Ref. No. AA/TL/MOP/1
Date: 26.04.2021

In view of the emergency situation, EoI issue and closing dates to be noted as below	
Issue of EoI document	26.04.2021
Last date for submission of EoI response	03.05.2021

Subject: Technology Collaboration for Pressure Swing Adsorption (PSA) based Medical Oxygen Plant for onsite production of Oxygen.

1) Introduction:

This Expression of Interest (EoI) seeks response from Original Equipment Manufacturer (OEM) of Medical Oxygen Plant who are using Pressure Swing Adsorption (PSA) technique and molecular sieve (zeolite) technology to generate medical oxygen onsite directly from atmospheric air and are willing to be associated with BHEL through a license & technology collaboration agreement on long term basis to enable BHEL to manufacture and service the equipment for Medical Oxygen Plant.

BHEL is a leading state-owned company wherein Government of India is holding 63.17% of its equity. BHEL is an integrated power plant equipment manufacturer and India's largest engineering and manufacturing enterprise of its kind, catering to the core infrastructure sectors of Indian economy viz. energy, transportation, heavy engineering industry, renewable & non-conventional energy and Defence. The energy sector covers generation, transmission and distribution equipment for thermal, gas, hydro, nuclear and solar photo voltaic. BHEL has been in the business for more than 55 years and BHEL supplied power equipment account for more than 57% of the total thermal generating capacity in India. BHEL is also listed in both major stock exchanges of India. The company has 16 manufacturing units, 4 power sector regions, 8 service centers, 1 overseas office and 15 regional offices besides a host of project sites spread all over India and abroad. The annual turnover of BHEL for the year 2019-20 was around US $ 3 Billion*. BHEL's highly skilled and committed manpower of around 32500 employees, the state-of-art manufacturing facilities and practices together with the latest technologies, have helped BHEL to deliver a consistent track record of performance. To position leading state-owned company as Global Industrial giant for their exemplary performance, Government of India categorized BHEL as "Maharatna Company" in 2013, empowering the company with enhanced autonomy in decision making.

Our ongoing major technology tie-ups include agreements with Siemens, Germany (for steam turbines, generators and condensers); MHI, Japan (for Pumps); MPL, Japan (for Flue Gas Desulfurization Systems); Vogt Power International, USA (for HRSG); Indian Space Research Organization (ISRO) (for Space Grade Lithium-Ion Cells); NANO Company Ltd., Korea (for SCR Catalysts); HLB Power Company Ltd., Korea (for Gates and Dampers); Kawasaki Heavy Industries, Japan (for Stainless Steel Coaches for Metros); Valmet Automation Oy, Finland (for DCS System) and Babcock Power Environmental Inc., USA (for Selective Catalytic Reduction Systems). More details about the entire range of BHEL's products and operations can be obtained by visiting our website http://www.bhel.com.

BHEL's vision is to become a global engineering enterprise providing solutions for a better tomorrow. The company is striving to give shape to its aspirations and fulfill the expectations of the country by becoming a global player in realizing Government of India vision of "Aatma Nirbhar Bharat" through its flagship initiative of 'Make in India'.

2) Scope of Cooperation

In order to meet immediate requirement of Medical Oxygen Plants in India, BHEL is seeking responses from OEM for technology transfer and collaboration on a long term basis to manufacture and service the equipment for Medical Oxygen Plant using Pressure Swing Adsorption (PSA) technique and molecular sieve (zeolite) technology to generate medical oxygen directly from atmospheric air. The Medical Oxygen Plant

should be in the range of 300 LPM to 400 LPM generating medical grade oxygen.

BHEL intends to manufacture and service of equipment for such Medical Oxygen Plant under a long-term licensing & technology transfer agreement which could be operationalized with transfer of technology.

Interested parties/prospective collaborator meeting requirement of this EoI are invited to respond to this EoI.

Upon receipt of responses against EoI from the Prospective Collaborator, BHEL will review the responses to ascertain suitability of the offer made by the Prospective Collaborators and shortlist the parties for further discussions. Detailed discussions on commercial and other terms and conditions to finalise the Technology Collaboration Agreement (TCA) shall be held with shortlisted parties/Prospective Collaborators. The detailed terms and conditions for such a paid-up license agreement shall be mutually agreed upon.

