

|  <b>BHARAT HEAVY ELECTRICALS LIMITED ,BHOPAL</b>                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                          |             |            |
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| Document No.HCM/BT821102006/2021/01                                                                                                                                                                                                                                                                                                      |                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Rev. No. 02              | Dt of issue | 23-09-2020 |
| <b>SPECIFICATION CUM COMPLIANCE CERTIFICATE OF HYDRAULIC MULTI STUD BOLT TENSIONER/P RELOADING SYSTEM</b>                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                          |             |            |
| <b>NOTE:-</b>                                                                                                                                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                          |             |            |
| 1. Vendor must submit complete information against clause no. 1.0-25.3, The offer meeting this clause would only be processed                                                                                                                                                                                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                          |             |            |
| 2. The "Offered" Column and where applicable, the "Deviations" & "Remarks" Column of this format shall be filled in by the Vendor and submitted along with the offer. Inadequate / incomplete, ambiguous, or unsustainable information against any of the clauses of the specifications/requirements shall be treated as non-compliance. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                          |             |            |
| 3. The offer and all documents enclosed with offer should be in English language only.                                                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                          |             |            |
| 4. The information provided by vendor in specification cum compliance certificate will supersede any other information provided by vendor .                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                          |             |            |
| 4. Important: Vendor to submit offer in line with the tender specifications & in same order with supportive documents.                                                                                                                                                                                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                          |             |            |
| NAME & ADDRESS OF THE SUPPLIER :                                                                                                                                                                                                                                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                          |             |            |
|                                                                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                          |             |            |
| Supply, Installation & commissioning of Hydraulic multi stud Bolt Tensioner/Preloading system complying with these specifications                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                          |             |            |
| SNO                                                                                                                                                                                                                                                                                                                                      | DESCRIPTION FOR BHEL REQUIREMENT                                                                                                                                                                                                                                                                                                                                                                                                                                | SPECIFIED / CONFIRMED BY | OFFERED     | REMARKS    |
| 1                                                                                                                                                                                                                                                                                                                                        | Application : ( Operations/Jobs involved ):<br>Hydraulic Bolt/ Stud tensioner/Preloading system is required for assembly of Channel cover/water box with channel flange by means of elongation of Bolt/ Stud through hydraulic force for stud of various design of Heat Exchangers etc.                                                                                                                                                                         | Vendor to note & Confirm |             |            |
| 2                                                                                                                                                                                                                                                                                                                                        | Job Profile: The system should be used for preloading of studs sizes M36, M72, M27,M30 and M64 to provide the required required load .PI refer annexure-A hereby enclosed.                                                                                                                                                                                                                                                                                      | Vendor to note & Confirm |             |            |
| 3                                                                                                                                                                                                                                                                                                                                        | Job technical requirement : The system shall apply force/pressure through hydraulic power pack on the studs/bolts to produce required load on the studs/bolts. The system should be suitable to meet the required load required for each application as per annexure A. After tightening of nuts, Following shall be measured & recorded:<br><br>(i) Final load(by load pressure chart) on each stud as per annexure A<br>(ii) The percentage stud elongation . | Vendor to note & Confirm |             |            |



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## Annexure-I (Technical Specification)

