BHARAT HEAVY ELECTRICALS LIMITED
(A Government of India undertaking)

High Pressure Boiler Plant (HPBP),

TRICHY – 620 014, INDIA

NOTICE INVITING GLOBAL EXPRESSION OF INTEREST (EOI) FOR EMPANELMENT OF OEMs OR CONSULTANTS OR ENGINEERING SERVICE PROVIDERS FOR DESIGN AND ENGINEERING SERVICES OF METHANOL FIRING SYSTEM IN OIL/GAS FIRED BOILERS.

LETTER OF INVITATION

High Pressure Boiler Plant (HPBP), Bharat Heavy Electricals Limited (BHEL), Tiruchirappalli (India), invites EOI proposals from prospective OEMs or consultants or engineering service providers to be empaneled with BHEL for design and engineering services of Methanol firing system in oil/gas fired boilers.

i. The EOI includes the following documents:

Section 1 - Disclaimer

Section 2 - Schedule of EOI process

Section 3 –Details of EOI

Section 4 – Pre-Qualification Criteria

Section 5 – Broad Technical Specifications and Scope of Work

Section 6 – Details of documents to be submitted along with proposal

Section 7– BHEL's Supplier Evaluation Approval & Review procedure (SEARP) guidelines- 2016.

Section 8- Annexures

ii. Agencies interested in above EOI, may raise Pre-bid queries, if any, **on or before 27.03.2019.**

iii. Interested agencies shall submit their proposal along with covering letter and all supporting documents/ information as per **Section-6** in soft copies addressed to Email IDs indicated in the contact details (Section-2: B) on or before last date of Submission.

Sd/-

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SECTION-1

DISCLAIMER

1. The information contained in this Expression of Interest (EOI) document provided to the Applicants(s), by or on behalf of Bharat Heavy Electricals Limited (BHEL) or any of its employees or advisors, is provided to the Applicants (s) on the terms and conditions set out in this EOI document and all other terms and conditions subject to which such information is provided.
2. The purpose of this EOI document is to provide the Applicants (s) with information to assist the formulation of their Proposals. This EOI document does not purport to contain all the information each Applicants may require. This EOI document may not be appropriate for all persons, and it is not possible for BHEL, its employees or advisors to consider the business/investment objectives, financial situation and particular needs of each Applicant who reads or uses this EOI document. Each Applicant should conduct his own investigations and analysis and should check the accuracy, reliability and completeness of the information in this EOI document and where necessary obtain independent advice from appropriate sources.
3. BHEL, its employees and advisors make no representation or warranty and shall incur no liability under any law, statute, rules or regulations as to the accuracy, reliability or completeness of the EOI document.
4. BHEL may, in its absolute discretion, but without being under any obligation to do so, modify, amend or supplement the information in this EOI document.
5. An applicant means a Business Entity or Proprietor firm who has sufficient experience in accordance with the Conditions of Eligibility as detailed in EOI is permissible.
6. The issue of this EOI does not imply that BHEL is bound to select and shortlist Applicants to enter into tie-up agreements with shortlisted Applicants.
7. The respondent shall bear all costs associated with the preparation, technical discussion/presentation and submission of EOI, BHEL shall in no case be responsible or liable for these costs regardless of the conduct or outcome of the EOI process.
8. Canvassing in any form by the respondent or by any other agency on their behalf may lead to disqualification of their EOI.
9. 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.

SECTION-2

SCHEDULE OF EOI PROCESS & CONTACT DETAILS

A. SCHEDULE OF EOI PROCESS

The schedule of events during the Bidding Process shall be as follows -

Sl.No.	Event Description	Date
1	**Issue of EOI document**	**20.03.2019.**
2	**Date of raising Pre-bid queries on EOI specification**	**27.03.2019.**
3	**Date of Submission of Proposal**	**19.04.2019.**

B. CONTACT DETAILS:

All the correspondences and Proposal for Expression of Interest shall be addressed to the following**:**

To: **By MM**	**Copy to:** **By MM**

SECTION – 3

DETAILS OF EXPRESSION OF INTREST (EOI)

3.1 ABOUT BHEL

Bharat Heavy Electricals Limited (BHEL) **(**www.bhel.com**)** is a Government of India Undertaking and a Maharatna Company, Established in 1964. BHEL is an integrated power plant equipment manufacturer and one of the largest Engineering and Manufacturing Company of its kind in India. The company is engaged in the Design, Engineering, Manufacturing, Construction, Testing, Commissioning and servicing of a wide range of products and services for core sectors of the economy, viz. Power, Transmission, Industry, Transportation (Railways), Renewable Energy, Oil & Gas, Water and Defence with over 180 products offerings to meet the needs of these sectors. BHEL has been the bedrock of India's Heavy Electrical Equipment industry.

BHEL has a widespread network of 17 Manufacturing Divisions, 2 Repair Units, 4 Regional Offices, 8 Service Centres, 6 Overseas Offices, 6 Joint Ventures, 15 Regional Marketing Centres and current project execution at more than 150 project sites across India and abroad corroborates the humungous scale and size of its operations.

