

JASK Crude Oil Storage Tanks Project



نارفرمای طرح/MC طرح



6 S ontract No:



Mechanical Data Sheet For Crude Oil Main Pumps

Project	Unit	Phase	Discipline	Doc. Type	Serial	Revision	
325260	00	EB	ME		0005	A02	

Mechanical Data Sheet For Crude Oil Main Pumps (P-6001A~L)

A02	APPROVE FOR DESIGN	1-May-2019	E.DAVOODIPOOR	M.SAFFARZADEH	A.ESKANDARLU
A01	APPROVE FOR DESIGN	17-Mar-2019	E.DAVOODIPOOR	M.SAFFARZADEH	A.ESKANDARLU
A00	ISSUE FOR APPROVAL	5-Mar-2019	E.DAVOODIPOOR	M.SAFFARZADEH	A.ESKANDARLU
Rev	Description	Date	Prepared	Checked	Approved

GOREH-JASK Crude Oil Pipeline and JASK Storage Tanks

Program

کارفرمای طرح/ MC طرح Construction

JASK Crude Oil Storage Tanks Project





Mechanical Data Sheet For Crude Oil Main Pumps

	Project	Unit	Phase	Discipline	Doc. Type	Serial	Revision	شركت ملى مهندى وساختان نعنت
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2	*				52		102		152		
3	*	*	*		53		103		153		
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5	*				55		105		155		
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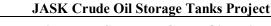
GOREH-JASK Crude Oil Pipeline and JASK Storage Tanks

Construction Program

Doc. Type



Contract No:



Phase

EB

Mechanical Data Sheet For Crude Oil Main Pumps

Discipline

ME

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Revision

A02

0005

P47 Note APPLICABLE TO: PROPOSAL APPLICABLE STANDARD: API-610 Rev FOR PETROLEUM ENGINEERING AND DEVELOPMENT COMPANY (PEDEC) UNIT P-6001A~L(NOTE 6) 3 JASK CRUDE OIL STORAGE TANKS PROJECT SERVICE CENTRIFUGAL NO. REQ PUMP SIZE TYPE No. STAGES 7 (NOTE 1) A02 5 MANUFACTURER AS PER AVL MODEL NOTE 1 SERIAL NO. NOTE 1 LIQUID CHARACTERISTICS 6 Maximum Rated SERVICE : CONTINUOUS Minimum LIQUID TYPE OR NAME 8 CRUDE OIL VAPOR PRESSURE 9 PUMPS OPERATE IN: PARALLEL RELATIVE DENSITY 0.880 10 CORROSION DUE TO: (6.12.1.9) TRACE OF CHLORIDE 11 SPECIFIC HEAT kJ/(kg-K) 1.964 1.774 1.774 EROSION DUE TO: (6.12.1.9) 12 H2S CONCENTRATION (ppm): (6.12.1.12) >60 13 OPERATING CONDITIONS (6.1.2) CHLORIDE CONCENTRATION (ppm): >50 LATER 14 Units Maximum Rated Normal Minimum PARTICULATE SIZE (DIA IN MICRONS) 15 NEGLIGIBLE PARTICULATE CONCENTRATION (PPM) PUMPING TEMPERATURE °C 40 16 FLOW m³/h 1056 960 17 DISCHARGE PRESSURE: (6.3.2 14.93 SUCTION PRESSURE bar g 0.23 19 DIFFERENTIAL PRESSURE bar 14.7 20 DIFFERENTIAL HEAD 170.5 A02 NPSH_A 22 HYDRAULIC POWER: kW 23 431.2 SITE AND UTILITY DATA 24 LOCATION: COOLING WATER: NOT APPLICABLE A02 26 UNDER ROOF 27 MOUNTED AT : GRADE TROPICALISATION REQD TEMP MAX ELECTRIC AREA CLASSIFICATION: PRESS bar d 28 6.1.22 ZONE MIN 29 GROUP TEMP CLASS SOURCE 30 SITE DATA : COOLING WATER CHLORIDE CONCENTRATION: ppm ELEVATION (MSL): INSTRUMENT AIR: 31 BAROMETER: 760 mmHg MAX kg/cm²g MIN bar g 6 / 32 RANGE OF AMBIENT TEMPS:MIN / MAX °C STEAM 93 33 RELATIVE HUMIDITY: MIN / MAX 35 / DRIVERS HEATING TEMP °C 34 UNUSUAL CONDITIONS: DUST Max 35 Min 36 UTILITY CONDITIONS: PRESS. bar g Max 37 ELECTRICITY: SHUTDOWN DRIVERS HEATING CONTROL Min 38 VOLTAGE 6000 V 230 39 PHASE 3PH 40 HERTZ 50Hz 50Hz PERFORMANCE(NOTE 1) DRIVER (7.1.5)-NOTE 13 41 42 PROPOSAL CURVE NO. Driver Type MOTOR 43 As Tested Curve No. NO IMPELLER DIA.: RATED VARIABLE SPEED REQUIRED MAX. MIN. mm NO 45 RATED POWER <627 kW EFFICIENCY SOURCE OF VARIABLE SPEED 46 RATED CURVE BEP FLOW (at rated impeller dia) OTHER NO m³/h 47 MIN FLOW: THERMAL m³/h STABLE m³/h MANUFACTURER AS PER AVL A02 48 PREFERRED OPERATING REGION (6.1.11) NAMEPLATE POWER 1000 ALLOWABLE OPERATING REGION 49 m³/h Nominal RPM 1500 50 MAX HEAD @ RATED IMPELLER m RATED LOAD RPM NOTE 1 51 MAX POWER @ RATED IMPELLER FRAME OR MODEL NOTE 1 52 NPSH3 AT RATED FLOW : ORIENTATION VERTICAL A02 < 6.5 m 53 CL PUMP TO U/S BASEPLATE LUBE GREASE-Li BASE NPSH MARGIN AT RATED FLOW: BEARING TYPE: ANTI-FRICTION SPECIFIC SPEED (6.1.9) NOTE 1 / NOTE 1 55 RADIAL m3/s, rpm, m 56 SUCTION SPECIFIC SPEED LIMIT THRUST NOTE 1 / NOTE 1 57 STARTING METHOD SUCTION SPECIFIC SPEED Open Valve (Fully-Loaded) MAX. ALLOW, SOUND PRESS, LEVEL REQD (6.1.14) (dBA) SEE DRIVER DATA SHEET LATER 58 EST MAX SOUND PRESS. LEVEL (dBA) MAX. SOUND POWER LEVEL REQ'D (6.1.14) EST MAX SOUND POWER LEVEL



