

E 7180677

**BHARAT HEAVY ELECTRICALS LIMITED, JHANSI**

|                   |                            |  |  |
|-------------------|----------------------------|--|--|
| Equipment         | Air washer unit-50,000 CFM |  |  |
| Specification No. | 7801                       |  |  |
| Item No.          | SP/MISC/11/77801           |  |  |
| Location          | BAY -9                     |  |  |
| Quantity          | 09 No's.                   |  |  |

**NOTE :**

1 VENDOR must submit complete information against clause No.12.0 The offer meeting this clause would only be processed.

2 The " offered" Column and where applicable, the " Deviations" Column of this format shall be filled in by the vendor and submitted along with the offer. Technical details also submitted with the offer. Inadequate / incomplete, ambiguous, or unsustainable information against any of the clauses of the specification / requirements shall be treated as non - compliance.

3 The offer and all documents enclosed with offer should be in English language only.

**NAME & ADDRESS OF THE SUPPLIER :**

**CONTACT PERSON'S NAME**

**TELEPHONE NOS.:**

**E-MAIL ADDRESS :**

**SCOPE :**

**DESIGN,SUPPLY, ERECTION AND COMMISSIONING OF AIR WASHER UNITS EACH 50000 CFM(Min.) WITH SUITABLE AIR DUCTING AND ELECTRICAL CONTROL PANEL .**

| S.No. | DESCRIPTION FOR BHEL REQUIREMENT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | ACTION BY vendor                         | OFFERED | DEVIATIONS |
|-------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------|---------|------------|
| 1     | <b>SCOPE</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                          |         |            |
| 1.1   | This specification governs the quality requirements of Design supply, erection and commissioning of air washer units capacity 50,000 CFM(Min.) each , suitable Air ducting( jet type diffuser made from Aluminum sheets with damper duly powder coated) with suitable supporting structure and electrical control panel.in BAY - 9 area &ducting (Location of air washer units will be as per the site requirement)                                                                                                                                            | vendor to confirm                        |         |            |
| 2     | <b>REQUIREMENT</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                          |         |            |
| 2.1   | Design supply, erection and commissioning of air washer units Cap- 50,000 CFM (Min.) each in bay-9 shop size Approx.(300 X 24 X 26M) with electrical controll panel & suitable air ducts including all required accessories.                                                                                                                                                                                                                                                                                                                                   | vendor to confirm                        |         |            |
| 2.2   | <b>Air Washer unit Quantity[Cap-50,000 CFM (Min.)] - 09 No.</b> with suitable Air duct Approx. length of Air duct is 350 Mtr.(Length of air duct may be increase/decrease as per site requirement. Vendor must lay the air duct as per site requirement in totality)                                                                                                                                                                                                                                                                                           | vendor to confirm                        |         |            |
| 2.3   | <b>Electrical Control Panel-09 No.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | vendor to confirm                        |         |            |
| 3     | <b>SPECIFICATION</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                          |         |            |
| 3.1   | <b>AIR WASHER UNITS 50000 CFM.(Min.)</b><br>Modular type Air washer units 50000 CFM/ 65 mm static pressure, water spray nozzles & piping network, cellulose cooling pads 7 mm flute, stainless steel 14/16 SWG water tank with anti corrosive coating, intake louvre with bird screen , fan outlet damper, 50 mm thick washable pre- filter 10 micron, G.I eliminators, double skin panels, blower motor with drive, inspection window etc.<br><br>capacity of the water tank to be specified                                                                  | vendor to confirm & specify the capacity |         |            |
| 3.2   | <b>AIR WASHER PANEL</b><br>double skin panels shall be 40 mm thick, made of Min 20 SWG Pre-plasticized and pre - painted with pvc Guard, galvenised sheet on outside and Min 22 swg inside with polyurethane foam insulation insulation of density not less than 38 kg/cu.m injected in between injection machine these panels shall be bolted from inside screwed from outside on the framework with rubber gasket in between to the make joints airtight etc<br>(G.I Sheet make:-Sail /Tata/jindal/ispac/JSW/equivalent national reputed make only-ref 3.13) | vendor to confirm & specify the make     |         |            |
| 3.3   | <b>Centrifugal Blower &amp; Motor</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                                          |         |            |