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| 4   | <b>ELECTRICALLY OPERATED HYDRAULIC PUMP : 1 No.</b>                                                                                                                                                                                                                                                                                                                    |                                                   |  |  |
| 4.1 | Compact high pressure electric Pump shall be light weight , suitable to use with Hydraulic Bolt tensioning tools and quick coupling hydraulic hose pipes.                                                                                                                                                                                                              | Vendor to note & Confirm                          |  |  |
| 4.2 | Pump capacity( Pressure ) : Min 1500 Bar                                                                                                                                                                                                                                                                                                                               | Vendor to confirm                                 |  |  |
| 4.3 | Pump shall have two stage design to provide high flow at low pressure for fast system fills and controlled flow at high pressure for safe and accurate operation.<br>1st stage oil flow : Minimum flow 3-4 litre/minute from 0 Bar upto minimum 25bar and maximum 30 bar.<br>2nd stage oil flow : Minimum flow 0.3-0.45 litre/minute beyond stage 1 and upto 1500 bar. | Vendor to confirm                                 |  |  |
| 4.4 | Electric motor shall be certified by CE & EMC directive compliance.                                                                                                                                                                                                                                                                                                    | Vendor to confirm & submit the relevent document. |  |  |
| 4.5 | Motor Power rating = Min 0.75 KW                                                                                                                                                                                                                                                                                                                                       | Vendor to specify                                 |  |  |
| 4.6 | Weight of Pump ( with oil ) = Maximum 40 kgs                                                                                                                                                                                                                                                                                                                           | Vendor to specify                                 |  |  |
| 4.7 | Pump unit should have minimum 6 mtr. shockproof cord properly protected with outer sheet with remote pendant enabling to control pump unit with a distance.                                                                                                                                                                                                            | Vendor to specify & confirm                       |  |  |
| 4.8 | Electric motor shall meet the design, assembly and test requirement as per NEMA 12 standard.                                                                                                                                                                                                                                                                           | Vendor to confirm & submit the relevent document  |  |  |
| 4.9 | Pump unit shall have emergency stop button which instantly vents pressure and switches power off.                                                                                                                                                                                                                                                                      | Vendor to confirm                                 |  |  |
| 5   | Pump unit shall have manually adjusted pressure regulator (relief) valve to avoid any over stroking.                                                                                                                                                                                                                                                                   | Vendor to confirm                                 |  |  |
| 5.1 | Electric Pump shall be mounted or integral with dual scale pressure gauge built in into a protective shroud to avoid any damage.                                                                                                                                                                                                                                       | Vendor to confirm                                 |  |  |
| 5.2 | Pump unit shall be capable of working on at least four studs at a time to achive the required load on studs as per annexure A                                                                                                                                                                                                                                          | Vendor to confirm                                 |  |  |
| 5.3 | Oil reservoir capacity : <b>Min 3 Litre</b>                                                                                                                                                                                                                                                                                                                            | Vendor to confirm                                 |  |  |
| 5.4 | Valve operation : <b>Manual</b>                                                                                                                                                                                                                                                                                                                                        | Vendor to confirm                                 |  |  |
| 5.5 | The pump unit shall switch automatically to high pressure mode ensuring the desired operating pressure is achieved quickly.                                                                                                                                                                                                                                            | Vendor to confirm                                 |  |  |

  
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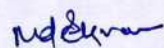
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| 6   | <b>HOSES AND CONNECTORS/FITTINGS</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                           |  |  |
| 6.1 | All the feed hydraulic hoses(minimum length 5mtr) and interconnecting Hydraulic hoses(minimum length 3 mtr) & fittings shall be suitable for maximum working pressure of 1500 Bar. Maximum pressure shall be mentioned on the same.                                                                                                                                                                                                                                                                               | Vendor to confirm                         |  |  |
| 6.2 | Hoses shall be manufactured from a multi-spiral steel reinforced polymer with a clear PVC cover for additional operator protection and resistance against abrasion and corrosion.                                                                                                                                                                                                                                                                                                                                 | Vendor to confirm                         |  |  |
| 6.3 | The hoses, connectors and pumps are all colour coded to ensure the correct hoses are used at related pressure & with correct tools only.                                                                                                                                                                                                                                                                                                                                                                          | Vendor to confirm                         |  |  |
| 6.4 | All hoses & fittings shall be marked with serial numbers for clear identification.                                                                                                                                                                                                                                                                                                                                                                                                                                | Vendor to confirm                         |  |  |
| 6.5 | All hoses & fittings shall be fitted with quick connectors and dust caps.                                                                                                                                                                                                                                                                                                                                                                                                                                         | Vendor to confirm                         |  |  |
| 6.6 | Fittings and assemblies are filled with oil, pressure tested and provided with test certificates.                                                                                                                                                                                                                                                                                                                                                                                                                 | Vendor to confirm and submit the document |  |  |
| 6.7 | Interconnected hose arrangement shall be suitable to work with equal pressure on four studs at a time.                                                                                                                                                                                                                                                                                                                                                                                                            | Vendor to confirm                         |  |  |
| 6.8 | Hoses shall be of <b>CEJN</b> make and shelf life to be mentioned.(for safety concerns)                                                                                                                                                                                                                                                                                                                                                                                                                           | Vendor to confirm                         |  |  |
| 7   | <b>Electrical</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                           |  |  |
| 7.1 | 230V(fluctuation $\pm 10\%$ ), 50HZ (fluctuation $\pm 3$ HZ), single Phase AC. Power Supply Voltage will be provided by BHEL at a single point near the equipment. All types of cables, connections, circuit breakers etc. required for connecting BHEL's power supply point to different parts of the machine/control cabinets, shall be the responsibility of vendor. However If vendor have other option like supply voltage ,phase & frequency etc. Pl specify it for <b>compatibility &amp; acceptance</b> . | Vendor to confirm                         |  |  |
| 7.2 | All electrical control should be dust proof.                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Vendor to confirm                         |  |  |
| 8   | <b>BOLT TENSIONER/PRELOADING SYSTEM</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                           |  |  |
| 8.1 | Each tool weight shall not exceed:<br>For M27 to M36 - not to exceed 7Kg.<br>For M64 to M72 - not to exceed 38 Kg.                                                                                                                                                                                                                                                                                                                                                                                                | Vendor to specify                         |  |  |



