



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



Contract No.

List of Applicable Codes and Standards

Class

A

2-98-5365 ف ق

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List of Applicable Codes and Standards

REV.	Date	Purpose of Issue	ORIG.	BY	PREP'D	CHECK'D	APP'D	COMPANY APP'D
00	8-Dec-2020	Issued for Comment	IOEC	-	A.Bolverdi	J.Hatamian	M.Aghaei	-



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TABULATION OF REVISED PAGES

Sheet	Revisions					
	00	01	02	03	04	05
1	X					
2	X					
3	X					
4	X					
5	X					
6	X					
7	X					
8	X					
9	X					
10	X					
11	X					
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13	X					
14	X					
15	X					
16	X					
17	X					
18	X					
19	X					
20	X					
21	X					
22	X					

Sheet	Revisions					
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Sheet	Revisions					
	00	01	02	03	04	05



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REVISION RECORD SHEET

REV. NO.	PURPOSE	LIST OF UPDATED MODIFIED SECTIONS IF ANY



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1. INTRODUCTION

1.1. Development Overview

The Resalat Field previously known as Rakhsh Field, is located in the Persian Gulf, some 80 km to the South of Lavan Island, in water depth of 65-75 meters. The facilities which were originally developed in 1968 have sustained some damage due to the Iran/Iraq war and adverse climate conditions thereafter.

To increase oil production capacity from this field (adding 12,000 stock barrels per day to current production), Iranian Offshore Oil Company (IOOC) has defined new project which includes Engineering, Drilling, Procurement, Construction for following items:

- New satellite Wellhead Platform (WHP1) with totally nine (9) conductor slots.
- Development and renovation of Existing offshore complex consist of new power generation, control system, HVAC, Electrical /control room, electrical panels(LV &MV),process & utility piping, and all necessary activities which shall be done for connection to existing facilities(Tie in requirements)
- Drilling of two new production wells in R1 and two wells in WHP1 platform and Re-entry and work-over of two existing well in R1 platform.
- One 10” productions submarine pipeline from WHP1 to PP and a single submarine cable (power and data) from SP to WHP1
- Inspection, Strengthening, Modification and Repair of existing R1 complex Jackets and topsides and replacement of boatlanding and Barge Bumpers.

