

TECHNICAL SPECIFICATION OF WELDING SIMULATOR

NOTE :-

1. The vendor (OEM) must fill the "offered" column in compliance to specified requirements and also "Deviations". (OEM- Original Equipment Manufacturer)
2. The offer and all the documents enclosed with the offer should be in English language only.
3. Vendor must offer "optional" feature mentioned in the specification with separate price of each. These features will be included in the scope of supply depending on sanctioned budget limit.

	ADDRESS OF THE SUPPLIER :	ADDRESS OF THE INDIAN AGENTS :		
	TELEPHONE NOS.:	TELEPHONE NOS.:		
	FAX NOS.:	FAX NOS.:		
	E-MAIL ADDRESS :	E-MAIL ADDRESS :		
SL. NO.	DESCRIPTION OF BHEL REQUIREMENT	REQUIRED	DEVIATION	REMARKS
1	Welding Simulator for training of the welders in Shielded Metal arc welding (SMAW), Gas Metal Arc welding (GMAW) and Gas Tungsten Arc Welding (GTAW)- optional and with recording and post analysis facility.	Vendor to offer		
2.0	Detailed specifications			
2.1	Training Processes:			
2.1.1	Shielded Metal arc welding	Vendor to offer		
2.1.2	Gas Metal Arc welding			
2.1.3	Gas Tungsten Arc Welding (optional)			
2.2	Welding Positions (Groove & Fillet both):			
2.2.1	Flat/Down Hand position	Vendor to offer		
2.2.2	Horizontal position			
2.2.3	Vertical position			
2.2.4	Overhead position			



2.3	Joint Types			
2.3.1	Plate Butt (Groove)	Vendor to offer		
2.3.2	Plate Fillet (TEE & Lap)			
2.3.3	Pipe to Pipe Butt (Optional)			
2.4	Materials-	Vendor to offer		
	Carbon steel			
2.5	Medium of Instruction	Vendor to offer		
2.5.1	English			
2.5.2	Hindi			
2.6	Model – Work bench model	Vendor to offer		
2.6.1	Monitor for trainer viewing			
2.6.2	SMAW holder with cable and necessary accessories			
2.6.3	GMAW Torch with cable and necessary accessories			
2.6.4	GTAW holder with cable and necessary accessories- optional			
2.6.5	Facility for fixing the work piece model in all position			
2.7	Network connectivity	Vendor to offer		
	Ethernet connectivity to be provided for online support			
2.8	Data Recording and Analysis			
2.8.1	Provision for recording and analysis of the following process parameters 1. Current (Wire feed rate) 2. Voltage 3. Travel speed 4. Travel angle 5. Torch angle 6. Arc Length 7. Defect analysis	Vendor to offer		

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2.8.2	Provision for Data retrieval and play back	Vendor to offer		
2.8.3	Online and Offline provision for analysis of trainee data against set values.			
2.8.4	Provision for print out of analysis			
2.8.5	Provision for having record of minimum 50 welders performance			
2.8.6	USB port to be provided for data transfer in MS office format			
2.9	Salient Features of Welding Simulator-			
2.9.1	SMAW process should have feature of arc ignition, manipulation of electrode, slag removal, electrode consumption & choice of selecting different electrode diameter.	Vendor to offer		
2.9.2	GMAW process should have feature of optimum welding speed, tip-to-work distance, tilt angle of welding torch, setting of parameter wrt dip transfer or spray transfer mode of weld pool, choice of selection of wire size/ shielding gas.	Vendor to offer		
2.9.3	Welding simulator should have provision of Haptic (related to touch/ feel) workpiece hardware e.g. in SMAW process, when electrode touches the work piece, then the welder must get the feel & subsequently welder retracts the electrode.	Vendor to offer		
2.9.4	Welding simulator should have provision of didactic guidance for welding parameters, distance & position of weld pool & welding skill. Simulator should use didactic signals for guiding the trainee on above parameters.	Vendor to offer		
2.9.5	Welding simulator should have provision of helmet with integral High Definition/ 3D screen so as to have actual simulation of welding i.e welder's view will be always on the work piece during the welding.	Vendor to offer		
2.9.6	Welding simulator should have green learning with no real arc/ smoke simulation methodology.	Vendor to offer		