JASK Crude Oil Storage Tanks Project



Project

OIL VISC. ISO GRADE

CONSTANT LEVEL OILER:

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Unit

Mechanical Data Sheet For Crude Oil Main Pumps

Discipline

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Contract No: Page 4 of 9 325260 00 $\mathbf{E}\mathbf{B}$ DS 0005 A02 CONSTRUCTION Note Rev API PUMP TYPE: [Based on API 610 definitions] CASING MOUNTING: VERTICAL 3 SEE ALSO PAGE 5 CASING TYPE: DIFFUSER (6.3.10)4 NOZZLE CONNECTIONS: (6.5.5)OH2 BACKPULLOUT LIFTING DEVICE REQD. (9.1.2.6) NO 5 Size Facing Rating Position CASE PRESSURE RATING: 6 SUCTION NOTE 1 RF 300 SIDE MAWP: °C (6.3.6)40 85 bar g 7 DISCHARGE NOTE 1 RF 300 SIDE HYDROTEST: 60 bar g 38 °C PRESSURE CASING AUX. CONNECTIONS: (6.4.3.2) Facing Rating Posn. HYDROTEST VS PUMP AS ASSEMBLY 9 Type NOT 10 BALANCE/LEAK OFF SUCT'N PRESS. REGIONS DESIGNED FOR MAWP YES APPLICABLE DRAIN NOTE 1 SIDE ROTATION: (VIEWED FROM COUPLING END) 11 1 SWF RF 300 CCW 12 VENT NOTE 1 SWF RF 300 SIDE IMPELLERS INDIVIDUALLY SECURED : YES NOT A02 PRESSURE GAGE BOLT OH 3/4/5 PUMP TO PAD / FOUNDATION : 13 APPLICABLE NO PROVIDE SOLEPLATE FOR OH 3/4/5 PUMPS TEMP GAGE 14 APPLICABLE NO A02 WARM-UP LINE 15 APPLICABLE ROTOR: 16 SHAFT FLEXIBILITY INDEX (SFI) (9.1.1.3) NOTE 1 Drain Valve Supplied By SUPPLIER First Critical Speed Wet (Multi stage pumps only) YES COMPONENT BALANCE TO ISO 1940 G1.0 YES 18 DRAINS MANIFOLDED YES 19 VENT Valve Supplied By SUPPLIER SHRINK FIT -LIMITED MOVEMENT IMPELLERS (9.2.2.3) NO 20 THREADED CONS FOR PIPELINE SERVICE & < 50°C (6.4.3.2) COUPLING:(7.2.3) 21 NO (7.2.13.f) 22 SPECIAL FITTINGS FOR TRANSITIONING (6.4.3.3) NO MANUFACTURER AS PER AVL CYLINDRICAL THREADS REQUIRED (6.4.3.8) 23 MODEL NOTE 1 GUSSET SUPPORT REQUIRED RATING (POWER/100 RPM) 24 NO NOTE 1 25 MACHINED AND STUDDED CONNECTIONS (6.4.3.12) NO SPACER LENGTH >125 26 MIN 1.5 External DRAIN TO SKID EDGE 27 YES RIGID N/A 28 COUPLING WITH HYDRAULIC FIT (7.2.10) N/A MATERIAL (6.12.1.1) COUPLING BALANCED TO ISO 1940-1 G6.3 (7.2.3) 30 COUPLING WITH PROPRIETARY CLAMPING DEVICE (7.2.11) APPENDIX H CLASS A-8 31 MIN DESIGN METAL TEMP (6.12.4.1) -2 32 REDUCED-HARDNESS MATERIALS REQ'D (6.12.1.12.1) YES COUPLING IN COMPLIANCE WITH (7.2.4) API 610 compliant Applicable Hardness Standard (6,12,1,12,3) COUPLING GUARD STANDARD PER (7.2.13.a) ANSI B15.1 33 MR0103 34 BARREL NOTE 1 Window on Coupling Guard YES BOWL : 35 NOTE 1 DIFFUSERS 36 BASEPLATE(NOTE 1) NOTE 1 37 IMPELLER: NOTE 1 API BASEPLATE NUMBER : IMPELLER WEAR RING : NOTE 1 BASEPLATE CONSTRUCTION (7.3.14) CASE WEAR RING: 39 NOTE 1 BASEPLATE DRAINAGE (7.3.1) 40 SHAFT: NOTE 1 MOUNTING : GROUTED NON-GROUT CONSTRUCTION: (7.3.13) Bowl (if VS-type) REQUIRED 42 VERTICAL LEVELING SCREWS: REQUIRED Inspection Class Level 3 43 BEARINGS AND LUBRICATION (6.10.1.1) LONGITUDINAL DRIVER POSITIONING SCREWS: REQUIRED 44 BEARING (TYPE / NUMBER): SUPPLIED WITH: I GROUT AND VENT HOLES YES (6.11.4)45 RADIAL SLEEVE I DRAIN CONNECTION YES THRUST MOUNTING PADS SIZED FOR BASEPLATE LEVELING (7.3.5) YES 46 ROLLER NOTE 1 47 REVIEW AND APPROVE THRUST BEARING SIZE: (9.2.5.2.4) MOUNTING PADS TO BE MACHINED (7.3.6) YES 48 PROVIDE SPACER PLATE UNDER ALL EQUIPMENT FEET YES 49 LUBRICATION: (6.10.2.2) (6.11.3) (9.6.1) FLOOD OTHER 50 PRESSURE LUBE SYSTEM TO ISO 10438-(9.2.6.5)ISO 10438 DATA SHEETS ATTACHED 50 REMARKS: 51 Pressurized Lube Oil System mtd on pump baseplate N/A 52 Location of Pressurized Lube Oil System mounted on baseplate N/A 53 54 INTERCONNECTING PIPING PROVIDED BY Supplier 55

