



# **M/s Andhra Pradesh Gas Distribution Corporation Ltd. (APGDC)**

A Joint Venture Company between GAIL Gas Limited (a wholly owned subsidiary of GAIL (India) Ltd.), a Central Government Public Sector Enterprise (PSU) and APGIC, an Andhra Pradesh State Government Public Sector Enterprise  
Kakinada

## **KAKINADA-SRIKAKULAM PIPELINE PROJECT (PHASE-I)**

**CORRIGENDUM # 2**

**PROCUREMENT  
OF**

**USM / TURBINE BASED METERING SKID**

**OPEN INTERNATIONAL  
COMPETITIVE BIDDING**

***E-Tender ID: 140042***

***Bid Document No.: 05/51/23QC/APGDC/030***



**PREPARED AND ISSUED BY**

**MECON LIMITED**

(A Govt. of India Undertaking)

Delhi, India



Andhra Pradesh Gas Distribution Corporation Ltd.

CORRIGENDUM #2

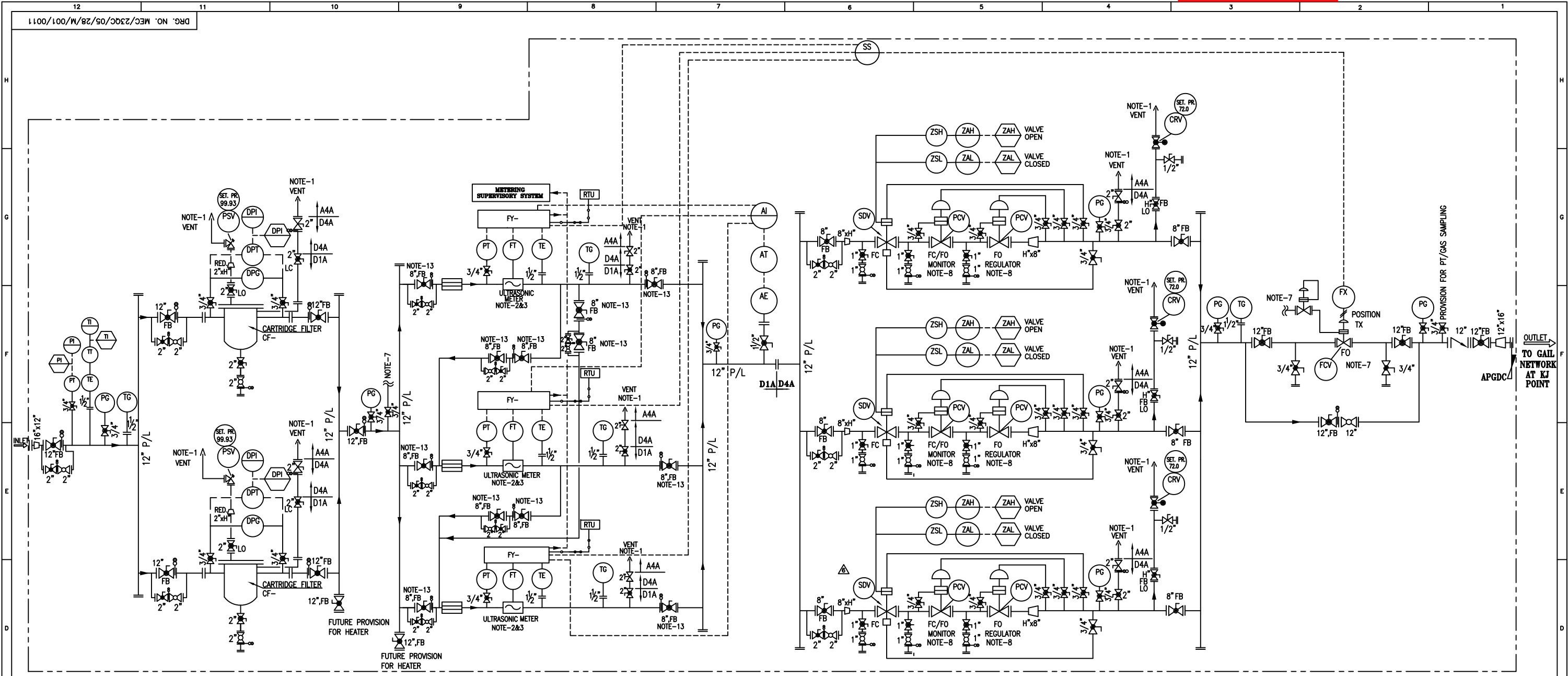
For  
**PROCUREMENT OF METERING SKIDS**  
 For  
**KAKINADA-SRIKAKULAM PIPELINE PROJECT (PHASE-1)**  
 Tender No. 05/51/23QC/APGDC/030 (E Tender No. 140042)



MECON LIMITED

Date: 25.09.2017

Sl. No.	Description	Volume	Page No.	Clause / Para / Section	Amendment / Addition / Modification / Deletion	
1	P&ID	II of II	213 of 633	-	Modification	Revised P&ID of KJ Point is attached as annexure-1 to the corrigendum.
2	Datasheet of Diff. Pressure Gauge	II of II	-	-	Addition	Datasheet of Diff. Pressure Gauge is attached as annexure-2 to the corrigendum.
3	Datasheet of Check Valve, Globe Valve, Ball Valve	II of II	-	-	Addition	Datasheet of Check Valve, Globe Valve, Ball Valve (7 nos. sheets) is attached as annexure-3 to the corrigendum.
4	MATERIAL REQUISITION	II of II	4 of 633	GROUP - C	Addition	LEL Detection System is in bidder's scope and specification attached with tender document shall be followed.
5	Heater Element	II of II	122 of 633	Clause no. 6.1	Deletion	The statement " the outer sheath of the heating elements shall be of alloy 800" stands deleted.
6	DATA SHEET FOR ELECTRIC PROCESS HEATER and CONTROL PANEL	II of II	111 of 633	Clause no. 23	Modification	The statement "20% of the (number) of Elements to be provided as unconnected spares" is modified to "3 nos. as spare".
7	ANNEXURE – V (APPROVED VENDOR LIST)	II of II	232 of 633	-	Addition	Following is added : "Suggested Vendors for DPG : 1) M/s AN Instruments Pvt. Ltd., New Delhi 2) M/s General Instruments Ltd., Mumbai 3) M/s WIKA"
8	MANDATORY SPARES	II of II	41 of 633	Clause no. 13.1	Addition	Following is added : "1 set of "Sensor Transducer assembly" is required for USM as Mandatory spare with each USM skid."
9	Reply to Pre Bid Queries	Clarification				The reply of pre bid queries is attached as Annexure-4 with this Corrigendum .
10	Date and time for submission of bid	I of II	5	1.9	Modification	Date and time for submission of bid for subject tender stands modified to: <b>"Upto 1400 hrs. (IST) on 10.10.2017"</b> Due Date & Time stated in cut-out slip shall stand modified to the above extent.
11	Date and time of opening of Un-priced Bids	I of II	5	1.10	Modification	Date and time of opening of Un-priced Bids for subject tender stands modified to: <b>"At 1500 hrs. (IST) on 10.10.2017"</b>
<b>All other terms and condition shall remain unchanged.</b>						



**CONSUMER'S DETAILS/PROCESS DATA**

**METERING SKID- (AT KJ POINT)**

CONSUMER	FLOW (MMSCMD)	ACTUAL PRESSURE Kg/Cm <sup>2</sup> (g)	REQUIRED OUTLET PRESSURE Kg/Cm <sup>2</sup> (g)	TEMPERATURE(DESIGN) UPSTREAM OF PCV AS MARKED	TEMPERATURE(DESIGN) DOWNSTREAM OF PCV AS MARKED	DESIGN PRESSURE	DESIGN CLASS
KG BASIN GAIL NETWORK	6.0	86-90	72	-29° TO 65°C	-45° TO 65°C	99.93 Kg/Cm <sup>2</sup> (g)	600#

- NOTES:**
1. ALL VENTS SHALL BE LOCATED MIN. HEIGHT OF 3 MTR. ABOVE THE HIGHEST OPERATING LEVEL.
  2. METERING SHALL BE DONE BY ULTRASONIC FLOW METER WITH CONTROL PANEL MOUNTED FLOW COMPUTER. INSTALLATION SHALL BE AS PER AG99 LATEST EDITION. HOWEVER THERE SHALL BE THREE STREAMS OF METERING (2W+1S).
  3. ENVIRONMENTAL ENCLOSURE REQUIRED FOR METERING INSTRUMENTS. INSULATION OF USM METER RUN & IMPLUSE LINES OF METERING INSTRUMENT IS REQUIRED.
  4. PROVISION SHALL BE KEPT TO HOOK UP INLET & OUTLET PR. & TEMP., FLOW PARAMETERS WITH SCADA. HOWEVER SCADA IS NOT IN THE SCOPE OF METERING SKID VENDOR.
  5. ALL BALL VALVES 2" & ABOVE SHALL BE TRUNION MOUNTED ONLY.
  6. ALL BALL VALVES BELOW 2" SHALL BE FULL BORE ONLY.
  7. FCV SHALL BE GAS ACTUATED & GAS TAPPING FOR ACTUATION OF FCV SHALL BE BEFORE METERING.
  8. SDV SHALL BE OF SLAM SHUT VALVE & SHALL BE CLOSED IN EVENT OF HIGH PRESSURE DISCHARGE FROM PRESSURE CONTROL VALVE.
  9. ALL DRAIN SHALL BE CONNECTED SECTIONWISE (FILTR, METER & PCV ETC.)
  10. MAX. VELOCITY FOR METER SHALL BE 20 mtr./sec.
  11. 20D UPSTREAM SHALL BE MAINTAINED FOR GC SAMPLE POINT.
  12. NO. & RATING OF PSV's AND CRV's TO BE DECIDED DURING DETAILED ENGINEERING.
  13. ALL ULTRASONIC METERING VALVES SHALL BE PROVIDED WITH LIMIT SWITCHES.
  14. SKID SHALL BE SYMMETRIC ACROSS CENTRE LINE.
  15. METERING SKID FACILITY HAS BEEN DESIGNED FOR 6 MMSCMD CAPACITY WITH 2W+1S SCHEME (FOR METERING & PRS FACILITY) AS DECIDED BY M/S APGDC.

**VALVE LEGEND**

	BALL VALVE FLANGE END
	BALL VALVE BW END/UP TO 1/2" SW END.
	PLUG VALVE BW END/UP TO 1/2" SW END.
	PLUG VALVE FLANGE END
	GLOBE VALVE.


QUANTITY-01 NO.

		<b>ANDHRA PRADESH GAS DISTRIBUTION CORPORATION LTD</b>	
		मेकॉन लिमिटेड	
		<b>MECON LIMITED</b>	
SECTION	OIL & GAS (LDP)	KAKINADA - SRIKAKULAM GAS PIPELINE PROJECT (PHASE-1)	
LOCATION	DELHI		
DESIGNED	UMAR		
DRAWN	UMAR		
CHECKED AND VERIFIED	A.K.B	<b>P &amp; ID OF METERING SKID FOR KG BASIN GAIL NETWORK</b>	
SIG	(A.K.JHA)	SCALE : NTS	REV
DATE	12.02.2015	DRG. NO. MEC/23QC/05/28/M/001/0011	6

REV.NO	DATE	ZONE	DESCRIPTION	BY	VERIFIED
12.09.17			REVISED AS PER PRE-BID QUERY	UMAR	A.K.B
29.09.16			GENERAL REVISION	UMAR	A.K.B
06.09.16			APGDC COMMENTS	UMAR	A.K.B
28.07.16			APGDC COMMENTS	UMAR	A.K.B
27.07.16			APGDC COMMENTS	UMAR	A.K.B
20.07.16			APGDC COMMENTS/GENERAL REVISION	UMAR	A.K.B

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REV	INST.	CONCURRED BY
12		
11		
10		
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1		

DIFFERENTIAL PRESSURE GAUGES								
UNITS : Flow > Liquid - m <sup>3</sup> /hr , Gas-SCMH , Steam - kg/hr. Pressure -> Bar(g), Temperature-°C, Level/ Length-> mm								
1. Type : Direct				13. Connection : ½" NPTF Connection Location : Side/ Bottom				
2. Mounting : Local/ Surface				14. Movement : SS 304				
3. Dial Size : 150mm Colour : White with Black Numerals				15. Diaphragm Seal Type Wetted Part Material Process Conn. Size & Rating Facing and Finish Capillary Material Flushing/ Filling Connection				
4. Case Material : SS 316				16. Over range protection : Maximum static pressure				
5. Bezel Ring : Screwed				17. Blow out protection : Required				
6. Window Material : Shatterproof Glass				18. Options a. Snubber b. Gauge Saver c. Siphon d. Liquid Filled Casing e. Vacuum Protection				
7. Enclosure : Weatherproof to IP55				19. <b>Make &amp; Model:</b>				
8. Pressure Element : Diaphragm								
9. Element Material : SS 316								
10. Socket Material : SS 316								
11. Accuracy : ± 1.5% of FSD or Better								
12. Zero Adjustment : Micrometer Pointer								
Tag No.	Range	Operating Pressure	Maximum Service Pressure	Maximum Service Temperature	Fluid	Service	Options	Qty.
DPG - ***	0-2	***	***	***	NATURAL GAS	***	**	***
<b>Notes:</b> * By Vendor ** with 5-way manifold *** As per P & ID 1 Tapings (3/4" sw) for the DPG connections shall be provided on the inlet and the outlet nozzle of the gas filters. 2 Differential Pressure Gauge shall be suitable for the maximum static pressure in both the legs. 3 Make : As per Approved Vendor List of MECON/Client enclosed in the Tender. 4 Above data sheet is typical for all the DPGs used in the respective P&IDs. Vendor shall submit the individual data sheet of each DPG.								
0	DATASHEET OF DIFFERENTIAL PRESSURE GAUGES					 MECON LTD. DELHI		
REV. NO.	METERING SKID					DS No: MEC/ 05/E5/DS/DPG -01		

**DATA SHEET FOR CHECK VALVE**

1.0 Valve Manufacturer : \_\_\_\_\_

2.0 Service : \_\_\_\_\_

3.0 Valve Size (NB), mm (inch) : \_\_\_\_\_ ANSI Rating : **300#** Design Standard : **API 6D**

4.0 MECON's Technical Specification No. : **MEC/TS/05/62/004,Rev-2**

5.0 Connecting Pipeline Design Pressure, bar : **49 kg/cm2** Design Temperature, °C : **-45°C to + 65°C**

6.0 **Connecting Pipe Specification** :

6.1 Material : \_\_\_\_\_

6.2 Diameter (OD), mm (inch) : \_\_\_\_\_

6.3 Thickness, mm : \_\_\_\_\_

7.0 **Valve Construction Design**

7.1 Type : \_\_\_\_\_

7.2 End Connections : **Flanged both ends**   
**Butt Weld both ends**   
**Flanged one end, butt weld other end**   
**Socket Weld as per ASME B 16.11**

7.3 Flanges (wherever applicable) : a) RF  FF  RTJ  NA   
b) Serrated  Smooth (125 to 200 microinches AARH)  NA

8.0 **Valve Material Specification**

Part	Specified Material	Material Offered (Equivalent or Superior)
8.1 Body	ASTM A352 Gr. LCB/ A 350 GR. LF2	
8.2 Cover	ASTM A352 Gr. LCB/ A 350 GR. LF2	
8.3 Disc/ Plates	SS316/ ASTM A352 Gr. LCB / A 350 GR. LF2 + Stellite	
8.4 Body Seat Rings (See Note-3)	SS316/ ASTM A352 Gr. LCB / A 350 GR. LF2 + Stellite	
8.5 Disc Hinge	SS316/ ASTM A352 Gr. LCB / A 350 GR. LF2	
8.6 Hinge Pin	SS 316 (No casting) / A 350 Gr. LF2	
8.7 Cover Stud Bolts	ASTM A320 Gr.L7	
8.8 Nuts	ASTM A194 Gr.4	
8.9 Cover Gasket	SS 304/316 Spiral Wound with Grafoil	
8.1 Spring	Inconel X-750	

9.0 Corrosion Allowance : **1.5 mm**

10.0 Location : Above Ground  Buried

11.0 Stem Extension Requirement : Yes  No

12.0 Gear Operator Requirement : Yes  No

13.0 Gas Powered Actuator Requirement : Yes  No

14.0 Fire Resistant Design Requirement : \_\_\_\_\_

15.0 **Valve Testing Requirement**

	Test Pressure (min.), kg/cm2(g)	Minimum Duration, minutes
15.1 Hydrostatic Test		
Body	<b>76</b>	<b>As per API 6D</b>
Seat	<b>57</b>	<b>As per API 6D</b>

16.0 **Valve Painting Specification**

i) Surface preparation by Short Blasting as per grade SA 2 1/2, Swedish Standard SIS-055 909.

ii) For above ground installation-Three coats of corrosion resistant paint shall be applied with minimum thickness of 300 micron (Permissible thickness in each coat shall be within 80 to 120 micron).

