TESTING, HEALTH ASSESMENT AND CALIBRATION OF FIELD INSTRUMENTS

AT

LPG AIR MIX PLANT - KOT GHULAM MUHAMMAD (SINDH),

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TERMS OF REFERENCE

1 INTRODUCTION

SSGC's LPG Air mix plant located at Kot Ghulam Muhammad, having a capacity of 100 MMBtu/hr, was commissioned in 2010. The plant is equipped with an existing Siemens SIMATIC S7-300 based automation and control system.

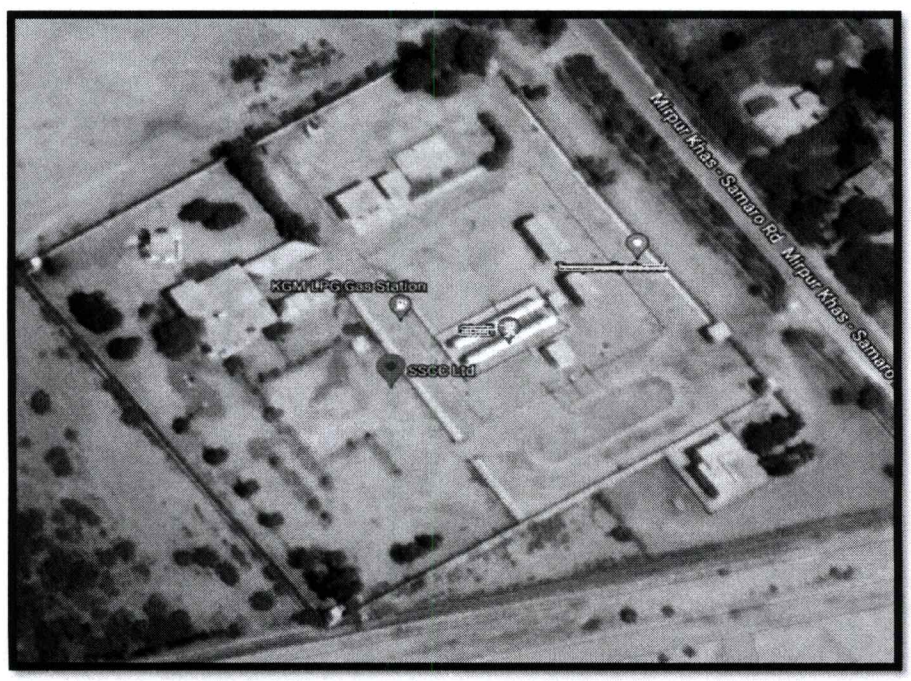
SSGC intends to engage the services of an experienced, qualified and professional contractor/service provider for **testing, health assessment, calibration, functional checking and instrument-side troubleshooting of the specified field instruments** installed at the LPG Air Mix Plant, Kot Ghulam Muhammad.

The assignment is intended to assess the operational condition of the field instrumentation and restore the instruments to their intended operational condition

2 LOCATION OF THE PLANT SITE:

LPG air mix plant Kot Ghulam Muhammad

- Co-ordinates: 25.29348, 69.25333
- Location: District Mirpur Khas, Sindh



Google map location of LPG air mix plant Kot Ghulam Muhammad

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3 SCOPE OF WORK

The scope of work shall primarily comprise inspection, testing, health assessment, calibration, loop/functional checking and instrument-side troubleshooting of the specified field instruments installed at LPG Air Mix Plant, Kot Ghulam Muhammad.

3.1 Testing, Health assessment and Calibration of field instruments

The Contractor/Service Provider shall:

(i) Conduct a comprehensive physical inspection of the specified field instruments and associated instrument-side cabling, connections, fittings and accessories to assess their existing physical and operational condition.
(ii) Assess & troubleshoot the health of the field instruments for restoring it to its original operational condition.
(iii) Carry out instrument-side loop continuity and functional checks, as applicable, to establish that the field instrument signals are being transmitted correctly through the existing field wiring.
(iv) Check the current operational status of the instruments and testing of the instruments listed in the BOQ.
(v) The Contractor shall inspect, identify and rectify, the existing field-side connections, including PROFIBUS PA field cabling, field-side wiring, and associated terminations, where applicable, to identify physical connection, continuity or instrument-side faults.
(vi) Where on-site troubleshooting is not sufficient, the Contractor shall, with prior approval of SSGC, carefully dismantle the affected instrument(s), transport them to its own workshop/laboratory and carry out detailed inspection, diagnostic testing and calibration. Any repair or replacement requirement shall be reported to SSGC for replacement of defective instrument, if required.
(vii) After completion of all repair and restoration activities, the Contractor shall carry out comprehensive functional testing of instruments operating correctly in accordance with the original plant design and intended operational requirements.