NOTE 1

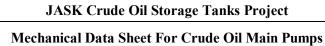
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GOREH-JASK Crude Oil Pipeline and JASK Storage Tanks

Construction Program





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				147	
1	Note	INSTRUMENTATION		SEAL SUPPORT SYSTEM MOUNTING	Rev
2		SEE ATTACHED API-670 DATA SHEET	N/A	SEAL SUPPORT SYSTEM MOUNTED ON PUMP BASEPLATE	
3		ACCELEROMETER (7.4.2.1)		(7.5.1.4) YES	
4		Number of Accelerometers		IDENTIFY LOCATION ON BASEPLATE	
5	***********	Mounting Location of Accelerometers		SHALL BE INSTALLED ON MOUNTING PLATE	
		Woulding Education of Accelerometers			
6		DDO/(OION FOR MTO ONLY (0.10.0.10)	N1 / A	INTERCONNECTING PIPING BY Supplier	
7		PROVISION FOR MTG ONLY (6.10.2.10)	N/A	MEGUANIGA GEAL (GOA) NOTE O	
8		Number of Accelerometers		MECHANICAL SEAL (6.8.1)-NOTE 2	
9		Mounting Location of Accelerometers		SEE ATTACHED ISO 21049/API 682 DATA SHEET NO	
10				ADDITIONAL CENTRAL FLUSH PORT (6.8.9) N / A	
11		FLAT SURFACE REQUIRED (6.10.2.11)	YES	HEATING JACKET REQ'D. (6.8.11) N / A	
12		Number of Accelerometers			
13		Mounting Location of Accelerometers		HEATING AND COOLING (6.1.17)-NOTE 11	402
14				COOLING REQ'D YES A	402
15		VIBRATION PROBES (7.4.2.2)		COOLING WATER PIPING PLAN	
16		PROVISIONS FOR VIB. PROBES	N/A	COOLING WATER RIPING	
17				FITTINGS	
		NUMBER PER RADIAL BEARING			
18		NUMBER PER AXIAL BEARING		COOLING WATER PIPING MATERIALS	
			N/A	COOLING WATER REQUIREMENTS:	
19		MONITORS AND CABLES SUPPLIED BY (7.4.2.4)		BEARING HOUSING m³/h	
20		***************************************		HEAT EXCHANGERm³/h	
21		TEMPERATURE (7.4.2.3)		TOTAL COOLING WATER m³/h	
22		PROVISIONS FOR TEMP PROBES	N/A	HEATING MEDIUM	
23		RADIAL BEARING TEMP.	N/A	OTHER	
24		NUMBER PER RADIAL BEARING		HEATING PIPING	
25	en an an an an an an an	THRUST BEARING TEMP.	N/A		nananarana
26		NUMBER PER THRUST BEARING ACTIVE SIDE		PIPING & APPURTENANCES	
27		NUMBER PER THRUST BEARING INACTIVE SIDE		MANIFOLD PIPING FOR PURCHASER CONNECTION (7.5.1.6)	
28		TEMP. GAUGES (WITH THERMOWELLS) (9.1.3.6)	N / A	VENT YES	
29		PRESSURE GAUGE TYPE		DRAIN YES	
30	**********	Remarks		COOLING WATER N/A	
31				TAG ALL ORIFICES (7.5.2.4)	
32				SOCKET WELD CONN ON SEAL GLAND (7.5.2.8) NO	
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# JASK Crude Oil Storage Tanks Project Mechanical Data Sheet For Crude Oil Main Pumps

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Project	Unit	Phase	Discipline	Doc. Type	Serial	Revision	ئىلگەن ئىلىن ئ ئىلىن ئىلىن ئى	