17.0 Lock Open/ Lock Close Requirement : **N.A.**

**Notes:**

1. This Valve Data Sheet shall be read in conjunction with MECON's Technical Specification No. MEC/TS/05/62/004,Rev-2.
2. Inspection and Testing shall be as per approved QAP, this Data Sheet, MECON's Technical Specification No. MEC/TS/05/62/004,Rev-2, API 6D, BS EN 12266 and other relevant standards.
3. Seats shall be non-renewable integral type.
4. 5% of valves shall undergo radiographic examination.
5. Bidder shall clearly write all/ any deviation against each part/ material of valve in the space provided for .  
Wherever bidder agrees with MECON's data sheet, bidder shall clearly indicate "agreed".
6. Charpy 'V' notch test on each heat of base material shall be conducted for all pressure containing & controlling parts such as body, bonnet, stem, disc, body seat, end flange, welding ends as well as the bolting material as per relevant material code.
7. Hardness test shall be carried out as per relevant material code
8. Painting procedure of the valves shall be as per Manufacturer's Standard.
9. Material Test Certificates and Hydro Test Reports shall be furnished prior to dispatch.

REV. NO.	DATE	ZONE	DESCRIPTIONS	BY	APPRD	REFERENCES	DRG. NO.														
REVISIONS						REFERENCES															
SECTION PROCESS & PIPING				CLIENT :		 <b>MECON LIMITED</b>															
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 10%;">NAME</th> <th style="width: 10%;">DATE</th> <th style="width: 10%;">CHKD</th> <th style="width: 10%;">DATE</th> </tr> <tr> <td>DSGN</td> <td>PM</td> <td>25.04.12</td> <td>AKJ</td> <td>25.04.12</td> </tr> <tr> <td>DRWN</td> <td></td> <td></td> <td></td> <td></td> </tr> </table>				NAME	DATE			CHKD	DATE	DSGN	PM	25.04.12	AKJ	25.04.12	DRWN					PROJECT :	
NAME	DATE	CHKD	DATE																		
DSGN	PM	25.04.12	AKJ	25.04.12																	
DRWN																					
APPROVED				O. P. JAIN		<b>DATA SHEET FOR CHECK VALVES</b> <b>(NB ≥ 2")</b>															
						SCALE :	REV														
						DATA SHEET NO.: MEC/WINO/05/28/M/001/DS/CV/79	0														

**DATA SHEET FOR GLOBE VALVES**


1. Valve Manufacturer : \_\_\_\_\_
2. Size : \_\_\_\_\_ Rating : ANSI 300# Design Standard : BS:1873
3. Purchaser's Specification : **Refer Technical notes for Gate & Globe Valves**
4. Design Pressure : **49 kg/cm<sup>2</sup>(g)** Design Temperature : **-29°C to + 65°C**
5. Corrosion Allowance : **1.5mm** Service : \_\_\_\_\_
6. End Connections : Flanged both ends as per ASME B 16.5   
 Butt Weld both ends as A-16.25   
 Flanged one end butt weld other end   
 Socket weld both ends as per ASME B16.11
7. Flanges (where applicable) : a) RF  FF  RTJ   
 b) Serrated  Smooth (125 to 200 AARH)
8. Connecting Pipe Specification : \_\_\_\_\_
9. Valve Material Specification :

	Part	Material	Material Offered (Equivalent or Superior)
9.1	Body	ASTM A 216 Gr.WCB	
9.2	Bonnet (Bolted)	ASTM A 216 Gr.WCB	
9.3	Stem (Rising)	13% Cr. Steel (No Casting)	
9.4	Disc(Loose Plug/Ball Type)	(ASTM A 216 Gr. WCB + 13% Cr Steel Facing) / 13% Cr Steel (Stellited)	
9.5	Body Seat Ring	ASTM A 216 Gr. WCB+13% Cr Steel Facing (Stellited)	
9.6	Stem Packing (Renewable with valve open on stream)	Corrosion inhibited die formed flexible graphite with braided anti extrusion rings	
9.7	Hand Wheel (Rising)	Malleable Iron/ Cast Steel/ Fab. Steel	
9.8	Bonnet Bolts	A 193 Gr. B7	
9.9	Bonnet Nuts	A194 Gr. 2H	
9.10	Bonnet Gasket	Spiral Wound SS 316 + Grafoil	

10. Hydrostatic Test Pressure  
 a) Body : **76 kg/cm<sup>2</sup>(g)**  
 b) Seat : **57 kg/cm<sup>2</sup>(g)**
11. Pneumatic Test Pressure with Air : **5.6 - 7 kg/cm<sup>2</sup> (g).**
12. Painting Specifications:  
 i) Surface preparation by Short Blasting as per grade SA 2 1/2, Swedish Standard SIS-055 909.  
 ii) For above ground installation-Three coats of corrosion resistant paint shall be applied with minimum thickness of 300 micron ( Permissible thickness in each coat shall be within 80 to 120 micron).

**Notes:**

- Valve specification sheet shall be read in conjunction with technical notes for Gate and Globe valves.
- Valve shall be designed for intrinsically fire safe.
- Testing shall be as per BS EN 12266-1, approved QAP, this specification and other relevant standards.
- Bidder shall clearly write all/ any deviation against each part/ material of valve in the space provided for .  
Wherever bidder agrees with MECON's data sheet, bidder shall clearly indicate "agreed".
- Charpy 'V' notch test on each heat of base material shall be conducted for all pressure containing parts such as body, end flange, welding ends as well as the bolting material as per ASTM A370. The test shall be conducted at 0°C. The minimum average absorbed energy per set of three specimen shall be 27 J with an individual minimum per specimen of 22 J.
- Hardness test shall be carried out on each heat of base material for all pressure containing parts of the valve. A full thickness cross section shall be taken for this purpose and the maximum hardness shall not exceed 248 HV10 based on minimum four measurements representing the entire thickness.
- Stem packing shall be renewable with valve open on stream .
- Painting procedure of the valves shall be as per Manufacturer's Standard.
- Material Test Certificates and Hydro Test Reports shall be furnished prior to dispatch.

REV. NO.	DATE	ZONE	DESCRIPTIONS	BY	APPRD	REFERENCES	DRG. NO.
SECTION PROCESS & PIPING							MECON LIMITED
	NAME	DATE	CHKD	DATE	CLIENT :		
DSGN	PM	25.04.12	AKJ	25.04.12	PROJECT :		
DRWN							
APPROVED O. P. JAIN						SCALE :	REV
DATA SHEET FOR GLOBE VALVES (NB≥2")						DATA SHEET NO.: MEC/WINO/05/28/M/001/DS/GV/78	0

**DATA SHEET FOR GLOBE VALVES**


1. Valve Manufacturer : \_\_\_\_\_
2. Size : \_\_\_\_\_ Rating : ANSI 300# Design Standard : BS:1873
3. Purchaser's Specification : Refer Technical notes for Gate & Globe Valves
4. Design Pressure : 49 kg/cm<sup>2</sup>(g) Design Temperature : -45°C to + 65°C
5. Corrosion Allowance : 1.5mm Service : \_\_\_\_\_
6. End Connections : Flanged both ends as per ASME B 16.5   
 Butt Weld both ends as A-16.25   
 Flanged one end butt weld other end   
 Socket weld both ends as per ASME B16.11  with 100mm pup pieces of A106 Gr. B Sch160
7. Flanges (where applicable) : a) RF  FF  RTJ   
 b) Serrated  Smooth (125 to 200 AARH)
8. Connecting Pipe Specification : \_\_\_\_\_
9. Valve Material Specification :

	Part	Material	Material Offered (Equivalent or Superior)
9.1	Body	ASTM A352 Gr. LCB/ A 350 GR. LF2	
9.2	Bonnet (Bolted)	ASTM A352 Gr. LCB/ A 350 GR. LF2	
9.3	Stem (Rising)	SS316 (No casting) / A 350 GR. LF2	
9.4	Disc(Loose Plug/Ball Type)	SS316 / ASTM A352 Gr. LCB / A 350 GR. LF2 + Stellite	
9.5	Body Seat Ring	SS316 / ASTM A352 Gr. LCB / A 350 GR. LF2 + Stellite	
9.6	Stem Packing (Renewable with valve open on stream)	Corrosion inhibited die formed flexible graphite with braided anti extrusion rings	
9.7	Hand Wheel (Rising)	Malleable Iron/ Cast Steel/ Fab. Steel	
9.8	Bonnet Bolts	ASTM A320 Gr.L7	
9.9	Bonnet Nuts	ASTM A194 Gr.4	
9.10	Bonnet Gasket	Spiral Wound SS 316 + Grafoil	

10. Hydrostatic Test Pressure  
 a) Body : 76 kg/cm<sup>2</sup>(g)  
 b) Seat : 57 kg/cm<sup>2</sup>(g)
11. Pneumatic Test Pressure with Air : 5.6-7 kg/cm<sup>2</sup> (g).
12. Painting Specifications:  
 i) Surface preparation by Short Blasting as per grade SA 2 1/2, Swedish Standard SIS-055 909.  
 ii) For above ground installation-Three coats of corrosion resistant paint shall be applied with minimum thickness of 300 micron ( Permissible thickness in each coat shall be within 80 to 120 micron).

**Notes:**

- Valve specification sheet shall be read in conjunction with technical notes for Gate and Globe valves.
- Valve shall be designed for intrinsically fire safe.
- Testing shall be as per BS EN 12266-1, approved QAP, this specification and other relevant standards.
- Bidder shall clearly write all/ any deviation against each part/ material of valve in the space provided for . Wherever bidder agrees with MECON's data sheet, bidder shall clearly indicate "agreed".
- Charpy 'V' notch test on each heat of base material shall be conducted as per relevant material code.
- Hardness test shall be carried out on each heat of base material for all pressure containing parts of the valve as per relevant material code.
- Stem packing shall be renewable with valve open on stream .
- Painting procedure of the valves shall be as per Manufacturer's Standard.
- Material Test Certificates and Hydro Test Reports shall be furnished prior to dispatch.

REV. NO.	DATE	ZONE	DESCRIPTIONS	BY	APPRD	REFERENCES	DRG. NO.
SECTION PROCESS & PIPING						 <b>MECON LIMITED</b>	
CLIENT :							
NAME	DATE	CHKD	DATE	PROJECT :			
DSGN	PM	25.04.12	AKJ	25.04.12			
APPROVED						SCALE :	REV
O. P. JAIN						DATA SHEET NO.: MEC/WINO/05/28/M/001/DS/GV/79	0
<b>DATA SHEET FOR GLOBE VALVES</b>							
<b>(NB ≥ 2")</b>							

**DATA SHEET FOR GLOBE VALVES**


1. Valve Manufacturer :
2. Size : Rating : ANSI **800#** Design Standard : **ISO 15761 / BS:5352**
3. Purchaser's Specification : **Refer Technical notes for Gate & Globe Valves**
4. Design Pressure : Design Temperature : **-29°C to + 65°C**
5. Corrosion Allowance : **1.5mm** Service :
6. End Connections : Flanged both ends as per ASME B 16.5   
 Butt Weld both ends as A-16.25   
 Flanged one end butt weld other end   
 Socket weld both ends as per ASME B16.11  with 100mm pup pieces of A106 Gr. B Sch160
7. Flanges (where applicable) : a) RF  FF  RTJ   
 b) Serrated  Smooth (125 to 200 AARH)
8. Connecting Pipe Specification : **N. A.**
9. Valve Material Specification :

	Part	Material	Material Offered (Equivalent or Superior)
9.1	Body	ASTM A 105	
9.2	Bonnet (Bolted)	ASTM A 105	
9.3	Stem (Rising)	13% Cr. Steel (No Casting)	
9.4	Disc(Loose Plug/Ball Type)	SS 316 + Stellite	
9.5	Body Seat Ring	SS 316 + Stellite	
9.6	Stem Packing (Renewable with valve open on stream)	Corrosion inhibited die formed flexible graphite with braided anti extrusion rings	
9.7	Hand Wheel (Rising)	Malleable Iron/ Cast Steel/ Fab. Steel	
9.8	Bonnet Bolts	A 193 Gr. B7	
9.9	Bonnet Nuts	A194 Gr. 2H	
9.10	Bonnet Gasket	Spiral Wound SS 316 + Grafoil	

10. Hydrostatic Test Pressure  
 a) Body : **210 kg/cm<sup>2</sup>(g)**  
 b) Seat : **155 kg/cm<sup>2</sup>(g)**
11. PnuematicTest Pressure with Air : **5.6-7 kg/cm2 (g).**
12. Painting Specifications:  
 i) Surface preparation by Short Blasting as per grade SA 2 1/2, Swedish Standard SIS-055 909.  
 ii) For above ground installation-Three coats of corrosion resistant paint shall be applied with minimum thickness of 300 micron ( Permissible thickness in each coat shall be within 80 to 120 micron).

**Notes:**

- Valve specification sheet shall be read in conjunction with technical notes for Gate and Globe valves.
- Valve shall be designed for intrinsically fire safe.
- Testing shall be as per BS EN 12266-1, approved QAP, this specification and other relevant standards.
- Bidder shall clearly write all/ any deviation against each part/ material of valve in the space provided for . Wherever bidder agrees with MECON's data sheet, bidder shall clearly indicate "agreed".
- Charpy 'V' notch test on each heat of base material shall be conducted for all pressure containing parts such as body, end flange, welding ends as well as the bolting material as per ASTM A370. The test shall be conducted at 0°C. The minimum average absorbed energy per set of three specimen shall be 27 J with an individual minimum per specimen of 22 J.
- Hardness test shall be carried out on each heat of base material for all pressure containing parts of the valve. A full thickness cross section shall be taken for this purpose and the maximum hardness shall not exceed 248 HV10 based on minimum four measurements representing the entire thickness.
- Stem packing shall be renewable with valve open on stream .
- Painting procedure of the valves shall be as per Manufacturer's Standard.
- Material Test Certificates and Hydro Test Reports shall be furnished prior to dispatch.