Adding to its achievements, BHEL has joined the elite club of select global giants having an installed base of over 170 GW of power generating equipment globally. BHEL also has a widespread overseas footprint in 78 countries with cumulative overseas installed capacity of BHEL manufactured power plants nearing 10,000 MW.

BHEL has technology tie-ups with leading companies in the world including General Electric Company, Siemens AG and Mitsubishi Heavy Industries Ltd., supported by technology developments in its own R&D centres. The quality & reliability of BHEL products at par with other Global players and adheres to international standards.

3.2 High Pressure Boiler Plant (HPBP), Tiruchirappalli

High Pressure Boiler Plant (HPBP), established in 1965 at southern part of India at Tiruchirappalli in Tamilnadu state is one of the major manufacturing units of BHEL dedicated to production of various kinds of Steam Generators. HPBP has established itself as leading reliable boiler manufacturer with worldwide references in numerous overseas territories including Europe, Middle-East, CIS countries and South-East Asia. HPBP not only manufactures pulverized coal fired boilers but also manufactures CFBC boliers, HRSGs, valves, oil field equipment and many other products of strategic importance for defence sector. HPBP has strong global reference base of various kind of boilers ranging from 30 MWe to 800 MWe. Valves division of HPBP manufactures around 100,000 valves a year.

3.3 OBJECTIVE OF EOI :

The objective of this EOI is to shortlist "OEMs or consultants or engineering service providers" and empanel them for future requirements in order to avail their Engineering services for Design and Engineering services of methanol firing system in oil/gas fired boilers. The scope of work and services of the OEMs or consultants or engineering service providers has been broadly defined in **Section-5**.

3.4 PROCESS OF EMPANELLING AND AVAILING SERVICES:

i. Prospective "OEMs or consultants or engineering service providers", who are meeting the Pre-Qualification Criteria (PQC) as per **Section- 4** shall submit their proposal for EOI **in English**.

ii. Evaluation shall be carried out as per BHEL "Supplier Evaluation Approval & Review Procedure (SEARP) guidelines- 2016 (Refer Section-7 for details).This document is also available on BHEL website under link: **http://www.bhel.com/**vender_registration/vender.php.

iii. Prospective "OEMs or consultants or engineering service providers" shall furnish all the filled in formats/ information/ documents/ credentials etc as per **Section-6.**

All the documents shall be submitted in English Language only. If, the *reference documents are in any other language*, the English translated copy of the same, duly certified, stamped and signed by local chamber of commerce of bidder's country shall be furnished along with the copy of original document.

iv. In case separate proposals are received from different Divisions of the same Organisation, BHEL reserves the right to consider proposal of any one of these Divisions for empanelment. BHEL decision on this shall be final.

v. BHEL shall intimate the shortlisted "OEMs or consultants or engineering service providers" for further discussions, presentations, etc. on their proposals. BHEL at their discretion shall inspect the OEMs or consultants or engineering service providers works/offices/project premises for the purpose of evaluation, as deemed necessary, before empanelment. BHEL decision on this shall be final.

vi. The selected agencies will be empaneled with BHEL as an "OEMs or consultants or engineering service providers" for availing their Engineering Services for "Design and Engineering of Methanol handling and Storage" including proposal engineering during bidding stage and detailed engineering during project execution stage.

vii. Subsequent to empanelment, whenever required, BHEL shall float a formal purchase enquiry along with the Tender/ Project specific requirements/scope of work/ purchase terms & conditions etc. The OEMs or consultants or engineering service providers will be finalised as per BHEL's procurement policies and Purchase Order will be placed accordingly.

viii. The performance of the empaneled OEMs or consultants or engineering service providers shall be evaluated periodically as per BHEL SEARP guidelines. Retention/Delisting of these agencies shall be at the discretion of BHEL based on performance feedback criteria.

ix. This Expression of Interest (EOI) is not an agreement and is not an offer or invitation to enter into an agreement/ tie-up/MOU of any kind with any party by BHEL.

3.5 Brief Description of EoI Process:

The interested prospective OEMs or consultants or engineering service providers shall ensure that their response along with Annexures (Broad technical capabilities of OEMs or consultants or engineering service providers as per Annexure-2, Experience in the field of methanol firing system as per Annexure-3 and detailed product reference for major supplies in last 5 years as per Annexure-4) are received by BHEL on or before **19 April 2019.** The response shall necessarily be accompanied with details on company background, product profile, methanol firing system proposed along with its technical details, reference list of Customers, performance certificates from customers, product data sheet and annual audited financial reports for last 3 (three) years including auditor's report.

