MECHANICAL DATA SHEET FOR LP CONDENSATE PUMPS

Note					Rev
	APPLICABLE TO:	PROPOSAL	APPLICABLE NTL/INTNTL STANDARD:	API-610	
	FOR	OIEC	UNIT	200	
	SITE	CHESHMEH KOSH	SERVICE	LP CONDENSATE PUMPS	
	NO. REQ	2 (1+1)	PUMP SIZE	TYPE: CENTRIFUGAL	No. STAGES
	MANUFACTURER		MODEL		SERIAL NO.

LIQUID CHARACTERISTICS

	Units	Minimum	Normal	Maximum
LIQUID TYPE OR NAME :	LP CONDENSATE			
VAPOR PRESSURE:	bar a			1,2
RELATIVE DENSITY :		0,955		0,955
SPECIFIC HEAT:	kJ/(kg-K)			
VISCOSITY:	cP		0,265	

SERVICE : CONTINUOUS
• IF INTERMITTENT NO. OF STARTS :
PUMPS OPERATE IN:
CORROSION DUE TO : (6.12.1.9)
EROSION DUE TO : (6.12.1.9)
H2S CONCENTRATION (ppm) : (6.12.1.12)
CHLORIDE CONCENTRATION (ppm) :
PARTICULATE SIZE (DIA IN MICRONS)
PARTICULATE CONCENTRATION (PPM)
CONTAMINATION OF LIQUID HANDLED
ALLOWED (with compatible fluid): YES
AIR ENTRAINMENT ALLOWED: NO
LEAKS ALLOWED: NO
ANTIFREEZING PROTECTION: NO
HAZARDOUS: NO
FLAMMABLE: NO
Pump Configuration: 1 Operating, 1 Spare

OPERATING CONDITIONS (6.1.2)

	Units	Maximum	Rated	Normal	Minimum
NPSHa Datum:			C.L. Impeller		
PUMPING TEMPERATURE:	°C		105		
12,13 FLOW :	m³/h		88,4	80,4	
DISCHARGE PRESSURE: (6.3.2)	barg		6,1		
SUCTION PRESSURE :	barg	4,05	0,7		0,7
DIFFERENTIAL PRESSURE :	bar		5,4		
DIFFERENTIAL HEAD :	m		58		
8 $NPSH_A$:	m		4,6		
HYDRAULIC POWER :	kW		13,3		

SITE AND UTILITY DATA

23 **LOCATION:** OUTDOOR / UNHEATED

MOUNTED AT : ● TROPICALISATION REQD

14 **ELECTRIC AREA CLASSIFICATION:** 6.1.22 ZONE 2
GROUP II B TEMP CLASS T3

SITE DATA :

1 **ELEVATION (MSL) :** 153 m **BAROMETER :** 960-965 mbar
RANGE OF AMBIENT TEMPS:MIN / MAX -1 / 51 °C
RELATIVE HUMIDITY: MIN / MAX 7 / 90 %
24 **UNUSUAL CONDITIONS:** DUST

UTILITY CONDITIONS :

ELECTRICITY :	DRIVERS	HEATING	CONTROL	SHUTDOWN
VOLTAGE	400			
PHASE	3			
HERTZ	50			

COOLING WATER :

