OIL & GAS DEVELOPMENT COMPANY LIMITED
REQUEST FOR QUOTATION
(SERVICES)

OGDCL House, Jinnah Avenue, Islamabad Pakistan

Description: Pipeline Network Optimization (Flow Assurance) Study for Mela Oil Field
RFQ No.: SER/CB/PE&FD-6400000037-A/2022
Services Required For: Mela Oil Field
Bidding Procedure: Single Stage – Two Envelope
Evaluation Criteria: Lump sum
Tax: Inclusive of all applicable taxes except PST/ICT
Bid Validity: 180 days from Technical bid opening
Bid Bond Amount: PKR 200,000/-
Bid Bond Validity: 210 days from Technical bid opening
Duration of Contract / Completion Period: 90 Days

Item No.	Description	Unit	Qty	Total Price (PKR)
10	FLOW ASSURANCE STUDY MELA OIL FIELD (AS PER ATTACHED TOR)	AU	1	

			Quantity					
Sub No	**Service No**	**Service Description**	**Val 1**	**Val 2**	**Quantity**	**Unit**	**Unit Price**	**Total Price**
10.1	9000005	DESIGN & CONSTRUCTION CONSULTATION	-	-	1	Lump Sum		
Val 1: **Val 2:**								

TERM OF REFERENCE (TOR)

FOR

PIPELINE NETWORK OPTIMIZATION (FLOW ASSURANCE) STUDY FOR MELA OIL FIELD

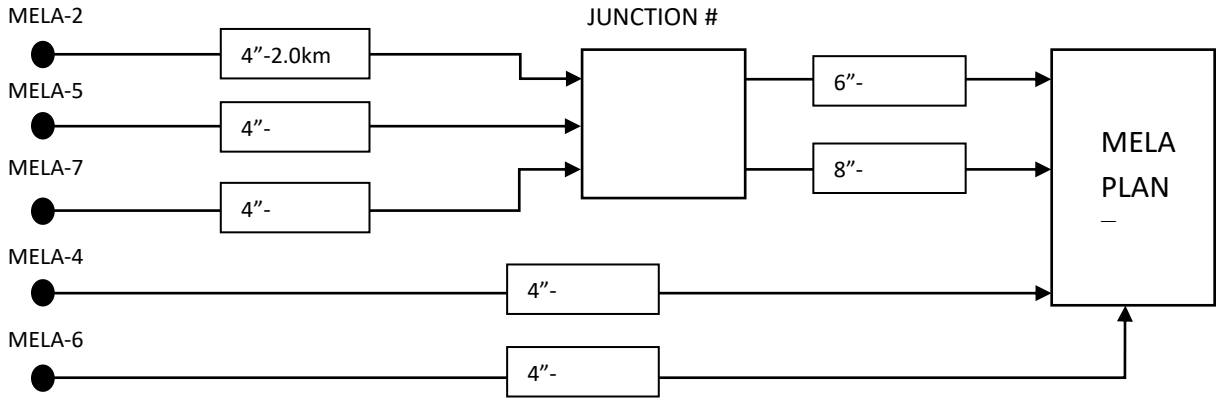
1. INTRODUCTION

Mela Oil Field is located in Shakardara, district Kohat in KPK province.

2. BACKGROUND

Produced hydrocarbon from Mela wells are being transported via 4", 6" & 8-inch dia pipelines to Mela Plant that consist of oil & gas separation, compression, and storage facility. The facility is somewhat 8-15Km away from different wellheads. After separation at facility, the gas is transported to nearby LPG plant while Oil is transferred to refineries.

Mela field consists of five producing wells that includes Mela-2, Mela-4, Mela-5, Mela-6 & Mela-7. The pipeline from wellheads of Mela-2, Mela-5 & Mela-7 gathers at junction # 1, from where fluid of Mela-5 & Mela-7 commingles and diverted to Mela plant via single 8-inch flow line. Fluid from Mela-2 from junction # 1 also diverted to Mela Plant via single 6-inch flow line. Fluid from Mela-6 and Mela-4 are diverted to Mela plant via dedicated 6-inch flow lines. Diversions of Mela fluids to Mela plant are also highlighted in the below schematic.



Due to rough terrain, elevation profiles, multiphase flow in pipelines and decreasing reservoir pressures of Mela field, significant pressure drop from wellhead to Plant has been observed which is impacting the overall hydrocarbon recovery from the field. To improve the hydrocarbon recoveries from the field, which is being impacted due to this surface network pressure drop, the Nashpa JV intend to evaluate and implement the cost-effective solution.

3. OBJECTIVE

The OGDCL is interested in engaging a third-party reputable CONSULTANT for undertaking the Pipeline Network Optimization Study to enhance the field production and to improve the overall hydrocarbon recovery from field. The main objectives of the subject study shall be to:

1. Conduct a detailed assessment of gathering network including steady state and transient analysis.
2. Perform the adequacy check of existing infrastructure from wellhead to front end compression.

