BHARAT HEAVY ELECTRICALS LIMITED
Centralised Stamping Unit, New Delhi

EXPRESSION OF INTEREST
For
SUPPLY OF MACHINE TOOLS FOR MANUFACTURE OF ELECTRICAL STEEL STAMPINGS

1. Expression of Interest (EOI) is invited for the following machine tools for manufacture of Electrical Sheet Stampings from reputed manufacturers as per enclosed Specification.

Scope of supply & services	Issue of Tender documents from	Last Date of submission
Ref. No. BHE/CSU/EOI/05 Grinding Machine for notching dies Quantity:1 Number	22.03.2007	05.04.2007
Ref. No. BHE/CSU/EOI/06 Radial Notching Machine Quantity:1 Number	22.03.2007	05.04.2007
Ref. No. BHE/CSU/EOI/07 Mechanical Power Press (100 T) Quantity:1 Number	22.03.2007	05.04.2007
Ref. No. BHE/CSU/EOI/08 Spot Welding Machine Quantity:1 Number	22.03.2007	05.04.2007
Ref. No. BHE/CSU/EOI/09 Projection Welding Machine Quantity:1 Number	22.03.2007	05.04.2007
Ref. No. BHE/CSU/EOI/10 Battery operated Transfer Trolley Quantity:1 Number	22.03.2007	05.04.2007

2. Address for purchase and submission of documents:

   Office of the Sr Manager (MM), CSU
   Third Floor, BHEL House
   Bharat Heavy Electricals Limited
   Siri Fort Road
   New Delhi 110 049
   Tel: +91 11 2649 2590
   Fax: +91 11 2600 1167
   Email: pkbanerjee@bhel.co.in

3. Bidders may submit EOI for one or more machine tools. However, EOI for each machine shall be submitted separately quoting Reference No as above.

4. Specifications/ documents may be obtained from the above office by hand. Bidders may also download the same from the web page of BHEL www.bhel.com (Tender Notifications) and use the documents for submission of EOI.

5. General Terms and Conditions and brief technical specifications of the machine tools are given in the Annexures.

6. Based on the submission of Expression of Interest by the bidders, BHEL will shot list the parties for issue of detailed tender specifications for submission of their techno-commercial offer and price bids. Therefore, detailed techno-commercial offers and prices are not to be submitted at this stage.

7. The offers are to be submitted in a sealed envelope properly marked.

8. BHEL takes no responsibility for any delay / loss of documents or correspondence sent by courier or post.

9. BHEL reserves the right to accept or reject any of the bids / all bids with or without deviation, or cancel / withdraw the invitation for EOI without assigning any reason whatsoever and in such case no bidder shall have any claim arising out of such action by BHEL.

Enclosures:

Annexure EOI-7: General terms and Conditions (For All Machine Tools)
Annexure EOI-8: Brief Technical Specification of Grinding Machine for notching dies
Annexure EOI-9: Brief Technical Specification of Radial Notching Machine
Annexure EOI-10: Brief Technical Specification of Mechanical Power Press
Annexure EOI-11: Brief Technical Specification of Spot Welding Machine
Annexure EOI-12: Brief Technical Specification of Projection Welding Machine
Annexure EOI-13: Brief Technical Specification of Battery operated Transfer Trolley

For & on behalf of BHEL

(P K Banerjee)
Sr Manager (MM), CSU
BHEL, New Delhi

Annexure: EOI-7

GENERAL TERMS AND CONDITIONS
(For All Machine Tools)

1. SUBMISSION OF OFFER

a) The EOI shall be addressed to the official as specified in the Notice Inviting EOI and shall be submitted with one original and two copies.

b) Sealed Offers may be submitted personally, by Courier or by registered post with due allowance for any transit/postal delay. The offers received after due date and time of opening are liable to be rejected.

c) Bidders must fill the schedules and furnish all the required information as per the instructions given in various sections of the Specification. Each and every page of the offer must be signed, stamped and submitted by the Bidder. The information furnished shall be complete by itself.

d) The offer shall be in English Language using international numerals. Metric system of units shall be used.

e) All entries in the Offer shall either be typed or be written in ink. Erasures and overwriting are not permitted and may render such Offers liable to summary rejection. The Bidder shall duly attest all cancellations and insertions.

2. RECEIPT OF OFFERS

a) The Offers shall be received in the office of the official inviting EOI till close of business (5.30 PM) on the last date of submission of EOI mentioned in the Notice Inviting EOI.