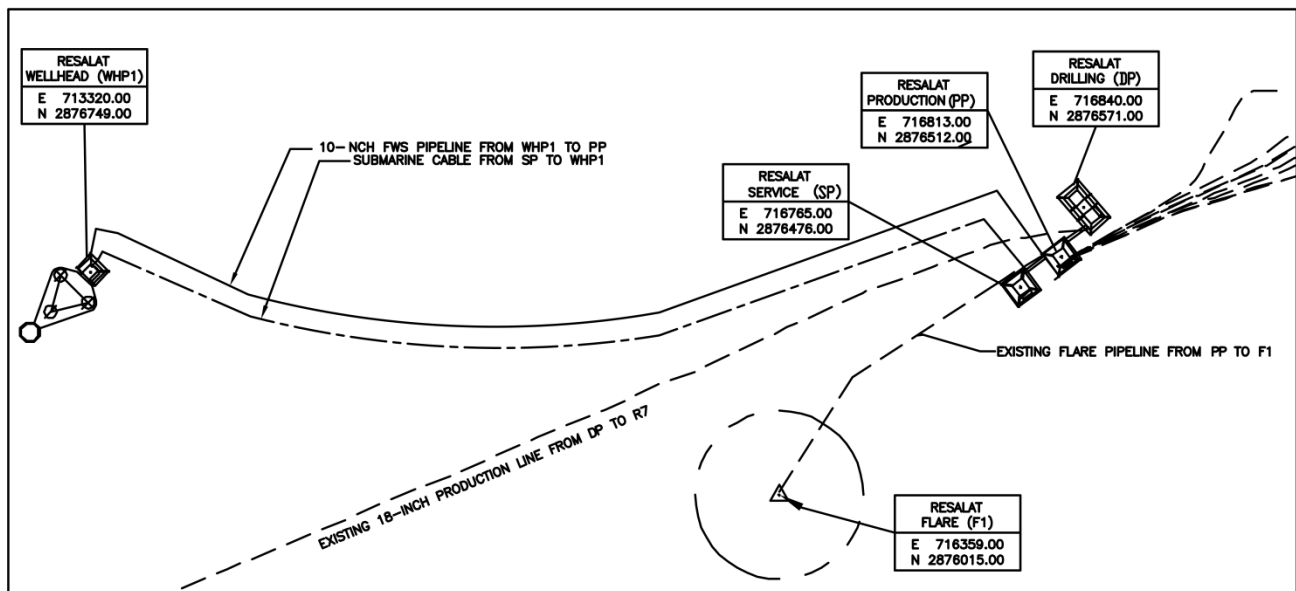


Figure 1: Resalat Development Field Layout (Datum ED 77, Zone 39, Cent. Meridian 51° East)



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1.2. Purpose of Scope

This document, prescribes the list of main applicable codes and standards used in PROJECT.

The latest edition of codes and standards issued at the contract date shall be used.

Any standard deviations may be accepted, if justifiable explanations can be presented but COMPANY/CONTRACTOR approval is required case by case.

1.3. Definitions

PROJECT	Resalat Oil Field Development – Phase 1
COMPANY	Iranian Offshore Oil Company (IOOC)
CONTRACTOR	Iranian Offshore Engineering and Construction Company
SUB-CONTRACTOR	Tehran Raymand Consulting Engineers (TRCE)
PURCHASER	Any firm who buy services, material and/or equipment for execution of the project within a dedicated contract.
SUPPLIER	Any vendor, manufacturer who supply any Service, Material or Equipment for the project
SHALL	Refer to a mandatory requirement
SHOULD	Refer to a recommendation
MAY	Refer to one acceptable course of action

2. CODES AND STANDARDS

All Work shall be completed in accordance with the latest engineering codes and standards at the effective of the contract.

3. REFERENCE DOCUMENTS

Not Applicable

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4. ABBREVIATIONS

Not Applicable

5. SYSTEM OF UNITS

SI metric system to be used. SI metric system Exceptions shall be as following:

• Diameter of pipe:	in
• Flange rating:	Ib
• Pressure:	bar, psi
• Temperature:	°C
• Viscosity:	cP
• Surface Tension:	dyne/cm
• Mass flow rate:	kg/hr
• Volumetric flow rate	Sm ³ /hr, MMSCFD, BOPD

6. MATERIAL CODES

All applicable codes and standards have been listed in below table

• Ferrous Material Specifications	ASME Sec. II Part A
• Non-Ferrous Material Specifications	ASME Sec. II Part B
• Specifications for Welding Rods, Electrodes, and Filler Metals	ASME Sec. II Part C
• Properties	ASME Sec. II Part D



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<ul style="list-style-type: none"> NONDESTRUCTIVE EXAMINATION 	ASME Sec. V
<ul style="list-style-type: none"> Engineering Standard for Corrosion Consideration in Material Selection 	IPS-E-TP-740(1)
<ul style="list-style-type: none"> Corrosion Consideration in Design 	IPS-E-TP-760
<ul style="list-style-type: none"> Inspection Standard for Corrosion Survey and Inhibitor Evaluation 	IPS-I-TP-802
<ul style="list-style-type: none"> Engineering Standard for Piping Material Selection (On Plot Piping) 	IPS-E-PI-221(1)
<ul style="list-style-type: none"> Standard Specification for Carbon and Alloy Steel Forgings for Pipe Flanges, Fittings, Valves, and Parts for High-Pressure Transmission Service1 	ASME A 694
<ul style="list-style-type: none"> Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware1 	ASME A 153
<ul style="list-style-type: none"> Damage Mechanisms Affecting Fixed Equipment in the Refining Industry 	API571
<ul style="list-style-type: none"> Pressure Vessel Inspection Code: In-service Inspection, Rating, Repair, and Alteration 	API STD 510
<ul style="list-style-type: none"> Guidelines and Methods for Inspection of Existing 	API RP 575
<ul style="list-style-type: none"> Atmospheric and Low-pressure Storage Tanks 	API-RP-653
<ul style="list-style-type: none"> Centrifugal Pumps for Petroleum, Petrochemical and Natural Gas Industries 	API 610
<ul style="list-style-type: none"> Avoiding Environmental Cracking in Amine Units 	API 945
<ul style="list-style-type: none"> Petroleum, petrochemical and natural gas industries-Materials selection and corrosion control for oil and gas production systems 	ISO 21457