0005

A02

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MAINTCHARES SYMMOND		Mada		SURF	ACE PREPA	RATION AND PA	INT		TEST(NOTE 4)		D
FROMONIC CONFECT   PROPERTY   P	1	Note	MANUEA OTUGES:		NEI'A						Rev
# SPORCESTONNO, WALLE 1550ED DURING PROMETERING DISCON   Purple Professor Performance   LATER   HOUSE   LATER   LATER   LATER   HOUSE   LATER   LATER										Yes	annan annan annan anna
Fig.   Paper		~~~~~		')							our new
MATERIAL CERTIFICATION REQUIRED   YES	4		SPECIFICATION NO.		WILL BE	ISSUED DURING	SENGINEERING	DESIGN	& DATA APPROVAL PRIOR TO SHIPMENT.	YES	ļ
PAMP	5	~~~~~							TEST WITH SUBSTITUTE SEAL (8.3.3.2.b)	NO	********
MOUNTAIN PLATE	6		PUMP:						MATERIAL CERTIFICATION REQUIRED CASING	YES	henenenenen
MISSIONAT   LATE	7		PUMP SURFACE PRE	PARATION			LATER		(6.12.1.8) IMPELLER	YES	
MONTRING PLATE	8	~~~~~	PRIMER				LATER		SHAFT	YES	on on one on one of
MUMINITED PLATE	9		FINISH COAT				LATER		OTHER	YES	
MOUNTING PLATE SURFACE PREPARATION   LATER   NO PRINCE   NET   NAME	10								CASTING REPAIR WELD PROCEDURE APPR REQD	YES	
10			MOUNTING PLATE:						(6.12.2.5) (6.12.3.1)		
Mary   March	11		MOUNTING PLATE SU	URFACE PR	EPARATION	1	LATER		INSPECTION REQUIRED FOR CONNECTION WELDS (6.12.3.4.d)		
A	12		PRIMER:				LATER		(6.12.3.4.e) MAG PARTICLE	YES	
A	13	~~~~	FINISH COAT				LATER		RADIOGRAPHY	YES	NAME OF THE PARTY
IMPROPRIATE (I.A.4.1)   IMPROPRIATE (I.A.4.1)   IMPROPRIATE (I.A.4.1)   IMPROPRIATE (I.A.4.1)   IMPROPRIATE (I.A.4.1)   IMPROVED (I.A.4.1.1)   IMPROVED (I.A.4	14		DETAILS OF LIFTING	DEVICES			LATER		LIQUID PENETRANT	YES	
VEX.   VARIABLE MARKE PROVINCE TUNN 6 MONTHS   YES	15								ULTRASONIC	YES	
DITION STORAGE MORE THAN 8 MONTHS   YES   RADIOGRAPH   YES   NEW	16	~~~~	SHIPMENT: (8.4.1)						INSPECTION REQUIRED FOR CASTINGS		nonenenenenen
DITION STORAGE MORE THAN 8 MONTHS   YES   RADIOGRAPH   YES   NEW			, ,	QUIRED				YES		YES	
SPARE ROTOR ASSEMBLY PACKAGED PORIJER SOURCED		*****			AN 6 MONTH	S					***************************************
MARKE FOR ASSEMBLY PACKAGED FORIF REQUIRED   MARKED FOR ASSEMBLY PACKAGED FORIF REQUIRED (M2 2.3)   MARKED FOR ASSEMBLY PACKAGED FOR WET STORAGE (9.2.8.3)   VES								-			
MADDINESS TEST REQUIRED (8.2.2.1)   YES	19		SPARE ROTOR ASSE	MBLY PAC	KAGED FOR	R(IF REQUIRED)					
SHIPPING S. STORAGE CONTAINER FOR VERT STORAGE (0.2.8.3)   M.O.						, ,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		NTAL			***************************************
Part						RT STORAGE (					
A PART					5 12		,		100000000000		
SAME PARTS   NOTE 3    YES   STATE PARTS   NOTE 3    YES   STATE PARTS   NOTE 3    YES   YES   NOTE 3    YES			NO DI IDGE (0.2.0.4)					NO	· <del>*</del> ··		
TART-UP			, ,	(NOTE 2	Λ.			INO			
NORMAL MAINTENANCE   YES		~~~~~		(IVOTE 3	,			VES		I E S	non-non-non-
Pump				ICE					COMPONENTS TO BE LESTED		***************************************
			NORMAL MAINTENAN	NCE	WEIGH	TC ka		YES	DECIDIAL LINDA ANDE TEOT (144 0)	VEO	
VTS			1				1			YES	
PRINCE   P	28		ITEM No	PUMP	DRIVER		OUNTING PLAT	TOTAL	NOTIFICATION OF SUCCESSFUL SHOP		an an an an an an an
BASEPLATE TEST (7.3.21)	29		VTS	VTS	VTS		VTS	#VALUE!	PERFORMANCE TEST (8.1.1.c) (8.3.3.5)	YES	
APPROPRIATION   APPROPRIATIO											
ADDITIONAL DATA REQUIREM (9.3.1)   YES   TEST NO SAL LEAKAGE (9.3.4.1)   WIT									` '		
OTHER PURCHASER REQUIRED (10.13)					·		1			7711	
COORDINATION MEETING REQUIRED (10.1.3)   YES				OTHE	R PURCHAS	ER REQUIREME	NTS			WIT	ANAMANANANA
MAXIMUM DISCHARGE PRESSURE TO INCLUDE			COORDINATION					VES			
MAX RELATIVE DENSITY								ILO			