SECTION– 4

PRE-QUALIFICATION CRITERIA

The Agency desiring for empanelment should meet all the Pre-Qualification Criteria mentioned below:

A) The OEMs or consultants or engineering service providers must be a **registered firm or a company** having Engineering Establishments to carry out Design and Engineering services of methanol firing system in oil/gas fired boilers and shall meet the following qualification requirements as on the date of submission of EoI:.

a. Prospective OEMs or consultants or engineering service providers should have at least three (3) years of experience in designing, engineering, supply, supervision of erection commissioning and performance testing of state-of-the-art Methanol firing system in oil/gas fired boilers. (To be substantiated by reference or any other relevant documentary evidence)

AND

b. Prospective OEMs or consultants or engineering service providers should have designed, engineered, manufactured/got manufactured/supplied, erected/supervised erection and commissioned/supervised commissioning of methanol firing system in oil/gas fired boilers with minimum 50 t/hr steaming capacity. Further, such methanol firing system should have been in successful continuous operation for a period not less than one (1) year as on the date of closing of this EoI. (To be substantiated with a performance certificate from the end client/customer as documentary proof)

B) The Consultant should have adequate and suitable manpower capable of carrying out all the engineering activities detailed in above clause-A, At least one (1) experienced process design expert specializing in Design and Engineering services of methanol firing system in oil/gas fired boilers projects should be on the rolls of company. [The expert should have carried out the design aspects as per clause A above for atleast one project]

C) The Design Office of the OEMs or consultants or engineering service providers should be adequately equipped with hardware like Computers, Printers/Plotters, and design software like AUTOCAD, as a minimum.

D) Design & engineering of firing system shall include all the Indian statutory codes /regulation especially applicable for India for all system for firing methanol if existing / new boiler.

SECTION– 5

BROAD TECHNICAL SPECIFICATION AND SCOPE OF WORK

5.1 INTRODUCTION:

HPBP-BHEL intends to carry out Proposal Engineering and Detail engineering for design and engineering services of methanol firing system in oil/gas fired boilers by utilizing the services of an "OEMs or consultants or engineering service providers" during bidding and contract execution stages respectively. The scope of services of the "OEMs or consultants or engineering service providers" is broadly specified below. However, job specific detailed scope of work shall be furnished along with formal purchase enquiry on project-to-project basis.

5.2 INFORMATION ABOUT EXISTING OIL/GAS FIRED BOILERS SUPPLIED BY BHEL:

BHEL has supplied boilers with the following firing system configurations in its existing installations wherein it is proposed to modify/retrofit the existing system and/or install a new system for methanol firing in place of following current systems:

1. Tangential firing of oil or gas or oil and gas
2. Front wall firing of oil or gas or oil and gas using SV (Spinner vane)/ R (Round) / Low NOx burners

Generally used oils in the above existing installations are Light Diesel Oil, High Speed Diesel, Heavy Fuel Oils and Refinery oils. Generally used gases in the above existing installations are Natural gas, Refinery gas and other fuel gases.

Typical data on the fuel being used in currently supplied boilers (for selection of methanol firing system) is provided in **Annexure – 1** for ready reference.

5.3 OEMS OR CONSULTANTS OR ENGINEERING SERVICE PROVIDERS 's SCOPE OF WORK:

The roles, responsibilities and scope of work of the "OEMs or consultants or engineering service providers " shall include following:

A) Scope of Work During Proposal Stage (Phase-I)

For new upcoming/retrofit projects

i. Carry out the detailed process design, within terminal point stipulated, including process design calculations, sizing of various equipment and systems, finalising process flow diagrams, detailed P&IDs/Process Schematics, control and operation write-ups, process and electrical utility requirements, chemicals consumption requirements, O&M consumable requirements, etc.

ii. Detailed study of Customer/Purchaser's tender documents. Preparation of Pre-Bid Queries/Questionare for seeking clarifications from the Customer/Purchaser on tender documents.

iii. Carryout feasibility study for upgradation to Methanol firing.

iv. Conceptual, basic, detailed engineering (including procurement specification for bought-out items) and supervisory services for erection and commissioning of complete Methanol firing system in existing oil/gas fired boilers with both corner and wall firing systems.

For existing gas fired boilers:
The scope shall include design and engineering of firing system equipped with only gas firing boiler and its integration with boiler

For existing oil or oil and gas fired boilers:
The scope shall include design and engineering of modification requirements in firing system equipped with oil firing or oil/gas firing, and its integration with boiler

The scope of services shall include conceptual, basic engineering (including procurement specification for bought-out items) and supervisory services for erection and commissioning of the following systems but not limited to these:

- Burners
- Igniters
- Atomization system
- Flame detectors including cooling system
- Methanol skids
- Control system modification / upgradation including burner management system associated control logics & auto-control loops
- Instrumentation
- Methanol flow measurement and associated control valves
- Fire detection system and fire extinguishing system
- Pipes to the skid from terminal point
- Pipes, valves and associated accessories
- Methanol main trip valve
- Methanol burner trip valves
- Combustion air / Damper control system
- Associated safety equipment (if applicable)
- Flue gas analyser (if required)
- Methanol Leak detection System (if required)
- Implications on boiler performance and auxiliary equipment due to methanol firing
- Layout of burner skid assembly along with its routing

Terminal point:
The terminal point of execution of the above scope shall be complete methanol firing system between the boiler front and burners

v. Preparation of comprehensive consolidated Technical Offer inclusive of Scope of Supply & Services/Terminal Points/Exclusions, Technical Deviations & Clarifications on tender specifications, Filled-up Technical Schedules etc

vi. Provide broad specifications/ technical data sheets of applicable equipment / systems etc. and identify suitable/probable sub-vendors/agencies for obtaining the budgetary quotations during proposal stage.

vii. Provide support for obtaining and evaluating the budgetary quotes from probable sub-vendors.

viii. Provide support in working out the cost/price estimates for the project including back-up cost working sheets.

ix. Support in finalising the requirements of O&M consumables & chemicals along with the BOM and technical specifications.

x. Study of existing system and modification of Mechanical, Electrical, C&I and DCS components for methanol firing

xi. Support during proposal stage activities for technical closure and acceptance of the bid including providing technical clarifications to Customer/Purchaser's queries, participation in pre-bid/ post bid-meetings as required.

