	BHARAT HEAVY ELECTRICAL LIMITED			Enquiry No. :	
	UNIT'S ADDRESS:			Due Date :	
	UNIT'S PHONE NO.:			Supplier Qtn. No.:	
	CONTACT PERSON'S NAME/DESGN./PHONE NO./E-MAIL (FROM PURCHASE DEPT.)			Specification Rev. No :	1
				Rev. Date:	28/04/2014

<u>SPECIFICATION CUM COMPLIANCE CERTIFICATION FOR</u> <u>MECHANISED PROGRAMABLE OSCILLATING GMAW SYSTEM SYNCHRONIZED WITH TURN TABLE FOR NARROW GROOVE STELLITING</u> <u>PROCESS (WITH LOCAL PREHEATING SYSTEM)</u>
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NOTE:-

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| | 1. Vendor must submit complete information against clause no. 19 (Qualifying Conditions). 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. All dimensions are in mm unless otherwise stated. |
| | 5. Vendor to quote price considering all the clause (clause 1-20) in this specification cum compliance certification. |

	NAME OF INDIAN AGENT :
ADDRESS OF THE SUPPLIER:	ADDRESS OF THE INDIAN AGENTS :
TELEPHONE NOS :	TELEPHONE NOS.:
FAX NOS :	FAX NOS.:
E-MAIL ADDRESS :	E-MAIL ADDRESS :

SCOPE : SUPPLY, ERECTION & COMMISSIONING OF MECHANISED PROGRAMABLE OSCILLATING GMAW SYSTEM SYNCHRONIZED WITH TURN TABLE FOR NARROW GROOVE STELLITING PROCESS (WITH LOCAL HEAT TREATMENT SYSTEM)				
1.0	PURPOSE & HP INNER CASING NARROW GROOVE DETAILS			

SCOPE : SUPPLY, ERECTION & COMMISSIONING OF MECHANISED PROGRAMABLE OSCILLATING GMAW SYSTEM SYNCHRONIZED WITH TURN TABLE FOR NARROW GROOVE STELLITING PROCESS (WITH LOCAL HEAT TREATMENT SYSTEM)

1.1	Purpose: CNC programable oscillating GMAW System synchronized with Turn Table with local preheating system should be suitable for stellite welding in narrow groove of the HP Inner casing and similar jobs with narrow groove as mentioned in 1.3.1 (in preheated condition) using mechanised GMAW processes and should be able to rotate the HP Inner casing and similar job at preset speed .	Vendor to offer with technical details			
1.2	Mechanized Programable Narrow Groove Stelling GMAW system Synchronized with Turn Table and local preheating system is comprised of following-	Vendor to offer with technical details			
1.2.1	CNC programable Narrow Groove GMAW System.	Vendor to offer with technical details			
1.2.2	MIG Welding Machine	Vendor to offer with technical details			
1.2.3	Wire feeder Unit (accessory)	Vendor to offer with technical details			
1.2.4	GMAW Welding Torch (accessory)	Vendor to offer with technical details			
1.2.5	Water Cooling Unit (accessory)	Vendor to offer with technical details			
1.2.6	Gas Manifold Unit (accessory)	Vendor to offer with technical details			
1.2.7	Motorized Column and Boom	Vendor to offer with technical details			
1.2.8	Turn Table	Vendor to offer with technical details			

SCOPE : SUPPLY, ERECTION & COMMISSIONING OF MECHANISED PROGRAMABLE OSCILLATING GMAW SYSTEM SYNCHRONIZED WITH TURN TABLE FOR NARROW GROOVE STELLITING PROCESS (WITH LOCAL HEAT TREATMENT SYSTEM)

1.2.9	Split Type operating type Platform	Vendor to offer with technical details			
1.2.10	Local preheating System	Vendor to offer with technical details			
1.2.11	Servo Voltage Stabilizer	Vendor to offer with technical details			
1.2.12	Centre Control Panel System	Vendor to offer with technical details			
1.2.13	CCTV Camera with monitor for monitoring	Vendor to offer with technical details			
1.2.14	Integrated fume extraction system	Vendor to offer with technical details			
1.3	HP Inner Casing Details and Basic Welding Conditions :				
1.3.1	The CNC programable GMAW welding system should be capable of carrying out stellite welding in Narrow Groove on following HP Inner Casing (Refer at annexure-I, annexure-II and annexure-III)- i. HP Inner Casing (660MW), Annexure I ii. HP Inner Casing (800MW), Annexure I iii. Threaded Ring - Annexure II iv. Conical Half Ring - Annexure III	Vendor to note			
1.3.2	Size & Weight: i. 660MW HP Inner Casing- Length- 3500mm, Weight / half (approx)- 16000 Kg, Diameter-1960mm (Max) (Annexure I) ii. 800MW HP Inner Casing- Length- 3500mm, Weight / half (approx)- 16000 Kg, Diameter-1960mm (Max) (Annexure I) iii. 660MW / 800MW Threaded Ring, diameter 450mm, Weight -130Kg. (Annexure II) Groove diameter- 4500mm (maximum), Weight 1025Kg (2 Conical Half Rings back to back) other details as per drawing of Conical half Ring as per (Annexure-III)	Vendor to note			

SCOPE : SUPPLY, ERECTION & COMMISSIONING OF MECHANISED PROGRAMABLE OSCILLATING GMAW SYSTEM SYNCHRONIZED WITH TURN TABLE FOR NARROW GROOVE STELLITING PROCESS (WITH LOCAL HEAT TREATMENT SYSTEM)

1.3.3	Material: i. Alloy Steel Rough Machined Casing Casting grade GX12CrMoVNb9-1 ii. Threaded Ring Forging grade X10CrMoWNiVNb9-1 iii. Conical Half Ring Steel grade IS2062 chemical composition and other properties as per annexure-I, II & III.	Vendor to note			
1.3.4	GMAW consumable: – ER NiCr-3 / stellite-21 wire diameter 0.8,1.0, 1.2,1.6 & 2.0mm				
1.3.5	Preheat/ Interpass Temperature: upto 350°C				
2 DETAILED TECHNICAL SPECIFICATION OF CNC PROGRAMABLE OSCILLATING GMAW SYSTEM SYNCHRONIZED WITH TURN TABLE FOR NARROW GROOVE STELLITING PROCESS (WITH LOCAL PREHEATING SYSTEM)					
2.1	GMAW Power Source, welding head mounted on the welding boom end with long length straight Torch, wire feeder unit, Cooling unit, Gas Manifold & Fume Extraction unit	Vendor to offer with technical details			
2.1.1	GMAW power Source:- Inverter based Synergic MIG Power source: MIG Pulse	Vendor to comply			
2.1.1.1	Input supply - 415V ± 10% variation, 3 phase, 50 Hz ± 3% variation	Vendor to comply			
2.1.1.2	Amp. Range 500A @ 60% duty cycle and 400 A @ 100% duty cycle	Vendor to comply			
2.1.1.3	Current slope time 250 A/ 1 Ms	Vendor to comply			
2.1.1.4	Power source cooling:- Air Cooled / Water cooled	Vendor to comply			
2.1.1.5	Code of construction: IP 23	Vendor to comply			
2.1.1.6	Modes: Continuous current and pulsed mode	Vendor to comply			
2.1.1.7	Wire Feeder unit - Light weight ,compact and rigid wire feeder with powered and grooved 4 Rollers drive with 2 nos. wire straightner rollers	Vendor to comply			
2.1.1.8	DC stepper motor	Vendor to comply			
2.1.1.9	Suitable for welding wire sizes of diameter 0.8, 1.0, 1.2 & 1.6mm	Vendor to comply			
2.1.1.10	Diameter of wire feed roll	Vendor to specify			
2.1.1.11	Current Capacity	Vendor to specify			
2.1.1.12	Wire feed speed contituous controllable - 250 - 25000 mm/min	Vendor to comply			

SCOPE : SUPPLY, ERECTION & COMMISSIONING OF MECHANISED PROGRAMABLE OSCILLATING GMAW SYSTEM SYNCHRONIZED WITH TURN TABLE FOR NARROW GROOVE STELLITING PROCESS (WITH LOCAL HEAT TREATMENT SYSTEM)

