

MAIN TURBINE-DRIVEN PUMP FOR LUBRICATING OIL SYSTEM

consisting of :

a. STEAM TURBINE - 07 MP8A

<u>Table</u>	<u>Name</u>	<u>Specificat.</u>
SOS.55565/4	Manufacturer : COPPUS	RT055201/Sp
	Type : TFV. 12	
	Installation : VERTICAL	
	Connect.sizes : Inlet 1½" NPT	
	Connect.sizes : Outlet 3" ASA 150 FF	
	Steam inlet : 240-250-275 psig.	
	Steam Outlet : 45-50-60 psig.	
	Inlet temperatur. : 420-500-550°F.	
	Rotation Speed : 1450 RPM.	
	Horse power : 40 HP	

b. PUMP (Main and auxiliary) - 07P8A

<u>Table</u>	<u>Name</u>	<u>Specificat.</u>
SOS.00271A/4	Manufacturer : KRACHT	RT055201/Sp
SOS.55429/4	Type : FMVZ 5/80	
	Fluid : Oil 45°C to 50°C	
	Suction pressure : 0 Kg/cm²	
	Discharge press. : 5 Kg/cm²	
	Operat.temperat. : 50 °C	
	Max.temperature : 80 °C	
	Capacity : 422 lt/1'	
	Rotation Speed : 1450 RPM.	
	Shaft power : 8.5 Cv.	
	Connect.sizes : Inlet 3" NPT (F)	
	Connect.sizes : Outlet 3" NPT (F)	
SOS.00 /4	Safety valve KRACHT type (set at 6 kg/cm²)	

**ROTARY PUMP (API 676-3RD)
DATA SHEET
U.S. CUSTOMARY**

DOCUMENT NUMBER: _____
CLIENT DOCUMENT NUMBER: _____

REVISION	0	1	2	3	4
DATE					
BY					
REVI/APPR					
JOB NO.	ITEM NO.				
PAGE 1 OF 3	REQ'N NO.				

1 APPLICABLE TO: ☐ PROPOSAL ☒ PURCHASE ☐ AS BUILT

2 END USER: CPC-Refinery

3 SITE: Lubrication Oil

4 SERVICE: KRACHT

5 MANUFACTURER: KRACHT

6

7 NOTE: ☐ INDICATES INFORMATION TO BE COMPLETED BY PURCHASER ☐ BY MANUFACTURER ☒ BY MANUFACTURER OR PURCHASER

8 **GENERAL**

9 NO. MOTORS DRIVEN: _____ OTHER DRIVER TYPE: Turbine driven

10 PUMP ITEM NO'S: _____ PUMP ITEM NO'S: _____

11 MOTOR ITEM NO'S: _____ DRIVER ITEM NO'S: _____

12 MOTOR PROVIDED BY: _____ DRIVER PROVIDED BY: COPPUS

13 MOTOR MOUNTED BY: _____ DRIVER MOUNTED BY: _____

14 MOTOR DATA SHEET NO: _____ DRIVER DATA SHEET NO: _____

15

16 **OPERATING CONDITIONS**

17 MIN NORMAL RATED MAX (1)

18 CAPACITY: (gpm) 111.5

19 OTHER OPER. CONDITIONS: (gpm) _____

20 DISCHARGE PRESSURE: (psig) 71.11

21 SUCTION PRESSURE: (psig) 0

22 DIFFERENTIAL PRESSURE: (psi) 71.11

23 NPSH AVAILABLE: 91.6 (ft) 13.7 PSI

24 NPIP AVAILABLE: (psia) _____

25 NPSHa3 / NPIP DATUM: ☐ C.L. SUCTION NOZZLE ☐ TOP OF FOUNDATION

26 DUTY CYCLE: ☒ CONTINUOUS ☐ INTERMITTENT

27 (1) Maximum - mechanical design

28

29 **PERFORMANCE**

30 RATED CAPACITY: (gpm) _____

31 NPSHa / NPIP REQUIRED: (ft) _____ (psia) _____

32 RATED SPEED: (rpm) _____

33 RATED VOLUMETRIC EFFICIENCY: (%) _____

34 RATED PUMP EFFICIENCY: (%) _____

35 REQUIRED POWER @ MAXIMUM VISCOSITY: (BHP) _____

36 REQUIRED POWER @ PRESSURE LIMITING VALV: (BHP) _____

37 REQUIRED POWER @ RATED CONDITION: (BHP) _____

38 MAXIMUM ALLOWABLE SPEED: (rpm) _____

39

40 **CONSTRUCTION**

41

42 **CONNECTIONS**

	SIZE	ANSI RATING	FACING	POSITION
SUCTION	<u>3"</u>			<u>Vertical</u>
DISCHARGE	<u>3"</u>			<u>90°</u>
GLAND FLUSH				
DRAINS				
VENTS				
JACKET				

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50 PIPE TO EDGE OF BASEPLATE ☐ VENT ☐ DRAINS