Detailed requirements of such visits/ no. of days etc shall be indicated in project specific Purchase Enquiry.

B) Scope of Work During Detail Engineering Stage (Phase-II)

For new upcoming projects:

i. Carry out the detailed process design, within terminal point stipulated, including process design calculations, sizing of various equipment and systems, finalising process flow diagrams, detailed P&IDs/Process Schematics, control and operation write-ups, process and electrical utility requirements, chemicals consumption requirements, O&M consumable requirements, etc.

ii. Detailed engineering of systems / components indicated in Section 5, Clause 5.2 (A) (iv).

iii. Preparation of layouts.

iv. Detailed Engineering of Fire Protection system if any.

v. Detailed Engineering of Identification of operational hazards and its mitigation, Other safety aspects as applicable.

vi. Basic engineering inputs required for carrying out detailed Electrical and C&I engineering.

vii. Procurement engineering including identifying all the bought outs, identifying probable suppliers in the market, preparation of suitable technical specifications for RFQs, evaluation of technical offers from the vendors in all sub-systems (Electrical/Mechanical/C&I etc.,).

viii. Provide engineering support in getting the engineering documentation approved by Customer/Purchaser or their Consultant, including participating in technical discussions with Customer/Purchaser/Consultant as required.

ix. Assisting BHEL in review and approvals of engineering/technical documentation of Sub-vendors/Suppliers.

x. Support in finalising the BOM including erection estimate , Mandatory Spares and Recommended Spares.

xi. Support in finalising the requirements of O&M consumables & chemicals along with the BOM and technical specifications.

xii. Preparation of Plant Operations and Maintenance Manuals, Plant operation procedures for effective and efficient operation of plant.

xiii. Provide support in Erection Supervision.

xiv. Visit of Engineering Consult's design experts to project site for resolving engineering and technical issues, as required during execution of the project.

<u>For existing plants which are already firing oil/gas fuels:</u>

xv. Feasibility study for upgradation to Methanol fuel

xvi. Design and detailed engineering the activities as per sl. No. (i) to (xiv) for upgrading to Methanol

Attention:

The language of communication with the "OEMs or consultants or engineering service providers" shall be English only. All the documents including the design/engineering documents shall be in English Language.

SECTION– 6

DOCUMENTS TO BE SUBMITTED ALONG WITH PROPOSAL

A. LIST OF DOCUMENTS TO BE SUBMITTED ALONG WITH PROPOSAL:

Prospective OEMs or consultants or engineering service providers should submit following documents along with their Proposal.

Sl No	Document Description	Filled in Formats to be Submitted with Proposal	Remarks
1.	Check List for Contractor/Consultant Registration Form	Annexure-VI of SEARP, Page II of II	
2.	Company Profile & Organizational Information	Annexure-VI of SEARP, Section-1: Page 1 to 6 of 10, (*except for Clause no-4, Man power details)*	
3	Resources owned by the company	Annexure-VI of SEARP, Section-1: Page 7 to 9 of 10	
4	Overall Work Experience	Annexure-VI of SEARP, Section-1: Page 10 of 10	
5	Check List for Pre-Qualification Criteria (PQC)	Format : S-1	
6	Details of Reference Projects with Methanol handling satisfying PQC	Format : S-2	
8	Details of other Projects of similar nature, executed by OEMs or consultants or engineering service providers.	Format : S-3	
8	Manpower details	Format : S-4	
9	Details of Process Design Experts specializing in Methanol projects	Format : S-5	
10	List of Office Infrastructure	Format : S-6	
11	List of clarification	Format : S-7	
12	Acceptance of EOI specification	Signed and stamped copy of EOI Specification No PEMC-07399	

Prospective consultants shall refer to "Guidelines to Contractors filling up the Registration Form", Annexure-VI, document no: AA: MM: SR: 01, Rev 01, Page I of II (Section-7), before filling the various format.