2.1.1.13	Adjustable range 1 : 1000 (approx)	Vender to comply			
2.1.1.14	Control accuracy- 1%	Vender to comply			
2.1.1.15	Forward / Reverse feeding, gas inching, wire inching, Dynamic control & pulse technology to reduce spatter level.	Vender to comply			
2.1.1.16	Type of wire feed motor	Vender to specify			
2.1.1.17	Wire retract control	Vender to comply			
2.1.1.18	Control with 4 quadrant Siemens transistor amplifier	Vender to comply			
2.1.1.19	Drive with servo motor with integrated feed back system	Vender to comply			
2.1.1.20	GMAW Welding Torches-				
2.1.1.21	GMAW welding torches, water Cooled should be quoted seperately for weld in narrow groove on bottom horizontal face & vertical face of groove walls.	Vender to offer with technical details			
2.1.1.22	500 amps, 100% duty cycle	Vender to specify			
2.1.1.23	Type of Torch	Vender to specify			
2.1.1.24	Torch Length (To account for jobs mentioned in 1.3.2 & other jobs to accommodate as per specification)	Vender to comply			
2.1.1.25	Should be suitable for welding wire sizes of diameter 0.8, 1.0, 1.2, 1.6mm	Vender to comply			
2.1.1.26	Provision of free adjustable positioning of the torch in different angle upto +_20 deg. position.	Vendor to comply			
2.1.1.27	Provision of hand indexing unit of torch	Vender to comply			
2.1.2.2	Water Cooling Unit-	Vender to comply			
2.1.2.3	Adequate cooling unit with closed water cycle for GMAW process and other accessories with following technical data-	Vender to specify			
2.1.2.4	Cooling medium-	Vender to specify			
2.1.2.5	Power consumption-	Vender to specify			
2.1.2.6	Input voltage- 230V / 1 phase / 50HZ	Vender to comply			
2.1.2.7	Capacity of water tank 20 liters (Approx)	Vender to specify			
2.1.2.8	Hydrostatic head: 10000 mm	Vender to comply			

SCOPE : SUPPLY, ERECTION & COMMISSIONING OF MECHANISED PROGRAMABLE OSCILLATING GMAW SYSTEM SYNCHRONIZED WITH TURN TABLE FOR NARROW GROOVE STELLITING PROCESS (WITH LOCAL HEAT TREATMENT SYSTEM)

2.1.2.9	Flow Rate: 2 to 3 liters / Minute	Vender to comply with detail			
2.1.2.10	Max. height of equipment (range), Hydro static head.	Vender to comply			
2.1.2.11	Weight of water tank	Vender to specify			
2.1.2.12	Gas Manifold Unit-				
2.1.2.13	Adequate gas manifold unit for GMAW process to be provided including gas valves, pipe connections & support unit. Flow meter should be provided on the gas path at appropriate location for gas flow measuremet.	Vender to comply			
2.1.2.14	Fume Extraction System-				
2.1.2.15	Suitable Fume Extraction System for GMAW process to be provided including following-	Vender to offer with technical details			
2.1.2.16	Fume extraction unit	Vender to offer & confirm with technical details			
2.1.2.17	Filter cartridge category	Vender to offer & confirm with technical details			
2.1.2.18	Filtercubes	Vendor to specify with technical details			
2.1.2.19	Pipe connections	Vender to comply			
2.1.2.20	Noise level ≤76 dB	Vender to comply			
2.1.2.21	Filter maintenance indicator	Vender to comply			
2.1.2.22	Easy access for machine cleaning	Vender to specify with detailed sketch			
2.1.2.23	Support unit for fume extraction	Vender to specify with detailed sketch			
2.1.3	MOTORIZED COLUMN AND BOOM				
2.1.3.1	X Axis- Boom:				
2.1.3.2	Length Max. including sliding GMAW welding head -7750mm. (approx) Available boom length with welding head in extreme position. 5000mm	Vender to comply			
2.1.3.3	Drive AC - servomotor Siemens 1FK7 encoder feedback	Vender to comply			

SCOPE : SUPPLY, ERECTION & COMMISSIONING OF MECHANISED PROGRAMABLE OSCILLATING GMAW SYSTEM SYNCHRONIZED WITH TURN TABLE FOR NARROW GROOVE STELLITING PROCESS (WITH LOCAL HEAT TREATMENT SYSTEM)

2.1.3.4	Speed adjustable between 1- 660mm/min.	Vendor to specify with technical details			
2.1.3.5	Control cabinet with central and sub distribution for X and Y movement for welding manipulator, the welding system and all other equipment. The control cabinet should be moveable.	Vender to comply			
2.1.3.6	Electrical & Mechanical limits on horizontal & vertical movement.	Vender to comply			
2.1.3.7	Pendant control for vertical & horizontal movement.	Vender to comply			
2.1.3.8	Manual lock to fix boom in any position.	Vender to comply			
2.1.3.9	Safety-limit switch lug & latch for fall of boom due to drive failure. Electronoc over current protection for boom motor & thermal over load trip for column motors.	Vender to comply			
2.1.3.10	All control cabinet to be fixed on stand at bed plate.	Vender to comply			
2.1.3.11	The vertical and horizontal boom should be designed in such a manner that it is able to take the load of wire feeder unit and its accessories.	Vender to specify with technical details			
2.1.3.12	Maintenance free boom drive unit with hardened guidance.	Vender to comply			
2.1.3.13	Manipulation of vertical motion should be with joystick.	Vender to comply			
2.1.3.14	Following modes of carriage motions (X axis) required:-				
2.1.3.15	i. Mode 1 - Slow movement for high precision torch positioning	Vender to comply			
2.1.3.16	ii. Mode 2 - Rapid movement 0.66m / min.	Vender to confirm			
2.1.3.17	iii. Mode 3 - Adjustable feed ranging from 1mm / min to 2000mm / min	Vender to confirm			
2.1.3.18	There should be provision of stoppers for carriage at both ends of rails.	Vender to confirm			
2.1.3.19	Flexible angle for GMAW torch. +_20 deg. adjustment angle of GMAW head. Sensor controlled precision servo guidance. Ball guidance high stiffness & torque absorption. Pivot movement manually.	Vender to confirm			
2.1.3.20	There should be provision of column rotation along with boom when machine is not in use or for maintainance purpose.	Vender to offer with technical details			
2.1.3.21	Rotary angle of the column- 360 deg.	Vendor to confirm			
2.1.3.22	Y Axis - Stroke-				
2.1.3.23	Vertical column height to suit job of 5000 mm.	Vender to comply			

SCOPE : SUPPLY, ERECTION & COMMISSIONING OF MECHANISED PROGRAMABLE OSCILLATING GMAW SYSTEM SYNCHRONIZED WITH TURN TABLE FOR NARROW GROOVE STELLITING PROCESS (WITH LOCAL HEAT TREATMENT SYSTEM)

2.1.3.24	Max. available job height under boom 5000 mm	Vender to comply			
2.1.3.25	Lift drive with Siemens AC - Servomotor	Vender to comply			
2.1.3.26	Vertical movement speed range - Continuously adjustable - 10 - 10,000 mm/ min.	Vender to offer with technical details			
2.1.3.27	Manipulation of vertical motion should be with joystick.	Vender to offer with technical details			
2.1.3.28	Slow movement / rapid movement	Vender to comply			
2.1.3.29	Base of column should have provision for clamping on bed plate.	Vender to confirm with technical details			
2.2	TURN TABLE				
2.2.1	Load carrying capacity- 20T	Vender to comply			
2.2.2	Table face plate diameter with provision of extension- 2500 mm, 8 nos (min) T slots.	Vender to offer with technical details			
2.2.3	Removable arms for extending table plate dia. Up to 5000mm	Vender to offer with technical details			
2.2.4	Provision for clamping with jaw and clamping with bed plate having alignment guide.	Vender to offer with technical details			
2.2.5	Siemens Servomotor with performance gear box with pinions. The inside Gearing & Pinions system sealed for life time. Regulation through Siemens 4 quadrant controller rated load capacity - 20Tons.	Vender to offer with technical details			
2.2.6	Supply voltage - 400V / 50 Hz, control voltage - 24V	Vender to comply			
2.2.7	Speed (continuously adjustable)	Vender to comply			
2.2.8	Speed range - 0.5 - 5.0 rpm.	Vender to comply			
2.2.9	Slow movement / rapid movement	Vender to comply			
2.2.10	Centralized control programed unit mounted at appropriate height.	Vender to offer with technical details			
2.2.11	Welding current transmission - 1000A	Vender to comply			
2.2.12	Remote control with digital display indicator.	Vender to comply			
2.2.13	There should be provision of rotation of turn table clockwise / anticlockwise	Vender to comply			
2.2.14	Base plate 2000 X 2000 mm	Vender to comply			

