Bharat Heavy Electricals Limited

Ramachandrapuram : : Hyderabad – 502032

Purchase Department

Product Division : Switchgear

Ref: HY/PUR/SG/GTSD124/EOI/01 date: 04.03.2021

Subject: Expression of Interest for identifying Indigenous supplier for Fr9E Transition piece Body

Dear Sir / Madam,

We are pleased to invite your offer for identifying Indigenous supplier for Fr9E Transition piece Body via e-procurement system. Interested Agencies are requested to submit their technical and financial credentials along with other details as mentioned in PQC, annex-I & annex-II to be submitted only through e-procurement portal of BHEL (https://eprocurebhel.co.in/nicgep/app) on or before **26.03.2021, 14.00hrs.**

Further information/clarification can be obtained at the address below during 8:00 to 16:30 hrs. IST. Bidders can also raise queries through email.

Mr. Sujeet Kumar
Deputy Manager/ Purchase-SG
4th Floor, Admin Building,
BHEL-Ramchandrapuram,
Hyderabad-502032
Contact No- 04023182428
E-MAIL: sujeetkum@bhel.in

The details submitted by the Agency (s) shall be complete in all respects and BHEL may seek clarifications / additional information as considered necessary.

Note: 1. Detailed Tender documents / Corrigenda, addenda, amendments, time extensions, clarifications etc. can be downloaded / accessed from the following websites: -

a. https://eprocurebhel.co.in/nicgep/app
b. www.bhel.com

2. For issue regarding submission of bid through e-procurement portal, bidder may contact customer care at email id "support-eproc@nic.in" or over telephone 0120-4001002, 0120-4001005 and 0120-6277787.

For & On behalf of HPEP, BHEL, HYD
(Sujeet Kumar)
Dy.Manager (Purchase-SG)

BHARAT HEAVY ELECTRICALS LIMITED

RAMACHANDRAPURAM:: HYDERABAD-502 032,INDIA

SWITCHGEAR DIVISION

Expression of Interest (Open tender)

Ref: HY/HPEP/SGE/EOI/TP/2021/0001

Introduction:

BHEL Hyderabad manufactures Heavy Duty Gas Turbines, ranging from 25 MW to 300 MW. The items referred herein will be used in the manufacture of these Gas turbines. BHEL intends to procure these items from reputed domestic vendors through an open tender.

Purpose of inviting EOI and mode of selection:

The open tender will be a two stage process- stage 1 is short listing of suitable competent vendors through an Expression of interest and stage 2 is issue of formal commercial enquiry to the selected vendors of stage 1, for procurement per BHEL tendering procedure.

BHEL is presently seeking Expression of Interest from reputed vendors in India for supply of the items mentioned herein.

Upon receipt of expression of interest from probable vendors, BHEL will scrutinize the information sought in this EOI and if found acceptable, will be considered for sending formal commercial enquiry as per company's procurement and tendering procedures for procurement of the items mentioned herein. Detailed specifications and drawings will be provided during the formal commercial enquiry and the lowest bidder (L1) is selected through a competitive bidding process for awarding the work. For the purpose of this EOI outline drawings/brief specifications are listed.

Only those vendors need to apply against this EOI who are in the business of supplying such items as mentioned herein for Gas turbines / Steam turbines / Aerospace parts and have full-fledged facilities for execution of these jobs. Offer from traders and stockists are not acceptable and will not be considered for evaluation.

Scope of Supply:

Item Description: Fr-9E Transition piece body Fab & Mach-Comb

The requirement is for the supply of Fr-9E Transition piece body Fab & Mach-Comb as per drawings provided. Sample drawing is enclosed in drawing for the EOI purpose. Complete drawings will be shared during commercial enquiry at Stage 2.

Following sample drawing/Specification are enclosed with this EOI:

Drg no: 03510991019-01, Fr9E Transition piece body Fab & Mach-Comb.

Material Specification: HY12762 Rev01 (Nimonic N-263).

Selected vendor needs to supply the items as per detailed part specifications and drawings that will be provided during the commercial enquiry at Stage 2. Raw material shall be sourced from reputed sources (preferably approved by BHEL) and relevant test certificates shall be provided (at the time of delivery) in support of the material meeting specification requirements (including finish and testing requirements). The ordered parts shall be subjected to inspection by third party / BHEL before accepting at our end. If required, supplied parts may be tested at BHEL works after supply. Vendor may need to support in proving the item.

