MECHANICAL DATA SHEET

CENTRIFUGAL PUMP
SI UNITS

DOC NO.:

PAGE: 1 of 3

PROJECT:	FPSO P-57	PREPARED				
CLIENT:		CHECKED				
ORDER NR.:		APPROVED				
		DATE				
		REVISION	0	1		

GENERAL INFORMATION

1 APPLICABLE TO: ● PROPOSAL ○ PURCHASE ○ AS BUILT
2 MANUF KSB MODEL CPK 300-400 A
3 SITE FPSO P-57 SERVICE Cooling Medium Pumps (3 x 50%) - Non API
4 NOTES: INFORMATION TO BE COMPLETED BY ○ PURCHASER ○ MANUFACTURER ○ MANUFACTURER OR PURCHASER

DATA SHEETS

		ITEM NO.	ATTACHED	ITEM NO.	ATTACHED	ITEM NO.	ATTACHED
6	PUMP	P-T2502 A/B/C	○		○		○
7	MOTOR	PM-T2502 A/B/C	○		○		○
8	GEAR		○		○		○
9	TURBINE		○		○		○

10 APPLICABLE OVERLAY STANDARD(S):

OPERATING CONDITIONS (5.1.3)

11 FLOW, NORMAL 1280 m³/h RATED 1280 m³/h
12 OTHER
13 SUCTION PRESSURE MAX. 6,5 bar(g)
14 DISCHARGE PRESSURE 12,5 bar(g)
15 DIFFERENTIAL PRESSURE 6,0 bar
16 DIFF HEAD 62,0 m NPSHA 76,0 m
17 PROCESS VARIATIONS (5.1.4)
18 STARTING CONDITIONS (5.1.4)
19 SERVICE ● CONT. ○ INTERMITTENT STARTS/DAY
20 ● PARALLEL OPERATION REQUIRED (5.1.13)

LIQUID (5.1.3)

LIQUID TYPE OR NAME Inhibited Fresh Water
○ HAZARDOUS ○ FLAMMABLE ○

	MIN.	NORMAL	MAX.
PUMPING TEMP (°C)		55	
VAPOR PRESS (bar)		0,156	
REL. DENSITY (SG)		0,986	
VISCOSITY (cP)		0,504	
SPECIFIC HEAT (kJ/kg/K)		not informed	

○ CHLORIDE CONCENTRATION (6.5.2.4) --- mg/l
○ H_2S CONCENTRATION --- mol fraction WET (5.12.1.12c)
CORROSIVE/EROSIVE AGENT --- (5.12.1.9)

SITE DATA (5.1.3)

21 LOCATION (5.1.30)
22 ○ INDOOR ○ HEATED ● OUTDOOR ○ UNHEATED
23 ○ ELECTRICAL AREA CLASSIFICATION (5.1.24/6.1.4)
24 ZONE 2 GR IIA CLASS T3
25 ○ WINTERIZATION REQD ○ TROPICALIZATION REQD
26 SITE DATA (5.1.30)
27 ○ ALTITUDE ____ m BAROMETER ____ bar
28 ○ RANGE OF AMBIENT TEMPS (MIN/MAX) ____ / ____ °C
29 ○ REL. HUMIDITY (MIN/MAX) ____ / ____ %
30 UNUSUAL CONDITIONS (5.1.30) ○ DUST ○ FUMES
31 ● OTHER CONDITION ACC. TO SBM SPECIFICATION SZF92001

DRIVER TYPE

32 ● INDUCTION MOTOR ○ STEAM TURBINE ○ GEAR
33 ○ OTHER

MOTOR DRIVER (6.1.1/6.1.4)

34 ○ MANUFACTURER WEG
35 ○ 300 kW ○ 1785 r/min.
36 ○ FRAME 355 M/L ○ ENCLOSURE IPW56
37 ● HORIZONTAL ○ VERTICAL ○ SERVICE FACTOR 1.0
38 ○ VOLTS/PHASE/HERTZ 440 / 3 / 60
39 ○ TYPE INDUCTION
40 ○ MINIMUM STARTING VOLTAGE (6.1.5) 80% Vn
41 ○ INSULATION F ○ TEMP. RISE 70 K
42 ○ FULL LOAD AMPS
43 ○ LOCKED ROTOR AMPS
44 ○ STARTING METHOD DIRECT
45 ○ LUBE Grease
46 BEARINGS (TYPE/NUMBER):
47 ○ RADIAL Antifriction / 6322-C3
48 ○ THRUST Antifriction / 6319-C3
49 ○ VERTICAL THRUST CAPACITY
50 UP N DOWN N