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|      | AMCA Certified double centrifugal blower 25H.P(Min.), 3 Phase electric motor through belt with adjustable motor frame , belt guard. Belts shall be of the oil resistant type. the number of belts shall be not less than two,dynamically balanced fan motors etc.<br>(Blower Make:- AMCA CERTIFIED)<br>(Make Of Motor- SIEMENS, GE, BHARAT BIJLEE, KIRLOSKER/ ABB/ Crompton/equivalent national reputed make only-ref 3.13)) | vendor to specify the motor rating and make |  |  |
| 3.4  | <b>Centrifugal Blower Housing</b>                                                                                                                                                                                                                                                                                                                                                                                            |                                             |  |  |
|      | Housing shall be of 14/16 swg. M.S/G.I sheet in welded construction , 1.2 mm galvanised wire mesh inlet guard..<br>(G.I Sheet make:-Sail /Tata/jindal/ispal/JSW/equivalent national reputed make only-ref 3.13))                                                                                                                                                                                                             | vendor to confirm & specify the make        |  |  |
| 3.5  | <b>Pre-filter 10 micron</b>                                                                                                                                                                                                                                                                                                                                                                                                  |                                             |  |  |
|      | Supply installation testing of cleanble metallic viscous type pre filter made out of aluminium wire mesh 50mm thick,<br>Make:- Reliance, Refcon, Aerotech, Sycon/equivalent national reputed make only-ref 3.13))                                                                                                                                                                                                            | vendor to confirm & specify the make        |  |  |
| 3.5  | <b>WATER SPRAY PUMP</b>                                                                                                                                                                                                                                                                                                                                                                                                      |                                             |  |  |
|      | Supply installation testing and commissioning of water spray pump with 3.0 HP(Min.) centrifugal pump one main and one standby<br>(Make Of Motor- SIEMENS, GE, BHARAT BIJLEE, KIRLOSKER/ ABB/ Crompton/equivalent national reputed make only-ref 3.13))                                                                                                                                                                       | vendor to specify the motor rating and make |  |  |
| 3.6  | <b>WATER SPRAY PIPE, VALVE, FITTING</b>                                                                                                                                                                                                                                                                                                                                                                                      |                                             |  |  |
|      | water spray piping with connected to the 3.0 HP(Min.) pumps one main and one standby pipe lines, fittings with butterfly, y-strainer, nrv, float vale, gauge, complete with welding, nipple, socket, elbow, bend, flanges, etc. primer, enamel paint etc. complete work as per site requirement.<br>(Make: Castle,sir, H guru, fiebig/ equivalent national reputed make only-ref 3.13))                                      | vendor to confirm & specify the make        |  |  |
| 3.7  | <b>WATER SPRAY M.S. PIPING</b>                                                                                                                                                                                                                                                                                                                                                                                               |                                             |  |  |
