



**Resalat Oil Field Development
Project
Phase 1 (EPC-EPD)**



Data sheet for Gas Turbine Generator Package

Job No. 98IEC01

Project	Facility	Discipline	Document	Seq.	Rev.
LRSL	R1X	RE	DS	210	00

Sheet No.
1 of 23

DATA SHEET FOR GTG PACKAGE

			<i>R. Kamyab</i>	<i>M. Moshkani</i>	
D0	2024-01-01	ISSUED FOR COMMENTS	RK	AM	HM
REV.	DATE	DESCRIPTION	PREPARED	CHECKED	APPROVED



Resalat Oil Field Development Project Phase 1 (EPC-EPD)



Data sheet for Gas Turbine Generator Package

Project LRSL	Facility R1X	Discipline RE	Document DS	Seq. 210	Rev. 0	Sheet No. 2 of 23
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<p>COMBUSTION GAS TURBINE (API 616-6th)</p> <p style="text-align: center;">DATASHEET SI UNITS</p>	<p>JOB NO. _____ ITEM NO. Tag no. LRSL26-PK-0301 A/B/C</p> <p>PURCHASE ORDER NO. _____</p> <p>SPECIFICATION NO. _____</p> <p>REVISION NO. _____ DATE _____</p> <p>PAGE 1 OF _____ BY _____</p>
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<p>1 APPLICABLE TO: <input checked="" type="radio"/> PROPOSAL <input type="radio"/> PURCHASE <input type="radio"/> AS-BUILT</p> <p>2 <input type="radio"/> FOR (9.1.3) _____</p> <p>3 <input type="radio"/> SITE (9.1.3) Resalat Oil Field</p> <p>4 <input type="radio"/> SERVICE (9.1.3) _____</p> <p>5 <input checked="" type="radio"/> CONTINUOUS <input checked="" type="radio"/> INTERMITTENT <input type="radio"/> STANDBY</p> <p>6 <input type="checkbox"/> MANUFACTURER _____ <input type="checkbox"/> MODEL _____</p> <p>7 <input type="checkbox"/> SERIAL NUMBER _____ <input type="checkbox"/> ISO RATING (3.1.25) _____ (Note 2, 11) MW _____ RPM _____</p>	<p><input type="radio"/> TECH READINESS LEVEL (6.1.1.1) _____</p> <p><input type="radio"/> TRL DOCUMENTATION REQUIRED (6.1.1.2) _____</p> <p><input type="radio"/> POWER MARGIN (6.1.7) _____ %</p> <p><input type="radio"/> SERVICE LIFE (6.1.2, 9.2.3.2.y) _____ yrs</p> <p><input type="radio"/> NUMBER REQUIRED _____</p> <p><input type="radio"/> MINIMUM AVAILABILITY (6.1.5) _____ %</p> <p><input type="radio"/> DRIVEN EQUIPMENT _____</p> <p><input type="radio"/> MINIMUM RELIABILITY (6.1.5) _____ %</p>
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8 LOCATION AND SITE CONDITIONS (6.1, 6.6)

9

10 INDOOR OUTDOOR UNDER ROOF PARTIAL SIDES IN BUILDING GRADE MEZZANINE HEATED UNHEATED

11 OTHER Offshore (Note 9) _____

12

13 EXTREME MAXIMUM AMBIENT TEMPERATURE _____ °C BUILDING CODE (6.5.13) _____

14 EXTREME MINIMUM AMBIENT TEMPERATURE _____ °C

15 MINIMUM DESIGN METAL TEMPERATURE (6.25.7) _____ °C

16 PIPING STANDARD (6.13.1) _____

17 ALTITUDE (6.1.24) _____ m WINTERIZATION REQD TROPICALIZATION REQD (7.5.8.11, 7.7.2.3.3)

18 GAS TURBINE ARRANGEMENT (6.1.10 Figure 1):

19 SINGLE SHAFT

20 TWO-SHAFT (WITH FREE POWER TURBINE) THREE-SHAFT (WITH FREE POWER TURBINE)

21 TWO-SHAFT (WITHOUT FREE POWER TURBINE) THREE-SHAFT (WITHOUT FREE POWER TURBINE)

22 SEISMIC DESIGN CRITERIA (6.6.3, 7.7.1.10)

23 APPLICABLE CODE _____ APPLICABLE SPECIFICATION _____

25 WIND DESIGN CRITERIA (6.6.4, 7.7.1.10)

26 APPLICABLE CODE _____ APPLICABLE SPECIFICATION _____

27 NONOPERATING EXTREME WIND DESIGN SPEED (6.6.5) _____ km/h

28 (See also Page 16)

<p>29 ELECTRICAL AREA CLASSIFICATION (6.5.4) (Note 12)</p> <p>30 <input type="radio"/> UNCLASSIFIED <input type="radio"/> HAZARDOUS</p> <p>31 <input type="radio"/> CLASS _____ DIV/ZONE _____ GROUP _____ TEMP. CODE _____</p> <p>32 COMPONENTS IN UNCLASSIFIED LOCATION (7.5.1.6)</p> <p>33 CODE: <input type="radio"/> NEC 500 <input type="radio"/> NEC 505 <input type="radio"/> IEC</p> <p>34 <input checked="" type="radio"/> OUTSIDE GT ENCLOSURES CLASS _____ DIV/ZONE _____ GROUP _____ TEMP. CODE _____</p> <p>35 <input checked="" type="radio"/> INSIDE GT ENCLOSURES CLASS _____ DIV/ZONE _____ GROUP _____ TEMP. CODE _____</p> <p>36 <input type="radio"/> THIRD-PARTY CERTIFICATION _____</p>	<p>30 ELECTRICAL CODES (6.5.3)</p> <p><input type="radio"/> NFPA 70 (NEC) <input type="radio"/> ATEX 2014/34/EU</p> <p><input type="radio"/> IEC 60079 <input type="radio"/> CSA C22-1-06</p> <p><input type="radio"/> OTHER _____</p>
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<p>38 UNUSUAL CONDITIONS (6.1 and 6.6)</p> <p>39 <input type="radio"/> DUST <input type="radio"/> FUMES</p> <p>40 <input type="radio"/> APPLICABLE SPECIFICATION FOR DUST LOADING _____</p> <p>41 <input type="radio"/> APPLICABLE SPECIFICATION FOR SNOW/ICE LOADING (7.7.1.10) _____</p>	<p>38 NOISE LIMIT REQUIREMENTS (6.3.1, 6.3.2)</p> <p>39 <input checked="" type="radio"/> GAS TURBINE ENCLOSURE 85 dB(A) @ 1 m <input type="radio"/> PRESSURE <input type="radio"/> POWER</p> <p>40 <input type="radio"/> INLET SYSTEM _____ dBA <input type="radio"/> PRESSURE <input type="radio"/> POWER</p> <p>41 <input type="radio"/> EXHAUST SYSTEM _____ dBA <input type="radio"/> PRESSURE <input type="radio"/> POWER</p> <p>42 <input type="radio"/> OVERALL FAR FIELD REQUIREMENT</p>
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<p>43 DOCUMENT HIERARCHY (5.3)</p> <p>44 <input type="radio"/> 1 _____ 5 _____</p> <p>45 <input type="radio"/> 2 _____ 6 _____</p> <p>46 <input type="radio"/> 3 _____ 7 _____</p> <p>47 <input type="radio"/> 4 _____ 8 _____</p> <p>48 <input type="radio"/> VENDOR HAVING UNIT RESPONSIBILITY (4) _____</p> <p>49 <input type="radio"/> OTHER _____</p>	<p>43 PAINTING (8.4.3.1) (Note 10)</p> <p><input checked="" type="checkbox"/> MANUFACTURER'S STANDARD</p> <p><input checked="" type="checkbox"/> MANUFACTURER'S STANDARD FOR MARINE ENVIRONMENT</p> <p><input type="radio"/> OTHER _____</p>
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<p>50 SHIPMENT (8.4) <input type="radio"/> TRUCK <input type="radio"/> RAIL <input type="radio"/> SHIP</p> <p>51 <input type="radio"/> ENVIRONMENTAL CONDITIONS (6.6.2) _____</p> <p>52 <input type="radio"/> TRANSPORTATION LOADS (6.5.14, 7.7.1.10) _____</p> <p>53 <input type="radio"/> DOMESTIC <input type="radio"/> EXPORT <input type="radio"/> EXPORT BOXING REQUIRED</p> <p>54 <input type="radio"/> DURATION OF OUTDOOR STORAGE IF MORE THAN 6 MONTHS (8.4.1.b) _____</p>	<p>50 CASING CONNECTIONS</p> <p>50 CASING BOLT THREADING (6.8.1)</p> <p><input type="checkbox"/> ISO 261 <input type="checkbox"/> ASME B1.1 <input type="checkbox"/> MIL-S-8879</p> <p>THREADS TYPE <input type="checkbox"/> TAPERED <input type="checkbox"/> STRAIGHT</p> <p>CASING FLANGES: <input type="checkbox"/> ISO <input type="checkbox"/> ASME</p> <p>MACHINED & STUDDED <input type="checkbox"/> ISO <input type="checkbox"/> ASME</p>
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55 SPARE ROTOR ASSEMBLY PACKAGED FOR (8.4.3.11)

56 DOMESTIC SHIPMENT EXPORT SHIPMENT VERTICAL STORAGE (8.4.3.11.e)

57 OTHER SPECIFIED LANGUAGE FOR SHIPPING UNIT MARKINGS (8.4.12.1) _____

59 Notes: LHV = Lower Heating Value; GG = Gas Generator; PT = Power Turbine;

60 1) There are different pressure at different fuel compositions which appropriate considerations shall be provided by Vendor.

61 2) Each GTG shall fulfill net power output at site condition .

62 3) deleted.

63 4) Vendor to complete all unspecified data on all sheets.

64 5) Certified point to be at the duty point of the generator as stated on the generator data sheet.

65 6) deleted.

66 7) The package to be supplied complete with a lube oil system in accordance with API 614 to serve the turbine, generator and gearbox.

67 Vendor shall submit data sheets in API format.

68 8) API 616 data sheet shall be filled out and submitted by Vendor

69 9) Dust, Fumes and marine environment shall be considered as an unusual condition.

70 10) Painting shall be as per project Painting Spec or proposed paint system by Vendor shall be suitable for marine environment.

71 11) 2X100% or 3X50% arrangement

72 12) Area Classification : Zone II Gas Group IIB Temperature Class T3



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COMBUSTION GAS TURBINE (API 616-6th) DATASHEET SI UNITS	JOB NO. _____ ITEM NO. _____ PURCHASE ORDER NO. _____ SPECIFICATION NO. _____ REVISION NO. _____ DATE _____ PAGE <u>2</u> OF _____ BY _____	REV
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GENERAL
1 CYCLE: <input type="checkbox"/> REGEN <input checked="" type="radio"/> SIMPLE <input type="radio"/> EXHAUST HEAT RECOVERY (7.7.3.1.1.b) 2 <input checked="" type="checkbox"/> DRIVEN EQUIPMENT POWER RANGE: <u>4.2MW (2X100% or 3X50%)</u> note1 <input type="checkbox"/> DRIVEN EQUIPMENT SPEED RANGE _____ RPM 3 <input type="checkbox"/> GAS TURBINE DRIVER OUTPUT SHAFT SPEED RANGE (6.1.15, 6.1.16, 7.5.3.4) _____ RPM 4 5 OPERATION <input type="radio"/> ATTENDED <input type="radio"/> UNATTENDED 6 <input type="checkbox"/> POTENTIAL MAXIMUM POWER (3.1.48) _____ MW <input type="checkbox"/> LIMITING CONDITIONS _____ 7 8 9