SCOPE : SUPPLY, ERECTION & COMMISSIONING OF MECHANISED PROGRAMABLE OSCILLATING GMAW SYSTEM SYNCHRONIZED WITH TURN TABLE FOR NARROW GROOVE STELLITING PROCESS (WITH LOCAL HEAT TREATMENT SYSTEM)

2.2.15	The rotation movement should be controlled by main control panel through operator panel.	Vendor to comply			
2.3	SPLIT TYPE OPERATING PLATFORM				
2.3.1	operating platform in 2 pieces integrated manually movable / adjustable height, each platform covers one side of job for better accessibility with Rail & stairs. Height - 2590 mm, Adjustable - 1590 mm, Breadth - 2500 mm. Final height , adjustable height, width & length for all jobs mentioned in 1.3.1.	Vendor to specify with sketch			
2.4	LOCAL PREHEATING SYSTEM				
2.4.1	Preheating arrangement with resistance heating mats enclosed in suitable jacket (in 2 parts) with quick clamp provision in HP Inner Casing for achieving temperature upto 350 deg C. Temperature to be maintained by pyrometer displayed in Control Panel. Vendor to give details of Power Rating (and no. of zones) with calculations.	Vendor to specify with technical details			
2.4.2	Accessories and spare required to be given by the vendor.	Vendor to specify			
2.4.3	Additionally contact type hand held thermocouple to be provided for local temperature measurement.	Vendor to specify with technical details			
2.5	SERVO VOLTAGE STABILIZER				
2.5.1	Oil / Air Cooled suitable Servo Controlled Voltage Stabilizer suitable for complete machine, its drives, controls, PLC etc., if required, for unbalanced load & supply conditions considering specified power supply & ambient conditions (0-50 deg.C)	Vendor to specify with technical details			
2.5.2	Rating	Vendor to specify			
2.5.3	Make and Model.	Vendor to specify			
2.5.4	Main supply: 3 Phase, 3 wire, 415± 5% Volt AC, 50 Hz, Input Voltage variation+_15% and output Voltage variation +_1%, Regulating speed 38V/S, IP - 21	Vendor to comply			
2.5.5	Technical leaflet of the offered model to be submitted along with the offer.	Vendor to comply			
2.6	CENTRAL CONTROL PANEL SYSTEM				

SCOPE : SUPPLY, ERECTION & COMMISSIONING OF MECHANISED PROGRAMABLE OSCILLATING GMAW SYSTEM SYNCHRONIZED WITH TURN TABLE FOR NARROW GROOVE STELLITING PROCESS (WITH LOCAL HEAT TREATMENT SYSTEM)

2.6.1	Software module of process control unit should contain following:-				
2.6.2	a) Provision of selecting welding process.	Vender to comply			
2.6.3	b) Provision of feeding welding parameters e.g. voltage, wire feed rate, welding speed, dia of groove at weld location, preheat temperature etc.	Vendor to specify with technical details			
2.6.4	c) Provision for storing 5 sets minimum of parameter in a single setting.	Vender to comply			
2.6.5	d) Provision of manual adjustment of main welding parameters e.g. voltage, welding speed & wire speed during welding process.	Vender to comply			
2.6.6	e) Screen 800 X 600 data acquisition preprogramming parameters like voltage, current, wire feed.	Vender to comply			
2.6.7	f) Provision of restart of stellite weld from same location after unexpected stop e.g. power failure.	Vender to comply			
2.6.8	g) Provision of observing various parameters at any time e.g. voltage, current, wire speed, welding speed, pre heat temperature including details of layer number, seam number, height of stellite welding completed/ balance weld overlay height etc	Vendor to specify with technical details			
2.6.9	h) Provision of selecting manual / automatic mode of welding process.	Vender to comply			
2.6.10	i) Provision of generating programme, saving programme, editing of programme deletion of programme of different components.	Vendor to specify with technical details			
2.6.11	j) Provision of password protection for changing critical parameters.	Vendor to specify with technical details			
2.6.12	k) Provision of dry run of welding torch before start of actual stellite weld for each layer.	Vendor to specify with technical details			
2.7	OTHER FEATURES-				
2.7.1	a) Provision of suitable infrared temperature sensor (digital highly accurate pyrometer) for non contact type temperature measurement during stellite welding.	Vendor to specify with technical details			
2.7.2	b) Provision of CCTV Camera system to monitor welding process before and after the welding area.	Vendor to specify with technical details			

SCOPE : SUPPLY, ERECTION & COMMISSIONING OF MECHANISED PROGRAMABLE OSCILLATING GMAW SYSTEM SYNCHRONIZED WITH TURN TABLE FOR NARROW GROOVE STELLITING PROCESS (WITH LOCAL HEAT TREATMENT SYSTEM)

2.8	CNC Welding Process Control Panel with video monitoring system- mounted close to welding operator. All the operator relevant controls should be positioned ergonomically for ease of adjustment. This will be used by operator for switching On /Off of the machine including emergency stop, welding sequencing, monitoring of all the operating parameters required during stellite welding operation. Controlling of the individual modules (e.g. column & boom, turn table, temperature control etc) of the complete system should be through control panel.	Vendor to specify with technical details			
2.8.1	CNC -welding process control unit is required for control of following-	Vendor to comply			
2.8.2	Simultaneous welding process control	Vendor to comply			
2.8.3	Sensing of welding head direction	Vendor to comply			
2.8.4	Temperature of work piece	Vendor to comply			
2.8.5	The PLC of welding process should be based on components of Siemens S7	Vendor to comply			
2.8.6	Software module of process control unit should contain following-				
2.8.7	User level menu & symbols on the video monitoring monitor (TFT monitor)	Vendor to comply			
2.8.8	Supply of welding parameters to the welding power source-				
2.8.8a	Provision of selecting welding process	Vendor to comply			
2.8.8b	Provision of feeding gas flow rate, pre purge, post purge etc for GMAW process	Vendor to comply			
2.8.9	Control of the operating sequence				
2.8.9a	Provision of feeding welding parameters automatic / manual on layer-to-layer basis for horizontal & vertical stellite welding . These parameters include position and angle of welding head at the start and at the end of each layer with provision of tilting of welding head.	Vendor to specify with technical details			
2.8.10	Monitoring of process & actual data				
2.8.10a	Provision of adjustment of main welding parameters e.g. voltage, welding speed & wire speed during stellite welding process.	Vendor to specify with technical details			
2.8.11	Integration with Turn Table				
2.8.11a	Provision of start of Casing movement & stopping of job movement.	Vendor to specify with technical details			
2.8.11b	Provision of clockwise & anticlockwise rotation of job during installed pre heating arrangement to prevent wire entanglement.	Vendor to specify with technical details			

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2.8.12	Other General features-				
2.8.12a	Provision of selecting manual/ automatic mode of welding process.	Vendor to comply			
2.8.12b	Provision of joysticks to control the movement of the machine manually.	Vendor to comply			
2.8.12c	User friendly menu & key buttons to control the machine on user level. The terminal should have illuminated buttons (IP 54) with changeable symbols.	Vendor to comply			
2.8.12d	Provision of navigation page for selecting various screens	Vendor to comply			
2.8.12e	Provision of complete alarm list & its occurrence time with history	Vendor to comply			
2.9	Software for operating the system				
2.9.1	It should have following features-				
2.9.2	Menus should be easy to understand & written in WinCC flexible.	Vendor to comply			
2.9.3	Important details of the machine should be shown on the display.	Vendor to comply			
2.9.4	It should be able to key-in data for horizontal & vertical stellite welding easily including step-over position & required overlap & software should arrange fully automatic stellite weld procedure. Software should adapt to the rotation speed according to actual weld diameter.	Vendor to specify with technical details			
2.9.5	There should be provision of height sensor & its programme to give estimation of final layer development.	Vendor to specify with technical details			
2.10	Operator Panel-				
2.10.1	Operator panel to be provided inclusive of PLC-console, the video monitor & the operation switches.	Vendor to comply			
2.11	Wire Drums for GMAW wire spools				
2.11.1	There should be provision of wire drums to be assembled at the end of the boom & should be properly protected against ambient humidity.	Vendor to confirm with sketch			
2.11.2	It should include following-				
2.11.3	Wire drum designed for rings type 25 as in DIN 8557	Vendor to comply			
2.11.4	Assembly console	Vendor to comply			
2.11.5	Wire guidance for GMAW wire upto the welding head	Vendor to comply			
2.12	Infrared Temperature Sensor -				
2.12.1	There should be provision of suitable Infrared temperature sensor (digital highly accurate pyrometer) for non-contact type temperature measurement of the Casing during preheating.	Vendor to offer with technical details			

