



Expression Of Interest (EOI) Notification

1. Introduction

Malleswaram field was discovered in 2010, and production was started from 2011. The reservoir properties indicate that it is a tight reservoir with very low permeability. Extensive HF campaign was carried out for production enhancement. The fluid characteristics indicate that crude is waxy and poses flow assurance challenges involving wax and asphaltene deposition in tubular resulting in reduced flow paths (well bore chocking). Consequently, this is leading to increased back pressure as well as drop in production.

In view of the issues with the existing methods of flow assurance and to sustain the production & recover more oil, we need sustainable method of flow assurance with the objective to provide an improved down hole heating system for use in conditioning oil and gas wells for increased flow, when such flow is impeded because of viscosity and/or paraffin blockage conditions. ONGC Rajahmundry Asset plans to implement the Down hole Electric Heating Tube technology to mitigate flow assurance problems at Malleswaram field by hiring the services along with O&M for a period of 03(three) years.

ONGC is hereby invites Expression Of Interest (EOI) from capable and experienced parties/vendors for Supply, Installation & commissioning of Down hole Electric Heating cable system in Oil and gas wells for a period of 03 years at Malleswaram Field, Rajahmundry Asset on hiring basis.

2. Objective

The primary objective of this Expression Of Interest (EOI) is to identify and collaborate with qualified service Providers, who possess the expertise and experience in Down hole Electric Heating cable system technology, which can be installed inside the Oil well production tubing for mitigation of Flow Assurance Problems.

ONGC intends to install and operate of 03 (Three) nos. of Downhole Electric Heating Cable system (DEHCS) inside production tubing of minimum OD 2 7/8" of the well for a period of 03 years at Malleswaram field of Rajahmundry Asset.

3. Scope of work

Under the proposed project, the selected technology provider will be required to design, build and install Downhole Electric Heating Cable system inside the Oil well production tubing for

mitigation of Flow Assurance Problems. The technology provider shall undertake, but not limited to the following activities:

The scope of the service provider is as under:

- **Design, Detailed Engineering, Supply, Installation and commissioning of Downhole Electric Heating Cable system**-Contractor shall undertake design and detailed engineering of the suitable down hole heating cable system. ONGC will provide a list of 10 wells along with required well information, as per data sheet provided by the Service provider, for installation of Downhole Heating Cable System.
- **Job Execution:** The Service Provider shall execute all the Downhole Electric Heating Cable system installations using their own equipment, manpower, consumables, etc. However, the operational steps may vary from well to well depending on job design. After completion of the job, the Service Provider shall start the system for production of the well. Before starting of the Downhole Electric Heating Cable installation, ONGC will carry out necessary tubing clean out process (Mechanical Scrapping, Chemical Cleaning etc.) and after establishing stabilized production rate, shall hand over the well to the Service Provider for the installation of Downhole Electric Heating Cable system.
- **Surface and sub-surface equipment:**
The Service Provider shall provide all the requisite surface and sub-surface equipment for carrying out the Downhole Electric Heating Cable system operation. Equipment shall include Cable Drum System, Work Platform, Injector, Pressure control equipment, Control Panel, Digital/Analog data monitor to Display the fluid temperature at well head, well head pressure control equipment, Bottom-hole and surface cables. Any other items/equipment/tools required for successful execution of the heating cable technology not mentioned in this document is to be provided by the Service Provider.
- **Electrical Power:** Electrical Power for the operation of Downhole Electric Heating Cable system will be provided by ONGC
- **Performance Criteria (KPI):** The following KPI will be the criteria for satisfactory performance trial after award of work and job execution.
The Surface Temperature of produced fluid shall be maintained at 60 Deg C (+/- 10%) or as specified by ONGC +/-10% (as this may vary from well to well based on crude characteristics).