3. Identify the bottleneck in the existing surface network and provide the optimum alternate (with least cost exposure) to overcome these bottlenecks in surface network.
4. Recommend the optimized and techno commercially viable strategy (i.e., Multiphase flow through well's dedicated lines, Multiphase well's commingle flow through a trunk line to plant, separation at well site or some nodal point and transport gas & liquid separately or any other option) for flow line network and gathering system.
5. Develop the complete road map for the implementation recommended strategy.

The outcome of the study shall provide OGDCL with a definite way forward and plan for implementation of the recommended strategy while ensuring the operability, reliability, and safety of the surface operations.

4. SCOPE OF WORK:

- The CONSULTANT shall carry out the detailed evaluation and engineering work to achieve the objective of the study.
- The CONSULTANT shall be required to undertake the following steps without any exceptions:

4.1. Development of the Gathering Network Model: The CONSULTANT shall develop the model of existing gathering network in OLGA software to benchmark existing pressure & temperature profile as a base case. The CONSULTANT shall collect available technical information, data, drawings, etc. related to the gathering network and processing facility to the extent relevant for developing the network model. If required, the CONSULTANT shall also develop/prepare a representative version of any other drawing, document and data related to the gathering network which is unavailable with OGDCL but will be essential for carrying out this action item.

4.2. Steady State Hydraulic Analysis: The CONSULTANT shall evaluate the entire gathering network on the forecasted production & pressure profiles to ascertain any hydraulic limitations with respect to the following:

1. Deliverability analysis, Pressure drops across flow lines, Back pressure effect,
2. Fluid velocities/ Erosion velocities,
3. Flow instabilities, Liquid hold up/ slugs/ slug Flow Analysis,
4. Hydrate formation.
5. Impact of addition of new/ upcoming wells. Best available location for Tie-In of upcoming development wells.

Evaluation of gathering network shall be carried out for the pressure ranges as per the installed compression at Plant. Iterations for the above analysis shall as a minimum be carried out in steps of 50 psig to ascertain the hydraulic limitations.

4.3. Transient Analysis: The CONSULTANT shall perform transient flow study for the complete flow line hydraulics from all wellheads to Plant inlet to capture the impact of operational upsets as well as planned operations. The subject analysis shall cover the entire forecasted production and pressure profiles over the pressure range of installed compression at Plant inlet. Iterations for the above analysis shall as a minimum be carried out in steps of 50 psig.

The transient analysis shall include dynamic multiphase flow simulation, determination of slug flows and identification of pigging volume as well as ramp-up and hydrodynamic slugs that may receive at each feeder line at Plant inlet during the different production scenarios. The scenarios shall include but not limited to the following:

1. Startup, Restart and Ramp up scenario
2. Turndown and Shutdown scenario

This transient analysis shall duly evaluate the aspects of slugging (terrain & hydrodynamic slugging) with recommendation of slug volume (gas/liquid arrival rates) at the plant inlet. The transient analysis shall also cover the following:

- Pressure dynamics of the system and its affect over performance of the system on the forecasted production and pressure profiles.
- Production analysis due to change in back pressure at the respective wells.
- Identification of liquid hold ups in the system, if any.

4.4. Flow Assurance & Network Optimization: Subsequent to the analysis carried out in *4.2 and 4.3 – Steady State Hydraulic Analysis & Transient Analysis*, the CONSULTANT shall perform detailed study of the entire surface network for addressing the limitations to maximum recovery from the field. The said evaluation shall be carried out as per the forecasted production and pressure profiles for the operating pressure range of installed compression with iterations as a minimum be carried out in steps of 50 psig. In this regard, following shall be undertaken by the CONSULTANT:

- Bottlenecks identified during the 4.2 and 4.3 – Steady State Hydraulic Analysis & Transient Analysis shall be studied in detail.
- Debottlenecking required in the gathering network, if any, shall be evaluated to improve the overall dynamics and reduce pressure losses of the gathering network.
- Recommendation to address the limitations identified in 4.2 and 4.3 to achieve the overall objective shall be provided.

The above may require any modification/upgradation of the existing flow lines or requirement of additional lines or separation. However, it needs to be noted that if there is any such requirement of additional flow lines and separation, then cost effective solution with minimum cost should be provided.

