

1	GENERAL										
2	Project:	INSTALLATION OF NEW GTC AT GANDHAR					Job No.:	B240			
3	Owner:	GAIL (INDIA) LIMITED					Site:	GPU GANDHAR			
4	Purchaser:						Unit:	NEW COMPR. AREA		Unit No: 910	
5	Item No.:	910-PA-901A/B					Service:	LUBE OIL PUMP FOR NG COMP.			
6	No. Reqd.:	TWO		Working:	ONE		Standby:	ONE		Parallel Operation Required:	☐ Yes ☐ No
7	Applicable to	☒ Proposal ☐ Purchase ☐ As Built									
8	☒ Scope option & Information specified by purchaser ☐ Information Reqd. from & option left to vendor. Vendor to cross ☒ the selected option.										
9	Driver: Working	E. Motor		Standby	E. Motor		Driver Supplied & Mounted By:	☒ Pump Mfr. ☐ Other			
10	OPERATING CONDITIONS										
11	Liquid Handled	Lube Oil					Capacity (m ³ /hr):	Min/Nor/Rated:			
12	Pumping Temp. (°C):	Normal				Max.	Discharge Pressure (kg/cm ² ,A):				
13	Specific Gravity at P.T./15°C:						Suction Pressure: Nor./ Max. (kg/cm ² ,A):				
14	Vapour Pressure at P.T. (kg/cm ² ,A):						Diff. Pressure (kg/cm ²) @ Rated Capacity:				
15	Viscosity at P.T. (cP/est):			Corr. /Eros. By:			Diff. Head (m) @ Rated Capacity:				
16	Solids in suspension	☐ Yes ☐ No		Size:			%	NPSH Available (m):			
17	MANUFACTURERS SPECIFICATIONS										
18	Pump Manufacturer:						Model No.:				
19	CONSTRUCTION					PERFORMANCE					
20	Casing Mounting:	☒ Centerline ☐ Foot ☐ Inline				Proposal Curve No.					
21	Casing Split:	☐ Axial ☒ Radial				Visc. Corr. Factor:	C ₀	C _Q	C _H		
22	Type:	☒ Single Volute ☐ Double Volute ☐ Diffuser				NPSH Reqd. (Water) (m):			F/L Speed (rpm):		
23	Casing Connection:	☒ Vent ☒ Drain ☐ Gauge				No. of stages:			Efficiency (%):		
24	Nozzles	Size	ANSI Rating	Facing	Position	Rated BkW(0% Tol.):	kW		Max.BkW rtd. Imp.:		
25	Suction	300#				BkW @ MCF(Δ=1.0):	kW		Rec. Driver Rating: (kW)		
26	Discharge	300#				Max.head rtd imp.(m):			Cap@ BEP(m ³ /hr):		
27	Imp. N (mm)	Max:		Rated:		Min:		Type:	Closed	MCF (m ³ /hr):Stable	Thermal
28	Brg.: Type/No. Radial:	Thrust:		Lub: Oil		M.A.W.P @ 15°C /P.T./Design Temp.(kg/cm ² ,G):					
29	Cplg.: Make/Type:	Fleximet w spacer		Nonspark Guard	☒ Yes ☐ No		Hydrostatic Test pressure (kg/cm ² ,G):				
30	Driver Half cplg. mounted by:	☒ Pump Mfr. ☐ Others				Rotation facing coupling end:		☐ CW ☐ CCW			
31	Packing Type:	Size:			No. of rings:	Seal flush/ Quench plan:		11/61		Material:	
32	Mech. Seal:	Model:			API Code:	Ext. seal flush fluid:				LPM: @ Kg/cm ² G/ °C	
33	Base Plate Drain Rim Type :	☒ Yes ☐ No		Fdn. Bolts:	☒ Yes ☐ No		Seal Barrier fluid:			LPM: @ Kg/cm ² G/ °C	
34	Throat Bush:	☒ Yes ☐ No		Matl.:			Bal. Device:	☐ Yes ☐ No		Ext. quench fluid:	LPM: @ Kg/cm ² G/ °C
35	Materials (API-610 Matl. Class):	S-8		MOC	ASTM Grades		C.W. Plan :			LPM: @ Kg/cm ² G/ °C	
36	I - Cast Iron (Ductile)	Casing	S				Weight(kg): Pump+Base+Coupling:			Driver:	
37	B - Bronze	Impeller	L				AUXILIARY PIPING INTERFACE CONNECTIONS				
38	S - Carbon Steel	Inner Case parts					(All interface conn.shall be termntd.with a flng. block valves)				
39	C - 11-13% Chr. Stl.	Sleeve Packed	---				Size	Rating(ANSI)	Facing		
40	h - Hardened	Sleeve Seal	L				Lantern Ring Inlet/Outlet				
41	f - Faced	Casing ring	JH-BHN	Lhf			Ext. Seal flush fluid Inlet/Outlet				
42	K - SS 304	Impeller ring	50(min)	Lhf			Seal Quench fluid Inlet				
43	L - SS 316	Shaft	X				Seal pot vent/ drain				
44	X - AISI 410	Throttle Bush					Casing vent/ drain				
45	Y	Throat Bush	L				C.W Inlet/ Outlet				
46	Z	Balance Drum					Base plate drain (only flanged)				
47	☒ Driver suitable for Pump starting with open Disc. Valve condition.					Casing steam jacket					
48	INSPECTION & TESTS (EACH PUMP)										
49		Witness	Observe			Witness	Observe				
50	☒ Shop Test / Inspection	☐	☐	☒ NPSH As Reqd. ☐ Per Spec. ☐ Mandatory		☒	☐				
51	☒ Material Certificates	☐	☐	☒ Dismantle Insp. & Re-assembly after Test		☒	☐				
52	☒ Hydrostatic	☒	☐	☒ Unitisation/Dimensional Check		☒	☐				
53	☒ Performance/Sound Level	☒	☐	☒ Check for direction of rotation of pump & driver.		☒	☐				
54	Applicable Specification: API Std. 610, 10 th Edition										
55	REMARKS:- 1) Max. allowable casing working pressure shall not be less than _____ kg/cm ² g @ ____ °C.										
56	2) Down Stream Design Pressure is _____ kg/cm ² g. Maximum shut-off, considering max suction pressure, including all tolerances shall not exceed this value.										
57	3) Both main & standby pump shall be identical in design, construction, speed,etc.										
58	4) Vendor shall fill in all the data for LOP & submit to EIL approval during detailed engg. stage										
59	5) Mechanical Seal shall be one from the makes as listed in Annexure-A of Job specification.										
60	6) Driver rating shall be suitable for start up & operation of pump at max. viscosity of lube oil(heater out of operation)										
61	7). Driver shall be suitable for autostart.										