REV. NO.	DATE	ZONE	DESCRIPTIONS	BY	APPRD	REFERENCES	DRG. NO.
SECTION PROCESS & PIPING							MECON LIMITED
DSGN	PM	25.04.12	AKJ	25.04.12	CLIENT :		
DRWN					PROJECT :		
APPROVED						SCALE :	REV
O. P. JAIN						DATA SHEET NO.: MEC/WINO/05/28/M/001/DS/GV/82	0
<b>DATA SHEET FOR GLOBE VALVES</b>							



**DATA SHEET FOR GLOBE VALVES**


1. Valve Manufacturer : \_\_\_\_\_
2. Size : \_\_\_\_\_ Rating : ANSI **800#** Design Standard : **ISO 15761 / BS:5352**
3. Purchaser's Specification : **Refer Technical notes for Gate & Globe Valves**
4. Design Pressure : \_\_\_\_\_ Design Temperature : **-45°C to + 65°C**
5. Corrosion Allowance : **1.5mm** Service : \_\_\_\_\_
6. End Connections : Flanged both ends as per ASME B 16.5   
 Butt Weld both ends as A-16.25   
 Flanged one end butt weld other end   
 Socket weld both ends as per ASME B16.11  with 100mm pup pieces of A106 Gr. B Sch160
7. Flanges (where applicable) : a) RF  FF  RTJ   
 b) Serrated  Smooth (125 to 200 AARH)
8. Connecting Pipe Specification : **N. A.**
9. Valve Material Specification :

	Part	Material	Material Offered (Equivalent or Superior)
9.1	Body	ASTM A350 Gr. LF2	
9.2	Bonnet (Bolted)	ASTM A350 Gr. LF2	
9.3	Stem (Rising)	SS316 (No Casting) /ASTM A350 Gr. LF2	
9.4	Disc(Loose Plug/Ball Type)	SS316 /ASTM A350 Gr. LF2 + Stellite	
9.5	Body Seat Ring	SS316/ASTM A350 Gr. LF2 + Stellite	
9.6	Stem Packing (Renewable with valve open on stream)	Corrosion inhibited die formed flexible graphite with braided anti extrusion rings	
9.7	Hand Wheel (Rising)	Malleable Iron/ Cast Steel/ Fab. Steel	
9.8	Bonnet Bolts	ASTM A320 Gr.L7	
9.9	Bonnet Nuts	ASTM A194 Gr.4	
9.10	Bonnet Gasket	Spiral Wound SS 316 + Grafoil	

10. Hydrostatic Test Pressure  
 a) Body : **210 kg/cm<sup>2</sup>(g)**  
 b) Seat : **155 kg/cm<sup>2</sup>(g)**
11. PnuematicTest Pressure with Air : **5.6-7 kg/cm2 (g).**
12. Painting Specifications:  
 i) Surface preparation by Short Blasting as per grade SA 2 1/2, Swedish Standard SIS-055 909.  
 ii) For above ground installation-Three coats of corrosion resistant paint shall be applied with minimum thickness of 300 micron ( Permissible thickness in each coat shall be within 80 to 120 micron).

**Notes:**

- Valve specification sheet shall be read in conjunction with technical notes for Gate and Globe valves.
- Valve shall be designed for intrinsically fire safe.
- Testing shall be as per BS EN 12266-1, approved QAP, this specification and other relevant standards.
- Bidder shall clearly write all/ any deviation against each part/ material of valve in the space provided for . Wherever bidder agrees with MECON's data sheet, bidder shall clearly indicate "agreed".
- Charpy 'V' notch test on each heat of base material shall be conducted as per relevant material code.
- Hardness test shall be carried out on each heat of base material for all pressure containing parts of the valve as per relevant material code.
- Stem packing shall be renewable with valve open on stream .
- Painting procedure of the valves shall be as per Manufacturer's Standard.
- Material Test Certificates and Hydro Test Reports shall be furnished prior to dispatch.

REV. NO.	DATE	ZONE	DESCRIPTIONS	BY	APPRD	REFERENCES	DRG. NO.
SECTION PROCESS & PIPING							MECON LIMITED
DSGN	PM	25.04.12	AKJ	25.04.12	CLIENT :		
DRWN					PROJECT :		
APPROVED O. P. JAIN							
DATA SHEET FOR GLOBE VALVES (NB≥2")						DATA SHEET NO.: MEC/WINO/05/28/M/001/DS/GV/83	

1.0 Valve Manufacturer :  
 2.0 Valve Size (NB), mm (inch) : ANSI Rating : **300#** Design Standard : **API 6D**  
 3.0 MECON's Technical Specification No. : **MEC/TS/05/21/002, Rev-1, Ed-1**  
 4.0 Connecting Pipeline Design Pressure, bar : **49 kg/cm2** Design Temperature, °C : **-45°C to + 65°C**  
 5.0 **Connecting Pipe Specification** :  
 5.1 Material :  
 5.2 Diameter (OD), mm (inch) :  
 5.3 Thickness, mm :

**6.0 Valve Construction Design**

6.1. Configuration : Reduced Bore  Full Bore   
 6.2. End Connections : Flanged as per ASME B16.5  Butt Welded as per ASME B16.25   
 6.3. Flanges (wherever applicable) : a) RF  RT  NA   
 b) Serrated  Smooth (125 to 200 microinches AARH)  NA   
 6.4 Ball Mounting : **Floating upto 4" and Trunnion Mounted 6" and above**  
 6.5 Valve body type : Fully Welded  Two/Three Piece Bolted  Either

**7.0 Valve Material Specification**

Part	Specified Material	Material Offered (Equivalent or superior)
7.1 Body	A 352 Gr. LCB/A 350 Gr. LF2	
7.2 Ball	SS316/ A 352 Gr.LCB/A 350 Gr. LF2 with 75 µENP coating	
7.3 Body Seat Rings	VITON/DEVILON for Floating type and SS316/ ASTM A352 Gr. LCB / A 350 GR. LF2 with 75 Micron ENP coating for Trunnion Mounted type	
7.4 Seat Seal	VITON/DEVILON for TMBV	
7.5 Stem	[(ASTM A350 Gr. LF2/SS 316 )+75 microns ENP](No casting)	
7.6 Stem Seals	VITON/PTFE	
7.7 Stud Bolts/ Nuts	ASTM A320 Gr.L7 / ASTM A194 Gr.4	

8.0 Corrosion Allowance : **1.5 mm** Service :  
 9.0 Location : Above Ground  Buried   
 10.0 Stem Extension Requirement : Yes  No   
 11.0 Gear Operator Requirement : Yes  for 6" and above No  for 4" and below  
 12.0 Actuator Requirement : Yes  No   
 13.0 Fire Resistant Design Requirement : **Type test as per API 607 for Floating Ball Valve**  
**Type test as per API 6FA for Trunnion Mounted Ball Valve**

**14.0 Valve Testing Requirement**

	Test Pressure (min.), kg/cm <sup>2</sup> (g)	Minimum Duration, minutes
14.1 Hydrostatic Test Body	76	As per API 6D
Seat	57	As per API 6D
14.2 Air Test	5.6-7	As per API 6D


15.0 Anti-Static Testing Requirement : **As per Standard API 6D (Latest Ed.)**

**16.0 Valve Painting Specification**

16.1 Surface preparation by Short Blasting as per grade SA 2 1/2, Swedish Standard SIS-055 909.  
 16.2 For above ground installation-Three coats of corrosion resistant paint shall be applied with minimum thickness of 300 micron ( Permissible thickness in each coat shall be within 80 to 120 micron). Colour of paint shade shall be RAL-7038, however any change in colour shall be finalized during drawing approval stage.  
 17.0 Lock Open/ Lock Close/Normally Close Requirement : **As indicated in P&ID.**

**Notes:**

- This Valve Data Sheet shall be read in conjunction with MECON's Technical Specification No. MEC/TS/05/21/002,Rev 1 ,Ed. 1
- Inspection and Testing shall be as per attached QAP, this Data Sheet, MECON's T.S., API 6D and other relevant standards.
- Stops shall be provided for positive alignment of ball with ports and ensure proper installation of handle.
- Short pattern valves (as per API 6D or otherwise) are not permitted. Only long pattern valves are to be supplied.
- Charpy V-notch & Hardness test for body, body adaptor, end flanges, ball, body seat rings, stem & studs / nuts shall be conducted as per relevant material code.
- Compressed asbestos fibre (CAF) shall not be used for body sealing / gasket materials.
- Material for body shall have a guaranteed minimum yield strength of .....psi. In case the same cannot be guaranteed, valves shall be provided with a 500 mm pup piece (integrally welded to the valve on each side) with strength equivalent to that of the connecting pipe - **N.A.**
- For welding end, the out of roundness (i. e. difference between maximum and minimum ID at pipe end) shall not be more than 0.5% of pipe OD.

REV. NO.	DATE	ZONE	DESCRIPTIONS	BY	APPRD	REFERENCES	DRG. NO.
REVISIONS							
SECTION PROCESS & PIPING				CLIENT :		 <b>MECON LIMITED</b>	
NAME	DATE	CHKD	DATE	PROJECT :			
DSGN	PM	25.04.12	AKJ	25.04.12			
DRWN							
APPROVED			O.P. Jain	<b>DATA SHEET FOR BALL VALVES</b> (NB ≥ 2")		SCALE :	REV
						DATA SHEET NO.: MEC/WINO/05/28/M/001/DS/BV/79	0

1.0 Valve Manufacturer :  
 2.0 Valve Size (NB), mm (inch) : ANSI Rating : **800#** Design Standard : **BS EN ISO 17292**  
 3.0 MECON's Technical Specification No. : ---  
 4.0 Connecting Pipeline Design Pressure, bar : **92 kg/cm2** Design Temperature, °C : **-45 to 65°C**  
 5.0 **Connecting Pipe Specification** : N.A  
 5.1 Material  
 5.2 Diameter (OD), mm (inch)  
 5.3 Thickness, mm  
 6.0 **Valve Construction Design**  
 6.1 Bore : Reduced  Full   
 6.2 End Connections : **Socket welded as per ASME B16.11**  
**100mm Extension Pups in ASTM A333 Gr.6 Sch. 160**

6.3.1 Flanges (wherever applicable) : a) RF  FF  RTJ  NA   
 6.3.2 Flange Face Finish : Serrated  Smooth (125 to 200 microinches AARH)  NA   
 6.4 Ball Mounting : **Floating Ball**

7.0 **Valve Material Specification**

Part	Specified Material	Material Offered
7.1 Body	<b>ASTM A350 GR. LF2</b>	
7.2 Ball	<b>SS 304/316 with 75µENP Coating</b>	
7.3 Body Seat	<b>RPTFE/ DELRIN</b>	
7.4 Gland	<b>SS304/SS316</b>	
7.5 Stem	<b>SS 304/316 + 75 µENP(No casting)</b>	
7.6 Body Seal	<b>Grafoil</b>	
7.7 Stem Seal	<b>Grafoil</b>	
7.8 Body Studs/Nuts	<b>ASTM A320 Gr. 7/ A194 Gr. 4</b>	

8.0 Corrosion Allowance : **1.5 mm** Service :

9.0 Location : Above Ground  Buried

10.0 Stem Extension Requirement : Yes  No

11.0 Gear Operator Requirement : Yes  No

12.0 Gas Powered Actuator Requirement : Yes  No

13.0 Fire Resistant Design Requirement : **Type-Test as per Standard API 607**

14.0 **Valve Testing Requirement**

Test	Body	Seat	Test Pressure (min.), kg/cm2(g)	Minimum Duration, minutes
14.1 Hydrostatic Test			<b>210</b>	<b>2</b>
			<b>155</b>	<b>2</b>
14.2 Air Test			<b>5.6-7.0</b>	<b>15</b>

15.0 Anti-Static Testing Requirement : **As per Standad BS EN ISO 17292**


16.0 **Valve Painting Specification**

- i) Surface preparation by Short Blasting as per grade SA 2 1/2, Swedish Standard SIS-055 909.
- ii) For above ground installation-Three coats of corrosion resistant paint shall be applied with minimum thickness of 300 micron ( Permissible thickness in each coat shall be within 80 to 120 micron). Colour of paint shade shall be RAL-7038, however any change in colour shall be finalized during drawing approval stage.

17.0 Lock Open/ Lock Close Requirement : **As indicated in P&ID**

Notes:

1. Material test certificates and hydrostatic test reports shall be furnished prior to despatch.
2. Detailed dimensional drawings showing cross-section with part numbers and materials shall be submitted for Purchaser's approval prior to manufacture of the valves.
3. All tests shall be as per BS:6755 (Part-I).
4. Valves shall have ball position indicator.
5. Stops shall be provided to ensure positive alignment of ball with ports and ensure proper installation of handle.
6. Each valve shall be provided with a wrench.
7. Valves shall be inspected and approved by Purchaser before despatch.
8. Gland packing assembly shall permit repair of gland packing under full line pressure.
9. Inspection and Testing shall be as per this specification, BS:6755 (Part-I) and other relevant standards and clause no. 5.0 of T.S. No.: MEC/TS/05/21/002,Rev-1,Ed-1.
10. Charpy V-notch & Hardness test for body, body adaptor, end flanges, ball, body seat rings, stem & studs / nuts shall be conducted as per relevant material code.

REV. NO.	DATE	ZONE	DESCRIPTIONS	BY	APPRD	REFERENCES	DRG. NO.	
REVISIONS								
SECTION PROCESS & PIPING				CLIENT :		 <b>MECON LIMITED</b>		
DSGN	PM	25.04.12	AKJ	25.04.12	PROJECT :			
DRWN								
APPROVED			O. P. JAIN	<b>DATA SHEET FOR BALL VALVES (NB&lt;2")</b>		DATA SHEET NO.: MEC/WINO/05/28/M/001/DS/BV/83	REV 0	



Andhra Pradesh Gas Distribution Corporation Ltd.

**Procurement of USM / TURBINE BASED METERING SKID  
FOR KAKINADA-SRIKAKULAM PIPELINE PROJECT (PHASE-1)  
Tender Doc. No.: 05/51/23QC/APGDC/030 (E Tender No. 140042 )  
Reply to Pre-Bid Queries**



MECON LIMITED

S.N.	Document No.	Cl. No.	Section	Section Detail/Description	Pre-bid query	APGDC/ MECON's Reply
1	231	AVL		Pressure Regulator & SSV: NIRMAL name is there in AVL for 8" #300RF rating.	We would like to inform that NIRMAL is approved vendor with EIL, GAIL for #600 class of Regulator. Please refer Mecon alst tender document No. Bid No. 05/51/23PH/GAIL/030 where NIRMAL is already approved. Refer enclosed supply reference list for #600 rating of Regulator. You are requested to provide your confirmation that NIRMAL make Pressure Regulator shall use for #600 rating.	PTR may be submitted. However, Tender Condition Prevails.
		P&ID for SOR A.1		USM is designed for 3X50% Capacity to cater requirement if minimum flow. Selected line size is 8" & suitable for flow rate of 3 MMSCMD where as PRS is designed for capacity 2X100% for the flow rate of 6 MMSCMD.	We understand that meter is designed for 3X50% capacity to cater the minimum flow rate (10% of maximum flow rate). Hence each USM stream is designed for minimum flow rate of 0.3 mmscmd at maximum pressure.  However as per P&ID we understand that we need to design the PRS for 2X100% capacity with 6 MMSCMD flow rate for each stream. At 6 MMSCMD flow, selected regulator opening will be much smaller i.e. around 1% when minimum flow across the meter passes (0.3 mmscmd) at maximum differential pressure through the regulator. We will have the problem with the functionality of the regulator opening at minimum flow rate which will pass through the meter.  In view of this you are requested to consider the PRS stream configuration as 3X50% capacity similar to USM configuration (3X50%) to cater the requirement of minimum flow rate passes through the meter.  Please confirm your acceptance and provide the revised P&ID with 3X50% configuration (3 MMSCMD Flow Rate) for each stream.	Refer Revised P&ID attached as annexure-1 with Corrigendum #2.
2	33	4.3		The maximum permissible pressure drop across the complete USM/ Turbine based metering skid is 3.0 kg/cm	For Item No. A.1, Flow Rate is 6 MMSCMD. Minimum Inlet pressure is 86 kg/cm <sup>2</sup> & maximum outlet pressure is 72 kg/cm <sup>2</sup> . There is a available pressure drop of 14 kg/cm <sup>2</sup> . Given 3 kg/cm <sup>2</sup> pressure drop on extreme lower end. Please confirm skid shall be designed for overall pressure drop of 6 kg/cm <sup>2</sup> .	Pressure drop across the skid of Item no. A.1 shall be 6 kg/cm <sup>2</sup> . Rest Tender condition prevails.
3	168/170	Regulator & SSV Datasheet		Regulator & SSV Body Material : ASTM A 350 LF2	We understand that regulator & SSV made of forged then the MOC shall be ASTM A 350 LF2 and if it is made of Cast then the equivalent grade of LTCS shall be considered i.e. ASTM A 350 LCB/LCC. Please confirm our understanding is correct.	Bidder's understanding is correct
4	34	6.1.1 & 6.1.3		6.1.1: All pressure boundary materials shall have certified material test reports (CMTRs) or certificate of compliance per the design code. Certifications shall be to EN 10204 Type 3.2 for pressure parts and Type 2.2 for other parts.  6.1.3: Vendor to carry out 3.2 certification for the complete supplied items.	We understand that Type 3.2 for pressure parts is applicable only for Mechanical components and not applicable for Ultrasonic Flow Meter & Turbine Flow Meter. However only Hydro test witness shall be done by TPI for USM & TM body. Please confirm our understanding is correct.	Type 3.2 is applicable for all the pressure parts of Ultrasonic Flow Meter & Turbine Flow Meter. Rest, Tender condition Prevails.
5	48	3.13		For USM Transducers ports shall be designed in a way to reduce the possibility of liquid or solid accumulation.	Referring this clause, it is noted that there can be possibility of solid and liquid accumulation. Due to this accumulation there is a possibility of liquid ingress into the transducers if there are not hermetically sealed. This will lead to transducer malfunctioning / failure in such kind of gas conditions.  As we understand that these transducers are wetted parts, Please confirm the transducer shall be hermetically sealed to avoid the solid & liquid accumulation.  Kindly clarify whether bidder needs to produce technical supporting documents with such reference installation where the transducers are working fine and immune to this solid and liquid ingress if occurred.	Transducers shall be hermetically sealed. Successful bidder to provide supporting technical documents.