- If any line is under-sized, or may become as such in future, it shall be identified.
- If the current gathering network can be optimized to increase the total field production, it shall be evaluated.
- Adequacy check of specifications of the existing flow lines shall be performed. Subsequently, study of the flow lines shall be conducted with the intent to avoid over or under specifications considering present & future production rates & pressure regimes.
- Liquid handling capacity check at the plant end (inlet slug catcher/production separators) shall be undertaken based on the outcome of 4.3 Transient Analysis. Similarly, requirement of slug catcher(s) or additional separation and their location shall be evaluated
- Where necessary, the requirement shall be quantified/sized, and the associated cost shall be provided with ±10-15 % accuracy. Estimated lead-time shall also be provided for such modifications.

5. DELIVERABLES

The study deliverables shall comprise all milestone to complete Pipeline Network Optimization Study as stated, implied, or inferred under Section 4 and shall be delivered in accordance with the time schedule. The deliverables shall include, but not limited, to the following:

1. Network Simulation Model duly calibrated for the above study.
2. Steady state & Transient Gathering Network Analysis Study Report.

3. Flow Assurance & Network Optimization Report
4. Recommendations with Techno-Commercial Analysis

The CONSULTANT shall be required to submit a report at the end of each step in Section 4 for OGDCL review, approval and the progression to next step. The report shall be comprehensive and should cater, but not be limited to, the following aspects:

- Detailed Technical Narrative.
- Gap Findings, Bottleneck & Limitations.
- Comparative tabulation for the various options covering the pertinent aspects.
- Any other technical content considered necessary.
- Assumptions.
- Results & Conclusion.
- Recommendations, if any other.

6. PROGRESS REPORTING & REPORTING

6.1. Progress Measurement / Monitoring System

The CONSULTANT shall provide Gantt Chart after the award of contract which shall have inter dependencies and will contain all key milestones.

The schedule of the study shall be developed using suitable software like Primavera / MS Project. The work progress shall be measured based on physical progress and not on resources utilized; i.e. it shall be based on deliverables completed.

6.2. Progress Reporting

A weekly progress report shall be submitted over the whole study duration. The report shall contain details on all aspects of the study over the reporting period and give an up-to-date and clear picture of the progress and overall status of the Works. The report shall highlight detailed information of the progress of Works, variations with explanations for slippage in schedule and the recovery plan as may be required. The report shall, as a minimum, include:

1. Overall Project Status
    - Executive summary.
    - Design and Engineering - Brief description of tasks executed.
    - Areas of concern and mitigation measures.
    - Constraints.
    - High level forecast for next 2 weeks.
    - Recovery actions (when required i.e., if there is any slippage).
    - Study Progress Report on the Gantt chart.

6.3. Progress Review Meetings

Following meetings shall be held during the course of the study:

- Kick-off meeting.
- Engineering review meeting, preferably at OGDCL's premises, at the end of each step mentioned as 4.1 – 4.4 in the Scope of Work.

- Monthly Progress Review meetings to discuss technical issues and review progress; mode of communication shall be mutually agreed.
- Design reviews and presentations on key decision-making stages; mode of communication shall be mutually agreed.
- Draft report and formal presentation, preferably at OGDCL's premises, at the end of study to close out all matters followed by submission of final dossier.
- In addition to the above, meetings may also be called upon as per requirement by the OGDCL through Videocon/MS Team/Zoom.
- The CONSULTANT shall submit minutes of meetings to OGDCL for review and comment within four (4) Days of their occurrence date.

7. SPECIAL NOTES

1. The Study shall be carried out in a minimum possible timeframe, which is envisaged to be not more than 90 calendar days effective from Work order date.
2. CONSULTANT shall use the information provided herein for undertaking the study. If any information is missing, the same shall be communicated to the OGDCL during pre-bid clarifications. In case the information cannot be made available by the OGDCL, the same will have to be either assumed or arranged by the CONSULTANT in consultation with OGDCL.
3. All information shared with the CONSULTANT shall be strictly confidential and used exclusively for the requested services.
4. CONSULTANT being an expert shall be responsible for providing quality services as per all applicable local and international standards and norms.
5. As part of technical proposal, BIDDER shall provide the following documents:
    a. Undertaking that the bidder confirms their complete understanding of the requirements within scope and adherence to responsibilities mentioned in the document.
    b. Organization Profile & Structure.
    c. List of study conducted by the BIDDER in the last five (05) years for demonstrating prior experience for undertaking such studies which involves developing the gathering network model and carrying out steady state and transient analysis using OLGA software.
    d. Completion Certificates of the aforementioned studies.
    e. CVs of Study Manager, Senior Engineers, Engineers, Supervisors and other team members proposed for different phases of the study.
    f. Study Execution Plan which shall include but not limited to;
        - Organization structure.
        - Staffing Plan for all phases of the project.
        - Roles and Responsibilities of the proposed team.
        - Detailed narrative on the study execution strategy.
        - Project Schedule.
        - Illustrative study schedule management plan.
        - Illustrative Quality Assurance Plan.
    g. Bidder shall provide lessons learnt for similar studies in the bid;
    h. Bidder shall mention the data list/needs list required from OGDCL in undertaking the subject study.
6. Any amount of work not conceived by the bidder but is required to complete the objectives of the study shall be under the CONSULTANT's responsibility.

