



NOIDA
10.12.2018

EXPRESSION OF INTEREST (EOI)

INVITING TECHNICAL PROPOSALS FOR ENLISTMENT OF CONSULTANTS FOR “OPTIMIZATION STUDY OF GAS PROCESSING UNITS OF GAIL AND ADEQUACY CHECK OF RUNNING LPG PLANTS AT GAIL VIJAIPUR ON RLNG IN CONJUNCTION WITH C2-C3 RECOVERY PLANT”

Interested reputed Consultants experienced in similar jobs are invited to submit application in prescribed format along with necessary documents in support of their technical and financial capabilities in order to get enlisted for the proposed job.

The completed Application form along with attachments in a sealed envelope super-scribed with **“Application for enlistment of Consultants for Optimization study of Gas Processing Units of GAIL and adequacy check of running LPG plants at GAIL Vijaipur on RLNG in conjunction with C2-C3 recovery plant”** may be forwarded to the address mentioned below or the same can also be emailed to a.chopra@gail.co.in or vp04799@gail.co.in within 15 days of publication of this EOI i.e. latest by **24th December, 2018**. Application received after 24th December, 2018 will not be entertained.

Consultants applying against the EOI will be screened based on the technical proposals submitted by them in the attached template along with supporting documents. Shortlisted consultants will only be eligible to participate in the subsequent tendering process for engagement of consultant(s) for the project.

Brief Scope of work, Terms of engagement is indicated in the following sections. Detailed Scope of Work, Schedule of Rates, Evaluation Methodology, Bid Evaluation Criteria etc. will be intimated during the subsequent tendering process.

Address for Submission of Proposal & Documents

Deputy General Manager (O&M)-CO

GAIL (India) Ltd

20th Floor, GAIL Jubilee Tower

B- 35 & 36, Sector-1

Noida-201301

Uttar Pradesh, India

Email: vp04799@gail.co.in

Contact no: +91-(120) 2446400/4862400 ext.12010



SCOPE OF WORK & SPECIAL CONDITIONS

1. Back Ground:

GAIL has five Gas Processing facilities for recovery of value-added fractions from natural gas such as C2-C3, LPG, Ethane, Propane, Pentane, and Naphtha. These plants are located at Vijaipur- (Madhya Pradesh) (Two trains of LPG units), Vaghodia-(Gujarat), Auraiya (Uttar Pradesh), Usar (Maharashtra) and Gandhar (Gujarat). Three such plants Vaghodia, Vijaipur and Pata are located along the HVJ pipeline and recover Natural Gas components for producing Liquid Hydrocarbon Products (LHC). Other two plants at Gandhar and Usar recover Natural Gas components for producing LHC from the Natural gas received from Local fields.

GAIL (India) Ltd has commissioned a C2C3 Recovery plant at Vijaipur. Prior to this GAIL was operating two LPG Recovery plants at Vijaipur. Post commissioning of C2C3 plant, the rich gas which was being processed in LPG plants is being processed in C2- C3 plant. Earlier it was envisaged that no additional gas will be available for processing in LPG plants however with the improvement in gas availability (mainly RLNG) gas is available for processing in the LPG plants also. Brief process description of C2-C3 recovery and LPG plant is attached as **Annexure1**.

The design gas processing capacities of the plants are as follows:

- i. C2- C3 plant Vijaipur : 20.2 MMSCMD Rich gas and RLNG 1.5 MMSCMD
- ii. LPG plant -1 Vijaipur : 7.5 MMSCMD rich gas
- iii. LPG plant-2 Vijaipur : 7.5 MMSCMD rich gas
- iv. LPG Plant Gandhar : 5.0 MMSCMD mixed Gas
- v. LPG Plant Vaghodia : 2.5 MMSCM rich gas

SCOPE OF WORK

2. PART-I- GPU OPTIMIZATION STUDIES

2.1 The scope of Work will include optimization studies of the following Gas Processing Units (GPU) of GAIL:

- i. GPU Vijaipur (C2-C3 Recovery plant and LPG Recovery plant 1 & 2)
- ii. GPU Gandhar