MATERIALS (5.2.1.1)

○ ANNEX H CLASS (5.12.1.1)
○ MIN. DESIGN METAL TEMP. (5.12.4.1) -30 °C
○ REDUCED HARDNESS MATERIALS REQD (5.12.1.12)
○ ~~BARREL~~/CASE A216 WCB IMPELLER A743 CF8M
○ CASE/IMPELLER W/ EAR RINGS A276 Tp 316
○ SHAFT A276 Tp 316
○ DIFFUSERS not applicable

PERFORMANCE

○ PROPOSAL CURVE NO. attached ○ 1785 r/min.
○ IMPELLER DIA. RATED 379 MAX 404 MIN 353 mm
○ IMPELLER TYPE closed
○ RATED POWER 274,10 kW EFFICIENCY 77,6 %
○ MINIMUM CONTINUOUS FLOW:
THERMAL 336 m³/h STABLE 672 m³/h
○ PREFERRED OPER. REGION 1344 to 1848 m³/h
○ ALLOWABLE OPER. REGION 672 to 2016 m³/h
○ MAX. HEAD @ RATED IMPELLER 72 m
○ MAX. POWER @ RATED IMPELLER 311,7 kW
○ NPSHR @ RATED FLOW 11,4 m (5.1.10)
○ MAX. SUCTION SPECIFIC SPEED 10803 (5.1.11)
○ MAX. SOUND PRESS. LEVEL REQD 85 dBA (5.1.16)
○ EST. MAX. SOUND PRESS. LEVEL < 85 dBA (5.1.16)
○ EST. MAX. SOUND POWER LEVEL ____ dBA (5.1.16)

UTILITY CONDITIONS (5.1.3)

ELECTRICITY	VOLTAGE	PHASE	HERTZ
DRIVERS	440	3	60
HEATING	220	1	60

SYSTEM VOLTAGE DRIP ○ 80% ○ OTHER

STEAM	MAX. PRESS	MAX. TEMP	MIN. PRESS	MIN. TEMP.
DRIVERS				
HEATING				

COOLING WATER (5.1.19) SOURCE
SUPPLY TEMP. (°C) ____ MAX. RETURN TEMP. (°C)
NORM. PRESS (bar) ____ DESIGN PRESS (bar) ____
MIN. RET. PRESS. (bar) ____ MAX. ALLOW. D.P. (bar) ____
CHLORIDE CONCENTRATION --- mg/kg

REMARKS:

MECHANICAL DATA SHEET
CENTRIFUGAL PUMP
SINGLE STAGE OVERHUNG (TYPE OH)
SI UNITS

DOC NO.:

PROJECT:	FPSO P-57	PREPARED				
CLIENT:		CHECKED				
ORDER NR.:		APPROVED				
		DATE				
		REVISION	0	1		

CONSTRUCTION

ROTATION: (VIEWED FROM COUPLING END) ● CW ○ CCW

PUMP TYPE (4.1):

● OH2 ○ OH3 ○ OH6 ● OTHER OH1

CASING MOUNTING:

● CENTERLINE ○ IN-LINE ● OTHER FOOT

CASING TYPE:

● SINGLE VOLUTE ○ MULTIPLE VOLUTE ○ DIFFUSER

CASE PRESSURE RATING:

○ OH6 PUMP SUCTION REGION DESIGNED FOR MAWP (5.3.6)

● MAX ALLOWABLE WORKING PRESSURE 13 bar @ 85 °C

● HYDROTEST PRESSURE 20 bar

NOZZLE CONNECTIONS (5.4.2):

	SIZE	FLANGE RATING	FAC G	POSITION
SUCTION	14"	150#	RF	END
DISCHARGE	12"	150#	RF	TOP

PRESSURE CASING AUXILARY CONNECTIONS (5.4.3):

	NUMBER	SIZE (DN)	TYPE
DRAIN	6B	1"	Flanged
VENT			
WARM-UP			

○ MACHINED AND STUDDED CONNECTIONS (5.4.3.8)

○ CYLINDRICAL THREADS REQUIRED (5.4.3.3)

ROTOR:

○ COMPONENT BALANCE TO ISO 1940 G 1.0 (5.9.4.4)