51 **PUMP TYPE**

52 ☒ INTERNAL GEAR ☐ TWIN-SCREW ☐ VANE ☐ LOBE

53 ☐ EXTERNAL GEAR ☐ 3-SCREW ☐ PROGRESSING CAVITY

54 ☐ ROTARY GEAR ☐ OTHER

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PUMPED FLUID

17 TYPE OR NAME OF PUMPED FLUID: Lube oil (ISO VG 68)

18 MIN NORMAL RATED

19 TEMPERATURE: (°F) 113-122

20 VAPOR PRESS.: (psia) _____

21 RELATIVE DENSITY (SG): 0.85

22 VISCOSITY: (cP) 150 VG

23 SPECIFIC HEAT: _____ Cp (BTU/lb °F)

24 CORROSIVE/EROSIVE AGENTS DESCRIPTION: ☐ EROSION ☐ CORROSIVE

25 CHLORIDE CONCENTRATION: (ppm) _____

26 H₂S CONCENTRATION: (ppm) _____

27 FLUID: ☐ HAZARDOUS ☒ FLAMMABLE ☐ OTHER

28 GAS ☐ ENTRAINED ☐ SLUG FLOW % BY VOLUME or GVF _____

29 SOLIDS PARTICLE SIZE DISTRIBUTION & MIN/MAX: (µ) _____

30 SHAPE ☐ CONCENTRATION ☐ HARDNESS _____

31

32 **SITE AND UTILITY DATA**

33 LOCATION: ☐ INDOOR ☒ OUTDOOR

34 HEATED ☐ UNHEATED ☐ UNDER ROOF

35 ELECTRICAL AREA CLASS _____ GROUP _____ DIV _____

36 ZONE _____ GROUP _____ TEMP CLASS _____

37 WINTERIZATION REQD ☐ TROPICALIZATION REQD ☐

38 SITE DATA: ☐ ELEVATION _____ (°F) ☐ BAROMETER _____ (psia)

39 RANGE OF AMBIENT TEMPS: MIN/MAX _____ / _____ (°F)

40 **UNUSUAL CONDITIONS**

41 ☐ DUST ☐ FUMES ☐ SALT ATMOSPHERE

42 ☒ OTHER _____

43 **UTILITY CONDITIONS**

44 ELECTRICITY: N/A

	DRIVERS	HEATING	CONTROL	SHUTDOWN
VOLTAGE				
HERTZ				
PHASE				

45

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50 **COOLING WATER** N/A

	INLET	RETURN	DESIGN	MAX Δ
TEMP (°F)				
PRESS. (psig)				
SOURCE				

51

52 **INSTRUMENT AIR** N/A

	MAX	MIN
PRESSURE (psig)		

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APPLICABLE SPECIFICATIONS:

API-676 POSITIVE DISPLACEMENT PUMPS - ROTARY

58	REMARKS:	☐ GOVERNING SPECIFICATION (IF DIFFERENT)
59		☐ NACE MR0103 (6.13.2.13) ☐ NACE MR0175 / ISO 15156
60		☐ OTHER
61		