NOTE: In case the offered Lube Oil Pump is of Rotary type use sheet 2 of 3 and 3 of 3.

25.03.19	A	AS	NK
Date	Rev	Job Engineer	Rev. & Approved By

1	GENERAL							
2	Project: INSTALLATION OF NEW GTC AT GANDHAR				Job no.: B240			
3	Owner: GAIL (INDIA) LIMITED				Site: GPU GANDHAR			
4	Purchaser:				Unit: NEW COMPR. AREA		Unit No.: 901	
5	Item No. 910-PA-901 A/B				Service LUBE OIL PUMP FOR RICH GAS COMPRESSOR			
6	No. Required: Two		Working: One		Stand by: One		Driver: Working: E. MOTOR Stand by: E. MOTOR	
7	Applicable to		☒ Proposals		☐ Purchase		☐ As Built	
8	☒ Scope Option & Information specified by Purchaser ☐ Information required from & options left to vendor. Vendor to cross [X] the selected Option							
9	Manufacturer:				Size & Type:		Model:	
10	OPERATING CONDITIONS (Refer data sheets provided)							
11	☒ Liquid: Lube Oil				☐ Rated Capacity at PT (m ³ /hr): (@ Min. viscosity)			
12	☐ Pumping Temperature (°C) (Max / Min):				☐ Capacity (m ³ /hr): (@ Max. viscosity)			
13	☐ Specific Gravity at PT:				☐ Discharge Pressure (kg/cm ² , a) (Rated):			
14	☐ Vapour Pressure at PT (kg/cm ² , a):				☐ Suction Pressure (kg/cm ² , a) (Rated):			
15	☐ Viscosity at PT (Cp/Cst) (Min / Max):				☐ Differential Pressure (kg/cm ² , a):			
16	☐ Corrosion Erosion caused by:				☐ NPSH available (m):			
17	☐ Presence of Solids:				☐ Jacketing / Tracing Required		☐ Steam ☐ Electric	
18								
19	SITE / INSTALLATION / UTILITY DATA (Rem 4)							
20	Location: ☒ Indoor		☐ Outdoor w/w/o roof		☐ Heated		☒ Unheated	
21	Site Temperature (°C):		Max: Min:		☐ Elect. Area Hazard:		Div: Class: Group:	
22	☐ Available Steam Pr. (kg/cm ² g):		Min:		Nor:		Max:	
23	Temperature (°C)		Min:		Nor:		Max:	
24								
25								
26	APPLICABLE CODES & STANDARDS							
27	APPLICABLE CODES & STANDARDS: API STANDARD 676, 3rd edition							
28	PERFORMANCE							
29	☐ Rated Capacity (m ³ /hr) @ min. viscosity:				☐ Direction of Rotation from Coupling End ☐ CW ☐ CCW			
30	☐ Pump (rpm) @ max. viscosity:				☐ Relief Valve Set Pressure (kg/cm ² , g):			
31	☐ NPSH Required (m):				☐ Relief Valve Acc. Pressure (kg/cm ² , g):			
32	☐ Rated speed (rpm):				☐ BKW @ Max Viscosity (kW):			
33	☐ Displacement (m ³ /hr):				☐ BKW @ Relief Valve Setting (kW):			
34	☐ Volumetric efficiency (%):				☐ BKW at accumulation Pr.:			
35	☐ Mechanical Efficiency (%):				☐ Motor Rating (kW):			
36	☐ Overall Efficiency (%):				☐ Allowable Speed (rpm) Max:		Min:	
37								
38								
39	CONSTRUCTION FEATURES							
40	Nozzles	Size	Rating/Facing	Position	Nozzles	Size		
41	Suction				Jacket Inlet			
42	Discharge				Jacket Outlet			
43	Vent				C.W Supply			
44	Drain				C.W Return			
45	Gland / Flush				Steam Quenching			
46	PUMP TYPE: ☒ Gear OR ☒ Screw				☐ Sliding Vane			
47	☐ External Gear ☐ Internal Gear				Gear Type ☐ Spur Gear ☐ Helical Gear			
48	☐ Twin Screw ☐ Triple Screw ☐ Progressive Cavity							
49	Rotor Mount: ☒ Between Brg. ☐ Overhung				☐ Packing: ☐ No. Of Rings:			
50	☒ Relief Valve: ☐ Built In ☒ Ext.				Steam Jacketing: ☐ Casing ☐ Stuffing Box ☐ None			
51	☐ Timing Gears: ☐ Yes ☐ No				☒ Mechanical Seals:			
52	☐ Bearing (Make/Model):				☐ Manufacturer and Model:			
53	☐ Lubrication Type for Bearing:				☐ Mech. Seal API Code: ☒ API 610 Seal Flush Plan:			
54	☐ Pumped Fluid ☐ Ring Oil ☐ Oil Mist				Piping for Seal Flush & Quench furnished by:			
55	☐ External ☐ Oil Flood ☐ Grease				☒ Pump Vendor ☐ Others			
56	☐ Maximum Allowable Working Pressure (kg/cm ² , g):				☐ Piping for Cooling / Heating furnished by:			
57	☐ Hydrostatic Test Pressure (kg/cm ² , g):				☐ Pump Vendor ☐ Others			
58	☐ Steam Jacket Design Pressure (kg/cm ² , g):							
59								
60								
61								
62								