COUPLINGS:

● MANUFACTURER J.Crane ● MODEL TSKS 0350

● RATING (kW PER 100 RPM) 35

● SPACER LENGTH 250mm ● SERVICE FACT. > 1.75

○ COUPLING BALANCED TO ISO 1940-1 G 6.3 (6.2.3)

○ COUPLING WITH PROPRIETARY CLAMPING DEVICE (6.2.11)

○ COUPLING PER ISO 14691 (6.2.4)

○ COUPLING PER ISO 10441 (6.2.4)

● COUPLING PER API671 (6.2.4) ○ ASME B15.1

● NON-SPARK COUPLING GUARD (6.2.14c)

○ COUPLING GUARD STANDARD PER _____ (6.2.14a)

BASEPLATES:

○ API BASEPLATE NUMBER (ANNEX D)

○ NON-GROUT CONSTRUCTION (6.3.13)

○ OTHER

MECHANICAL SEAL (5.8.1)

○ SEE ATTACHED ISO 21049/API682 DATA SHEET

REMARKS: Pump as per ASME B73.1

Couplings as per API 610

SURFACE PREPARATION AND PAINT

○ MANUFACTURER'S STANDARD ○ OTHER (SEE BELOW)

○ SPECIFICATION NO.

PUMP:

○ PRIMER

○ FINISH COAT

BASEPLATE (6.3.17):

○ PRIMER

○ FINISH COAT

○ DETAILS OF LIFTING DEVICES (6.3.20)

SHIPMENT (7.4.1):

○ DOMESTIC ● EXPORT ○ EXPORT BOXING REQD

○ OUTDOOR STORAGE MORE THAN 6 MONTHS

SPARE ROTOR ASSEMBLY PACKAGED FOR:

○ HORIZONTAL STORAGE ○ VERTICAL STORAGE

○ TYPE OF SHIPPING PREPARATION

HEATING AND COOLING

○ HEATING JACKET REQUIRED (5.8.9)

○ COOLING REQUIRED

○ COOLING WATER PIPING PLAN (6.5.3.1)

CW PIPING:

○ PIPE ○ TUBING ○ FITTINGS

CW PIPING MATERIALS:

○ S. STEEL ○ C. STEEL ○ GALVANIZED

COOLING WATER REQUIREMENTS:

BEARING HOUSING _____ m^3/h

HEAT EXCHANGER _____ m^3/h

TOTAL COOLING WATER _____ m^3/h

HEAT MEDIUM: ○ STEAM ○ OTHER

HEATING PIPING: ○ TUBING ○ PIPE

BEARINGS AND LUBRICATION

BEARING (TYPE NUMBER) 5.10.1):

● RADIAL Antifriction / NU 413 C3

● THRUST Antifriction / 2 x 7315 BG

LUBRICATION (5.11.3, 5.11.4):

○ GREASE ● OIL

○ PURGE OIL MIST ○ PURE OIL MIST

● CONSTANT LEVEL OILER PREFERENCE (5.10.2.2)

○ OIL VISC. ISO GRADE

INSTRUMENTATION

○ ACCELEROMETER (6.4.2.1)

○ PROVISION FOR MOUNTING ONLY (5.10.2.11)

○ FLAT SURFACE REQUIRED (5.10.2.12)

○ TEMP. GAUGES (WITH THERMOWELLS) (8.1.3.6)

○ PRESSURE GAUGE TYPE

MASSES

MASS OF PUMP (kg)	620
MASS OF COUPLING (kg)	33
MASS OF BASEPLATE (kg)	877
MASS OF DRIVER (kg)	2015
TOTAL MASS (kg)	3545

	MECHANICAL DATA SHEET **CENTRIFUGAL PUMP** **SINGLE STAGE OVERHUNG (TYPE OH)** **SI UNITS**	DOC NO.: PAGE: **3 of 3**

PROJECT:	FPSO P-57	PREPARED				
CLIENT:		CHECKED				
ORDER NR.:		APPROVED				
		DATE		1		
		REVISION	0			

SPARE PARTS (TABLE 18)