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| 8.2  | Maximum 4 load cells shall cover all the applications of M27, M30, M36, M64 and M72 as per annexure-A by utilising single load cell for different sizes of studs by replacing the bridge/puller/socket. | Vendor to confirm   |  |  |
| 8.3  | It shall have the provision for piston stroke indication.                                                                                                                                               | Vendor to confirm   |  |  |
| 8.4  | The load cell will alignment bolt axis.                                                                                                                                                                 | Vendor to confirm   |  |  |
| 8.5  | Cylinders shall be designed and tested at minimum 120 percent of rated pressure (submit the relevant document at the time of PDI).                                                                      | Vendor to confirm.  |  |  |
| 8.6  | Vendor must ensure to measure and show the required load on pressure chart on each stud and submit the bolt/ stud tensioning & elongation measurement method / procedure.                               | Vendor to confirm . |  |  |
| 8.7  | It shall have minimum stroke length of 10mm.                                                                                                                                                            | Vendor to confirm   |  |  |
| 8.8  | Measure the final elongation of stud by plunger dial indicator. Plunger shall be mounted on Magnetic base .                                                                                             | Vendor to confirm   |  |  |
| 8.9  | If direct load is not measured by the system then, proper charts, graphs, load pressure calculations, load pressure chart to be provided for load values on stud.                                       | Vendor to confirm   |  |  |
| 9    | All load cells shall have fine surface finish to provide long lasting finish against dust laden shop environments.                                                                                      | Vendor to confirm   |  |  |
| 9.1  | All the part should have anti-slip grip for secure handling.                                                                                                                                            | Vendor to confirm   |  |  |
| 9.2  | All component of Bolt tensioner/preloading system shall be heat treated and nitrided/ carbonised. (submit the relevant document at the time of PDI)                                                     | Vendor to confirm . |  |  |
| 9.3  | All hydraulic cylinders shall fully comply with the criteria set forth in ASME B30.1 standard ( submit the relevant document at the time of PDI)                                                        | Vendor to confirm   |  |  |
| 9.4  | All tool bridges shall be quick release from load cell (no need for tools) allowing for quicker swapping of components.                                                                                 | Vendor to confirm   |  |  |
| 10   | <b>Safety arrangements :Following safety features in addition to other standard safety features should be provided in the system:</b>                                                                   |                     |  |  |
| 10.1 | System should have adequate and reliable safety interlocks / devices to avoid damage to the machine, workpiece , Tools and the operator due to the malfunctioning or mistakes.                          | Vendor to confirm   |  |  |