OPERATION TO TRIP SPEED YES  MAX DIA: IMPELLERS AND/OR NO OF STAGES YES  MAX DIA: IMPELLERS AND/OR NO OF STAGES YES  MAX DIA: IMPELLERS AND/OR NO OF STAGES YES  MPSH 15T STG ONLY (8.3.4.3.2)  MPSH 15T STG ONLY (8.3.4.3.3)  MIT  DEST MESTING TO H 1.6 OR ISO 9906 (8.3.4.3.3)  MIT  DEST MESTING TO H 1.6 OR ISO 9906 (8.3.4.3.3)  MIT  DEST MESTING TO H 1.6 OR ISO 9906 (8.3.4.3.3)  MIT  DEST MESTING TO H 1.6 OR ISO 9906 (8.3.4.3.3)  MIT  DEST MESTING TO H 1.6 OR ISO 9906 (8.3.4.3.3)  MIT  DEST MESTING TO H 1.6 OR ISO 9906 (8.3.4.3.3)  MIT  DEST MESTING TO H 1.6 OR ISO 9906 (8.3.4.3.3)  MIT  DEST MESTING TO H 1.6 OR ISO 9906 (8.3.4.3.3)  MIT  DEST MESTING TO H 1.6 OR ISO 9906 (8.3.4.3.3)  MIT  DEST MESTING TO H 1.6 OR ISO 9906 (8.3.4.3.3)  MIT  DEST MESTING TO H 1.6 OR ISO 9906 (8.3.4.3.3)  MIT  DEST MESTING TO H 1.6 OR ISO 9906 (8.3.4.3.3)  MIT  DEST MESTING TO H 1.6 OR ISO 9906 (8.3.4.3.3)  MIT  DEST MESTING TO H 1.6 OR ISO 9906 (8.3.4.3.3)  MIT  DEST MESTING TO H 1.6 OR ISO 9906 (8.3.4.3.3)  MIT  DEST MESTING TO H 1.6 OR ISO 9906 (8.3.4.3.3)  MIT  DEST MESTING TO H 1.6 OR ISO 9906 (8.3.4.3.3)  MIT  DEST MESTING TO H 1.6 OR ISO 9906 (8.3.4.3.3)  MIT  DEST MESTING TO H 1.6 OR ISO 9906 (8.3.4.3.3)  MIT  DEST MESTING TO H 1.6 OR ISO 9906 (8.3.4.3.3)  MIT  DEST MESTING TO H 1.6 OR ISO 9906 (8.3.4.3.1)  MIT  DEST MESTING TO H 1.6 OR ISO 9906 (8.3.4.3.1)  MIT  DEST MESTING H 1.6 OR ISO 9906 (8.3.4.3.1)  MIT  DEST MESTING H 1.6 OR ISO 9906 (8.3.4.3.1)  MIT  DEST MESTING H 1.6 OR ISO 9906 (8.3.4.3.1)  MIT  DEST MESTING H 1.6 OR ISO 9906 (8.3.4.3.1)  MIT  DEST MESTING H 1.6 OR ISO 9906 (8.3.4.3.1)  MIT  DEST MESTING H 1.6 OR ISO 9906 (8.3.4.3.1)  MIT  DEST MESTING H 1.6 OR ISO 9906 (8.3.4.2.1)  MIT  DEST MESTING H 1.6 OR ISO 9906 (8.3.4.2.1)  MIT  DEST MESTING H 1.6 OR ISO 9906 (8.3.4.2.1)  MIT  DEST MESTING H 1.6 OR ISO 9906 (8.3.4.2.1)  MIT  DEST MESTING H 1.6 OR ISO 9906 (8.3.4.2.1)  MIT  DEST MESTING MESTING ADD AD (8.3.3.1)  MIT  DEST MESTING MESTING AD AD (8.3.3.1)  MIT  DEST MESTING MESTING AD (8.3.4.1)  MIT  DEST MES			WAXIWOW DIS	SCHARGE F	KL330KL I		ATIVE DENCITY	VEC			
MAX DIA. IMPELLERS ANDIOR NO OF STAGES   YES											
NPSH TESTING TO HI 1.6 OR ISO 9906 (8.3.4.3.3)   WIT				MA	V DIA IMPE					***************************************	
### TORSIONAL ANALYSIS / REPORT (6.9.2.10)  ### PROGRESS REPORTS  ### OUTLINE OF PROC FOR OPTIONAL TESTS (10.2.5)  ### OUTLINE OF PROC FOR OPTIONAL TESTS (10.2.5)  ### ADDITIONNAL DATA REQUIRING 20 YEARS RETENTION (8.2.1.1)  ### ADDITIONNAL PROPOSED (8.9.4.1)  ### ADDITIONNAL PROPOSED (8.9.4.1)  ### ADDITIONNAL PROPOSED (8.9.4.1)  ### ADDITIONNAL PROPOSED (8.9.4.1.1)  ### ADDITIONNAL PROPOSED (8.9.4.1)  ### ADDITIONNAL PROPOSED (8.9.4.1.1)  ### ADDITIONNAL P				IVIP	IX DIA. IIVIF L	LLLING AND/OR	NO OF STAGES	ILO			
PROGRESS REPORTS   YES   RETEST ON SEAL LEAKAGE (8.3.3.2.d)   WIT			TORSIONAL /	ANALVEIC /	DEDORT (6)	0.2.40\		VEC			
A2					REPORT (6.	9.2.10)					***************************************
ADDITIONNAL DATA REQUIRING 20 YEARS RETENTION (8.2.1.1)  YES SOUND LEVEL TEST (8.3.4.1)  WIT  SOUND LEVEL TEST (8.3.4.5)  WIT  CLEANLINESS PRIOR TO FINAL ASSEMBLY (8.2.2.6)  WIT  CLEANLINESS PRIOR TO FINAL ASSEMBLY (8.2.2.6)  WIT  DYNAMIC BALANCE ROTOR (6.9.4.4)  WIT  WIT  CLEANLINESS PRIOR TO FINAL ASSEMBLY (8.2.2.6)  WIT  DYNAMIC BALANCE ROTOR (6.9.4.4)  WIT  WIT  CHECK FOR CO-PLANAR MOUNTING PAD SURFACES  WIT  WIT  WIT  CHECK FOR CO-PLANAR MOUNTING PAD SURFACES  WIT  MECHANICAL RUNTEST UNTIL OIL TEMP STABLE (8.3.4.2.1)  WIT  TRANSIENT TORSIONAL RESPONSE (6.9.2.4)  SEBERING LIFE CALCULATIONS REQUIRED (6.10.1.6)  SEBERING LIFE CALCULATIONS REQUIRED (6.10.1.6)  TO ASING RETIREMENT THICKNESS DRAWING (10.32.3)  NO  BRG HSG RESONANCE TEST (8.3.4.7)  STRUCTURAL RESONANCE TEST (8.3.9.2)  NON-WIT  STRUCTURAL RESONANCE TEST (8.3.9.2)  NON-WIT  STRUCTURAL RESONANCE TEST (8.3.4.6)  CONNECTION BOLTING (7.5.1.7)  SS  CADMIUM PLATED BOLTS PROHIBITED  YES  VENDOR TO KEEP REPAIR AND HT RCDS (8.2.1.1.c)  YES  VENDOR SUBMIT TINSPECTION CHECK LIST (8.1.5)  WIT  COMPLETE UNIT TEST (8.3.4.1)  YES  CLEANLINESS PRIOR TO FINAL ASSEMBLY (8.2.2.6)  WIT  CLEANLINESS PRIOR TO FINAL ASSEMBLY (8.2.2.6)  WIT  CLEANLINESS PRIOR TO FINAL ASSEMBLY (8.2.2.6)  WIT  MECHANICAL RUNTEST INSTITUTEST (8.3.4.2.1)  WIT  ### MECHANICAL RUNTEST INSTITUTEST (8.3.4.2.1)  ### WIT  ### MIT  #					ODTIONAL	FOTO (40.0.5)					