	INLET	RETURN	DESIGN	
TEMP °K		MAX		
PRESS. kPa		MIN		
SOURCE				

COOLING WATER CHLORIDE CONCENTRATION: ppm

INSTRUMENT AIR : MAX kPa MIN kPa

STEAM

		DRIVERS	HEATING
TEMP °K	Max		
	Min		
PRESS. kPa	Max		
	Min		

PERFORMANCE

2	PROPOSAL CURVE NO.	RPM	
	As Tested Curve No.		
	IMPELLER DIA.: RATED	MAX.	MIN. mm
	RATED POWER kW	EFFICIENCY	(%)
	RATED CURVE BEP FLOW (at rated impeller dia)		m³/h
	MIN FLOW : THERMAL m³/s	STABLE	m³/h
	PREFERRED OPERATING REGION (6.1.11)	to	m³/h
	ALLOWABLE OPERATING REGION	to	m³/h
11	MAX HEAD @ RATED IMPELLER		m
	MAX POWER @ RATED IMPELLER (6.8.9)		kW
	NPSH3 AT RATED FLOW :		m
	CL PUMP TO U/S BASEPLATE		m
8	NPSH MARGIN AT RATED FLOW :		m
	SPECIFIC SPEED (6.1.9)	m3/s, rpm, m	
	SUCTION SPECIFIC SPEED LIMIT	230 (SI UNITS)	
19, 7	SUCTION SPECIFIC SPEED	m3/s, rpm, m	
1	MAX. ALLOW. SOUND PRESS. LEVEL REQD (6.1.14)	85	(dBA)
	EST MAX SOUND PRESS. LEVEL		(dBA)
	MAX. SOUND POWER LEVEL REQ'D (6.1.14)		
	EST MAX SOUND POWER LEVEL		

DRIVER (7.1.5)

Driver Type	MOTOR
GEAR	
VARIABLE SPEED REQUIRED	NO
SOURCE OF VARIABLE SPEED	
OTHER	
MANUFACTURER	
NAMEPLATE POWER	kW
Nominal RPM	
RATED LOAD RPM	
FRAME OR MODEL	
ORIENTATION	HORIZONTAL
LUBE	GREASE
BEARING TYPE:	
RADIAL	/
THRUST	/
STARTING METHOD	Open Valve (Fully-Loaded)
SEE DRIVER DATA SHEET	

CONSTRUCTION

Note		Rev
3	**API PUMP TYPE:** OH2 [Based on API 610 definitions]	
3		
4,10	**NOZZLE CONNECTIONS:** (6.5.5)	

	Size	Facing	Rating	Position	
17,21 SUCTION		RF	*300*	END	
DISCHARGE		RF	*300*	TOP	

PRESSURE CASING AUX. CONNECTIONS: (6.4.3.2)

	No.	Size	Type	Facing	Rating	Posn.
BALANCE/LEAK OFF						
DRAIN	1	3/4"		RF	*300*	
VENT						
PRESSURE GAGE						
TEMP GAGE						
WARM-UP LINE						

	Drain Valve Supplied By	SUPPLIER
	DRAINS MANIFOLDED	YES
	VENT Valve Supplied By	SUPPLIER
	VENTS MANIFOLDED	YES
5	THREADED CONS FOR PIPELINE SERVICE & < 50°C (6.4.3.2)	
	SPECIAL FITTINGS FOR TRANSITIONING (6.4.3.3)	
	CYLINDRICAL THREADS REQUIRED (6.4.3.8)	
	GUSSET SUPPORT REQUIRED	
	MACHINED AND STUDDED CONNECTIONS (6.4.3.12)	
	VS 6 DRAIN	
	DRAIN TO SKID EDGE	YES

MATERIAL (6.12.1.1)

3	APPENDIX H CLASS	S-6
	MIN DESIGN METAL TEMP (6.12.4.1)	°C
	REDUCED-HARDNESS MATERIALS REQ'D (6.12.1.12.1)	
	Applicable Hardness Standard (6.12.1.12.3)	
	BARREL :	
	CASE :	
	DIFFUSERS	
	IMPELLER :	
	IMPELLER WEAR RING :	
	CASE WEAR RING :	
	SHAFT:	
	SHAFT SLEEVE:	
18	Inspection Class	Level 3

BEARINGS AND LUBRICATION (6.10.1.1)

BEARING (TYPE / NUMBER): (6.11.4)

3	RADIAL	BALL	/
3	THRUST	BALL	/

REVIEW AND APPROVE THRUST BEARING SIZE : (9.2.5.2.4)