PERFORMANCE

STEAM OR WATER INJECTION		<input type="checkbox"/> EMISSIONS (6.2.7)		<input type="checkbox"/> AUGMENTATION (6.2.7)																	
PERFORMANCE PARAMETERS (6.6)		SITE RATED (3.1.65)	NORMAL OPERATING (3.1.39)	SITE MAX TEMP	SITE MIN TEMP															SITE MIN TURNDOWN	
<input checked="" type="checkbox"/> DRIVEN EQUIPMENT PWR	MW (6.1.7, 7.9.6.1)																				
<input type="checkbox"/> POWER FACTOR (GEN-SET)	(6.1.23)																				
<input type="checkbox"/> INLET DP	mm H2O (7.7.2.1.3.2)																				
<input type="checkbox"/> EXHAUST DP	mm H2O (7.7.3.1.1)																				
<input type="checkbox"/> AIR DRY BULB TEMP (INLET)	°C (6.1.24)			45	7																
<input type="checkbox"/> GT INLET AIR COOLING (Y/N)																					
<input type="checkbox"/> GT INLET AIR HEATING (Y/N)																					
<input type="checkbox"/> GT INLET TEMP	°C																				
<input type="checkbox"/> RELATIVE HUMIDITY	% (6.1.24)			100	30																
<input type="checkbox"/> BAROMETRIC PRESS	kPa (6.1.24)																				
<input type="checkbox"/> GT OUTPUT SHAFT POWER	MW																				
<input type="checkbox"/> GG SHAFT SPEED	RPM																				
<input type="checkbox"/> PT OUTPUT SHAFT SPEED	RPM (6.1.15)																				
<input type="checkbox"/> HEAT RATE (LHV)	kJ/kW-h																				
<input checked="" type="checkbox"/> NO _x EMISSIONS	PPMV (6.2.1, 7.9.6.1)																				
<input checked="" type="checkbox"/> CO EMISSIONS	PPMV (6.2.1, 7.9.6.1)																				
<input checked="" type="checkbox"/> CO ₂ EMISSIONS	PPMV (6.2.1, 7.9.6.1)																				
<input checked="" type="checkbox"/> SO _x EMISSIONS	PPMV (6.2.1, 7.9.6.1)																				
<input checked="" type="checkbox"/> HYDROCARBON EMISSIONS	PPMV (6.2.1, 7.9.6.1)																				
<input checked="" type="checkbox"/> PARTICULATE EMISSIONS	PPMV (6.2.1, 7.9.6.1)																				
<input type="checkbox"/> FIRING TEMPERATURE	°C																				
<input type="checkbox"/> AIR FLOW	kg/s																				
<input type="checkbox"/> GG EXHAUST TEMP	°C																				
<input type="checkbox"/> PT EXHAUST FLOW	kg/s																				
<input type="checkbox"/> PT EXHAUST TEMP	°C																				
<input type="checkbox"/> FUEL TYPE	(6.1.24)																				
<input type="checkbox"/> FUEL FLOWRATE	kg/h																				
<input checked="" type="checkbox"/> FUEL TEMPERATURE	°C																				
<input checked="" type="checkbox"/> STEAM FLOW	kg/h (6.2.7)																				
<input checked="" type="checkbox"/> WATER FLOW	m ³ /h (6.2.7)																				

AIR COMPRESSOR: 46 <input type="checkbox"/> STAGES _____ <input type="checkbox"/> MAXIMUM TIP SPEED _____ m/s 47 <input type="checkbox"/> TYPE _____ <input type="checkbox"/> PRESSURE RATIO _____ 48 CASING SPLIT (6.7.3) <input type="checkbox"/> AXIAL <input type="checkbox"/> RADIAL 49 ROTOR <input type="checkbox"/> SOLID <input type="checkbox"/> BUILT-UP TURBINE: 51 <input type="checkbox"/> STAGES _____ <input type="checkbox"/> MAXIMUM TIP SPEED _____ m/s 52 CASING SPLIT (6.7.3) <input type="checkbox"/> AXIAL <input type="checkbox"/> RADIAL 53 ROTOR <input checked="" type="checkbox"/> SOLID <input checked="" type="checkbox"/> BUILT-UP MATERIALS: 55 <input type="checkbox"/> COMPRESSOR CASING _____ 56 <input type="checkbox"/> TURBINE CASING _____ 57 <input type="checkbox"/> COMBUSTOR LINER _____ 58 <input type="checkbox"/> COMBUSTOR HEAT SHIELD _____	COMBUSTORS (6.10) <input type="checkbox"/> NUMBER OF COMBUSTORS _____ <input type="checkbox"/> FUEL NOZZLES PER COMBUSTOR _____ <input type="checkbox"/> CONFIGURATION _____ <input type="checkbox"/> MAXIMUM ALLOWABLE TEMP. VARIATION _____ °C APPLICABLE PLANE _____ <input type="radio"/> COMBUSTOR FLAMEOUT DETECTION (7.5.9.8.2) <input checked="" type="checkbox"/> FLAME <input checked="" type="checkbox"/> TEMPERATURE <input checked="" type="checkbox"/> SPEED CHANGE REMARKS: _____ _____ _____
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59 **REMARKS:** Note 1) Each GTG shall have net power output at site condition .
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COMBUSTION GAS TURBINE (API 616-6th)

DATASHEET SI UNITS

JOB NO. _____ ITEM NO. _____
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REV

FUEL SYSTEM (7.9)

- 2 TYPE GAS (7.9.1.2) LIQUID (7.9.3) DUAL (7.9.3.10, 7.9.5)
 3 **DUAL SYSTEM REQMTS** (7.9.3.10, 7.9.5) GAS/GAS LIQUID/GAS LIQUID/LIQUID
 4 FUEL GAS COMPRESSION SYSTEM REQD (7.9.1.2.1.4) MAX TRANSFER TIME (7.9.5.2.a) _____ sec
 5 MIN TRANSFER TIME (7.9.5.2.b) _____ sec

GAS FUELS (7.9.2)

GAS FUEL SYSTEM AND COMPONENTS

7 HC DEW PT, °C @ kPa @ @ @

9 FUEL ANALYSIS - MOL % (6.1.24.e, 7.9.2.1) all compositions at 110 psig

10 COMPOSITION (7.9.1.1.2)

	sweet	sour	mix
11 Nitrogen	0.0437	0.0033	0.0261
12 Carbon dioxide	0.0095	0.0568	0.0301
13 H2S	0.0000	0.0098	0.0043
14 Methane	0.6850	0.6134	0.6538
15 Ethane	0.1175	0.1556	0.1341
16 Propane	0.0863	0.0914	0.0885
17 n-Butane	0.0333	0.0384	0.0355
18 n-Pentane	0.0100	0.0134	0.0115
19 n-Hexane	0.0044	0.0052	0.0048
20 n-Heptane	0.0000	0.0014	0.0006
21 n-Octane	0.0000	0.0006	0.0003
22 n-Nonane	0.0000	0.0002	0.0001
23 H2O	0.0103	0.0103	0.0103
24 SUM	1.0	1.0	1.0
25 MW	23.19	25.57	24.23
26			
27			
28			
29 TOTAL	100.00	100.00	100.00
30 AVG. MOL. WT.			
31 <input type="checkbox"/> LHV MJ/m3			
32 <input type="checkbox"/> WOBBE INDEX MJ/m3			
33 <input type="checkbox"/> FUEL TEMP REQ'D °C			
34 <input type="checkbox"/> FUEL PRESS REQ'D kPag			

- MANUAL ISOLATION VALVE MFR (7.9.1.2.1.1) _____
- VALVE PRESSURE PROVING (7.9.1.2.7.4)
- EXTERIOR VENT VALVE (7.9.1.2.5.3)
- PRIMARY FAST SHUT OFF MFR (7.9.1.2.4.4) _____
- LEAK TIGHT SHUT OFF MFR (7.9.1.2.4.3) _____
- FUEL SHUT-OFF VALVE SUPPLIED BY VENDOR (7.9.1.2.5.1)
 MANUFACTURER _____
- DUAL Y-TYPE STRAINERS REQ'D (7.9.1.2.6.2)
- GAS FUEL HEATER SUPPLIED BY VENDOR (7.9.2.5.4)
- LIQUID FUEL HEATER SUPPLIED BY PURCHASER (7.9.3.13.2)
- GAS FUEL SUPERHEAT REQMT (7.9.2.1.3) _____ °C
- COALESCING FILTER SIZED FOR DEW POINT CONTROL (7.9.2.2.2)
- RATE OF CHANGE OF WI (7.9.2.4.2) _____ MJ/m³
- RATE OF CHANGE OF MWI (7.9.2.4.2) _____ MJ/m³/K
- SPECIAL FUEL ANALYSIS EQUIPMT SUPPLIED BY VENDOR (7.9.2.4.3)
- CALORIMETER
- GAS CHROMATOGRAPH
- WOBBE METER
- FUEL GAS LINE PRE-START PURGE SYSTEM (7.9.1.2.1.5)
- FUEL GAS PRESSURE REGULATOR SUPPLIED BY VENDOR (7.9.1.2.1.6)
- VALVE CERTIFICATION REGULATORY AGENCY (7.9.1.2.1.3)

REMARKS:

PIPING, TUBING & DESIGN DETAILS

- NACE STANDARD (6.20.13)
- NACE MR0103 MR0175
- FUEL SYSTEM FLANGE RATING _____
- PIPING / TUBING GRADE _____
- TUBE FITTING MFR (7.6.1.9) _____
- MAXIMUM VENT BACKPRESSURE (7.9.1.2.4.7) _____ kPag

"SHIP LOOSE" FUEL GAS SYSTEM COMPONENTS

- Y-TYPE STRAINERS _____
- DUPLEX FUEL GAS FILTERS _____
- PIPING _____
- HEATERS _____
- GAS ANALYSIS EQUIPMENT _____

REMARKS:



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COMBUSTION GAS TURBINE (API 616-6th)	JOB NO. _____ ITEM NO. _____ REVISION _____ DATE _____ PAGE <u>4</u> OF _____ BY _____
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FUEL SYSTEM (7.9)

1 TYPE GAS (7.9.1.2) LIQUID (7.9.3) DUAL (7.9.3.10, 7.9.5)
 2 **DUAL SYSTEM REQMTS (7.9.3.10, 7.9.5)** GAS/GAS LIQUID/GAS LIQUID/LIQUID
 3 FUEL GAS COMPRESSION SYSTEM REQD (7.9.1.2.1.4) MAX TRANSFER TIME (7.9.5.2.a) _____ sec
 4 MIN TRANSFER TIME (7.9.5.2.b) _____ sec

LIQUID FUEL SYSTEM (7.9.3)	LIQUID FUEL ANALYSIS (7.9.4)
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7 **FUEL GRADES (7.9.1.1.2, 7.9.4.1):**
 8 ASTM D2880 GRADE (7.9.4.3)
 9 GRADE 0-GT _____
 10 GRADE 1-GT _____
 11 GRADE 2-GT _____
 12 GRADE 3-GT _____
 13 GRADE 4-GT _____
 14 ASTM D1655 (7.9.4.3)
 15 JET A OR JET A-1 _____
 16 JET B _____
 17 OTHER, INDICATE ANALYSIS (7.9.4.3) _____
 18 FUEL SHUT-OFF VALVE SUPPLIED BY VENDOR (7.9.3.5.2)
 19 SECOND STRAINER REQUIRED (7.9.3.7.2)
 20 FUEL TRANSFER EQUIPMENT SUPPLIED BY VENDOR (7.9.3.14)
 21 LIQUID FUEL TREATMENT REQUIRED YES NO
 22 LIQUID FUEL HEATER SUPPLIED BY PURCHASER (7.9.3.13.1, 7.9.3.13.2)
 23 LIQUID FUEL PRESS RANGE _____ kPag