SOUND LEVEL TEST (8.3.4.5)   WIT		~~~~~					10N (0.2.4.4)	YES		********************	mannan
LATERAL ANALYSIS REQUIRED (9.1.3.4) (9.2.4.1.3)   YES   CLEANLINESS PRIOR TO FINAL ASSEMBLY (8.2.2.6)   WIT			ADDITIONNAL	LUATAREC	KUIKING 20	IEAKS KETENT	ION (8.∠.1.1)	VEO			***************************************
MODAL ANALYSIS REQUIRED (9.3.9.2)   YES											
DYNAMIC BALANCE ROTOR (6.9.4.4)   YES											
A8						2)			40.00.00.00.00.00.00.00.00.00.00.00.00.0		
A9					, ,						
NO					,			YES			
TRANSIENT TORSIONAL RESPONSE (6.9.2.4)   YES   SEARING LIFE CALCULATIONS REQUIRED (6.10.1.6)   YES			VFD STEADY	STATE DAM	MPED RESP	ONSE ANALYSIS	S (6.9.2.3)				ļ
BEARING LIFE CALCULATIONS REQUIRED (6.10.1.6)   YES										WIT	
IGNITION HAZARD ASSMT TO EN 13463-1 (7.2.13.e)   NO						,			4 HR. MECH RUN TEST (8.3.4.2.2)		
CASING RETIREMENT THICKNESS DRAWING (10.3.2.3)  CASING RETIREMENT THICKNESS DRAWING (10.3.2.3)  FLANGES RQD IN PLACE OF SKT WELD UNIONS (7.5.2.8)  FLANGES RQD IN PLACE OF SKT WELD UNIONS (7.5.2.8)  SEMOVE / INSPECT HYDRODYNAMIC BEARINGS AFTER TEST  (9.2.7.5)  CONNECTION BOLTING (7.5.1.7)  SS  CADMIUM PLATED BOLTS PROHIBITED  YES  VENDOR TO KEEP REPAIR AND HT RCDS (8.2.1.1.c)  YES  VENDOR SUBMIT TEST PROCEDURES (8.3.1.1)  YES  LOCATION OF AUXILIARY EQUIPENT TEST  BUBACT TEST (6.12.4.3)  IMPACT TEST (6.12.4.3)  PER RAME SECTION VIII  WIT	52						٠ .				
FLANGES RQD IN PLACE OF SKT WELD UNIONS (7.5.28)  FLANGES RQD IN PLACE OF SKT WELD UNIONS (7.5.28)  FLANGES RQD IN PLACE OF SKT WELD UNIONS (7.5.28)  FLANGES RQD IN PLACE OF SKT WELD UNIONS (7.5.28)  NO  (9.2.7.5)  AUXILIARY EQUIPMENT TEST (8.3.4.6)  EQUIPMENT TO BE INCLUDED IN AUXILLIARY TESTS  VENDOR TO KEEP REPAIR AND HT RCDS (8.2.1.1.c)  YES  VENDOR SUBMIT TEST PROCEDURES (8.3.1.1)  SUBMIT INSPECTION CHECK LIST (8.1.5)  YES  IMPACT TEST (6.12.4.3) PER EN 13445  PER ASME SECTION VIII  WIT											
	53							NO	STRUCTURAL RESONANCE TEST (9.3.9.2)	NON-WIT	
CONNECTION BOLTING (7.5.1.7)   SS							.2.8)		REMOVE / INSPECT HYDRODYNAMIC BEARINGS AFTER TEST		ļ
57         CADMIUM PLATED BOLTS PROHIBITED         YES         EQUIPMENT TO BE INCLUDED IN AUXILLIARY TESTS           58         VENDOR TO KEEP REPAIR AND HT RCDS (8.2.1.1.c)         YES           59         VENDOR SUBMIT TEST PROCEDURES (8.3.1.1)         YES           60         SUBMIT INSPECTION CHECK LIST (8.1.5)         YES           61         IMPACT TEST (6.12.4.3) PER EN 13445           62         PER ASME SECTION VIII         WIT			INCLUDE PLO	OTTED VIBR	ATION SPE	CTRA (6.9.3.3)		NO	(9.2.7.5)		
VENDOR TO KEEP REPAIR AND HT RCDS (8.2.1.1.c)   YES	56		CONNECTION	N BOLTING (	7.5.1.7)	***************************************	SS		AUXILIARY EQUIPMENT TEST (8.3.4.6)		
59 VENDOR SUBMIT TEST PROCEDURES (8.3.1.1) 60 SUBMIT INSPECTION CHECK LIST (8.1.5) 7ES 61 IMPACT TEST (6.12.4.3) PER EN 13445 62 PER ASME SECTION VIII WIT	57		CADMIUM PLA	ATED BOLT	S PROHIBIT	ED		YES	EQUIPMENT TO BE INCLUDED IN AUXILLIARY TESTS		
60 SUBMIT INSPECTION CHECK LIST (8.1.5)  101  102  103  104  105  105  105  105  105  105  105	58		VENDOR TO E	KEEP REPA	IR AND HT F	RCDS (8.2.1.1.c)		YES			
61 IMPACT TEST (6.12.4.3) PER EN 13445 62 PER ASME SECTION VIII WIT	59		VENDOR SUB	BMIT TEST F	ROCEDURE	S (8.3.1.1)		YES	LOCATION OF AUXILIARY EQUIPENT TEST		
62 PER ASME SECTION VIII WIT	60		SUBMIT INSP	ECTION CH	ECK LIST (8	.1.5)		YES			
	61								IMPACT TEST (6.12.4.3) PER EN 13445		
REMOVE CASING AFTER TEST WIT	62								PER ASME SECTION VIII	WIT	
									REMOVE CASING AFTER TEST	WIT	
	ш	ı								100 C	



