

## Subject: Technology Collaboration for Fired Heaters (FH)

### 1) Introduction:

This Expression of Interest (Eoi) seeks response from Original Equipment Manufacturers (OEMs), who are willing to be associated with BHEL through a license & technology collaboration agreement on long term basis, to enable BHEL to design, engineer, manufacture, assemble, quality control, test, supply, install, erect, commission, repair, service and retrofit state of the art Fired Heaters to meet market requirements.

- 1.1) Bharat Heavy Electricals Limited (BHEL) is a leading state owned company, wherein Government of India is holding 63.06% of its equity. BHEL is an integrated power plant equipment manufacturer and one of the largest engineering and manufacturing organization in India, catering to the core infrastructure sectors of Indian economy viz. energy, transportation, heavy engineering industry, defence, renewable and non-conventional energy. The energy sector covers generation, transmission and distribution equipment for hydro, thermal, nuclear and solar photo voltaic. BHEL has been in this business for more than 50 years and BHEL supplied equipment account for more than 57 % of the total thermal generating capacity in India. BHEL is also listed in stock exchanges of India. The company has 17 manufacturing units, 4 power sector regions, 8 service centers, 8 overseas offices and 15 regional offices besides host of project sites spread all over India and abroad. The annual turnover of BHEL for the year 2014-15 was **US\$ 5.04 Billion\***, with profit before tax of **US\$ 349 Million\***. BHEL's highly skilled and committed manpower of approximately **44900** employees, the state of art manufacturing facilities and latest technologies, has helped BHEL to deliver a consistent track record of performance. To position leading state owned companies as Global Industrial giant & as a recognition for their exemplary performance, Government of India categorized BHEL as "Maharatna Company" in 2013, empowering the company with enhanced autonomy in decision making. With the current order book exceeding **US \$ 16.1 Billion\***, BHEL is poised for excellent future growth. Our ongoing major technology tie-ups include agreements with GE, USA (for gas turbines); Siemens, Germany (for steam turbines, generators and condensers); Metso Automation Inc., Finland (for control & instrumentation); Alstom, France (for Super-Critical Boilers & pulverisers); MHI, Japan (for pumps); MHPS, Japan (for Flue Gas Desulfurization Systems); Vogt Power International, USA (for HRSG); GENP, Italy (for compressors); Turbo Lufttechnik, Germany (for fans) and Sheffield Forge masters International, UK (for forgings). More details about the entire range of BHEL's products and operations can be obtained by visiting our web site [www.bhel.com](http://www.bhel.com).

### 1.2) About HPVP unit of BHEL:

Bharat Heavy Plate and Vessels Limited (BHPV) based at Visakhapatnam, Andhra Pradesh, erstwhile a wholly owned subsidiary of BHEL has been merged with BHEL with effect from 30<sup>th</sup> Aug 2013. Consequent to the Merger, BHPV has become 17<sup>th</sup> manufacturing unit of BHEL and is now known as "Heavy Plates and Vessels Plant (HPVP)" ([www.bhelviz.co.in](http://www.bhelviz.co.in)).

HPVP's strategically located manufacturing facility at Visakhapatnam is accredited with ISO 9001 and has supplied numerous quality process plant equipment, cryogenic, combustion, oil & gas systems on turnkey basis and provided services suited to specific requirements of its customers.

The major products of HPVP include crude stabilization unit, gas sweetening & LPG recovery plant, LPG terminal (storage and handling facilities), flue gas conditioning skid,

[\*Note: Currency conversion rate considered: 1 US \$=Rs 62.59 as on 31<sup>st</sup> March 2015]

ammonia storage systems (double wall storage tanks), desalter plant, evaporators, mounded LPG storage facilities, vacuum ejector and condensers systems, Sulfur Recovery Unit (SRU)/Amine Regen Unit (ARU)/Sour Water Stripper (SWS) packages, group gathering / gas collecting stations, skid mounted packages for oil & gas/fertilizer industries and process equipment for off shore platforms etc.