SCOPE : SUPPLY, ERECTION & COMMISSIONING OF MECHANISED PROGRAMABLE OSCILLATING GMAW SYSTEM SYNCHRONIZED WITH TURN TABLE FOR NARROW GROOVE STELLITING PROCESS (WITH LOCAL HEAT TREATMENT SYSTEM)

2.12.2	Temperature of preheated Casing should be displayed on video monitor.	Vendor to comply			
2.13	CC TV Camera System-				
2.13.1	There should be provision of CCTV Camera system to monitor welding process before and after the welding area.	Vendor to offer with technical details			
2.13.2	This system should include-				
2.13.2.1	Colour compact camera with 1/3" CMOS picture sensor	Vendor to comply			
2.13.2.2	Software for monitoring data to monitor	Vendor to comply			
2.14	Rails for Column & Boom				
2.14.1	Suitable rails for movement of carriage of column & boom complete with all needed rail fixing devices to be provided	Vendor to comply			
2.15	Operator Platform				
	Suitable platform for good access to the stellite weld area along the way of Casing to be provided	Vendor to comply			
2.16	Control cabinet at suitable location to accommodate all the controls for all subsystems and their interfacing etc fitted with main control Panels. This is used for sequencing and controlling the individual modules of the complete system. All control cabinet should have air condition for its smooth function & prolonged life. Air conditioner should be suitable for Indian climatic condition with temperature range from 0-50 deg.C & relative humidity of 95% max.. Also, control panels should have sufficient illumination and power receptacles/ plug points of 220 volts, 5/15 Amp AC with on/off switch should be provided	Vendor to offer with technical details			
3	SERVO VOLTAGE STABILIZER				
4	SPARES : (Vendor to mention identification number of each spare with price of each item seperately	Vendor to comply			
4.1	Spares of CNC programable oscillating GMAW System synchronized with Turn Table with local preheating system.				
4.1.1	Mechanical Spares : Following Spares are to be offered.				
4.1.1.1	Spring Washers- 60 nos	Vendor to confirm			
4.1.1.2	Wire feed rolls 1.2mm, V knurled- 4 nos	Vendor to confirm			
4.1.1.3	Contact tips 1.2mm, GMAW- 100 nos	Vendor to confirm			
4.1.1.4	Gas nozzle, GMAW- 10 nos	Vendor to confirm			

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4.1.1.5	Cooling jacket inlet, GMAW- 10 nos	Vendor to confirm			
4.1.1.6	Cooling jacket tightening ring- 10 nos	Vendor to confirm			
4.1.1.7	Gas Diffuser, GMAW- 10 nos	Vendor to confirm			
4.1.1.7	O-Ring set- 10 nos	Vendor to confirm			
4.1.1.8	Thread fastening piece, GMAW- 10 nos	Vendor to confirm			
4.1.1.9	Controller wire feed motor- 1 no	Vendor to confirm			
4.1.1.10	Wire guiding hose set- 2 nos	Vendor to confirm			
4.1.1.11	Suction nozzle - 2 nos	Vendor to confirm			
4.1.1.12	Injector needle- 2 nos	Vendor to confirm			
4.1.1.13	Rubber Injector- 5 nos	Vendor to confirm			
4.1.1.14	Air Filter for water coolant- 6 nos	Vendor to confirm			
4.1.1.15	Any other spare recommended by the vendor	Vendor to specify			
4.1.2	Pneumatic Spares : Following Spares are to be offered.				
4.1.2.1	Filter unit- 2 nos	Vendor to confirm			
4.1.2.2	Distribution Block- 1 no	Vendor to confirm			
4.1.2.3	Way Valve of each type-1 no	Vendor to confirm			
4.1.2.4	Relief Valve of each type - 3 nos	Vendor to confirm			
4.1.2.5	Coupling- 2 nos	Vendor to confirm			
4.1.2.6	Illuminated Strip of each type- 8 nos	Vendor to confirm			
4.1.2.7	One-way restrictor- 2 nos	Vendor to confirm			
4.1.1.8	Any other spare recommended by the vendor	Vendor to specify			
4.1.3	Electrical /Electronic Spares : Following Spares are to be offered.				
4.1.3.1	Main contactor - 2 nos	Vendor to confirm			
4.1.3.2	Auxilliary switches - 2nos of each type	Vendor to confirm			
4.1.3.3	Push Buttons - 5 nos each type	Vendor to confirm			
4.1.3.4	Fuses - 10 nos of each type	Vendor to confirm			

SCOPE : SUPPLY, ERECTION & COMMISSIONING OF MECHANISED PROGRAMABLE OSCILLATING GMAW SYSTEM SYNCHRONIZED WITH TURN TABLE FOR NARROW GROOVE STELLITING PROCESS (WITH LOCAL HEAT TREATMENT SYSTEM)

4.1.3.5	Automatic circuit breakers - 1 no of each type	Vendor to confirm			
4.1.3.6	Power switch - 1 no	Vendor to confirm			
4.1.3.7	Main Control Switch - 1 no	Vendor to confirm			
4.1.3.8	Control cards for welding power source- 1 nos of each type	Vendor to confirm			
4.1.3.9	Thyristors/IGBT/Diodes for welding power source- 2 nos of each type	Vendor to confirm			
4.1.3.10	Stick out / Level sensors - 2 no of each type	Vendor to confirm			
4.1.3.11	Proximity / Limit Switches - 2 no of each type	Vendor to confirm			
4.1.3.12	Data video monitor with Power Supply - 1 no	Vendor to confirm			
4.1.3.13	Video Camera - 1 no	Vendor to confirm			
4.1.3.14	Power Modules / Control cards for Main Drives - 1 no of each type	Vendor to confirm			
4.1.3.15	Servo Motors for main drives - 1no of each type	Vendor to confirm			
4.1.3.16	Servo drives / Inverter Modules for Auxilliary Drives - 1no of each type	Vendor to confirm			
4.1.3.17	HMI / Control Panel - 1no	Vendor to confirm			
4.1.3.18	PLC CPU & I/O Modules- 1no of each type	Vendor to confirm			
4.1.3.19	CAN BUS / PROFI BUS DP Modules - 1no of each type	Vendor to confirm			
4.1.3.20	GMAW Gas System Controller - 1no	Vendor to confirm			
4.1.3.21	Pyrometer / Laser Sensor / Laser Pointer - 1no	Vendor to confirm			
4.1.3.22	Indicator bulbs / LEDs - 50 nos.	Vendor to confirm			
4.1.3.23	Any other spare recommended by the vendor	Vendor to specify			
4.2	Spares of Local Preheating System-				
4.2.1	Spares for Furnaces				
4.2.1.1	Ceramic mat heaters of each type	Vendor to confirm			
4.1.1.2	Any other spare recommended by the vendor	Vendor to specify			
4.1.1.3	Contact type hand held thermocouple	Vendor to specify			
4.2.2	Spares for Heater replacement				
4.2.2.1	Tubular cable lug of each type- 100 nos	Vendor to confirm			
4.2.2.2	Insulated Butt Connector of each type- 100 nos	Vendor to confirm			

SCOPE : SUPPLY, ERECTION & COMMISSIONING OF MECHANISED PROGRAMABLE OSCILLATING GMAW SYSTEM SYNCHRONIZED WITH TURN TABLE FOR NARROW GROOVE STELLITING PROCESS (WITH LOCAL HEAT TREATMENT SYSTEM)

4.2.2.3	Crimping plier for cable lug & butt connector- 1no	Vendor to confirm			
4.2.2.4	Installation retainer clip of each type- 50 nos	Vendor to confirm			
4.1.1.5	Any other spare recommended by the vendor	Vendor to specify			
4.2.3	Spares for Cable Connection-				
4.2.3.1	Plugs for each type of cable - 10 nos	Vendor to confirm			
4.2.3.2	Sockets for each type of cable - 10 nos	Vendor to confirm			
4.1.1.3	Any other spare recommended by the vendor	Vendor to specify			
4.2.4	Spares for Transformer-				
4.2.4.1	Filter insert for Transformer- 20 nos	Vendor to confirm			
4.2.4.2	Main contactor for Transformer- 1no	Vendor to confirm			
4.2.4.3	Emergency stop- 1 no	Vendor to confirm			
4.2.4.4	Circuit Breaker - 1no of each type	Vendor to confirm			
4.2.4.5	Main power switch for Transformer- 1 no	Vendor to confirm			
4.2.4.6	Indication lamp for Transformer - 3 nos of each type	Vendor to confirm			
4.2.4.7	Main fuse for Transformer- 5 nos	Vendor to confirm			
4.2.4.8	Any other spare recommended by the vendor	Vendor to specify			
4.2.5	Spares for Control Station				
4.2.5.1	Filter insert for control station- 20 nos	Vendor to confirm			
4.2.5.2	Relays - 2nos of each type	Vendor to confirm			
4.2.5.3	Switch contactor for control station- 2 nos	Vendor to confirm			
4.2.5.4	Emergency switch- 1 no	Vendor to confirm			
4.2.5.5	Selector / Auxilliary Switches - 2 nos of each type	Vendor to confirm			
4.2.5.6	Circuit Breakers - 1no of each type	Vendor to confirm			
4.2.5.7	Main power switch for control station- 1 no	Vendor to confirm			
4.2.5.8	Power source unit for 12V supply	Vendor to confirm			
4.2.5.9	Temperature controller- 5 nos	Vendor to confirm			

