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BHARAT HEAVY ELECTRICALS LIMITED
CENTRAL FOUNDRY FORGE PLANT
Local Stress Relieving Equipment
SPECIFICATION NO. : FT/SP/64 REV 00

1.0 DESCRIPTION:

This specification governs the requirement of Local Stress Relieving Equipment.

2.0 OBJECTIVE:

The equipment shall be used for carrying out stress relieving on local areas of casting after weld repairs.

3.0 SCOPE:

Scope of supply includes design, manufacture, supply and commissioning of the equipment at CFFP. The technical and general requirements of the local SR equipment are given below.

The supplier shall give guarantee for trouble free operation of the equipment for period of eighteen months from the date of commissioning of the unit.

4.0 TECHNICAL REQUIREMENTS

4.1 Information about castings and stress relieving conditions

- 4.1.1 The equipment should be able to carry out Stress Relieving on localised area of casting having wall thickness in the range of 50 mm to 350 mm.
- 4.1.2 The soaking temperature during Stress Relieving cycle can vary from 560 to 740 degree Celsius.
- 4.1.3 The soaking period of SR shall be in the range of 4 to 16 hours.
- 4.1.4 The cooling rate after soaking shall be 20 degree Celsius/hour maximum and heating rate will vary between 20-50 degree Celsius/hour.
- 4.1.5 The castings which are required to be stress relieving shall be of various grades of steel like Plain C, 1.5% Mn steel, Cr-Mo-V steel, 9Cr1Mo steels, stainless steels, etc.

4.2 The equipment must be complete in all respect including the heat treatment unit with multichannel program controller, temperature recorder, and energy regulators with auto manual switch for each individual heating circuit. The power source, automatic programmer and recorder are to be mounted on good quality movable trolley type covered panel.

4.3 Power source (130 KVA) suitable for specified job requirement with safe working output voltage of 60/65 V to be provided. The input supply shall be 415V, 50Hz \pm 10%.

4.4 The inbuilt program controller should have following characteristics:

- 4.4.1 Number of control channels: 12 Nos.
- 4.4.2 Display: Digital
- 4.4.3 Control: On-Off type 2A resistive load
- 4.4.4 Calibration certificate & Operation Manual: To be provided by vendor

4.5 Necessary cabling system for power source as per details given below should be provided alongwith equipment:

- 4.5.1 30 Sqmm Feed Cable (25 m long with male and female camlocks) – 12 Nos.
- 4.5.2 30 sqmm return cable (25 m long with male and female camlocks) – 12 Nos.
- 4.5.3 4 way splitter cable – 24 Nos.

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- 4.6 K-Type insulated thermocouple wire 100 m roll – 5 Nos. to be provided alongwith equipment.
- 4.7 Thermocouple attachment unit for thermocouple wire with job to be provided.
- 4.8 Temperature recorder is to be provided by vendor alongwith its calibration certificate and operation and service manual. The technical parameters of the recorder should be as follows:
 - 4.8.1 Range : 0-1200 degree Celsius
 - 4.8.2 Display: Digital Sequential
 - 4.8.3 No. of points: 12 points
 - 4.8.4 Accuracy: 0.25% of FSV
 - 4.8.5 Chart: Fan fold 180 mm
 - 4.8.6 Power supply: 230 V, 50Hz \pm 10%
 - 4.8.7 Thermocouple: Cromel Alumel (K Type)
 - 4.8.8 Spares: Printing cartridges (3 Nos) and Chart Rolls (25 Nos)
- 4.9 Compensating cable 25 meter long x 12 Nos. with plug and socket should be provided alongwith equipment.
- 4.10 Flexible ceramic mat heaters of size 205x250 mm (48 Nos) and 255x205 mm (48 Nos) - (60/65 V, 2.7/3.25 KW rating) to heat the local areas should be provided alongwith equipment. The heating elements will be connected with one metre long heat resistant, flexible cold tail at both ends and connectors/sockets.
- 4.11 Necessary tool kit set consisting of Crimping tool, mat hook, tightening stop, cutting tool, allen keys, spanners, pliers, screw driver, screw spanner, etc to be provided by vendor.

5.0 DETAILS TO BE INCLUDED IN THE OFFER:

Following details are to be included while submitting the offer

- (a) Adopted principle of stress relieving equipment.
- (b) General Arrangement drawings of equipment
- (c) Space requirement
- (d) Breakup cost of different mechanical, electrical and instrumentation equipments to be quoted separately.
- (e) List of spares – mechanical, electrical and instrumentation for two years troublefree operation. Price of spares to be quoted separately.
- (f) List of fast wearing consumable parts and its price to be quoted separately.
- (g) Power rating of total system and voltage.
- (h) Electrical power requirement
- (i) All accessories to be quoted separately with price.

6.0 DOCUMENTS TO BE PROVIDED WITH SUPPLY:

- Three sets of documents as given below shall accompany the equipment.
 - a) Operation and Maintenance manual.
 - b) Electric Circuit diagram.
 - c) Assembly drawing / diagram showing placement of components / spare parts list along with make, rating & specification.
 - d) Details of bought out items with their specification, addresses of vendors.

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- e) Test certificate.
- f) Any other relevant information

7.0 INSPECTION, DEVIATION AND REPLACEMENT

7.1 BHEL reserves the right to inspect equipment at site before despatch. The supplier shall be given prior intimation in such case. However inspection at BHEL shall be final. The supplier shall offer BHEL representative all reasonable test facilities without charge to satisfy the latter that the equipment is being furnished in accordance with this specification.

7.2 The equipment shall be tested at CFFP, BHEL and will be binding on supplier. If the equipment received at CFFP is not found in accordance with the requirements, it shall be rejected.

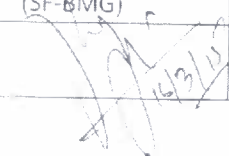
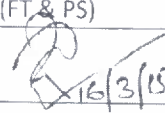
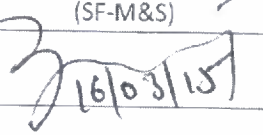
7.3 For any deviation from the specification demanded by the supplier prior approval of BHEL must be obtained in writing.

8.0 ERECTION AND COMMISSIONING and TRIALS

8.1 Supplier to take full responsibility for carrying out the erection, start up, testing of machine, it's control and all types of other supplied equipment, etc. Service requirement like power shall be provided by BHEL. Tools, tackles, instruments and other necessary equipment required to carry out all the above activities should be brought by the supplier.

8.2 On-site training to BHEL personnel to be provided by vendor on various aspects of operation of the equipment.

8.3 Vendor shall be required to prove out the machine by carrying out local SR on one of the actual castings available on shop floor during commissioning.

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 16/3/15	 16/3/15	 16/03/15	