3. SHORT LISTING OF BIDDERS

a) Only Bidders who have previous experience in the work of the nature and description detailed in the Specifications, who continue to be in business in this field and who are financially sound to undertake the work, are expected to be short listed for this work. Offer from Bidders who do not have proven and established experience in the field is not likely to be considered.

b) Offers will be accepted from the equipment manufacturers only and not from their agents.

4. SCOPE OF SUPPLY AND SERVICES

a) The scope of supply and services shall cover design, procurement, manufacture assembly and testing at supplier's works, packing and forwarding, supply FOB Port of Despatch (for foreign supplies) / Ex-Works Station of Despatch or FOR site (for domestic supplies), installation, commissioning and testing at BHEL works.

b) Marine/ inland transportation, unloading and storage at BHEL Works will be taken care of by BHEL/ other contractors.

c) Training of BHEL personnel in operation and maintenance of the machine tools is also to be provided at supplier's works as well as at BHEL works as required.

d) Recommended/ mandatory spares for two years operation are to be provided.

5. DETAILED TECHNO-COMMERCIAL OFFER

a) BHEL will issue a detailed Tender to the short listed bidders at a later date and they will be asked to submit their detailed techno- commercial and price bid. Therefore, detailed techno-commercial offer and price bid is not to be submitted at this stage.

6. DELIVERY

a) The machine tools are required to be supplied FOB Port of Despatch (for foreign supplies) / Ex-Works Station of Despatch or FOR site (for domestic supplies) by December 2007/ January 2008.

b) The machine tools are planned to be commissioned for commercial use at BHEL works progressively in February / March 2008.

c) Bidders are required to indicate the delivery period/ commissioning schedule keeping in mind their current and expected order execution program and BHEL's requirement.

7. TECHNICAL SPECIFICATIONS

a) Brief Technical Specifications of the machine tools are given in the Annexures. The Technical Specifications are preliminary and may undergo change at the time of issue of detailed tender documents.

b) Bidders may submit their comments for modification, if any, for improved performance, technical up gradation, maintenance facilities, cost reduction etc.

8. INFORMATION TO BE SUBMITTED

The Bidder shall give full information in respect of the following. Non-submission of this information may lead to rejection of the Offer.

a) Details of Company/ Firm:

Details of the company or the firm, its nature of business etc.

b) Financial Status:

Financial status of the company for the last three years (minimum) to show that the company is financially sound. Certified copies of audited accounts for last 3 years shall be submitted for this purpose.

DUNS number (allotted by M/s Dun & Bradstreet) shall be mentioned in the

offer, if allotted.

c) Organisation Details:

Information to show that company has qualified and competent persons to undertake the work called for in the Specifications.

d) Previous Experience:

I. A statement giving particulars of the various similar machine tools supplied/ under manufacture.

II. The following information is to be submitted about the companies where machines have been supplied.

i. Name of the customer / company where similar machine is installed and is in operation.
ii. Complete postal address of the customer.
iii. Month & Year of commissioning.
iv. Application for which the machine is supplied with details of accuracies achieved on the job.
v. Name and designation of the contact person of the customer.
vi. Phone, Fax no. and email address of the contact person of the customer.
vii. Performance certificate from the customers regarding satisfactory performance of machine supplied to them.

III. BHEL reserves the right to verify the information provided by Vendor. In case the information provided by the vendor is found to be false/ incorrect, the offer is liable to be rejected.

e) After Sales Setup

Existing and proposed after sales set up of the company giving details of how the company plans to support BHEL by way of supply of spares and services in case of order.

f) Delivery Schedule

Proposed delivery schedule.

g) Supplier Registration Form

The Supplier Registration Form, duly filled up, with necessary enclosures, shall be submitted.

The form may be downloaded from BHEL website www.bhel.com (Supplier Registration – New Supplier – Registration Forms).

Suppliers who are registered with other units of BHEL may also quote their registration number for reference.

Annexure: EOI - 8

BRIEF TECHNICAL SPECIFICATION OF GRINDING MACHINE FOR NOTCHING DIES

(EOI Reference No: BHE/CSU/EOI/05)

1. PURPOSE

The Grinding Machine for notching dies will be used for grinding notching dies used for production of stampings from electrical sheet steel for rotating electrical machines. The die face will normally be of tool steel. The material removal will be low as the dies will be ground for sharpening the cutting edges.