SCOPE : SUPPLY, ERECTION & COMMISSIONING OF MECHANISED PROGRAMABLE OSCILLATING GMAW SYSTEM SYNCHRONIZED WITH TURN TABLE FOR NARROW GROOVE STELLITING PROCESS (WITH LOCAL HEAT TREATMENT SYSTEM)

4.2.5.10	Energy regulator- 3 nos	Vendor to confirm			
4.2.5.11	Any other spare recommended by the vendor	Vendor to specify			
4.3 Spares of Servo Voltage Stabilizer					
4.3.1	All type of PCBs- 1no each	Vendor to confirm			
4.3.2	All types of transformer- 1no each	Vendor to confirm			
4.3.3	DC motor- 1no	Vendor to confirm			
4.3.4	Capacitor- 1no	Vendor to confirm			
4.3.5	All types of switches- 1no each	Vendor to confirm			
4.3.6	Limit switch- 1no	Vendor to confirm			
4.3.7	Glass Fuses- 5 nos	Vendor to confirm			
4.3.8	Any other spare recommended by the vendor	Vendor to specify			
4.4	Note- All types of spares for total Mechanised programable oscillating GMAW System synchronized with Turn Table with local preheating system, Local Preheating System and other accessories should be available for at least ten years after supply of the machine. If component or control is likely to become obsolete in this period, the vendor should inform BHEL sufficiently in advance and provide drawings of parts / details of spares & suppliers to enable BHEL to procure these in advance, if required	Vendor to note			
5 Toolings					
5.1	Toolings for CNC programable oscillating GMAW System synchronized with Turn Table with local preheating system in a proper Tool Box including wrenches, screwdriver, files, soft head/ Engineer's hammer, pliers, files, hand grinder, hand drilling m/c, drills, grinding/ cutting discs, gas nozzle cleaner, measuring tape, Lubricant/grease, grease gun & any other item recommended by the vendor	Vendor to offer with technical details			
5.2	Toolings for Local Preheating System in a proper Tool Box including spanners, screw drivers, hammer, allen keys, crimping plier, cutting plier & any other item recommended by the vendor	Vendor to offer with technical details			
5.3	Toolings for other accessories e.g. Turn Table, voltage stabilizer & Motorized column and boom as recommended by the vendor	Vendor to offer			
6 SERVICES PROVIDED BY BHEL					

SCOPE : SUPPLY, ERECTION & COMMISSIONING OF MECHANISED PROGRAMABLE OSCILLATING GMAW SYSTEM SYNCHRONIZED WITH TURN TABLE FOR NARROW GROOVE STELLITING PROCESS (WITH LOCAL HEAT TREATMENT SYSTEM)

6.1	Input Power Supply : 415 volt \pm 10 % ; 50 Hz., 3 phase, 3 wire A.C.supply.	Vendor to note			
6.2	Power Supply will be provided by BHEL at a single point near the Mechanised programmable oscillating GMAW System synchronized with Turn Table with local preheating system as per layout recommended by Vendor. All types of switches, cables (including BHEL power supply point to power source of welding system, local preheating system & other utilities), connections, circuit breakers etc. required for connecting BHEL's power supply point to different parts of the machine/control cabinets including Voltage Stabilizer etc. shall be supplied by the vendor. Length of input cables to be supplied by the vendor as per actual layout of the machine.	Vendor to note			
7	Tropicalisation: All electrical / electronic equipment shall be tropicalized.	Vendor to note			
7.1	All electrical & electronic control cabinets & panels should be dust and vermin proof.	Vendor to confirm			
7.2	All electrical components in the cabinets should be mounted on DIN Rail.	Vendor to confirm			
7.3	All electrical / electronic panels to be provided with adequate door locks. All electrical & electronic panels including operator's panel should have sufficient illumination and power receptacles/plug points of 220Volts, 5/15 Amp AC with on/off switch. All electrical adapters/receptacles, fittings, consumables etc. should be Indian or should have compatibility with Indian equivalents.	Vendor to confirm			
7.4	All motors shall conform to IEC or Indian Standards	Vendor to confirm			
7.5	Vendor should ensure the proper earthing for the machine and its peripherals/accessories. Any material requirement for the same should be informed with foundation design/drawings. The vendor can take earthing connection from the nearest column of the production shop.	Vendor to note			
8	SAFETY ARRANGEMENTS Following safety features in addition to other standard safety features should be provided on the machine:				
8.1	GMAW System synchronized with Turn Table with local preheating system should have adequate and reliable safety interlocks / devices to avoid damage to the system, job loaded on the system and the operator due to the malfunctioning or mistakes. Preheating system should be continuously monitored and alarm / warning indications through lights/ alarm on the control panel should be available.	Vendor to comply			

SCOPE : SUPPLY, ERECTION & COMMISSIONING OF MECHANISED PROGRAMABLE OSCILLATING GMAW SYSTEM SYNCHRONIZED WITH TURN TABLE FOR NARROW GROOVE STELLITING PROCESS (WITH LOCAL HEAT TREATMENT SYSTEM)

8.2	A detailed list of all alarms / indications provided on the stellite welding system should be submitted by the supplier.	Vender to specify with technical details			
8.3	All the rotating parts used on the GMAW System synchronized with Turn Table with local preheating system should be statically & dynamically balanced to avoid undue vibrations & noise.	Vender to comply			
8.4	Emergency Switches at suitable locations as per International Norms should be provided.	Vender to comply			
8.5	Water pipe lines should not run with electrical cable in the same trench.	Vender to comply			
9	ENVIRONMENTAL PERFORMANCE OF THE MACHINE : The GMAW System synchronized with Turn Table with local preheating system should conform to following factors related to environment :				
9.1	Maximum noise level shall be ≤ 76 dB(A) at normal load condition, 1 meter away from the preheating system with correction factor for back ground noise, if necessary. This will be measured as per international standards like DIN 45635-16, if required. Supplier to demonstrate compliance to noise level, if so required.	Vender to comply			
9.2	There shall not be any hazardous emissions from the GMAW System synchronized with Turn Table with local preheating system during operation.	Vender to comply			
9.3	No hazardous chemicals shall be required to be used in the GMAW System synchronized with Turn Table with local preheating system.	Vender to comply			
9.4	If any safety / environmental protection enclosure is required it should be built in the machine by the vendor.	Vender to comply & confirm			
9.5	Paint of the machine should be oil / coolant resistant RAL 6011 Apple Green (Polyurethane Paint)and should not get peeled off and mixed up with coolant etc.	Vender to comply			
10	DOCUMENTATION :				
10.1	Three sets of following documents (Hard copies) in English language should be supplied along with the machine	Vender to comply			

SCOPE : SUPPLY, ERECTION & COMMISSIONING OF MECHANISED PROGRAMABLE OSCILLATING GMAW SYSTEM SYNCHRONIZED WITH TURN TABLE FOR NARROW GROOVE STELLITING PROCESS (WITH LOCAL HEAT TREATMENT SYSTEM)

