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Fax: 01334-226462, Phone: 01334-281147;  
Mobile - +91 9899095970  
E-mail: [sanjay.singh@bhel.in](mailto:sanjay.singh@bhel.in)

Tender no: C/6410/2019/27151 T1

Due Date: 20-Nov-2019

[www.bhel.in](http://www.bhel.in) NIT\_49648

**NOTICE OF EXPRESSION OF INTREST FOR CNC 5AXES MILLING MACHINE FOR MARINE PROPELLER AS PER ENCLOSED SPECIFICATIONS**

The Heavy Electrical Equipment Plant (HEEP) located in Haridwar, is one of the major manufacturing plants of BHEL. The core business of HEEP includes design and manufacture of large steam and gas turbines, turbo generators, hydro turbines and generators and so on.

**We are looking for reputed vendors having capability for supplying following materials-**

| SN | MAT.CODE    | Description                                    | QUATITY |
|----|-------------|------------------------------------------------|---------|
| 1  | ZW030301017 | CNC 5AXES MILLING MACHINE FOR MARINE PROPELLER | 1       |

**Contact persons:**

Mr. Sanjay Singh

Designation: Senior Engineer (PPX-CAPITAL)

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संजय सिंह

**SANJAY SINGH**

व० अभियन्ता

Sr. ENGINEER

सामग्री प्रबन्धन

MATERIALS MANAGEMENT

बी०एच०ई०एल०, (हीप), हरिद्वार

B.H.E.L., (HEEP), HARIDWAR

*Sanjay Singh*  
30/05/2019



**BHARAT HEAVY ELECTRICALS LIMITED**  
HEEP: HARDWAR-249 403 (UK)  
Fax: 01334-226462, Phone: 01334-281147;  
Mobile - +91 9899095970  
E-mail: [sanjay.singh@bhel.in](mailto:sanjay.singh@bhel.in)

The offers received will be technically evaluated by BHEL & successful short listed parties will be asked to submit their detailed Techno-Commercial offers through formal NIT/Enquiry for our future requirements. Vendors shall confirm that there is no deviation with respect to BHEL Specifications. However deviations, if any are to be listed as a separate attachment. The offers that do not meet the substantial requirements of our specifications are liable to be ignored.

**Following documents are to be necessarily filled and submitted along with the technical offer:**

1. Details/ Documents in support of Specification / PQR (Annexure-I up-loaded)
2. Supplier/Vendor Registration Form- Go through online supplier registration portal <https://supplier.bhel.in>. After filling the online registration form send the copy of same along with your offer within due date.
3. Details of Manufacturing Facility
4. Company Profile.
5. Financial report of the company.
6. Past experience along with documentary proof.

Only Technical BID along with the documents mentioned above should be sent and the envelope containing the offer shall be duly sealed and super scribed as "Technical Offer for (ITEM NAME) AGAINST Tender No. C/6410/2019/27151 T1.

**Due Date-20-Nov-2019, SUBMITTED BY (Name of company)"**

- This notification shall be published on [www.bhel.com](http://www.bhel.com), and [www.bhelhwr.co.in](http://www.bhelhwr.co.in)
- Last date for downloading tender documents shall be 19-Nov-2019 till 1700 Hrs.(IST). Tenders will be received up to 13:45 Hrs. (IST) on 20-Nov-2019 will be considered and opened on the same day at 14:00 Hrs. (IST) in the Tender Room BHEL HEEP, Haridwar,
- Technical Offers complete in all respect must be addressed to "Shri Sanjay Singh, Senior Engineer (PPX-Capital)".
- EMD & Tender fee are not applicable.
- The Quotation should be from the Principal / Original Manufacturer, failing which the quotation may likely to be ignored. In Case the quotation is submitted through agent, the quotation must accompany original authorization letter.
- Late offers will not be considered in any case. BHEL will not be responsible for any type of postal delay / incomplete information from vendor.
- Amendments / Corrigendum, if any, will be hosted on our web site only.