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iii. GPU Vaghodia

2.2 The scope of optimization studies will be as follows but not limited to :

- 2.2.1 Simulation of existing process for each GPU with respect to various feed gas composition and draw results for expected plant performance w.r.t. recovery potential, energy consumption etc. Compare results with the expected & actual performance, design condition and identify the process bottlenecks including equipment performance degradation.
- 2.2.2 Optimization of the recovery processes of GPU's for maximization of the recovery of C₂+ components from Natural Gas available through GAIL Pipelines. The consultant will provide cost effective feasible solution for enhancing the efficiency, performance and recovery factors at GPU's.
- 2.2.3 Carrying out Heat and Mass balance and suggesting feasible improvement measures.
- 2.2.4 The consultant will also examine the actual consumption of utilities (Chemicals, Electricity, Fuel, Air, Nitrogen, and Water etc.) and compare with the design values and suggest measures for optimization of the consumption of these utilities.
- 2.2.5 The consultant shall carry out Process optimization based on available Gas composition at the battery limit of GPU's viz. Rich Gas, RLNG and mixed gas and provide solution for maximization of recoveries of C₂+ components at GPU's.
- 2.2.6 The consultant will study the as is process and provide solutions for running the units independently without getting effected by downstream lean gas consumption upsets. The consultant will provide the solutions for increasing the capacity utilization of these plants.
- 2.2.7 The consultant will do analysis of the Flaring and venting of gases and provide solution for minimizing the same.



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2.2.8 The consultant may also suggest and provide details of the available software solutions for in house production planning and optimization of consumption of utilities (energy, water, Chemicals etc.) that may be helpful in day to day decision making if deemed essential for GAIL.

3. PART II- LPG PLANT (1 & 2) VIJAIPUR – ADEQUACY CHECK

3.1.1 LPG plants at Vijaipur were commissioned in year 1991 and 1992 respectively and were designed by EIL for processing of 7.5 MMSCMD Rich HVJ gas each. Subsequently in the year 2015 GAIL has commissioned C2- C3 recovery unit at Vijaipur as part of Petrochemical plant. The C2-C3 recovery plant at Vijaipur has been designed and licensed by M/s EIL to process 21.0 MMSCMD rich gas and 1.5 MMSCMD RLNG.

3.1.2 With the commissioning of the C2- C3 recovery unit, equipment's of old LPG plants Mainly Fractionation columns (LEF, LPG, Propane and Naphtha) were integrated with the C2-C3 plant i.e. C3+ Liquid from C2-C3 plant is being fractionated at LPG plant distillation columns. Remaining assets of LPG plants were kept as standby and the plant is run as when there is limitation / shutdown in C2- C3 plant.

3.1.3 In order to utilize the assets of LPG Plants and harness the Liquid Hydrocarbon potential of RLNG, few in house modifications were done and GAIL started processing RLNG at one old LPG Recovery plant at Vijaipur. (Feed gas lines were laid to make available the RLNG for processing in LPG plants).

3.1.4 With the availability of rich RLNG, GAIL intends to utilize the old LPG plants to process RLNG along with the running of C2- C3 plant. GAIL plans to run both LPG plants at Vijaipur on RLNG. However it is envisaged that there will be some limitation in process and utilities systems while running both LPG plants along with C2- C3 recovery unit. In order to continue running of LPG plant on RLNG as feed gas following adequacy study are required to be done:



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3.1.4.1 Adequacy of Gas composition of RLNG for processing: LPG Plant is designed to process Rich Feed Gas of C3 content 4.48 mole % & C4 content 1.74 mole %. Post commissioning of C2C3 Plant, to harness liquid hydrocarbon potential of RLNG, LPG Plants has been started processing RLNG as feed gas with normally contains C3 0.9 – 2 % & C4 0.3 – 0.9 mol %. In case of Low C3/C4 contents in RLNG, running of LPG units is constrained due to very low temperature in separator vessels. To facilitate running of LPG with RLNG of low C3/C4 content, we need to mix rich gas to bring the mixed feed gas concentration up to minimum 0.6 mole%. But this will deprive C2C3 unit of corresponding amount of rich gas .The case needs to be envisaged for threshold limit of C3/C4 content in RLNG for running of LPG plants smoothly & economically.