FUEL ANALYSIS DATA (7.9.4.1)	ASTM METHOD	MEASURED VALUE	
Kinematic Viscosity @ 40 °C mm ² /s	D-7042	2.536	<input type="radio"/>
DISTILLATION DATA			
10% / 50% / 90% RECOVERY, °C MAX	D-86		<input type="radio"/>
END POINT, °C MAX			<input type="radio"/>
SULFUR CONTENT Mass%	D-4294	0.769	<input type="radio"/>
Color	D-1500	2.5	<input type="radio"/>
LAMP METHOD	D-1266		<input type="radio"/>
HIGH-TEMP METHOD	D-1552		<input type="radio"/>
CARBON RESIDUE (ON 10% BOTTOMS)			
	% WT. MAX.		<input type="radio"/>
CONRADSON	D-189		<input type="radio"/>
RAMSBOTTOM	D-524		<input type="radio"/>
Copper Corrosion for 3hr @ 100 oC	D-130	1a	<input type="radio"/>
AROMATIC CONTENT % WT			
	D-5186		<input type="radio"/>
ASH CONTENT Mass%	D-482	<0.001	<input type="radio"/>
SPECIFIC GRAVITY, kg/m ³ @ 15°C	D-4052	0.8332	<input type="radio"/>
FLASH POINT, °C	D-93	60.5	<input type="radio"/>
CLOUD POINT, °C	D-2500		<input type="radio"/>
POUR POINT, °C	D-97		<input type="radio"/>
Water & Sediment Vol%	D-2709	0.1	<input type="radio"/>
PARTICULATES, mg/100 ml	D-2276		<input type="radio"/>
TRACE METALS (ATOMIC ABSORPTION PREFERRED)			
	D-3605		<input type="radio"/>
SODIUM mg/L		<0.1	<input type="radio"/>
POTASSIUM mg/L		<0.1	<input type="radio"/>
CALCIUM mg/L		<0.1	<input type="radio"/>
VANADIUM mg/L		<0.3	<input type="radio"/>
LEAD			<input type="radio"/>
OTHER METALS			<input type="radio"/>
LOWER HEATING VALUE, MJ/kg	D-2382	42.680	<input type="radio"/>
REID VAPOR PRESSURE, bar	D-323		<input type="radio"/>
OLEFIN CONTENT, % VOL	D-1319		<input type="radio"/>
Heat of Combustion Mj/Kg	D-240	46.79	<input type="radio"/>

Distillation Range @ 760 mmHg	Result	
REMARKS: 1BP	168.4	
10% Vol Recovery °C D-86	194.5	
20% Vol Recovery °C D-86	212.6	
30% Vol Recovery °C D-86	230.7	
40% Vol Recovery °C D-86	248.9	
50% Vol Recovery °C D-86	267.0	
60% Vol Recovery °C D-86	284.1	
70% Vol Recovery °C D-86	302.1	
80% Vol Recovery °C D-86	322.0	
90% Vol Recovery °C D-86	352.2	
FBP	392.8	

36 **FUEL PUMP SYSTEM DETAILS**
 37 FUEL PUMP PRV SET POINT _____ kPag
 38 PUMP RATED CAPACITY _____ l/min

41 **PIPING, TUBING & DESIGN DETAILS**
 42 NACE STANDARD (6.20.13)
 43 NACE MR0103 MR0175
 44 FUEL SYSTEM FLANGE RATING _____
 45 PIPING / TUBING GRADE _____
 46 TUBE FITTING MFR (7.6.1.9) _____
 47 MAXIMUM VENT BACKPRESSURE (7.9.1.2.4.7) _____ kPag

48 **REMARKS:** _____
 49 _____
 50 _____
 51 _____
 52 _____

REMARKS: Note: Cloud point and Pour point specification shall be 40 °F and 30o °F respectively from 21 st. March to 23 rd. September.



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COMBUSTION GAS TURBINE (API 616-6th)		JOB NO. _____ ITEM NO. _____ REVISION _____ DATE _____ PAGE <u>5</u> OF _____ BY _____
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CONSTRUCTION FEATURES - ROTOR No. 1 DESCRIPTION:

1		
2	<input type="checkbox"/> SPEEDS: 100 % SPEED _____ RPM	
3	<input type="checkbox"/> MAX. CONT. _____ RPM <input type="checkbox"/> TRIP _____ RPM	
4	<input type="checkbox"/> LATERAL CRITICAL SPEEDS (DAMPED) (6.16.2.1)	
5	FIRST CRITICAL _____ RPM _____ MODE	
6	SECOND CRITICAL _____ RPM _____ MODE	
7	THIRD CRITICAL _____ RPM _____ MODE	
8	FOURTH CRITICAL _____ RPM _____ MODE	
9	<input type="checkbox"/> PROTOTYPE OR MODIFIED ROTOR SUPPORT (6.16.2.21)	
10	<input checked="" type="checkbox"/> TRAIN LATERAL ANALYSIS (6.16.2.8)	
11	<input checked="" type="checkbox"/> TRAIN TORSIONAL ANALYSIS (6.16.4.2) TORS SF (6.16.4.8) _____	
12	<input type="checkbox"/> TORSIONAL CRITICAL SPEEDS:	
13	FIRST CRITICAL _____ RPM	
14	SECOND CRITICAL _____ RPM	
15	THIRD CRITICAL _____ RPM	
16	FOURTH CRITICAL _____ RPM	
17	<input type="checkbox"/> PURCHASER REVIEW OF CAMPBELL/GOODMAN DIAGRAM (6.14.3.4.6)	
18	VIBRATION (6.16.6.2) (6.16.6.3)	
19	<input type="checkbox"/> ACCEPTANCE LIMITS: SHAFT _____ μm P-P	
20	CASE _____ mm/s	
21	<input type="checkbox"/> INCLUDE MODEL DATA IN LATERAL ANALYSIS (6.16.2.20)	
22	ROTATION, VIEWED FROM DRIVE END <input type="checkbox"/> CW <input type="checkbox"/> CCW	

MATERIALS OF CONSTRUCTION (6.20) (Note 1)

<input type="checkbox"/> ROTOR BLADES _____			
<input type="checkbox"/> STATOR VANES _____			
<input type="checkbox"/> BLADE/VANE COATING _____			
<input type="checkbox"/> SHAFT _____			
<input type="checkbox"/> TURBINE:			
TURBINE STAGE	NOZZLES	BLADES	DISKS or SHROUDS

BALANCING:

<input type="checkbox"/> RESIDUAL UNBALANCE CHECK (6.16.5.2.5)
<input type="checkbox"/> HS BALANCING (6.16.5.3.1)
<input type="checkbox"/> LS RESIDUAL UNBALANCE CHECK AFTER HS BALANCE (6.16.5.3.15)
HIGH-SPEED BALANCING ACCEPTANCE CRITERIA (6.16.5.3.2)
<input type="checkbox"/> GRADE 2.5 <input type="checkbox"/> ISO 11342 <input type="checkbox"/> 1.0 mm/s
<input type="checkbox"/> EXTRA VIBRATION PROBES DURING TESTING (6.16.5.3.7)

ROLLING ELEMENT BEARINGS AND BEARING HOUSINGS (6.17.2)

RADIAL BEARINGS	DE	NDE	RADIAL / THRUST	RADIAL	THRUST
	BRG No:	BRG No:		BRG No:	BRG No:
26	<input type="checkbox"/> TYPE		<input type="checkbox"/> TYPE		
27	<input type="checkbox"/> MANUFACTURER		<input type="checkbox"/> MANUFACTURER		
28	<input type="checkbox"/> SIZE mm		<input type="checkbox"/> SIZE mm		
29	<input type="checkbox"/> RATED SHAFT SPEED RPM		<input type="checkbox"/> RATED SHAFT SPEED RPM		
30	<input type="checkbox"/> RADIAL LOAD N		<input type="checkbox"/> RADIAL/THRUST LOAD N		
31	<input type="checkbox"/> BEARING 'C' RATING N		<input type="checkbox"/> BEARING 'C' RATING N		
32	<input type="checkbox"/> L-10 BEARING LIFE hr		<input type="checkbox"/> L-10 BEARING LIFE hr		
33	<input type="checkbox"/> INNER / OUTER RACE MAT'L		<input type="checkbox"/> INNER / OUTER RACE MAT'L		
34	<input type="checkbox"/> ROLLING ELEMENT MAT'L		<input type="checkbox"/> ROLLING ELEMENT MAT'L		
35	<input type="checkbox"/> CAGE MATERIAL		<input type="checkbox"/> CAGE MATERIAL		
36	<input type="checkbox"/> BEARING SPAN _____ mm				

HYDRODYNAMIC BEARINGS AND BEARING HOUSINGS (6.17.3, 6.17.5, 6.18)

RADIAL	DE	NDE	THRUST	ACTIVE	INACTIVE
	BRG No.	BRG No.		DE/NDE	DE/NDE
42	<input type="checkbox"/> TYPE		<input type="checkbox"/> TYPE		
43	<input type="checkbox"/> MANUFACTURER		<input type="checkbox"/> MANUFACTURER		
44	<input type="checkbox"/> SHAFT DIAMETER mm		<input type="checkbox"/> SHAFT DIAMETER mm		
45	<input type="checkbox"/> BEARING LENGTH mm		<input type="checkbox"/> BEARING SIZE mm		
46	<input type="checkbox"/> AREA, mm ²		<input type="checkbox"/> AREA mm ²		
47	<input type="checkbox"/> UNIT LOAD (ACT/ALLOW) N/mm ²		<input type="checkbox"/> UNIT LOAD (ACT/ALLOW) N/mm ²		
48	<input type="checkbox"/> BASE MATERIAL		<input type="checkbox"/> BASE MATERIAL		
49	<input type="checkbox"/> BABBITT THICKNESS mm		<input type="checkbox"/> BABBITT THICKNESS mm		
50	<input type="checkbox"/> NO. PADS		<input type="checkbox"/> NO. PADS		
51	<input type="checkbox"/> LOAD: BETWEEN/ON PAD		<input type="checkbox"/> PIVOT: CENTER/OFFSET %		
52	<input type="checkbox"/> PIVOT: CENTER/OFFSET %				
53	<input type="checkbox"/> BEARING SPAN _____ mm				
54	<input type="checkbox"/> DAMPER BEARING				
55	<input type="checkbox"/> BABBITT TO BACKING ULTRASONIC INSPECTIONS (6.17.3.6)		<input type="checkbox"/> BABBITT TO BACKING ULTRASONIC INSPECTIONS (6.17.5.11)		

REMARKS: Note 1: Comply with Sour Gas Composition



Resalat Oil Field Development Project Phase 1 (EPC-EPD)



Data sheet for Gas Turbine Generator Package

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CONSTRUCTION FEATURES - ROTOR No. 1 DESCRIPTION:

BEARING TEMPERATURE SENSORS (7.5.9.3)

PROXIMITY PROBES

RADIAL SHAFT VIBRATION PROBES (7.5.9.6.1)

USE ATTACHED API 670 DATASHEETS INSTEAD OF THIS DATA SHEET

SEE ATTACHED API-670 DATASHEETS

THERMOCOUPLE TYPE _____

TYPE _____ MODEL _____

RTD MATERIAL _____ RESISTANCE _____ Ω

MFR _____

SENSOR LOCATION-JOURNAL BEARING:

NO. AT EACH SHAFT BRG _____ TOTAL NO. _____

NUMBER _____ EA PD _____ EVERY OTH PAD _____ PER BRG

OSCILLATOR-DEMODULATOR SUPPLIED BY _____

OTHER _____

MFR _____ MODEL _____

SENSOR LOCATION-THRUST BEARING

MONITOR SUPPLIED BY _____

NO. (ACT) _____ EA PD _____ EVERY OTH PAD _____ PER BRG

LOCATION _____

OTHER _____

MFR _____ MODEL _____

NO.(INACT) _____ EA PD _____ EVERY OTH PAD _____ PER BRG

SCALE RANGE _____ ALARM SET POINT _____ μm

OTHER _____

SHUTDOWN SET POINT _____ μm TIME DELAY _____ seconds

MONITOR SUPPLIED, INSTALLED AND CALIBRATED (7.5.9.3.4)

AXIAL POSITION PROBES (7.5.9.6.1)

MONITOR SUPPLIED BY _____

SEE ATTACHED API-670 DATASHEETS

LOCATION _____

TYPE _____ MODEL _____

MFR _____ MODEL _____

SCALE RANGE _____ ALARM SET POINT _____ $^{\circ}\text{C}$

MFR _____ NUMBER _____

SHUTDOWN SET POINT _____ $^{\circ}\text{C}$ TIME DELAY _____ sec

OSCILLATOR-DEMODULATOR SUPPLIED BY _____

MFR _____ MODEL _____

MONITOR SUPPLIED BY _____

LOCATION _____

CASING AND ROLLING ELEMENT VIBRATION TRANSDUCERS (7.5.9.6.2)

SEE ATTACHED API-670 DATASHEETS

MFR _____ MODEL _____

LOCATION _____

MFR _____ NUMBER _____

MONITOR SUPPLIED BY _____

SCALE RANGE _____ ALARM SET POINT _____ μm

LOCATION _____

SHUTDOWN SET POINT _____ μm TIME DELAY _____ sec

MFR _____ MODEL _____

SCALE RGE _____ ALARM SET POINT _____ mm/s

SHUTDOWN SET POINT _____ mm/s TIME DELAY _____ sec

REMARKS:

REMARKS:



