भारत हेवी इलेक्ट्रिकल्स लिमिटेड
(सामग्री प्रबंधन विभाग)
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(MATERIAL MANAGEMENT DEPARTMENT)
Corporate Research & Development Division, Vikasnagar,Hyderabad–500 093 INDIA

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MKVH Sarma
Sr DGM

BHEL-R&D/11-12/03 EOI 27-May-2011

Expression of Interest – Laser peening system

BHEL Corporate R&D division invites expression of interest from original equipment manufacturers (OEM's) for "Laser peening system" for enhancing the fatigue life of engineering components."

Any changes shall be updated on our website www.bhel.com. Under this heading. All vendors are requested to visit the site regularly.

This is for finalizing the technical specifications and short list of prospective vendors.

Vendors may please note that BHEL shall deal directly with foreign vendors, wherever required, for procurement of goods/ services. However, if any foreign principal desires to avail of the services of an Indian agent, then the foreign principal should ensure compliance to regulatory guidelines-which require mandatory submission of and Agency Agreement. The Agency agreement should specify the precise relationship between the foreign OEM/ foreign principal and their Indian agent and their mutual Interest in the business. All services to be rendered by the agent/ associate, whether of general nature or in relation to the particular contract, must be clearly stated by the foreign supplier/ Indian agent. Any payment, which the agent or associate receives in India or abroad from the OEM, whether as commission or as a general retainer fee should be brought on record in the agreement and be made explicit in order to ensure compliance to laws of the country. Any agency commission to be paid by BHEL to the Indian agent shall be in Indian currency only. Wherever Indian agents are representing on behalf of their principals, the relevant authorization letter and agency agreement copy to be enclosed along with technical bid to consider the offer failing which BHEL shall deal with the principal for all correspondence and business purposes.

Manufacturers and suppliers of the Laser peening system may send their quotations along with catalogues, super-scribing the cover/ email 'Expression of Interest-Laser peening system/ BHEL-R&D/11-12/03 EOI dt 27-May-2011' to:

Materials Management Department (Purchase),
BHEL Corporate R&D division
Vikasnagar, Hyderabad 500093
Attn/CP: Sri MKVH Sarma, Sr DGM-Purchase
Ph: +91 40 2388 2304; Mob: +91 94907 48302
E_mail: sarma_mkvh@bhel.co.in

Expression of interest

Laser peening specifications

The Laser peening system should be capable of generating compressive stresses of magnitude over 500 MPa at the surface on steel and titanium alloy. It should have the following specifications, viz.**,**

1) Specifications

a)	Laser pulse energy:	5 - 20 J variable
b)	Laser spot diameter:	2 - 4 mm variable
c)	Pulse repetition rate :	2 – 5 Hz variable
d)	Pulse duration:	10-20 ns (FWHM) variable
e)	Energy stability:	< 5% RMS
f)	Divergence:	< 0.5 mrad
g)	shot to shot energy variation:	< 2% RMS
h)	flash lamp lifetime:	>10exp(6) shots
i)	Master oscillator producing TEM_{00} output.	
j)	Constant irradiance (flat top) beam profile.	
k)	Articulated arm for accurate beam delivery.	

1. The process will be coupled with our existing robot for its operation. The model of our robot is KUKA KR-60, whose details can be provided to the supplier. The laser peening system controller will serve as the slave to this robot (master) i.e. the laser peening operation will be controlled by the robot program. Integration between robot controller and Laser peening controller shall be in the scope of supplier. All the necessary hardware for integration (such as Profibus cable, connectors etc) shall be provided.
2. **Spares:** Mandatory spares for trouble-free running of the system for a minimum period of one year shall be supplied along with the equipment.
3. **Pre-dispatch Inspection and training:** Pre-dispatch inspection and training of the equipment at the manufacturing works of the supplier shall be carried out before its dispatch to BHEL R&D.
4. **Installation and Commissioning:** The party shall be responsible to carry out the installation and commissioning of the laser peening system at BHEL R&D. Installation shall include positioning/orientation of the system including grouting (if necessary), electrical connections, etc. that are necessary for carrying out commissioning. Supplier shall provide foundation drawing if separate foundation requiring civil works is essential. Supplier should specify any specific pre-installation requirements at BHEL R&D so as to ensure smooth installation & commissioning.
5. **Guarantee clause:** The supplier should guarantee the system for a minimum period of 2 years from the date of commissioning.

6. The supplier will establish the laser peening process and demonstrate the generation of compressive stresses in steel as well as Titanium alloy (Ti6Al4V) of over 500 MPa at the surface during installation & commissioning.
7. **Manuals:** Two copies (Hard copy and soft copy) of detailed operating manuals (in English) covering all aspects of the system including operation, maintenance, etc. to be provided.
8. **Client list:** The supplier may provide a list of clients/parties where such similar equipments have been sold elsewhere in the world and their details.
9. **Safety:** All necessary safety precautions shall be made as per international norms so as to make the laser peening process safe and reliable. The supplier shall submit the detailed procedure for carrying out laser peening, including all the safety precautions to be adhered to during the process.
10. Compliance statement of specifications and terms and conditions to be submitted along with offer by supplier.