The consultant shall also analyze and specify the requirement of minimum contents of Ethane, Propane and Ethane in feed gas for processing in the LPG plants considering the plant safety and process requirement.

3.1.4.2 Adequacy of existing Feed Gas and Lean gas headers to handle the total gas processed :

Case study to be conducted for running C2C3 plant at 21.72 MMSCMD (19.68 MMSCMD (820Ksm³/hr) rich gas including CO₂+ 2.86 MMSCMD RLNG gas) and for running both LPG plant at 7.5 MMSCMD (0.72MMSCMD rich gas and 6.78 MMSCMD RLNG) each. Adequacy of Feed gas and lean gas headers (HP and MP) to handle additional lean gas while processing in the above configuration needs to be studied.

3.1.4.3 Adequacy of the Fractionation columns: The Propane and LPG column of LPG Train-11 and Train-12 are currently handling liquid hydrocarbon from C2C3 column bottom liquid. After running of both LPG plants on RLNG feed gas the liquid hydrocarbon generated from LPG plants at LEF column will also need to be processed into Propane & LPG Columns. An adequacy study needs to be carried out for identifying maximum amount of LHC that can be handled by LPG & Propane columns. Moreover the existing LEF column adequacy is



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also to be checked for fractionation as LPG column in case of RLNG processing.

3.1.4.4 Adequacy of Chillers and expander and associated systems:

GAIL is experiencing continuous high differential pressure across liquid paths in LPG 1 unit chiller. The reason to be analyzed during adequacy study and load constraints, if any, which could arise due to this, may be studied in detail for both units. In case of the processing of RLNG the expander outlet temperature goes much lower. The consultant shall provide broad details of changes / limitations / bottlenecks in Original equipment Manufacturer (OEM) equipment's and queries to be put to OEM. Client will approach OEM separately for taking it further for implementation.

3.1.4.5 Adequacy of process Piping and Interlocks for processing of RLNG:

The consultant shall do adequacy check of the process piping for processing of RLNG due to change in operating parameters and also review of process interlocks if required. Consultant shall also suggest further measures required for the implementation of the recommendations.

3.1.4.6 The consultant will do a simulation analysis of the processes of the integrated running of C2-C3 plant and both LPG plants and identify the limitations in the process and procedures and provide solutions for de-bottlenecking of these limitations.

3.1.4.7 The consultant will study the adequacy of the processes and equipment's based on the limitations and will provide the recommendations / solutions that may involve process changes / Modifications.

3.1.4.8 The consultant will also provide the broad equipment specification for the modification proposed. The consultant will provide revised design process conditions and capacity of the LPG plants considering the processing of RLNG / mixed gas



3.1.4.9 Adequacy of the Offsite Utilities plants - Vijaipur:

- A. ETP plant** at Vijaipur was designed to treat effluent generated from LPG plants, as per design of C2C3 plant existing ETP has been utilized in C2C3 plant. Post running of LPG plants on RLNG as Feed Gas, adequacy of Effluent treatment plants need to be checked. The consultant shall provide adequacy report and provide pre-feasibility for the recommended modification / changes/ capacity augmentation if required.
- B. Raw water Treatment plant:** Two Raw water treatment plants (RWTP) were designed to supply treated water to LPG Plants. As per design of C2C3 plant both existing RWTP has been utilized for C2C3 Plant & no new RWTP has been set up for this reason. Later on one RWTP was modified to supply treated water to C2C3 plant. Post running of LPG Plants on RLNG, adequacy of existing raw water treatment plants to cater requirements of LPG plants needs to be carried out. The consultant shall provide adequacy report and provide pre-feasibility for the recommended modification / changes/ capacity augmentation if required.
- C. Cooling Towers:** Cooling tower combined (CT 1/2/3) adequacy for all 03 plants running at full load along with STG running at full load. Extra cell at CT-3 was discussed some times. The consultant shall provide adequacy report and provide pre-feasibility for the recommended modification / changes/ capacity augmentation if required.