Resalat Oil Field Development Project Phase 1 (EPC-EPD)



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1 CONSTRUCTION FEATURES - ROTOR No. 2 DESCRIPTION:

<p>2 <input type="checkbox"/> SPEEDS: 100 % SPEED _____ RPM</p> <p>3 <input type="checkbox"/> MAX. CONT. _____ RPM <input type="checkbox"/> TRIP _____ RPM</p> <p>4 <input type="checkbox"/> LATERAL CRITICAL SPEEDS (DAMPED) (6.16.2.1)</p> <p>5 FIRST CRITICAL _____ RPM _____ MODE</p> <p>6 SECOND CRITICAL _____ RPM _____ MODE</p> <p>7 THIRD CRITICAL _____ RPM _____ MODE</p> <p>8 FOURTH CRITICAL _____ RPM _____ MODE</p> <p>9 <input type="checkbox"/> PROTOTYPE OR MODIFIED ROTOR SUPPORT (6.16.2.21)</p> <p>10 <input checked="" type="checkbox"/> TRAIN LATERAL ANALYSIS (6.16.2.8)</p> <p>11 <input checked="" type="checkbox"/> TRAIN TORSIONAL ANALYSIS (6.16.4.2) TORS SF (6.16.4.8) _____</p> <p>12 <input type="checkbox"/> TORSIONAL CRITICAL SPEEDS:</p> <p>13 FIRST CRITICAL _____ RPM</p> <p>14 SECOND CRITICAL _____ RPM</p> <p>15 THIRD CRITICAL _____ RPM</p> <p>16 FOURTH CRITICAL _____ RPM</p> <p>17 <input type="checkbox"/> PURCHASER REVIEW OF CAMPBELL/GOODMAN DIAGRAM (6.14.3.4.6)</p> <p>18 VIBRATION (6.16.6.2) (6.16.6.3)</p> <p>19 <input type="checkbox"/> ACCEPTANCE LIMITS: SHAFT _____ μm P-P</p> <p>20 CASE _____ mm/s</p> <p>21 <input type="checkbox"/> INCLUDE MODEL DATA IN LATERAL ANALYSIS (6.16.2.20)</p> <p>22 ROTATION, VIEWED FROM DRIVE END <input type="checkbox"/> CW <input type="checkbox"/> CCW</p>	<p style="text-align: center;">MATERIALS OF CONSTRUCTION (6.20) (Note 1)</p> <p><input type="checkbox"/> ROTOR BLADES _____</p> <p><input type="checkbox"/> STATOR VANES _____</p> <p><input type="checkbox"/> BLADE/VANE COATING _____</p> <p><input type="checkbox"/> SHAFT _____</p> <p><input type="checkbox"/> TURBINE:</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <thead> <tr> <th style="width: 15%;">TURBINE STAGE</th> <th style="width: 15%;">NOZZLES</th> <th style="width: 15%;">BLADES</th> <th style="width: 15%;">DISKS or SHROUDS</th> </tr> </thead> <tbody> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </tbody> </table> <p>BALANCING:</p> <p><input type="checkbox"/> RESIDUAL UNBALANCE CHECK (6.16.5.2.5)</p> <p><input type="checkbox"/> HS BALANCING (6.16.5.3.1)</p> <p><input type="checkbox"/> LS RESIDUAL UNBALANCE CHECK AFTER HS BALANCE (6.16.5.3.15)</p> <p>HIGH-SPEED BALANCING ACCEPTANCE CRITERIA (6.16.5.3.2)</p> <p><input type="checkbox"/> GRADE 2.5 <input type="checkbox"/> ISO 11342 <input type="checkbox"/> 1.0 mm/s</p> <p><input type="checkbox"/> EXTRA VIBRATION PROBES DURING TESTING (6.16.5.3.7)</p>	TURBINE STAGE	NOZZLES	BLADES	DISKS or SHROUDS																
TURBINE STAGE	NOZZLES	BLADES	DISKS or SHROUDS																		

23 ROLLING ELEMENT BEARINGS AND BEARING HOUSINGS (6.17.2, 6.18)

RADIAL BEARINGS	DE	NDE	RADIAL / THRUST	RADIAL	THRUST
	BRG No:	BRG No:		BRG No:	BRG No:
26 <input type="checkbox"/> TYPE			<input type="checkbox"/> TYPE		
27 <input type="checkbox"/> MANUFACTURER			<input type="checkbox"/> MAT km/h		
28 <input type="checkbox"/> SIZE mm			<input type="checkbox"/> SIZE mm		
29 <input type="checkbox"/> RATED SHAFT SPEED RPM			<input type="checkbox"/> RATED SHAFT SPEED RPM		
30 <input type="checkbox"/> RADIAL LOAD N			<input type="checkbox"/> RADIAL/THRUST LOAD N		
31 <input type="checkbox"/> BEARING 'C' RATING N			<input type="checkbox"/> BEARING 'C' RATING N		
32 <input type="checkbox"/> L-10 BEARING LIFE hr			<input type="checkbox"/> L-10 BEARING LIFE hr		
33 <input type="checkbox"/> INNER / OUTER RACE MAT'L			<input type="checkbox"/> INNER / OUTER RACE MAT'L		
34 <input type="checkbox"/> ROLLING ELEMENT MAT'L			<input type="checkbox"/> ROLLING ELEMENT MAT'L		
35 <input type="checkbox"/> CAGE MATERIAL			<input type="checkbox"/> CAGE MATERIAL		
36 <input type="checkbox"/> BEARING SPAN _____ mm					

39 HYDRODYNAMIC BEARINGS AND BEARING HOUSINGS (6.17.3, 6.17.5, 6.18)

RADIAL	DE	NDE	THRUST	ACTIVE	INACTIVE
	BRG No.	BRG No.		DE/NDE	DE/NDE
42 <input type="checkbox"/> TYPE			<input type="checkbox"/> TYPE		
43 <input type="checkbox"/> MANUFACTURER			<input type="checkbox"/> MANUFACTURER		
44 <input type="checkbox"/> SHAFT DIAMETER mm			<input type="checkbox"/> SHAFT DIAMETER mm		
45 <input type="checkbox"/> BEARING LENGTH mm			<input type="checkbox"/> BEARING SIZE mm		
46 <input type="checkbox"/> AREA mm ²			<input type="checkbox"/> AREA mm ²		
47 <input type="checkbox"/> UNIT LOAD (ACT/ALLOW) N/mm ²			<input type="checkbox"/> UNIT LOAD (ACT/ALLOW) N/mm ²		
48 <input type="checkbox"/> BASE MATERIAL			<input type="checkbox"/> BASE MATERIAL		
49 <input type="checkbox"/> BABBITT THICKNESS mm			<input type="checkbox"/> BABBITT THICKNESS mm		
50 <input type="checkbox"/> NO. PADS			<input type="checkbox"/> NO. PADS		
51 <input type="checkbox"/> LOAD: BETWEEN/ON PAD			<input type="checkbox"/> PIVOT: CENTER/OFFSET %		
52 <input type="checkbox"/> PIVOT: CENTER/OFFSET %			LUBRICATION: <input type="checkbox"/> FLOODED <input type="checkbox"/> DIRECTED		
53 <input type="checkbox"/> BEARING SPAN _____ mm			THRUST COLLAR: <input type="checkbox"/> INTEGRAL <input type="checkbox"/> REPLACEABLE		
54 <input type="checkbox"/> DAMPER BEARING					
55 <input type="checkbox"/> BABBITT TO BACKING ULTRASONIC INSPECTIONS (6.17.3.6)			<input type="checkbox"/> BABBITT TO BACKING ULTRASONIC INSPECTIONS (6.17.5.11)		

56 **REMARKS:** Note 1: Comply with Sour Gas Composition

57 _____

58 _____



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CONSTRUCTION FEATURES - ROTOR No. 2 DESCRIPTION:

BEARING TEMPERATURE SENSORS (7.5.9.3)

PROXIMITY PROBES

RADIAL SHAFT VIBRATION PROBES (7.5.9.6.1)

AXIAL POSITION PROBES (7.5.9.6.1)

CASING AND ROLLING ELEMENT VIBRATION TRANSDUCERS (7.5.9.6.2)

REMARKS:

REMARKS:

mm/s
sec



Resalat Oil Field Development Project Phase 1 (EPC-EPD)



Data sheet for Gas Turbine Generator Package

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CONSTRUCTION FEATURES - ROTOR No. 3 DESCRIPTION:

- 1
- 2 SPEEDS: 100 % SPEED _____ RPM
- 3 MAX. CONT. _____ RPM TRIP _____ RPM
- 4 LATERAL CRITICAL SPEEDS (DAMPED) (6.16.2.1)
- 5 FIRST CRITICAL _____ RPM _____ MODE
- 6 SECOND CRITICAL _____ RPM _____ MODE
- 7 THIRD CRITICAL _____ RPM _____ MODE
- 8 FOURTH CRITICAL _____ RPM _____ MODE
- 9 PROTOTYPE OR MODIFIED ROTOR SUPPORT (6.16.2.21)
- 10 TRAIN LATERAL ANALYSIS (6.16.2.8)
- 11 TRAIN TORSIONAL ANALYSIS (6.16.4.2) TORS SF (6.16.4.8) _____
- 12 TORSIONAL CRITICAL SPEEDS:
- 13 FIRST CRITICAL _____ RPM
- 14 SECOND CRITICAL _____ RPM
- 15 THIRD CRITICAL _____ RPM
- 16 FOURTH CRITICAL _____ RPM
- 17 PURCHASER REVIEW OF CAMPBELL/GOODMAN DIAGRAM (6.14.3.4.6)
- 18 VIBRATION (6.16.6.2) (6.16.6.3)
- 19 ACCEPTANCE LIMITS: SHAFT _____ μm P-P
- 20 CASE _____ mm/s
- 21 INCLUDE MODEL DATA IN LATERAL ANALYSIS (6.16.2.20)
- 22 ROTATION, VIEWED FROM DRIVE END CW CCW

MATERIALS OF CONSTRUCTION (6.20) (Note 1)

- ROTOR BLADES _____
- STATOR VANES _____
- BLADE/VANE COATING _____
- SHAFT _____
- TURBINE:

TURBINE STAGE	NOZZLES	BLADES	DISKS or	SHROUDS

BALANCING:

- RESIDUAL UNBALANCE CHECK (6.16.5.2.5)
- HS BALANCING (6.16.5.3.1)
- LS RESIDUAL UNBALANCE CHECK AFTER HS BALANCE (6.16.5.3.15)
- HIGH-SPEED BALANCING ACCEPTANCE CRITERIA (6.16.5.3.2)
- GRADE 2.5 ISO 11342 1.0 mm/s
- EXTRA VIBRATION PROBES DURING TESTING (6.16.5.3.7)

ROLLING ELEMENT BEARINGS AND BEARING HOUSINGS (6.17.2)

RADIAL BEARINGS	DE	NDE	RADIAL / THRUST	RADIAL	THRUST
	BRG No:	BRG No:		BRG No:	BRG No:
<input type="checkbox"/> TYPE			<input type="checkbox"/> TYPE		
<input type="checkbox"/> MANUFACTURER			<input type="checkbox"/> MAI km/h		
<input type="checkbox"/> SIZE mm			<input type="checkbox"/> SIZE mm		
<input type="checkbox"/> RATED SHAFT SPEED RPM			<input type="checkbox"/> RATED SHAFT SPEED RPM		
<input type="checkbox"/> RADIAL LOAD N			<input type="checkbox"/> RADIAL/THRUST LOAD N		
<input type="checkbox"/> BEARING 'C' RATING N			<input type="checkbox"/> BEARING 'C' RATING N		
<input type="checkbox"/> L-10 BEARING LIFE hr			<input type="checkbox"/> L-10 BEARING LIFE hr		
<input type="checkbox"/> INNER / OUTER RACE MAT'L			<input type="checkbox"/> INNER / OUTER RACE MAT'L		
<input type="checkbox"/> ROLLING ELEMENT MAT'L			<input type="checkbox"/> ROLLING ELEMENT MAT'L		
<input type="checkbox"/> CAGE MATERIAL			<input type="checkbox"/> CAGE MATERIAL		
<input type="checkbox"/> BEARING SPAN _____ mm					

HYDRODYNAMIC BEARINGS AND BEARING HOUSINGS (6.17.3, 6.17.5, 6.18)