7. CONSULTANT shall be responsible for arranging all the transportation, if any.
8. CONSULTANT shall use licensed OLGA software for developing the gathering network model and carrying out steady state and transient analysis. The OGDCL may allow a software alternate/equivalent to OLGA, however prior approval shall be solicited by the CONSULTANT during the bidding stage.
9. CONSULTANT shall be responsible to have all relevant licensed software and associated knowledge and expertise that may be required to carry out the requested services.

8. GENERAL NOTE:

1. OGDCL will provide available data / document as per Annexure-2. Any other data available will be provided as per requirement of consultant. Any information / data missing above and deemed necessary for the report shall be in the scope of the CONSULTANT and consultant can seek data from OGDCL.
2. Consultant shall abide by all legal & other requirements under the law of Pakistan & requirement related to Oil & Gas Industry, Central Inspectorate of mines, Environmental Protection Agencies, other state-owned regulatory bodies.
3. CONSULTANT shall follow OGDCL Procurement procedures & COMPANY HSE Policy.
4. The OGDCL shall provide boarding and lodging to CONSULTANT's personnel at Mela Plant, if required.

9. DURATION OF CONTRACT:

The duration of the contract will be 90 calendar days effective from work order issuance date.

10. BID BOND:

Bid Bond/Bid Security amounting to **PKR 200,000/-** (Pakistani Rupees Two Hundred Thousand Only) is to be attached/provided **with technical bid**. Please see Master Set of Tender Document for further details.

11. Mode of Procurement:

1. Bids against this tender are invited on "**Single Stage Two Envelope Bidding Procedure"** through press tendering, therefore, the bidders shall submit original and copy of their Technical and one original financial bid.
2. The bidders shall submit one original technical and one original financial bid along with soft copies of technical bids sealed in respective envelope.

Note: The Master Set of Tender Documents for Services uploaded on OGDCL's website (www.ogdcl.com) is the integral part of this TOR.

12. COMPLETION SCHEME

Milestone	Name	Completion Time
1 (Ref. 4.1)	**Development of Dynamic Gathering Network Model**	
2 (Ref. 4.2)	**Steady State Hydraulic Analysis**	
3 (Ref. 4.3)	**Transient Analysis**	
4 (Ref. 4.4)	**Flow Assurance & Network Optimization Phase**	
5 (Ref. 4.5)	**Recommendations and Techno Commercial analysis**	

13. FINANCIAL EVALUATION CRITERIA

Financial evaluation will be carried out on **Lump Sum** amount for complete package.

14. TECHNICAL EVALUATION CRITERIA

S. No.	Description	Marks	Remarks	Marks Obtained
1	Valid Registration Certificate with Pakistan Engineering Council under engineering consultancy.	10		
2	Copies of last five Consecutive years Registration Certificate with Pakistan Engineering Council under engineering consultancy.	20	10 marks are for last 5 consecutive years +2 marks for each additional year (Max marks for additional years= 10)	
3	Copies of less than five Consecutive years Registration Certificate with Pakistan Engineering Council under engineering consultancy.	Zero	Company/Firm having less than five consecutive years of Registration with Pakistan Engineering Council under engineering consultancy for E&P companies in Pakistan will not be technically qualified.	
4	Confirmation to conduct study as per TOR on Licensed OLGA Software.	30		
5	Non-Confirmation to conduct study as per TOR on Licensed OLGA Software.	Zero		
6	List of studies conducted by the BIDDER in the last five (05) years for demonstrating prior experience for undertaking such studies which involves developing the gathering network model and carrying out steady state and transient analysis using OLGA software with supporting documents/work orders.	10	2 marks for each study. Maximum 10 marks.	
	Relevant Completion Certificates of studies as per Sr. No. 6 above	10	2 marks for each completion certificate. Maximum 10 marks.	
7	Less than 5 consecutive Years of engineering consultancy services experience for E&P companies in Pakistan.	Zero	Company/Firm having less than five consecutive years of engineering consultancy services for E&P companies in Pakistan will not be technically qualified.	
8	Valid NTN Certificate	2.5		
9	Valid Sales Tax Registration Certificate	2.5		
10	Bank Statement from 01 July 2019 to June 30, 2022.	15	Zero marks if less period bank statements are provide OR the banks statements are not for specified period	
	Total	100		

Note: - Qualifying Marks for technical Bid acceptance are **80**.

Annexure-2

List of available data / documents to be provided by OGDCL

1. As built of Pipeline
2. As built of Gathering Area
3. Production Profile.