ROTARY PUMP (API 676-3RD) DATA SHEET U.S. CUSTOMARY		DOCUMENT NUMBER: _____					
		CLIENT DOCUMENT NUMBER: _____					
		REVISION	0	1	2	3	4
		DATE					
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		JOB NO.			ITEM NO.		
		PAGE	2	OF	3	REQ'N NO.	
CONSTRUCTION		MATERIALS					
1		☐ MIN DESIGN METAL TEMP (6.13.6.1) _____ (°F)					
2	CASING	☐ CASING					
3	☐ MAX. ALLOWABLE CASING PRESS (6.3.1): _____ (psig) @ _____ (°F)	☐ STATOR / LINER					
4	☐ MAXIMUM ALLOWABLE SUCTION PRESSURE: _____ (psig) @ _____ (°F)	☐ END PLATES					
5	☐ HYDROSTATIC TEST PRESSURE - Suct / Disch: _____ / _____ (psig)	☐ ROTOR (S)					
6	ROTATING ELEMENTS	☐ VANES					
7	ROTOR MOUNT ☐ BTWN BEARINGS ☐ OVERHUNG	☐ SHAFT					
8	TIMING GEARS ☐ YES ☐ NO ☐ TYPE _____	☐ SLEEVE (S)					
9	BEARING TYPE: ☐ RADIAL ☐ THRUST	☐ GLAND (S)					
10	BEARING NUMBER: ☐ RADIAL ☐ THRUST	☐ BEARING HOUSING					
11	LUBRICATION TYPE: ☐ CONSTANT LEVEL OILERS	☐ TIMING GEARS					
12	☐ PUMPED FLUID ☒ RING OIL ☒ OIL SPLASH	☐ ELASTOMERS / GASKETS					
13	☐ EXTERNAL ☐ OIL FLOOD ☐ GREASE	☐ CONTROLLED HARDNESS REQUIRED (6.13.2.13)					
14	☐ LUBRICANT Info (Visc, etc)	QA INSPECTION AND TEST					
15	MECHANICAL SEALS	☐ SPECIAL MATERIAL TESTS (See design codes + weld + inspection sheet)					
16	☐ MANUFACTURER AND MODEL	☐ LOW AMBIENT TEMP. MATERIALS TESTS (6.13.6.5)					
17	☐ MANUFACTURER CODE	☒ COMPLIANCE WITH INSPECTOR'S CHECK LIST					
18	☐ API 682 AND DATA SHEETS	☒ CERTIFICATION OF MATERIALS (user to define affected components in remarks)					
19	☐ API 682 SEAL FLUSH PLAN	☐ SURFACE / SUBSURFACE EXAM'S (user defines affected components in remarks)					
20	☐ API 682 SEAL CODE	☐ RADIOGRAPHY					
21		☐ ULTRASONIC					
22	DRIVER TYPE	☐ MAGNETIC PARTICLE					
23	☐ INDUCTION MOTOR ☒ STEAM TURBINE ☐ GEAR ☐ OTHER	☐ LIQUID PENETRANT					
24	DRIVE MECHANISM	☐ COMPONENT PMI					
25	☒ DIRECT-COUPLED ☐ ASD ☐ OTHER	☐ HARDNESS OF PARTS, WELDS & HEAT AFFECTED ZONES					
26	☒ COUPLING MANUFACTURER	☐ VENDOR SUBMIT TEST PROCEDURES (8.3.1.2)					
27	☒ COUPLING TYPE	☐ SUPPLIER TO KEEP REPAIR AND HT RECORDS (8.2.1.1)					
28	☐ RATING (MAX TORQUE) _____ ☐ MODEL _____						
29	☒ SPACER LENGTH _____ (IN) ☐ S.F.						
30	☐ COUPLING BALANCED ☐ MANF STD ☐ AGMA 9000 CLASS 10 (7.2.3)						
31	☐ COUPLING PER API 671 (7.2.4)						
32	☐ COUPLING HUB ATTACHMENT						
33	☐ STRAIGHT ☐ KEYED ☐ TAPERED						
34	COUPLING GUARD TYPE						
35	☐ STEEL ☐ BRASS ☐ NON-METALLIC ☐ OTHER						
36	☒ NON SPARK COUPLING GUARD (7.2.15)						
37							
38	☐ MOTOR DRIVER (SEE MOTOR DATA SHEET) <i>N/A</i>						
39	☐ IEEE 841 ☐ API 541 ☐ API 546 ☐ OTHER						
40	☐ ASD SUPPLIED BY ☐ PURCHASER ☐ MOTOR SUPPLIER						
41	☐ MANUFACTURER _____ ☐ TYPE _____						
42	☐ FRAME _____ ☒ ENCLOSURE						
43	☐ HORIZONTAL ☒ VERTICAL						
44	☐ (HP) _____ (rpm)						
45	☐ VOLTS _____ PHASE _____ HERTZ _____ SERVICE FACTOR _____						
46	☐ VARIABLE SPEED RANGE _____ (rpm)						
47	☐ MINIMUM STARTING VOLTAGE (7.1.2.2) _____						
48	☐ INSULATION ☐ TEMP. RISE						
49	☐ FULL LOAD AMPS						
50	☐ LOCKED ROTOR AMPS						
51	☐ STARTING METHOD						

	NON-WIT	WIT	OBSERV
☒ SHOP INSPECTION (8.1)	☐	☐	☒
☒ HYDROSTATIC (8.3.2)	☐	☐	☒
☐ WITH WETTING AGENT	☐	☐	☐
☒ PERFORMANCE (8.3.4)	☐	☒	☐
☐ RETEST ON SEAL LEAKAGE	☐	☐	☐
☒ NPSH / NPIP (8.3.7.1)	☐	☐	☒
☐ TRUE PEAK VELOCITY DATA	☐	☐	☐
☒ COMPLETE UNIT TEST (8.3.7.2)	☐	☒	☐
☐ SOUND LEVEL TEST (8.3.7.3)	☐	☐	☐
☐ CLEANLINESS PRIOR TO FINAL ASSEMBLY (8.2.3.3)	☐	☐	☐
☐ HIGH DISCHARGE PRESSURE @ PLV	☐	☐	☐
☐ CHECK FOR CO-PLANAR AT MOUNTING PAD SURFACES (7.4.7)	☐	☐	☐
☐ 1 HR MECHANICAL RUN TEST AFTER OIL TEMP STABLE (8.3.5.1)	☐	☐	☐
☐ 4 HR. MECH RUN AFTER OIL TEMP STABLE (8.3.5.2)	☐	☐	☐
☐ AUXILIARY EQUIPMENT TEST (8.3.4.3)	☐	☐	☐
☐ OTHER	☐	☐	☐
☐ TEST WITH SUBSTITUTE SEAL (8.3.5.3)	☐	☐	☐
☐ SUPPLIER SUBMIT TEST DATA WITHIN 24 HOURS	☐	☐	☐

52	☐ LUBE		☒ INCLUDE PLOTTED VIBRATION SPECTRA
53	BEARINGS (TYPE/NUMBER):		☐ RECORD FINAL ASSEMBLY RUNNING CLEARANCES (8.2.1.1f)
54	☐ RADIAL	/	☒ PERFORMANCE CURVE & DATA APPROVAL PRIOR TO SHIPMENT (8.3.9)
55	☐ THRUST	/	☐ REDUCED SPEED TEST REQUIRED
56			
57			

