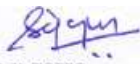
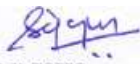
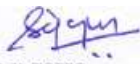


					REF.: CE/416/CBLMS-SG/OT/PS							
				REV.: 00								
				PAGE: 1 of 7								
		PURCHASE SPECIFICATION FOR STRAIN GAUGE TYPE – COAL BUNKER LEVEL MONITORING SYSTEM										
COPY RIGHT AND CONFIDENTIAL THE INFORMATION ON THIS DOCUMENT IS THE PROPERTY OF BHARAT HEAVY ELECTRICALS LIMITED. IT MUST NOT BE USED DIRECTLY OR INDIRECTLY IN ANY WAY DETRIMENTAL TO THE INTEREST OF THE COMPANY.												
		<table border="1" style="width: 100%;"> <tr> <td data-bbox="300 1587 852 1766" rowspan="2"> REVISIONS: 00 </td> <td colspan="3" data-bbox="852 1587 1510 1766"> APPROVED BY  S. K. TOPPO </td> </tr> <tr> <td data-bbox="852 1766 1091 1925"> PREPARED BY  D. Ghosh </td> <td data-bbox="1091 1766 1279 1925"> ISSUED 416 </td> <td data-bbox="1279 1766 1510 1925"> DATE 05/01/2021 </td> </tr> </table>				REVISIONS: 00	APPROVED BY  S. K. TOPPO			PREPARED BY  D. Ghosh	ISSUED 416	DATE 05/01/2021
REVISIONS: 00	APPROVED BY  S. K. TOPPO											
	PREPARED BY  D. Ghosh	ISSUED 416	DATE 05/01/2021									



A. GENERAL INSTRUCTIONS TO BIDDERS:

- 1) All required documents against this Tender/Specification shall be submitted in English only.
- 2) Introduction: Bidders are required to offer Coal Bunker level System – Strain Gauge type in Power Plant applications.
- 3) Deviations (if any) shall be discussed with only those bidders who quote for this tender.
- 4) Bidders shall confirm to submit unit price of each components as quoted, in pricing format Table – 2; which shall be used for addition / deletion of items and mandatory spares supply, valid for the tenure of purchase order from the date of bid opening, for the commercially successful offer.
- 5) Bidders has to submit clause-wise compliance to this specification and has to furnish the technical evaluation checklist format Table – 1.
- 6) In the event of ordering, a representative of vendor shall visit site for collection of drawings / details of the Coal Bunkers and its support structure for detailed engineering of the system.
- 7) In the event of dispatch, a representative of vendor shall visit site with approved BOM for validation of supplies made
- 8) Vendor's scope shall include Erection/ mounting of sensors, commissioning and handing over to the customer at site.
- 9) Vendor to include one site visit of min. 7 man-days during Performance Availability Test.

B. SCOPE OF SUPPLY:

Following items are required to be supplied as per detailed technical requirement / specification mentioned further

Coal Bunker Level monitoring system complete with Strain Gauge Sensors, Electronics, Panels – Total for Four (4) Units each Unit having Six (6) Bunkers.

C. TECHNICAL REQUIREMENTS FOR COAL BUNKER LEVEL SYSTEM

- 1) The Coal Bunker Indicating System shall consist of all necessary semiconductor strain gauge sensors, electronic unit comprising of signal conditioner, amplifier, isolated output signal (4-20mA DC) transmitter, limit value monitors and power supply, Bar graph type LED indicator for continuous level indications and all mounting accessories required for complete installation of the system. Separate set of sensors and separate electronic unit and display shall be provided for each Bunker.
 - 2) Bidder may note that as per support systems/ structure envisaged for coal Bunkers, there may be interactions among the adjacent Bunkers. The details of the support systems/ structure shall be obtained from the enclosed typical Reference Drawings. The Bidder shall provide required no. of sensors and make the mounting
-

arrangement in such a way that the system meets the specified accuracy in spite of interactions among the adjacent Bunkers. Bidder shall furnish full justification as to how the same is achieved.

- 3) The electronic units shall be housed in a cubicle in the control room. The bar graph type LED indicator shall be supplied along with mounting panel by the Bidder for mounting the same in Trippler Floor. Cables for the signal transmission between strain gauge sensors and electronic unit and between electronic units and bar graph type LED indicator shall be in BHEL's scope. However, Bidder shall indicate the type of above cables in the offer.
- 4) Bidder shall provide signal booster, if necessary for the signal to be transmitted to bargraph indicator to be mounted on control room panel.
- 5) Electronic unit and Level Indicators: Each electronic unit shall include signal conditioners, amplifiers, limit value monitors, power supply for all the strain gauge sensors of the respective coal bunker, controls for Zero and span adjustments, high and low set adjustments, transmitter for 4-20mA DC galvanically isolated output signals. The electronic unit shall provide two nos. of galvanically isolated 4-20mA DC signals, one for DDCMIS and one for the local indicators at Trippler floor. The overall accuracy of the system, including the accuracies of all devices i.e. sensor, control unit, transmitter and indicator shall be **10% or better**.
- 6) If it is found that the offered system does not meet the accuracy of 10% during commissioning, additional sensors along with all necessary accessories to be supplied by the bidder to meet the 10% accuracy, without any commercial implication on BHEL.
- 7) Strain Gauge Sensors:
The Bunker level sensors shall be of semiconductor strain gauge type with Nickel plated Carbon Steel base suitable for bolting on the structural member, strain on the sensor represents weight/level of each bunker. The elongation/compression of the sensor base is sensed by two semiconductor elements forming a half bridge circuit. The sensor shall be encapsulated hermetically with 3 wire flexible lead for external connections. The sensor base material shall be matched with that of its mount. The strain gauge sensor shall be rugged, immune to temperature variations, vibrations, & shock, and easy to install and shall meet the following performance specifications as minimum:
 - a) Non-linearity : 0.1 %
 - b) Repeatability & Hysteresis : 0.05 %
 - c) Compensated temperature range : 0-55°C
 - d) Number of strain gauge sensors : Vendor to decide meeting accuracy requirements