LUBRICATION : (6.10.2.2) (6.11.3) (9.6.1)	RING OIL
PRESSURE LUBE SYSTEM TO ISO 10438- (9.2.6.5)	
ISO 10438 DATA SHEETS ATTACHED	
Pressurized Lube Oil System mtd on pump baseplate	
Location of Pressurized Lube Oil System mounted on baseplate :	
INTERCONNECTING PIPING PROVIDED BY	
OIL VISC. ISO GRADE	VG 46
CONSTANT LEVEL OILER :	REQUIRED

CASING MOUNTING:	CENTERLINE
CASING TYPE: (6.3.10)	RADIAL
OH3 BACKPULLOUT LIFTING DEVICE REQD. (9.1.2.6)	

CASE PRESSURE RATING:

MAWP : (6.3.6)		bar g	@	130 °C	D2
HYDROTEST : 1.5 x MAWP		bar g	@	°C	D2

HYDROTEST OH PUMP AS ASSEMBLY	YES
SUCT'N PRESS. REGIONS DESIGNED FOR MAWP	YES
ROTATION: (VIEWED FROM COUPLING END)	D2
• IMPELLERS INDIVIDUALLY SECURED :	
• BOLT OH 3/4/5 PUMP TO PAD / FOUNDATION :	
• PROVIDE SOLEPLATE FOR OH 3/4/5 PUMPS	
ROTOR:	
SHAFT FLEXIBILITY INDEX (SFI) (9.1.1.3)	
First Critical Speed Wet (Multi stage pumps only)	
COMPONENT BALANCE TO ISO 1940 G1.0	YES
SHRINK FIT -LIMITED MOVEMENT IMPELLERS (9.2.2.3)	

COUPLING:(7.2.3) **(7.2.13.f)**	
MANUFACTURER	
MODEL	Flexible with spacer
RATING (POWER/100 RPM)	
SPACER LENGTH	mm
SERVICE FACTOR	MIN 1.5
RIGID	
COUPLING WITH HYDRAULIC FIT (7.2.10)	
COUPLING BALANCED TO ISO 1940-1 G6.3 (7.2.3)	YES
COUPLING WITH PROPRIETARY CLAMPING DEVICE (7.2.11)	
COUPLING IN COMPLIANCE WITH (7.2.4)	
COUPLING GUARD STANDARD PER (7.2.13.a)	
Window on Coupling Guard	

BASEPLATE

API BASEPLATE NUMBER :	
BASEPLATE CONSTRUCTION (7.3.14)	
BASEPLATE DRAINAGE (7.3.1)	Entire Baseplate Drain Pan or Rim
MOUNTING :	GROUTED
NON-GROUT CONSTRUCTION : (7.3.13)	
VERTICAL LEVELING SCREWS :	REQUIRED
LONGITUDINAL DRIVER POSITIONING SCREWS :	
SUPPLIED WITH : • GROUT AND VENT HOLES	YES
• DRAIN CONNECTION	YES
MOUNTING PADS SIZED FOR BASEPLATE LEVELING (7.3.5)	YES
MOUNTING PADS TO BE MACHINED (7.3.6)	YES
PROVIDE SPACER PLATE UNDER ALL EQUIPMENT FEET	
OTHER	

REMARKS :

Note	INSTRUMENTATION		Rev
	SEE ATTACHED API-670 DATA SHEET		
	ACCELEROMETER (7.4.2.1)		
	Number of Accelerometers		
	Mounting Location of Accelerometers		
	PROVISION FOR MTG ONLY (6.10.2.10)		
3,6	Number of Accelerometers		
	Mounting Location of Accelerometers		
	FLAT SURFACE REQUIRED (6.10.2.11)		
20	Number of Accelerometers		
3	Mounting Location of Accelerometers		
23			
	VIBRATION PROBES (7.4.2.2)		
	PROVISIONS FOR VIB. PROBES		
	NUMBER PER RADIAL BEARING		
	NUMBER PER AXIAL BEARING		
15,16	TEMPERATURE (7.4.2.3)		
	PROVISIONS FOR TEMP PROBES		
	RADIAL BEARING TEMP.		
	NUMBER PER RADIAL BEARING		
	THRUST BEARING TEMP.		
	NUMBER PER THRUST BEARING ACTIVE SIDE		
	NUMBER PER THRUST BEARING INACTIVE SIDE		
	TEMP. GAUGES (WITH THERMOWELLS) (9.1.3.6)		
	PRESSURE GAUGE TYPE		
	Remarks		
	INSTRUMENTATION SHALL BE IN ACCORDANCE WITH		
	"TECHNICAL SPECIFICATION FOR PROCESS CENTRIFUGAL		
	PUMPS" DOC. No. NGL-CT-1-0000-ME-SP-2001, PAR. 7.4.		