ROTARY PUMP (API 676-3RD) DATA SHEET U.S. CUSTOMARY		DOCUMENT NUMBER: _____					
		CLIENT DOCUMENT NUMBER: _____					
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		JOB NO.	ITEM NO.				
		PAGE 3	OF 3	REQ'N NO.			
1 PIPING & APPURTENANCES		PREPARATION FOR SHIPMENT					
2 MANIFOLD PIPING FOR PURCHASER CONNECTION		☐ DOMESTIC ☐ EXPORT ☐ EXPORT BOXING REQ'D					
3 ☒ VENT ☒ DRAIN ☒ STEAM / COOLING WATER		☐ OUTDOOR STORAGE MORE THAN 6 MONTHS					
4 ☐ HEATING JACKET REQ'D (6.3.6) ☒ COOLING REQ'D		SURFACE PREPARATION AND PAINT					
5 ☒ PIPE ☒ TUBING; FITTINGS _____		☐ MANUFACTURER'S STANDARD ☐ OTHER (SEE BELOW)					
6 ☒ C.S. ☒ GALVANIZED ☒ S. STEEL		☐ SPECIFICATION NO. _____					
7 ☒ VALVES: ☒ CARBON STEEL ☒ S. STEEL		PUMP: (8.4.3.1)					
8 ☒ FLANGES REQUIRED IN PLACE OF SOCKET WELD UNIONS		☐ PRIMER _____					
9 ☒ MOUNT SEAL POT OFF BASEPLATE		☐ FINISH COAT _____					
10 CONNECTION BOLTING ☐ CADMIUM PLATED BOLTS PROHIBITED		BASEPLATE: (8.4.3.1)					
11 ☐ PTFE COATING ☐ ASTM A153 GALVANIZED		☐ PRIMER _____					
12 ☐ PAINTED ☐ SS		☐ FINISH COAT _____					
13 HEATING AND COOLING		WEIGHTS (lb)					
14 HEATING MEDIUM: ☐ STEAM ☐ OTHER		☐ PUMP ☐ BASE ☐ GEAR ☐ DRIVER					
15 ☒ STEAM JACKET/COOLING WATER PRES. _____ (psig) @ _____ (°F)		TOTAL WEIGHT _____					
16 COOLING WATER REQUIREMENTS:		BASEPLATE					
17 ☐ BEARING HOUSING _____ (gpm) @ _____ (psig)		☐ BY PUMP MANUFACTURER ☐ SUITABLE FOR EPOXY GROUT					
18 ☐ LUBE OIL COOLER _____ (gpm) @ _____ (psig)		☐ EXTENDED FOR <i>As per attached drawing</i>					
19 ☐ SEAL OIL COOLER _____ (gpm) @ _____ (psig)		☐ DRAIN-RIM ☐ DRAIN-PAN					
20 ☐ OTHER _____ (gpm) @ _____ (psig)		☐ NON-GROUT CONSTRUCTION (7.4.2)					
21 TOTAL COOLING WATER _____ (gpm) @ _____ (psig)		OTHER PURCHASER REQUIREMENTS					
22 INSTRUMENTATION <i>N/A</i>		NAMEPLATE UNITS ☐ U.S. CUSTOMARY ☒ SI					
23 ☐ ACCELEROMETER(S)		☐ RELIEF VALVES BY PUMP MFRG ☐ INTERNAL ☐ EXTERNAL					
24 ☐ PROVISION FOR MTG ONLY		PIPING FOR SEAL FLUSH FURNISHED BY:					
25 ☐ FLAT SURFACE REQUIRED		☐ PUMP VENDOR ☐ OTHERS					
26 ☐ RADIAL BEARING TEMP. ☐ THRUST BEARING TEMP.		PIPING FOR COOLING/HEATING FURNISHED BY:					
27 ☐ TEMP. GAUGES (WITH THERMOWELLS)		☐ PUMP VENDOR ☐ OTHERS					
28 ☐ PRESSURE GAUGE TYPE _____ ☐ OTHER _____		☐ PROVIDE TECHNICAL DATA MANUAL					
29		☒ INSTALLATION LIST IN PROPOSAL (9.2.3.1)					
30 REMARKS:		REMARKS:					
31							
32							
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ROTARY PUMP (API 676-3RD)