FORMAT: S-1

CHECK LIST FOR PRE-QUALIFICATION CRITERIA (PQC)

Sl no.	PQC Criteria	Bidders Response (Yes / No)	Supporting Document(s) Required (Only if Bidder response is-Yes)
A	The OEMs or consultants or engineering service providers must be a **registered firm or a company** having Engineering Establishments to carry out design and engineering services of methanol firing system in oil/gas fired boilers		Firm Registration Certificate to be enclosed
B	In last 3 (Three) years, the OEMs or consultants or engineering service providers , should have successfully carried out Design and Engineering of the following type of methanol firing system in oil/gas fired boilers		If yes, furnish the following details a) Filled in Format: S-2 andS-3, and b) Supporting documents for each Project reference, as per Clause no- 3 (1) and (2) of **Section-7** (Guidelines to Contractors filling up the Registration Form).
	a. Prospective OEMs or consultants or engineering service providers should have at least three (3) years of experience in designing, engineering, supply, supervision of erection commissioning and performance testing of state-of-the-art Methanol firing system in oil/gas fired boilers. (To be substantiated by reference or any other relevant documentary evidence)		
	And b. Prospective OEMs or consultants or engineering service providers should have designed, engineered, manufactured/got manufactured/supplied, erected/supervised erection & commissioned/supervised commissioning of methanol firing system in oil/gas fired boilers with minimum 50 t/hr steaming capacity. Further, such methanol firing system should have been in successful continuous operation for a period not less than one (1) year as on the date of closing of this EoI. (To be substantiated with a performance certificate from the end client/customer as documentary proof)		

Sl no.	PQC Criteria	Bidders Response (Yes / No)	Supporting Document(s) Required (Only if Bidder response is-Yes)
C	In last 3 (Three) years, the OEMs or consultants or engineering service providers should have completed the following Engineering activities as a minimum:		Work order/ Purchase order and Work completion certificate issued by customer(s).
	• Detailed Engineering of methanol firing system in oil/gas fired boilers as applicable including development of PFDs/Schemes/P&ID`s, process design calculations. • Detailed Engineering of Layouts. • Detailed Engineering of Fire Protection system for methanol firing system in oil/gas fired boilers facilities • Identification of operational hazards and its mitigation, Other safety aspects as applicable. • Obtaining of required approvals from statutory and regulatory bodies • Procurement Engineering including preparation of Purchase Specifications of major equipment/systems of the plants. • Engineering of basic inputs for Civil, Electrical and Control & Instrumentation Engg.		PFDs/Schemes/P&ID`s prepared by Consultant and approved by Customer indicating similar scope. Document No:……/……./……. Customer Order copy and Customer completion Certificate for similar Proposal engineering scope. Document No.:…… & …..…….
	Procurement Engineering including preparation of Purchase Specifications of major equipment/systems of the plants.		Order copy/ Engineering scope Documents approved / agreed with Customer, indicating similar scope in methanol projects. Document No:…….
4	The OEMs or consultants or engineering service providers should have adequate and suitable manpower capable of carrying out all the engineering activities detailed in above Clause-C, simultaneously for two (2) Tender-Proposals and one (1) contract-stage project. At least one (1) experienced process design expert specializing in methanol firing system in oil/gas fired boilers projects should be on the rolls of company.		Resume of at least one (1) methanol Process Design Experts specializing in methanol firing system in oil/gas fired boilers design. (Details to be provided as per Format: S-3)

5	The Design Office of the OEMs or consultants or engineering service providers should be adequately equipped with hardware like Computers, Printers/Plotters, and design software like AUTOCAD, as a minimum.		Details to be provided as per Format : S-5

Signature & Stamp of Authorized Signatory

FORMAT: S-2

DETAILS OF REFERENCE PROJECTS

OEMs or consultants or engineering service providers shall submit documents as per "SEARP guidelines Annexure-IV, Clause No:3 of Page I of II in support of each work experience in following format.

Sl.No	**Project details**	**Project-1**	**Project-2**	**Project-3**
1	Name of the Project			
2	End Customer details (Name of the Organisation, Contact person, phone no, email ID)			
3	Details of EPC bidder/ Contractor who has ordered the Engineering Work. (Contact information like Name of the Organisation, Contact person, phone no, email ID etc to be provided)			
4	Capacity of the boiler			
5	Date of start of Engineering			
6	Date of completion of Engineering			
7	Date of commencement of operation of the plant			
8	Brief scope of Engineering Work			
9	Value of Engineering services in INR/ USD .			
10	Documents submitted in support of above work experience. (Refer: SEARP guidelines Annexure-IV, Clause No:3 of Page I of II)			

Signature & Stamp of Authorized Signatory

FORMAT: S-3

DETAILS OF OTHER PROJECTS OF SIMILAR NATURE, EXECUTED BY OEMS OR CONSULTANTS OR ENGINEERING SERVICE PROVIDERS.

OEMs or consultants or engineering service providers shall furnish the information in following format.

Sl.No	**Project details**	**Project-1**	**Project-2**	**Project-3**
1	Name of the Project			
2	End Customer details (Name of the Organisation, Contact person, phone no, email ID)			
3	Details of EPC bidder/ Contractor who has ordered the Engineering Work. (Contact information like Name of the Organisation, Contact person, phone no, email ID etc to be provided)			
4	Capacity of the boiler			
5	Date of start of Engineering			
6	Date of completion of Engineering			
7	Date of commencement of operation of the plant			
8	Brief scope of Engineering Work			
9	Value of Engineering services in INR/ USD .			
10	Documents submitted in support of above work experience. (Refer: SEARP guidelines Annexure-VI, Clause No:3 of Page I of II)			