2. SPECIFICATION

2.1. The major specifications are as follows:

2.1.1	**Work Piece Details**	
	Work Piece Width	200 mm
	Work Piece Length	400 mm
	Work Piece Height	30 to 100 mm
	Work Piece Weight, Max	10 kg
	Grinding Width	150 mm
	Grinding Length	350 mm
2.1.2	**Machine Details**	
	Table Width, Min	300 mm
	Table Length, Min	600 mm
	Table Speed	2 to 20 mm/Min
	No of table speed changes	Step less
	Vertical Travel over magnetic chuck	200 mm
2.1.3	**Tool Spindle Details**	
	No of Spindles	1
	Spindle drive capacity	2.5 kW
	Spindle Speed (Variable)	2000 to 3000 rpm
	Outside diameter of grinding wheel	200 to 300 mm

3. CONSTRUCTION

3.1. The grinding machine for notching dies shall be with reciprocating table and single horizontal axis grinding head. The body frame shall be rigid.

3.2. The machine bed shall be sturdy and shall have high precision guide ways. Proper lubrication of table guide ways shall be provided.

3.3. The drive system shall be with a variable drive AC motors and shall be suitable for all speeds and feeds.

3.4. An electro-permanent magnetic chuck shall be supplied for mounting on the table. The dimensions of the chuck shall be same as the dimensions of the table. The dies will normally be mounted on the chuck for grinding. The magnetic chuck shall be magnetised by a single shot of electrical power so that there is no heat built up even when the chuck is left on for a long periods of time.

4. OPERATION AND CONTROL SYSTEM

4.1. Operator's panel having complete machine control system shall be provided.

4.2. Programmable logic controllers with distributed peripherals connected with a standard field bus system for machine control shall be provided.

Annexure: EOI - 9

BRIEF TECHNICAL SPECIFICATION OF RADIAL NOTCHING MACHINE

(EOI Reference No: BHE/CSU/EOI/06)

1 PURPOSE

The Radial Notching Machine will be used for notching and cropping circular & segmental blanks of electrical sheet steel for stator and rotors of rotating electrical machines. Loading and unloading of the blanks shall be manual.

2 SPECIFICATION

2.1 Capacity & Size

Nominal Press force	250 kN
Lamination Thickness	0.30 to 1 mm
Throat	450 - 850 mm
Distance between bed & slide, stroke down, slide adjustment up	240 mm
Stroke of Slide	40 mm
Slide Adjustment	40 mm
Stroking speed (infinitely adjustable)	50 – 250 spm
Working Height above bed	85 - 100 mm
Distance between slide centre and spindle centre, max	900 – 1250 mm
Distance between slide centre and spindle centre, min	200 – 300 mm
Minimum Number of Slots / Circle	36
Maximum Number of Slots / Circle	216
Maximum Number of Segments / circle	36
Minimum Number of Segments / circle	2
Maximum Slot Size	50 x 270 mm
Table Clamping Area, Approximately	400 x 500 mm
Slide Clamping Area, Approximately	160 x 280 mm

2.2 Indexing System

A cam indexing system shall be provided.

The indexing accuracy shall be within +/- 0.05 mm per 500 mm diameter of stamping.

It shall be possible to change the tool without changing the notching parameters.

2.3 Operation and Control System:

Operator's panel having complete machine control system shall be provided.

Programmable logic controllers with distributed peripherals connected with a standard field bus system for machine control shall be provided.

Annexure: EOI - 10

BRIEF TECHNICAL SPECIFICATION OF MECHANICAL POWER PRESS

(EOI Reference No: BHE/CSU/EOI/07)

1 PURPOSE

The Mechanical Power Press will be used for producing circular & segmental blanks of electrical sheet steel for stator and rotors of rotating electrical machines. Loading and unloading of the blanks shall be manual.

2 SPECIFICATION

2.1 Capacity & Size

Press Technical Data	
Press force, 5 mm before Bottom Dead Centre	1000 kN
Clearance between the uprights: Width (Left to Right) Depth (Front to Back)	 1050 mm 500 mm
Die installation height between clamping plate and ram, stroke down, adjustment up	300 - 400 mm
Ram stroke	75 - 125 mm
Adjustment of ram	200 mm
Clamping area of table: Width (Left to Right) Depth (Front to Back)	 1400 mm 800 mm
Clamping area of ram: Width (Left to Right) Depth (Front to Back)	 1200 mm 600 mm
Nominal stroking rate (variable)	5 - 20 strokes per minute

2.2 Construction Features

The press shall be single action eccentric shaft drive type with fixed bolster.

The press frame shall be of welded steel mono-bloc structure, stress-relieved and annealed. Alternatively, link press frame (four piece, hydraulically pre-stressed tie rod construction) is also acceptable. The press feet shall be machined for easy installation.

The drive of the press shall be via flat belt, flywheel, clutch, brake and heavy-duty gear directly on the eccentric shaft. Mass counter balance of the rotating masses shall be ensured for vibration free running of the press.