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3.2 **Making the LPG air mix plant system work**

The contractor is responsible for making the entire control loop / system operational, which shall include:

3.2.1 Air Flow Stream and Control Valve

(i) The service provider will ensure all the operational aspects of airflow stream as per the drawing – 1.

(ii) The Contractor shall perform instrument-side testing, calibration, functional checking and troubleshooting of the instruments and associated field-side connections.

3.2.2 LPG Vapour Flow Stream

(i) The service provider will ensure all the operational aspects of LPG vapor flow stream as per the drawing – 1.

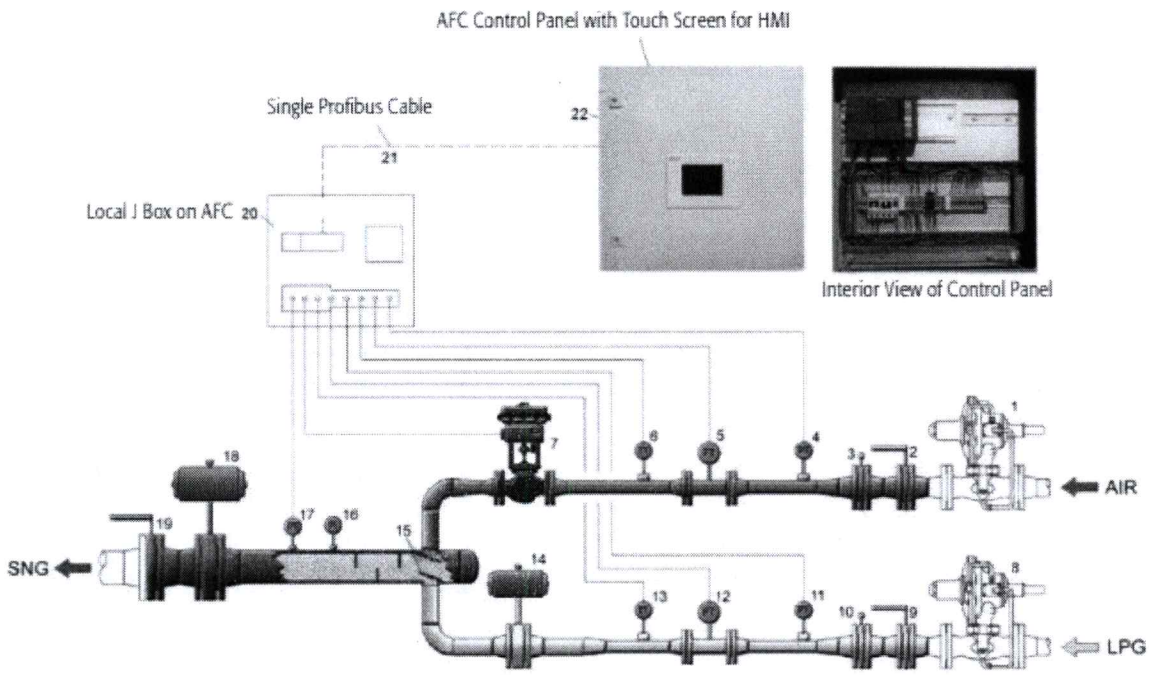
(ii) The Contractor shall perform instrument-side testing, calibration, functional checking and troubleshooting of the instruments and associated field-side connections on LPG vapour flow stream.

3.2.3 The SNG Blender / Mixer

(i) The Contractor shall perform instrument-side testing, calibration, functional checking and troubleshooting of the instruments and associated field-side connections on SNG blender and the SNG stream as per drawing - 1.

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Drawing - 1



1 8 **Pressure Regulators** *(Not provided)*

2 9 **Butterfly-type Isolation Valve**

3 10 **Wafer-type Back Flow Check Valve**

4 11 **Pressure Transmitters** *(Pressure correction of the flow data)*

5 12 **Flow Meters**

6 13 **Temperature Sensor [RTD]** *(Temperature correction of the flow data)*

7 **Air Flow Control Valve** *(Controls air flow based on flow and control parameters)*

14 **LPG Vapor Automatic Safety Valve** *(Pneumatically opens – spring close; Valve closes where there is a safety violation)*

15 **Turbulators** *(Internal to header)*

16 **Pressure Indicator** *(Displays mixed gas discharge pressure)*

17 **Pressure Transmitter** *(Provides mixed gas discharge pressure signal to the control system)*

18 **SNG Discharge Safety Valve** *(Pneumatically opens – spring close; Valve closes when there is a safety violation)*

19 **Butterfly-type Isolation Valve**

20 **Local Explosion-proof Junction Box** *(Mounted on the AFC Blender)*

21 **Profibus Cable** *(Single cable link from the AFC Junction Box to the Control Panel)*

22 **Control Panel** *(With "Touch Screen;" Operator-friendly and compact)*

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4 OBLIGATIONS OF CONTRACTOR / SERVICE PROVIDER

The contractor shall be obliged to:

(i) Maintain the confidentiality of all information, data, drawings, documents and deliverables obtained during the execution of the work and shall not share any part thereof with any other person or firm without prior written approval of SSGC.