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<ul style="list-style-type: none"> Petroleum and Natural gas Industries-Material for Use in H2S Containing Environments in Oil and Gas Production 	NACE MR 0175-ISO 15156
<ul style="list-style-type: none"> Evaluation of Pipeline and Pressure Vessel Steels for Resistance to Hydrogen-Induced Cracking 	NACE TM 0284
<ul style="list-style-type: none"> Standard Test Method Laboratory Testing of Metals for Resistance to Sulfide Stress Cracking and Stress Corrosion Cracking in H2S Environments 	NACE TM 0177
<ul style="list-style-type: none"> Material Selection 	NORSOK M-001
<ul style="list-style-type: none"> Corrosion Monitoring Design 	NORSOK M-005
<ul style="list-style-type: none"> Guidelines on materials requirements for carbon and low alloy steels for H2S-containing environments in oil and gas production. 	EFC Publications Number 16
<ul style="list-style-type: none"> Corrosion Resistant Alloys for Oil and Gas Production: Guidance on General Requirements and Test Methods for H2S Service 	EFC Publications Number 17
<ul style="list-style-type: none"> Advances in Corrosion Control and Materials in Oil and Gas Production. 	EFC Publication Number 26

7. DESIGN CODES FOR PROCESS DESIGN

<ul style="list-style-type: none"> Sizing, Selection & Installation of Pressure Relieving Devices In Refineries 	API RP 520
<ul style="list-style-type: none"> Pressure Relieving & Depressuring Systems 	API STD 521/ISO 23251
<ul style="list-style-type: none"> Venting Atmospheric and Low-pressure Storage Tanks 	API RP 2000

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8. DESIGN CODES FOR STATIC EQUIPMENT AND HVAC DESIGN

8.1. Fired Heater

ASME Sec. I, API 560, API 630, API STD.530, ASTM, ASME B36.10, B16.9, B16.28

8.2. Quench System (incl. Steam Drums)

ASME Sec. VIII Div. 1

8.3. Heat Exchangers

<ul style="list-style-type: none"> Process shell and tube exchangers and double pipe heat exchangers 	TEMA Class R, ASME Sec. II, V, VIII Div. 1, Sec.IX and API 660,IPS
<ul style="list-style-type: none"> Auxiliary shell and tube exchangers for rotating and packaged equipment 	Vendor's standards
<ul style="list-style-type: none"> Surface condensers 	ASME Sec. VIII, Div.1 / HEI (Heat Exchanger Institute)
<ul style="list-style-type: none"> Air cooled exchangers tube bundles 	API 661, ASME Sec. VIII,IPS
<ul style="list-style-type: none"> Plate exchangers 	API 662 (for Gasketed, Semi-Welded and Welded type,) / ASME Sec. VIII Div. 1 , IPS

8.4. Pressure Vessels

<ul style="list-style-type: none"> Pressure vessels 	ASME Sec. VIII, Div.1 or 2, Sec II, V, IX, IPS
<ul style="list-style-type: none"> Steam drums / Power boiler 	ASME Sec. VIII, Div.1 or 2, Sec II, V, IX, IPS
<ul style="list-style-type: none"> Pig Launcher/Receiver 	ASME Sec. VIII, Div.1 or 2, Sec II, V, IX / ASME B 31.4 or B 31.8 , IPS
<ul style="list-style-type: none"> Auxiliary vessels for rotating and vessels in packaged equipment 	Vendor's standards