4. Information Sought from Interested Parties

Interested vendors are invited to submit their proposal in PDF format within 21 calendar days from the date of EOI publication in newspapers/ONGC website. Proposals must include:

- Executive Summary.
- Detailed Technical Proposal and methodology.
- Relevant experience – Past work in similar projects.
- Case studies, performance reports from past deployments.
- Certifications (if applicable).
- Client references.
- Details of company profile and relevant experience.
- Limitations or boundary conditions of the technology, if any.

5. Submission Guidelines

Interested parties/bidders are invited to submit their EOI documents electronically (PDF format) within 21 calendar days from publication of this notification in News Papers, encompassing following:

- **Executive Summary:** A concise overview of the proposal.
- **Detailed Proposal:** Comprehensive responses to the information requirements outlined in Section 4.
- **Supporting Documents:** Relevant project documents, work experience certifications, and any other pertinent documentation.

Contact Information: Interested parties/bidders are invited to submit their EOI, including any details/queries/clarifications required on the objectives and scope of the work in the subject EOI to:

Head MIND, ONGC

Deendayal Urja Bhawan,

5, Nelson Mandela Marg, Vasant Kunj

New delhi-110070,

Tel- (011) - 26752010 / 26752035

Email: sanghi_sanjiv@ongc.co.in / mishra_sb@ongc.co.in

6. Evaluation Criteria

Interested parties/bidders may be asked to present a proposal/submission before a committee. Submissions will be assessed based on:

- **Technical Competence:** Proven capacity and completed jobs in Down Hole Heating Cable Technology.
- **Regularity Acumen:** Understanding of and experience in HC industry and Down Hole Heating Cable Technology.

7. Confidentiality

All information received by ONGC as a part of this EOI, will be ONGC's property and will be kept strictly confidential and utilised for its internal purpose only.

8. Disclaimer

This EOI is intended for market exploration and does not constitute a commitment to award any contract. ONGC reserves the right to modify or cancel this EOI process at any stage without assigning any reason and without incurring any liability.



SCOPE OF WORK **AND** **TECHNICAL SPECIFICATIONS**

Hiring of services for Supply, Installation, commissioning of Down hole Electric Heating cable for mitigation of Flow Assurance Problems in Oil wells along with O&M
at
Malleswaram field, Rajahmundry Asset for a period of 03 (three) years.

SCOPE OF WORK AND TECHNICAL SPECIFICATIONS

1.0 INTRODUCTION

Oil and Natural Gas Corporation Limited (ONGC) is planning to install down hole electric heating cable in oil wells to mitigate flow assurance problems. Malleswaram field is located about 120 Kms from Rajahmundry, Andhra Pradesh State. For this purpose, a down hole electric heating cable is to be supplied, installed inside the well along with Operation and Maintenance of the system to receive the crude from the well at the installation for further process

Work to be performed by the Service Provider under the scope for installation and operation of 03 (Three) nos. of **Downhole Electric Heating Cable system (DEHCS) inside production tubing** of minimum OD 2 7/8" of the well for a period of 03 years. References to specifications, instructions, and standards for materials, tools or equipment that the Service Provider shall need to satisfy or adhere to in performance of the works are also covered under this section.

Initially, the Downhole Electric Heating Cable system (DEHCS) inside production tubing will be installed in 01 (One) no. of jointly selected well and the Performance trial will be carried out for 30 days in which the technology will be established. If the set KPI are met successfully, the Contract will be executed as per the terms and conditions.

2.0 BROAD SCOPE OF WORK:

2.1. ONGC intends to carry out effective wax mitigation operation using Downhole Electric Heating Cable System (DEHCS) in wells under Rajahmundry Asset.