SEAL SUPPORT SYSTEM MOUNTING

SEAL SUPPORT SYSTEM MOUNTED ON PUMP BASEPLATE (7.5.1.4) **YES**

IDENTIFY LOCATION ON BASEPLATE

INTERCONNECTING PIPING BY **Supplier**

MECHANICAL SEAL (6.8.1)

SEE ATTACHED ISO 21049/API 682 DATA SHEET

ADDITIONAL CENTRAL FLUSH PORT (6.8.9)

HEATING JACKET REQ'D. (6.8.11)

MECHANICAL SEAL AS PER API 682

PLAN 21 - Single Mechanical Seal

HEATING AND COOLING (6.1.17)

COOLING REQ'D

COOLING WATER PIPING PLAN

COOLING WATER PIPING

FITTINGS

COOLING WATER PIPING MATERIALS

COOLING WATER REQUIREMENTS:

BEARING HOUSING m³/s

HEAT EXCHANGER m³/s

TOTAL COOLING WATER m³/s

HEATING MEDIUM

OTHER

HEATING PIPING

PIPING & APPURTENANCES

MANIFOLD PIPING FOR PURCHASER CONNECTION (7.5.1.6)

VENT **YES**

DRAIN **YES**

COOLING WATER **N / A**

TAG ALL ORIFICES (7.5.2.4)

SOCKET WELD CONN ON SEAL GLAND (7.5.2.8)

Note	SURFACE PREPARATION AND PAINT		TEST		Rev
18	MANUFACTURER'S STANDARD	NO	SHOP INSPECTION (8.1.1)	Yes	
	OTHER (SEE BELOW)	YES	PERFORMANCE CURVE		
	SPECIFICATION NO. NGL-CT-1-0000-PI-SP-2016		& DATA APPROVAL PRIOR TO SHIPMENT.	YES	
			TEST WITH SUBSTITUTE SEAL (8.3.3.2.b)	NO	
	PUMP:		MATERIAL CERTIFICATION REQUIRED CASING	YES	
	PUMP SURFACE PREPARATION YES		(6.12.1.8) IMPELLER	YES	
	PRIMER YES		SHAFT	YES	
	FINISH COAT YES		OTHER (Shaft sleeve & Wear rings)	YES	
			CASTING REPAIR WELD PROCEDURE APPR REQD	YES	
	BASEPLATE:		(6.12.2.5) (6.12.3.1)		
	BASEPLATE SURFACE PREPARATION **YES**		INSPECTION REQUIRED FOR CONNECTION WELDS (6.12.3.4.d)		
	PRIMER: **YES**		(6.12.3.4.e) MAG PARTICLE 100%	YES	
	FINISH COAT **YES**		RADIOGRAPHY 100%	YES	
	DETAILS OF LIFTING DEVICES		LIQUID PENETRANT		
			ULTRASONIC		
	SHIPMENT: (8.4.1) EXPORT		INSPECTION REQUIRED FOR CASTINGS		
	EXPORT BOXING REQUIRED	YES	MAG PARTICLE	YES	
	OUTDOOR STORAGE MORE THAN 6 MONTHS	YES	For critical areas RADIOGRAPHY	YES	
			For impeller LIQUID PENETRANT	YES	
	SPARE ROTOR ASSEMBLY PACKAGED FOR:		ULTRASONIC		
	ROTOR STORAGE ORIENTATION (9.2.8.2)		HARDNESS TEST REQUIRED (8.2.2.7) (If Required)	YES	
	SHIPPING & STORAGE CONTAINER FOR VERT STORAGE (9.2.8.3)		ADDNL SUBSURFACE EXAMINATION (6.12.1.5) (8.2.1.3)	YES	
			FOR	SHAFT	
	N2 PURGE (9.2.8.4)		METHOD	UT	
9	**SPARE PARTS**		PMI TESTING REQUIRED (8.2.2.8)	YES	
	START-UP	YES	COMPONENTS TO BE TESTED		
	NORMAL MAINTENANCE	YES			
	WEIGHTS kg		RESIDUAL UNBALANCE TEST (J.4.1.2)		