**For any further details please log on to [www.bhel.com](http://www.bhel.com) or [www.bhelhwr.co.in](http://www.bhelhwr.co.in)**

संजय सिंह  
SANJAY SINGH

व० अभियन्ता  
Sr. ENGINEER

सामग्री प्रबन्धन

MATERIALS MANAGEMENT  
बी०एच०ई०एल०, (हीप), हरिद्वार  
B.H.E.L., (HEEP), HARIDWAR

(SANJAY SINGH)  
SENIOR ENGINEER (PPX-Capital)

*Sanjay Singh*  
30/08/2019

**SCOPE:** SUPPLY, ERECTION & COMMISSIONING OF CNC 5 AXES MILLING MACHINE  
COMPLYING WITH SPECIFICATIONS AS BELOW.

**PURPOSE:** This machine is required for carrying out rough & finish milling operations on large size marine propeller (material – NAB: Nickel Aluminium Bronze) having 7 nos. highly skewed blades integral with its hub (single mono-block casting) having outer diameter 5.5-6m, weight approx. 22 tons.

Offered machine should be capable of machining as per specified purpose. (Vendor to confirm)

**WORK PIECE MATERIAL:**

Casting of NAB: Nickel Aluminium Bronze – NES 747 part 2  
Mechanical Properties: Tensile Strength 586Mpa, Yield Strength 241 Mpa,

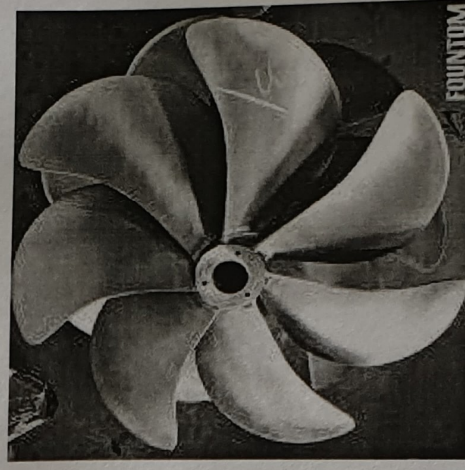
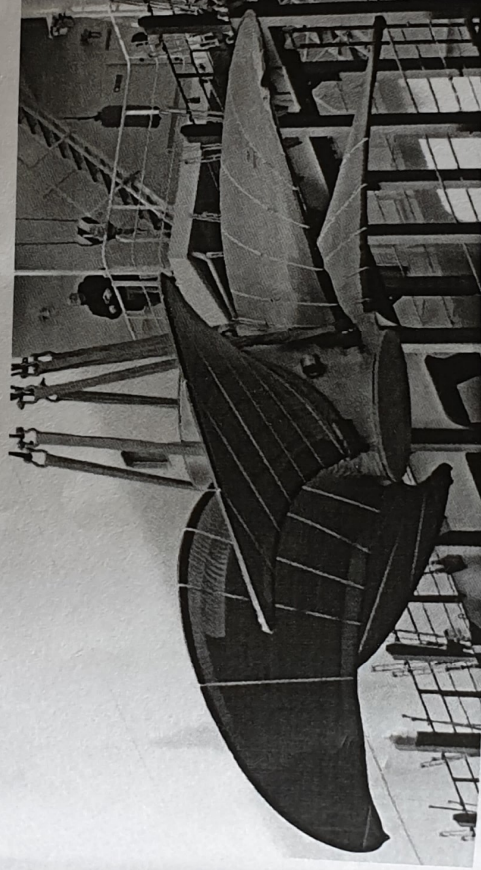
Percentage Elongation 18%

Chemical Composition: Cu 79%, Pb 0.03%, Fe 3-5 to 4.5%, Ni 4 to 5%, Al 8.5 to 9.5 %, Mn 0.8-1.5%, Si 0.1% (Value indicates maximum permissible limit. Fe content does not exceed Ni content)

(Vendor to confirm suitability of the offered machine for Propeller of specified material for the specified purpose.)