Signature & Stamp of Authorized Signatory

FORMAT: S-4

MANPOWER DETAILS

A) DETAILS OF ORGANIZATION

1	Organization Total manpower Strength (In number).	
2	Organization Chart submitted	Yes/ No

B) DEATILS OF MANPOWER

Sl no	**Category**	**No of Persons**	**Educational qualification**	**Relevant Experience (In years)**	**Remarks**
1	Process Engineering				
2	Civil Engineering				
3	Electrical Engineering				
4	Controls and Instrumentation Engineering				
5	Draftsman/ Designers				
6	Supporting Staff (Finance, Human Resources, office staff etc)				

FORMAT: S-5

DETAILS OF PROCESS DESIGN EXPERTS SPECIALIZING IN DESIGN AND ENGINEERING SERVICES OF METHANOL FIRING SYSTEM IN OIL/GAS FIRED BOILERS

OEMs or consultants or engineering service providers shall submit Resume of at least one (1) Process Design Experts specializing in Methanol handling & storage process design with following information, as a minimum.

OEMs or consultants or engineering service providers should attach Separate document with their EOI Proposal indicating complete details.

i. Personal Details (Name, Age, Nationality etc)

ii. Educational Qualifications with specialization

iii. Total experience in Process design and engineering services of methanol firing system in oil/gas fired boilers (in years).

iv. Details of Company/organization served with Designation, Roles & Responsibilities, Period of service etc in each organization.

v. Details of overall Projects experience (Customer Name, plant Capacity, role in the project etc)

vi. Date of Appointment in Present Company with Designation, Roles & Responsibilities,

vii. Details of Special achievements/ awards/ recognitions/ Patents etc.

Signature & Stamp of Authorized Signatory

FORMAT: S-6

DETAILS OF OFFICE INFRASTRUCTURE

Sl.No.	Description of Items	Quantity (Nos)	Remarks
1	Computers/ Workstations		
2	Printers		
3	Internet & E-Mail facility		
4	Details of available software		
	a) AUTOCAD		
	b) Any other special Software: (Provide Details: Application & Purpose of the software, Manufactures name, Version , date of procurement, Licence no. etc)		

Signature & Stamp of Authorized Signatory

FORMAT-S-7

LIST OF CLARIFICATIONS

Sl.No.	Reference clause of EOI Document	Clarification by OEMs or consultants or engineering service providers	Response by BHEL
1			
2			

Signature & Stamp of Authorized Signatory

SECTION– 7

Supplier Evaluation Approval & Review procedure (SEARP) guidelines- 2016, Document no AA: SSP:SR:01, Rev 02 is enclosed for reference.

SECTION– 8

ANNEXURES

Annexure -1

TYPICAL FUEL ANALYSIS CURRENTLY BEING USED IN EXISTING BOILERS

HEAVY FUEL OIL (As per IS 1593-1971 Heavy Grade)

Sl.No.	Characteristics	Unit	Heavy Fuel Oil (HFO) as per IS 1593-1971 Heavy Grade
1.	Viscosity	CS	370 max. at 50°C
2.	Flash point (Min) (Pensky Martins closed)	Deg.C	66
3.	Pour Points	Deg.C	-
4.	Gross calorific value	kcal/kg	10,000
5.	Ash content by weight (Max)	%	0.1
6.	Total sulphur content by weight (Max.)	%	4.5
7.	Sediment by weight (Max)	%	0.25
8.	Water content by volume (Max)	%	1.0
9.	Acidity (inorganic)		Nil
10.	Carbon Residue (Ransbottom) (by weight) maximum	%	-

HIGH SPEED DIESEL OIL CHARACTERISTICS

[As per IS 1460-2005 (BS-II)]

Sr. No.	Description	Unit	Value
1	PHYSICAL PROPERTIES		
	a. Distillation volume recovery @ 350 ^{0}C	% vol. (min)	85
	b. Distillation volume recovery @ 370 ^{0}C	% vol. (min)	95
	c. Kinematic Viscosity @ 40 ^{0}C	cSt	2.0 – 5.0
	d. Density @ 15 ^{0}C	kg/m^3	820 – 860
	e. Pour Point		
	- Summer	^{0}C (max)	15
	- Winter	^{0}C (max)	03
	f. Cold Filter Plugging Point		
	- Summer	^{0}C (max)	18
	- Winter	^{0}C (max)	06
	g. Flash Point (Abal)	^{0}C (max)	35
	h. Lubricity WSD 1.4 @ 60 ^{0}C	Microns (max)	460
2	HEATING VALUE		
	a. Higher Heating Value (HHV)	Kcal/Kg	11000
	b. Lower Heating Value (LHV)	Kcal/Kg	10300
3	ACIDITY		
	a. Inorganic	mg KOH/g	Nil
	b. Total	mg KOH/g	0.2 (max.)
4	Copper Strip Corrosion 3 hours @100^{0}C	No.	1 (max)
5	RCR on 10% residue	% wt.	0.3 (max)
6	CONTAMINANTS		
	a. Ash	ppm (wt.)	100 (max)
	b. Sediments	% wt	0.05 (max)
	c. Total Sulphur	% wt	0.05 (max)
	d. Water Content	% volume	0.05 (max)
	e. Trace Metals		
	- Na + K	ppm (wt)	0.30 (max)
	- Vanadium	ppm (wt)	0.50 (max)
	- Lead	ppm (wt)	0.50 (max)
	- Calcium	ppm (wt)	2.0
	- Ni + Zn	ppm (wt.)	Nil
7	Nitrogen content (FBN)	% wt.	0.015