Andhra Pradesh Gas Distribution Corporation Ltd.

**Procurement of USM / TURBINE BASED METERING SKID  
FOR KAKINADA-SRIKAKULAM PIPELINE PROJECT (PHASE-1)  
Tender Doc. No.: 05/51/23QC/APGDC/030 (E Tender No. 140042 )  
Reply to Pre-Bid Queries**



MECON LIMITED

S.N.	Document No.	Cl. No.	Section	Section Detail/Description	Pre-bid query	APGDC/ MECON's Reply
6	48	3.13 & 3.11		Clause No. 13: The meter design shall have the facility to remove / replace the transducers in situ under line operating condition. Failure or removal of one pair of transducers shall not cause the meter to lose all measurement function.. Clause No. 11: Retraction tool is not required.	As online extraction tool is not required as per tender specification, we understand that the transducers shall be removed offline by taking process shutdown. Accordingly the bidder can suggest the suitable design for transducer replacement or removal. Kindly confirm.  Please note that transducer of any make of USM are wetted parts. As a whole unit needs to be replaced or removed to be made in situ under line operating condition then online extraction tool is mandatory for any USM. None of the USM supplier can perform this without an online extraction tool or without isolating the process.  Both above things are contradictory. Please clarify.	Retraction tool is not required. Rest, Tender Condition Prevails.
7	47	3.4		Internal surface roughness of 250 Ra or less (smoother) is required for the meter tube (including upstream & down stream straight runs). Meter tube shall be honed for achieving the same and a certificate from TPI shall be submitted to MECON/CLIENT before flow calibration.	We understand that Honing for upstream-downstream meter run need to be is mandatory requirement and need to perform as per tender clause.	Honing is mandatory & to be carried out as per tender document.
8	47	3.1		The over-all uncertainty (including lab uncertainties) of the supplied system shall be equal to or better than +/-0.3% for USM skids	The overall GAIL Lab uncertainty is 0.3 to 0.36%. Kindly confirm whether GAIL Hazira lab is acceptable for meter calibration. If we add meter uncertainty it will be higher than 0.3% which will not fulfill tender requirement of 0.3%. Kindly confirm whether the bidders can consider GAIL Hazira facility with this uncertainty level.	Tender Condition Prevails.
9	51	3.3.e		The Ultrasonic meters shall be 'flow calibrated' with natural gas and shall have calibration certificate duly signed by laboratories approved by weights and measures authority of its country of origin or recognized international Institutes like NMI, PTB, Pigsar, Trans Canada Calibrations(TCC) Canada, Measurement Canada, Colorado Engineering Experiment Station Inc.(CEESI) USA etc.	You are requested to accept the FORCE Denmark lab for Wet calibration of USM Meter.	Tender Condition Prevails.
10	35	6.3.1		Radiography test : 100% radiography shall be carried out on all casting. Radiography procedure and area of casting to be radiographed shall be as per ANSI B16.34 and acceptance criteria shall be as per ANSI B16.34 Annexure B. Two shots shall be taken for each area to be radiographed, as a minimum	Please confirm Radiography is applicable for Items Valves, Filter, PSV, Pressure Regulator & SSV. We understand that if USM & Turbine Body is made of cast iron radiography is applicable and made of forging radiography is not applicable. Please confirm our understanding is correct.	100% Radiography is applicable for all the items made of casting. For forging/ formed material UT shall be conducted.
11	134	Data Sheet - Ball Valve 600#		Data sheet doesn't show requirement of RT test	Kindly confirm 100 % RT is required for pressure class $\geq$ 600# Ball valves	Confirmed.
12	143	Data Sheet - Check Valve 600#		Data sheet doesn't show requirement of RT test	Kindly confirm 100 % RT is required for pressure class 600# check valves	Confirmed.



Andhra Pradesh Gas Distribution Corporation Ltd.

**Procurement of USM / TURBINE BASED METERING SKID  
FOR KAKINADA-SRIKAKULAM PIPELINE PROJECT (PHASE-1)  
Tender Doc. No.: 05/51/23QC/APGDC/030 (E Tender No. 140042 )  
Reply to Pre-Bid Queries**



MECON LIMITED

S.N.	Document No.	Cl. No.	Section	Section Detail/Description	Pre-bid query	APGDC/ MECON's Reply
13	144	Data Sheet- Globe Valve 600#		Data sheet doesn't show requirement of RT test	Kindly confirm 100 % RT is required for pressure class 600# Globe valves	Confirmed.
14	468	3.4		Valves under NACE should follow the requirements of MR-01-75...	We understand that NACE is not required for this tender for any type of Valves; kindly confirm our understanding is correct.	Bidder's understanding is correct.
15					Kindly furnish data sheet for Ball & Check Valves of 300# (Low Temp)	Refer datasheet of Check Valve, Ball Valve attached as annexure-3 with <b>Corrigendum #2.</b>
16					Kindly furnish data sheet for Globe Valves for 300# & 800#	Refer datasheet of Globe Valve attached as annexure-3 with <b>Corrigendum #2.</b>
17	219 & 128	P&ID and Datasheet of Heater		P&ID: Referring to Notes- Point No: 14, Skid inlet temp will be 25° C to be considered. AS per Datasheet Inlet Temp : 15 - 25 °C & Outlet Temp : 40 - 45 °C	We understand that Heater shall be designed for Min inlet temp to heater Inlet will be 15°C & Max temp to Heater outlet will be 45°C . Kindly confirm our understanding is correct.	Inlet & Outlet temp. indicated in heater datasheet to be considered for heater design.
18				Filter Vessel & QOC Requirement	Since all skids are #600 rating skids, You are requested to confirm that Filter Vessel & QOC shall be ASME U Stamp.	Confirmed.
19	22	2.2 (t)		One number of Laptop & Color Deskjet / laserjet Printer (with metering supervisory system) to be supplied with each USM based Metering skid of Group A and one no. of dot matrix printer (for panel mounted Flow Computers) with auto switch between flow computers shall be provided with each Metering skid of Group A, B (for item B.1 only) & C	1) We understand that One number of Laptop & Color Deskjet / laserjet Printer (with metering supervisory system) and one no dot matrix printer (for panel mounted Flow Computers) with auto switch between flow computers shall be provided with each Metering skid for group A. 2) One no dot matrix printer (for panel mounted Flow Computers) with auto switch between flow computers shall be provided with each Metering skid for group B.1 & C. 3) No Laptop is required for Group B.1 & C. 4) For group B.2, laptop & printer is not required. Please confirm our understanding is correct.	1) Bidder's understanding is correct. Rest, Tender Condition prevails. 2) Bidder's understanding is correct. Rest, Tender Condition prevails. 3) Bidder's understanding is correct. Rest, Tender Condition prevails. 4) Bidder's understanding is correct. Rest, Tender Condition prevails.
20	23	2.3 (e & f)		Clause (e): One Gas metering system with three metering stream (for each Skid of Group A.1) of multi-path (minimum 4 path) ultrasonic gas flow meters (2 operating + 1 stand by stream) with flow profiler, meter runs. Flow computer shall be provided for each meter stream with all interface accessories. Each metering stream shall be designed for 50 % of capacity Clause( f): One Gas metering system with two metering stream (for Item no. A.2 & A.3) of multi-path (minimum 4 path) ultrasonic gas flow meters (1 operating + 1 stand by stream) with flow profiler, meter runs and <b>gas chromatograph</b> . Flow computer shall be provided for each meter stream with all interface accessories. Each metering stream shall be designed for 100 % of capacity	As per clause no.2.3.f, we understand that GC is required only for Item No. A.2 & A.3 where as clause no. 2.3.j mention that GC required for all skid sof group A which is contradictory. Please confirm requirement of GC for Item No. A.1, A.2 & A.3.	Gas Chromatograph is required for all the Items of Group A.
21	138 & 428	5.1.4-b) Inspection & Tests		All valves, with body fabricated from plates or made by forgings, shall be <b>ultrasonically examined</b> in accordance with the procedure and acceptance standard of <b>Annexure E of ASME B16.34.</b>	Data sheet doesn't show any requirement of MPI & UT Test. Kindly confirm weather UT & MPI is needed or not??	It is needed depending on valve materials offered. Refer valve gap and technical specification attached with tender.
22	23	2.3.d		Requirement of Quick Opening Closure	As per Datasheet QOC is nto required , however a sper technical specificaion QOC shall eb applicabel for vessle size 12"& above. Please clarify	Refer filter datasheet attached with tender document.



Andhra Pradesh Gas Distribution Corporation Ltd.

**Procurement of USM / TURBINE BASED METERING SKID  
FOR KAKINADA-SRIKAKULAM PIPELINE PROJECT (PHASE-1)  
Tender Doc. No.: 05/51/23QC/APGDC/030 (E Tender No. 140042 )  
Reply to Pre-Bid Queries**



MECON LIMITED

S.N.	Document No.	Cl. No.	Section	Section Detail/Description	Pre-bid query	APGDC/ MECON's Reply
23	213-219	P&ID		You have shown <b>DPG</b> across filters .	We couldn't find data sheet for Diff Pressure gauge; kindly furnish same.	Refer Data sheet of Diff. Pressure gauge attached as annexure-2 with <b>corrigendum #2.</b>
24					We understand that Third party inspection charges shall be in the scope of Bidder; Kindly confirm our understanding is correct.	Bidder's understanding is correct. Rest, Tender Condition prevails.
25	161-162	Data sheet for PG & TG		case material aluminium	please note that case material shall be SS304 is standard material. kindly accept the same	Case Material : SS304 is also acceptable for PG & TG.
26	191	Data sheet for field mounted FC		The installation of flow computer, its batteries, solar panel shall be in safe area (appx 15 feet) or in <b>separate canopy outside the main skid canopy</b> with the necessary cables and accessories shall be done.	We understand that canopy is not required for any skid. Similarly, canopy is also not required for Flow computers.	Canopy for complete skid is not required. However canopy is required for all the electronic/electrical items installed in the field. Rest, Tender Condition Prevails.
27	76 & 208	System Architecture and specifications of Onlinr Gas Chromatograph MEC/05/ES/TS/GC - 030		Proposed System Architecture for USM Based Metering system As per GC specs : Four nos. 4 to 20 mA (isolated) output signals for driving 600 Ohms load resistance. Outputs will be used for: (and shall be user configurable)	Based on system architecture, we have not noticed analogue outputs connection anywhere. In view of this we understood that analogue output are not required in GC. The New Age Gas chromatographs are now communicating on digital communication. Thus not all GCs will have facility of having analog outputs. Requirement of analog outputs will restrict the model selection. Please remove requirement of analog outputs from specs if their use is not envisaged.	Datasheet & TS for Gas Chromatograph shall prevail. However, system architecture attached with tender document is typical & will be finalized during detail engg. Rest, Tender condition prevails.
28	74 to 76	Specifications of Onlinr Gas Chromatograph MEC/05/ES/TS/GC - 030		Separate Descriptions of "Analyzer Unit and Programmable control Unit" and "Communication Interface / Display unit" are given in specifications.	Please note that communication and display are integral part of Field mounted analyzer and programmable control unit i.e. Gas Chromatograph. This GC unit shall have digital communication through RS485/ethernet link to panel mounted flow computer. Please confirm our understanding is correct.	"Analyzer unit & Programmable Control Unit" is field mounted & "Communication Interface / Display Unit" is control room panel mounted. Rest, Tender Condition prevails.
29	21 and 76	SCOPE OF SUPPLY AND Specifications of Onlinr Gas Chromatograph MEC/05/ES/TS/GC - 030		SCOPE OF SUPPLY 2.2 c : The G.C Controller to be mounted in the same metering panel. GC specs Communication Interface/display unit Vii: Programmable control unit can be either part of the analyzer in the field or it can be part of the control room mounted interface / display unit.	Please note that communication and display are integral part of Field mounted analyzer and programmable control unit i.e. Gas Chromatograph. This field mounted GC unit shall have digital communication through RS485/ethernet link to panel mounted flow computer. The GC data shall be displayed on Flow computer on control panel. The GC data shall also be available to connected portable configurator and Metering supervisory computer. Please confirm our understanding is correct.	Datasheet & TS for Gas Chromatograph shall prevail. Rest, Tender condition prevails.
30	24	SCOPE OF SUPPLY		SCOPE OF SUPPLY 2.3 j : The GC probe shall be installed at least 20D downstream from any flow disturbing elements such as elbows, valves, headers, tees as per ISO 10715. Separate Flanged Outlet pipe with provision for GC probe installation shall be provided for the same (It can be supplied loose).	As the distance 20D is high and alsoo the GC spool to be supplied loose, we recommend to shift the GC connection to outlet of skid. This location shift will make skid GA arrangement easy.	Tender Condition Prevails.
31	24 and 175	SCOPE OF SUPPLY and USM datasheet		SCOPE OF SUPPLY 2.3 n) The wet calibration of meter (USM) shall be performed with Natural gas at 45-50 Kg/cm2 or more along with its upstream and down stream meter runs and profiler / Flow straightner. The upstream & down stream meter runs USM datasheet : US Meter shall be wet calibrated with Natural Gas near to the average of min. & max. metering pressure with Upstream & Down Stream pipes length with profiler.	We understand that calibration pressure for the USM shall be at the average of (Min to max) operation pressure. Accordingly for the KJ Point (SOR A.1) , the calibration pressure will be above 80 kg/cm2. This pressure is not available at any of the third party calibration labs. Accordingly please accept FORCE Denmark calibration Lab which is the only calibration facility in Europe which can calibrate meters around 60 bar. You are reueste to accept this calibration facility & pressure.	Pressure for Wet Calibration of USM shall be 45-50 Kg/cm2 or more. Rest, Tender condition prevails.
32	27	SCOPE OF WORK, 2.3.10 D		The calibration reports should also contain verification for minimum two flow readings after adjustment of factors as per AGA 9 / 7.	Please confirm that this clause is only applicable for ultrasonic meter and not for turbine meter.	Confirmed. Rest Tender condition prevails.
33	41	13.1.d		Mandatory Spares- Filter Element :2 Set	We understand that 1 Set of Filter Element means No of Elements instaled in 1 Filter Vessel. Please confirm.	Confirmed.



