

	<b>GAIL KHERA PROJECT FOR PROCUREMENT OF BALL VALVE</b>	
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**CORRIGENDUM – 2**

**DATED: 27.06.2011**

**TENDER NO. – 110330E/WGI/GAIL/01-R0**

**E-Tender No. - 8000003092**

<b>Sr. No.</b>	<b>Page / Sheet No</b>	<b>Cl. No</b>	<b>Section / Doc No</b>	<b>Subject</b>	<b>Addition / Deletion / Modification</b>	<b>Remarks</b>
1.	Vol. II of II			Technical	Technical Specification of Gas Over Oil Actuator	Addition
2.	Vol. II of II			Technical	Data Sheet of Gas Over Oil Actuator	Addition

**Corrigendum- 2 is to be treated as part of the original Tender document and while submitting your offer; Corrigendum-2 shall also be signed, stamped and submitted along with Tender Document.**



GAIL (India) Limited  
KHERA COMPRESSOR STATION  
UPGRADATION PROJECT



TECHNICAL SPECIFICATION  
FOR  
GAL OVER OIL ACTUATOR

CLIENT JOB NO.

-

TOTAL SHEETS

6

DOCUMENT NO

11

0330E

03

08

02

009

REV	DATE	DESCRIPTION	PREP	CHK	APPR
0	22.06.11	ISSUED FOR TENDER	NC	ASD	AD
A	16.06.11	ISSUED FOR IDC	NC	ASD	AD

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**TECHNICAL SPECIFICATION  
FOR  
GAS OVER OIL ACTUATOR**

**Document No.**

**Rev**

**11-0330E-03-08-02-009**

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## 1.0 GENERAL

### 1.1 SCOPE

This specification together with the attached data sheets covers the Purchaser's requirements for the design, materials of construction, manufacture, testing and shipping of Gas Over Oil Actuators. In case of contradiction, the data sheets overrule the general requirements of this specification.

## 2.0 REFERENCE DOCUMENTS

Reference is made in this specification to the latest edition of the following codes, standards and specifications:

### Codes and Standards

ASME B31.8	: Gas Transmission and Distribution Piping Systems.
ASME B16.5	: Steel Pipe Flanges and Flanged Fittings.
ASME B16.47	: Large Diameter Steel Flanges: NPS 26 through NPS 60
ASME SEC. VIII	: Boiler and Pressure Vessels Code.
ANSI B 1020.1	: Pipe Threads, General Purpose
SA 370	: Mechanical testing of steel products
SA 530	: General requirements for specialized carbon and alloy steel pipes.
API 1104	: Welding of pipelines and related facilities.
BS 5351	: Steel ball valves for the petroleum, petrochemical and allied industries.
EN 473	: Qualification and certification of NDT personnel general principles.
EN 10204	: Metallic product: type of inspection document
50020	: Electric apparatus for potentially explosive atmosphere – Intrinsic safety (I)
NEC	: National Electric Code
IEC	: International Electrotechnical Commission

## 3.0 DEFINITIONS

Shall	: This verbal form indicates requirements strictly to be followed in order to confirm to the standards and from which no deviation is permitted.
Should	: This verbal form indicates that among several possibilities one is particularly suitable without mentioning or excluding others or that a certain course of action is preferred but not necessarily required.
May	: This verbal form indicates a course of action permissible within the limits of this standard.
Can	: This verbal form used for statements of possibility & capability, whether material, physical or casual.



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#### 4.0 SCOPE

- 4.1 Vendors shall submit a detailed specification sheet for each item offered which shall provide all the details regarding type, material of construction, electrical/pneumatic/hydraulic scheme, etc. of the actuator and their accessories.
- 4.2 Vendor shall highlight the deviations, if any, from the purchaser's data sheets and shall provide reasons for the same. In case no deviations as indicated, it shall be assumed that all specifications are met by vendor.
- 4.3 Vendor shall separately quote for two years operational spares for each instrument and its accessories.
- 4.4 The model number is solely the responsibility of the vendor. In case of contradiction the contents of data sheets has priority over the model number.
- 4.5 Prior to shipment, Manufacturer shall submit one reproducible and six copies of following:
  - a) Test/ calibration/ inspection certificate for all items.
  - b) Manual for installation, erection instructions, maintenance and operation instructions.
- 4.6 All documents shall be in English Language.
- 4.7 Final documents shall be submitted in CD.
- 4.8 Statutory body certificates for offered instruments as applicable.

#### 5.0 TECHNICAL REQUIREMENTS

- 5.1 The basic requirements of Gas Over Oil Actuator are as follows:
  - a) Actuator shall be gas over oil type, quarter turn operation type.
  - b) Actuator torque shall be minimum 1.25 times the maximum valve break torque required at full rated differential pressure of valve.
  - c) Vendor shall indicate actuator model no., valve torque and actuator torque in tabular form.
  - d) Pneumatic connections shall be of min ½" OD size and rating suitable for pressure conditions and shall be SS316 . Suitable connectors shall be used wherever required.
  - e) All tube fittings shall be SS316.
  - f) Valve with actuator shall be suitable for installation in horizontal pipeline.
  - g) All accessories as applicable shall be mounted on SS back plate, which on turn shall be mounted on actuator.