RADIAL	DE	NDE	THRUST	ACTIVE	INACTIVE
	BRG No.	BRG No.		DE/NDE	DE/NDE
<input type="checkbox"/> TYPE			<input type="checkbox"/> TYPE		
<input type="checkbox"/> MANUFACTURER			<input type="checkbox"/> MANUFACTURER		
<input type="checkbox"/> SHAFT DIAMETER mm			<input type="checkbox"/> SHAFT DIAMETER mm		
<input type="checkbox"/> BEARING LENGTH mm			<input type="checkbox"/> BEARING SIZE mm		
<input type="checkbox"/> AREA, mm ²			<input type="checkbox"/> AREA mm ²		
<input type="checkbox"/> UNIT LOAD (ACT/ALLOW) N/mm ²			<input type="checkbox"/> UNIT LOAD (ACT/ALLOW) N/mm ²		
<input type="checkbox"/> BASE MATERIAL			<input type="checkbox"/> BASE MATERIAL		
<input type="checkbox"/> BABBITT THICKNESS mm			<input type="checkbox"/> BABBITT THICKNESS mm		
<input type="checkbox"/> NO. PADS			<input type="checkbox"/> NO. PADS		
<input type="checkbox"/> LOAD: BETWEEN/ON PAD			<input type="checkbox"/> PIVOT: CENTER/OFFSET %		
<input type="checkbox"/> PIVOT: CENTER/OFFSET %					
<input type="checkbox"/> BEARING SPAN _____ mm					
<input type="checkbox"/> DAMPER BEARING					
<input type="checkbox"/> BABBITT TO BACKING ULTRASONIC INSPECTIONS (6.17.3.6)			<input type="checkbox"/> BABBITT TO BACKING ULTRASONIC INSPECTIONS (6.17.5.11)		

- LUBRICATION:** FLOODED DIRECTED
- THRUST COLLAR:** INTEGRAL REPLACEABLE

REMARKS:

Note 1: Comply with Sour Gas Composition



Resalat Oil Field Development Project Phase 1 (EPC-EPD)



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CONSTRUCTION FEATURES - ROTOR No. 3 DESCRIPTION:

BEARING TEMPERATURE SENSORS (7.5.9.3)

PROXIMITY PROBES

RADIAL SHAFT VIBRATION PROBES (7.5.9.6.1)

AXIAL POSITION PROBES (7.5.9.6.1)

CASING AND ROLLING ELEMENT VIBRATION TRANSDUCERS (7.5.9.6.2)

REMARKS:

REMARKS:



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UTILITIES (9.2.3.2.i)																																											
<input checked="" type="checkbox"/> UTILITY CONDITIONS: <table style="width: 100%; border-collapse: collapse;"> <tr> <th style="width: 33%;">STEAM:</th> <th style="width: 33%;">AUXILIARY DRIVERS</th> <th style="width: 33%;">HEATING</th> </tr> <tr> <td>INLET MIN _____ MPag _____ °C _____ MPag _____ °C</td> <td></td> <td></td> </tr> <tr> <td>NORM _____ MPag _____ °C _____ MPag _____ °C</td> <td></td> <td></td> </tr> <tr> <td>MAX _____ MPag _____ °C _____ MPag _____ °C</td> <td></td> <td></td> </tr> <tr> <td>EXHST MIN. _____ MPag _____ °C _____ MPag _____ °C</td> <td></td> <td></td> </tr> <tr> <td>NORM _____ MPag _____ °C _____ MPag _____ °C</td> <td></td> <td></td> </tr> <tr> <td>MAX _____ MPag _____ °C _____ MPag _____ °C</td> <td></td> <td></td> </tr> <tr> <th style="text-align: center;">STARTING</th> <th style="text-align: center;">INJECTION</th> <td></td> </tr> <tr> <td>INLET MIN _____ MPag _____ °C _____ MPag _____ °C</td> <td></td> <td></td> </tr> <tr> <td>NORM _____ MPag _____ °C _____ MPag _____ °C</td> <td></td> <td></td> </tr> <tr> <td>MAX _____ MPag _____ °C _____ MPag _____ °C</td> <td></td> <td></td> </tr> <tr> <td>EXHST MIN. _____ MPag _____ °C</td> <td></td> <td></td> </tr> <tr> <td>NORM _____ MPag _____ °C</td> <td></td> <td></td> </tr> <tr> <td>MAX _____ MPag _____ °C</td> <td></td> <td></td> </tr> </table> <input type="checkbox"/> INLET AIR EVAPORATIVE COOLING / FOGGING WATER: INLET TEMPERATURE _____ °C DESIGN TEMPERATURE _____ °C NORM PRESS _____ MPag DESIGN PRESS _____ MPag WATER QUALITY _____	STEAM:	AUXILIARY DRIVERS	HEATING	INLET MIN _____ MPag _____ °C _____ MPag _____ °C			NORM _____ MPag _____ °C _____ MPag _____ °C			MAX _____ MPag _____ °C _____ MPag _____ °C			EXHST MIN. _____ MPag _____ °C _____ MPag _____ °C			NORM _____ MPag _____ °C _____ MPag _____ °C			MAX _____ MPag _____ °C _____ MPag _____ °C			STARTING	INJECTION		INLET MIN _____ MPag _____ °C _____ MPag _____ °C			NORM _____ MPag _____ °C _____ MPag _____ °C			MAX _____ MPag _____ °C _____ MPag _____ °C			EXHST MIN. _____ MPag _____ °C			NORM _____ MPag _____ °C			MAX _____ MPag _____ °C			<input type="checkbox"/> TOTAL UTILITY CONSUMPTION: (Note 1) IAH / COOLING / IAC WATER _____ / _____ / _____ m3/hr STEAM LEVEL _____ MPag _____ MPag _____ MPag STEAM, NORMAL _____ kg/h _____ kg/h _____ kg/h STEAM, MAX _____ kg/h _____ kg/h _____ kg/h INSTRUMENT AIR _____ 120 _____ Nm3/hr NITROGEN _____ Nm3/hr MOTORS (AUXILIARIES) _____ 120 _____ kW BATTERY CHARGERS _____ kW HEATERS _____ 2.5 _____ kW <input type="checkbox"/> GAS TURBINE AIR EXTRACTION (7.7.2.8.1, 7.7.2.9.4.5) <input type="checkbox"/> FLOW _____ Nm3/h PRESS _____ MPag TEMP _____ °C <input type="checkbox"/> MAXIMUM PRESSURE AVAILABLE AT MINIMUM SPEED: _____ MPag <input type="checkbox"/> MINIMUM SPEED: _____ RPM <input type="checkbox"/> DISCHARGE TEMPERATURE _____ °C <input type="checkbox"/> COMPRESSOR EXTRACTION STAGE NUMBER: _____ <input type="checkbox"/> BLEED VALVE DESIGN APPROVAL REQUIRED (7.7.2.8.7) <input type="checkbox"/> INSTRUMENT AIR PRESSURE DESIGN, MPag _____ MAX _____ NORMAL _____ MIN _____ <input type="checkbox"/> NITROGEN PRESSURE DESIGN _____ MPag MAX _____ NORMAL _____ MIN _____
STEAM:	AUXILIARY DRIVERS	HEATING																																									
INLET MIN _____ MPag _____ °C _____ MPag _____ °C																																											
NORM _____ MPag _____ °C _____ MPag _____ °C																																											
MAX _____ MPag _____ °C _____ MPag _____ °C																																											
EXHST MIN. _____ MPag _____ °C _____ MPag _____ °C																																											
NORM _____ MPag _____ °C _____ MPag _____ °C																																											
MAX _____ MPag _____ °C _____ MPag _____ °C																																											
STARTING	INJECTION																																										
INLET MIN _____ MPag _____ °C _____ MPag _____ °C																																											
NORM _____ MPag _____ °C _____ MPag _____ °C																																											
MAX _____ MPag _____ °C _____ MPag _____ °C																																											
EXHST MIN. _____ MPag _____ °C																																											
NORM _____ MPag _____ °C																																											
MAX _____ MPag _____ °C																																											
<input type="checkbox"/> COOLING WATER: INLET TEMPERATURE _____ °C MAX RETURN _____ °C DESIGN TEMPERATURE _____ °C NORM PRESS _____ MPag MIN RETURN _____ MPag DESIGN PRESS _____ MPag MAX ALLOW ΔP _____ MPa D WATER SOURCE _____	<input type="checkbox"/> ELECTRICITY (7.5.8.1) <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 25%;"></th> <th style="width: 12.5%;">MOTORS</th> <th style="width: 12.5%;">HEATING</th> <th style="width: 12.5%;">CONTROL</th> <th style="width: 12.5%;">SHUTDOWN</th> </tr> </thead> <tbody> <tr> <td>VOL km/h</td> <td style="text-align: center;">230</td> <td></td> <td></td> <td></td> </tr> <tr> <td>HERTZ</td> <td style="text-align: center;">50</td> <td></td> <td></td> <td></td> </tr> <tr> <td>PHASE</td> <td style="text-align: center;">3</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <input type="checkbox"/> ALARM IN LIEU OF PILOT LIGHTS (7.5.8.3.2)		MOTORS	HEATING	CONTROL	SHUTDOWN	VOL km/h	230				HERTZ	50				PHASE	3																									
	MOTORS	HEATING	CONTROL	SHUTDOWN																																							
VOL km/h	230																																										
HERTZ	50																																										
PHASE	3																																										
<input type="checkbox"/> INLET AIR CHILLING (IAC) WATER: INLET TEMPERATURE _____ °C MAX RETURN _____ °C DESIGN TEMPERATURE _____ °C NORM PRESS _____ MPag MIN RETURN _____ MPag DESIGN PRESS _____ MPag MAX ALLOW D P _____ MPag	REMARKS: Note 1: All utility consumptions to be confirmed by Vendor. Note 2: Connection sizes to be confirmed by Vendor. All flanges to ANSI B 16.5 Note 3: For anti-friction bearings, modify entries as required. Show L-10 life.																																										

PURCHASER CONNECTIONS (6.13) (7.6) (Note 2)							
MAIN CONNECTION	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	WELDING DESIGN APPROVAL (6.24.6.4)	SIZE	FACING AND RATING	INLET & EXHAUST ORIENTATION (7.7.1.2)	FLANGED OR STUDDED	MATING FLG AND GASKET BY VENDOR (6.13.6)	GAS VELOCITY m/s
Inlet							
Exhaust							
Fuel gas supply		2"	300 lb./R.F.				
Diesel fuel supply		2"	150 lb./R.F.				
Inst. Air		2"	150 lb./R.F.				
Drain		2"	150 lb./R.F.				