10.2	Detailed operation & maintenance manual of complete GMAW System synchronized with Turn Table with local preheating system including column & boom, manipulator/ positioner with all drawings of machine assemblies/sub-assemblies/parts including Electrical / Pneumatic circuit diagrams. All Assembly/ Sub Assembly Drawings shall be supplied with the part list also.	Vender to comply			
10.3	Detailed operation & maintenance manual of the complete local preheating system including power transformer, control station and heating pads with all drawings of machine assemblies/sub-assemblies/parts including Electrical circuit diagrams. All Assembly/ Sub Assembly Drawings shall be supplied with the part list also.	Vender to comply			
10.4	Operation & maintenance manual of voltage stabilizer.	Vender to comply			
10.5	Catalogues, Operation & Maintenance Manuals of all bought out items including drawings, wherever applicable.	Vender to comply			
10.6	PLC user programme (hard copy) along with comments in English List. All documents in English language.	Vender to comply			
10.7	Complete list of parts/items(Bill of materials) used in the system in English language.	Vender to comply			
10.8	Complete list of spares for GMAW System synchronized with Turn Table with local preheating system and accessories, along with specification / type / model, and name & address of the spare supplier	Vender to comply			
10.9	One additional set of all the above documentation on CD ROM, wherever possible.	Vender to comply			
11	PRE DISPATCH INSPECTION- Scope of pre dispatch inspection at vendor's works will be as follows-				
11.1	GMAW System synchronized with Turn Table with local preheating system-				
11.1.1	Checking of all the items including spares/ consumables/ toolings as per ordering scope.	Vender to note			
11.1.2	Predispatch Inspection of the complete integrated GMAW System synchronized with Turn Table with local preheating system for functional test including movement/ travel of column & boom, welding heads, manipulator & roller support	Vender to note			

SCOPE : SUPPLY, ERECTION & COMMISSIONING OF MECHANISED PROGRAMABLE OSCILLATING GMAW SYSTEM SYNCHRONIZED WITH TURN TABLE FOR NARROW GROOVE STELLITING PROCESS (WITH LOCAL HEAT TREATMENT SYSTEM)

11.1.3	GMAW System synchronized with Turn Table with local preheating system to be demonstrated on carbon steel mock up piece (Groove diameter 1500mm minimum with 60 deg. sector) the similar groove of HP Inner Casing (no of layers- 2 buffer layers at the bottom) and vertical face of groove (no of layers -3 minimum on each side with stellite -21). <u>This mock-up piece will be arranged by the vendor.</u>	Vender to note			
11.1.4	Groove stellinging done on mock-up piece will be checked for following- a. Visual checking and dye penetrant test for freedom from any defect e.g. crack/ lack of fusion/ any discontinuity b. Macro examination of cut section from horizontal & vertical stellite welded area from at least 4 locations. There should not be any defect e.g. crack/ lack of fusion/ any discontinuity	Vender to note			
11.2	Local Preheating System -				
11.2.1	Checking of all the items including spares/ consumables/ toolings as per ordering scope.				
11.2.2	Demonstration of all features of the preheating system, control system & accessories to the satisfaction of BHEL for efficient & effective use as mutually agreed.	Vender to note			
11.3	Other accessories (Voltage Stabilizer)				
11.3.1	Checking of all the items including spares/ consumables/ toolings as per ordering scope.	Vender to note			
11.3.2	Demonstration of all features of the above accessories to the satisfaction of BHEL for efficient & effective use as mutually agreed.	Vender to note			
11.3.3	Note- In case, above accessories are of Indian make, inspection of accessories will be carried out at Indian vendor's work which will be coordinated by the supplier before dispatch.	Vender to note			
11.4	Training of BHEL persons at vendor's works will be provided as per clause 13.0	Vender to note			
12	PROVE-OUT GROOVE STELLITING AT BHEL SHOP				

SCOPE : SUPPLY, ERECTION & COMMISSIONING OF MECHANISED PROGRAMABLE OSCILLATING GMAW SYSTEM SYNCHRONIZED WITH TURN TABLE FOR NARROW GROOVE STELLITING PROCESS (WITH LOCAL HEAT TREATMENT SYSTEM)

12.1	Vendor shall be fully responsible for establishing and demonstrating groove stelling on HP Inner casing mock-up component as per Welding Procedure suggested by BHEL after erection of GMAW System synchronized with Turn Table with local preheating system at BHEL shop. Achieving smooth stellite welded surface free from surface defects and sound weld deposit free from defects (by D.P test) is necessary condition for acceptance of thestellite welding on HP Inner casing groove mockup sample. Note- It is suggested to establish welding parameters on seperate trial mock-up piece before carrying out stellite welding on actual job.	Vendor to accept & offer			
12.2	Vendor shall be fully responsible for demonstrating stellite welding on actual groove of HP Inner casing (at both both halves) in preheated condition as per developed Welding Procedure to the full satisfaction of BHEL after fully establishing the groove stelling system at BHEL shop. Achieving smooth stellite welded surface free from surface defects and sound weld deposit free from defects (by D.P test) is necessary condition for acceptance of the groove stellite welding on actual groove of HP Inner casing.	Vendor to accept & offer			
13	TRAINING OF BHEL PERSONEL				
13.1	BHEL persons should be trained at vender's works for eight man weeks period in the following areas (including pre dispatch inspection)- 1. Production 2. Programming 3. Mechanical Maintenance 4. Electrical & Electronic Maintenance	Vendor to confirm			
13.1 a	Demonstration of all the features of the GMAW System synchronized with Turn Table with local preheating system and all the accessories for their efficient and effective use by BHEL.	Vendor to confirm			
13.1b	Demonstration of complete stellite welding operation both in automatic and manual mode on suitable mockup sample (details will be given by BHEL) for efficient and effective understanding of the BHEL Trainees.	Vendor to confirm			
13.1c	Programming features of the control system and training on programming and entering the programed data into the system.	Vendor to confirm			
13.1d	Mechanical & hydraulic maintenance of the system & other supplied equipments.	Vendor to confirm			
13.1.e	Electrical & electronic maintenance of the system, Preheating system and other supplied equipments.	Vendor to confirm			
13.2	Air fare, boarding & lodging for the trainees shall be born by BHEL.	Vendor to note			

SCOPE : SUPPLY, ERECTION & COMMISSIONING OF MECHANISED PROGRAMABLE OSCILLATING GMAW SYSTEM SYNCHRONIZED WITH TURN TABLE FOR NARROW GROOVE STELLITING PROCESS (WITH LOCAL HEAT TREATMENT SYSTEM)

13.3	Competent, English speaking experts shall be arranged by the vender during training for satisfactory & effective training of BHEL personals.	Vendor to confirm			
13.4	Training of BHEL machine operators in the operation of complete machine & accessories etc by the supplier's experts / engineers during their stay at BHEL works.	Vendor to confirm			
13.5	Groove stellinging on one number of full size mockup (representing actual groove stellite welding operation, as per BHEL drawing) by BHEL operator under supervision of the vender's expert / engineer at BHEL works.	Vendor to confirm			
14 ERECTION & COMMISSIONING					
14.1	Vendor shall submit the preliminary layout drawings for getting BHEL's approval within one month from the date of Letter of Intent (LOI) or Purchase Order, whichever is earlier.	Vendor to confirm			
14.2	Complete Foundation Design including details viz. static / dynamic load details etc. and final layout drawings shall be submitted by the supplier within two months after getting BHEL's approval for Preliminary layout drawings.	Vendor to note			
14.3	The layout should consist of all requirements pertaining to complete machine including space requirement for all accessories/ attachments/ offered items.	Vendor to note			
14.3.1	BHEL shall construct complete foundation for the system under supervision of supplier and at vendor's responsibility.	Vendor to note			
14.3.2	Vendor should arrange equipments required for the testing of soil chemistry / foundation, if required by the vendor.	Vendor to note			
14.3.3	The vendor shall also indicate detailed specifications/requirement of earthing material, grouting compound and grouting procedure etc. for foundation bolts of the machine.	Vendor to note			
14.4	Erection & Commissioning of the complete GMAW System synchronized with Turn Table with local preheating system and other accessories/attachments with all electrical & mechanical connections shall also be responsibility of the vendor.	Vendor to note			

SCOPE : SUPPLY, ERECTION & COMMISSIONING OF MECHANISED PROGRAMABLE OSCILLATING GMAW SYSTEM SYNCHRONIZED WITH TURN TABLE FOR NARROW GROOVE STELLITING PROCESS (WITH LOCAL HEAT TREATMENT SYSTEM)