PAGE _____ OF _____

JOB NO. _____ ITEM NO.(S) _____

REQ / SPEC NO. _____

PRESSURE DESIGN CODES

PURCH ORDER NO. _____ DATE _____

WELDING REQUIREMENTS

INQUIRY NO. _____ BY _____

PURCHASER DEFINED MATERIAL INSPECTIONS

REVISION NO. _____ DATE: _____

1	APPLICABLE TO: ☐ PROPOSALS ☐ PURCHASE ☒ AS BUILT					
2	FOR _____ UNIT _____					
3	SITE _____ SERVICE _____					
4	NO. REQ _____	PUMP SIZE _____	TYPE _____	NO. STAGES _____		
5	MANUFACTURER _____		MODEL _____	SERIAL NO. _____		
6						
7	NOTES: INFORMATION BELOW TO BE COMPLETED: ☐ BY PURCHASER ☐ BY MANUFACTURER ☒ BY MANUFACTURER OR PURCHASER					
8	PRESSURE VESSEL DESIGN CODE REFERENCES.					
9	THESE REFERENCES MUST BE LISTED BY THE MANUFACTURER					
10						
11						
12	WELDING AND REPAIRS (6.13.5 & 6.13.1)					
13	THESE REFERENCES MUST BE LISTED BY THE PURCHASER. (DEFAULT TO TABLE 5 IF NO PURCHASER PREFERENCE IS STATED)					
14	☐ ALTERNATE WELDING CODES AND STANDARDS (6.13.5.1) Vendor defined - Purchaser approved					
15	Welding Requirement (Applicable Code or Standard)		Purchaser defined	Default per Table 5		
16	Welder/operator qualification		☐	☐		
17	Welding procedure qualification		☐	☐		
18	Non-pressure retaining structural welding such as baseplates or supports		☐	☐		
19	Magnetic Particle or Liquid Penetrant examination of plate edges		☐	☐		
20	Postweld heat treatment (user specified in remarks below)		☐	☐		
21	Postweld heat treatment of casing fabrication welds		☐	☐		
22	WELDING APPROVALS:					
23	☐ Submit Weld Procedures for approval					
24	☐ Submit Pressure Boundary Weld Maps for approval on major weld repairs at pump mfr.					
25	MATERIAL AND OTHER INSPECTIONS (6.2.2.1.1)(6.2.3.1)					
26	THESE REFERENCES MUST BE LISTED BY THE PURCHASER (DEFAULT TO TABLE 6 IF NO PURCHASER METHOD PREFERENCE IS STATED)					
27	ALTERNATIVE MATERIAL INSPECTIONS AND ACCEPTANCE CRITERIA (SEE TABLE 6)					
28	Type of inspection	Para.	List Methods (if not API 676 defaults)	Press Bdry. Fabs	Piping	Press. Bdry. Cstgs.
29						Witness
30	☐ MSS-SP55 Visual casting inspection	6.13.3.3				☐
31	☐ Magnetic particle inspection at foundry	8.2.2.1.1	☐	☐	☐	☐
32	☐ Liquid penetrant inspection at foundry	8.2.2.1.1	☐	☐	☐	☐
33	☐ RT critical areas casing casting at foundry	8.2.2.1.1	☐	☐	☐	☐
34	☐ Magnetic particle insp. - finished machined	8.2.2.1.1	☐	☐	☐	☐
35	☐ Liquid penetrant insp. - finished machined	8.2.2.1.1	☐	☐	☐	☐
36	☐ RT critical areas casing - near fin. mach'd.	8.2.2.1.1	☐	☐	☐	☐
37	☐ MT or PT of Fab'd PB* edges	6.13.5.3d	☐	☐	☐	☐
38	☐ MT or PT case attachment welds	8.2.2.1.1	☐	☐	☐	☐
39	☐ MT or PT rotor at foundry	8.2.2.1.1	☐	☐	☐	☐
40	☐ RT butt welds in aux. piping		☐ ASME B31.3 or 31.4 or 31.8	☐	☐	☐
41	☐ MT or PT rotor - finished machined	8.2.2.1.1	☐	☐	☐	☐
42	☐ PMI all alloy pressure bndry components	8.2.4	☐	☐	☐	☐
43	☐ PMI alloy piping	8.2.4	☐	☐	☐	☐
44	☐ PMI alloy rotors	8.2.4	☐	☐	☐	☐
45	☐ Barstock with UT certificate for shaft	8.2.2.1.1	☐	☐	☐	☐
46	☐ Charpy Impact Test pressure bndry parts	6.13.6.5	☐	☐	☐	☐
47	☐ Casing caliper thickness check		☐	☐	☐	☐
48	☐ Rotor balance to ISO 1940 G2.5	6.8.1.9	☐	☐	☐	☐
49	☐ Hardness of parts, welds & HAZ		☐	☐	☐	☐
50	☐ Record Final assembly Clearances	8.2.1.1f	☐	☐	☐	☐
51	Material Test Reports 6.13.2.10: ☐ Casing* ☐ Rotor / Vanes ☐ Stators ☐ Shaft ☐ Bolting ☐ Aux Piping ☐					
52	HAZ is "heat affected zone" *Casing is any pressure containing or retaining part *PB is pressure boundary					

ROTARY PUMP (API 676-3RD)

PRESSURE DESIGN CODES

WELDING REQUIREMENTS

PURCHASER DEFINED MATERIAL INSPECTIONS

JOB NO. 0 PAGE 7 OF 0
 REQ / SPEC NO. 0 ITEM NO.(S) 0
 PURCH ORDER NO. 0 DATE 0
 INQUIRY NO. 0 BY 0
 REVISION NO. 0 DATE: 0

1	APPLICABLE TO:	☐ PROPOSALS	☐ PURCHASE	☒ AS BUILT
2	FOR	0	UNIT	0
3	SITE	0	SERVICE	0
4	NO. REQ	0	PUMP SIZE	0
5	MANUFACTURER	0	MODEL	0
6			NO. STAGES	0
7	PAGE No. / LINE No.	REMARKS		
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GENERAL-PURPOSE STEAM TURBINE DATA SHEET SI UNITS

JOB NO. _____ ITEM NO. _____
PURCHASE ORDER NO. _____
SPECIFICATION NO. _____
REVISION NO. _____ DATE _____
PAGE 1 OF 3 BY _____