2.2. The typical representative completion details of the wells are as follows:

Casing	: 5 ½" or 7" or 9 5/8" OD
Tubing	: 2 7/8 inch OD, 6.5 ppf, or larger.
Tubing Depth	: From Surface to 4000 m.
Well profile	: Straight/J-bend or S-bend.
Production rate	: Min 5 KLPD to Max 150 KLPD of crude oil with associated gas.
Water cut	: Varying between 0 to 90% for oil wells.
FTHP	: From 7 Ksc to 350 Ksc in case of self-flowing or 25 Ksc to 40 Ksc in case of artificial lift
SBHP	: 60 Ksc to 450 Ksc

2.3. The scope of the service provider, but not limited to:

- 2.3.1 Design and detailed engineering of Downhole Electric Heating Cable system based on data provided by ONGC.
- 2.3.2 Supply of all Surface & Subsurface equipment, consumables and tools & tackles required for successful installation of Downhole Electric Heating Cable system inside the well along with operations and maintenance of the entire system.
- 2.3.3 Installation of Downhole Electric Heating Cable system in accordance to Oilfield Safety Standards.
- 2.3.4 Supply of competent requisite manpower.
- 2.3.5 Operation and maintenance in complete along with spares, consumables, manpower, tools & tackles and any other equipment
- 2.3.6 Monitoring of performance of Downhole Electric Heating Cable on continuous basis for performance evaluation and generation of reports.
- 2.3.7 To supply/provide any other items/equipment/tools required for successful execution of the heating cable technology not mentioned in this document.
- 2.3.8 Daily report shall be generated by the service provider and submitted to ONGC covering hourly operation of the system.
- 2.3.9 Format of the daily report will be finalised covering all criteria's and required parameters for determining optimal settings, jointly between ONGC and the Service provider. Report will be substantiated with digital/analogue read-outs from the surface read out system.
- 2.3.10 Surface Temperature of the produced fluid shall be maintained **60°C +/- 10%** (to be intimated by ONGC to Service provider in writing and will be on well-to-well basis)
- 2.3.11 The Contract shall be for a period of 03(three) years from date of successful completion of trial run of first well as per the terms and conditions of the contract.

- 2.3.12 Preventive/Scheduled maintenance of the system shall be carried out by Service provider upon written approval from installation manager for each event.
- 2.3.13 Breakdown maintenance of the system shall be rectified within 2 hrs. for each occurrence. Penalties as outlined by ONGC shall be applicable beyond the 02 hrs. allowed for rectification of breakdown.
- 2.3.14 ONGC will provide requisite electrical power up to rated electrical power consumption certified by OEM/packager.
- 2.3.15 Service Provider shall submit electrical wiring diagram prior to installation for ONGC's approval.
- 2.3.16 In case of unforeseen down hole problem(s)/changes in well behaviour in the meantime, any of the selected wells may be replaced by other well(s) requiring Downhole Electric Heating Cable completion.

3.0 DETAILS OF SERVICE REQUIREMENT

The Service Provider shall have to provide the following services to ONGC during the tenure of the Contract period:

3.1. Job design:

The Company shall provide a list of 10 wells along with required well information, as per data sheet provided by the Service provider, for installation of Downhole Heating Cable System. Accordingly, the ONGC will make the preparatory well preparation plan in consultation with the Service Provider for the selected wells to be covered under the Contract.

Design of well preparatory operations for the selected wells will need to be completed prior to start of mobilization of Service Provider's equipment to the well site.

3.2. Job Execution:

Before starting of the Downhole Electric Heating Cable installation, ONGC will carry out necessary tubing clean out process (Mechanical Scrapping, Chemical Cleaning etc.) and after establishing stabilized production rate, shall hand over the well to the Service Provider for the installation of Downhole Electric Heating Cable system.

The Service Provider shall execute all the Downhole Electric Heating Cable system installations using their own equipment, manpower, consumables, etc. However, the operational steps may vary from well to well depending on job design. After completion of the job, the Service Provider shall start the system for production of the well.

Prior to handing over of well to the Service Provider, ONGC will reconfirm, in the presence of Service Provider's representative, the following details in confirmation to the data sheet provided earlier by ONGC.