ITEM No	PUMP	DRIVER	GEAR	BASE	TOTAL

	OTHER PURCHASER REQUIREMENTS			
	COORDINATION MEETING REQUIRED (10.1.3)	YES	NOTIFICATION OF SUCCESSFUL SHOP	
22	MAXIMUM DISCHARGE PRESSURE TO INCLUDE		PERFORMANCE TEST (8.1.1.c) (8.3.3.5)	YES
	MAX RELATIVE DENSITY	YES	BASEPLATE TEST (7.3.21)	
	OPERATION TO TRIP SPEED		HYDROSTATIC	WIT
	MAX DIA. IMPELLERS AND/OR NO OF STAGES	YES	HYDROSTATIC TEST OF BOWLS & COLUMN (9.3.13.2)	
	CONNECTION DESIGN APPROVAL (9.2.1.4)		PERFORMANCE TEST	WIT
	TORSIONAL ANALYSIS / REPORT (6.9.2.10)		TEST IN COMPLIANCE WITH (8.3.3.2)	8.3.3.2
	PROGRESS REPORTS	YES	TEST DATA POINTS TO (8.3.3.3)	8.3.3.3
	OUTLINE OF PROC FOR OPTIONAL TESTS (10.2.5)		TEST TOLERANCES TO (8.3.3.4)	Table 16
	ADDITIONNAL DATA REQUIRING 20 YEARS RETENTION (8.2.1.1)		NPSH (8.3.4.3.1) (8.3.4.3.4) (If Required)	WIT
			NPSH-1ST STG ONLY (8.3.4.3.2)	
	LATERAL ANALYSIS REQUIRED (9.1.3.4) (9.2.4.1.3)		NPSH TESTING TO HI 1.6 OR ISO 9906 (8.3.4.3.3)	
	MODAL ANALYSIS REQUIRED (9.3.9.2)		TEST NPSHA LIMITED TO 110% SITE NPSHA (8.3.3.6)	
	DYNAMIC BALANCE ROTOR (6.9.4.4)	YES	RETEST ON SEAL LEAKAGE (8.3.3.2.d)	OBSERVE
	INSTALLATION LIST IN PROPOSAL (10.2.3.l)		RETEST REQUIRED AFTER FINAL HEAD ADJ (8.3.3.7.b)	WIT
	VFD STEADY STATE DAMPED RESPONSE ANALYSIS (6.9.2.3)		COMPLETE UNIT TEST (8.3.4.4.1)	WIT
			SOUND LEVEL TEST (8.3.4.5)	NON-WIT
	TRANSIENT TORSIONAL RESPONSE (6.9.2.4)		CLEANLINESS PRIOR TO FINAL ASSEMBLY (8.2.2.6)	NON-WIT
	BEARING LIFE CALCULATIONS REQUIRED (6.10.1.6)	YES	LOCATION OF CLEANLINESS INSPECTION	
	IGNITION HAZARD ASSMT TO EN 13463-1 (7.2.13.e)		NOZZLE LOAD TEST	
	CASING RETIREMENT THICKNESS DRAWING (10.3.2.3)		CHECK FOR CO-PLANAR MOUNTING PAD SURFACES	
	FLANGES RQD IN PLACE OF SKT WELD UNIONS (7.5.2.8)		MECHANICAL RUN TEST UNTIL OIL TEMP STABLE	
	INCLUDE PLOTTED VIBRATION SPECTRA (6.9.3.3)	YES	4 HR. MECH RUN AFTER OIL TEMP STABLE (8.3.4.2.1)	WIT
	CONNECTION BOLTING (7.5.1.7)		4 HR. MECH RUN TEST (8.3.4.2.2)	
	CADMIUM PLATED BOLTS PROHIBITED			
	VENDOR TO KEEP REPAIR AND HT RCDS (8.2.1.1.c)		BRG HSG RESONANCE TEST (8.3.4.7)	
	VENDOR SUBMIT TEST PROCEDURES (8.3.1.1)	***YES***	STRUCTURAL RESONANCE TEST (9.3.9.2)	
	SUBMIT INSPECTION CHECK LIST (8.1.5)	***YES***	REMOVE / INSPECT HYDRODYNAMIC BEARINGS AFTER TEST	
			(9.2.7.5)	
			AUXILIARY EQUIPMENT TEST (8.3.4.6)	OBSERVE
			EQUIPMENT TO BE INCLUDED IN AUXILLIARY TESTS	