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Reply to Pre-Bid Queries**



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S.N.	Document No.	Cl. No.	Section	Section Detail/Description	Pre-bid query	APGDC/ MECON's Reply
34	41	13.1.a/b/c		Mandatory Spares- Repair Kit for PCV :2 Set	We understand that 1 Set of PCV repair kit means spares required for PCV (Active & Monitor) for single stream. Please confirm.	Confirmed.
35	56	TECHNICAL SPECIFICATION FOR TURBINE METER 18.4		Wet Calibration of Flow Meters shall be done at average metering pressure at the following nominal flow rates: 0.025 qmax, 0.05 qmax, 0.1 qmax, 0.25 qmax, 0.5 qmax, 0.75 qmax, and qmax.	The lowest calibration point shall be 0.025Qmax or minimum flow capacity of wet calibration lab. This is specifically important when meter size is small. Please confirm your acceptance.	Tender Condition Prevails.
36	181	DATASHEET OF PANEL MOUNTED FLOW COMPUTER 5.0 outputs		a) 4 – 20 mA DC analog output for corrected volumetric flow rate, line pressure, line temperature, energy rate & FCV positioning command (5 Nos.) b) 4 – 20 mA DC analog output for corrected totalised volume and uncorrected totalised volume (in future).	Only 4 analog outputs are available in standard flow computers like Emerson S600+. Thus in order to comply the requirement, pressure and temperature values can be directly multiplied from pressure and temperature transmitters using signal multipliers(P&F/MTL). This philosophy is adopted in previous GAIL projects. Please confirm acceptance.	Tender Condition Prevails.
37	209	PROPOSED SYSTEM ARCHITECTURE		System architecture shows LEL detectors	Please confir that LEL detectors are not applicable for skid with field mounted flow computer.	Confirmed.
38	35	6.2.b		Pneumatic Leak test of complete skid at max. operating pressure.	We understand that pneumatic leak test shall be doen at 7 kg/cm2 pressure. Please confirm our understanding is correct.	Tender Condition Prevails.
39		178		Clause 26.0 of GCC shall stand modified to the following extent: 15.1. In a supply contract, the portion of supply completed in all respect which can be used for commercial operation shall not be considered for applying PRS, if delivered within contractual delivery period. The remaining supplies which are completed beyond the contractual delivery shall attract price reduction schedule @1/2 % of the delayed delivery value maximum upto 5% of the <b>total order value</b> . 15.2. The value referred in PRS clause is excluding taxes and duties.	We understand that PRS shall be applicable on undelivered portion and order value of undelivered portion only, not on the total order value. Mecon / APGDC requested to confirm that our understanding is correct.	PRS shall be applicable on delayed delivery value, however, maximum upto 5% of the total order value. Tender conditions prevail.
40		17 of 633		<b>For Group – B:</b> The scope of work / supply includes Design, Engineering, Manufacturing, Inspection, Testing and Supervision for Installation & commissioning of metering skid consisting of Filtration, Pressure Reduction system, Flow measurement through Turbine meter with panel mounted Flow Computer (For Item no. B.1) including Metering Panel / field mounted Flow Computer (For Item no. B.2) & its accessories, LEL Detection System (For Item no. B.1) , flow control and valves, piping, instruments & fittings as per P & ID's. The Required capacity, Pressure Rating, Quantity and Location of the Skids shall be as per P & ID.	We understand that for Item B.2, the LEL detection system is not required. Mecon requested to confirm that our understanding is correct.	Bidder's understanding is correct. Rest, Tender Condition prevails.







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S.N.	Document No.	Cl. No.	Section	Section Detail/Description	Pre-bid query	APGDC/ MECON's Reply
41		17 of 633		<b>For Group – C:</b> The scope of work / supply includes Design, Engineering, Manufacturing, Inspection, Testing and Supervision for Installation & commissioning of metering skid alongwith Electrical Heater consisting of Heater, Filtration, Pressure Reduction system, Flow measurement through Turbine meter with panel mounted Flow Computer including Metering Panel & its accessories, flow control and valves, piping, instruments & fittings as per P & ID's. The Required capacity, Pressure Rating, Quantity and Location of the Skids shall be as per P & ID.	We understand that LEL detection system is not envisaged for Group C items. Mecon requested to confirm that our understanding is correct.	LEL Detection system is to be considered for Group C and is in bidder's scope.
42		21 of 633		Bidder shall also supply suitable power cable (for supply of UPS/ Non UPS power to control panel, power distribution etc.) and also cable required for SCADA/ RTU connectivity	Mecon requested to provide exact details for cables to be provided for power and SCADA / RTU connectivity.	Necessary cables required for transferring all the signals to SCADA / RTU and for power up the panel is in bidder's scope. Rest, Tender Condition Prevails.
43		22 of 633		One number of Laptop & Color Deskjet / laserjet Printer (with metering supervisory system) to be supplied with each USM based Metering skid of Group A and one no. of dot matrix printer (for panel mounted Flow Computers) with auto switch between flow computers shall be provided with each Metering skid of Group A, B (for item B.1 only) & C.	By referring this clause, we understand that Laserjet printer and Laptop is required only for Group A, USM based metering skids. For Group B and C, only Dot matrix printer to be provided. Please confirm that our understanding is correct.	Refer reply to query no. 19.
44		25 of 633		The custody transfer equipments at field like transmitters (pressure & temperature) shall be installed in an environmental enclosure to minimize the effects of ambient temperature variations and shall be lockable for prevention of unauthorized data entry	We understand that environmental enclosure of MS sheet to be provided in accordance to the drawing provided in tender on page no. 230 for metering transmitters. FRP type enclosure is not envisaged for this tender. Please confirm our understanding is correct.	Drawing provided on page 230 of 633 is not applicable for custody transfer equipments at field like transmitters (pressure & temperature). Suitable enclosures shall be provided for custody transfer equipments at field like transmitters (pressure & temperature) to minimize the effects of ambient temperature variations and shall be lockable for prevention of unauthorized data entry.
45		31 of 633		All electronic/electrical instruments and equipments shall be suitable for area classification as per IEC codes and shall be tested by any recognized authority like BASEEFA, FM, PTB, CMRI etc. and shall be certified by CCOE. All the configurators, gas cylinders shall be certified by CCOE	Many of the vendors from approved vendor list provided with tender for electrical / electronic instruments and equipment do not provide CCOE certificate. Please alternatively also accept ATEX or other approved certificates for instruments/ equipment where CCOE is not available.	Acceptance of ATEX certification shall be dealt during detail Engg. and if not accepted, item having CCOE certificate shall be offered.
46		31 of 633		Approval from NMI/ PTB/ NPL or original flow meter manufacturer for the complete skid (including upstream/down stream piping) design including GAD & P&ID for custody transfer application.	We understand that this clause is not applicable for turbine meter as NMI/PTB/NPL or original flow meter manufacturer do not approve P&ID and GAD of turbine meters for complete skid. The GAD of upstream/downstream piping of turbine meter shall be provided to Mecon for reference. Kindly confirm acceptance.	Approval of GAD & P&ID from NMI / PTB/ NPL/ equivalent body or original meter manufacturer is not applicable for turbine based metering skids. Rest, Tender condition prevails.
47		41 of 633		Mandatory spares list	We understand that spare list mentioned on page 41 supersedes all other requirement of spares mentioned elsewhere in tender. If any other spares required other than mentioned on page 41, Please provide detailed list of same.	Refer Clause no. 13.1, Page 41 of 633, Vol II of II & corrigendum for Mandatory spares. Also, spares as asked elsewhere in tender document shall also be provided.
48		118 of 633		TIC shall take field input through 4 wire duplex RTD installed in outlet gas line. Two nos of independent RTD with thermowell shall be provided for this purpose and one selector switch for input selection.	The requirement mentioned here is contradictory itself. If duplex RTD is required than another RTD requirement shall be void. We understand that only one no of RTD duplex is required. Mecon requested to clarify and confirm the acceptance.	Two numbers of duplex RTD, one in each heater outlet gas line, shall be provided.
49		118 of 633		TIC shall take field input through 4 wire duplex RTD installed in outlet gas line. Two nos of independent RTD with thermowell shall be provided for this purpose and one selector switch for input selection.	We understand that RTD required here shall be installed at outlet gas line of each heater and will not be installed at common outlet of both heaters. Please confirm our understanding is correct.	Two numbers of duplex RTD, one in each heater outlet gas line, shall be provided.

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S.N.	Document No.	Cl. No.	Section	Section Detail/Description	Pre-bid query	APGDC/ MECON's Reply
50		118 of 633		5. TECHNICAL REQUIREMENTS Another pair of skid RTDs 2 nos shall be provided for heater skin temperature measurement and same shall be used for tripping and alarm generation in case of overheating of heater for heater protection.	One no of skid RTD would be used for both alarm generation and tripping purpose by using Relay output. Another pair of skid RTD will be in no use. So, Mecon requested to confirm the acceptance of 1 no of skin RTD.	Two numbers of RTD, one in each heater, shall be provided for heater skin temperature measurement.
51		128 of 633		5. Flow (Maximum) 0.055 MMSCMD 6. Inlet Pressure 75 - 80 Kg/cm2(g) 7. Outlet Pressure 74.5 - 79.5 Kg/cm2(g) 8. Inlet Temperature 15 - 25 OC 9. Outlet Temperature 40 - 45 OC	As per the sizing calculation of heater, considering parameters 0.055 MMSCMD flow, Inlet temperature as 15 Degc and outlet temperature 45 Degc, the heat duty required for heater is coming as 30KW. Mecon requested to confirm whether actual heat duty as per sizing to be considered or any minimum heat duty / additional heat duty to be provided for heaters. Please clarify and confirm.	Will be dealt during detail engineering.
52		130 of 633		MOC of sheath material : SS 321	MOC of sheath material mentioned here is contradictory with the MOC mentioned on page no 122, technical specifications of electric heater. There, it has mentioned as Alloy 800. Mecon requested to clarify the requirement.	MOC of Sheath material shall be SS-321. MOC of sheath material mentioned on Page no. 122 shall be ignored.
53		130 of 633		No of spare elements : 3 no	We understand that the spare heating elements requirement mentioned as "20% of the number of elements to be provided unconnected" in datasheet of electric heater supersedes the requirement mentioned in GAD as well as anywhere in tender. Mecon requested to confirm that our understanding is correct.	3 numbers of spare heater elements shall be provided. Requirement of 20% spare heater elements as per Electrical Datasheet No. MEC/DS/05/E9/040A shall be ignored.
54		-		-	Mecon requested to confirm that U stamping for heater vessels required or not, as the same is not mentioned in tender.	Required.
55		153 to 159 of 633		CRV Basis code : API 520 / 526	As per T4S specs., the CRV should be designed at 1% of design flowrate. Kindly confirm acceptance.	Confirmed
56		161 & 162 of 633		Case material & Bezel ring	Vendors from approved vendor list had obsoleted Cast Aluminum, screwed bezel. Instead of it the vendor's provide SS304, bouynet bezel, which is superior. Kindly confirm acceptance.	Case Material : SS304 & Bayonet bezel is also acceptable for PG & TG.
57		161 & others		Note : Manifold shall be either of same make as of PG, DPT, P	Approved vendor list for SS valve / Manifolds of this tender has other reputed vendors except Swagelok / Parker, who have supplied SS manifolds to GAIL in the past. We request you to accept all vendors of Approved vendor's list for SS manifolds for all gauges and transmitters.	For SS valves / manifold, vendor list attached with tender document shall prevail.
58		162 of 633		Mercury filled gauge, SAMA class V B	Vendors from approved vendor list had obsoleted Mercury filled TGs. Alternatively, bimetallic type temperature gauges are also used. please confirm acceptance of bimetallic type gauges.	Bimetallic type temperature gauges are also acceptable.
59		168 & 170 of 633		Body material: ASTM A350 LF2	Many of the vendors from the approved vendor list don't manufacture valves with Forged (ASTM A350 LF2) material, which creates monopoly situation for the supply of PCV and SSV for this tender. Please accept suitable casting material ASTM A352 LCB. Kindly confirm acceptance.	Acceptable.
60		177 of 633		Body material : ASTM A216 LCB / LCC	We understand that body material material should be ASTM A216 WCB / WCC instead of LCB / LCC. Please confirm our understanding is correct.	Bidder's understanding is correct.
61		177 of 633		4. Turbine Meter shall be wet calibrated with Natural Gas near to the average of min. & max. metering pressure with Upstream & Down Stream pipes length with flow straightener.	GAIL (India) Ltd. has introduced their facility at Hazira for wet calibration of meter. Mecon requested to confirm whether their calibration facility and certifications would be valid or not for this tender.	Refer reply to query no. 8.
62		177 of 633		4. Turbine Meter shall be wet calibrated with Natural Gas near to the average of min. & max. metering pressure with Upstream & Down Stream pipes length with flow straightener.	In all tenders of GAIL (India) Ltd., only Turbine meter and its flow straightener needs to be wet calibrated without US / DS spools. The spools of calibration lab generally used for the calibration. We understand that the same philosophy for wet calibration of turbine meter and its flow straightener is applicable for this tender. Mecon / APGDC requested to confirm the acceptance.	Turbine meter to be wet calibrated with associated flow profiler only. Rest, Tender Condition Prevails.



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63		179 of 633		The flow computer shall be certified for custody transfer applications by laboratory / institutes authorized by weights and measures authority of its country of origin such as NMI, PTB, Pigsar or other reputed International Standard laboratories such as Trans Canada Calibrations (TCC) Canada, Measurement Canada, Colorado Engineering Experiment Station Inc. (CEESI) USA., Calibration Certificates to be submitted for all the Flow Computers separately	We understand from the specifications that offered flow computer should have valid type approval of NMI/PTB certificate for use in custody transfer application & appropriate NMI/PTB certificate needs to be attached with BID- request / at approval of datasheets M/s GAIL to confirm if our understating is correct.	Tender Condition Prevails.
64		181 of 633		Outputs : a) 4 – 20 mA DC analog output for corrected volumetric flow rate, line pressure, line temperature, energy rate & FCV positioning command (5 Nos.) b) 4 – 20 mA DC analog output for corrected totalised volume and uncorrected totalised volume (in future).	Total 7 nos of Analog outputs required as per this mentioned clause. Please note that Emerson make S600+ flow computer have only 4 nos of AOs. To resolve this issue in past executed jobs GAIL / Mecon used to take line pressure, line temperature, energy rate & FCV positioning command through Serial to Analog converter.	Tender Condition Prevails.
65		-		-	The datasheet of Differential Pressure Gauge is not found in tender. Mecon requested to provide the same.	Refer Data sheet of Diff. Pressure gauge attached as annexure-2 with corrigendum #2.
66		-		-	The datasheet of Globe Valve greater than or equal to 2" for 300# (Normal temperature CS material) is not found in tender. Mecon requested to provide the same.	Refer datasheet of Globe Valve attached as annexure-1 with Corrigendum #2.
67		-		-	The datasheet of Globe Valve greater than or equal to 2" for 300# (Low temperature CS material) is not found in tender. Mecon requested to provide the same.	Refer datasheet of Globe Valve attached as annexure-1 with Corrigendum #2.
68		-		-	The datasheet of Globe Valve for 1/2" to 1.5" (Normal temperature CS material) is not found in tender. Mecon requested to provide the same.	Refer datasheet of Globe Valve attached as annexure-1 with Corrigendum #2.
69		-		-	The datasheet of Globe Valve for 1/2" to 1.5" (Low temperature CS material) is not found in tender. Mecon requested to provide the same.	Refer datasheet of Globe Valve attached as annexure-1 with Corrigendum #2.
70		-		-	The datasheet of Check Valve greater than or equal to 2" for 300# (Low temperature CS material) is not found in tender. Mecon requested to provide the same.	Refer datasheet of Check Valve attached as annexure-1 with Corrigendum #2.
71		-		-	M/s Escorts is approved in vendor list of EIL, GAIL and other PSUs. They have supplied heaters of more than 500KW ratings to EIL, IOCL, GAIL and other PSUs. Mecon requested to approve M/s Escorts for supply of heaters for this tender.	PTR may be submitted. However, Tender Condition Prevails.
72			Data Sheet	DPG Data Sheet	Kindly provide DPG data sheet	Refer Data sheet of Diff. Pressure gauge attached as annexure-2 with corrigendum #2.
73			Approved Vendor List	DPG AVL	Kindly provide approved vendors of DPG	Refer corrigendum #2.
74			Approved Vendor List	Turbine Meter	Itron Turbine meter are accepted by Gail & all consultant. Kindly include their name in AVL for Turbine meter	PTR may be submitted. However, Tender Condition Prevails.
75			Approved Vendor List	Ball Valve	M/s Shayburg Ball Valve are approved & accepted by EIL & Other Consultant. Kindly accept their Ball Valve for this tender	PTR may be submitted. However, Tender Condition Prevails.
76			Approved Vendor List	Gauges & RTD	Precision Mass India Pvt Ltd was Formerly Ashcroft India Pvt Ltd & was approved in Gail,Eil and other CGD. Please accept the name change & include them in AVL. Document for name changed attached	PTR may be submitted. However, Tender Condition Prevails.
77			Approved Vendor List	Filter	Emerson Filter are approved by Mecon. Kindly include them in AVL	PTR may be submitted. However, Tender Condition Prevails.
78			Data Sheet	Pressure Transmitter	Kindly accept Pressure Transmitter with 0.075% accuracy span instead of 0.025%	Tender Condition Prevails.