4. OTHER INFORMATION

- 4.1.1 LPG plant at Vaghodia was commissioned in 1993 and designed by EIL for a processing of 2.5 MMSCMD Rich Natural gas from HVJ network. However with the commissioning of C2-C3 recovery plant at GAIL Vijaipur, due to shortfall of rich gas for processing, the plant is presently being run with Rich RLNG or Mixed gas.
- 4.1.2 LPG recovery plant at Gandhar was commissioned in year 2001 to process 5 MMSCMD from various gas sources of ONGC in Bharuch region. The plant has been designed by EIL and is presently processing



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mixed gas from different sources and RLNG. The operation of this plant is presently being governed by the availability of gas from the local Oil & Gas fields and downstream consumers.

- 4.2 The consultant team may visit the sites if required for understanding of the Process and procedures.
- 4.3 The consultant will engage sufficient team members with requisite experience in the similar engagements.

5. Deliverables:

- i. The consultant shall visit sites for understanding of the processes and collection of data and information if required.
- ii. The consultant will provide a brief action plan for study before the start of jobs along with the details of the team members that will be working with GAIL.
- iii. The consultant shall give a detailed presentation to GAIL management on the recommendations (shall include only feasible options) that may include change in existing process or modifications if required.
- iv. The consultant shall provide feasibility and adequacy report for simultaneous running of C2-C3 plant and LPG recovery plants 1 & 2 at Vijaipur.
- v. The consultant shall provide the pre-feasibility report for various modifications proposed.
- vi. The consultant shall prepare and submit separate reports for each plant.
- vii. The consultant shall submit draft report for review by GAIL before submission of final report.
- viii. The consultant shall categorize the recommendations on the basis of the time and cost required for implementation.
- ix. Consultant shall provide detailed roadmap & cost benefit analysis for the implementations of recommendations.

6. Period Of Contract

The proposed adequacy study is to be completed within **Six Months (06 months)** from the date of issue of LOI.



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Sr. no.	Phase of study	Time Period
i.	Detailed study of GAIL Processes , Site visits and as is condition survey	04 Months
ii.	Submission of draft report	01 month
iii.	Submission of final report	01 month

7. TERMS OF PAYMENT

Detailed payment terms shall be provided in the tender document for engagement of consultants after this EOI stage.

8. CONFLICT OF INTEREST

GAIL policy requires that consultants provide professional, objective, and impartial advice and at all times hold the client's interests paramount, without any consideration for future work, and that in providing advice they avoid conflicts with other assignments and their own corporate interests. Consultants to be engaged for this assignment that would be in conflict with their prior or current obligations to other clients, or that may place them in a position of being unable to carry out the assignment in the best interest of GAIL, shall not be eligible to participate in this process of engagement. Without limitation on the generality of the foregoing, consultants shall not be engaged under the circumstances set forth below:

- (a) Conflict between consulting activities and procurement of goods, works or services (other than consulting services covered in the scope of present engagement): A firm that has been engaged by GAIL to provide goods, works, or services (other than consulting services covered by these Guidelines) for a project, and each of its affiliates, shall be disqualified from providing consulting services related to those goods, works or services for the Project. Conversely, a firm engaged to provide consulting services for the preparation or implementation of a project, and each of its affiliates, shall be disqualified from subsequently providing goods, works or services (other than consulting services covered by these Guidelines) resulting from or directly related to the firm's consulting services for such preparation or implementation.
- (b) Conflict among consulting assignments: Neither consultants (including their personnel and sub-consultants) nor any of their affiliates shall be engaged for any assignment that, by its nature, may be in conflict with



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another assignment of the consultants. As an example, consultants engaged to prepare engineering design for an infrastructure project shall not be engaged to prepare an independent environmental assessment for the same project, and consultants assisting a client in the privatization of public assets shall neither purchase, nor advise purchasers of, such assets. Similarly, consultants engaged to prepare Terms of Reference (TOR) for an assignment shall not be engaged for the assignment in question.

- (c) Relationship with Employer's staff: Consultants (including their personnel and sub-consultants) that have a business or family relationship with a member of the Employer's staff (or of the project implementing agency's staff) who are directly or indirectly involved in any part of: (i) the preparation of the TOR of the contract (ii) the selection process for such contract or (iii) supervision of such contract may not be awarded a contract, unless the conflict stemming from this relationship has been resolved in a manner acceptable to the Employer throughout the selection process and the execution of the contract.
- (d) A Consultant, who prepares Detailed Feasibility Report (DFR) of a Project, is not debarred from participating as Project Management Consultant (PMC) for the same Project as both are services in nature.