Pre-qualification criteria

Sl. No.	Terms & Conditions	Supplier confirmation (YES/NO)	Deviations (if any mention clearly)
1.	Pre-Qualifying Requirements for all Vendors: The bidder is required to furnish self-attested documentary proof for having acquired following pre-qualification requirement (PQR) The following conditions have to be satisfied by the vendor, with documentary proof to be enclosed with tender (Technical), failing which the offer will not be considered for evaluation: i. Vendor should furnish the sheet metal forming/Fabrication and machining experience with Super alloys (like Hastealloy, Nimonic etc...). Latest PO copies not less than 5 years, Material test reports, quality plans etc. shall be submitted to BHEL. ii. Supplier shall submit turn over details for last 3 years which shall be used for assessing supplier's current financial status. iii. Vendor should submit the evidence of formed component Super alloys have minimum size of Length = 700mm, Breadth = 400mm, Thickness = 3 mm & above. iv. Vendor should provide details on making Die, Jigs & Fixture required to manufacture the transition piece assembly. v. Vendor should provide in-house facility of TIG welding facility / Automatic welding facility (Robotic welding) vi. Vendor should have in house facility of Press for sheet formation (upper Half & Lower Half), Laser cutting/CNC		

	cutting for trimming of extra length, Heat treatment, FPI (fluorescent penetrant inspection), Die penetrant (DP) and Radio Graphic Test. vii. If the vendor doesn't have the facility of Hydraulic Press, laser cutting machine, Heat treatment and Radiography facility, in this case vendor shall submit the alternate source details during technical scrutiny. viii. Vendor shall submit the complete manufacturing process plan for Fr9E Transition piece assembly. Local hammering, Local Heating/Strengthening is strictly prohibited. ix. Documents to be submitted a) Brief profile of the organization b) Product profile c) Experience list d) Manpower resources e) Quality system f) Vendor/OEM should have ISO 9001.Bidders shall enclose the certifications in their offer. x. "The offers of the bidders who are on the banned list and also the offer of the bidders, who engage the services of the banned firm shall be rejected. The list of banned firms is available on BHEL website "www.bhel.com".		
2.	If any information given by the bidder is found to be incorrect at later stage, BHEL reserves the right to reject the bid submitted by bidder / cancel the award of order. The vendors shortlisted, will be considered for registration with BHEL at www.bhel.com under supplier registration link. http://www.bhel.com/vender_registration/vender.php		
Company Seal:		Authorised Signatory	
		Name:	
		Designation	

रवि जटोथ
Ravi Jatoth
प्रबंधक / एस जी इंजीनियरींग
Manager / SG Engg.
भा.एच.ई.एल. हैदराबाद, BHEL,HYD-32

NICKEL BASED ALLOY SHEET, PLATE AND BAR
Grade: Nimonic 263

1.0 GENERAL:

This specification governs the quality requirements of Nickel based alloy bars, sheets and plates for high temperature application.

2.0 APPLICATION:

For components like transition piece etc. in Gas Turbines.

3.0 CONDITION OF DELIVERY:

3.1 **Sheet :** Hot or cold rolled, solution annealed and descaled unless solution annealing is done in an atmosphere yielding a bright finish.

3.2 **Bar and Plate:** Hot rolled, solution annealed and descaled.

4.0 COMPLIANCE WITH NATIONAL STANDARDS:

There is no National / International Standard covering this grade of material. However, this specification is based on B50 A774 – S2 of M/s. GE, USA.

5.0 DIMENSIONS AND TOLERANCES:

5.1 Dimensions shall be as specified in the purchase order.

5.2 Tolerances:

5.2.1 The tolerances on bars shall be as follows:

Specified dimensions in mm	Tolerances	
	Plus	Minus
Upto 25.4 mm, incl.	0.41	0.41
Over 25.4 to 50.8 mm, incl.	0.78	0.41
Over 50.8 to 101.6 mm, incl.	1.19	0.78
Over 101.6 mm.	3.18	1.60

PLANT PURCHASING SPECIFICATION
HYDERABAD

5.2.2 The tolerances on sheets shall be as follows:

Specified thickness in mm	Tolerance on thickness, mm Width ranges, mm	
	1220 mm and under	Over 1220 mm to 1525 mm incl.
Over 0.457 to 0.635, incl.	± 0.076	±0.102
Over 0.635 to 0.864, incl.	±0.102	±0.127
Over 0.864 to 1.42, Incl.	0.127	±0.152
Over 1.42 to 1.78, incl.	±0.152	±0.178
Over 1.78 to 1.98, incl.	±0.178	±0.203
Over 1.98 to 2.36, incl.	±0.203	±0.229
Over 2.36 to 2.77, incl.	±0.229	±0.254
Over 2.77 to 3.18, incl.	±0.254	±0.305
Over 3.18 to 3.56, incl	±0.305	±0.356
Over 3.56 to 4.35, incl.	±0.356	±0.406
Over 4.35 to 4.75, incl.	±0.381	±0.432