### 1.3) Experience of HPVP in Fired Heaters:

HPVP has been an established manufacturer of fired heaters for industries in the oil & gas sector since 1973. HPVP had a technology collaboration with M/s Lummus, Netherland for Fired Heaters till 1995-96, which enabled it to supply about 63 nos. fired heaters till date including Hot Oil Heater of 28.38 MM Kcal/hr to Bharat Oman Refineries Ltd., Bina; Atmospheric Heater of 66.89 MM Kcal/hr; Vacuum Heater of 34.16 MM Kcal/hr to Bharat Petroleum Corporation Limited (BPCL), Mumbai and Naphtha Hydrotreater (NHT) Charge Heater of 6.99 MM Kcal/hr; NHT Splitter Reboiler of 17.16 MM Kcal/hr to Hindustan Petroleum Corporation Limited (HPCL), Visakhapatnam in India.

With the expertise gained in manufacture, erection and commissioning of fired heaters, HPVP has been in a position to take up total systems involving heaters on turnkey basis, encompassing civil, structural, electrical, instrumentation and piping.

HPVP's range of heaters include crude and vacuum heaters, coker heaters, visbreaker heaters, catalytic reformer heaters, fired reboilers for refining process, steam super heaters, hot oil heaters, charge heaters, recycle heaters and start up heaters.

### 1.4) In order to meet upcoming market requirements in Industry and to upgrade to the state of art technology for Fired Heaters, BHEL intends to enter into a Technology Collaboration Agreement (TCA) on long term basis with a leading Original Equipment Manufacturer (OEM).

### 2) Scope of cooperation :

BHEL seeks a partner for entering into a TCA for state of the art & proven Fired Heaters. The TCA shall enable BHEL to design, engineer, manufacture, assemble, quality control, test, supply, install, erect, commission, repair, service and retrofit of Fired Heaters. The detailed terms and conditions for such a paid-up license agreement shall be mutually agreed upon. The duration of the TCA shall be around 8 to 10 years. Indicative scope of technology transfer for Fired Heaters is given in Annexure-1.

Business sharing option, during the initial period of technology assimilation by BHEL can also be considered.

### 3) Prequalification requirements (PQR):

The Prospective Collaborator shall meet the following conditions as on the date of submission of Eoi:

- 3.1) Prospective Collaborator should have at least 7 years of experience in designing, engineering, manufacturing, supply, erection & commissioning, performance testing, operation, procurement and maintenance of state of the art Fired Heaters.
- 3.2) The Prospective Collaborator should have thermal & mechanical design and detailed engineering capability for Fired Heaters.

- 3.3) The Prospective Collaborator should have executed Fired Heater contracts which includes engineering, procurement (critical items like Burners as a minimum), manufacturing, fabrication, erection & commissioning and performance testing on his own.
- 3.4) In addition, the Prospective Collaborator should have executed at least one (1) contract for Fired Heaters with minimum heat duty of 20 MM Kcal/hr in last seven (7) years and such Fired Heater should have completed satisfactory operation for a minimum period of one (1) year as on the date of closing of this Eoi. (To be substantiated by an end user certificate.)
- 4) **Brief Description of Eoi Process:**

The interested Prospective Collaborators shall ensure that their response along with annexures is received by BHEL on or before **September 21, 2015**. The response shall necessarily be accompanied with details on company background, technical features/product catalogue, information on market share, reference list as per Annexure-4 and annual audited financial reports for last 3 (three) years including auditor's report.

In case any further information is needed, kindly feel free to contact us.

The respondent shall submit their offer with all annexures duly signed.

Your response may be sent to the following address:

General Manager  
Technology Licensing & Joint Ventures  
Bharat Heavy Electricals Limited  
BHEL House, Siri Fort  
New Delhi - 110049  
India  
Phone: +91 11 66337809  
Mob: +91 9871094069  
Fax: +91 11 26492974  
Email: [shakil@bhel.in](mailto:shakil@bhel.in)