### GOREH-JASK Crude Oil Pipeline and JASK Storage Tanks

### Construction Program







### **Mechanical Data Sheet For Crude Oil Main Pumps**



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#### **VERTICAL PUMP SUPPLEMENTAL DATA SHEET** Note VERTICAL TYPE (FIG 1.1) VS6 Rev REMARKS 3 4 VERTICAL PUMPS-NOTE 1 VERTICAL PUMPS (CONT'D)-NOTE 1 (+) UP PUMP THRUST: (-) DOWN LINE SHAFT: STATIC THRUST Ν Ν LINE SHAFT DIAMETER mm AT MIN FLOW Ν Ν TUBE DIAMETER mm 10 LINE SHAFT COUPLING: AT RATED FLOW Ν Ν AT MAX FLOW N LINESHAFT CONNECTION 12 MAX THRUST Ν Ν 13 SOLEPLATE REQUIRED SUCTION STRAINER TYPE 14 SOLEPLATE Length x Width LEVEL CONTROL m m 15 SOLEPLATE THICKNESS mm IMPELLER COLLETS ACCEPTABLE 16 MOUNTING FLANGE REQUIRED HARDENED SLEEVES UNDER BEARINGS (9.3.10.5) 17 COLUMN PIPE: RESONANCE TEST 18 DIAMETER STRUCTURAL ANALYSIS (9.3.5) 19 LENGTH m 20 NUMBER DRIVER ALIGNMENT SCREWS 21 SPACING SUCTION CAN m 22 GUIDE BUSHINGS: SUCTION CAN THICKNESS mm 23 NUMBER LENGTH 24 LINE SHAFT BEARING SPACING mm DIAMETER mm 25 GUIDE BUSHING LUBE: SEPARTATE MOUNTING PLATE (9.3.8.3.1) 26 PROVIDE SEPARATE SOLEPLATE (9.3.8.3.3) 27 DRAIN PIPED TO SURFACE (9.3.13.5) 28 BOWL HEAD CALCULATION REQUIRED 29 MATERIALS (additional)-NOTE 1 SUCTION CAN / BARREL: 30 LINESHAFT SLEEVES : 31 DISCHARGE HEAD: BEARING RETAINER: 32 BOWL SHAFT : SHAFT ENCLOSING TUBE : 33 LINESHAFT: DISCHARGE COLUMN: 34 LINESHAFT HARDFACING : PRESSURE RATING: HYDRO 35 BELLMOUTH: HEAD 36 BOWL BEARING : COLUMN PIPE 37 LINESHAFT BEARING : SUMP ARRANGEMENT-NOTE 7 38 SUMP DIMENSIONS : 39 40 GRADE ELEVATION LATER NOT APPLICABLE LOW LIQUID LEVEL 42 C.L. OF DISCHARGE NOTE 1 43 SUMP DEPTH 9 m 44 PUMP LENGTH 8 m 45 GRADE TO DISCH. GRADE TO LOW LIQUID LVL 46 APPLICABLE 47 GRADE TO 1ST STG IMPL'R. NOTE 1 NOT SUBMERGENCE REQ'D APPLICABLE SUMP DIAMETER 49 Φф 50 51 52 53 Фd 54 55 56









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### **Mechanical Data Sheet For Crude Oil Main Pumps**

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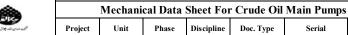
Discipline Project Unit Phase Doc. Type Serial Revision Contract No: Page 8 of 9 ME 0005 A02 325260 00 EB DS PRESSURE VESSEL DESIGN CODE REFERENCES 2 THESE REFERENCES MUST BE LISTED BY THE MANUFACTURER 3 CASTING FACTORS USED IN DESIGN (TABLE 3) YES SOURCE OF MATERIAL PROPERTIES YES 5 WELDING AND REPAIRS THESE REFERENCES MUST BE LISTED BY THE PURCHASER. (DEFAULT TO TABLE 10 IF NO PURCHASER PREFERENCE IS STATED) 8 ALTERNATE WELDING CODES AND STANDARDS WELDING REQUIREMENT (APPLICABLE CODE OR STANDARD) 10 WELDER/OPERATOR QUALIFICATION WELDING PROCEDURE QUALIFICATION 12 NON-PRESSURE RETAINING STRUCTURAL WELDING SUCH AS BASEPLATES OR SUPPORTS 13 MAGNETIC PARTICLE OR LIQUID PENETRANT EXAMINATION OF PLATE EDGES 14 POSTWELD HEAT TREATMENT 15 POSTWELD HEAT TREATMENT OF CASING FABRICATION WELDS 16 MATERIAL INSPECTION 17 18 THESE REFERENCES MUST BE LISTED BY THE PURCHASER DEFAULT TO TABLE 14 ALTERNATIVE MATERIAL INSPECTIONS AND ACCEPTANCE CRITERIA (SEE TABLE 14) (8.2.2.5) TYPE OF INSPECTION METHOD FOR FABRICATIONS FOR CASTINGS 19 20 RADIOGRAPHY 21 ULTRASONIC INSPECTION 22 MAGNETIC PARTICLE INSPECTION 23 LIQUID PENETRANT INSPECTION 24 VISUAL INSPECTION (all surfaces) 25 26 REMARKS: 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60