Resalat Oil Field Development Project Phase 1 (EPC-EPD)



Data sheet for Gas Turbine Generator Package

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COMBUSTION GAS TURBINE (API 616-6th)

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REV

DATASHEET SI UNITS

- 1 **INSTRUMENTATION, LUBRICATION & HARDWARE**
- 2 OUTDOOR CONTROLS AND INSTRUMENTATION CODE (7.5.1.2.1, 7.5.8.18)
- 3 IEC 60529 IP66 NEMA 250 4X OTHER _____
- 4 INSTRUMENTATION MOUNTING (7.5.1.2) INDOOR OUTDOOR
- 5
- 6 REDUNDANT CONTROL SYSTEM EQUIPMENT (7.5.2.15)
- 7 REDUNDANT SENSORS AND INPUTS PER API 614 (7.5.2.16)
- 8 UPS DURATION (7.5.2.18) _____ MINUTES
- 9 CONTROL SYSTEM POWER (7.5.6.5) AC DC
- 10 DCS LINK REQD (7.5.2.19)
- 11 DCS DATA COMMUNICATION FREQUENCY (7.5.2.20) _____ ms
- 12 SIL RATING (7.5.2.24) _____
- 13 SPECIAL MOUNTING ARRANGEMENTS REQD (7.5.5.13)
- 14 SHUTDOWN SENSING DEVICE ISOLATION REQ'D (7.5.5.29)
- 15 CONFORMAL COATINGS ON PRINTED CIRCUIT BOARDS (7.5.6.11)
- 16 EVENT RECORDER REQUIRED (7.5.5.27)
- 17 GAUGE BOARD LOCATION
- 18 SEPARATE TACHOMETER DISPLAY (7.5.9.1.2)
- 19 SPEED SENSOR (7.5.9.1.3) ACTIVE PASSIVE
- 20 TACHOMETER MANUFACTURER _____
- 21 GLYCERINE-FILLED GAUGES (7.5.9.4.2)
- 22 CONTROL WIRING (7.5.8.21.8): ARMORED METAL CONDUIT
- 23 **CONTROL SYSTEM DETAILS:**
- 24 MACHINERY PROTECTION ARRANGEMENTS (7.5.5.1)
- 25 DISTRIBUTED INTEGRATED
- 26 SWITCHES ALLOWED FOR ALARM, TRIP & SHUTDOWN (7.5.5.14.2)
- 27 REQ'D COMMUNICATION PROTOCOL (7.5.7.5) _____
- 28 FIRST-OUT ANNUNCIATOR REQ'D (7.5.5.23) _____
- 29 **LOAD CONTROL - GOVERNOR (7.5.3)**
- 30 MAKE _____ MODEL _____
- 31 ISOCHRONOUS DROOP
- 32 REMOTE SHUTDOWN SIGNAL TYPE: Electric
- 33 CONTROL SIGNAL RANGE (7.5.3.4) _____ (Note 1) _____ mA
- 34 **CONTROL SYSTEMS**
- 35 **NONLOGIC SOLVER CONTROL TYPES (7.5.2.11):**
- 36 MECH | PNEU HYDRAULIC ELECTRIC
- 37 MICROPROCESSOR BASED ELECTRONIC
- 38 **CONTROL CONSOLES (7.5.6.2)**
- 39 OFF-SKID INDOOR OFF-SKID OUTDOOR ON-SKID (7.5.6.3)
- 40 OFF-SKID CONTROL PANEL CABLE LENGTH (7.5.6.2 b) _____ m
- 41 **ADDITIONAL HMI QUANTITY (7.5.7.4)**
- 42 PORTABLE _____ DESKTOP _____ PANEL _____
- 43 HMI START-UP GRAPHICS REQ'D (7.5.7.6.3)
- 44 **STARTING SYSTEM (7.5.2.5)**
- 45 MANUAL SEMI-AUTOMATIC AUTOMATIC
- 46 PURGE PERIOD (7.5.4, 7.5.4.2) _____ MINUTES
- 47
- 48 **REMARKS:** Note 1: Maintain speed upon failure control signal or actuator.
- 49 _____
- 50 Note 2: Lube oil system shall comply with API 614 and serve
- 51 turbine, compressor and Gearbox. Vendor shall submit _____
- 52 API 614 data sheets.
- 53 _____
- 53 Note 3: Instrumentation and controls to be generally in accordance
- 53 with API RP11PGT. Vendor to complete table.
- 53 _____
- 53 Note 4: Vendor shall supply vibration and temperature monitoring for
- 53 the complete package in compliance with the requirements of API 670.
- 53 _____
- 53 Note 5: Vendor shall also submit completed API format data sheets for
- 53 the monitoring system of the complete package in accordance with
- 53 the requirements of the appropriate API specifications.
- 53 _____
- 53 Note 6: Vendor to advise method of annunciation.

LUBRICATION SYSTEMS

API 614 (6.19.6)

MINERAL LUBE SYSTEM (6.19.5)

OIL VISCOSITY _____
 LUBE SPECIFICATION _____

COMMON TO GAS GENERATOR or SINGLE SHAFT GT
 FREE POWER TURBINE LOAD GEAR
 DRIVEN EQUIPMENT AUXILIARIES

SYNTHETIC LUBE OIL SYSTEM (6.19.3, 6.19.5)

USE SYNTHETIC LUBE (6.19.3, 6.19.5)
 OIL VISCOSITY _____
 LUBE SPECIFICATION _____

COMMON TO GAS GENERATOR or SINGLE SHAFT GT
 FREE POWER TURBINE LOAD GEAR
 DRIVEN EQUIPMENT AUXILIARIES
 REAL-TIME OIL DEBRIS DETECTION AND DISPLAY (7.5.9.7.2)

OIL REQUIREMENTS

FLOW (m³/h) PRESSURE (MPag) HEAT LOAD (kW)

GAS GENERATOR		
POWER TURBINE		
HYD START SYSTEM		
MINERAL OIL RESERVOIR CAPACITY		liters
SYNTHETIC OIL RESERVOIR CAPACITY		liters
HYDRAULIC OIL RESERVOIR CAPACITY		liters

HYDRAULIC OIL SPECIFICATION

WEIGHTS & DIMENSIONS

INSTALLED SHIPPING DIMENSIONS
 (kg) (kg) LxWxH (m)

	available space for each package	9X3X4.7
GAS GENERATOR		
POWER TURBINE		
GT ENCLOSURE		
INLET FILTER HOUSE		
INLET AIR DUCTING		
VENT DUCTING		
EXHAUST DUCTING		
MIN OIL CONSOLE		
SYN OIL CONSOLE		
MIN OIL SEPARATOR		
SYN OIL SEPARATOR		
MIN OIL AIR COOLER		
SYN OIL AIR COOLER		
HYD START SKID		
CO ₂ CYLINDER SKID		
WATER WASH SKID		
TOTAL PACKAGE WT		
MAX ERECTION WT		ITEM _____
MAX MAINT WT		ITEM _____
<input type="radio"/> MEASURE GT PACKAGE WEIGHT AND CENTER OF GRAVITY (8.4.3.9)		



Resalat Oil Field Development Project Phase 1 (EPC-EPD)



Data sheet for Gas Turbine Generator Package

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INSTRUMENTATION & HARDWARE										
	INSTRUMENT TYPE		INSTRUMENT LOCATION			TRANS- MITTERS FURNISHED BY		CONTROL ROOM RECEIVERS FURN BY		
	INDICATING	RECORDING	LOCAL	LOCAL PANEL	CONTROL ROOM	VENDOR	OTHERS	VENDOR	OTHERS	
DESCRIPTION (7.5.5.13.1)										
SINGLE OR MULTI-SHAFT GAS TURBINE										
TACHOMETER(S)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
AIR INLET SYSTEM ΔP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
COMPRESSOR DISCHARGE PRESSURE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FUEL FILTER DP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FUEL SUPPLY PRESSURE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
STARTING GAS SUPPLY PRESSURE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
STARTING GAS EXHAUST PRESSURE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEMP COMBUSTOR MEASUREMENT	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEMP GAS TURB CONTROL PANEL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
INLET AIR TEMPERATURE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEMPERATURE, GG COMPRESSOR DISCHARGE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEMPERATURE, RADIAL BEARING	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEMPERATURE, THRUST BEARING	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEMPERATURE, FUEL MANIFOLD	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEMPERATURE, LUBE OIL RESERVOIR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
FIRED HOUR METER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
A) NUMBER STARTS COUNTER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
B) START SEQUENCE TIMER	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LUBE OIL INLET PRESSURE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LUBE OIL INLET TEMPERATURE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LUBE OIL RESERVOIR LEVEL	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LUBE OIL PUMP PRESSURE INDICATORS (NO.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LUBE OIL COOLER OIL INLET TEMPERATURE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LUBE OIL COOLER OIL OUTLET TEMPERATURE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LUBE OIL COOLER COOLANT INLET TEMPERATURE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LUBE OIL COOLER COOLANT OUTLET TEMPERATURE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LUBE OIL FILTER DP	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LUBE OIL PRESSURE EACH LEVEL (NO.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
CONTROL OIL PRESSURE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SITE FLOW INDICATOR EACH DRAIN (NO.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
INLET GUIDE VANE POSITION INDICATOR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
EXHAUST DUCT DIFFERENTIAL PRESSURE INDICATOR	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEMPERATURE, EXHAUST	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
ENCLOSURE COOLING AIR EXHAUST TEMPERATURE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
POWER TURBINE										
TACHOMETER(S) (NO.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEMPERATURE, EXHAUST	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEMPERATURE, RADIAL BEARING	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
TEMPERATURE, THRUST BEARING	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
SITE FLOW INDICATOR EACH DRAIN (NO.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LUBE OIL INLET PRESSURE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
LUBE OIL INLET TEMPERATURE	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

REMARKS:

1) to be considered the "Specification for Instrument & Control System For Package Units "(LRSL-000-IN-SP-645)

2) to be Considered Specifications of instrument Equipments, communications and Interfaces with the control system in accordance with Project Spec.



Resalat Oil Field Development Project Phase 1 (EPC-EPD)



Data sheet for Gas Turbine Generator Package

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ALARMS AND SHUTDOWNS (7.5.5.13, 7.5.5.13.1)

No.	DESCRIPTION	APPLIES TO:		ANNUNCIATED IN FIRST OUT PANEL SUPPLIED BY VENDOR (7.5.5.23)		SENSING DEVICES TO BE FURNISHED BY		INDICATING	LIGHT ONLY
		SINGLE SHAFT OR GG	FREE PT	ALARM	SHUT-DOWN	VENDOR	OTHERS		
6	RADIAL SHAFT VIBRATION	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	
7	AXIAL THRUST POSITION	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	
8	OVERSPEED	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	
9	CASING VIBRATION	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	
10	HIGH THRUST BEARING TEMPERATURE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	
11	HIGH RADIAL BEARING TEMPERATURE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	
12	LOW FUEL SUPPLY PRESSURE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	
13	HIGH FUEL FILTER Δ P	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	
14	GAS TURBINE TEMPERATURE SPREAD HIGH	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	
15	EXHAUST OVER TEMPERATURE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	
16	FAILURE OF OVER-TEMPERATURE SHUTDOWN DEVICE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	
17	HIGH INLET AIR Δ P EACH FILTER	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	
18	COMBUSTOR FLAME-OUT	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	
19	CHIP DETECTOR, BEARING	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	
20	FAILURE STARTING CLUTCH TO ENGAGE OR DISENGAGE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	
21	LOW OIL PRESSURE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	
22	HIGH LUBE OIL TEMPERATURE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	
23	LOW LUBE OIL RESERVOIR LEVEL	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	
24	HIGH LUBE OIL RESERVOIR LEVEL	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	
25	HIGH OIL FILTER Δ P	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	
26	LUBE OIL SPARE PUMP OPERATING	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	
27	LOW CONTROL OIL PRESSURE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	
28	LOW STARTING GAS PRESSURE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	
29	ANTI-ICING SYSTEM - NOT OPERATING	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	
30	LOW D.C. VOLTAGE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	
31	EMERGENCY D.C. PUMP OPERATING	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	
32	RESERVOIR HEATER "ON"	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	
33	IMPLOSION DOOR OPEN	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	
34	EXTERNAL PERMISSIVE START SIGNAL	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	
35	EXTERNAL SHUTDOWN SIGNAL	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	
36	LOSS OF AUXILIARY COOLING AIR	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	
37	LAMP TEST PUSH BUTTON	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	
38	ENCLOSURE HIGH TEMPERATURE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	
39	CONTROL SIGNAL FAILURE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	
40	CONTROL SYSTEM ACTUATOR FAILURE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	
41	GOVERNOR FAILURE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	
42	ENCLOSURE VENT FAN FAILURE	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	
43	SPARE ENCLOSURE VENT FAN OPERATING	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	
44	WOBBE METER	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	
45	GAS CHROMATOGRAPH	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	
46	EXHAUST GAS ANALYZER	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="checkbox"/>	

47 **REMARKS:** _____

48 _____

49 _____

50 _____



Resalat Oil Field Development Project Phase 1 (EPC-EPD)



Data sheet for Gas Turbine Generator Package

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SI UNITS

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ACCESSORIES SUPPLIED BY GAS TURBINE MANUFACTURER

ENVIRONMENTAL CONDITIONS (6.6)

INLET SYSTEM (7.7.2)

INLET METEOROLOGICAL CONDITIONS (6.6.1, 6.6.6):

4 WIND SPEED & DIRECTION _____ km/h

5 SEE ATTACHED WIND ROSE

6 RAINFALL MAX RATE _____ mm/h

7 SNOWFALL MAX RATE _____ mm/h

8 FOG OR MIST CONDITIONS _____

9 ICING CONDITIONS _____

10 REMARKS _____

11 _____

12 _____

INLET HEATING (7.7.2.9.4.1) FOD SCREEN (7.7.2.1.7)

INLET PLENUM WINDOW (7.7.1.12)

INLET DUCTWORK INTERFACE POINTS (7.7.1.4.1)