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8.5. Storage Tanks

<ul style="list-style-type: none"> Atmospheric 	API 650,IPS
<ul style="list-style-type: none"> Pressurized 	API 620, ASME Section VIII, Div. 1,IPS

8.6. HVAC

<ul style="list-style-type: none"> HVAC Design 	ASHRAE, SMACNA, NFPA 90A & 90B, Iranian National Building codes, NPC, ISO 15138, AMCA, AHRI, HVCA DW/144, BESA, IBC, SOLAS , IPS
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9. ROTATING MACHINERY FOR PROCESS

9.1. Pumps

<ul style="list-style-type: none"> Centrifugal pumps 	API 610, except for slurry pumps or any other particular pumps which cannot be covered by API, well known International standard to be specified
<ul style="list-style-type: none"> Seal less centrifugal pumps 	API 685
<ul style="list-style-type: none"> Positive displacement pumps – reciprocating 	API 674
<ul style="list-style-type: none"> Positive displacement pumps – controlled volume 	API 675
<ul style="list-style-type: none"> Positive displacement pumps – rotary 	API 676
<ul style="list-style-type: none"> Liquid ring vacuum pumps 	API 681

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9.2. Chemical Injection Units

Vendor's standard

9.3. Auxiliaries

<ul style="list-style-type: none"> Lubrication, Shaft Sealing and Control Oil Systems and Auxiliaries 	API 614
<ul style="list-style-type: none"> Pumps-shaft sealing systems for centrifugal rotary pumps 	API 682
<ul style="list-style-type: none"> Vibration, axial position bearing, temperature monitoring 	API 670
<ul style="list-style-type: none"> Machinery protection systems 	API 670
<ul style="list-style-type: none"> Ancillary items 	Vendor's standard

9.4. Packaged Equipment

<ul style="list-style-type: none"> Main pressure vessel 	ASME Sec. VIII, Div. 1
<ul style="list-style-type: none"> Main shell and tube exchangers 	ASME Sec. VIII, Div. 1 and TEMA
<ul style="list-style-type: none"> Auxiliary vessels, tanks and exchangers 	Vendor's standard
<ul style="list-style-type: none"> Pumps 	As per specified in this document
<ul style="list-style-type: none"> Internal piping 	As per specified in this document
<ul style="list-style-type: none"> Connection Flange with outside (Up to 24") 	ASME B16.5
<ul style="list-style-type: none"> Connection Flange with outside (24" and above) 	ASME B16.47 series A or B
<ul style="list-style-type: none"> Instruments/Electrical 	IEC-ISA

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9.5. Boilers

ABMA, Pressure parts: ASME Sec.1, others: Vendor's standard

9.6. Ancillary System

• Crane / Hoist	Vendor's standard
• Loading arms	NFPA, OCMA and Vendor's standard

9.7. Flare Assembly

API RP 520 & 521, AISC, ASME Sec. VIII, API STD 537

10. PIPING DESIGN

• Process piping / Flare piping	ASME B31.3
• Boiler piping	ASME B31.1
• Recommended Practice for Design and Installation of Offshore Production Platform Piping Systems	API-RP-14E
• Engineering standard for Plant Design System	IPS-E-PI-240
• Refrigeration Piping	ASME B31.5
• Cement lined piping	AWWA C 602-83 or equivalent Vendor's standard
• Rubber lined piping	ASTM D 3491-85 or equivalent Vendor's standard
• General Standard for Pipe Supports	IPS-G-PI-280
• Pipe Hanger and Support - Selection And Application	MSS SP-69