|      | water spray pump and drain pipe m.s. 65 mm B, class piping to be connected with one main and one standby pump, butterfly, y-strainer, nrv, float vale, gauge, complete with welding, cutting,nippal, socket, elbow, bend etc. primer, enamel paint complete work as per site requirement<br>(Make:- JSW,Jindal,Tata, Sail /equivalent national reputed make only-ref 3.13))                                                  | vendor to confirm & specify the make        |  |  |
| 3.8  | <b>GI DUCTING</b>                                                                                                                                                                                                                                                                                                                                                                                                            |                                             |  |  |
|      | Air washer Ducts made out of G.I.sheets FOR SUPPLY AIR Complete job as per detailed drawings including suspension from RCC ceiling/structure support at floor/ground with MS hangers/ angle steel flanges, fasteners, etc.as per IS 655.<br>(G.I Sheet make:-Sail /Tata/jindal/ispal/JSW/equivalent national reputed make only-ref 3.13)) & gauge 18,20 only                                                                 | vendor to confirm & specify the make        |  |  |
| 3.9  | <b>Supply installation testing of Grilles :</b>                                                                                                                                                                                                                                                                                                                                                                              |                                             |  |  |
|      | Adjustable blade type MS Powder coated Supply air grills. M.S Volume Control Dampers for Supply Duct.<br>(Make:- Ravistar, survex,Tristar,Carryaire/equivalent national reputed make only-ref 3.13))                                                                                                                                                                                                                         | vendor to confirm & specify the make        |  |  |
| 3.10 | <b>Electrical Power cable for Air washer Motor</b>                                                                                                                                                                                                                                                                                                                                                                           |                                             |  |  |
|      | Supply installation, testing and termination of suitable electrical power/control cable for air washer motor pvc insulated pvc sheathed steel armoured multicore Copper conductor of size 4 core X 10 mm with 8.0 SWG. G.I wire as per requirement.<br>(Make:- Finolex, Incab, Havells/equivalent national reputed make only-ref 3.13) )                                                                                     | vendor to confirm & specify the make        |  |  |
| 3.11 | <b>Electrical Power cable for water spray pump</b>                                                                                                                                                                                                                                                                                                                                                                           |                                             |  |  |
|      | Supply installation, testing and termination of electrical power /control cable for water spray pump pvc insulated pvc sheathed steel armoured multicoulor Copper conductor of size 4 core X 06 mm with 8.0 SWG. G.I wire as per requirement.<br>(Make:- finolex, incab, Havells/ /equivalent national reputed make only-ref 3.13))                                                                                          | vendor to confirm & specify the make        |  |  |
| 3.12 | <b>Electrical Panel.</b>                                                                                                                                                                                                                                                                                                                                                                                                     |                                             |  |  |