			Rev
	LOCATION OF AUXILIARY EQUIPENT TEST		D2
	IMPACT TEST (6.12.4.3)	***PER EN 13445***	D2
		PER ASME SECTION VIII ***NON-WIT***	D2
	REMOVE CASING AFTER TEST		D2

Note	PRESSURE VESSEL DESIGN CODE REFERENCES	Rev

THESE REFERENCES MUST BE LISTED BY THE MANUFACTURER

CASTING FACTORS USED IN DESIGN (TABLE 3)

SOURCE OF MATERIAL PROPERTIES

WELDING AND REPAIRS

THESE REFERENCES MUST BE LISTED BY THE PURCHASER. (DEFAULT TO TABLE 11 IF NO PURCHASER PREFERENCE IS STATED)

ALTERNATE WELDING CODES AND STANDARDS	
WELDING REQUIREMENT (APPLICABLE CODE OR STANDARD)	DEFAULT TO TABLE 11
WELDER/OPERATOR QUALIFICATION	DEFAULT TO TABLE 11
WELDING PROCEDURE QUALIFICATION	DEFAULT TO TABLE 11
NON-PRESSURE RETAINING STRUCTURAL WELDING SUCH AS BASEPLATES OR SUPPORTS	DEFAULT TO TABLE 11
MAGNETIC PARTICLE OR LIQUID PENETRANT EXAMINATION OF PLATE EDGES	DEFAULT TO TABLE 11
POSTWELD HEAT TREATMENT	DEFAULT TO TABLE 11
POSTWELD HEAT TREATMENT OF CASING FABRICATION WELDS	DEFAULT TO TABLE 11

MATERIAL INSPECTION

THESE REFERENCES MUST BE LISTED BY THE PURCHASER — DEFAULT TO TABLE 15 — YES

ALTERNATIVE MATERIAL INSPECTIONS AND ACCEPTANCE CRITERIA (SEE TABLE 15) (8.2.2.5)

TYPE OF INSPECTION	METHOD	FOR FABRICATIONS	FOR CASTINGS
RADIOGRAPHY			
ULTRASONIC INSPECTION			
MAGNETIC PARTICLE INSPECTION			
LIQUID PENETRANT INSPECTION			
VISUAL INSPECTION (all surfaces)			

REMARKS :