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79			05/51/23QC/APGDC/030 - MEC / 05 / E5/ TS / TFM-030 Sec 9 (Page 54 of 633)	Straightening vanes shall be provided to eliminate swirls and cross current setup by the pipe-fittings, valves or regulators preceding the meter inlet piping. Straightening vanes shall be designed according to latest revision of AGA Report No-3. Straightening vanes shall be tube bundle of 316 SS tubes and shall be designed and approved by the meter manufacturer.	As per AGA-7 In-built straightener (Within Flow Meter) is acceptable. Please confirm the same.	Tender Condition Prevails.
80			05/51/23QC/APGDC/030- MEC / 05 / E5/ TS / TFM-030 Sec 16 (Page 55 of 633)	The turbine meter shall be calibrated with natural gas near operating pressure.	Kindly confirm whether calibration using air is acceptable.	Tender Condition Prevails.
81			05/51/23QC/APGDC/030- MEC / 05 / E5/ TS / TFM-030 Sec 17 (Page 55 of 633)	The turbine meters shall have HF pulses on the meter head and shall be connected to the flow computer. For Turbine meter of size up to 3", one(1) HF pulse and one(1) LF pulse is also acceptable. However for Turbine meter of size 4" and above, two(2) nos. of HF pulse is required.	As per our understanding, only one HF pulse input shall be connected to flow computer and the other (LF/HF) shall be considered as spare. Please confirm.	Tender Condition Prevails.
82			05/51/23QC/APGDC/030- MEC / 05 / E5/ TS / TFM-030 Sec 18.3 (Page 56 of 633)	Flow calibration shall be performed for at least seven points and error curve shall be obtained. Test medium shall be Natural Gas.	Kindly confirm whether calibration using air is acceptable.	Tender Condition Prevails.
83			05/51/23QC/APGDC/030- MEC / 05 / E5 / TS/ GC -030 (Page 71 to 81 of 633)	Technical Specification for On line Gas Chromatograph	As per our understanding, gas chromatograph is applicable only for Metering Package with Ultrasonics Flow Meters (i.e Group-A). Please confirm.	Gas Chromatograph is required for all the Items of Group A.
84			05/51/23QC/APGDC/030- MEC/23QC/05/E9/E/00 1 Sec 2.2.3 (Page 105 of 633)	All the power and control cables from Electrical Panel to Heater Control Panel and to Electrical Heater required as per the specification.	Kindly provide the distance between Heater Control Panel and Metering skid to consider the cable length as the Heater Control Panel to be installed at indoor.	Please refer 2.2.1 (i) of Scope of Work (Page 21 of 633) in Volume-II of II.
85			05/51/23QC/APGDC/030- MEC/23QC/05/E9/E/00 1 Sec 2.2.4 (Page 105 of 633)	All flame proof double compressed nickel plate cable glands for power and control cable	As per standard installation practice, Non-certified brass glands are acceptable for indoor use. Please confirm.	Tender Condition Prevails.
86			05/51/23QC/APGDC/030- MEC/23QC/05/E9/E/00 1 Sec 3.0 (Page 105 of 633)	Hydrocarbon handling areas have been generally classified as zone 1, gas group IIA/IIB as per IS: 5572, API RP-500, OISD - 113 and IP Rules. All equipments to be installed in these areas shall be suitable for the area classification with temperature class T3 (2000C), CMRI testing and approved by CCOE, DGFAS and having BIS license.	Imported items may come only with ATEX/IECEx /FM/UL/CSA certificate. As per standard installation practice if the item is certified to use in Zone 1 IIA/IIB T3 or Class 1 Div 2, it is acceptable to use in our metering skid. Please confirm.	Tender Condition Prevails.
87			05/51/23QC/APGDC/030- MEC/DS/05/E9/040A Sec 24 (Page 111 of 633)	Terminal Box (applicable for Hazardous Area) Minimum Nema 4X with IP 66/Ex-e	As per IEC 60079.14, Ex'd'is suitable for Zone 1. Hence we can use the same. Please confirm.	Tender Condition Prevails.
88			05/51/23QC/APGDC/030- MEC/TS/05/E9/040A Sec 3.1.8 (Page 111 of 633)	Use of thermostat for power control shall be avoided.	As per IEC requirements, use of thermostat for Power Control is acceptable for Zone 1 applications. Hence we can use the same. Please confirm.	Tender Condition Prevails.



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89			05/51/23QC/APGDC/030- MEC/ 05/E5/DS-PG (Page 161 of 633)	Options: Liquid filled casing shall be provided	As per standard installation practice, liquid filled casing is required for the applications where the vibration will be more (i.e Pump discharge, compressor discharge, etc). As our package is simple metering skid, no liquid filled casing is required for all gauges. please confirm.	Liquid filled casing is not required.
90			05/51/23QC/APGDC/030- DS No: MEC/ 05/E5/DS TG (Page 162 of 633)	As per Temperature gauge data sheet, Mercury Filled Temperature is selected. Please kindly note that this type of gauges is banned.	As per our understanding Bimetal type Temperature gauges are acceptable for our metering skid. Please confirm.	Bimetallic type temperature gauges are also acceptable.
91			05/51/23QC/APGDC/030- DS No: MEC/ 05/E5/DS TG (Page 162 of 633)	Thermowell flange material shall be SS316.	As per previous bids with Mecon specification, ASTM A105 flange is acceptable for Thermowell. We hope the same is acceptable for this project. Please confirm.	Tender Condition Prevails.
92			05/51/23QC/APGDC/030- DS No: MEC/ 05/E5/DS PT (Page 163 of 633)	Accuracy shall be $\pm 0.025\%$ of SPAN	As per standard supply of metering skids $\pm 0.1\%$ accuracy is acceptable. Also most of our previously supplied skids with this accuracy is proven with good working condition. We hope for this project the same is acceptable. Please confirm.	Tender Condition Prevails.
93			05/51/23QC/APGDC/030- DS No: MEC/ 05/E5/DS RTD (Page 164 of 633)	Thermowell flange material shall be SS316.	As per previous bids with Mecon specification, ASTM A105 flange is acceptable for Thermowell. We hope the same is acceptable for this project. Please confirm.	Tender Condition Prevails.
94			05/51/23QC/APGDC/030- DS No: Rev. MEC/ 05/E5/DS-FCV (Page 172 of 633)	Body Material: ASTM A352 GR. LCB/A350 GR. LF2	As per Control valve Manufacturer standard Casting body will be used. Please confirm whether casting body with Low temp. grade (A 352 Gr LCC) is acceptable.	Acceptable
95			05/51/23QC/APGDC/030- Doc. No.: MEC/05/E5/FC-SIV (Page 179 of 633)	Panel Mounted Flow Computers	As per our understanding, Flow Computer shall be installed indoor. Please confirm.	Tender Condition Prevails.
96			05/51/23QC/APGDC/030- Doc. No.: MEC/05/E5/FC-SIV (Page 184 of 633)	Original licensed software for retrieving the stored data, programming the Flow Computer using Laptop, software based on Windows 2000/XP shall be offered.	As per our understanding, one no. of software with license shall be supplied to retrieve data from all Flow Computers. Please confirm.	Tender Condition Prevails.
97			05/51/23QC/APGDC/030- Doc No: MEC/ 05/E5/FC-SIV/01 (Page 187 to 192 of 633)	SIV FOR TURBINE FLOW COMPUTER	As per our understanding, Flow Computer shall be Panel mounted and hence this specification is not applicable. Please confirm.	Tender Condition Prevails.
98			05/51/23QC/APGDC/030- DS No: MEC/ 05/E5/DS/FC -01 (Page 187 to 192 of 633)	DATA SHEET OF FIELD MOUNTED FLOW COMPUTER	As per our understanding, Flow Computer shall be Panel mounted and hence this specification is not applicable. Please confirm.	Tender Condition Prevails.
99			05/51/23QC/APGDC/030- DS No: MEC/ 05/E5/DS LEL (Page 196 to 201 of 633)	DATASHEET OF LEL DETECTION SYSTEM	As per our understanding, LEL detection is not applicable for our metering skids. Please confirm. If LEL detectors to be considered please provide the quantity for each skid.	Tender Condition Prevails.



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MECON LIMITED

S.N.	Document No.	Cl. No.	Section	Section Detail/Description	Pre-bid query	APGDC/ MECON's Reply
100			05/51/23QC/APGDC/030-DS No: MEC/05/E5/Spec.- Laptop (Page 207 of 633)	SPECIFICATION FOR LAPTOP	As per our understanding, Laptop will be under client scope. Pelase confirm. If Laptop to be considered please provide the quantity.	Refer reply to query no. 19.
101			05/51/23QC/APGDC/030-MEC / 05 / E5 / TS/ CP 030 (Page 60 to 70 of 633)	SPECIFICATION FOR CONTROL PANEL & ACCESSORIES	Please confirm Flow computer can be mounted on this control panel itself.	Panel Mounted Flow Computers may be mounted in the bidder's supplied Metering panel. No separate panel for flow computer is required.
102			Inspection & Testing	As per scope of work Vendor to carry out 3.2 certification for the complete supplied items and as per datasheet 3.1 certification	Required conformation regarding certifications shall be EN 10204 Type 3.2 or 3.1 .	Tender Condition Prevails.
103			Inspection & Testing for Pipe, Flange, Fittings , Gaskets and Fasteners	As per scope of work Vendor to carry out 3.2 certification for the complete supplied items and as per QAP & Technical spec 3.1 certification	we shall follow 3.1 certification for Pipe, Flange, Fittings , Gaskets and Fasteners as per QAP & Technical spec.	3.2 certification to be done for Pipe, Flange, Fittings , Gaskets and Fasteners.
104			Ball, Globe & Check valve	As per datasheet of ball, globe & check valve radiography not required and as per Technical spec radiography required 100% 600# and above	we shall follow as per Technical spec for Ball, Globe & Check valve.	Required as specified in Technical specification.
105			Pressure safety valve & Creep relief valve	As per datasheet of PSV & CVR radiography required 100 % as per Technical spec radiography required 100% 600# and above	we shall follow as per Technical spec for Pressure safety valve and creep relief valve.	Refer PSV/CRV datasheet attached with tender document.
106			Self activated pressure control valve and Slam shut valve	As per datasheet 100% radiography required and as per tender QAP no radiography required	Required conformation regarding radiography of PCV & SSV.	100% radiography to be done, if applicable.
107			2.2 SCOPE OF SUPPLY 1) x)	A structural skid complete with necessary drip pan, walkways, staircase, platforms, gratings, handrails for access for operation and maintenance.	Drip Pan shall not be applicable for the Gas skids. Please confirm.	Tender Condition Prevails.
108			2.3 Further Scope of Work and supply: q) 6. TESTING AND INSPECTION 6.3.2 ) b)	The metering stream (flow meter, up-stream & down stream meter tube, flow profiler, impulse tubing of Pressure transmitter, thermo- well, impulse tubing of on line GC) shall be completely insulated to ensure an even heat transfer throughout the meter run when subjected to ambient environment.	Specifications for insulations are not clear, where it is cold / hot insulation. Whereas same is not applicable for turbine meter. Please confirm.	Tender Condition Prevails.
109			6. TESTING AND INSPECTION 6.1.1	Certifications shall be to EN 10204 Type 3.2 for pressure parts	Kindly accept EN 10204 Type 3.1 Certifications.	Tender Condition Prevails.
110			13.1 Mandatory Spares	All type of gasket and studs- 1 set All type of IO barrier/ relay/ terminal as applicable (to be installed in excess of 20%, minimum 01 no.)	Please clarify.	For Gasket : 1 set means 2 nos.of each size & For Studs : 1 set means all the nuts & studs required for 1 no. flange joint of each size. All type of IO barrier/ relay/ terminal as applicable (excess of 20% or 01 no.). Rest Tender Condition prevails.
111			TECHNICAL SPECIFICATION FOR TURBINE METER SPEC. No. : MEC / 05 / E5/ TS / TFM-030 Clause 9	Straightening vanes shall be provided to eliminate swirls and cross current setup by the pipe-fittings, valves or regulators preceding the meter inlet piping. Straightening vanes shall be designed according to latest revision of AGA Report No-3. Straightening vanes shall be tube bundle of 316 SS tubes and shall be designed and approved by the meter manufacturer.	we understood that for Turbine meters with inbuilt straightners, mentioned clause in not applicable.	Tender Condition Prevails.
112			ELECTRIC PROCESS HEATER and CONTROL PANEL MEC/DS/05/E9/040A 4)	Floor-mounted with suitable supports, mounting arrangement	We understood Installation of electric heater is floor mounted & Not on skid and shall be supplied seperately. Hnecne required Civil scope of work shall be in customer scope.	Electrical Heater Control panel shall be Floor mounted, however Electric Heater shall be skid mounted.
113			P&ID	P&ID mentioned 3/4" Root valves for Instrument Tappings.	Kindly accpet 1/2" connctions for instument and sensing lines.	Tender Condition Prevails.



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S.N.	Document No.	Cl. No.	Section	Section Detail/Description	Pre-bid query	APGDC/ MECON's Reply
114			PRESSURE REDUCTION SKID AT IPS-3 (Ref P & ID No.: MEC/23QC/05/28/M/001/0015)	Pipe sizes Inlet : 12" Outlet : 12"	As per pipe sizing Pipe sizes shall be as below, please accept Inlet : 8" Outlet : 10"	Tender Condition Prevails.
115			TYPE – 2 (FOR CGDN / CONSUMER CONNECTIVITY) (Ref P & ID No.: MEC/23QC/05/28/M/002/0002)	Pipe sizes Inlet : 2" Outlet : 3"	As per pipe sizing Pipe sizes shall be as below, please accept Inlet : 1.5" Outlet : 2"	Tender Condition Prevails.
116			TYPE – 1 (FOR CGDN / CONSUMER CONNECTIVITY) (Ref P & ID No.: MEC/23QC/05/28/M/002/0001)	Pipe sizes Inlet : 2" Outlet : 3"	As per pipe sizing Pipe sizes shall be as below, please accept Inlet : 1.5" Outlet : 2"	Tender Condition Prevails.
117			2.3.10. b)	Calculation of metering system uncertainty based on the approved design and it shall be within +/-0.3 %. (Vendor shall submit the Calculation for overall system uncertainty including all components of the metering system). Wet Calibration of Ultrasonic / Turbine Meters shall be done (at 45-50 Kg/cm2 or more) by the bidder considering the above mentioned overall uncertainty. The calibration shall be done at minimum 7 points initially. The calibration shall be done at the following nominal flow rates: 0.025 qmax, 0.05 qmax, 0.1 qmax, 0.25 qmax, 0.5 qmax, 0.75 qmax, and qmax. The calibration reports should also contain verification for minimum two flow readings after adjustment of factors as per AGA 9 / 7.		Tender Condition Prevails.
118			1.0 GENERAL Flow Rate	Each streams of Skid shall be designed to cater flow of 50% / 100 % of max. (Rated) flow capacity (as per P&ID).	We understand that mentioned flow on P&ID is max Rated flow.	Bidder's understanding is correct.
119			P&ID	Pg.No. 213 to 219 of 633 Temperature Design Upstream as - 29 to 65 DegC. Temperature Design Downstream - 45 to 65Deg C.	Kindly Confirm the working & sizing temperature for regulator.	Tender Condition Prevails.
120			P&ID	Pg.No. 213 to 219 of 633	Point 14 of notes. Temperature at inlet of the skid has been asumed 25 Deg C(Min). How ever M/s APGDC has to confirm. Please confirm the Minimum temperature it will be useful in material selection.	Tender Condition Prevails.
121			Data Sheet: pressure control valves & Slam shut Pg.no. 169 , 170	Body Material: ASTM A352 GR. LCB/A350 GR. LF2	If Minimum temperature is 25 Deg C then WCB material will be suitable, because WCB can withstand upto -25Deg C to 65 Deg C. Kindly Confirm	Tender Condition Prevails.
122			Data Sheet: pressure control valves Pg.no. 169	SS 316 STELLITED. Trim Material	Kindly accept SS316 as trim material.	Tender Condition Prevails.
123			General	Electrical Heaters	We understand that Electrical heater is not required for Group A Skids. Please Confirm.	Confirmed.
124			VOL II of II Page 23 of 633, Clause no. 2.2, ff)	The direction of Inlet & outlet is fixed. However the orientation and detailed GAD will be approved as per the plot details and will be dealt during detailed engineering	Please confirm the Orientation of the Skid. Is it in straight line -Filtration-Metering-PRS?	Tender Condition Prevails.
125			P&ID	Design Temperature is mentioned in the P&ID	Please provide the operating temperature ranges for instrument designing purpose.	Tender Condition Prevails.
126			VOL II of II Page 23 of 633, Clause no. 2.3, d)	The dry gas filtration system shall be used to remove dust particles up to 3 micron and to remove condensate if any	We understand that we have to supply the coalescing type filter so that it can remove the condensate if any. Please confirm.	Tender Condition Prevails.
127			VOL II of II Page 23 of 633, Clause no. 2.3, j)	The GC probe shall be installed at least 20D downstream from any flow disturbing elements such as elbows, valves, headers, tees as per ISO 10715.	Please confirm we have to consider 20D distance from any elbow, valve, tee , header for installation of the sampling probe for GC	Tender Condition Prevails.