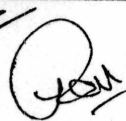
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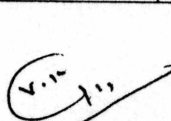
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|------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|--|--|
|      | Supply Installation of electrical panel made out of 14/16 SWG CRCA sheet, instrumentation section of the following INCOMING: 1 No. 200 Ampere MCCB, Bus bars, 3 nos. indication Lamp, volt & ampere metering device with 25H.P.(Min.) Air washer motor, 2 X 3 HP pump motor starter, relay and control device etc. as per requirement of system. At suitable place for easy operation.<br>(Make:- L & T / SIEMENS/ GE/equivalent national reputed make only-ref 3.13)                                                                                                  | vendor to confirm & specify the make |  |  |
| 3.13 | <b>Equivalent national reputed make only</b><br>This term means that only companies equivalent to the listed ones, in following counts, would be considered:<br>- Similar ISO/ OSHAS Certifications<br>- Similar DIN/ BIS Test Certifications for the product range offered.<br>- Similar level of reputed clientele with offered equipment/item in service for last 3 years.<br>For the same, Vendor needs to submit Published catalogues, quality systems & test certificates before hand. Only after the prior approval of BHEL can this category of items be used. | vendor to confirm & specify the make |  |  |
| 4    | <b>CIVIL WORK</b><br>All civil work room or shed, construction of foundation for equipment will be in the scope of bhel.supplier has to provide complete civil drawing well in time before delivery.(within 15 days after the date of p.o.)                                                                                                                                                                                                                                                                                                                            | vendor to confirm                    |  |  |
| 5    | <b>ELECTRICAL/WATER SUPPLY</b><br>Electrical & water supply will be provided by BHEL at the possible nearest point.                                                                                                                                                                                                                                                                                                                                                                                                                                                    | vendor to confirm                    |  |  |
| 6    | <b>PACKING:</b><br>All components shall be suitably packed so that the material reaches BHEL without any damage/loss in transit.                                                                                                                                                                                                                                                                                                                                                                                                                                       | vendor to confirm                    |  |  |
| 7.0  | <b>MISCELLANEOUS :</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                      |  |  |
| i    | One no, 3 Phase electric motor suitable for blower is to be supplied (same make, model & capacity used in blower) as a spare along with supply.                                                                                                                                                                                                                                                                                                                                                                                                                        | vendor to confirm                    |  |  |
| ii   | Ducting work will be done according to drawing which is approved by bhel before start the work.                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | vendor to confirm                    |  |  |
| iii  | vendor has to prove the CFM of each unit on the time of commissioning at bhel jhansi. Duly calibrated Instrumente used for proving the CFM will be arranged by vendor.                                                                                                                                                                                                                                                                                                                                                                                                 | vendor to confirm                    |  |  |
| iv   | All material used should be of the best of their respective kinds and should of the appropriate I.S. Specification & all workman ship should be of best quality.                                                                                                                                                                                                                                                                                                                                                                                                       | vendor to confirm                    |  |  |
| v    | First fill oil, grease etc. for the commissioning of the air washer shall be provided (if applicable)by the supplier.All the system in the condition of ready to use with all necessary accessories.                                                                                                                                                                                                                                                                                                                                                                   | vendor to confirm                    |  |  |
| vi   | List of bought out items should be furnished with names of makers and complete literature about the items should be supplied.                                                                                                                                                                                                                                                                                                                                                                                                                                          | vendor to confirm                    |  |  |
| vii  | Not with standing any thing the details in this specification, if any thing else is required for its functioning the same shall be specially brought and included in offer                                                                                                                                                                                                                                                                                                                                                                                             | vendor to confirm                    |  |  |
| viii | submit the offer with full detailed working drawing of system .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | vendor to submit                     |  |  |
| ix   | vendor can visit the site before submitting the offer to asses the work, space available for air washer, location of air washer units ,air out put(out flow) direction of air washer unit,route of air duct line etc.                                                                                                                                                                                                                                                                                                                                                  | vendor to note                       |  |  |
| x    | All material required for the supporting structure of air duct will be in the scope of supplier.                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | vendor to confirm                    |  |  |
| xi   | The equipment is to be inspected & tested at supplier works by our representatives prior to dispatch as per specification. Inspection call will be send by vendor 15 day in advance to BHEL.                                                                                                                                                                                                                                                                                                                                                                           | vendor to confirm                    |  |  |
| xii  | All exposed material used should be galvanised or power coated.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | vendor to confirm                    |  |  |
| 8    | <b>PAINTING :</b><br>The structural steel work & frame should be given one coat of suitable primer with 25 micron of DFT (Dry film Thickness) and 48 hours of compalsory curing after painting. Final paint should be done with two coats of gray synthetic enamel paint/ specified by BHEL lateron( vendor must take approval before statr the work) each with a DFT of 25 microns and intermittent curing of minimum 16 hours..                                                                                                                                      | vendor to confirm                    |  |  |
| 9    | <b>ERECTION AND COMMISSIONING</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                      |  |  |