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<ul style="list-style-type: none"> Pipes 	
<ul style="list-style-type: none"> Welded and Seamless Wrought Steel Pipe 	ASME B36.10M
<ul style="list-style-type: none"> Stainless Steel Pipe 	ASME B36.19M
<ul style="list-style-type: none"> Line Pipe 	API Spec. 5L
<ul style="list-style-type: none"> Copper Nickel Alloy Piping for Offshore Applications Specification, Pipe, Fitting 	EEMUA Pub.No.144 90/10
<ul style="list-style-type: none"> Fittings 	
<ul style="list-style-type: none"> Factory Made Wrought Steel Butt Welding Fittings 	ASME B16.9
<ul style="list-style-type: none"> Forged Fittings, Socket Welding and Threaded 	ASME B16.11
<ul style="list-style-type: none"> Wrought Steel Butt Welding Short Radius Elbows and Returns 	ASME B16.28
<ul style="list-style-type: none"> Bolts, Nuts, Screw, Pipe, Threads 	
<ul style="list-style-type: none"> Unified Inch Screw Threads 	ASME B1.1
<ul style="list-style-type: none"> Pipe Threads, Aghajari-1 Compressor Station Purpose (Inch) 	ASME B1.20.1
<ul style="list-style-type: none"> Square and Hex Nuts (Inch Series) 	ASME B18.2.2
<ul style="list-style-type: none"> Square and Hex Bolts and Screws (Inch Series) 	ASME B18.2.1
<ul style="list-style-type: none"> Ferrous Pipe Plugs, Bushings, and Lock Nuts with Pipe Threads 	ASME B16.14
<ul style="list-style-type: none"> Specification for High Test Wrought Butt Welding Fittings 	MSS SP-75
<ul style="list-style-type: none"> Swage Nipples and Bull Plugs 	MSS SP-95
<ul style="list-style-type: none"> Forged Carbon Steel Branch Outlet Fittings 	MSS SP-97
<ul style="list-style-type: none"> Flanges 	

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<ul style="list-style-type: none"> Pipe Flanges and Flanged Fittings (Up to 24") 	ASME B16.5
<ul style="list-style-type: none"> Large Diameter Steel Flanges (26" and larger) 	ASME B16.47 Series A or B
<ul style="list-style-type: none"> Standard Finishes for Contact Faces of Pipe, Flanges and Connecting Ends Flanges of Valves and Fittings 	MSS SP-6
<ul style="list-style-type: none"> Orifice Flanges 	ASME B16.36
<ul style="list-style-type: none"> Safety relief valves 	API RP 520 / 527, ASME Sec. VIII or Sec. I
<ul style="list-style-type: none"> Specification for Fire Test for Valves 	API 6FA
<ul style="list-style-type: none"> Specification for Fire Test for Check Valves 	API 6FD
<ul style="list-style-type: none"> Valve Inspection and Testing 	API 598
<ul style="list-style-type: none"> Standard Marking Systems for Valves, Fittings, Flanges and Unions 	MSS SP-25
<ul style="list-style-type: none"> Valves 	
<ul style="list-style-type: none"> Steel Gate Valves-Flanged and Butt Welding Ends Bolted Pressure Seal Bonnets 	API 600
<ul style="list-style-type: none"> Compact Steel Gate Valves-Flanged, Threaded, Welding and Extended 	API 602
<ul style="list-style-type: none"> Class 150, Cast, Corrosion Resistant Flanged – End Gate Valves 	API 603
<ul style="list-style-type: none"> Flanged ends ductile iron gate valves 	API 604
<ul style="list-style-type: none"> Compact Carbon Steel Gate Valve Extended Body 	API 606
<ul style="list-style-type: none"> Metal ball valves, flanged, threaded and welding ends 	API 608
<ul style="list-style-type: none"> Butterfly valves, double flanged, lug type and wafer type 	API 609