LIGHT DIESEL OIL (LDO) CHARACTERISTICS

(As per IS 15770-2008)

Sr. No.	Description	Unit	Value
1	Pour Point (max)	°C	21 °C & 12°C for Summer and Winter respectively
2	Kinematic viscosity at 40 °C	cSt	2.5 to 15.0
3	Sediment percent by mass (max)	% wt.	0.10
4	Total sulphur percent by mass (max)	% wt.	1.5
5	Ash percentage by mass (max)	% wt.	0.02
6	Carbon residue (Rams bottom) percent by mass (max.)	% wt	1.50
7	Acidity inorganic		Nil
8	Flash point (Min.) - Pensky Martens	°C	66
9	Copper strip corrosion for 3 hours at 100°C		Not worse than no:2
10	Water content (max)	% vol.	0.25
11	GCV	kcal/kg	10000

REFINERY GAS

Sr. No.	Description	Unit	Value
1	Hydrogen H_2	Mol %	16.95
2	Carbon monoxide CO	Mol %	0.14
3	Methane CH_4	Mol %	76.79
4	Ethane C_2H_6	Mol %	2.61
5	Propane C_3H_8	Mol %	0.95
6	n – Butane C_4H_{10}	Mol %	0.44
7	Iso – Butane C_4H_{10}	Mol %	0.17
8	N - Pentane C_5H_{12}	Mol %	0.23
9	Ethylene C_2H_4	Mol %	0.10
10	Nitrogen N_2	Mol %	0.65
11	Carbon dioxide CO_2	Mol %	0.95
12	Water Vapour	Mol %	0.02
	Total Composition	Mol %	100
13	LHV	Kcal/kg	11735
14	HHV	Kcal/kg	13043

NATURAL GAS

Sr. No.	Description	Unit	Minimum Value
1.	Methane	Vol %	93.00
2.	Ethane	Vol %	3.13
3.	Propane	Vol %	1.50
4.	Butane	Vol %	0.60
5.	Pentane	Vol %	0.30
6.	Hexane	Vol %	0.20
7.	Nitrogen	Vol %	1.00
8.	Carbon dioxide	Vol %	0.27
9.	Total Sulphur	ppmv	NIL
10.	Heavy Metals	ppb wt.	-

FUEL GAS

Sr. No.	Description	Unit	Value
1.	Hydrogen	Vol %	15.94
2.	Methane	Vol %	64.00
3.	Ethylene	Vol %	0.01
4.	C3 Acetylene	Vol %	0.03
5.	Propylene	Vol %	0.01
6.	Butadine	Vol %	11.00
7.	Other C4's	Vol %	9.00
8.	C5's	Vol %	0.01
9.	HHV	Kcal/kg	13000

Annexure-2

Broad technical capabilities of Prospective OEMs or consultants or engineering service providers for Methanol firing System in oil/gas fired boilers

Sl. No.	Description	Prospective OEM or consultant or engineering service provider's response
1.	Indicate whether Prospective OEMs or consultants or engineering service providers has the capability to perform the following to address requirements of New and Retrofit Methanol firing System in oil/gas fired boilers:	
	a) Capability in preparation of complete arrangement including layout of all equipment starting from boiler front to burner	
	b) P&ID of the **Methanol firing System in oil/gas fired boilers**.	
	c) Design calculation for design and selection of Methanol firing System in oil/gas fired boilers and its associated sub-systems indicated as part of Scope in Section 5	
	d) Design basis and selection of various components of the methanol firing system along with valves, piping & instrumentation and their location and quantum, safety system in all applicable areas	
	e) Capability in preparing specification for various Bought out Items in each of the system listed as a part of scope in Section 5 above, and all other items which are required for completeness of the methanol firing system.	
	f) Design & engineering of Flame detectors, instrumentation, controls logics for complete methanol firing system and integration of methanol firing system with boiler	

Sl. No.	Description	Prospective OEM or consultant or engineering service provider's response
	g) Capability in preparation of Design basis for complete methanol firing system.	
	h) Highest capacity of methanol firing system offered for new installations and its associated details like customer name, plant name and other technical information	
	i) Highest capacity of methanol firing system offered for retrofit installations where already oil/gas is being used as a fuel and its associated details like customer name, plant name and other technical information	
	j) Manufacturing drawings for the total methanol firing system	
	k) Erection procedure for complete methanol firing system erection drawings for methanol firing system.	
	l) Complete list of equipment required for methanol firing system for lifting, handling, installation, maintenance and unloading.	
	m) Capability in preparation of complete bill of materials for methanol firing system	
	n) Operation and maintenance of methanol firing system	
	o) Performance guarantee test procedure.	
	p) Capability in Commissioning of Methanol firing System	

(SIGNATURE)

