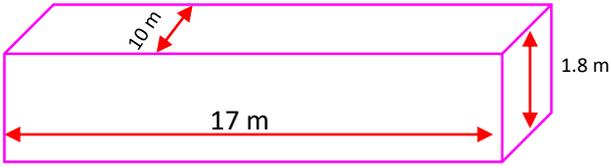


ANNEXURE - A

TECHNICAL SPECIFICATION

Item Description : High-Temperature Camera System for Monitoring Tube and Pipe Movement Inside Reheating Furnace (1 No) – Hot Mill, Seamless Steel Tube Plant

Sl.No	Description	Specification	Vendor Confirmation
1	Furnace Dimension	 <p>Length - 17 mts, Width - 10 mts, Height - 1.8 mts. Furnace wall thickness : 450 mm</p>	
2	Furnace temperature range	Min 850 deg C to max 1300 deg C	
3	Camera Type	High temperature furnace camera with auto retraction device (pneumatic or Motorized retraction). Automatic retraction shall occur under the following conditions to prevent system failure or damage: i) Temperature exceeding designed set point. ii) Power supply failure. iii) Air supply failure. All will be Vendor in scope.	
4	Type of view	Straight view	
5	Manual Retraction	The camera system shall have an additional manual retraction mechanism .	
6	Camera resolution	1920 X 1080 or better	
7	Viewing Angle	87°x70° or better	
8	Camera insertion length	750 mm or more	
9	Filter assembly	4 stage air filter assembly and 4 stage air filter or better	
10	Camera Body material	Minimum SS316 material .	
11	Instrument Accessories	All Instrument accessories such as Solenoid valve, Pressure Switch, Reservoir Tank, Digital Temperature controller, MCBs & Terminals, Fully wired HTCCTV control operation etc. will be vendor scope	
12	UPS	If system requires UPS, Vendor should supply UPS for the system	
13	Lens	High temperature resistant lens should withstand temperature 1300 deg C.	
14	Camera Monitor	Minimum 24 inch monitor or better (Monitor will be viewed from operator cabin).	
15	Storage	Camera recording shall be stored minimum 1 month or more.	

16	Air supply	<p>Air supply will be provided by BHEL at a pressure range of 4 to 5 bar. If the required pressure for the camera system exceeds the available supply pressure, the vendor shall provide an additional compressor unit to meet the demand.</p> <p><i>* The vendor is responsible for providing and installing suitable filtration and drying systems to achieve the necessary air quality level for camera.</i></p>	
17	Water supply	<p>Water will be supplied by BHEL at pressure of 1 bar. If the required water pressure for the camera system exceeds the available supply pressure, the vendor shall provide an additional pump system or alternate system to meet the demand.</p> <p><i>*The vendor is responsible for providing and installing suitable filtration system to achieve the necessary water quality levels for camera. These systems should be capable of removing contaminants such as dust, particulates, other impurities that could affect the camera system's operation. If a chiller unit is required to maintain the water temperature, the vendor shall provide the same.</i></p>	
18	Accessories	All fasteners and fittings, connector, hoses, tubes, panels, cables etc. is in Vendor scope.	
19	Incoming supply	110VAC /220VAC in BHEL scope	
20	Monitoring hours	The camera system shall support continuous 24-hour daily monitoring.	
21	Maintenance Manual	Vendor should provide maintenance manual for mechanical system.	
22	Documents	Drawings, product catalogues, data sheets, and other relevant documents shall be submitted along with the bid. Any additional details required must be provided upon request during the technical evaluation. Failure to submit the required documents offer shall be rejected.	
23	Warranty	24 months from the date of commissioning. Warranty should be for complete unit. In case of any defects during this period the supplier shall promptly carryout remedial measures to correct any defects at site or replace at free of cost .Warranty certificate shall be submitted.	
24	Commissioning	Installation and commissioning of the equipment is in Supplier scope	

ANNEXURE - B

**Item: High-Temperature Camera System for Monitoring Tube and Pipe Movement Inside Reheating Furnace
(1 No) – Hot Mill, Seamless Steel Tube Plant**

Tentative Bill of Material (BOM) for(1 No) as given below

S.No	Description	UOM	Qty	Vendor Confirmation
	HIGH TEMPERATURE REHEATING FURNACE MONITORING SYSTEM	No	1	
	High temperature CCTV HD camera with High Temperature Resistance Lens - Camera Resolution: 1920 X 1080 - Viewing Angle: 87 X 70 - Cooling: Air Cooling - Tube: Double Tube - Camera Insertion Length: 750MM	No	1	
	Pneumatic Automatic Retract System up to 54 Inch, Retract Rail with 30 Inch Stroke cylinder	No	1	
	Automatic shutter mechanism, port will be closed once HTCCTV is withdrawn from the furnace	No	1	
	4 stage air filter assembly 4-STAGE AIR FILTER CAPACITY:100 SCFM INLET PRESSURE:100 PSI, 5 & 0.01(OIL REMOVAL) MICRON	No	1	
1	Control Cabinet with accessories and hoses consisting of the following: 1). Solenoid valve. 2). Pressure Switch. 3). Reservoir Tank 4). Digital Temperature controller. 5). MCBs & Terminals. 6). Fully wired HTCCTV control operation	No	1	
	4 Channel NVR with 1TB Hard Disk	No	1	
	Fibre optic transmitter and receiver convertor, Qty : In Set	No	1	
	Monitor : 230 VAC, 50 Hz - Monitor Size : 24 Inch.	No	1	
	Ethernet cable	Mtr	10	
	Fibre optics cable, SM 4 Core, Armoured cable	Mtr	100	
	Fibre optic accessories i.e. (pigtail, patch cord), Qty - 1 Lot	Lot	1	
	Limit switch, Qty : In Set	Set	1	
	High Temperature SS braided hose each 06 Mtr, Qty - 1 Lot	Lot	1	