**SECTION 3**

**TECHNICAL PROPOSAL**

**FLOWMETERS FOR WATER INJECTION FACILITY PROJECT**

**TENDER No.:** CMIT-PRT-10.30-160007-1

April, 2016

## General Introduction

Missan Oil Field is located in the SE of Iraq, close to the border with Iran, some 175 kilometers N-NW of the city of Basrah, and 350km SE of Bagdad – the capital of Iraq. Missan Oil Field includes three producing fields such as Abu Ghirab, Buzurgan and Fauqi. The flowmeters of this purchase order are used for water injection project in BUS area of Missan Oil Field.

This Material Requisition, together with the referenced specifications and Material take-off, describes the minimum requirements for design, materials, manufacture, inspection, testing, and supply of flow meters for Water Injection project. The purpose of this document is to define the minimum requirements of the Scope of Work, and provide references, specifications and standards, which the VENDOR shall undertake. This document shall be read in conjunction with all others given in the ITT.

Compliance with the requirements of this requisition or any of the documents referred to herein shall not relieve the vendor of his responsibility to supply flow meters of proper workmanship and materials conforming to good engineering practice to meet the specified conditions.

## Design Base

* 1. **Ambient Data**

|  |  |
| --- | --- |
| Ambient Temperature, Maximum： | 55°C |
| Ambient Temperature, Minimum： | -5°C |
| Black Bulb Temperature： | 80°C |
| Maximum Daily Rainfall (24 hours)： | 57mm |
| Relative Humidity： | 25% to 80% |

**2.2. Water Characteristics**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Unit | Maximum | Minimum |
| Liquid Type  | Treated oily water |
| Vapour pressure | Kpa(a) | 71 | 47 |
| Relative density |  | 1.005 |  |
| Specific heat | KJ/(KG\*K) | 0.015 |  |
| Viscosity | mPa·s | 0.000656 |  |
| Corrosion due to  | Cl**ˉ** H2S |
| PH |  | 5.9 |  |
| Total suspended solids | Mg/l | ≤5 |  |
| Mid. Particle size | µm | ≤3 |  |
| Max particle size | µm | ≤10 |  |
| H2S concentration | ppm | 30 |  |
| Chloride concentration | ppm | 149413 |  |
| Oil content | ppm | ＜10 |  |

**2.3 Installation Environment:** Outdoor

**2.4 Data Sheet and Related drawing**

|  |  |  |
| --- | --- | --- |
| 1 | CMIT-712-INS-15 03-5006\_0 | DATA SHEET FOR FLOWMETER |
| 2 | CMIT-712-INS-15.03-5001\_B | SPECIFICATION FOR GENERAL INSTRUMENT |
| 3 | CMIT-712-PRO-15.01-5102\_B\_P&ID | Typical Water Injection Manifold(BU-36) for BU Area |

The drawing and data sheet list in the table are in the appendix of this technical part.

##  Standard and Code

The laboratory calibration of flow meters should according to EN45001 or ISO 17025 standards, and with strictly CE marking, have strictly EMC laboratory and material testing laboratory, in strictly accordance with the standard of EU pressure equipment.

Quality management system: ISO9001

Flange and fitting: ASME, ASMT

Industrial analog signal: ISA S50.1

Instrument Protection: IEC 529

Manufacturer Standard

## Scope of Supply

The Vendor’s scope of supply shall include, but not limited to the following items and services:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Item** | **Description** | **Piping Diameter** | **Normal Flow rate (m3/h)** | **Operation Pressure** **(Mpag)** | **Number (set)** |
| 1 | Electromagnetic Flow meter | 6” | 73-100m3/h | 22 | 10  |
| 2 | Electromagnetic Flow meter | 6” | 100m3/h | 1 | 1 |

* **The bidders are required to recommend and supply flow meters model which shall fully meet upper conditions and datasheet requirement**, other better proposals from bidders are acceptable but must be approved by company. The flow meters to be supplied must be brand new.
* All installation mated flanges, flange gaskets, bolts, nuts, washers and other accessories shall be supplied by vendor.
* Inspection and testing as specified in the Inspection & Testing Plan
* Packing, protection & preservation for transportation and storage.
* Provide vendor documentation as specified.
* Special tools for flow meters handling and transportation (if any).
* Spare parts for commissioning and two years normal running (bidder recommend).
* The flowmeters should be from: Emerson, Krohne, E+H, Siemens, Yokogawa.
* The origin should be West Europe, Germany, Switzerland, USA or Japan.

## Technical Requirement

* + The flow meters should be compact style.
	+ The material should be suitable for the high Cl- and H2S fluid.
	+ The material that not be specified in the DATA SHEET could be in accordance with the manufacturer standard, but must fit in the operation condition.
	+ Local backlit LCD display with pushbutton, current and accumulated value display
	+ Self diagnostics function.
	+ Work voltage 24VDC, output signal 4-20mA, HART
	+ Adjustable zero point and measurement range
	+ Explosive proof rating: ExdⅡCT4.
	+ Measurement accuracy:≤0.5%
	+ The name plate material should be 304 stainless steel and with manufacturer name, brand, model, range and etc. on it, the nameplate should be fixed on the flow meters.
	+ The flow meters body should have the permanent flow direction symbol
	+ Other requirement not mentioned above or in datasheet according to the manufacturer standard.