OFFSHORE MIN AIR ENTRANCE HEIGHT (7.7.2.3.20) _____ m

SELF-CLEANING (7.7.2.3.21) ISOLATION VALVES (7.7.2.4.3)

RELATIVE HUMIDITY SENSOR (7.7.2.4.7)

HIGH VELOCITY INLET SYSTEM

FINAL ELEMENT FILTER CLASS (7.7.2.3.5) _____

ADDITIONAL VANE SEPARATOR (7.7.2.2.4)

FILTER MFR. _____ MODEL _____

MAINTENANCE INTERVAL _____ MONTHS

INLET FILTERS REPLACEABLE DURING OPERATION (7.7.2.6.1)

MANOMETER MFR _____ MODEL _____

RANGE _____ mm H₂O

DUCTING GAUGE / MATERIAL _____ / _____

EXPANSION JOINT MFR _____ TYPE _____

EXPANSION JOINT SOUND-ABSORBING MATERIAL PROVISIONS (7.7.1.15)

COMBUSTION AND VENT. AIR INTAKE GAS DETECTORS (7.7.2.1.4, 7.8.3.13)

FILTER HOUSE LIGHTING ON UPS (7.7.2.3.17.c)

ONLINE GAS TURBINE WASH SYSTEM (7.7.2.10.2)

NUMBER OF WASH SKIDS (7.7.2.10.3)

_____ PORTABLE CARTS _____ FIXED WASH SKIDS

CLEANING FREQUENCY _____ DAYS

REMARKS _____

CHEMICAL CONTAMINANTS IN THE AIR (6.6.7): (ppmv)

14 SODIUM (Na) _____

15 POTASSIUM (K) _____

16 CALCIUM (Ca) _____

17 CHLORIDE (Cl) _____

18 SULPHATE (SO₄) _____

19 NITRATE (NO₃) _____

20 TRACE METALS (V, Pb, Ni, Zn) _____

21 SULPHUR DIOXIDE (SO₂) _____

22 AMMONIA (NH₃) _____

23 NITROUS OXIDES (NO_x) _____

24 HYDROCARBONS (VOC) _____

25 HYDROGEN SULFIDE (H₂S) _____

26 CHLORINE GAS (Cl₂) _____

27 HYDROCHLORIC ACID (HCl) _____

28 NEON (Ne) _____

29 OZONE (O₃) _____

30 HELIUM (He) _____

31 METHANE (CH₄) _____

32 KRYPTON (Kr) _____

33 HYDROGEN (H₂) _____

34 NITROUS OXIDE (N₂O) _____

35 CARBON MONOXIDE (CO) _____

36 XENON (Xe) _____

37 NITROGEN DIOXIDE (NO₂) _____

INLET SILENCERS (7.7.2.7):

SILENCER MFR _____ Δ P _____ mm H₂O

SILENCER MATERIALS _____

INLET COOLER TYPE:

WETTED-MEDIA (7.7.2.9.2.2.1) ATOMIZING SPRAY (7.7.2.9.2.3.1)

HEAT EXCHANGER (7.7.2.9.3.1)

COOLANT-SIDE CONDITIONS (7.7.2.9.3.5):

MAX. AVAILABLE FLOW (L/MIN) _____

MAX. TEMP (°C) _____ MIN TEMP (°C) _____

MAX. PRESS. (kPa) _____ MIN. PRESS. (kPa) _____

COOLANT COMPOSITION OR ANALYSIS _____

EXCHANGER MFR _____

MODEL _____ Δ P _____ mm H₂O

PARTICULATE CONTAMINANTS IN AIR (6.6.8):

39 SEAWATER _____

40 COASTAL WATER _____

41 ROADS WITH HEAVY TRAFFIC _____

42 DRY LAKE BED _____

43 NEARBY COOLING TOWER _____

44 PETROCHEMICAL INDUSTRY _____

45 FOSSIL FIRED POWER PLANT _____

46 GENERAL CHEMICAL INDUSTRY _____

47 PAPER AND PULP INDUSTRY _____

48 CEMENT PRODUCTION _____

49 QUARRIES _____

50 AGRICULTURAL ACTIVITIES _____

51 PRODUCTION OF FERTILIZERS _____

52 MINING AND METALLURGICAL ACTIVITIES _____

REMARKS _____



Resalat Oil Field Development Project Phase 1 (EPC-EPD)



Data sheet for Gas Turbine Generator Package

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COMBUSTION GAS TURBINE (API 616-6th)	REV
DATASHEET SI UNITS	
JOB NO. _____ ITEM NO. _____	
REVISION _____ DATE _____	
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INSPECTION AND TESTING; CONTROLS AND INSTRUMENTATION (8.1.1)

#	DESCRIPTION	REQ	WIT	OBS	REQUIREMENTS
2	SHOP INSPECTION AND TESTS:				MATERIALS INSPECTION REQUIREMENTS
3	CLEANLINESS PRIOR TO ASSEMBLY (8.2.3.3)	<input type="radio"/>	<input type="radio"/>		<input type="radio"/> PARTS REQUIRING RADIOGRAPHY TEST, SEE ATTACHED LIST (8.2.1.3)
4	HYDROSTATIC (8.3.2)		<input type="radio"/>	<input type="radio"/>	<input type="radio"/> PARTS REQUIRING MAGNETIC PARTICLE TEST, SEE ATTACHED LIST (8.2.1.3)
5	GAS FUEL SYSTEM PNEUMATIC TEST (8.3.3.1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> PARTS REQUIRING LIQUID PENETRANT TEST, SEE ATTACHED LIST (8.2.1.3)
6	MECHANICAL RUN TEST (MRT) (8.3.4)		<input type="radio"/>	<input type="radio"/>	<input type="radio"/> PARTS REQUIRING ULTRASONIC TEST, SEE ATTACHED LIST (8.2.1.3)
7	ON BASE AUX SYSTEMS INCL IN MRT (8.3.4.1.10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> 100% WELD INSPECTION (6.24.6.1) <input type="radio"/> X-RAY <input type="radio"/> MAG <input type="radio"/> LPI
8	JOB AUX SYSTEMS INCL IN MRT (8.3.4.2.10)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> WELDING HARDNESS TESTING (8.2.3.4)
9	<input type="radio"/> CONTRACT CPLG <input type="radio"/> IDLING ADAPTOR(S)				<input type="radio"/> PMI (6.20.17.a through m)
10	<input type="radio"/> CONTRACT VIBRATION PROBES				<input type="radio"/> PMI ADDITIONAL COMPONENTS (6.20.17.n), SEE ATTACHED LIST
11	POLAR VIBRATION PLOTS (8.3.4.3.6.a)	<input type="radio"/>			<input type="radio"/> CONNECTION DRAWINGS (6.24.6.4)
12	COPY OF VIB DATA (8.3.4.3.8)	<input type="radio"/>			
13	SPARE ROTOR IN MRT (8.3.4.2.9)		<input type="radio"/>	<input type="radio"/>	MISCELLANEOUS INSPECTION AND TESTING:
14	PERFORMANCE TEST (8.3.5.1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> VENDOR REVIEW & COMMENTS ON PIPING & FOUNDATION (6.5.10.a)
15	<input type="radio"/> ISO 2314 <input type="radio"/> ASME PTC				<input type="radio"/> SUPPLIER TO OBSERVE PARTING OF FLANGES (6.5.10.b)
16	COMPLETE UNIT TEST (8.3.5.2.1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> SUPPLIER CHECK ALIGNMENT AT OPERATING TEMPERATURE (6.5.10.c)
17	FUEL CHANGEOVER TESTS (8.3.5.2.7.a)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> SUPPLIER WITNESS INITIAL ALIGNMENT CHECK (6.5.10.d)
18	STARTS WITH SITE FUEL (8.3.5.2.7.b)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> LIST OF DATA TO KEEP 20 YRS (8.2.1.1.a, 8.2.1.1.g), SEE ATTACHED LIST
19	TORSIONAL VIBRATION (8.3.5.2.3)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	VENDOR'S DATA:
20	SOUND PRESSURE LEVEL TEST (8.3.5.3.1)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> DATA TRANSMITTAL IDENTIFIER (9.1.3) _____
21	SOUND POWER LEVEL TEST (8.3.5.3.2)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	_____
22	ROTOR OVERSPEED TEST (8.3.5.4)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> NUMBER OF PROPOSAL HARDCOPY (9.2.1.a) _____
23	AUXILIARY EQUIPMENT TEST (8.3.5.5)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> SPARE PARTS OPTIMIZATION ANALYSIS (9.2.3.2.w)
24	VENTILATION SYSTEM VALIDATION (8.3.5.6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> FAILURE MODES AND EFFECTS ANALYSIS (9.2.3.2.x)
25	ENCLOSURE LEAK TEST (8.3.5.7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> LIFECYCLE ANALYSIS (9.2.3.2.y) <input type="radio"/> DISCOUNT RATE _____ %
26	GAS TURBINE POST TEST INSPECTION (8.3.5.8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	PERFORMANCE CURVES (9.2.4)
27	HYDRAULIC COUPLING HUB/SHAFT FIT (8.3.5.9)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> km/h
28	GEN GOV RESPONSE TEST (8.3.5.2.8)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> INCREMENTAL POWER FOR STEAM/WATER (9.2.4.4.b)
29	GOV RESPONSE TIME RECORDED (8.3.5.10.1)	<input type="radio"/>			<input type="radio"/> EFFECTS OF AIR TEMPERATURE ON EXHAUST FLOW (9.2.4.4.c)
30	OVERSPEED RESP TIME RECORDED (8.3.5.10.2)	<input type="radio"/>			<input type="radio"/> RUN DOWN CURVES (9.2.4.4.d)
31	SPARE PARTS TEST (8.3.5.11)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> AIR EMISSIONS (9.2.4.4.e)
32	FIRE PROTECTION TEST (8.3.5.12)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/> NUMBER OF CONTRACT DATA HARDCOPIES (9.3.1.6) _____
33	UNIT CONTROL PANEL FAT (8.3.7)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	SOFTCOPY DRAWING FORMAT (9.3.2.4)
34	OTHER TESTS AND INSPECTIONS (8.3.5.13)	<input type="radio"/>	SEE ATTACHED		<input type="radio"/> PDF <input type="radio"/> NATIVE CAD <input type="radio"/> OTHER _____
35	GT FIELD PERFORMANCE TEST (8.3.6)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	SOFTCOPY IOM MANUAL FORMAT (9.3.6.1.c)
36	FIT UP & ASSEMBLY OF PARTS (8.4.9)		<input type="radio"/>	<input type="radio"/>	<input type="radio"/> PDF <input type="radio"/> OTHER _____
37	<input type="radio"/> SUCCESSFUL PRELIM TESTS PRIOR TO WITNESSED TESTS (8.1.8.2)				
38	INSPECTOR'S CHECKLIST VERIFIED BY (8.1.6)				REMARKS: _____
39	<input type="radio"/> PURCHASER <input type="radio"/> VENDOR				_____
40	REMARKS:				_____
41	_____				_____
42	_____				_____
43	_____				_____
44	_____				_____
45	_____				_____
46	_____				_____
47	_____				_____
48	_____				_____
49	_____				_____
50	_____				_____
51	_____				_____
52	_____				_____
53	_____				_____
54	_____				_____
55	_____				_____
56	_____				_____
57	_____				_____



Resalat Oil Field Development Project Phase 1 (EPC-EPD)



Data sheet for Gas Turbine Generator Package

Job No. 98IEC01	Project	Facility	Discipline	Document	Seq.	Rev.	Sheet No.
	LRSL	R1X	RE	DS	210	00	20 of 23

1	Equipment No. :						
2	Service Name : LUBE OIL COOLERS						Quantity : 6
3	Bay size (W x L) mm	No. of bays		Draft type :		Induced	Forced
4	Heat exchanged, kW	MTD (Effec.), °C					
5	Surface per unit, m ²	Finned tube	Bare tube				
6	Transfer rate, W / m ² °C	Finned tube	Bare tube, service		Bare tube, clean		