- a. Mechanical Scrapping of the well up to installation depth of the cable.
- b. Temperature gradient of the well
- c. Pressure gradient of the well

- d. Reservoir Pressure & Temperature
- e. Production Rate
- f. Water Cut Ratio

3.3. Surface and sub-surface equipment:

The Service Provider shall provide all the requisite surface and sub-surface equipment for carrying out the Downhole Electric Heating Cable system operation.

Surface equipment shall include Cable Drum System, Work Platform, Injector and Pressure control equipment

During Operation:

- Control Panel
- Well head pressure control equipment
- Bottom-hole and surface cables

Any other items/equipment/tools required for successful execution of the heating cable technology not mentioned in this document is to be provided by the Service Provider.

3.3.1. Subsurface Equipment

Cable Type	: KGn MP-12/2x1,5-50-90-Oa
Break Load	: 50 kN
Max Operating Temp	: 100 0C
Outer Diameter	: 25mm
Weight in air	: 1056kg/km
Weight in water	: 525 Kg/km

3.3.2. SURFACE DATA ACQUISITION UNIT

Downhole Electric Heating Cable surface system should provide Digital/Analog data monitor to Display the fluid temperature at well head. This data will form part of the job report to be provided to the Company on daily basis.

3.4. Electrical Power:

Electrical Power for the operation of Downhole Electric Heating Cable system will be provided by ONGC.

3.5. Manpower

The Service Provider shall provide competent and experienced manpower as required to carry out the jobs covered by the Contract in a professional and efficient manner.

3.6. Post Installation performance evaluation:

The Service Provider shall carry out performance evaluation and prepare detailed technical reports for each individual well. The evaluation reports shall focus mainly on

- a. Surface Temperature of produced fluid.

The installation report shall contain complete electrical diagrams and installation schematics for record of the Company.

3.7. Performance Criteria (KPI):

The following KPI will be the criteria for satisfactory performance trail.

- a. The Surface Temperature of produced fluid shall be maintained at 60°C (+/- 10%) or as specified by ONGC +/-10% (as this may vary from well to well based on crude characteristics).

Annexure A

Specification of Heating Cable System

1. Specification of the Heating Cable:

- 1.1 Cable Construction material shall be High Density Thermal Resistance Polymers
- 1.2 Cable contains core heating element which shall be completely shielded with Steel/metal armor Cable contains data line to accommodate Downhole temperature or pressure monitoring as required by the ONGC
- 1.3 Cable OD should be less than 1"
- 1.4 Cable Length should be as per client requirement up to maximum of 2500 meters
- 1.5 Cable should generate Temperature from Ambient to 90°C

2. Specification of Control Station

- 2.1 Control Station shall be Self-Contained, unitized inside cabin to ensure proper functioning of the entire cable system
- 2.2 Control Station would generate data from daily operation and the same can be either remotely or physically collected from the station
- 2.3 If ONGC has installed pressure or temperature monitors at the end of the cable, then the Control Station will provide that data.
- 2.4 Operating ambient temperature from -15°C to +50°C
- 2.5 Control Station shall be IP 45 Protection complaint.

3. Specification of Surface system:

- 3.1 Roller Console shall have primary lock on Cable to avoid movement and Mechanical Lock to avoid cable movement provided at wellhead
- 3.2 Surface system should have Stuffing box (Flanged or threaded) at well head for pressure control
- 3.3 Safety Tray system to safely move cable from Wellhead to Control Station.
- 3.4 Hot surfaces of cable or any equipment at surface should be adequately protected by proper insulation.

4. Installation process:

- 4.1 Cable should not be anchored or tied to the wall of the tubing and will be lowered into the well without any intervention.
- 4.2 Install or uninstall the heating cable should be without Work over of the well.
- 4.3 ONGC will provide a clean ingress into the well by performing a mechanical scraping or any other intervention to remove the deposits on the tubing walls, before installation of the cable.
- 4.4 ONGC will not provide any work over rig or any CTU unit for this installation, if required
- 4.5 Service provider shall provide all the required scaffolding and other requirement to complete the installation and carry out any intermittent repairs or uninstalls.