5.2.3 The tolerances on plates shall be as follows:

Specified thickness (T) mm	Tolerance on thickness mm, plus only For width Ranges shown, mm			
	Up to 1220 mm, excl	1220 to 1525 excl.	1525 to 1830 excl.	1830 to 2135 excl.
Above 4.75 to 7.94, excl.	0.113 T	0.132 T	0.150 T	0.169 T
7.94 to 9.53, excl.	0.094 T	0.113 T	0.132 T	0.150 T
9.53 to 11.11, excl.	0.088 T	0.094 T	0.113 T	0.132 T
11.11 to 12.70, excl	0.075 T	0.088 T	0.094 T	0.113 T
12.70 to 15.87, excl.	0.063 T	0.075 T	0.088 T	0.094 T
15.87 to 19.05, excl.	0.057 T	0.069 T	0.075 T	0.088 T
19.05 to25.40, excl.	0.050 T	0.057 T	0.069 T	0.075 T
25.4 and over	0.050 T	0.050 T	0.057 T	0.069 T

Minus tolerance shall be 0.254 mm for all widths and all thickness.

6.0 MANUFACTURE:

The material shall be produced by Vacuum Induction Melting (VIM) followed by vacuum Arc Refining (VAR) or Electro slag Refining (ESR). Any other process shall be mutually agreed upon.

7.0 HEAT TREATMENT:

This material shall be solution annealed by heating to a temperature with in the range of 1120° C to 1175° C, holding at the temperature for a time commensurate with the thickness and rapidly cooling (air cool or faster)

8.0 FREEDOM FROM DEFECTS:

The sheets, plates and bars shall be free from cracks, seams, fissures, laps and other harmful defects.

9.0 FINISH:

The material should possess a bright finish and have surface appearance as close as possible to a commercial corrosion resistant steel No. 1 finish.

10.0 TEST SAMPLES:

10.1 Chemical Analysis: One test sample shall be taken per melt.

10.2 Metallurgical Tests: One test sample per lot comprising of plate/ sheet/ bar of the same size, melt and heat treatment batch shall be taken for Metallurgical Testing.

10.2.1 The test specimens for tensile test on bars shall be selected as follows:

a) For bars upto dia 40 mm, the specimen axis shall coincide with the central axis of the material.
b) For bars above dia 40mm, the specimen axis shall be located midway between the centre and the surface and shall be parallel to the direction of rolling.

10.2.2 For plate and sheet, the tensile test specimen shall be taken with the axis perpendicular to the direction of rolling.

11.0 CHEMICAL COMPOSITION:

The chemical analysis of the material shall be as follows:

Element	Min.%	Max.%
C	0.04	0.08
Mn	-	0.60
Si	-	0.40
P	-	0.015
S	-	0.007
Cr	19.00	21.00
Co	19.00	21.00
Mo	5.60	6.10
Ag	-	0.0005
Fe	-	0.70
Bi	-	0.0001
Ti	1.90	2.40
Ni	Bal.	-
Al	0.30	0.60
Cu	-	0.20
Pb	-	0.002

NOTE: 1) Elements not listed in this table shall not be intentionally added without prior approval of BHEL.

2) Ti + Al = (2.40 to 2.80)%.

12.0 METALLURGICAL PROPERTIES:

12.1.0 As solution heat treated, the material shall meet the following requirements.

12.1.1 **Hardness -** Material shall have a maximum room temperature hardness of Rockwell 15 N of 70 or 20 HRC or 228 BHN maximum (Ref. ASTM E18).

12.1.2 **Bending -** Sheet and plate material, through 4.78 mm thickness, shall withstand without cracking, bending at room temperature through the angle indicated below around a diameter equal to the bend factor times the nominal thickness of the material, with the axis of bend parallel to the direction of rolling (Ref. ASTM E290).