Annexure-1

Indicative Scope of Technology Transfer

a)	Licensing & transfer of state of the art technology relating to the design, engineer, manufacture, assemble, quality control, test, supply, install, erect, commission, repair, operate and retrofit of the Fired Heaters
b)	Transfer of applicable computer programs including logics and source code if any
c)	Transfer of improvements/modifications/developments/up gradations carried out by the Prospective Collaborator over the duration of the technology transfer for taking care of new market requirements and obsolescence.
d)	Transfer of site feedback and troubleshooting information
e)	Training of BHEL engineers in the design, engineer, manufacture, assembly, quality control/quality assurance, testing, installation, erection, commissioning, maintenance & operation of the above Fired Heaters
f)	Deputation of Prospective Collaborator's experts to assist BHEL in absorbing the technology for licensed products
g)	Support through engineering services from Prospective Collaborator's design office / manufacturing facilities for licensed products
h)	Transfer of information to enable BHEL to source/procure those items, which the Prospective Collaborator sources from outside (as these are not manufactured by the Prospective Collaborator) for use in the Fired Heaters

(SIGNATURE)

Annexure -2

Prospective Collaborator's Experience in the field of Fired Heaters

Sl. No.	Requirement	Prospective Collaborator's response YES/NO and remarks if any
(a)	Whether the Prospective Collaborator is an Original Equipment Manufacturer (OEM) of Fired Heaters	
(b)	Whether the Prospective Collaborator has an experience of minimum 7 years in the designing, engineering, manufacturing, supply, erection & commissioning, performance testing, operation, procurement and maintenance of Fired Heaters	
(c)	Whether details of company background, product catalogues have been enclosed	
(d)	Whether information on market share has been enclosed	
(e)	Whether Prospective Collaborator's detailed reference list have been enclosed	
(f)	Whether Prospective Collaborator's annual audited financial reports for last 3 years have been enclosed	
(g)	Whether a summary of experience & reference as per Annexure-4 have been enclosed	
(h)	Whether the Fired Heaters offered for technology transfer is the latest being marketed by the Prospective Collaborator	
(i)	Whether customers (end users) letters / documentary evidence for satisfactory operation of Fired Heaters have been enclosed for meeting PQR as mentioned in clause 3 of this Eoi.	
(j)	Whether the Prospective Collaborator owns the IPRs for the technology being proposed for transfer under the Technology Collaboration Agreement (TCA) or have unencumbered right from the owner of the IPRs to sub-license the technology, if applicable.  If yes, list of such IPRs to be enclosed.	

(SIGNATURE)

Annexure -3

Additional technical features of Fired Heaters proposed for TCA

Sl. No.	Description	Prospective Collaborator's Response
1.	<p>Indicate whether Prospective Collaborator has the capability of designing following Heaters:</p> <ul style="list-style-type: none"> <li>a) Cylindrical type (Alloy Steel &amp; Stainless Steel coil metallurgy) (kindly indicate heat duty range in MM Kcal/hr)</li> <li>b) Cabin type (Alloy Steel &amp; Stainless Steel coil metallurgy) (kindly indicate heat duty range in MM Kcal/hr) <ul style="list-style-type: none"> <li>i) Horizontal type</li> <li>ii) Vertical type</li> </ul> </li> <li>c) Any other types of Fired Heaters (kindly indicate heat duty range in MM Kcal/hr)</li> </ul>	
2.	<p>Indicate whether Prospective Collaborator has the capability of designing Air Preheater (APH) system including:</p> <ul style="list-style-type: none"> <li>a) FD &amp; ID Fan sizing (indicate range of KW rating)</li> <li>b) APH (Cast Tube APH &amp; Glass Tube APH) in MM Kcal/hr (capacity / range to be given)</li> </ul>	
3.	<p>Indicate whether Prospective Collaborator has the capability of designing following Burners:</p> <ul style="list-style-type: none"> <li>a) Oil fired Burners (indicate range of Heat duty in MM Kcal/hr)</li> <li>b) Gas fired Burners (indicate range of Heat duty in MM Kcal/hr)</li> <li>c) Dual fired Burners (indicate range of Heat duty in MM Kcal/hr)</li> </ul>	
4.	<p>Indicate whether Prospective Collaborator has undertaken in-house manufacturing of above burners</p>	

(SIGNATURE)

**Annexure -4**

**Reference List:** The Prospective Collaborator shall furnish a summary of their product reference as detailed below for major supplies in last 10 years

Sl. No.	Project name / location	Type of Fired Heaters	Heat Duty (MM Kcal/hr)	Year of supply	Year of Commissioning

(SIGNATURE)