D. DOCUMENTATION

- 1) The Bidder shall submit the following documents along with the offer.
 - a) Complete BOM for Coal Bunker Level Indicating System including strain gauge sensors, electronic units housed in cubicle, Bar graph type LED indicators and all necessary accessories with relevant catalogs.
 - b) Complete technical literature for strain gauge sensors, electronic unit's etc.
 - c) Mounting details for strain gauge sensors.
 - d) Technical evaluation checklist duly filled.
 - e) Clause-wise compliance to specification / deviation list.
- 2) Documents to be furnished in the events of order, before dispatch of items:-
 - a) Detailed BOM including all items. Data sheets/ GA drawings and Instrument schedule. Erection drawings / wiring chart. System Architecture & Write-up. These documents shall be submitted for approval from end-user.
 - b) Test certificates/ reports and calibration reports, for approval.
 - c) Erection drawings/ Wiring chart.
 - d) Field Quality Plan with detailed instruction for handling and storage of items.
 - e) O & M manuals – 4 sets hardcopies (2 sets to BHEL-EDN & 2 sets with consignment to site). Also, a soft copy of O & M manual to be provided.



TABLE – 1

**TECHNICAL EVALUATION CHECKLIST FOR
COAL BUNKER LEVEL INDICATING SYSTEM**
(To be filled by the vendor and submitted along with the offer)

Project :

Enquiry No. :

Vendor :

Specification No. :

Tick  'YES' OR 'NO' AS APPLICABLE. IF ANY DEVIATION IS TAKEN, IT SHOULD BE CLEARLY INDICATED IN A SEPARATE "LIST OF DEVIATIONS" TO BE ATTACHED TO THE OFFER

"If no deviations are listed, it shall be assumed that there are no deviations. Vendor's offer not accompanied with this filled in technical evaluation checklist shall be rejected."

1. Is the coal bunker level indicating system offered with the following?

a. Strain gauge sensors

b. Electronic units housed in cubicle

c. Bar graph type LED indicator

d. All mounting accessories required for complete installation of system.

2. Are separate set of sensors and separate electronic unit & display provided for each of the bunkers indicated in the Instrument Schedule?

3. Are the number and location of sensors adequate to meet accuracy requirement?

4. Is signal booster required/ offered for signal transmission to control room where bar graph type indicators are located?

YES

NO



**Purchase Specification for
Strain Gauge Type –
Coal Bunker Level Monitoring System**

REF.: CE/416/CBLMS-SG/OT/PS
REV.NO: 00
PAGE: 6 of 7

5. Does each electronic unit include the following?

- a. Signal conditioners
- b. Amplifiers
- c. Limit value monitors
- d. Power supply for all strain gauge sensors of the respective coal bunker.
- e. Controls for zero & span adjustments
- f. High & Low set point adjustments
- g. Transmitter for 4-20mA DC isolated output signals.

6. Does the electronic unit provide three numbers of galvanically isolated 4-20mA DC signals?

7. Is the overall accuracy of the system (including accuracies of all the devices i.e. sensors, control unit, transmitter and indicator) better than or equal to 10%?

TABLE – 2

PRICING SHEET – CBLMS – STRAIN GAUGE:

Note: This Pricing sheet shall be filled by the commercially successful bidder, for as quoted price.

SL NO	DESCRIPTION	UNIT	QTY	UNIT PRICE (RS.)	TOTAL PRICE (RS.)
1	STRAIN GAUGE SENSORS- PER BUNKER	NOS.			
2	ELECTRONIC LEVEL TRANSMITTER	NOS.			
3	SENSOR MOUNTING ACCESSORIES	SET			
4	JUNCTION BOXES	NOS			
5	ANALOG OUTPUT CURRENT SPLITTER	NOS			
6	BAR GRAPH INDICATOR	NOS			
7	ENCLOSURE PANEL	NOS			
8	COMMISSIONING CHARGES	SET			
9	UNIT RATE OF SENSOR CABLE FOR ADDITION/DELETION	METER			

Note 1: - Unit rates quoted will be used for addition/deletion requirements raised during commissioning/detailed engineering of the system.

Note 2: - The above pricing sheet is only indicative and any other major components needed for the system shall be added and unit prices for the same to be given separately.