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h) Actuators shall be equipped with adjustable stoppers for opening and closing of valves. At normal operating conditions these stoppers at the actuator shall be limiting the opening and closing of valves.

5.2 The actuators control panel shall be weatherproofed to IP-66 .

The logic components / tubing inside the panel shall be SS316 material as minimum. All electrical components mounted inside the panel shall be intrinsic safe and shall be certified by a statutory body like UL/BASEEFA/ATEX ETC.

5.3 The control logic shall enable the following:

a) Local and remote selection in field.

b) Maintenance/panel/SCADA selection in local panel.

c) Logic function shall include open/ close facilities. Logic may be implemented using relay logic in control panel. Panel / SCADA contacts shall be momentary, hold on contacts shall be used in logic.

d) Remote function shall facilitate remote closure and opening of valve (without any manual intervention if all process interlocks are met). In case electrical signal to solenoid valves fail, the valve shall remain in the last position (Stay put).

e) Manual local hydraulic operation of valve , with hand pumps, in case of non availability of pneumatic (gas) operation.

f) High differential pressure inhibit switch shall inhibit the remote operation of the valve, when differential becomes high (more than 3 bars). However it shall be possible to operate the valve locally.

g) Close command (or open command) shall be inhibited during valve opening (or valve closing) and be made effective only after 100% opening (or closing ) is achieved.

5.4 Hydraulic cylinders shall be sized so that the actuator / operator shall be capable of minimum two open / close operations in the event of loss of line pressure.

5.5 Contractor shall supply gas filter regulators to derive power gas pressure to required level (min 5 bars) for the operation of the logic. Actuator sizing shall be based on minimum gas pressure available in pipeline.

5.6 Solenoid valves shall be mounted inside the actuator control panel for the remote open/close operation of the valve actuators. Solenoid valves shall be intrinsically safe and certified.

5.7 All equipment and accessories shall be tropicalised and provided with anti-corrosion protection, suitable for use in corrosive atmosphere.

5.8 All material shall be new, clean and free from rust, pits, and obvious defects.

5.9 The range (min/max) of opening/closing timings for gas over oil actuator valves shall be 36-55 seconds.

5.10 Material for studs shall be ASTM A193 GR. B7 and nuts shall be ASTM A 194 GR. 2H.



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5.11 Contractor shall provide the following potential free contacts.

- a) Local / remote selector switch in local position and remote position.
- b) Maintenance / local / SCADA selector switch indication in maintenance / panel / SCADA mode
- c) High Differential pressure.
- d) Valve open position.
- e) Valve close position.

All potential free contacts and remote open / close commands shall be provided in a terminal block in actuator control panel. Suitable provisions for cable entry / exit shall also be provided.

## 6.0 TAG PLATE

Actuator shall have SS name plate permanently fastened to the superstructure, which shall be visible when it is in service.

The name plate shall have following information:

- a) Manufacturer's name and trade mark.
- b) Valve tag number.
- c) Actuator model no. & serial no.
- d) Order no. (Optional).

## 7.0 SHIPPING PROTECTION

7.1 All openings shall be suitably protected and all exposed surfaces suitably coated to prevent entry of foreign material and avoid damage during shipment.