## Quality Assurance, Inspection &Testing

* 1. **Quality Assurance**

The Vendor shall maintain and use a Quality System which is based on ISO 9001 to control the work. If the Vendor selects sub-contracts for part of the work, he shall ensure that only those subcontractors or Vendors are used who can demonstrate that they operate Quality Systems based on ISO 9001 or ISO 9002 as applicable. The Vendor shall give his sub-contractors or Vendors assistance in attaining the required standard, if necessary. This shall not relieve the Vendor of his responsibility for the quality of the finished work. Company reserves the right to audit the Vendor’s Quality System.

**6.2 Inspection and Testing**

Inspection and testing shall meet the requirements of the Company’s Specification for Quality Assurance.

The responsibility for quality control and inspection rests with the Vendor; however, Company may inspect the materials, fabrication, assembly and testing of the item during all phases of the work.

Inspection and testing shall be done by Vendor and some tests will be witnessed by Company or his representatives if required.

Company reserves the right to inspect each item. Company, at its discretion, may additionally nominate authorized inspection agency. The responsibility for inspection, certification, etc. of all materials, parts etc. lies with the Vendors.

All flow meters should be calibrated in laboratory of factory before leave the factory and the vendor should submit the calibration certificate.

100 percentage Hydraulic Test and performance test shall be certified by Third Party Inspection. The third party inspection must be chosen from below list approved by Iraq government:

|  |  |
| --- | --- |
| S/N | TPI Companies |
| 1 | LIoyd’s Register EMA |
| 2 | Bureau Veritas of France |
| 3 | Intertek Group PLC |
| 4 | TUV Rheinland Middle East FZE |
| 5 | DNV |

All items shall be inspected for compliance with:

* Applicable Codes, standards and specifications, which shall also include sub-referenced standards therein.
* Test and Inspection Plans produced by the Vendor.

Inspectors have the right to request additional inspections or tests to ensure that the item complies with this requisition and all relevant codes and standards.

Any acceptance or release of item following an inspection or test activity shall in no way relieve the Vendor of his responsibility to provide guarantees as to the suitability of the materials, workmanship and performance of the item in accordance with this requisition.

## Guarantee:

The guarantee period is one (1) year from the date the flow meter is put in operation, or eighteen (18) months from date flow meter achieve delivery, whichever comes first.

The Vendor shall guarantee the flow meters performance when operated at the conditions specified herein. The Vendor shall specifically state the limits in the process guarantee, in terms of variance from design composition, in his proposal. The guarantee will include the following essential elements as a minimum:

* Flow meters shall meet the stated product quality specifications.
* The Vendor will warrant the item to be free of defects in material and workmanship, and that it is of adequate size and capacity to fulfill the design and operating conditions specified herein.
* The Vendor shall replace and install without cost to Company any materials, supplies or items which fails under design conditions due to defects in material or workmanship if the defect is observed and/or such failure occurs within guarantee period, the Vendor shall replace and install without cost to Company any materials, supplies or item involved.
* In guarantee period, any required modifications, inspection/test or additions to correct any deficiencies will be completed in the field location of Iraq. If it’s necessary that the modification or maintenance to be carried out in factory, all the cost should be borne by vendor.
* Acceptance of this order will signify acceptance of all conditions of this guarantee.

## Document

The vendor shall submit all completion and handover documents in ENGLISH according to Company’s request instruction; the follow document list is for your information.

8.1 In the bidding document the tenderers should supply the ISO9001 certificate of manufacture, detailed data, size, material, mated flange and other accessories, specification and standards.

8.2 After the award of contract, vendor should delivery the detailed design documents to Company for system design(3 sets of electronic format in CD-ROM, 5 sets of paper format) within one week, include but not limited as following contents: the connection piping size, mated flange and fasteners, various standards and specification, weights and other requirements.

8.3 All other documents for Company design, installation, operation and maintenance

8.4 Delivery attached documentation includes the quality certificate, material certificate, test report, calibration report and certificate, third part inspection report and certificate, installation, operation &maintenance manual. (1 set for each flow meter) should be delivered with the flow meters.

## Transport and protection

The vendor must take into considerations that all flow meters shall be prepared for ocean shipment and storage for extended periods outside in an ocean environment. Care must be taken to protect the products from external attack by the elements and from the impact of moisture and humidity.

Adoption of suitable packing methods and materials is at the sole discretion of the Vendor, and should any loss, damage and/or deterioration be caused due to improper packing, the consequences shall be the responsibility of the Vendor.

Vendors shall indicate the requirements of protection for flow meters shipment, storage at site and installation during construction.

##  Delivery Schedule

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Milestone No.** | **Milestone Description** |  |  |  |  | **Scheduled Date**  |
| Milestone 1 | Contract Date |  |  |  |  | Contract Effective Date |
| Milestone 2 | The first batch(6 sets 1500LB flow meters) delivered in UMM QASR PORT or CNOOC’S Camp |  |  |  |  | 4 months after Contract Effective Date |
| Milestone 3 | The second batch(4 sets 1500LB flow meters and 1 set 150LB flow meters) delivered in UMM QASR PORT or CNOOC’S Camp | 8 months after Contract Effective Date |