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128			VOL II of II Page 24 of 633, Clause no. 2.3, n)	The wet calibration of meter (USM) shall be performed with Natural gas at 45-50 Kg/cm2 or more along with its upstream and down stream meter runs and profiler / Flow straightener. The upstream & down stream meter runs ( for USM & Turbine) shall be honed and the maximum meter tube roughness should not exceed 250 RA	We understand that USM shall be calibrate at the maximum available pressure at the third party lab closer to the maximum operating pressure. Please confirm our understanding is correct.	Pressure for Wet Calibration of USM shall be 45-50 Kg/cm2 or more. Rest, Tender condition prevails.
129			VOL II of II Page 30 of 633, Clause no. 3.3.1	UP converters/ Electro pneumatic positioner, Filter regulators, Actuators, positioners shall be suitable for Natural gas (sour) application	As per the gas composition provided, H2S is not present in the gas. We understand that this is not a sour gas. Please confirm our understanding is correct.	Tender Condition Prevails.
130			VOL II of II Page 36 of 633, Clause no. 6.3.2	Flow Meter, Meter run, Flow computer and accessories shall be offered for pre-dispatch inspection to APGDC and / or APGDC's representatives. Following tests, checks shall be conducted: a) Physical/ dimensional checks and workmanship. Checking of meter tube roughness. Calibration including establishing linearity and repeatability over the entire range. Wet calibration of Ultrasonic Flow Meter for USM based skid shall be performed at 45-50 Kg/cm2 or more along with UP (10D + Profiler + 10D) & Down (5D) meter runs and Wet calibration of Turbine Flow Meter for Turbine based skid shall be performed at 45-50 Kg/cm2 or more along with flow straightener.	We understand that Wet calibration shall not be the witness point for the Customer or customers representative. Please confirm.	Confirmed.
131			VOL II of II Page 41 of 633, Clause no. 13.1	Mandatory Spares for USM, FC are not specified	In the Mandatory spares list, there are no spares mentioned for the USM and Flow computers. Please confirm the requirement of the spares.	Refer reply to query no. 149.
132			VOL II of II Page 79 of 633, Clause no. 1.26	The on line Gas chromatograph shall be certified for custody transfer application from Nmi/ PTB.		Tender Condition Prevails.
133			P&ID	Design Pressure is mentioned as 99.93 Kg/cm2 and In the PMS D1A, As per Note-6, design pressure to be considered is mentioned as 92 Kg/cm2	Please clarify the requirement of the design pressure to be considered.	Design pressure mentioned in P&IDs shall prevail.
134			Datasheet for USM	BODY MOC for 8" & below USM is mentioned as A350- LF2	We understand that, A 352 LCC Cast body Meter can also be acceptable as this is low temp cast material.	Acceptable
135			VOL II of II Page 26 of 633, Clause no. ff-e)	Licensed software shall be provided in name of APGDC for Speed of Sound calculation (as per AGA 10) as mentioned in Clause No 8 of AGA9.	We understand that Bidder shall provide the third party license like Kelton. Please confirm.	Tender Condition Prevails.
136			P&ID- KJ Point	FCV at downstream of the Metering skid	We understand that, KJ point station being a tap-Off station, FCV may not be required in the skid. Please confirm the requirement of the FCV.	Tender Condition Prevails.
137			P&ID HPCL Vizag	Size of the USM metering skid is mentioned as 8"	As per the given process parameters and the velocity limit of 20 m/s, 6" USM can be accommodated for measurement of the flow. Please clarify.	Tender Condition Prevails.
138			P&ID Essar	Size of the USM metering skid is mentioned as 8"	As per the given process parameters and the velocity limit of 20 m/s, 6" USM can be accommodated for measurement of the flow. Please clarify.	Tender Condition Prevails.
139			VOL II of II Page 34 of 633, Clause no. 6.1.1 and 6.1.3)	All pressure boundary materials shall have certified material test reports (CMTRs) or certificate of compliance per the design code. Certifications shall be to EN 10204 Type 3.2 for pressure parts and Type 2.2 for other parts.  Vendor to carry out 3.2 certification for the complete supplied items.	We understand that as per GAIL standard practice, mechanical items like pipes, flanges, fitting, valves shall be with 3.2 certification and electronic items like USM, Flow computer, transmitters, FCV, regulators shall be with 3.1 certifications. Please confirm our understanding is correct.	In case of electronic items like USM, TFM, FCV, regulators, SSV, etc. 3.2 to be carried out for pressure parts and final inspection shall be carried out by TPI. Rest, Tender Condition Prevails.
140			P&ID	Provision for Heater tap off points	We understand that the tap-off for the heater system shall be at the downstream of the Metering skid as per the standard practice. Please confirm our understanding is correct.	Tender Condition Prevails.
141			P&ID		Position of Heater Tap off in Group A skids should be before PRS. Please confirm	Tender Condition Prevails.
142			P&ID		Please confirm requirement of Check Valves at each PRS stream outlet	Tender Condition Prevails.
143			P&ID		As per our understanding the Meter Size in Group A Skids shall be same as per line size as mentioned in our P &ID. Please confirm our understanding	Bidder's understanding is correct. Rest, Tender Condition prevails.
144			Page 23		In datasheet of Filters (HPCL Vizag and Essar) QOC is not applicable mentioned. Hhowever as p+A27:E45er our understanding the QOC is required for all vessel size 12" Dia. Please confirm our understanding is correct	Refer filter datasheet attached with tender document.





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S.N.	Document No.	Cl. No.	Section	Section Detail/Description	Pre-bid query	APGDC/ MECON's Reply
145			VOL II of II Page 33 of 633, Clause no.4.0))	Process Description	The maximum permissible pressure across USM skids is higher than 3 Kg/cm <sup>2</sup> g mentioned in the tender for designing the skids. We request Mecon/ APGDC to allow SSV and regulator with available pressure to optimise sizing and for better performance	Pressure drop across the skid of Item no. A.1 shall be 6 kg/cm <sup>2</sup> . Rest Tender condition prevails.
146					We request APGDC/ Mecon to review the requirement of LTCS MOC for Pressure Regulating system because even after pressure reduction the gas temperature will be well above the design temperature of CS MOC (-29 deg C)	Tender Condition Prevails.
147			VOL II of II Page 35 of 633, Clause no.6.2 Clause B)		As per our understanding we have to perform pneumatic leak test during FAT at 7 Kg/cm <sup>2</sup> not at operating pressure as mentioned in the clause. Please confirm our understanding is correct	Tender Condition Prevails.
148			VOL II of II Page 36 of 633, Clause no.6.3.1 Clause C)		Requirement of Hydro test along with Meter Run is not applicable for Gas Ultrasonic Meter. However we will be performing Hydro test of bare body of the meter at Manufacturing location	Hydrotest of meter runs & bare body of meter is to be carried out. Rest, Tender Condition Prevails.
149			VOL II of II Page 41 of 633, Clause no13.0 and 13.1)	Mandatory Spares	Mandatory spares list is only mentioned for PRS. However there is no mention of spares requirement for critical instruments like Ultrasonic Meter, Gas Chromatograph and Flow Computer. Please review and advice	1 set of "Sensor Transducer assembly" is required for USM as Mandatory spare with each USM skid. However, Mandatory spare for FC & GC is not required. Rest, Tender Condition Prevails.
150					As per understanding Regulator, SSV and Meter both Cast and Forged body is acceptable and necessary tests like radiography etc is applicable	Tender Condition prevails. However, equivalent casting grades are also acceptable.
151				Approved Vendor List for Ball Valves	As per our understanding all approved vendors in GAIL/ EIL for Ball Valves like Flowchem, Microfinnish etc are accepted	PTR may be submitted. However, Tender Condition Prevails.
152			Globe Valve and Check valve datasheet for LTCS Material	As per P&ID, the PMS code for the PRS Skid and downstream valves including the FCV is D4A	We understand that the PMS code fD4A shall be considered for the downstream of the PRS skid valves, FCV and NRV Please confirm our understanding is correct	Tender Condition Prevails.
153			Datasheet	Globe Valve and Check valve datasheet for LTCS Material	Please provide the Datasheets for the LTCS material Globe valves and Check Valves	Refer datasheet of Globe Valve, Check Valve attached as annexure-1 with Corrigendum #2.
154	Technical	Volume II of II	Point No. e Page No. 21 of 633	e) All the documents pertaining to Electrical Heater are attached elsewhere in bid document.	Please provide the outlet temperature required to be controlled.	Inlet & Outlet temp. indicated in heater datasheet to be considered for heater design.
155	Technical	Volume II of II	Point No. f Page No. 21 of 633	Supply of on line Solar Panel & Battery operated field mounted Flow Computer (For Item no. B.2) and panel mounted FC for rest of the Metering skid as per MR.	Please provide the detail of Solar Panel Specs.	Bidder to submit details for review / approval considering tender document. Rest, Tender Condition Prevails.
156	Technical	Volume II of II	Point No. g Page No. 21 of 633	GSM Modem shall be provided with each flow computer for polling data from master control station (previous 35 days data) and remote data monitoring.	We understand that, Pooling software will be provided by GAIL.	Tender Condition Prevails.
157	Technical	Volume II of II	Point No. i Page No. 21 of 633	Supply of all types of cables such as signal, alarm, control, earthing cable, power cables (as applicable). For supply of cables, Distance between metering skid (field) and Control room/ Metering panel shall be approx. 150 Meters.	Request to reconfirm the cable distance for individual settings.	Tender Condition Prevails.
158	Technical	Volume II of II	Point No. j Page No. 21 of 633	The distance between Power distribution/ UPS and Control panel shall be approx. 50 meters. The distance between Control panel and SCADA/ RTU panel shall be approx. 30 meters.	Please provide the serial port availability at SCADA side. The same need to be considered for Cable/distance selection.	Bidder to provide cables for all the serial ports indicated against each of the item in tender document. Rest, Tender condition prevails.
159	Technical	Volume II of II	Point No. r Page No. 22 of 633	Any special tools/ tackles required shall be in scope of vendor.	We understand that, the supply of Retraction tool is not in our scope for USM./	Supply of Retraction tool is not in bidder's scope. Rest, Tender condition prevails.
160	Technical	Volume II of II	Point No. n Page No. 24 of 633	The wet calibration of meter (USM) shall be performed with Natural gas at 45-50 Kg/cm <sup>2</sup> or more along with its upstream and downstream meter runs and profiler / Flow straightener. The upstream & downstream meter runs ( for USM & Turbine) shall be honed and the maximum meter tube roughness should not exceed 250 RA.	Please confirm the acceptance of GAIL Hazira Calibration Facility.	Tender Condition Prevails.



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S.N.	Document No.	Cl. No.	Section	Section Detail/Description	Pre-bid query	APGDC/ MECON's Reply
161	Technical	Volume II of II	Point No. 11.2 Page No. 39 of 633	Impulse tube/ pipe of size 1/2" shall be used as impulse lines. The Impulse pipe/ pipe fittings for instrument installation shall be as per the piping material specifications of respective process lines. Tubing when used between manifold and the instrument shall be, 12mm OD with SS316 material of construction as a minimum. The material selected shall be suitable for the process fluid conditions.	We request to GAIL/Mecon to use 1/2" OS ss tubes and fittings.	Tender Condition Prevails.
162	Technical	Volume II of II	Point No. h Page No. 25 of 633	Blocking Tee/ Double Tee/ other Noise attenuation devices downstream of Pressure reduction skid and at up-stream of FCV for proper protection / functioning of Ultrasonic meters as required. Check & pay facility for USM meter run to be provided and facility for meter verification as per "CHECK & PAY" configuration shall be provided in the Metering Supervisory System. Z-configuration for taking the Ultrasonic meters in series should have 2 nos. of FB Ball vales and a spectacle blind in between. Spectacle blinds to be considered at the inlet lines, outlet lines and inlet valve bypass lines of Metering section of skid & in drain line of filter. All spectacle blinds to be greased.	We understand the Blocking tee arrangement is not required for our USM , hence the same shall be as OEM.	Tender Condition Prevails.
163	Technical	Volume II of II	Point No. 6.1.3 Page No. 24 of 633	6.1.3 Vendor to carry out 3.2 certification for the complete supplied items.	We understand the same is not required for USM	Type 3.2 is applicable for all the pressure parts of Ultrasonic Flow Meter. Rest, Tender condition Prevails.
164	Technical	Volume II of II	Technical specification of turbine meter Point No. 9 Page No. 54 of 633	Straightening vanes shall be provided to eliminate swirls and cross current setup by the pipe-fittings, valves or regulators preceding the meter inlet piping. Straightening vanes shall be designed according to latest revision of AGA Report No-3. Straightening vanes shall be tube bundle of 316 SS tubes and shall be designed and approved by the meter manufacturer.	Please provide acceptance to use plate type flow straightner.	Tender Condition Prevails.
165	Technical	Volume II of II	Specification for Control Panel & Accesories Point No. a Page No. 63 of 633	Panel dimension : 1200(W) mm x 2100(H) mm x 800(D) mm (Including channel base) Finalized during detail engineering.	Please confirm the acceptance of 1600 / 1000 MM width panel	Tender Condition Prevails. However, panel width may be finalized during detail engg.
166	Technical	Volume II of II	Specification for Control Panel & Accesories Point No. b Page No. 63 of 633	Control Panel : 3 mm thick CRCA steel/5.0 mm thick HRCA steel, Welded to frame	Please confirm the acceptance of Rittal Standard Specs.	Rittal Make panels are also acceptable. Rest, Tender Condition Prevails.
167	Technical	Volume II of II	Technical specification of turbine meter Point No. 12 Page No. 55 of 633	Turbine meter/ flow computer shall have a continuous monitoring feature for detecting missing blades or bearing problems and to give alarm in such situation.		TS of turbine meter shall prevail. Rest Tender condition prevails.
168	Technical	Volume II of II	Technical specification of turbine meter Point No. 17 Page No. 55 of 633	The turbine meters shall have HF pulses on the meter head and shall be connected to the flow computer. For Turbine meter of size up to 3", one(1) HF pulse and one(1) LF pulse is also acceptable. However for Turbine meter of size 4" and above, two(2) nos. of HF pulse is required.	We understand that TGM shall be included with 2 HF pulse, please provide confirmation.	
169	Technical	Volume II of II	Technical specification of turbine meter Point No. 18.3 Page No. 56 of 633	18.3 Flow calibration shall be performed for at least seven points and error curve shall be obtained. Test medium shall be Natural Gas.	Please provide confirmation for Calibration with Air for smaller meter.	Tender Condition Prevails.
170	Technical	Volume II of II	Technical specification of turbine meter Point No. 18.3 Page No. 56 of 633	18.3 Flow calibration shall be performed for at least seven points and error curve shall be obtained. Test medium shall be Natural Gas.		
171	Technical	Volume II of II	Specification for Control Panel & Accesories Point No. a Page No. 63 of 633	Panel dimension : 1200(W) mm x 2100(H) mm x 800(D) mm (Including channel base) Finalized during detail engineering.	Please confirm the acceptance of 1600 / 1000 MM width panel	Tender Condition Prevails. However, panel width may be finalized during detail engg.