7.2 All items shall be adequately packed to withstand shipping conditions without damage.



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GAS OVER OIL ACTUATOR

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CLIENT		GAIL India Limited				KHERRA COMPRESSOR STATION UPGRADATION PROJECT			
QUANTITY		04 (FOUR) SETS							
TAG NOS.		* (To suit Valve Tag Nos.)							
UNITS		Flow Rate : MMSCMD				Pressure : kg/cm2g		Temperature : Deg. C	
GENERAL	1	Tag Number				As per P&ID / Schematic Diagram (Enclosed)			
	2	Line Number				As per P&ID / Schematic Diagram (Enclosed)			
	3	Line size & Schedule				As per P&ID / Schematic Diagram (Enclosed)			
	4	Service				Natural Gas			
	5	P&ID No. / Schematic Diagram No.				Annexure-II (Enclosed)			
	6	Area Classification				IEC Zone-2, Gas Group-IIA & IIB, T3			
ACTUATOR	Type		Gas over oil, quarter turn operation						
	Min. Gas pressure for actuator sizing		*						
	Supply pressure: Min/Nor/Max.		Supplier to consider as per optg. pressure						
	Power gas supply connection		*						
	Tubing material		SS 316						
	Tubing size: Pneumatic/Hydraulic		1/2" O.D.minimum.						
	Filter regulator		Required						
	Valve position indicator		OPEN/CLOSE						
	Manual override		Required on the actuator LCP						
	Failure Position		Fail in last position						
	Painting		As per painting specification						
	Local control panel		Required						
	Control panel material		SS 316						
	Logic/Tubing components		SS 316 (minimum)						
	Tube fittings		SS 316						
	Panel enclosure class		IP-66						
	Gas storage & hyd. Cylinder capacity		Min. two open & two close operations in case of loss of line pressure						
	Accessories		*						
Position switches		Required for both open and closed positions							
Solenoid valve		Required							
Adjustable stopper for actuator		Required for both opening & closing							
Stem Extension		*							
VALVE	Switch Type		Proximity type						
	Contact Rating		*						
	Cable Entry (Junction Box)		1/2" NPT (F) (2 Nos.)						
	Switch Quantity		One						
	Enclosure Material		SS 304						
	Enclosure Class		NEMA 4X (Note-1)						
	Certification		Required						
	Certification Agency		UL/FM/BASIEFA or Equal						
SERVICE	Fluid		Natural Gas						
	Flow :	Min.	Max.	As per Data Sheet of Ball Valve (Enclosed)					
		Normal		As per Data Sheet of Ball Valve (Enclosed)					
	Operating Pressure	Min	Norm	Max	As per Data Sheet of Ball Valve (Enclosed)				
	Press. Drop at normal flow		(bar g)		As per Data Sheet of Ball Valve (Enclosed)				
	Design Pressure		(bar g)		As per Data Sheet of Ball Valve (Enclosed)				
	Temperature	Operating	Design	As per Data Sheet of Ball Valve (Enclosed)					
	Density at normal flow	Mol. Wt.		As per Data Sheet of Ball Valve (Enclosed)					
	Compressibility Factor	Cp/Cv		As per Data Sheet of Ball Valve (Enclosed)					
	Viscosity	Cp		As per Data Sheet of Ball Valve (Enclosed)					
OTHERS	Manufacturer		*						
	Model No.	VALVE		**					
		ACTUATOR		*					
		VALVE POSITION SWITCH		*					
NOTES	* Bidder to provide		** Refer Valve Data Sheet						
	1	The Switches shall be intrinsically safe to specified area classification.							
	2	Flying Leads are not acceptable.							
	3	Supplier shall provide Local/remote selector switch and Maintenance/ panel/ scada selector switch.							
	4	Valve Vendor shall opt for Actuators from the attached list of Actuator Manufacturers. If Valve Vendor opt for any other actuator manufacturer not appearing in the list, the credentials and past track record of the new actuator manufacturer shall be submitted for purchaser review prior to construction							
		DATA SHEET FOR GAS OVER OIL ACTUATOR				DOCUMENT NO.		Rev.	
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GAIL KHERA PROJECT  
FOR PROCUREMENT OF BALL VALVE



Tender No - 110330E/WGI/GAIL/01-R0  
E Tender No. - 8000003092

Replies to Bidders Queries Dtd: 27.06.2011

Sr No	Clause	Subject	Section/Description	Bidder Queries	WGI / GAIL-Replies to Bidder's Queries
1		MOC of Valve Body	Data Sheet of Ball Valve	Body material WCB, we suggest to change to ASTM A105, because forging can eliminate the defect of casting, for example, air hole, sand inclusion etc.	In addition to the MOC stated in data sheet, body material ASTM A105 also be accepted.
2		MOC of Ball	Data Sheet of Ball Valve	Ball material WCB, we suggest to change to ASTM A105+ENP, because forging can eliminate the defect of casting, for example, air hole, sand inclusion etc.	In addition to the MOC stated in data sheet, body material ASTM A105+ENP also be accepted.
3		Data Sheet & Technical Specification of Actuator		We could not found any specification and data sheet of gas over oil actuator.	Attached with corrigendum-2
4	1.2 of MR sr no. 2.0,3.0,4.0 and 6.0	Material Requisition of Ball Valve	MR of Ball Valve	We could not understand the requirement at item no. 2.0, 3.0, 4.0 and 6.0 in technical bid document at point 1.2 on page 4 of 34 of Vol. II of II, please clarify.	200% Gasket for each valve means four nos. gasket for each valve i.e. Total 16 nos. 100% Fasteners for each valve means No. of Studs, Hex Nuts & Washers required on each side flange multiplied by 2 (Two). Two nos. of set of Seat Ring and/or O-Ring etc. for each ball valve. First fill of lubricant means initial fill of both the hydraulic tanks with hydraulic fluids only.
5		Selection of Actuator size		We hereby request yourself to provide the minimum and maximum line pressure for gas over oil actuated Ball Valve of size 30" 600#.	Minimum and maximum line pressure shall be considered as 42.0 kg/cm <sup>2</sup> g and 92.0 kg/cm <sup>2</sup> g respectively.