**SPECIFICATIONS/REQUIREMENTS:**

1. Shape & Photograph of Propeller for Reference only:



2. Broad Technical Details of the Propeller:

2.1. Single Mono-block Casting

2.2. 7 nos. Highly Skewed Blades integral with its Hub

2.3. Hub Dimensions (Approx.): Height 1.2 m, Inner Diameter 500 mm (through bore), Outer Diameter 800 mm

2.4. Outer Diameter of Propeller with integral Blades: 5.5 to 6 m

2.5. Weight (Approx.): 22 tons

2.6. Applicable Manufacturing/Tolerance/Accuracy Standard: ISO-484/2, Class 'S' with Surface

Finish 08 microns Ra

*(Handwritten signatures and initials)*

Propeller of specified size as per applicable Manufacturing/Tolerance/Accuracy Standard in minimum job setups. Vendor to confirm & inform details of available axes with their traverses. Vendor to inform no. of job setups required for the specified machining requirement.

4. Vendor to inform following details about offered machine:-

- 4.1. Configuration of the offered machine with supporting layout/photo (i.e. single/double column, moving/fixed crossrail, rotary/swiveling/tilting/fixed table, type of machine etc.)
- 4.2. Technical features, size, weight capacity etc. to accommodate propeller casting as per details mentioned above.
- 4.3. Maximum Job Size (Length x Width x Height) which can be accommodated on table of the offered machine for 5 or more axes milling.
- 4.4. Size of machine's Spindle / Ram and tool mounting details.
- 4.5. Main Drive – Type and Rating.
- 4.6. Make & Model of CNC System.
- 4.7. Details and broad Specifications of offered attachments /Accessories.

5. Vendor to offer following with the machine:-

- 5.1. CAM software (customized for programming for propeller machining) with matching hardware for CNC programming for complete milling of Propeller Blade Profiles, Fillets with Hub and Hub's external surface between the blades etc. with post processor for the offered machine. Vendor to inform relevant broad details.
- 5.2. Recommended set of Spares for two years running of the machine.
- 5.3. Machine's Pre-dispatch Inspection by BHEL team and Geometrical/Positioning accuracy/Machining tests at vendor's works (to be witnessed by BHEL).
- 5.4. Machine's installation (Erection & Commissioning) at site (BHEL works) including Geometrical/Positioning accuracy/Machining tests. Civil construction at site for foundation of machine, as per design by vendor, shall be in scope of BHEL.
- 5.5. Complete tooling package (all types of Cutting Tools, Tool Holders/Adapters, Tooling Accessories/Attachments/Spares/Extensions etc. as per recommendation/requirement of Vendor) for machining of one Propeller of specified size on the machine after machine's erection/startup at site (BHEL works). Rough Estimate may be considered as propeller's

10.11.2019

manufacturing drawing is presently not available. Machining allowance of 20mm on each surface is to be considered.

5.6. Proveout machining of one Propeller of specified size, by vendor's expert, on the machine after machine's erection/startup at site (BHEL works) for which tooling package has been offered at Sl.No. 5.5.

5.7. Documentation for Operation and Maintenance of the machine with relevant drawings/catalogues.

5.8. Training to BHEL's Operators, Programmers and Maintenance personnel.

6. Vendor to inform whether it shall be possible to achieve surface finish of 0.8 microns Ra, all around, on blade surfaces with offered Machine, Attachment/Accessories, Tooling etc.. In case, polishing/grinding after milling operation is required to achieve surface finish of 0.8 microns Ra, Vendor to offer required equipment/attachment with broad technical details to achieve required finish on the offered machine or may recommend/offer different equipment/machine. In that case, vendor to inform value of surface finish achievable after milling operation as well as allowance on milled surfaces which shall be required to be polished or ground to achieve final dimensions/profile.