14.5	Successful proving of stellite welding on the groove of HP Inner casing mock-up and on the actual HP Inner casing as per developed WPS/PQR by the supplier shall be considered as part of commissioning for the machine . All other features and functions, as mentioned at Sl. No. - 13.0 (GMAW System synchronized with Turn Table with local preheating system Acceptance) shall also be part of the commissioning activity.	Vendor to note			
14.6	Tools, Tackles, instruments and other necessary equipment required to carry out all erection & commissioning activities should be arranged and brought by the supplier.	Vendor to note			
14.7	Commissioning spares, required for commissioning of the complete stellite welding system within stipulated time, shall be brought by the supplier on returnable basis.	Vendor to note			
14.8	Schedule of Erection and Commissioning shall be submitted with the offer.	Vendor to note			
14.9	Terms & conditions for Erection & Commissioning should be furnished in detail (Mock up & actual job) separately by vendor along with offer.	Vendor to comply			
14.10	Portion, if any, of the machine, accessories/attachments and other supplied items where paint got rubbed or peeled off during transit or erection should be repainted and matched with the original adjoining paint by the vendor. For this purpose, the vendor should supply sufficient quantity of touch-up paint of various colours/shades of paints used. The vendor shall ensure performing touching after commissioning but before final acceptance.	Vendor to comply			
15 AMBIENT CONDITIONS & THERMAL STABILITY					
15.1	The complete GMAW System synchronized with Turn Table with local preheating system should be suitable for continuous operation to its full capacity for 24 hours a day and 7 days in the Fabrication Shop under existing power supply and ambient operating conditions, as mentioned below.	Vendor to comply			
15.1.1	Power Supply (AC): Voltage = 415V ± 10% , Frequency= 50Hz ± 3 , No. of phases = 3 phase.	Vendor to note			

SCOPE : SUPPLY, ERECTION & COMMISSIONING OF MECHANISED PROGRAMABLE OSCILLATING GMAW SYSTEM SYNCHRONIZED WITH TURN TABLE FOR NARROW GROOVE STELLITING PROCESS (WITH LOCAL HEAT TREATMENT SYSTEM)

15.1.2	<p>Ambient Operating Conditions: Temperature = 0 to 50 degree Celsius Relative Humidity = 95% max. Weather conditions are tropical. Atmosphere may be dust laden during some part of the year. Machine shall be kept in the normal shop floor condition without any temperature controlled enclosure/shop. Max. temperature variation is 25 deg Celsius in 24 hours.</p>	Vender to note			
15.1.3	<p>Thermal Stability: Thermal Stability of the complete GMAW System synchronized with Turn Table with local preheating system components and all supplied items including controls for their trouble free operation with specified accuracy in the specified Ambient Conditions should be ensured and confirmed by vendor.</p>	Vender to note			
16	<p>PACKING - Sea worthy & rigid packing for all items of GMAW System synchronized with Turn Table with local preheating system & controls, all Accessories and other supplied items to avoid any damage/loss in transit. When machine is dispatched in containers, all small loose items shall be suitably packed in boxes. In case machine is dispatched in container, the container shall be brought up to BHEL, Haridwar. De- stuffing of container shall be carried out at BHEL, Haridwar by the vendor's representative. Any type of material handling equipment required for the de-stuffing of the container shall be brought by the vendor at Haridwar on returnable basis.</p>	Vender to note			
17	<p>GUARANTEE - Guarantee for complete GMAW System synchronized with Turn Table with local preheating system and all supplied accessories/attachments/equipments/items for 24 months from the date of commissioning/ acceptance of the GMAW System synchronized with Turn Table with local preheating system.</p>	Vender to accept			
18	GENERAL				
18.1	GMAW System synchronized with Turn Table with local preheating system / Machine Model No.	Vender to specify			
18.2	Total connected load (KVA)	Vender to specify			
18.3	Total Space required (Length, Width, Height) for complete GMAW System synchronized with Turn Table with local preheating system and accessories/attachments.	Vender to specify with sketch			
18.4	Painting of Machine / Electrical Panels : RAL 6011 Apple Green (Polyurethane Paint)	Vender to comply			

SCOPE : SUPPLY, ERECTION & COMMISSIONING OF MECHANISED PROGRAMABLE OSCILLATING GMAW SYSTEM SYNCHRONIZED WITH TURN TABLE FOR NARROW GROOVE STELLITING PROCESS (WITH LOCAL HEAT TREATMENT SYSTEM)

18.5	Total weight of the GMAW System synchronized with Turn Table with local preheating system	Vender to specify			
18.6	Weight of the heaviest assembly of the GMAW System synchronized with Turn Table with local preheating system.	Vender to specify			
18.7	Dimensions of largest part of the GMAW System synchronized with Turn Table with local preheating system with maximum length.	Vender to specify			
18.8	All the outsourced items / standard sub deliveries should be from reputed suppliers and details should be mentioned in the offer	Vender to comply			
18.9	Detailed catalogues, sketches /drawings / photographs pertaining to the offered GMAW System synchronized with Turn Table with local preheating system and accessories/attachments/items should be submitted with the offer.	Vender to comply			
18.10	Hydraulic, Pneumatic & Oil piping should be preferably metallic except places where flexible piping are essential. All the pipes required for the same shall be supplied by the vendor.	Vender to note			
18.11	All Cables and Hoses etc. should be well supported & protected in trays / brackets / drag chains etc.	Vender to note			
19	QUALIFYING CONDITIONS (Including clause no. 19.1, 19.2, 19.3, 19.4 & 19.5)	Refer the tender document named 'Pre - Qualifying Requirement (PQR)'			

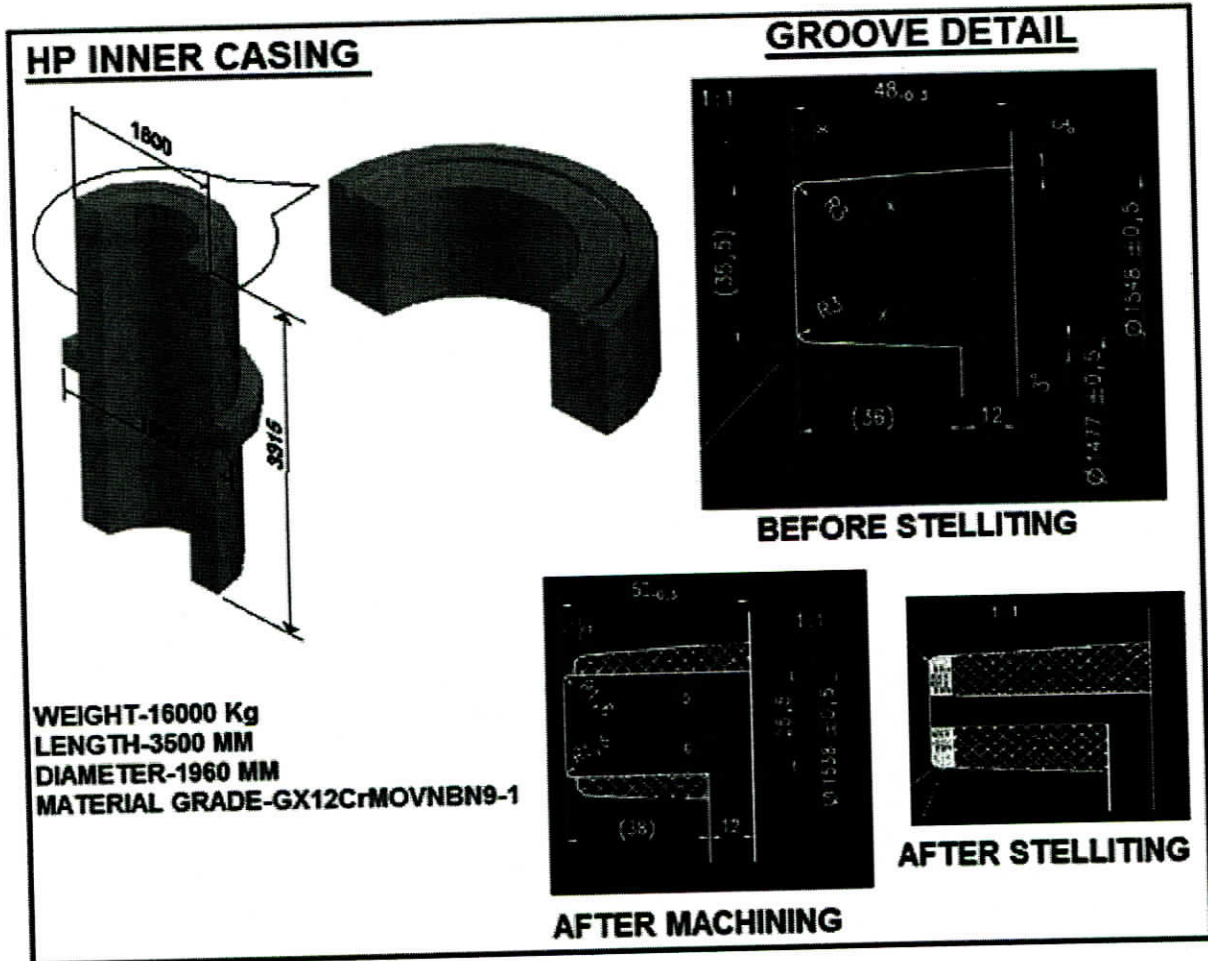
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20	Point wise Confirmation - Vendor should confirm/clarify point wise (all the points) as per specification and provide original technical leaflet, technical details, photographs, scope of supply etc. at the first instance.	Vender to confirm/comply			
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HP Inner Casing