  
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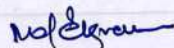
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| 10.2 | All the pipes, cables etc. in the system should be well supported and protected. These should not create any hindrance to operator's movement for effective use of machine.                                                                                                                                                                                                                                                                                          | Vendor to confirm           |  |  |
| 10.3 | All the moving parts used in the system should be statically & dynamically balanced to avoid undue vibrations.                                                                                                                                                                                                                                                                                                                                                       | Vendor to confirm           |  |  |
| 10.4 | Power off switches and relief valves at where ever required shall be provided .                                                                                                                                                                                                                                                                                                                                                                                      | Vendor to confirm           |  |  |
| 10.5 | All safety instructions should be displayed on the machine.                                                                                                                                                                                                                                                                                                                                                                                                          | Vendor to confirm           |  |  |
| 10.6 | <b>Environmental performance of the equipment.</b><br><b>The Machine shall conform to following factors related to environment</b>                                                                                                                                                                                                                                                                                                                                   |                             |  |  |
| 10.7 | Maximum noise level shall be 95 dB(A) measured at a distance of 1 meter from the equipment, at normal load/operating conditions.                                                                                                                                                                                                                                                                                                                                     | Vendor to confirm           |  |  |
| 10.8 | No hazardous chemicals shall be used in the entire system.                                                                                                                                                                                                                                                                                                                                                                                                           | Vendor to confirm           |  |  |
| 10.9 | If any safety / environmental protection enclosure is required it should be built in the system by the vendor.                                                                                                                                                                                                                                                                                                                                                       | Vendor to confirm           |  |  |
| 11   | Machine should contain bio degradable, fire resistant hydraulic fluid.                                                                                                                                                                                                                                                                                                                                                                                               | Vendor to confirm           |  |  |
| 12   | <b>Tools required for Commissioning, Operation &amp; Maintenance</b>                                                                                                                                                                                                                                                                                                                                                                                                 |                             |  |  |
| 12.1 | Special and necessary tools (Tool kit etc ) if any required for commissioning, Installation, Operation, demonstration and maintenance of the machine shall arranged by the Vendor                                                                                                                                                                                                                                                                                    | Vendor to confirm           |  |  |
| 13   | <b>SPARES</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                             |  |  |
| 13.1 | All type of spares ( to be quoted saparetely) for trouble free operation for two years or 5000 tightening cycle after the guarantee period. Please ensure to submit a list of such spares with quantity along with offer; Spare list should be in the format such as Spares name, Spare Part No, Unit of measurement(UoM), Qty, Unit rate.etc. Offer shall be in package or set or lot .<br>(This price will be not be considered for evaluation of bid-L1 Criteria) | Vendor to confirm & submit. |  |  |



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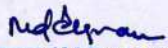
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| 14   | <b>Document to be submitted</b> ( After placement of order )                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                          |  |  |
| 14.1 | Three sets of following documents (Hard copies) and one set in soft copy in English language should be supplied along with the machine                                                                                                                                                                                                                                                                                                                                                                                                                          | Vendor to confirm        |  |  |
| 14.2 | Operating manuals of the equipment.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Vendor to confirm        |  |  |
| 14.3 | Pre despatch Inspection report and guarantee certificate of the equipment covering two year guarantee from date of commissioning.                                                                                                                                                                                                                                                                                                                                                                                                                               | Vendor to confirm        |  |  |
| 14.4 | Maintenance manual of Machine.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Vendor to Confirm        |  |  |
| 14.5 | Calibration certificate of pump & Plunger type dial indicator and test certificates of complete system shall be supplied along with the machine.                                                                                                                                                                                                                                                                                                                                                                                                                | Vendor to Confirm        |  |  |
| 15   | <b>Ambient conditions &amp; thermal stability</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                          |  |  |
| 15.1 | Total machine and all supplied items should work trouble free and efficiently under following operating conditions and should give specified accuracies:<br>1). Ambient Conditions: Temperature : 10 to 45 degree Celsius.<br>2). Relative Humidity = 70% max.                                                                                                                                                                                                                                                                                                  | Vendor to Confirm        |  |  |
| 16   | <b>Working conditions</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                          |  |  |
| 16.1 | Atmosphere may be dust laden. Machine shall be kept in the normal shop floor condition.Max. temperature variation is up to 25 deg Celsius in 24 hours.                                                                                                                                                                                                                                                                                                                                                                                                          | Vendor to Confirm        |  |  |
| 16.2 | The complete equipment/machine along with its attachments & accessories, should be suitable for 8-10 Hrs. intermittent operation to its full capacity.                                                                                                                                                                                                                                                                                                                                                                                                          | Vendor to Confirm        |  |  |
| 17   | <b>Installation, Commissioning, Trial Operation (prove out ) &amp; machine acceptance at BHEL works.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                        |                          |  |  |
| 17.1 | Complete installation , commissioning of equipment , training, conducting all the tests & demonstration of all its features, control system & accessories to the entire satisfaction of BHEL is the sole responsibility of Vendor.The system is to be installed/demostrated at the site by the supplier with their own expenditure for manpower, tools & tackles etc.(if required). Other erection equipment's like measuring instruments & devices for testing & commissioning of machines(if required) should be brought by the supplier on returnable basis. | Vendor to Confirm        |  |  |
| 17.2 | Service requirement like power, air & water shall be provided by BHEL. Other requirements like crane shall also be provided by BHEL depending upon the availability. Details of these requirements should be informed by vendor in advance.                                                                                                                                                                                                                                                                                                                     | Vendor to Note & Confirm |  |  |