Annexure -3

Prospective OEM or consultant or engineering service provider's experience in the field of methanol firing system for oil/gas fired boilers & other applications

Sl. No.	Requirement	Prospective OEM or consultant or engineering service provider's response YES/NO and remarks if any.
1)	For how many years, Prospective OEMs or consultants or engineering service providers is in business of methanol firing system	
2)	Whether Prospective OEMs or consultants or engineering service providers has carried out system design of methanol firing for boiler with tangential firing of only oil. If so indicate how many system?	
3)	Whether Prospective OEMs or consultants or engineering service providers has carried out system design of methanol firing for boiler with tangential firing of only gas. If so indicate how many system?	
4)	Whether Prospective OEMs or consultants or engineering service providers has carried out system design of methanol firing for boiler with tangential firing of oil and gas. If so indicate how many system?	
5)	Whether Prospective OEMs or consultants or engineering service providers has carried out system design of methanol firing for boiler with front wall firing of only oil. If so indicate how many system?	
6)	Whether Prospective OEMs or consultants or engineering service providers has carried out system design of methanol firing for boiler with front wall firing of only gas. If so indicate how many system?	
7)	Whether Prospective OEMs or consultants or engineering service providers has carried out system design of methanol firing for boiler with front wall firing of oil and gas. If so indicate how many system?	
8)	Whether Prospective OEMs or consultants or engineering service providers has proven operational experience **in methanol firing system in oil/gas fired boilers** with minimum 50 t/hr steaming capacity	
9)	Whether Company background & its product profile along with technical details of methanol firing system for oil/gas fired boiler (highest capacity) which is being offered to BHEL under this EoI is enclosed?	
10)	Whether product data sheet has been enclosed	
11)	Whether information on market share has been enclosed	
12)	Whether Prospective OEMs or consultants or engineering service providers detailed reference list has been enclosed	
13)	Whether Prospective OEMs or consultants or engineering service providers annual audited financial reports including auditor's report for last 3 years has been enclosed	

Sl. No.	Requirement	Prospective OEMs or consultants or engineering service provider's response YES/NO and remarks if any.
14)	Whether the methanol firing system offered for BHEL is the latest being marketed by the Prospective OEMs or consultants or engineering service providers	
15)	*"*Prospective *OEMs or consultants or engineering service providers should have at least three (3) years of experience in designing, engineering, supply, supervision of erection commissioning and performance testing of state-of-the-art* ***Methanol firing system in oil/gas fired boilers****."* Whether Prospective OEMs or consultants or engineering service providers meets above PQR and requisite supply reference or any other relevant documentary evidence to substantiate the above PQR has been submitted.	
16)	*"Prospective OEMs or consultants or engineering service providers should have designed, engineered, manufactured/got manufactured/supplied, erected/supervised erection and commissioned/supervised commissioning of* ***methanol firing system in oil/gas fired boilers*** *with minimum 50 t/hr steaming capacity. Further, such* ***methanol firing system*** *should have been in successful continuous operation for a period not less than one (1) year as on the date of closing of this EoI."* Whether Prospective OEMs or consultants or engineering service providers meets above PQR and requisite supply reference or any other relevant documentary evidence to substantiate the above PQR has been submitted.	
17)	Whether Prospective OEMs or consultants or engineering service providers has confirmed their design & performance of methanol firing system. If so furnish the constituent analysis of methanol for which the firing system was designed.	
18)	Please furnish the range of typical compositions of the methanol handled?	
19)	List the provisions incorporated to mitigate corrosion in pipes/valves/burners in methanol?	
20)	Have you envisaged any proprietary / normal additives for menthol in your design?	

21)	Have you got proven scanner system for menthol firing considering that methanol is invisible?	
22)	Have met all the Indian Statutory regulations required for methanol firing in India & abroad and list those regulations met.	

(SIGNATURE)

Annexure -4

Reference List: The Prospective OEMs or consultants or engineering service providers shall furnish a summary of their product reference as detailed below for major supplies in last 5 years

Sl. No	Customer/ Country	No of units	Steaming capacity, t/hr	Type of firing: (Tangential/ Wall fired)	Type of fuels originally fired	Type of fuels fired after modification	Supply type: New / Retrofit	Date of order	Commissioning Date	No of burners (firing methanol) and its capacity	Type of atomizer	Methanol Flow at burner inlet and boiler front	Methanol pressure at burner inlet and boiler front	Atomizing medium (if any)	Type of flame detection system employed	Type of igniter

Description	Design (Yes / No)	Engineering (Yes/No)	Manufactures/Got Manufactured /Supply	Erection / Supervised Erection	Commissioning / Supervised Commissioning
Burners					
Igniters					
Atomization system					
Flame detectors including cooling system					
Methanol skids					
Control system upgrade including burner management system					
Instrumentation					
Methanol flow measurement and associated control valves					
Fire detection system and fire extinguishing system					
Pipes to the skid from terminal point					
Pipes, valves and associated accessories					
Methanol main trip valve					
Methanol burner trip valves					
Combustion air / Damper control system					
Associated safety equipment (if applicable)					

(SIGNATURE)