The ram shall be welded steel structure, stress-relieved & annealed, and shall be driven by the connecting rod. The weight of the slide and upper die shall be balanced via air cylinders.

Bed and Ram plates shall be provided with T-slots to fasten dies. T slot size will be informed after order.

2.3 Operation and Control System

The Control Panel shall house all PLC, main disconnect switches, fuses, control relays etc as applicable.

All necessary electrical interlocks shall be incorporated for safe press operation.

An open-type control system for control of the production process shall be provided.

Secondary programmable logic controller with distributed peripherals connected with a standard field bus system for machine control shall be provided.

It shall be possible to set the following 3 sets of operations - Inching, Single Auto Cycle and Continuous Auto cycle.

Annexure: EOI - 11

BRIEF TECHNICAL SPECIFICATION OF SPOT WELDING MACHINE

(EOI Reference No: BHE/CSU/EOI/08)

1 PURPOSE

The Spot Welding Machine will be used for spot welding of ventilation spacers on circular & segmental stampings of electrical sheet steel for stator and rotor of rotating electrical machines. Loading and unloading of the blanks shall be manual.

2 SPECIFICATION

2.1 Capacity & Size

Thickness of stamping	0.30 to 1 mm
Thickness of ventilation spacer	5 to 12 mm
3 phase electrical rating with 50% duty cycle	50 – 100 kVA
Throat	500 - 1300 mm
Chord of stamping at outside diameter	300 – 1250 mm
Radial depth of stamping	200 – 1000 mm

2.2 Operating System

A pneumatically operating system for machine operation shall be provided.

The pneumatic system shall be complete with solenoid valve, air filter, lubricator, regulator etc.

2.3 Control System:

Operator's panel having complete machine control system shall be provided.

The machine shall be duly interfaced with microprocessor based weld controller.

Annexure: EOI - 12

BRIEF TECHNICAL SPECIFICATION OF PROJECTION WELDING MACHINE

(EOI Reference No: BHE/CSU/EOI/09)

3 PURPOSE

The Projection Welding Machine will be used for projection welding of ventilation spacers on circular & segmental stampings of electrical sheet steel for stator and rotor of rotating electrical machines. Loading and unloading of the blanks shall be manual.

4 SPECIFICATION

4.1 Capacity & Size

Thickness of stamping	0.30 to 1 mm
Thickness of ventilation spacer	5 to 12 mm
3 phase electrical rating with 50% duty cycle	150 – 250 kVA
Throat	400 - 550 mm
Length of stamping at outside diameter	300 – 1200 mm
Radial depth of stamping	200 – 500 mm

4.2 Operating System

A pneumatically operating system for machine operation shall be provided.

The pneumatic system shall be complete with solenoid valve, air filter, lubricator, regulator etc.

4.3 Control System:

Operator's panel having complete machine control system shall be provided.

The machine shall be duly interfaced with microprocessor based weld controller.

Annexure: EOI - 13

BRIEF TECHNICAL SPECIFICATION OF BATTERY OPERATED TRANSFER TROLLEY

(EOI Reference No: BHE/CSU/EOI/10)

1 PURPOSE

The Battery Operated Transfer Trolley will be used for inter bay transport of material, mainly sheet steel and stampings of electrical sheet steel of rotating electrical machines. The trolley shall be suitable for indoor and outdoor application.

2 SPECIFICATION

2.1 Capacity & Size

Capacity of Transfer Trolley	20 Tonnes
Face to Face distance of track rail (Broad Gauge Line)	1676 mm
Length of trolley Bed	3000 - 4000 mm
Width of trolley bed	2500 mm
Minimum ground clearance	100 mm
Available side clearance from rail centres	2500 mm
Height of bed from rail level	1000 mm
Length of travel	100 M
Speed range	3 – 15 M/ min
Creep speed	3 M/ min

2.2 Drive System

Battery voltage	48 V DC
Battery Rating	300 – 350 AH
Motor rating at 48 V DC	7.5 HP
Gear box and clutch system	To suit
Braking system – to stop fully loaded trolley with in	1 – 2 M

2.3 Battery Charger

Power Supply input	415 V
Charging Time	8 -10 Hrs
Charger type	Constant current

2.4 Construction

The transfer Trolley shall be fabricated fro rolled steel sections and steel plates.

Sufficient space shall be provided for maintenance of motor, gearbox, wheels, coupling etc.

2.5 Operating System

The operation of the trolley shall be through pendent control box mounted on both ends.

A control panel shall be provided for mounting necessary controls for the electric system.