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<ul style="list-style-type: none"> Steel Globe Valves-Flanged and Butt-welding Ends, Bolted Bonnets 	API STD.623
<ul style="list-style-type: none"> Wafer and Wafer-Lug Check Valves 	API STD. 594
<ul style="list-style-type: none"> Check valves wafer, wafer-lug and double flanged type 	API 594
<ul style="list-style-type: none"> Metal Plug Valves-Flanged, Threaded and Welding Ends 	API 599
<ul style="list-style-type: none"> Flanged steel check valves 	BS-1868
<ul style="list-style-type: none"> Flanged steel globe valves 	BS-1873
<ul style="list-style-type: none"> Copper alloy globe, globe stop and check and Gate valves 	BS-5154
<ul style="list-style-type: none"> Cast iron and carbon steel butterfly valves 	BS EN 593
<ul style="list-style-type: none"> Cast iron wedge and double disc gate valves 	BS EN 1171
<ul style="list-style-type: none"> Cast Iron check valves 	BS EN 12334
<ul style="list-style-type: none"> Screw down diaphragm valves 	BS EN 13397
<ul style="list-style-type: none"> Cast iron globe and globe stop and check valves 	BS EN 13789
<ul style="list-style-type: none"> Forged steel gate, globe, check valves 	BS EN ISO 15761
<ul style="list-style-type: none"> Steel ball valves 	BS EN ISO 17292
<ul style="list-style-type: none"> Bolted Bonnet Steel Gate Valves for the Petroleum, Petrochemical and Allied Industries 	ISO 10434
<ul style="list-style-type: none"> Valves-Flanged, Threaded and Welding End 	ASME B16.34
<ul style="list-style-type: none"> Face to Face and End to End Dimensions of Valves 	ASME B16.10
<ul style="list-style-type: none"> Rubber seated Butterfly valves 	AWWA C504
<ul style="list-style-type: none"> Gaskets 	

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<ul style="list-style-type: none"> • Metallic Gaskets for Pipe Flanges- Ring Joint Spiral-Wounded, and Jacketed 	ASME B16.20
<ul style="list-style-type: none"> • Nonmetallic flat gaskets for pipe flanges 	ASME B16.21

10.1. Welding

<ul style="list-style-type: none"> • Welding and brazing qualification non-interfiled, qualification for welding procedures and welders 	ASME Sec. IX
<ul style="list-style-type: none"> • Non-destructive examination non-interfiled 	ASME Sec. V
<ul style="list-style-type: none"> • Welding electrode and welding techniques 	AWS
<ul style="list-style-type: none"> • Welding consumables — Covered electrodes for manual metal arc welding of non-alloy and fine grain steels — Classification 	ISO 2560
<ul style="list-style-type: none"> • Welding Guidelines for the Chemical, Oil, and Gas Industries 	API 582

10.2. Insulation

<ul style="list-style-type: none"> • Materials 	ASTM
---	------

10.3. Painting

<ul style="list-style-type: none"> • Surface preparation 	SSPC, SIS or equivalent
<ul style="list-style-type: none"> • Materials 	ASTM
<ul style="list-style-type: none"> • Machinery painting 	Vendor's standard

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11. STRUCTURAL STEEL DESIGN

- Design

AISC, API RP2A, ANSI AWS D.1.1

12. FIRE FIGHTING AND PROTECTION SAFETY

- Design

NFPA 11, 12, 13, 14, 15, 2001, 70, 72, API-RP-2218, API-PUB-2030, API RP 520, API-STD-521 IP Code Part 15, DIN and NPC regulations and standards

- Materials

Vendor's standard

12.1. Environmental

- Design

- Ministry of Health Requirements (Occupational Exposure Limits).
- IPS-G-SF-860
- IPS-G-SF-870
- IPS-G-SF-880
- IPS-G-SF-900
- Regulations of the Department of Environment (DOE)