- Weight of R/M HP Inner Casing (half):- 16000kg
- Length: - 3500mm
- Diameter: -1960mm (max.)
- Material grade: - HW19683 (GX12CRMOVNBN9-1)

Groove Details-



Pradeep

Aditya

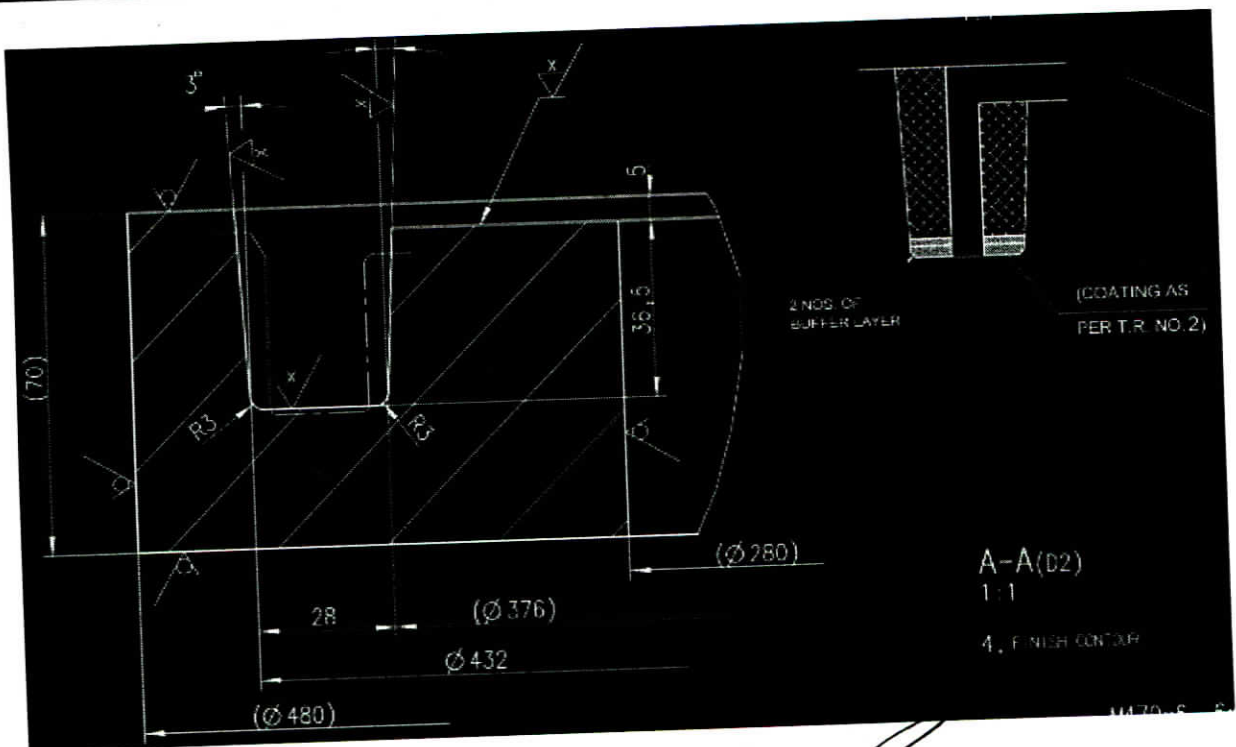
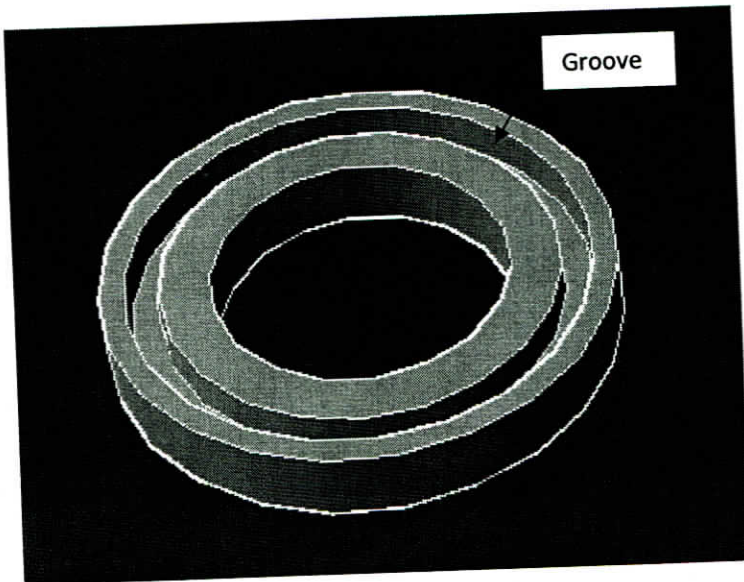
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Threaded Ring

- Weight of R/M Threaded Ring-40kg
- Diameter-480mm
- Height- 70mm
- Material grade- HW18812 (X10CRMOVNB9-1)

Groove details-



Handy

Adresh

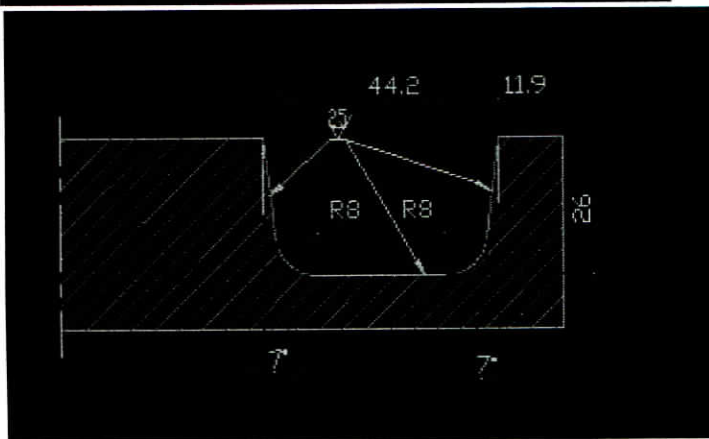
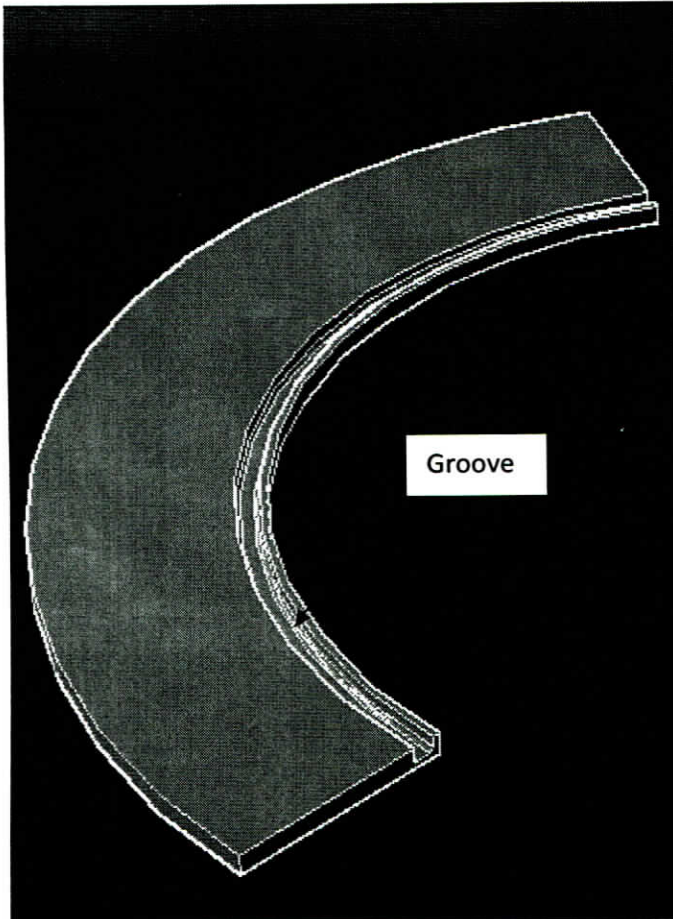
[Signature]

Xivim

Conical Half Ring

- Weight of two conical half ring after joining back to back- 1025kg
- Outer diameter-4782mm
- Material grade- AA10119 (IS:2062)

Groove details-



Bhandari

Abhishek

[Signature]

Alman