

CLARIFICATION NO. 03

TENDER NO. PROC-FC/CB/PE&FD/MR-4591/2019 (GAS ENGINEER DRIVEN RECIPROCATING COMPRESSOR PACKAGE FOR MARU RETI FIELD)

OGDCL response against bidder query are as under:

Bidder Query: As per Note 7 two different gas analysis has be provided and both should be considered for each operating cases. So, operating condition 1 should be calculated for RAW GAS 1 and RAW GAS 2 gas analysis, operating conditions 2 in that same way.

Please confirm or clarify.

OGDCL Reply:

Confirm.

With reference to datasheet 0504196-01-DS-001, two different process/raw gas compositions are provided along with three operating conditions for design of required reciprocating compressor. Vendor to design proposed compressor package keeping in view all operating conditions at each process gas composition.

Bidder Query: But in data sheets we have also Fuel Gas analysis, note 6 and operating condition 3, that are more critical for calculations and gas analysis for this column is missed. Please explain what we should do with fuel gas analysis and operating condition 3. If this should be calculated also, please provide gas analysis.

OGDCL Reply:

Process gas will be used as fuel / start gas for operating proposed compressor package. When considering Raw gas 1, for design of proposed compressor package, Raw gas 1 shall be consider as fuel and start gas. Similarly, when considering Raw gas 2, for design of proposed compressor package, Raw gas 2 shall be consider as fuel and start gas.

As process/raw gas contains high amount of nitrogen which result in engine de rating. Vendor to provide engine de rating calculation sheet from engine manufacturer.

GAS ANALYSIS

Note - 7

SERVICE		RAW GAS	RAW GAS	RAW GAS	
		1	2	Fuel gas	
		MOLE%	MOLE%	MOLE%	
METHANE	- CH ₄	72.6624	83.3808	Note - 6	
ETHANE	- C ₂ H ₆	0.0799	0.1867		
PROPANE	- C ₃ H ₈				
ISO-BUTANE	- C ₄ H ₁₀				
NORMAL BUTANE	- C ₄ H ₁₀	0.0006			
ISO-PENTANE	- C ₅ H ₁₂				
NORMAL PENTANE	- C ₅ H ₁₂	0.0006			
HEXANE	- C ₆ H ₁₄	0.0059	0.0261		
HEPTANE+	- C ₇ H ₁₆				
HEPTANE+MW/SG	-				
AMMONIA	- NH ₃				
AIR	-				
WATER VAPOR	- H ₂ O	0.7052	0.4510		
OXYGEN	- O ₂				
NITROGEN	- N ₂	24.3383	14.9188		
HYDROGEN	- H ₂				
HYDROGEN SULFIDE	- H ₂ S				
CARBON MONOXIDE	- CO				
CARBON DIOXIDE	- CO ₂	2.2069	1.0366		
TOTAL	- 100%	100.00	100.00		
MIXTURE MW	-	19.600	18.890		
C _p /C _v	-	1.324	1.322		
RELATIVE HUMIDITY, %	-				
COMPRESSIBILITY FACTOR	-	0.9936	0.9934		
			NORMAL OPERATING POINT		
		OPERATING CONDITION 1	OPERATING CONDITION 2	OPERATING CONDITION 3	RATED CONDITION
SERVICE		RAW GAS	RAW GAS	RAW GAS	RAW GAS
NUMBER OF STAGES		VTS	VTS	VTS	VTS
SUCTION TEMPERATURE	- °C	41.1	41.1	41.1	VTS
SUCTION PRESSURE (Note - 2)	- BARG (PSIG)	3.44738 (50)	3.44738 (50)	6.89476 (100)	VTS
DISCHARGE PRESSURE (Note - 2)	- BARG (PSIG)	13.7895 (200)	17.2369 (250)	17.2369 (250)	VTS
UNIT GAS REQUIRED CAPACITY	- MMSCFD	12.00	12.00	12.00	VTS
		OPERATING CONDITION			
SERVICE		RAW GAS			
NUMBER OF STAGES					
SUCTION TEMPERATURE	- °C		Max		
SUCTION PRESSURE (Note - 2)	- BARG(PSIG)		Normal		
DISCHARGE PRESSURE (Note - 2)	- BARG(PSIG)		Max		
UNIT REQUIRED CAPACITY	- MMSCFD		Normal		

As per Note 7 two different gas analysis has be provided and both should be considered for each operating cases. So, Operating condition 1 should be calculated for RAW GAS 1 and RAW GAS 2 gas analysis, Operating conditions 2 in that same way. Please confirm or clarify. But in data sheets we have also Fuel Gas analysis, note 6 and operating condition 3, that are more critical for calculations and gas analysis for this column is missed. Please explane what we should do with fuel gas analysis and operating condition 3. If this should be calculated also, please provide gas analysis.

Notes:

- 1 VTS = VENDOR TO SPECIFY
- 2 PRESSURES MEASURED AT INLET AND OUTLET FLANGES OF PACKAGE
- 3 PACKAGE HAZOP REPORT SHALL BE SUBMITTED TO COMPANY FOR REVIEW.
- 4 VENDOR/PACKAGER SHALL SUBMIT ALL RELEVANT DESIGN DOCUMENTS INCLUDING BASIS OF DESIGN, VESSEL SIZING SHEETS, PCV SIZING SHEETS, PSV SIZING SHEETS, VENT & BLOWDOWN STUDY AND REPORTS ETC.
- 5 VENDOR SHALL PROVIDE PFD, H&MB, P&ID, DETAIL OPERATION MANUAL, CONTROL AND SAFEGUARDING MANUAL, MAINTENANCE MANUAL, START-UP & SHUTDOWN MANUAL, CAUSE & EFFECT SHEETS, HAZOP, SIL REPORTS. VENDOR SHALL PROVIDE SEPARATE DELIVERABLES.
- 6 PROCESS GAS WILL BE USED AS START GAS / FUEL GAS FOR PROPOSED COMPRESSOR PACKAGE.
- 7 TWO DIFFERENT GAS ANALYSIS ARE PROVIDED. VENDOR TO CONSIDER BOTH FOR EACH OPERATING CASE.
- 8 DUE TO THE PRESENCE OF HIGH NITROGEN CONTENT IN FUEL GAS, VENDOR TO SUGGEST ENGINE DE-RATING DUE TO FUEL GAS CONTENT. VENDOR TO PROVIDE DE-RATING CALCULATION SHEET FROM ENGINE MANUFACTURER.