PERFORMANCE DATA - TUBE SIDE

8	Fluid name			Bubble point,			°C
9	Total fluid entering,	kg/h			Pour point	Freeze point	°C
10	Inlet pressure,	barg			Dew point,		
11	Pressure drop (allowable/calculated)	bar			Latent heat,	kJ/kg	
12	Velocity (allowable/calculated)	m/s			Inside fouling resistance,	m ² °C / W	
13						Out	
14			In	Out	Specific heat, liquid,	kJ/kg °C	
15	Temperature,	°C			Specific heat, vapour,	kJ/kg °C	
16	Liquid,	kg/h			Viscosity, liquid,	mPa.s	
17	Vapour,	kg/h			Viscosity, vapour,	mPa.s	
18	Non condensables,	kg/h			Molecular weight, vapours		
19	Steam,	kg/h			Molecular weight, non condensable		
20	Water,	kg/h			Density, liquid,	kg/m ³	
21	Thermal Conduct., liquid,	W / m °C			Density, vapour,	kg/m ³	
22	Thermal Conduct., vapour,	W / m °C					

PERFORMANCE DATA - AIR SIDE

24	Air quantity / item,	Nm ³ /h	Face velocity,	m/s	Air inlet temperature,	°C **	
25	Air quantity / fan,	m ³ /h	Mass velocity ,	kg/s.m ²	Air outlet temperature,	°C *	
26	Static pressure,	mbarg	Altitude,	m	Minimum amb. temp.,	°C	
27			*) Net free area		**) Design dry bulb		

DESIGN - MATERIALS - CONSTRUCTION

29	Design pressure,	barg	Test pressure,	barg	Design temperature,	°C 85	
31	Tube bundle		Header		Tube		
32	Size (W x L), m	No./bay	Type	Plug type	Welded	Seamless	
33	No. of tube rows		Material	A240-316L	Material	A312 TP 316L	
34	Arrangement		Number of passes		O.D.	inch 1"	
35	Bundles in parall.	In series	Plug material	A479-316L	Thickness:	Minim.	Aver., mm
36	Bundle Frame		Slope, mm/m		No./bundle	Length,	m
37			Gasket material		Pitch,	mm	Layout
38	Miscellaneous		Corrosion allow., mm		Tube-tube sheet joint:	Expand.	Welded
39	Structure mounting	Piperack	Grade	Size inlet nozz., inch	Quantity	Fin	
40	Louvers	Auto	Manual	Size outlet nozz. inch	Quantity	Type Extruded	
41	Design code	API 661	Code Stamp	Rating & facing		Material	Aluminium
42	Proj. specific.			Plug type		Outside dia.,	mm
43	Sur 2018-02-25			Louvers material	Alumin.	GRP	Stock thks., mm MT
44	Surface prep. headers			Vents / Drains		Spacing,	No./m

MECHANICAL EQUIPMENT

46	Fan		Driver			Speed reducer	
47	Mfr. & Model			Mfr. & Model	Mfr. & Model		
48	No./bay			Type	Duty, kW	Type	
49	Diameter, mm	Speed, rpm		No./bay	Speed, rpm	No./bay	
50	No. of blades	Angle		Enclosure	Agma rating,		kW
51	Blade material	Alumin.	GRP	Voltage	V	Speed ratio,	/1
52	Hub material			Phase	Vibration switch		
53	Max. allow. / calc. tip speed,	m/s			Cycle	Hz	Enclosure
54	Power/fan @ des. temp.,	kW			Controls - air side		
55	Power/fan @ min. amb. temp.,	kW			Control action on air failure	Support	Structure Pedestal
56	Pitch adjustment	Auto	Manual	Fan pitch	Min	Max	Lockup
57				Louvers	Open	Closed	Lockup
58				Air recircul.	None	Internal	External
59				Signal air press.	barg		
60				Supply air press.	barg	Plot area (W x L), m	

Notes

- 1) For each generator package the Vendor shall supply two lube oil coolers each rated for 100% duty (1 duty, 1 standby). Each cooler shall have 1 x 100% duty fan fitted.
- 2) lube oil coolers shall be suitable to operate in offshore and marine condition.



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	GENERATOR DATA			Rev.
1	Manufacturer	-	VTS	
2	Duty/Operation	-	continuous/ Parallel operation	
3	Type and model no.	-	VTS	
4	Applied Standard	-	IEC60034	
5	Driven type	-	Direct Engine	
6	Duty factor	-	S1	
7	Maximum continuous power (ISO)	kVA	VTS	
8	Max. continuous power at site condition	KW/kVA	2000KW/2500 kVA	
9	Max. reactive power at ISO condition	kVar	VTS	
10	Min. reactive power at site condition	kVar	VTS	
11	Max. Continuous rating (MCR) for Class F temp. rise B	kVA	VTS	
12	Power factor	-	0.8	
13	Terminal Voltage	V	6.6 KV @ Full Load	
14	Stator winding connection	-	Wye (4-wire)	
15	Frequency	Hz	50	
16	Synchronous speed	rpm	1500	
17	Rotation	-	CW	
18	Maximum number of start per hour	-	3	
19	Permissible overload (For more detail refer project Spec. for Gas Engine Gerenartor)	%	10% for two hours	
20	Insulation class for Stator, Rotor and exciter windings	-	F	
21	Temp rise class for Stator, Rotor and Exciter windings	-	B	
22	Enclosure and Terminal Box IP	-	42	
23	Enclosure type	-	Acoustic type enclosure	
24	Cooling method for generator	-	fan ventilated	
25			screen protected with air intake filters	
26	Alternator Cooling Air	m ³ /min	VTS	
27	Mounting	-	Horizontal and Foot	
28	Neutral insulation level	kV	Full line to line voltage	
29	Terminal box Position(facing NDE)	-	Left hand Side	
30	Neutral terminal position(facing NDE)	-	Right hand Side	
31	Terminal/Neutral box, IP code	-	IP 42	
32	Main terminal/Neutral box type	-	Phase segregated	
33	Dynamically balanced rotor	-	Required	
34				
35	Short circuit ratio at rated volts and current		25 kA	
36	Generator short circuit rating		VTS	
37	Current	%FLC		
38	Time	Sec.		
39	Synchronous reactance, X _d (base kVA=Generator kVA)	P.U.	Required Saturated / Required unsaturated	
40	Synchronous reactance, X _q (base kVA=Generator kVA)	P.U.	Required Saturated / Required unsaturated	
41	Transient re Generator and auxiliaries	P.U.	VTS	
42	Transient re Terminal boxes and bearings	P.U.	VTS	
43	Sub transient reactance, X'' _d	P.U.	VTS	
44	Sub transient reactance, X'' _q	P.U.	VTS	
45	Zero sequence reactance X ₀	P.U.	VTS	
46	Negative sequence reactance X ₂	P.U.	VTS	
47	Time constant (Td', Td'', Tq', Tq'', Ta)			
48	T' _d (open circuit / short circuit)	Sec	VTS	
49	T'' _d (open circuit / short circuit)	Sec	VTS	
50	T' _q (open circuit / short circuit)	Sec	VTS	
51	T'' _q (open circuit / short circuit)	Sec	VTS	
52	T _a (Armature short circuit)	Sec	VTS	
53				



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1	Generator efficiency (at rated pf)							
2		-1/4 Full load		%		VTS		
3		-1/2 Full load		%		VTS		
4		-3/4 Full load		%		VTS		
5		-Full load		%		not lower than 97%		
6	Inertia constant(Driver&Gen.) H			kWs/kVA		VTS		
7	Damping factor			pu		VTS		
8	Saturation factor			-		VTS		
9	(Field current to produce 1.2puV on overcurrent)							
10	Neg. phase seq. heating char.(I ² =k)					VTS		
11	Exciter type					Brushless- Self Excitation		
12		Exciter						
13		Manufacturer				VTS		
14		Model				VTS		
15	AVR model					VTS		
16	AVR manufacturer					VTS		
17	AVR Voltage regulation			%		±1.2		
18	AVR Adjusting range			%		-10 , +25		
19	Excitation voltage			V		VTS		
20	Excitation ceiling voltage and duration			V&Sec		VTS		
21	Excitation current							
22	Full load			A		VTS		
23	No load			A		VTS		
24	Largest motor to start (voltage drop at terminal of motor			kW		250		
25	Maximum deliverable kVA for motor starting (voltage drop			KVA		VTS		
26	Neutral Grounding method					Grounded by NGR 200A		
27	Generator anti-condensation heater consumption			kW		VTS		
28	Lifting Lugs					Required		
29	Cable details					VTS		
30	Type of Rotor					Stiff		
31	Type bearings (DE & NDE)					Sleeve		
32	Lubrication type					Oil splash		
33	Rotor Shaft					Solid		
34	MATERIALS (note 1)							
35	Generator Base frame/Housing					VTS		
36	Generator rotor Core/Bars					VTS		
37	Generator Shaft material					VTS		
38	Generator fan material					VTS		
39	Generator Cooler/Cooler tube material					VTS		
40	Generator end ring material					VTS		
41	Generator bolting material					VTS		
42	Generator Windings material					Annealed copper		
43	Notes: 1- Offshore and corroding weather condition shall be considered in selecting material of each part.							
44								
45	GENERATOR SET ENCLOSURE & BASE FRAME							
46								
47	Acoustic insulation system / protection for generator					Required		
48		Enclosure, IP code				55		
49		With self supporting container				VTS		
50		Canopy or Container type / manufacturer				Positive pressure/VTS		
51		Material / thickness			/ mm	CS / VTS		
52		Ventilation fan				Required		
53		Number of openings / type				VTS		
54		Inlet and exhaust air dampers				VTS		
55		Fire & Gas detection				Yes		
56		Automatic fire fighting system				Yes		
57		Internal lighting system				Yes		
58		Internal ventilation system				VTS		
59		Air conditioning of control boards compartment				VTS		
60		Size (L x W x H)			mm	VTS		
61		Access doors for engine or generator removal				VTS		
62		Noise limitation method				VTS		
63		General service outlets (V- ph - Hz)				VTS		
64		Painting				VTS		
65	Base Frame							
66	Materials of construction					VTS		
67	Size (L x W x H)				mm	VTS		
68	Non-slip check floor					VTS		
69	Setting points					Required		
70	Lifting points					Required		
71	Earthing lugs					Required		
72	Painting (Suitable for offshore condition)					Required		
73								
74	WEIGHTS & DIMENSIONS							
75								
76	WEIGHTS							
77	Generator unit complete				kg	VTS		
78	Heaviest maintenance (item)					VTS		
79	Generator				kg	VTS		
80	Generator control panel				kg	VTS		
81								
82	DIMENSIONS							
83	Generator (L x W x H)				mm	VTS		
84	Generator unit, overall (L x W x H)				mm	VTS		
85	Additional maint. clearance Engine (L x W x H)				mm	VTS		
86	Additional maint. clearance generator (LxWxH)				mm	VTS		
87	Generator control panel (HxWxD)				mm	VTS		



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CONTROL PANEL			
1	Panel accessories:		
2	Lamps test push-button	Yes	
3	Fuses and terminals for outgoing feeders	Yes	
4	Manual and automatic synchronizing facilities	Yes	
5	Local/Remote Selector switch	Yes	
6	Undrilled gland plate	Yes	
7	Generator anti-condensation heater contactors	Yes	
8	Lube oil and water heater contactor	Yes	
9	Fuel solenoid on/off switch (lockable)	Yes	
10	Speed control potentiometer and voltage adjustment rheostat	Yes	
11	Generator Mode of Operation (Droop/ Isochronous)	Droop & Isochronous	
12	Start and stop push buttons	Required on Local Panel and Command from Remote	
13	Panel illuminating lamp and switch	Yes	
14	Anti-condensation heater with thermostat and manual switch	Yes	
15			
16	Required accuracy and burden:	(*)	
17	For Measuring CTs:		
18	For Protection CTs:		
19	For Differential Protection:		
20			
21	Protection(with required CTs & VTs):	(*)	
22	Under voltage relay		
23	Over voltage relay		
24	Overload relay		
25	Over current relay		
26	Over current earth fault relay		
27	Stator voltage restrained 3 phase overcurrent		
28	Negative phase sequence relay		
29	Anti-motoring relay		
30	Synchro-check relay		
31	Winding over temperature		
32	Over and Under frequency relay		
33	Field failure relay		
34	Generator differential		
35	Reverse Power Fault		
36	Rotor Earth Fault		
37	Over excitation		
38	loss of excitation		
39	Voltage balance		
40	Lock Out		
41	Over/Under frequency		
42			
43	(*) Refer to "Schematic diagram for MV Switchgear, Doc. No. LRSL-R1X-EL-SM-001"		
44			