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S.N.	Document No.	Cl. No.	Section	Section Detail/Description	Pre-bid query	APGDC/ MECON's Reply
172	Technical	Volume II of II	Specification for Control Panel & Accessories Point No. b Page No. 63 of 633	Control Panel : 3 mm thick CRCA steel/5.0 mm thick HRCA steel, Welded to frame	Please confirm the acceptance of Rittal Standard Specs.	Rittal Make panels are also acceptable. Rest, Tender Condition Prevails.
173	Technical	Volume II of II	Technical Specification for On line Gas Chromatograph Point No. c Page No. 76 of 633	e) RS485/RS-232C communication ports with modbus protocols to communicate with Flow Computers of various make like Instromet, RMG, Daniel, Bristol Babcock, FMC, OMNI, PIETRO etc. installed in the same control room.	Please include Elster Instomet Make Flow Computer FC1.	Included.
174	Technical	Volume II of II	Technical Specification for On line Gas Chromatograph Point No. c Page No. 76 of 633	c) Four nos. 4 to 20 mA (isolated) output signals for driving 600 Ohms load resistance. Outputs will be used for: (and shall be user configurable): I. Gross calorific value II. Relative density (specific gravity) III. Mole % CO2 IV. Mole % N2 Each output should be user assignable.	We request GAIL / Mecon to avoid 4 - 20 Ma, as the same is not used nowadays for metering.	Tender Condition Prevails.
175	Technical	Volume II of II	PORTABLE CONFIGURATOR: Point No. c Page No. 77 of 633	i. The Portable configurator should have at least Pentium-4 processor, 10 GB hard disk, 128 MB internal RAM, serial port, CD Combo Drive, 17" LCD display. Other details are as under: a) The portable configurator should provide the facility to store all the analysis results made in the past. They can be retrieved and printed out at any time. This PC will be used for following functions: i) Any modification in the programs, which will be used by the analyzer. ii) To Retrieve all data from the analyzer including the chromatogram and should have the facility to configure/ change user related data and should have diagnostic features to face any trouble shootings.	Please confirm the requirement of Separate Laptop for GC, however GC softwares can be loaded on HMI PC.	For USM skids, Laptop is already envisaged & the GC software needs to be loaded in that laptop. Rest, Tender condition prevails.
176	Technical	Volume II of II	Technical Specification for On line Gas Chromatograph: Point No. 1.9 Page No. 79 of 633	Gas Chromatograph shall transmit data to remotely mounted flow computers through serial link. Required hardware/ software for serial communication Flow computers shall be provided by the bidder. Bidder to note that the GC shall also provide the gas data to flow computers (2 nos.) supplied with SOR item. All the requisite hardware / software shall be supplied by the bidder.	Please note that, GC is a slave devise, hence remote dialing is not standard feature available.	Tender Condition Prevails.
177	Technical	Volume II of II	PORTABLE CONFIGURATOR: Point No. 1.9 Page No. 77 of 633	The vendor shall supply min. two each pre-filled calibration gas cylinders (one for each composition as mentioned in process data elsewhere) with regulator mechanism. A recognized laboratory must certify the calibration gas. The calibration gas specification must be approved by the purchaser prior to purchase. The calibration gas shall have a minimum certification accuracy of $\pm 0.2\%$ for components (mole %) greater than 10 % and $\pm 0.5\%$ for components (mole%) between 1 % to 10% and $\pm 1.0\%$ for components (mole%) below 1%. The calibration shall be traceable to NPL or equivalent (the traceability certificate to be submitted) with 03 years stability. Gas volume per cylinder shall be approximately 2.13 M3. The Qty of the gas supplied shall be suitable for 2 year continuous operation.	Please confirm the requirement of two calibration gas cylinders, please also provide the gas composition for selecting the calgas.	Tender Condition Prevails. However, gas composition may be provided to successful bidder.
178	Technical	Volume II of II	Datasheet of PT Page no.: 163 of 633	Element : Diaphragm	We request GAIL / Mecon to accept Piezo restive transducers in place of Diaphragm type. Please provide your confirmation.	Acceptable, subject to meeting rest of the tender conditions.
179	Technical	Volume II of II	Datasheet of PT Page no.: 163 of 633	Body Material : Carbon Steel	Please accept the material as per the manufacturer	Body material superior to carbon steel is also acceptable. Rest, tender condition prevails.
180	Technical	Volume II of II	General	Vendor List	We understand that the approved vendor list of GAIL is also acceptable in said Tender. Kindly confirm	PTR may be submitted. However, Tender Condition Prevails.
181	Technical	Volume II of II	General	PG	We understand that pressure gauge is installed between PCV in PRS . Kindly confirm the same.	Refer Revised P&ID attached as annexure-1 with Corrigendum #2.
182	Technical	Volume II of II	Datasheet of DPT Page no.: 166 of 633	5 -Way Manifold shall be either of same Make as of DPT or of Swagelok / Parker Make.	Manifold shall be either of same Make as of DPT, please elaborate. Can we choose separate manufacturer as per Mecon Vendor list.	For SS valves / manifold, vendor list attached with tender document shall prevail.
183	Technical	Volume II of II	Datasheet of DPT Page no.: 166 of 633	Element: Diaphragm	We request GAIL / Mecon to accept Piezo restive transducers in place of Diaphragm type. Please provide your confirmation.	Acceptable, subject to meeting rest of the tender conditions.
184	Technical	Volume II of II	Datasheet of DPT Page no.: 166 of 633	Body Material Carbon Steel	Please accept the material as per the manufacturer	Body material superior to carbon steel is also acceptable. Rest, tender condition prevails.



Andhra Pradesh Gas Distribution Corporation Ltd.

**Procurement of USM / TURBINE BASED METERING SKID  
FOR KAKINADA-SRIKAKULAM PIPELINE PROJECT (PHASE-1)  
Tender Doc. No.: 05/51/23QC/APGDC/030 (E Tender No. 140042 )  
Reply to Pre-Bid Queries**



MECON LIMITED

S.N.	Document No.	Cl. No.	Section	Section Detail/Description	Pre-bid query	APGDC/ MECON's Reply
185	Technical	Volume II of II	Datasheet of PCV Page no.: 169 of 633	Datasheet of PCV	Please provide the acceptable DP across the compel skid and also across the PCV.Is the same is engaged in the tender.	Pressure drop across the skid of Item no. A.1 shall be 6 kg/cm2. Rest Tender condition prevails.
186	Technical	Volume II of II	Datasheet of USM Page no.: 169 of 633	Material - Body 8" & Below size USM: Forged ASTM A350 Gr. LF2. 10" & Above Size USM: A333 Gr.6 (Meter Body) & ASTM A350 LF2(Flange)	Please accept the material as per the meter manufacturer	Equivalent casting grade is also acceptable.
187	Technical	Volume II of II	Specification of Flow computer Page No. 179 of 633	GSM Modem shall be provided with each flow computer for remote data configuration, remote data uploading (previous 35 days data) and remote data monitoring.	Please confirm GSM / GPRS modem to be supplied.	Refer clause no. 2.2.g), page no. 21 of 633. Rest, tender condition prevails.
188	Technical	Volume II of II	Datasheet of Panel Mounted Flow Computer Point No. g Page No. 180 of 633	g) Additional 7 Nos. 4-20mA DC (2 Wire) superimposed with digital signal (HART Protocol) from 'SMART' Pressure Transmitters representing inlet line pressure, Temperature Transmitters representing inlet line temperature, Diff. Pressure Transmitters representing DP across filters, FCV position feedback.	Please provide the acceptance of PLC to accept the additional I/O.	PLC is acceptable, subject to meeting rest of the tender conditions and PLC shall be of approved Make of APGDC/MECON.
189	Technical	Volume II of II	Datasheet of Panel Mounted Flow Computer Point No. i Page No. 180 of 633	i) Digital Inputs from SDV.		PLC is acceptable, subject to meeting rest of the tender conditions and PLC shall be of approved Make of APGDC/MECON.
190	Technical	Volume II of II	Datasheet of Panel Mounted Flow Computer Point No. 5. Outputs (a) Page No. 180 of 633	5. Outputs : a) 4 – 20 mA DC analog output for corrected volumetric flow rate, line pressure, line temperature, energy rate & FCV positioning command (5 Nos.)		Tender Condition Prevails.
191	Technical	Volume II of II	GSM Modem Point No. 5. Outputs (a) Page No. 184 of 633	GSM MODEM	Please confirm GSM / GPRS modem to be supplied.	Refer clause no. 2.2.g), page no. 21 of 633. Rest, tender condition prevails.
192	Technical	Volume II of II	GSM Modem Point No. 9 Page No. 185 of 633	Flow Computer Validation Software Supplier to provide licensed Software in the name of Client for authenticating the algorithm written in the Flow Computer as per AGA-9.	Please confirm the requirement of Kelton software.	Tender Condition Prevails.
193	Technical	Volume II of II	Datasheet of Field Mounted Flow computer Point No. 9 Page No. 188 of 633	9. Power supply : Solar Panel (SP) Charge System with 6/12 V DC Chargeable Gelcell Battery Backup for at least 30 non sunny days and mounting Hardware for Mounting in a Hazardous area.	We understand that, 30 Non sunny days is too much for designing the Battery, 7 days are sufficient.	Tender Condition Prevails.
194	Technical	Volume II of II	Datasheet of Supervisory System Page No. 193 of 633	Datasheet of Supervisory System	Please provide the technical specification for Industrial PC.	Datasheet attached with tender document is tentative. However, complete Metering Supervisory System shall be of latest specification.
195	Technical	Volume II of II	Datasheet of LEL Page No. 198 of 633	LEL monitor Specs	Please reconfirm the LEL monitor specs.	Tender Condition Prevails. However, Two (high and high –high) common potential free outputs for hook up with SCADA and two spare potential free outputs for future use shall also be provided by the bidder.
196	Technical	Volume II of II	Laptop Page No. 207 of 633	Requirement of Laptop	Please reconfirm the requirement of Separate Laptop for GC.	For USM skids, Laptop is already envisaged & the GC software needs to be loaded in that laptop. Rest, Tender condition prevails.
197	Technical	Volume II of II	Proposed System Architecture for USM Based Metering Skid Page No. 207 of 633	FCV Input and Output	Please except external PID controller.	Refer clause no. 2.3.t), page no. 25 of 633. Rest, tender condition prevails.



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S.N.	Document No.	Cl. No.	Section	Section Detail/Description	Pre-bid query	APGDC/ MECON's Reply
198	Technical	Volume II of II	Proposed System Architecture for TGM/RPD Based Metering Skid Page No. 209 of 633	Signal form LEL	What are the serial data required from LEL monitor, request also to provide the moitor specs.	Tender Condition Prevails. However, serial data to be provided as per site requirement.
199	Technical	Volume II of II	General	Pressure drop	We request GAIL/Mecon to confirm maximum DP allowed or not?	Pressure drop across the skid of Item no. A.1 shall be 6 kg/cm2. Rest Tender condition prevails.
200	Technical	Volume II of II	General	Pressure drop	Please provide the acceptable DP across the compel skid and also across the FCV. The same is required for the sizing of FCV.	Pressure drop across the skid of Item no. A.1 shall be 6 kg/cm2. Rest Tender condition prevails.
201	Technical	Volume II of II	General	Temperature	We request Mecon/GAIL to Please provide inlet and outlet temperature of all station	Tender conditions prevail.
202	Technical	Volume II of II Annexure III	General	Drawings	As per the drawings provided in the tender document 03 streams of 8" Metering Lines with 02 stream of PRS at downstream have been considered. We would like to inform you that in this scenario it shall be difficult to design the PRS as per the tender requirement. We request you to kindly consider higher size (12") 02 metering streams which will suffice the flow requirement. As per our experience it will reduce the operation & maintenance cost drastically and also will be a feasible option. Request you to kindly confirm on the same.	Tender conditions prevail.
203	Commercial	1.0 Salient Features Of Bid Document	Volume I of II Clause No. 1.5 Page No.: 4 of 220	Delivery from Fax of Acceptance : 9 (nine) months from the date of issue of Fax of Acceptance (FOA) on FOT site Basis. Date of receipt & acceptance of material at site shall be considered as the date of delivery.	Looking into the size of meters and the requirement of Calibration and 3.2 certification we request MECON / GAIL to kindly accept delivery period of atleast 10 months from the date of FOA.	Tender conditions prevail.
204	Commercial	26. Price Reduction Schedule For Delayed Delivery	Volume I of II 26. Price Reduction Schedule For Delayed Delivery Page No.: 170 of 220	26.1.1 Deductions shall apply as per following formula: In case of delay in delivery of equipment/materials or delay in completion, total contract price shall be reduced by ½ % (half percent) of the total contract price per complete week of delay or part thereof subject to a maximum of 5% (five percent) of the total contract price.	As per our understanding PRS shall be applicable only on undelivered portion, please confirm.	PRS shall be applicable on delayed delivery value, however, maximum upto 5% of the total order value. Refer Clause no. 15 of SCC-Goods, Vol.-I. Tender conditions prevail.
205	Commercial	PRS	20. Guarantee Page No.: 168 of 220	If any trouble or defect, originating with the design, material, workmanship or operating characteristics of any materials, arises at any time prior to twelve(12) months from the date of the first commercial operation of the Plant for which the materials supplied under the Contract form a part thereof, or twenty four (24) months from the date of last shipment whichever period shall first expire, and the SELLER is notified thereof, SELLER shall, at his own expense and as promptly as possible, make such alterations, repairs and replacements as may necessary to permit the materials to function in accordance with the specifications and to fulfill the foregoing guarantees.	Generally item warranty as per GAIL terms is 18 months from the date of last shipment or 12 months from the date of commissioning. Request you to kindly accept the same.	Tender conditions prevail.
206	Commercial	--	---	Date and time of opening of Un-priced Bids at : At 15:00 hrs. (IST) on 25.09.2017	Looking into the extensiveness of the said tender, may we request GAIL to kindly extend the bid submission date by atleast 2 to 3 weeks from the date of reply to Pre-Bid queries.	Bid is to be submitted within bid due date & time. Refer Corr. #1.
207	Page No. 21		Scope of Supply & responsibility	Online Solar Panel	Please confirm online solar panel is required for Line Item B1. Only, for other line item solar panel is not required.	Tender conditions prevail.



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208	Page No. 21		Scope of Supply & responsibility	SCADA/RTU	SCADA/RTU is not in vendors scope of supply, please confirm	Confirmed. Rest Tender Condition Prevails.
209	Page no. 146		Datasheets	Filter Datasheet	Please confirm mounting of filter as it is written in datasheets that filter should be mounted horizontally, whereas in P&ID filter are vertically mounted.	Refer filter datasheet attached with tender document.
210	Page no.150		Datasheets	Note 4. Impact test	For cartirde filter material, we have to follow the code requirement for impact test or will follow as mentioned in the datasheets.	Tender conditions prevail.
211	Page NO. 103		Electric Heater Control Panel	Thyristor Control Panel	Single thyristor control panel is required for both the heater?. Redundancy is required or not, please confirm	Separate thyristor control panel for each heater shall be provided.
212	Page NO. 103		Electric Heater Control Panel	Thyristor Control Panel	PLC operated Thyristor Control Panel is required or not??	Will be dealt during detail engineering.
213	Page NO. 103		Electric Heater Control Panel	Thyristor Control Panel	Please provide if there is any vendor list of thyristorcontro,panel.	PTR may be submitted. However, Tender Condition Prevails.
214	Page No. 239		Vendor List	Ball Valve make list	Request you to include Flowchem as approved vendor for manual vales	PTR may be submitted. However, Tender Condition Prevails.
215	Page No. 239		Vendor List	Safety Valve Make list	Request you to include Leser as approved vendor for safety valve	PTR may be submitted. However, Tender Condition Prevails.
216	Page No. 128		Electric Heater Control Panel	Heater datasheet	Please confirm mounting of electric heater vertical or horizontal	Tender Condition Prevails.