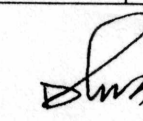
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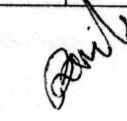
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|--------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------|--|--|
| 9.1    | The air washer and air duct is to be erected by the supplier at site with their own labour, tools and tackles, winch etc.(including consumable required for E&C) .The air washer system must be commissioned and tested/ checked before handing over.                                                                                      | vendor to confirm |  |  |
| 9.2    | All material (foundation bolt etc.)required for the erection &commissioning of system will be in the scope of vendor.                                                                                                                                                                                                                      | vendor to confirm |  |  |
| 9.3    | Successful proving by the supplier shall be considered as part of commissioning                                                                                                                                                                                                                                                            | vendor to confirm |  |  |
| 9.4    | Location of Air washer unit will be indicated by BHEL JHANSI                                                                                                                                                                                                                                                                               | vendor to confirm |  |  |
| 9.5    | E & C schedule to be submitted by vendor before start the workat                                                                                                                                                                                                                                                                           | vendor to confirm |  |  |
| 10     | <b>GUARANTEE</b>                                                                                                                                                                                                                                                                                                                           |                   |  |  |
|        | Guarantee regarding workmanship, motors, material used, design and performance should be provided by the party for a period of 24 months from the date of successful commissioning of the complete installation..                                                                                                                          | vendor to confirm |  |  |
| 11     | <b>Documentation</b>                                                                                                                                                                                                                                                                                                                       |                   |  |  |
| 11.1   | <b>During participation in technical Bid.</b>                                                                                                                                                                                                                                                                                              |                   |  |  |
| 11.1.1 | G.A. Drawing for air washer and air duct                                                                                                                                                                                                                                                                                                   | vendor to submit  |  |  |
| 11.1.2 | Approx. foot area of air washer                                                                                                                                                                                                                                                                                                            | vendor to specify |  |  |
| 11.1.3 | Approx. Electrical load of each air washer                                                                                                                                                                                                                                                                                                 | vendor to specify |  |  |
| 11.1.3 | Technical literature                                                                                                                                                                                                                                                                                                                       | vendor to submit  |  |  |
| 11.1.4 | Total weight of the equipment.                                                                                                                                                                                                                                                                                                             | vendor to specify |  |  |
| 11.1.5 | Requirement of power, water, air etc with details like quantity and pressure.                                                                                                                                                                                                                                                              | vendor to specify |  |  |
| 11.2   | <b>After Receipt of Order: (For approval)</b>                                                                                                                                                                                                                                                                                              |                   |  |  |
| 11.2.1 | Three set of GA drawing of complete system.                                                                                                                                                                                                                                                                                                | vendor to confirm |  |  |
| 11.2.2 | Three sets of electrical schematic and control circuit diagram                                                                                                                                                                                                                                                                             | vendor to confirm |  |  |
| 11.3   | <b>With the supply</b>                                                                                                                                                                                                                                                                                                                     |                   |  |  |
| 11.3.1 | Three sets of maintenance manual, operation manual of m/c. Spares - part list concerned drawing of spares in hard copy and one set in soft copy.                                                                                                                                                                                           | vendor to confirm |  |  |
| 11.3.2 | Catalogues, O&M Manuals of all bought out items including drawings- 3 set in hard copy and one set in soft copy.                                                                                                                                                                                                                           | vendor to confirm |  |  |
| 12.0   | <b>QUALIFYING CONDITIONS</b>                                                                                                                                                                                                                                                                                                               |                   |  |  |
| i      | Only those vendors [manufacturer of cooling system (document required)] who have supplied and installed at least 05 Nos. air washer unit of 50000 CFM capacity or more capacity in the last five year and any two of them air washer units presently working satisfactorily for more then last two years(performance certificate required) | vendor to submit  |  |  |
| ii     | Company name & postal address,phone, FAX no. , email address and designation of the contact person of the customer / company along with Purchase Order no. and Purchase Order (Copy of Purchase Order should be furnished).                                                                                                                | vendor to submit  |  |  |
| iii    | Performance certificate from the customers,regarding satisfactory performance of air washer units supplied to them.                                                                                                                                                                                                                        | vendor to submit  |  |  |
| 13     | <b>BHEL reserves the right to verify information submitted by vendor. In case the information is found to be false / incorrect, the offer shall be rejected.</b>                                                                                                                                                                           | vendor to confirm |  |  |

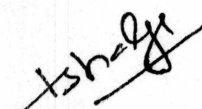
  
D.K.Sharma  
Dy.Mgr.(TRM)

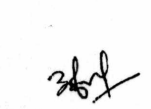
  
Y.K.Dhingra  
Dy.Mgr.(MOD)

  
V.K.Gupta  
Dy.Mgr.(WEX)

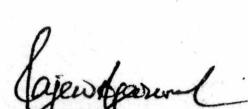
  
Dhirendra Kumar  
Mgr.(TRM)

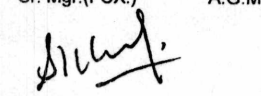
  
S.K.Bajpayee  
Mgr.(WEX)

  
K.D.Gupta  
Sr. Mgr.(FCX.)

  
Oscar Angel  
A.G.M(TRM-PT)

  
Sanjeev Rastogi  
A.G.M(WEX,MOD)

  
Rajeev Agrawal  
A.G.M(Quality&Test)

  
S.J.chakrobarty  
A.G.M(WEX,MOD,FCX&HSE)