63	MATERIALS					
64	☒ Stator Body / Casing: CS			☒ Sleeve(s): SS316		
65	☐ Stator Liner / Insert:			☒ Bearing Housing: CS OR CI		
66	☐ End Plates:			☐ Timing Gears:		
67	☒ Rotor(s): Nitrided Steel or SS			☒ Mounting / Base Plate: MS		
68	☐ Vanes:			☐ Discharge Piping:		
69	☐ Shaft:			☐ Gland(s):		
70	☐ Packing: Mech. Seal Faces: C Vs. WC			☒ Relief Valve: Body: CS Trim: SS316		
71						
72						
73	INSPECTION & TESTING					
74	Description	Required	Witnessed	Description	Required	Witnessed
75	Shop Inspection	☒	☐	Performance Test	☒	☒
76	Material Certificates	☒	☐	NPSH Test	☒	☒
77	Hydrostatic test (Casing & Jacket)	☒	☒	R.V Set Functional Test	☒	☒
78	Rotor Dyn. Balancing (Observed)	☒	☐	Dismantle Inspection	☒	☒
79	Mechanical Run	☒	☒			
80						
81						
82	DRIVER					
83	☒ Type of Driver:		☒ Elec. Motor	☐ Steam Turbine ☐ Other:		
84	☒ Driver Supplied & mounted by Pump Manufacturer			☐ Driver Supplied and mounted by other		
85	☐ Driver kW:			☐ Speed (rpm):		
86						
87						
88	DRIVE MECHANISM					
89	☒ Direct Coupled	☐ V- Belt	☐ Variable Speed	☐ Gear	☐ Gear Make:	
90	☐ Coupling Make:		☐ Coupling Type:	☐ Coupling Guard (Non-sparking type)		
91						
92						
93						
94	☒ By Pump Manufacturer		☒ Common Base plate for pump driver, auxiliaries			
95	☒ Drain rim type		☐ Drip tray type	☐ Overall Size (lxbxh) (mm):		
96						
97						
98	WEIGHT					
99	☐ Pump only (kg):		☐ Driver (kg):	☐ Gear Box (kg):		
100	☐ Base plate (kg):		☐ Misc. (kg):	☐ Total Weight (kg):		
101						
102	REMARKS:					
103	1). Equipment Manufacturer to supply his standard design with respect to pump sealing.					
104	2). Pump casing design pressure shall not be less than kg/cm ² @ °C.					
105	3). Mechanical Seal shall be one from the makes as listed in Annexure-A of Job specification.					
106	4). Refer Site & Utility data Doc. No. B240-910-80-42-SU-5010					
107	5). Driver rating shall be suitable for start up & operation of pump at max. viscosity of lube oil (heater out of operation)					
108	6). Both main & standby pump shall be identical in design, construction, speed etc.					
109	7). Driver shall be suitable for autostart.					
110						
111						
112	NOTE: In case the offered Lube Oil Pump is of Centrifugal type use sheet 1 of 3.					
113						
114						
115						

16.04.19	A	AS	NK
Date	Rev	Job Engineer	Rev. & Approved By