(ii) Check the relevant field-side electrical supply and instrument connections and rectify field-side faults, where required, to enable the specified field instruments to function properly.

(iii) Ensure that all safety precautions are followed in accordance with applicable industry practices, statutory requirements and relevant safety standards while carrying out the work at the LPG Air Mix Plant.

(iv) In case of any damage caused to any equipment, accessory, ancillary, instrument or other plant property which is operational, functional or otherwise outside the scope of repair/replacement, the Contractor/Service Provider shall be solely responsible for such damage and shall provide the necessary replacement, installation and/or repair to restore the affected item to its original condition, at no additional cost to SSGC.

(v) Arrange all necessary tools, testing/calibration equipment, instruments, manpower, transportation, PPE and other resources, along with qualified and experienced personnel, required for execution of the onsite and workshop activities.

(vi) Coordinate the execution of work with SSGC's designated representative to minimize disruption to plant operations. No instrument shall be dismantled or removed from the plant without prior approval of SSGC.

(vii) The LPG Air Mix Plant is operated for SNG supply to customers on a daily basis and any unnecessary shutdown or isolation may interrupt gas supply. Accordingly, the Contractor shall plan and execute the work in consultation with SSGC and shall advise the requirement for dismantling, isolation or shutdown of any instrument only where such action is necessary and unavoidable.

(viii) SSGC shall not be liable to pay any levies, taxes, expenditures, payments or other charges except those specifically included in the Bill of Quantities (BOQ) section of the tender.

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5 COMPLETION TIMELINE

Time for completion of the work against the entire job is **45 days** after the issuance of Letter to Proceed.

The Contractor shall prepare its work schedule in consultation with SSGC and shall coordinate the execution of activities with the plant representative to minimize any impact on ongoing plant operations.

6 PAYMENT SCHEDULE

(i) SSGC shall not make any mobilization or advance payment.

(ii) Payment shall be made after successful completion of the work, and acceptance of the completed work by SSGC to its satisfaction.

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8 TECHNICAL EVALUATION CRITERIA

The bidder shall meet the following minimum technical requirements:

(i) The bidder shall nominate a Project Manager/Focal Person, who shall be a PEC-registered Engineer having adequate experience, preferably more than seven (07) years, in the field of instrumentation and control within the Oil & Gas/Petroleum/LPG industry. The bidder shall submit the CV of the proposed Project Manager/Focal Person along with the bid.

(ii) The bidder shall have at least two (02) Diploma of Associate Engineers (DAEs), among its proposed technical personnel. At least one (01) shall be from Electronics / Instrumentation & Control / Electrical discipline and at least one (01) shall be from Process / Mechanical discipline, each having adequate experience, preferably more than five (05) years, in process instrumentation and control within the Oil & Gas/Petroleum/LPG industry. CVs of the proposed personnel shall be submitted along with the bid.

(iii) The bidder/firm shall have relevant experience during the last five (05) years in testing, calibration, health assessment, functional checking and troubleshooting of process instrumentation, control valves, valve positioners, transmitters, flow meters, temperature instruments and associated field instrumentation in the LPG, Petroleum or Oil & Gas sector. The bidder shall submit documentary evidence in the form of relevant Work Orders/Purchase Orders/Completion Certificates or equivalent documents demonstrating such experience.

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7 BILL OF QUANTITY

Sr. No.	Description of Work	UOM	Qty.	Unit Price (Rs.)	Total Value (Rs.)
01	**Testing, health assessment, calibration and instrument-side functional checking / troubleshooting of the following field instruments, including associated field-side connections / wiring, as applicable, in accordance with the Scope of Work:**	Job Pkg	01		
	a) SNG Control Valve (01 No)				
	b) Air Control Valve (01 No)				
	c) Vapor Control Valve (02 Nos.)				
	d) Valve Positioners (03 Nos.)				
	e) Pressure Transmitters (03 Nos.)				
	f) Temperature Sensors (02 Nos.)				
	g) Flow meters (02 Nos.)				
TOTAL AMOUNT:					