Note		Rev
	Note 1: REFER TO SITE CONDITION ON "DESIGN BASIS" DOC No. NGL-CT-1-0000-PR-DB-2001.	
	Note 2: ELECTRIC MOTORS SHALL BE GOVERNED BY "SPECIFICATION FOR LV MOTORS", DOC. NO. NGL-CT-1-0000-EL-SP-2007. ALSO ELECTRICAL DATA SHEET FOR LV MOTORS SHALL BE FILLED BY VENDOR.	
	Note 3: TO BE REVIEWED AND CONFIRMED BY PUMP VENDOR.	
	Note 4: ALLOWABLE LOADS ON FLANGES SHALL BE AT LEAST TWICE OF THE VALUES SPECIFIED IN TABLE 5 OF API 610 (11th EDITION).	
	Note 5: DRY, FLEXIBLE, SPACER TYPE COUPLING WITH NON SPARK GUARD SHALL BE USED.	
	Note 6: MECHANICAL SEAL SHALL BE AS PER API 682 AND VENDOR SHALL FILL OUT MECHANICAL SEAL DATA SHEET OF API 682 DURING DETAIL ENGINEERING PHASE. ALSO SPECIFIED SEAL SPECIFICATIONS IN THIS DATA SHEET SHALL BE REVIEWED AND VERIFIED BY PUMP AND SEAL VENDORS.	
	Note 7: AUTOMATIC START TO BE PROVIDED FOR PUMPS.	
	Note 8: MARGIN BETWEEN NPSHR AND NPSHA SHALL BE 0,6 METER OR ABOVE FROM MINIMUM CONTINUOS STABLE FLOW UP TO AND INCLUDING THE RATED FLOW, AND 0,3 METER AT THE LESSER OF MAXIMUM ALLOWABLE FLOW. NPSH TEST SHALL BE PERFORMED WHEN NPSHA - NPSHR < 1 METER.	
	Note 9: FOR COMMISSIONING AND 2 YEARS OPERATING SPARE PART LIST, REFER TO NGL-CT-1-0000-ME-LI-2001.	
	Note 10: SUCTION LINE 8", DISCHARGE LINE 6".	
	Note 11: SHUT-OFF PRESSURE SHALL BE SPECIFIED BY VENDOR.	
	Note 12: MINIMUM TURNDOWN REQUIRED 30% REFERRED TO NORMAL CAPACITY.	
	Note 13: MINIMUM AND MAXIMUM FLOWRATES WILL BE SPECIFIED BY PUMP VENDOR.	
	Note 14: AREA CLASSIFICATION IS PRELIMINARY. PLEASE SEE NGL-CT-1-0000-FA-LY-8004.	
	Note 15: FOR PUMP INSTRUMENTATION, THE RELEVANT CLAUSE OF SPECIFICATION FOR PROCESS CENTRIFUGAL PUMPS "NGL-CT-1-0000-ME-SP-2001" SHALL BE FOLLOWED.	
	Note 16: INSTRUMENTATION FOR LV MOTOR SHALL BE PROVIDED AS PER "SPECIFICATION FOR LV MOTORS", DOC. NO. NGL-CT-1-0000-EL-SP-2007.	
	Note 17: PUMP DESIGN PRESSURE 11 barg. PUMP DESIGN TEMPERATURE 130°C.	
	Note 18: SEE ITP FOR MACHINERY, DOC. No. NGL-CT-1-0000-ME-PR-2001.	
	Note 19: SUCTION SPECIFIC SPEED SHALL BE CALCULATED ACCORDING TO API 610 ANNEX A.	
	Note 20: ALL MECHANICAL SEAL INSTRUMENTS ACCORDING TO API 682 SHALL BE SUPPLIED BY VENDOR.	
	Note 21: MAWP TO BE SPECIFIED @ MAXIMUM DESIGN TEMPERATURE.	
	Note 22: IN ACCORDANCE WITH PAR. 8.3.3.3 OF PROJECT SPECIFICATION DOC. No. NGL-CT-1-0000-ME-SP-2001.	
	Note 23: COOLING WATER IS NOT AVAILABLE AND AIR FINNED COOLERS SHALL BE USED FOR COOLING PURPOSE.	
	Note 24: AS PER SITE CONDITION ON "DESIGN BASIS" DOC No. NGL-CT-1-0000-PR-DB-2001, THE NUMBER OF DAYS WITH DUST SHALL BE ASSUMED 103 DAYS/YEAR.	