Nominal Thickness	Angle Degrees, Min.	Bend Factor
Upto 1.27 mm Incl.	180	1.0
Over 1.27 mm to 4.78 mm Incl	180	2.0

12.1.3 **Grain size** - Material shall conform to the following grain size requirements (Ref. ASTM E112)

Thickness, mm	Avg. Grain size ASTM No.	Random Max. Grain Size ASTM No.
Upto 1.27 mm, Incl	3	1
Over 1.27 mm to 50.8	2	0

12.2.0 After precipitation heat treatment, 800 ± 15° C for 8 hrs ± 30 mins., the material shall be capable of meeting the following requirements.

12.2.1 **Hot tensile test (**at 780 ± 5° C) (Ref. ASTM E21)

Tensile Strength, Mpa, min. = 542

Yield Strength, 0.2% offset, Mpa, min = 404

Elongation in 2" or 4d, % min = 9

12.2.2 **Creep** (at 780°C) (Ref. ASTM E139)

A tensile specimen, maintained at 780°C, while a load sufficient to produce an initial stress of 101 Mpa when applied continuously, shall not exceed 0.1% total plastic strain in 50 hrs.

13.0 **RETESTS:**

13.1 If, any of the test specimen fails to meet the requirement specified, the sample sheet, plate or bar from which the test specimen are taken shall be rejected and two further sample sheet, plate or bar from the same lot shall be taken for retest.

13.2 If, any of the retests also fails, manufacturer is at liberty to heat treat the material in question. However, not more than two heat treatments are allowed.

13.3 If, after heat treatment, the mechanical properties are not complied with, the entire lot shall be rejected.

14.0 **INSPECTION AT SUPPLIERR'S WORKS:**

The representative of BHEL shall have free access to the supplier;s works at all times during the execution of the order, to satisfy himself that the material is produced as per the quality requirement of this specification. All reasonable facilities shall be extended to him, free of charge. He may witness sampling, testing and marking called for in this specification/order.

15.0 TEST CERTIFICATE :

Three copies of the test certificates shall be supplied furnishing the following details:

(a) HY12762 Rev.01
(b) Material grade : Nimonic 263
(c) BHEL Order No.
(d) Dimensions.
(e) Melt Number
(f) Process of Manufacture
(g) Heat treatment and details batch number
(h) Results of Chemical analysis, Mechanical Tests, Stress Rupture, Bend Tests and Metallographic tests with representative photomicrographs.

16.0 PACKING AND MARKING:

16.1 Sheets and plates:

Sheets shall be supplied in bundles or in packages each weighing upto a maximum of 3000Kg. Sheets shall be securely packed in water proof paper or Hessian cloth and securely tied round with hoop iron and wooden battens underneath to prevent the sheets from damage during transit.

For plates below 25mm thick, each pile (preferably of 16 plates) shall be marked the supplier's identification mark, the melt number and HY 12762 on the top plate. Each plate of 25 mm thickness and above shall be stamped/ painted with the supplier's identification mark, melt number and HY12762. Plates shall be suitably packed to prevent damage during transit.

In addition, each bundle/package and each plate of 25 mm thickness and above shall bear the following information.
(a) HY12762 Rev.01
(b) BHEL Order No.
(c) Melt No./ Heat treatment batch.
(d) Size / Weight
(e) Manufacturer's Name

16.2 Each bar over 50 mm diameter shall be stamped with HY 12762, Melt No., BHEL order No. at one end or on end face. Bars up to 50 mm diameter shall be bundled together and tied with wire at 3 to 4 places along the length of the bars.
A metal label shall be securely attached to each bundle and shall bear the following information

a) HY12762 Rev.01
b) BHEL Order No.
c) Melt No./ Heat treatment batch.
d) Size / Weight
e) Manufacturer's Name

Bharat Heavy Electricals Limited

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Purchase Department

Product Division : Switchgear

EOI Ref: HY/PUR/SG/GTSD124/EOI/01 date: 04.03.2021

Annexure-I: Financial Details

Firm's ref. No: …….

Date : …….

Description/ Details	FY 2019-20	FY 2018-19	FY 2017-18
Turn Over			
Net Worth			

Note- Agency to furnish the audited financial accounts (including auditor's report, balance sheet, profit & loss account and notes) of the last three years.

(Sign & Company Seal)

Bharat Heavy Electricals Limited

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Annex-II

Response to EOI for identifying Indigenous supplier for manufacturing and supply of Fr9E Transition piece Body

In response to your EOI, we are pleased to submit the details of our firm as below:

1	**Name of the firm and Website**	
2	**Name of the MD/CEO**	
3	**Address of firm**	
4	**Contact Person with Designation and Mobile No & Email**	
5	**Any Other information**	

(Sign & Company Seal)