3) Prequalification requirements (PQR)

The Prospective Collaborator (Applicant) should be an Indian OEM who has the right to license / sublicense the technology for Medical Oxygen Plant using Pressure Swing Adsorption (PSA) technique and molecular sieve (zeolite) technology to generate oxygen onsite directly from atmospheric air and shall meet the following conditions as on the last date of submission of this EoI:

3.1 Applicant should have manufactured/got manufactured, supplied, commissioned and successfully working at least three (03) numbers of PSA based Medical Oxygen Plants in last five (05) years of any capacity with a purity of oxygen generated in the range of 93% ± 3%.

AND

3.2 At least one of the above three (03) plants should have the capacity in the range of 240 LPM and above of oxygen.

Prospective Collaborator to share suitable documents to satisfaction of BHEL to substantiate the PQRs.

4) Brief Description of EoI Process:

The interested prospective collaborators shall ensure that their response, along with details requested as per the following Annexures of this EoI is received by BHEL on or before **03rd May 2021 (Monday):**

Annexure 1	Indicative Scope of TCA
Annexure-2	Collaborator's Experience in the field of Medical Oxygen Plant as specified in this EoI
Annexure-3	Indicative technical features of Medical Oxygen Plant proposed for technology tie-up
Annexure-4	Reference list

The response(s) shall necessarily be accompanied with details on the following:

1. Company background
2. Technical details & system description
3. Reference list of customers
4. Annual audited financial reports for last 3 (three) years including auditor's report

The responding prospective collaborators, on submission of their response, can be called for further discussions at a short notice.

The respondent shall submit their offer through hard copy / soft copy by e-mail with all Annexures duly signed. In case any further information is needed, kindly feel free to contact us. In case any amendment/ corrigendum issued to this EoI, it shall be notified only at www.bhel.com.

5) Schedule of EoI & contact details:

5.1 Schedule of EoI:

The schedule of EoI shall be as follows:

Sl. No.	Description	Date
1.	Issue of EoI document	26.04.2021
2.	Last date for submission of EoI response	03.05.2021

5.2 Contact Details:

The respondent shall submit their response with all annexures duly signed to the following official:

Deputy General Manager (Technology Licensing)
Corporate Technology Management
Bharat Heavy Electricals Limited
BHEL House, Siri Fort
New Delhi – 110049, India
Phone: +91 11 66337213 / 7339 /7458
Mobile: +91 7838293011 / 9390852645 / 9818103430
Fax: +91 11 26492974
Email: techeoi@bhel.in

6) Miscellaneous:

6.1. Right to accept or reject any or all Applications:

a) Notwithstanding anything contained in this EoI, BHEL reserves the right to accept or reject any Application and to annul the EoI Process and reject all Applications, at any time without any liability or any obligation for such acceptance, rejection or annulment, and without assigning any reasons therefore. In the event that BHEL rejects or annuls all the Applications, it may, at its discretion, invite all eligible OEMs/Suppliers to submit fresh Applications.

b) BHEL reserves the right to disqualify any Applicant during or after completion of EoI process, if it is found there was a material misrepresentation by any such Applicant or the Applicant fails to provide, within the specified time, supplemental information sought by BHEL.

c) BHEL reserves the right to verify all statements, information and documents submitted by the Applicant in response to the EoI. Any such verification or lack of such verification by BHEL shall not relieve the Applicant of his obligations or liabilities hereunder nor will it affect any rights of BHEL.

6.2 Governing Laws & Jurisdiction:

The EoI process shall be governed by and construed in accordance with, the laws of India and the Courts at New Delhi (India) shall have exclusive jurisdiction over all disputes arising under, pursuant to and/ or in connection with the EoI process.