1	APPLICABLE TO: ☐ PROPOSAL ☒ PURCHASE ☐ AS BUILT			UNIT <u>07 unit (Hydro treating)</u>		
2	FOR _____			NO. REQUIRED <u>01</u>		
3	SITE <u>CPC - Refinery</u>			DRIVEN EQUIPMENT <u>Gear Pump</u>		
4	SERVICE <u>Steam</u>			MODEL <u>TFV 12</u> SERIAL NO. _____		
5	MANUFACTURER <u>COPPUS</u>					
6	NOTE: ☐ INDICATES INFORMATION COMPLETED BY PURCHASER ☐ BY MANUFACTURER ☒ BY MFR IF NOT BY PURCHASER					
7	☐ OPERATING CONDITIONS			☐ PERFORMANCE		
8	OPERATING POINT	POWER, kW HP	SPEED, RPM	OPERATING POINT/STEAM CONDITION	NO. HAND VALVES OPEN (5.4.1.4)	STEAM RATE, kg/kW-HR
9						
10	NORMAL			NORMAL/NORMAL (CERTIFIED SR)		
11						
12	RATED	10	1450	RATED/NORMAL		
13	OTHER (4.1.4)			(1) MIN. INLET - MAX EXHAUST		
14	☐ DUTY, SITE AND UTILITY DATA					
15	APPLICATION IS (SPARED, UNSPARED)			(1) ☐ RATED ☐ % RATED ☐ NORMAL (4.1.4)		
16	☐ WIDE SPEED RANGE ☐ RAPID START			APPLICABLE SPECIFICATION		
17	☐ SLOW ROLL REQ. (4.10.4) ☐ HAND VALVES REQ. (5.4.1.5)			API-611 OTHER _____		
18	DUTY ☒ CONTINUOUS ☐ STANDBY					
19	☐ UNATTENDED AUTO START (4.1.6)			CONSTRUCTION		
20	LOCATION (4.1.14) ☐ INDOOR ☐ HEATED ☐ UNHEATED			TURBINE TYPE ☐ HORIZ ☒ VERTICAL		
21	☒ OUTDOOR ☐ ROOF ☒ W/O ROOF			NO STAGES _____ WHEEL DIA, mm _____		
22	AMBIENT TEMP., °C: MIN. <u>25</u> MAX <u>35</u>			ROTOR: ☐ BUILT UP ☐ SOLID ☐ OVERHUNG		
23	UNUSUAL CONDITIONS ☒ DUST ☐ SALT ATMOSPHERE			☐ BETWEEN BRGS		
24	(4.1.14) ☐ OTHER _____			☐ RE-ENTRY		
25	ELECT. AREA (4.1.13) CLASS _____ GROUP _____ DIV _____			BLADING ☐ 2 ROW ☐ 3 ROW ☐ RADIAL		
26	☐ NON-HAZARDOUS			CASING SPLIT ☐ AXIAL ☐ CENTERLINE ☐ FOOT		
27	CONTROL POWER V _____ PH. _____ HZ _____			☐ VERT. JACKSCREWS (4.2.13)		
28	AUX. MOTORS V _____ PH. _____ HZ _____			VERTICAL TURBINE FLANGE		
29	COOLING WATER: PRESS, BARG _____ Δ P, PSI _____			☐ NEMA "P" BASE ☐ OTHER (4.4.9)		
30	FLOW, m³/hr _____ Δ T, °C: _____			TRIP VALVE ☐ INTEGRAL ☐ SEPARATE		
31	ALLOW. SOUND PRESS LEVEL (4.1.12) _____ dBA @ _____ m			INTERSTAGE SEALS ☐ LABYRINTH ☐ CARBON		
32	☐ STEAM CONDITIONS			END SEALS ☐ CARBON RING, NO/BOX _____		
33		MAX	NORMAL	☐ LABYRINTH ☐ MATERIAL _____		
34	INLET PRESS, (BARG)(kPa G) <u>PSig</u>	<u>275</u>	<u>250</u>	☐ MECHANICAL ☐ MFB _____		
35	INLET TEMP. <u>°F</u>	<u>550</u>	<u>500</u>	TYPE RADIAL BEARINGS (4.9.1) _____		
36	EXHAUST PRESS (BARG) (mmHGA) <u>PSig</u>	<u>60</u>	<u>50</u>	TYPE THRUST BEARING (4.9.2) _____		
37	☐ STEAM CONTAMINANTS (4.11.1.7)			☐ CALCULATED THRUST LOAD _____ BAR (4.9.15)		
38	TURBINE DATA			☐ BEARING MFR's ULTIMATE RATING _____ BAR		
39	☐ ALLOW SPEEDS, RPM, MAX _____ MIN _____			THRUST COLLAR (4.9.10.2) ☐ REPLACEABLE ☐ INTEGRAL ☐ NONE		
40	☐ MAX CONT SPEED, RPM (3.1.10) _____			☒ LUBE OIL VISCOSITY (4.10.3) ISO GRADE _____		
41	☐ TRIP SPEED, RPM _____ BLADE TIP VEL, mm/s _____			LUBRICATION ☐ RING OILED ☐ PRESSURE ☒ GREASE		
42	☐ FIRST CRITICAL SPEED, RPM (4.8.2.1) _____			OIL MIST (4.9.19)		
43	☐ EXH. TEMP °C _____ NORMAL _____ NO LOAD _____			☐ PURGE OIL MIST ☐ PURE OIL MIST		
44	☐ POTENTIAL MAX POWER, KW (3.1.20) _____			☐ BEARING HOUSING OILER TYPE _____		
45	☐ MAX. NOZZLE STEAM FLOW, kg/hr _____			CASING DESIGN		
46	ROTATION FACING GOVERNOR END ☐ CCW ☐ CW			INLET		
47	☐ DRIVEN EQUIPMENT THRUST, N (4.9.11) _____			EXHAUST		
48	(VERTICAL TURBINE) (4.9.3)			MAX. ALLOW. PRESS, BARG _____		
49	☐ WATER PIPING FURN. BY ☐ VENDOR ☐ OTHERS			MAX ALLOW. TEMP, °C _____		
50	☐ OIL PIPING FURN. BY ☐ VENDOR ☐ OTHERS			HYDRO TEST PRESS., BARG _____		