  
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| 17.3      | Details of different sizes of bolt/ stud mentioned to be taken care of by the machine are per attached in <b>Annexure A</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | Vendor to note               |  |  |
| 17.4      | Vendor to provide tentative time taken to shift load cells from set of four studs to another set of four studs.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Vendor to specify            |  |  |
| 17.5      | <p>To prove out the equipment capability vendor has to demonstrate the bolt/ stud tensioning &amp; tightening of nuts of four set of studs on a test flange containing minimum four studs of any one sizes mentioned in annexure A at BHEL Bhopal works. Test flange will be arrange by BHEL &amp; under BHEL scope :</p> <p>1) Supplier to demonstrate measurement of the required load( to be decided by BHEL Bhopal considering the designed capacity of the sytem) on each stud.</p> <p>2) Supplier to demonstrate and measure the stud elongation of each stud.</p> <p>Successful demonstration &amp; installation of equipment shall be treated as equipment is successfully installed and commissioned and accepted to BHEL.</p> | Vendor to note & confirm     |  |  |
| 17.6      | Vendor has also to be proved out one job containing any size mentioned in annexure A to full satisfaction of BHEL and BHEL customer.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Vendor to Confirm            |  |  |
| <b>18</b> | <b>Training at BHEL Bhopal</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                              |  |  |
| 18.1      | Bidder shall provide training to BHEL Engineers in operation and maintenance                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Vendor to Confirm            |  |  |
| 18.2      | To & fro fare, boarding ,lodging, fooding, Local transport etc. for Trainer shall be under vendor scope .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Vendor to note               |  |  |
| 18.3      | Competent, English speaking experts shall be arranged by the vendor during training for satisfactory & effective training of BHEL personnel.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Vendor to note               |  |  |
| 18.4      | Training charges ( if any ) at Bhopal work for 2 days basis shall be quoted separately.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Vendor to specify ( if any ) |  |  |
| <b>19</b> | <b>Painting</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |                              |  |  |
| 19.1      | Equipment / machine shall be protected by applying good quality coating to prevent corrosion, shall be rust proof and suitable for specified weather conditions. Coating of the machine should be oil/coolant resistant. Selection of colour is as per the choice of vendor.                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Vendor to note & confirm     |  |  |
| <b>20</b> | <b>Packing</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |                              |  |  |
| 20.1      | Equipment along with its loose items, accessories etc. shall be packed systematically in sea worthy packing boxes which shall be rigid enough to avoid any kind of damage during handling, transit & storage. Packing list of all boxes to furnished before dispatch.                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Vendor to confirm            |  |  |

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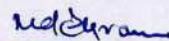
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# Annexure-I (Technical Specification)