Annexure-1

Indicative Scope of Technology Transfer

(a)	Licensing & transfer of state of the art technology relating to the manufacturing (including detailed drawing) and servicing of equipment for Medical Oxygen Plant as specified in this EoI.
(b)	Assistance in planning & establishing the new manufacturing facility & processes/ suitable augmentation at BHEL's existing facilities/processes by way of expert advice in terms of identifying, sizing & selection of equipment / machinery required for manufacturing, their layout and foundation etc. Assistance for commissioning of the manufacturing facilities, design of special tools and dies, jigs & fixtures etc.
(c)	Transfer of applicable computer programs including Logics & Source Code (wherever applicable).
(d)	Transfer of improvements/modifications/developments/up gradations to be carried out by the Applicant during the period of TCA for taking care of new market requirements and obsolescence. Subsequent updates required due to component obsolescence or updates implemented by Applicant due to safety consideration would also be provided.
(e)	During the commissioning and regular operation, if any modifications/updates are carried out to improve the performance/reliability of the system the same shall also be transferred to BHEL with complete know-how.
(f)	Training of BHEL engineers in the field of manufacturing and servicing of equipment for Medical Oxygen Plant as specified in this EoI.
(g)	Deputation of Collaborator's experts to assist BHEL in absorbing the technology for Medical Oxygen Plant as specified in this EoI.
(h)	Support through engineering services from Collaborator's design office / manufacturing facilities for Medical Oxygen Plant as specified in this EoI.
(i)	Transfer of information to enable BHEL to source/procure those items, which Prospective Collaborator sources from other vendors (as these are not manufactured by the prospective Collaborator) for use in Medical Oxygen Plant as specified in this EoI.

(SIGNATURE)

Annexure -2

Collaborator's Experience in the field of Medical Oxygen Plant as specified in this EoI

Sl. No.	Requirement	Prospective Collaborator response YES/NO and remarks if any
(a)	Whether the Prospective Collaborator is an Indian OEM of Medical Oxygen Plant	
(b)	Whether the Prospective Collaborator has the right to license / sublicense the technology for Medical Oxygen Plant using Pressure Swing Adsorption (PSA) technique and molecular sieve (zeolite) technology to generate medical oxygen onsite directly from atmospheric air	
(c)	Whether documentary evidence to substantiate the below PQRs has been submitted by Prospective Collaborator. Applicant should have manufactured/got manufactured, supplied, commissioned and successfully working at least three (03) numbers of PSA based Medical Oxygen Plants in last five (05) years of any capacity with a purity of oxygen generated in the range of 93% ± 3%.	
	At least one (01) number of PSA based Medical Oxygen Plant should have the capacity in the range of 240 LPM and above of oxygen.	
(d)	Whether Prospective Collaborator confirms its willingness to facilitate BHEL in establishing required manufacturing facilities for Medical Oxygen Plant as specified in this EoI.	
(e)	Whether the Prospective Collaborator (Applicant) has been blacklisted / banned business dealings by any Ministry or any Department of Government India.	
(f)	Whether any of the Prospective Collaborator's previous contract was terminated or part terminated due to bidder's failure.	
(g)	Whether the Prospective Collaborator suffered bankruptcy / insolvency in the last ten (10) years.	
(h)	Whether details of company background, product catalogues have been enclosed.	
(i)	Whether information on market share has been enclosed.	
(j)	Whether copy of Prospective Collaborator's detailed reference list has been enclosed.	
(k)	Whether copy of Prospective Collaborator's annual audited financial reports for last three (03) years has been enclosed.	
(l)	Whether a summary of experience & references have been enclosed.	
(m)	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.	

Sl. No.	Requirement	Prospective Collaborator response YES/NO and remarks if any
(n)	Whether the Prospective Collaborator confirms the Transfer of essential technology to BHEL to enable BHEL to manufacture and service the equipment for Medical Oxygen Plant as specified in this EoI.	

(SIGNATURE)

Annexure-3

Indicative technical features of Medical Oxygen Plant proposed for technology tie-up

Product Oxygen Concentration	93±3 %
Outlet Pressure	4 - 5.5 bar 'g'
Capacity	300 LPM to 400 LPM
Oil Content	≤ 0.1 ppm
Dew Point	< -50 ˚C
Carbon Dioxide Conc.	≤ 300 ml/m3
Carbon Monoxide Conc	≤ 5 ml/m3
Noise Level	69 db

Note:

1. Oxygen Compressor to charge oxygen cylinders of 47 Litre water capacity at the rate of 20 cylinders per 8 hours.
2. Compliance with European/Indian Pharmacopeia and ISO 10083:2006(E)
3. Stored oxygen supply for transient power failures
4. Low Energy consumption
5. Frame Built, Skid Mounted design
6. High Quality Touch screen control unit and remote control access

(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**.**

S. No.	Customer	Capacity and Year of Supply	Application/ Purpose	Operational Hours (in Hrs.)	Performance Details	Remarks, if any

(SIGNATURE)