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☐ MATERIALS 2 HIGH PRESSURE CASING _____ GRADE _____ 3 EXHAUST CASING _____ GRADE _____ 4 NOZZLES _____ GRADE _____ 5 BLADING _____ GRADE _____ 6 WHEELS _____ GRADE _____ 7 SHAFT _____ GRADE _____ 8 ☒ SHAFT COATING UNDER PACKING (4.6.2.3) 9 MATERIAL _____ 10 APPLICATION METHOD _____ 11 THICKNESS _____ 12 GOV. VALVE TRIM _____ 13 INLET STRAINER _____ MESH SIZE _____ 14 COUPLING SPACER/HUBS _____ 15 COUPLING DIAPHRAGMS (DISKS) _____ ☒ STEAM CONTROL 17 SPEED CHANGER ☒ MANUAL ☐ PNEUM. ☐ ELECT (5.4.2.3) 18 MFR. _____ MODEL _____ <table border="1" style="width:100%; border-collapse: collapse; margin-top: 5px;"> <tr> <th style="width:33%;">CONTROLLED VARIABLE</th> <th style="width:33%;">OPERATING RANGE</th> <th style="width:33%;">CONTROL SIGNAL</th> </tr> <tr> <td>21 SPEED _____ TO _____ RPM 3/mA _____ TO _____ BARG/ma</td> <td></td> <td></td> </tr> <tr> <td>22 _____ TO _____ RPM 3/mA _____ TO _____ BARG/ma</td> <td></td> <td></td> </tr> </table> ☐ CONNECTIONS (4.4.1) <table border="1" style="width:100%; border-collapse: collapse; margin-top: 5px;"> <tr> <th style="width:15%;">SIZE</th> <th style="width:10%;">RAT'G</th> <th style="width:10%;">FAC'G</th> <th style="width:10%;">POS.</th> <th style="width:55%;">MATING PARTS FURNISHED (4.4.6.5)</th> </tr> <tr> <td>26 INLET 1.5"</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>27 EXHAUST 3"</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>28 DRAINS</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>29</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>30</td> <td></td> <td></td> <td></td> <td></td> </tr> </table> ☐ COUPLINGS (5.2) ☐ SEE SEPARATE DATA SHEET <table border="1" style="width:100%; border-collapse: collapse; margin-top: 5px;"> <tr> <th style="width:30%;">LOCATION</th> <th style="width:35%;">TURBINE</th> <th style="width:35%;">DRIVEN</th> </tr> <tr> <td>32 ☐ MAKE</td> <td></td> <td></td> </tr> <tr> <td>34 ☒ MODEL</td> <td></td> <td></td> </tr> <tr> <td>35 ☐ RATING (HP/100RPM)</td> <td></td> <td></td> </tr> <tr> <td>36 ☐ LUBRICATION</td> <td></td> <td></td> </tr> <tr> <td>37 ☒ LIMITED END FLOAT</td> <td></td> <td></td> </tr> <tr> <td>38 ☐ SPACER LENGTH</td> <td></td> <td></td> </tr> <tr> <td>39 ☒ SERVICE FACTOR</td> <td></td> <td></td> </tr> <tr> <td>40 ☐ TURBINE VENDOR MOUNTS HALF COUPLING</td> <td></td> <td></td> </tr> </table> 41 DYN. BALANCE CL (5.2.8) 42 ☐ AGMA CLASS 8 ☐ OTHER _____ 43 TURBINE SHAFT ☐ TAPER ☐ STRAT ☐ HYDRAULIC FIT HUB ☐ MOUNTING PLATES 46 TYPE: (5.3.1.1) ☐ BASEPLATE ☐ SOLEPLATE 47 FURN. BY: ☐ TURBINE VENDOR 48 ☐ DRIVEN EQUIPMENT VENDOR ☐ OTHER _____ 49 EQUIPMENT TO BE MOUNTED: (5.3.2.1) 50 ☐ TURBINE ☐ GENERATOR ☐ GEAR 51 ☒ PUMP ☐ OTHER _____ 52 ☐ UNGROUTED BASEPLATE (5.3.2.4) 53 ☐ SUITABLE FOR COLUMN MOUNTING 54 ☐ TURBINE VENDOR FURNISHES SUBPLATES	CONTROLLED VARIABLE	OPERATING RANGE	CONTROL SIGNAL	21 SPEED _____ TO _____ RPM 3/mA _____ TO _____ BARG/ma			22 _____ TO _____ RPM 3/mA _____ TO _____ BARG/ma			SIZE	RAT'G	FAC'G	POS.	