13. ELECTRICAL DESIGN

- General

IEC, NEMA, ISO, ANSI, API, EN, BS, IPS

- Electrical motors

IEC 60034

- Illumination level

API 540

- Transformer

IEC 60076

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• Air craft warning system	IEC 60529, ICAO or equivalent
• Cathodic protection system	NACE, IEC, NEC or equivalent
• Area classification	API RP 505
• Certifications for hazardous classification	IEC, EN, CENELEC, BS, NFPA, ANSI, API or equivalent (as per CLIENT/MC approval)
• Ex-type electrical EQUIPMENT selection	IEC 60079

14. CONTROL & INSTRUMENTATION DESIGN

• General	ISO, ISA, API, IEC, NFPA NACE, AGA
• Instrument Process Connection	ANSI – B31.3 , B16.5 , B1.20, B46.1
• Relief Valves	ASME Sec.VIII , API-2000 , 520 , 526 , 527 MSS-SP-55
• Control Valve	ISA S75.02 , ISA S75.03 , ISA S75.04, ISA S75.01, ISA S75.05, ISA S75.15 ANSI-B16.37,B16.104 , B16.10 ANSI FCI-70-2 , MSS-SP-55, IEC-534-8-3
• Cables	BS-5308 , IEC 60794, IEC60331, IEC60332, EN 50288 , T-G-652
• Flow Measurement (Liquid Hydrocarbons)	API-2545 , ISO-2714,ISO-2715,ISO-6551
• Differential Pressure Flow Measuring Elements	ISO 5167 , BS-1042
• Thermocouple /RTD	IEC-60584 / IEC-60751

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• Proximity Switch	NAMUR
• Instruments and Control Systems	ISA RP 551 ~ 555 , ISA S5.1 , ISA S5.3 IEC-60337
• Machines Monitoring System	API 670
• Ethernet	IEEE 802.3
• Control Systems	IEC 61131 , IEC 61508 , IEC-61511 ISA S18.1 , ISA S5.1 ~ S5.5
• Electrical	IEC-60337 , IEC-60529 , IEC-60079, IEC-61000-5-2 CENELEC-50014~50020 , 50039
• Control Center	ISA-RP 60.8 , ISO-11064

15. BUILDINGS DESIGN

• Architectural Design	IBC, IMO SOLAS, API RP 2A, BS 3958, BS 4800 OSHA
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16. TELECOM DESIGN

• General	• ITU-R , ITU-T, EIA,BS, IEE, IEEE, ISO,IEC,CENELEC, IMO regulation, ICAO Regulation, CEPT Publication , SOLAS Recommendation
• Telephone System	• ITU-T,G.703 • IEC-60529,61083-1,61083-2,61000-4-2,61000-4-3,60079-1 • IEEE C37.90.1



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



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<ul style="list-style-type: none"> PA/GA System 	<ul style="list-style-type: none"> IEC-60079.1,60529,61000,60068-2-1/2,60849,60092-375 BS-6840,60529,6259,5228
<ul style="list-style-type: none"> CCTV System 	<ul style="list-style-type: none"> IEC 60529,60332.61000,60751,60068 UL BS 50132---2-1,50132-4-1,50132-5,50132-7,55022,50082-2,60065,60601,60950
<ul style="list-style-type: none"> LAN System 	<ul style="list-style-type: none"> ISO/IEC 11801 ITU-T G.703 IEEE 802.3u ,802.3z
<ul style="list-style-type: none"> Fiber Optic Cable 	<ul style="list-style-type: none"> IEC 60793, 60794 ITU-T G.652, G.651
<ul style="list-style-type: none"> VHF System 	<ul style="list-style-type: none"> ITU-R 285-5/282-6 ITU-T E.211,G.703 IEC 61083-1, 61083-2, 61000-4-2, 61000-4-3,60079-1
<ul style="list-style-type: none"> Cables 	<ul style="list-style-type: none"> BS-1442 , 2316, 3573, 4109, 5099, 5308, 5425-1, 6746 IEC 60794, 60028, 60173, 60228, 60331, 60332, 60885, 60966