1 O START-UP O NORMAL MAINTENANCE

OTHER PURCHASER REQUIREMENTS

2 O COORDINATIN MEETING REQUIRED (9.1.3)
3 O MAXIMUM DISCHARGE PRESSURE TO INCLUDE (5.3.2)
4 O MAXIMUM RELATIVE DENSITY
5 O MAX. DIAMTER IMPELLERS AND/OR NO. OF STAGES
6 O OPERATION TO TRIP SPEED
7 O OH3 BERING HS6 LIFTER (8.1.2.6)
8 O CONNECTION DESIGN APPROVAL (5.12.3.4)
9 O TORSIONAL ANALYSIS REQUIRED (5.9.2.1)
10 O TORSIONAL ANALYSIS REPORT (5.9.2.6)
11 O PROGRESS REPORTS (9.3.3)
12 O OUTLINE OF PROCEDURES FOR OPTIONAL TESTS (9.2.5)
13 O ADDITIONAL DATA REQUIRING 20 YRS RETENTION (7.2.1.1f)

PIPING AND APPURTENANCES

14 MANIFOLD PIPING TO SINGLE CONNECTION (6.5.1.6)
15 O VENT O DRAIN O COOLING WATER
16 O MOUNT SEAL RESERVOIR OFF BASEPLATE (6.5.1.4)
17 O FLANGES REQD IN PLACE OF SOCKET WELD UNIONS (6.5.2.8)
18 O INSTALLATION LIST IN PROPOSAL (9.2.3L)
19 CONNECTION BOLTING
20 O PTFE COATING O ASTM A153 GALVANIZED
23 O PAINTED O SS

QA INSPECTION AND TESTING

24 O SHOP INSPECTION (7.1.4)
25 O PERFORMANCE CURVE APPROVAL
26 O TEST WITH SUBSTITUTE SEAL (7.3.3.2b)
27 ● MATERIAL CERTIFICATION REQUIRED (5.12.1.8)
28 ● CASING ● IMPELLER ● SHAFT
29 O OTHER _____
30 O CASING REPAIR PROCEDURE APPROVAL REQD (5.12.2.5)
31 ● INSPECTION REQD FOR CONNECTION WELDS (5.12.3.4e)
32 O MAG PARTICLE ● LIQUID PENETRANT (*1)
33 O RADIOGRAPHIC O ULTRASONIC (ON REPAIRED PARTS)
34 O HARDNESS TEST REQUIRED (7.2.2.3) _____
35 O ADDL SUBSURFACE EXAMINATION FOR 7.2.1.3
36 FOR _____
37 METHOD _____

QA INSPECTION AND TESTING

TEST	NON-WIT	W-IT	OBSERVE
● HYDROSTATIC (7.3.2)	O	●	O
● PERFORMANCE (7.3.3)	O	●	O
O RETEST ON SEAL LEAKAGE (7.3.3.2d)	O	O	O
O NPSH (7.3.4.2)	O	O	O
O TRUE PEAK VELOCITY DATA (7.3.3.4d)	O	O	O
O COMPLETE UNIT TEST (7.3.4.3)	O	O	O
O SOUND LEVEL TEST (7.3.4.4)	O	O	O
O CLEANLINESS PRIOR TO FINAL ASSEMBLY (7.2.2.2)	O	O	O
O NOZZLE LOAD TEST (6.3.6)	O	O	O
O CHECK FOR CO-PLANAR MOUNTING PAD SURFACES 7.3.3)	O	O	O
O MECHANICAL RUN UNTIL OIL TEMP STABLE (7.3.4.7.1)	O	O	O
O 4 HR MECHANICAL RUN AFTER OIL TEMP STABLE (7.3.4.7.3)	O	O	O
● 4 HR MECHANICAL RUN TEST	O	●	O
O BRG HSG RESONANCE TEST (7.3.4.6)	O	O	O
O AUX EQUIPMENT TEST (7.3.4.5)	O	O	O
O IMPACT TESTING (5.12.4.3)			
O PER EN 13445	O	O	O
O PER ASME VIII	O	O	O

O VENDOR KEEP REPAIR AND HT RECORDS (7.2.1.1c)
O VENDOR SUBMIT TEST PROCEDURES (7.3.1.2/9.2.5)
O VENDOR SUBMIT TEST DATA WITHIN 24 HOURS (7.3.3.3e)
O INCLUDE PLOTTED VIBRATION SPECTRA (5.9.3.3)
O SUBMIT INSPECTION CHECKLIST (7.1.6)

38 **REMARKS:** For Tests details, see document code IP.
39 (*1) Where applicable
40
41
42
43
44
45
46
47
48
49
50
51
52