MATING PARTS FURNISHED (4.4.6.5)	26 INLET 1.5"					27 EXHAUST 3"					28 DRAINS					29					30					LOCATION	TURBINE	DRIVEN	32 ☐ MAKE			34 ☒ MODEL			35 ☐ RATING (HP/100RPM)			36 ☐ LUBRICATION			37 ☒ LIMITED END FLOAT			38 ☐ SPACER LENGTH			39 ☒ SERVICE FACTOR			40 ☐ TURBINE VENDOR MOUNTS HALF COUPLING			☐ ACCESSORY EQUIPMENT BY VENDOR ☐ REMOTE TRIP ☐ SOLENOID ☐ VACUUM BREAKER (5.4.2.9) ☐ AUTOMATIC STEAM SEALING SYSTEM (4.7.5) GLAND VACUUM DEVICE WITH: (4.7.4) ☐ WATER EJECTOR ☐ STEAM EJECTOR ☐ SENTINEL WARNING VALVE (5.4.5.2) ☐ INSULATION, TYPE: _____ ☐ TACHOMETER (5.4.4.1), TYPE _____ ☒ MFR. _____ ☒ MODEL _____ ☐ MOUNTED BY _____ ☐ THERMAL RELIEF VALVES (5.4.4.7.3) ☐ SHUTOFF VALVES FOR SHUTDOWN SENSORS ☐ LOCAL GAUGE BOARD WITH FOLLOWING PRESSURE GAUGES: (5.4.3.1) ☐ THROTTLE STEAM ☐ FIRST STAGE ☐ NOZZLE RING ☐ EXHAUST ☐ LIQUID FILLED GAUGES (5.4.4.4) ☐ INSTRUMENT PANEL (5.4.3.2.1) ☐ BASEMOUNT ☐ FREE STANDING ☐ EXTERNAL LUBE OIL SYSTEM ☐ CIRCULATING (4.10.5) ☒ PRESSURE (4.10.6) VENDOR FURNISH SYSTEM FOR: ☐ TURBINE ☐ OTHER _____ OIL SYSTEM TO BE: ☐ CONSOLE TYPE ☐ MOUNTED ON BASEPLATE OIL SYSTEM TO INCLUDE FOLLOWING EQUIPMENT: (4.10.5)(4.10.7) ☒ STANDBY OIL PUMP: TYPE DRIVER _____ ☐ LOW OIL PRESS ALARM SWITCH ☐ LOW OIL PRESS TRIP SWITCH ☐ HEATER (4.10.8) ☐ ELECTRIC ☐ STEAM ☐ OIL DRAIN SIGHT FLOW INDICATORS ☐ HAND OPERATED STANDBY PUMP ☐ VIBRATION AND POSITION DETECTORS (5.4.6) ☐ FURNISH PROVISIONS FOR MOUNTING NON-CONTACTING VIBRATION PROBES (4.9.32) ☐ FURN. AXIAL POSITION PROBES ☒ NO. OF PROBES _____ ☒ MFR. _____ ☒ MODEL _____ ☐ FURN. RADIAL PROBES ☐ NO. OF PROBES PER BEARING _____ ☒ MFR. _____ ☒ MODEL _____ FURNISH BEARING METAL TEMP SENSORS FOR: ☐ RADIAL BEARINGS ☐ THRUST BEARINGS TURBINE VENDOR SUPPLIES AND CALIBRATES MONITORS FOR: ☐ AXIAL AND RADIAL PROBES ☐ BEARING TEMPERATURE SENSORS ☐ SEE SEPARATE DATA SHEETS FOR DETAILS
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1	ENGINEERING REQUIREMENTS							☐ PREPARATION FOR SHIPMENT			
2	☐ SUPPLY ENGR. DATA FOR LATERAL/TORSIONAL ANALYSES (4.8.1.7)							TURBINE AUX. EQUIPMENT AND SPARE ROTOR PREPARED FOR (6.4.1): ☐ DOMESTIC SHIPMENT ☐ EXPORT SHIPMENT REMARKS: _____ _____ _____ _____			
3											
4	☐ CALCS AND/OR DATA FOR SEPARATION MARGIN (4.8.2.2)										
5	☐ TRAIN TORSIONAL VIBRATION ANALYSIS (4.8.3.5)										
6	☐ WEIGHT OF HALF KEYS (4.8.4.2)										
7	☐ RESIDUAL UNBALANCE CHECK (4.8.4.3)										
8											
9											
10	REMARKS: _____										
11											
12											
13											
14											
15											
16											
17	INSPECTION REQUIREMENTS							TESTS (6.3)			
18	☐ 100% ULTRASONIC INSPECTION AFTER ROUGH MACHINING (6.2.2.3.1)							REQ'D.			
19	☐ USE INSPECTOR'S CHECK LIST							WITN.			
20	CASTING SURFACE INSPECTION (6.2.2.1.1) ☐ MSS SP-55							OBSVD. (6.1.5)			
21	☐ OTHER _____										
22	☒ WELD INSPECTION (6.2.2.1.2)										
23	SPECIAL NDT INSPECTION (6.2.1.3)										
24											
25											
26								WEIGHTS			
27	COMPONENT	MAG. PART.	DYE PENET.	RADIO-GRAPHIC	ULTRA-SONIC	OBSE-RVED	WITN.				
28	T&T VALVE					☒	☒				
29	STM CHEST					☒	☐				
30	CASING					☒	☐				
31	PIPING					☒	☐				
32	ROTOR					☒	☐				
33						☐	☐				
34						☐	☐				
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37	REMARKS: _____										
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