P.I. no.821102006

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| 21   | <b>Pre-Despatch Inspection</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                          |  |
| 21.1 | A). For indigenous Works:-Pre-dispatch testing and inspection of the machine will be witnessed by BHEL personal at the Vendor's works for capacity and parameters. An inspection call shall be given by the Vendor at least 20 days before the date of inspection. Four copies of inspection & test certificate and guarantee certificate shall be submitted and got approved before dispatch.<br>B). For Foreign Bidders: PDI will be witnessed by Third Party inspection agency such as LLoyd, Bureau Veritas or TUV Sud (Inspection charges to be quoted separately and to be borne by vendor) | Vendor to confirm                        |  |
| 21.2 | Inspection Shall be carried out as per attached QAP in vendors works for indigenous & foriegn vendors (vendor to submit test proecduer after placement of order of each bolt tesiner).                                                                                                                                                                                                                                                                                                                                                                                                            | Vendor to confirm                        |  |
| 21.3 | Demonstration / physical inspection of all features, shall be done to the full satisfaction of BHEL representative before despatch. Test material shall be under vendor scope.                                                                                                                                                                                                                                                                                                                                                                                                                    | Vendor to note                           |  |
| 22   | <b>GUARANTEE:</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                          |  |
| 22.1 | The machine should be guaranteed for 24 <u>months</u> from the date of commissioning/acceptance of the equipment at site. Free after sales services is to be provided during the guarantee period including free replacement of defective parts, if any.                                                                                                                                                                                                                                                                                                                                          | Vendor to confirm                        |  |
| 23   | <b>General : Vendor to furnished following information along with the offer.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                          |  |
| 23.1 | Equipment model No. of main item like Pump, System Hoses,connector etc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | Vendor to specify                        |  |
| 23.2 | Detailed catalogues, sketch/ photographs and technical literature of the machine and accessories/ attachments.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    | Vendor to submit                         |  |
| 23.3 | Calibration procedure/Test procedures of equipment are to be provided ( After placement of Order ). It is required to ensure the desired parameter set are to be achieved. References international standard norm / code etc. world wide adopted if any, follows for calibration .                                                                                                                                                                                                                                                                                                                | Vendor to note & confirm                 |  |
| 23.4 | <b>First filling of consumables required like Hydraulic Oil etc.</b> if any shall supplied will be under vendor scope . Indigenous (Indian) source or Indian equivalent and specifications of oils / greases are also to be provided by the vendor.                                                                                                                                                                                                                                                                                                                                               | Vendor to note ,specify if any & confirm |  |
| 23.5 | Separate lump-sum charges (if any) for PDI, Training , installation, commissioning and demonstration are to be indicated separately in the offer.                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Vendor to Note & specify charges if any  |  |
| 23.6 | 1). Vendors must have ISO 9001 quality certification and follow all international quality standards.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Vendor to confirm                        |  |
| 23.7 | Bolt / stud tensioning process and catalog shall be submitted along with offer.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Vendor to confirm                        |  |

Prepared by:

  
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Safety Deptt.

Vendor Signature with Official Stamp  
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| 23.8 | <b>Delivery</b> : Approximate time of Delivery (In Weeks) ex-works                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Vendor to specify                               |  |  |
| 23.9 | Approximate time of Installation & Commissioning (In Days or Weeks)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Vendor to specify                               |  |  |
| 24   | Major items like Pump,Bridge & Load cells shall be of same make except Hose pipe shall be of CEJN make.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Vendor to Note & submit the relevent document . |  |  |
| 24.1 | <b>All the displays, measuring and controlling parameters shall be in English language .</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Vendor to note                                  |  |  |
| 24.2 | <b>Maintenance Friendly</b> : All the machine components shall have easy accessibility for easy maintenance.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Vendor to confirm                               |  |  |
| 24.3 | Full spares and service centre shall be available in India .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       | Vendor to confirm                               |  |  |
| 25   | <b>Scope of Works &amp; supply</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |                                                 |  |  |
| 25.1 | Design,manufacturing, supply and commissioning of complete Bolt tensioner/Preloading system as per specification and other requirement as specified to cover stud sizes mentioned in annexure A : One set ( complete package ) include:<br>1) One electrically operated hydraulic pump as per clause no. 4.<br>2) One feed hose of minimum length 5 mtr as per clause 6.<br>3) Four interconnecting hose of minimum length 3 mtr as per clause 6.<br>4) one no. Tee block/Coupler set.<br>5) Two no. plunger type dial indicator with magnetic base duly calibrated for measurement of elongation. | Vendor to confirm                               |  |  |
| 25.2 | Tool Kit: One set as per vendor standard (if required for the system)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Vendor to confirm                               |  |  |
| 25.3 | Demonstration, prove out & acceptance of machine at BHEL works for <b>clause No 17.</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Vendor to Note & Confirm                        |  |  |

  
  
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