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					NOTES			
Note								

NOTE 2: PLAN 13-538 IS RECOMMENDED. ARC-COOLED HEAT EXCHANGER SHALL APPLY IN PLAN SIS.  NOTE 3: VERDOR SHALL FOLLOW AND SEPTION FOR THE PLAN PROPERTY OF START—FOR AND HORMAL MAINTENANCE (DURING DETA), ENCOMERENG DESIGN.  NOTE ALREADOR SHALL FOLLOW YEST AND INSPECTION PROCEDURE AND STEPS TO BE TAKEN AS PER THE APPROVED INSPECTION AND TEST TAKEN.  NOTE SHEAD DATIO THAT S DEPRIED AS SHITTOF HEAD PER RATED HEAD FOR RESIGN A TEST CASES SHALL BE WITHIN 119 %. TO 139 %, MAINTENANCE HEAD FOR PLAN FOR PER HEAD FOR RESIGN A TEST CASES SHALL BE WITHIN 119 %. TO 139 %, MAINTENANCE HEAD FOR PLAN FOR PER SHEAD FOR PLAN FOR PER SHEAD FOR PER SHEAD BY VENDOR.  NOTE STIRS DATA SHEET IS APPLICABLE TO P-BROZAL LAND P-BROSAL-LAS WELL.  NOTE 7-SUMP DIMENSIONS IN DEPTH AND CHAMETER ARE PROVISIONAL AND ARE SUBJECT TO CHANGE DURING DETAIL ENGINEERING DESIGN.  NOTE STORE SHEAD PLAN FAIR TATIONYPOR 12 SETS OF FUNDESS, S SETS OF INTROGEN CHARGING RITS SHALL BE SUPPLIED BY VENDOR.  LACK ICLORAGE OF THE DEPTH STATIONYPOR 12 SETS OF PUMPS, S SETS OF INTROGEN CHARGING RITS SHALL BE SUPPLIED BY VENDOR.  LACK ICLORAGE OF THE DEPTH STATIONYPOR 12 SETS OF PUMPS, S SETS OF INTROGEN CHARGING RITS SHALL BE SUPPLIED BY VENDOR.  LACK ICLORAGE OF THE PUMP OF THE FOLLOWING LACK YES AS A SHALL BE SUPPLIED BY VENDOR.  LACK ICLORAGE OF THE PUMP OF THE FOLLOWING LACK YES AS A SHALL BE SUPPLIED AND INSTALLED BY VENDOR.  LACK ICLORAGE.  A PIPE AND THE SETS OF PUMP, ONE SET OF BUNDPLIME FOR REPLIAND FURPOSES SHALL BE SUPPLIED AND INSTALLED BY VENDOR.  A PIPE AND THE SETS OF THE PUMP OF THE PUMP SHALL BE AT LEAST POSITIVE.  NOTE 15 DURING CHARGE OF THE PUMP, ONE SET OF BUNDPLIME FOR REPLIAND FURPOSES SHALL BE SUPPLIED AND INSTALLED BY VENDOR.  NOTE 15 DURING CHARGE OF THE PUMP OF THE PUMP SHALL BE AT LEAST POSITIVE.  NOTE 15 DURING CHARGE OF THE PUMP OF THE PUMP SHALL BE AT LEAST POSITIVE.  NOTE 15 DURING CHARGE OF THE PUMP SHALL BE AT LEAST POSITIVE.  NOTE 15 DURING CHARGE OF THE PUMP SHALL BE AT LEAST POSITIVE.  NOTE 15 DURING CHARGE OF THE PUMP SHALL BE AT	7	NOTE 1: VENDOR IS TO SPECIFY(VTS)
(TYPICALLY TWO YEARS). NORMAL MAINTENANCE PERIOD,WHICH IS ASSUMED TWO YEARS AT THIS STAGE, WILL BE FINALIZED DURING DETAIL ENGINEERING DESIGN.  NOTE 4:VENDOR SHALL FOLLOW TEST AND INSPECTION PROCEDURE AND STEPS TO BE TAKEN AS PER THE APPROVED INSPECTION AND TEST PLAN.  MEANWHILE BE STRICTLY ADVISED THAT NPSH TEST SHALL BE PERFORMED REGARDLESS OF NPSH MARGIN SUFFICIENCY.  NOTE 5:HEAD RATIO THAT IS DEFINED AS SHUTOFF HEAD PER RATED HEAD FOR DESIGN & TEST CASES SHALL BE WITHIN 110 %  TO 120 % MAXIMUM DISCHARGE PRESSURE SHALL NOT EXCEED 17.64 BARG.  NOTE 6:THIS DATA SHEET IS APPLICABLE TO P-6002A-L AND P-6003A-L, AS WELL.  NOTE 7:SUMP DIMENSIONS IN DEPTH AND DIAMETER ARE PROVISIONAL AND ARE SUBJECT TO CHANGE DURING DETAIL ENGINEERING DESIGN.  NOTE 8:FOR EACH PUMP STATION(FOR 12 SETS OF PUMPS), 6 SETS OF NITROGEN CHARGING KITS SHALL BE SUPPLIED BY VENDOR. EACH CHARGING KIT IS CONSISTING OF THE FOLLOWING ITEMS:  1. REQULATING VALVE(1 SET)  2. PRESSURE GUAGE(2 SETS) BEFORE AND AFTER REGULATING VALVE  3. QUICK COUPLING  4. PIPE AND TUBE SETS  5. TRANSPORTER EQUIPMENT  5. NZ CYLINDER  NOTE 9: FOR EACH SET OF PUMP, ONE SET OF HANDPUMP FOR REFILLING PURPOSES SHALL BE SUPPLIED AND INSTALLED BY VENDOR, IN THIS CASE 36 SETS OF HANDPUMPS SHALL BE SUPPLIED BY VENDOR(12 SETS FOR EACH PUMP STATION).  NOTE 19: NPSH MARGIN AT THE END CURVE OF THIS PUMP SHALL BE AT LEAST POSITIVE.  NOTE 11: FOR ANY SORT OF COOLING PURPOSES, AIR COOLED SYSTEM SHALL APPLY.  NOTE 12: NON-METAL PARTS(GASKET, RUBBER) SHALL BE ASBESTOS-FREE.  NOTE 14: ANY SORT OF ELECTRONIC TRANSMITTERS SUCH AS PRESSURE TRANSMITTER SHALL BE OF EEXIB IC T4.  NOTE 15: DURING THE OPERATION OF EACH PUMP, BEARING METAL/OIL TEMPERATURE AND VIBRATION MEASUREMENTS SHALL BE TAKEN AT LEAST TWO TIMES A DAY. HOWEVER, THE NECESSITY OF MACHINERY MONITORING SYSTEM SHALL BE RECONGIZED BY DETAIL ENGINEERING CONTRACTOR.		NOTE 2: PLAN 13+53B IS RECOMMENDED. AIR-COOLED HEAT EXCHANGER SHALL APPLY IN PLAN 53B.
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