to garage. However, these will be limited to 10 km and half an hour each way for the payment of purpose.	
4.	The above rates are inclusive of all charges towards driver, fuel, maintenance, lubricants, insurance and statutory taxes etc. No other charges shall be payable.	
5.	Duty hours shall be 12 hours/day. Depending on the site condition vehicle can be retained at site throughout the night and continued next morning in which case overtime (OT) beyond 12 hours will be paid as per agreed rates.	
6.	Night charges and overtime charges shall Not be paid concurrently beyond 11 pm.	
7.	The vehicle shall be diesel or petrol driven and in excellent running condition. In case of break down alternate replacement vehicle shall have to be provided by the agency otherwise BHEL will arrange the vehicle at the risk and cost of the agency.	
8.	For running charges, receipt of fuel shall be attached along with bill.	
9.	The maintenance of vehicle shall be responsibility of agency. However, suitable breaks for maintenance of vehicle shall be given as per convenience of BHEL, during this agency shall provide alternate vehicle.	
10.	All expenses towards state taxes/road tax, passenger taxes, road permits, pollution control certificate, insurance, driver's license etc. shall be borne by the agency. No claim in this regard will be entertained by BHEL.	
11.	Mobile Phone is compulsory for each driver who is on duty.	
12.	All legal responsibility of the vehicle shall be of the agency. Photocopy of all statutory requirements i.e. pollution test certificate, challan, vehicle registration book, driving license, ownership documents etc. will have to be made available/submitted to BHEL by the agency.	
13.	Toll tax and parking charges shall be paid by the agency which will be reimbursed to him by BHEL, as per actual, on submission of receipt.	
14.	Vehicle shall be used at site as per requirement till completion of work, if work completed before the contract period BHEL reserves the right to terminate the contract.	
15.	The vehicle may be required to be taken outside the power plant area whereby the same rates will be applicable.	
16.	During contract, if there is any dispute then the decision taken by the legal advisor appointed by BHEL shall be binding on both parties.	
17.	The meter reading shall be checked at random intervals to ensure its correctness.	
18.	Driver engaged shall be courteous and well behaved. Safety of driver, his accommodation, food and other facilities for the driver have to be arranged by the agency.	
19.	All bills shall be accompanied by vehicle log book, duly completed and signed by the users.	
20.	No payments shall be made for the unsigned mileage reflected in the log book.	
21.	Payment shall be made after completion of work on receipt of bills and duly verified by BHEL engineer in-charge by electronic transfer to the account in the bank identified by the agency.	
22.	Signed no due certificate from the owner of the vehicle along with signed wage sheet payment of drivers should be enclosed along with the bill.	

*Shakeel Malik*