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2.9.7	Welding simulator should have feature of- a. Weld bead simulation- With continuous arc with welding bead on simulator screen b. Weld pool simulation- Puddle arc with redhot weld simulation	Vendor to offer		
2.9.8	Simulation methodology should show weld bead on simulator screen without physical arc/ smoke to have green learning methodology.	Vendor to offer		
2.9.9	Welding simulator should have feature of 180° rotation 3D view from helmet.	Vendor to offer		
2.9.10	Welding Simulator should have provision of personal account with password for each welder trainee.	Vendor to offer		
3.0	Software Upgradation			
	The software upgrades is to be provided for first twelve months from the date of commissioning. Vendor to also provide software on CD.	Vendor to confirm		
4	Spares and Accessories			
4.1	Supplier should quote following spares with individual price of each with the offer- a. SMAW holder - 1no b. SMAW Electrode - 1no c. GMAW Torch - 1no d. GMAW Nozzle - 1no	Vendor to offer		
4.2	Vendor to provide complete list of spares for 12 months trouble free operation.	Vendor to offer		
5.0	DOCUMENTATION			
	Operation and maintenance manual in English language a. Three hard copies of the operation and maintenance manual b. One soft copy of the operation and maintenance manual	Vendor to confirm		
6.0	Warranty			
	Warranty for the software and hardware to be provided for 12 months from the date of commissioning	Vendor to confirm		

7.0	PACKING			
	Welding Simulator shall be dispatched in suitable packing to avoid any damage during handling, transit and storage.	Vendor to confirm		
8.0	PRE-DESPATCH INSPECTION			
	Pre-despatch inspection and acceptance of the Welding Simulator shall be made by BHEL at vendor's work prior to despatch. Specification compliance and performance of the welding simulator shall be checked and verified. Vendor will demonstrate all features of welding simulator during pre despatch inspection.	Vendor to confirm		
9.0	ERECTION & COMMISSIONING			
9.1	Erection & Commissioning (E&C) including demonstration of all the features of the welding simulator will be done by the vendor at BHEL work.	Vendor to confirm		
9.2	Vendor will impart training to BHEL personnel for 2 days during E&C of machine.			
10.0	FINAL ACCEPTANCE			
	Final acceptance shall be after installation & successful demonstration of the Welding Simulator at BHEL by the vendor to the full satisfaction of BHEL as per specification. However, commissioning certificate will be issued after 2 weeks (approx) of above activity for ensuring trouble free working of the machine.	Vendor to confirm		
11.0	QUALIFYING CRITERIA :			
11.1	Only OEM /OEM authorized vendors, who have supplied and commissioned at least one Welding Simulator in the past FIVE years and such Welding Simulator was working satisfactorily for more than 12 months after commissioning should quote. Both the periods should be prior to /on the tender opening date. The following information should be submitted by the vendor about the companies where such Welding Simulators have been supplied. This is required from all the vendors for qualification of their offer.	Vendor to accept & submit details.		
11.1.1	Name of the customer/Company where such machine(s) is(are) installed			
11.1.2	Complete postal address of the customer.			

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11.1.3	Month & Year of commissioning.	Vendor to accept & submit details		
11.1.4	Application for which the machine is supplied			
11.1.5	Name and designation of the contact person of the customer.			
11.1.6	Phone, FAX No. and email address of the contact person.			
11.1.7	Performance certificate from the customers regarding satisfactory performance of welding simulator supplied to them (Original Certificate or Through E-mail directly from the customer). The original performance certificate may be returned after verification by BHEL, if required.			
11.2	BHEL reserves the right to verify the information provided by vendor. In case the information provided by vendor is found to be false/ incorrect, the offer shall be rejected.	Vendor to accept.		

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15.6.15
 (BS Arm)
 AGNCL

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 Jitendra Kumar.
 (SE/WT)