9. CONFIDENTIALITY OF INFORMATION AND DATA

All information obtained by Consultant/consultant/expert during the project and all information / data / maps etc. provided by the Company to the Consultant / consultant / expert must be considered confidential and must not be divulged by the Consultant / consultant / expert or its personnel to any-one other than the Company's personnel. This obligation of Consultant/consultant/expert shall be in force even after the termination of the contract. No part of the consultancy work shall be permitted to be presented and / or published in scientific / technical papers / journals etc. without prior approval of the Company in this regard.

10. PRE QUALIFICATION REQUIREMENTS

10.1 Financial

The agency to be engaged through this EOI process shall be of sound financial standing evidenced by the following:



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- i) The minimum annual turnover of the Consultant as per their financial results in any one of the immediate three preceding financial years (i.e. 2017-18 , 2016-17, & 2015-16) shall be as under:

For Indian (Domestic) Consultants - Rs.1.53 Crores

For Foreign (Overseas) Consultants- USD 0.22 million

- ii) Consultant's Net worth should be positive as per the immediate preceding year's (i. e. FY 2017-18) audited financial statement.

- iii) Working Capital : Rs 30 lakh

In case the Consultant's working capital is inadequate, the Consultant should supplement this with a letter from the Consultant's bank, having net worth not less than Rs.100 Crores or US\$ 22 million, confirming the availability of line of credit to cover the inadequacy of working capital in the previous year to meet the working capital requirement.

Documentary evidence (Annual report, Balance sheet, P&L account) in support of the same shall be provided along with the proposal duly attested by CEO/ Authorized signatory/ Head of the organization of the company.

10.2 Technical

The Consultant must have successfully executed at least one consultancy job for Optimization of Processes / Adequacy studies/ Efficiency improvement / De- bottlenecking in Oil & gas Sector / Fertilizers / Petrochemical sector / Bulk Chemical plants of Govt./ PSE/ Reputed Private companies in India or abroad with a minimum work order value of Rs.1.53 crore (for Domestic / Indian Consultants) and US\$ 0.22 million (for foreign / overseas Consultants) in preceding five (05) years to be reckoned from EOI submission date.

Documentary evidence (WO copy, completion certificate, final payment receipt etc.) in support of the same shall be provided along with the proposal duly attested by CEO / Authorized signatory/ Head of the organization of the company.

Applicants with qualification / experience / certifications not relevant to the current requirement of engagement shall be excluded in the screening process. Decision of GAIL in this regard shall be final and binding and no representation or correspondences will be entertained.



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Any canvassing on the part of the applicant will make the application liable for rejection.

Subsequent to the above, a tender shall be issued to prequalified Consultants based on their response to EOI.



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APPLICATION FOR PRE-QUALIFICATION

1	Name of the Agency	
2	Address (HQ)	
3	Address (Consultant)	
4	Designated Person for Communication with Job Title	
5	Address of Designated Person	
	e-mail address	
	Mobile Number	
	Landline Number	
	Fax Number	
6	<p>Pre-Qualifying Technical Requirements (Attach documents)</p> <p>The Consultant must have successfully executed at least one consultancy job for Optimization of Processes / Adequacy studies/ Efficiency improvement / De- bottlenecking in Oil & gas Sector / Fertilizers / Petrochemical sector of Govt./ PSE/ Reputed Private companies in India or abroad with a minimum work order value of Rs.1.53 crore (for Domestic / Indian Consultants) and US\$ 0.22 million (for foreign / overseas Consultants) in preceding five (05) years to be reckoned from EOI submission date.</p> <p>Documentary evidence in support of the same shall be provided along with the proposal duly attested by CEO / Authorized signatory of the company.</p>	
7	Financial (Indicate Currency)	
	Turnover in last 3 years	
	Net Worth as on 31.3.2018	
	Attach Audited Balance Sheet – last 3 years	
8	Other information demonstrating Consultant's competence (attach documents)	Provide a list of key personnel with CVs

Place:

Date: _____

(Authorised Signatory)

Note: Documents in other than English Language shall have self-certified English translated copies.