

Supplementary Specification to API Standard 614 for Lubrication and Oil-control Systems and Auxiliaries

Revision history

VERSION	DATE	PURPOSE
1.0	April 2024	First Edition

Acknowledgements

This IOGP Specification was prepared by a Joint Industry Programme 33 Standardization of Equipment Specifications for Procurement organized by IOGP with support by the World Economic Forum (WEF).

Disclaimer

Whilst every effort has been made to ensure the accuracy of the information contained in this publication, neither IOGP nor any of its Members past present or future warrants its accuracy or will, regardless of its or their negligence, assume liability for any foreseeable or unforeseeable use made thereof, which liability is hereby excluded. Consequently, such use is at the recipient's own risk on the basis that any use by the recipient constitutes agreement to the terms of this disclaimer. The recipient is obliged to inform any subsequent recipient of such terms.

Please note that this publication is provided for informational purposes and adoption of any of its recommendations is at the discretion of the user. Except as explicitly stated otherwise, this publication must not be considered as a substitute for government policies or decisions or reference to the relevant legislation relating to information contained in it.

Where the publication contains a statement that it is to be used as an industry standard, IOGP and its Members past, present, and future expressly disclaim all liability in respect of all claims, losses or damages arising from the use or application of the information contained in this publication in any industrial application.

Any reference to third party names is for appropriate acknowledgement of their ownership and does not constitute a sponsorship or endorsement.

Copyright notice

The contents of these pages are © International Association of Oil & Gas Producers. Permission is given to reproduce this report in whole or in part provided (i) that the copyright of IOGP and (ii) the sources are acknowledged. All other rights are reserved. Any other use requires the prior written permission of IOGP.

These Terms and Conditions shall be governed by and construed in accordance with the laws of England and Wales. Disputes arising here from shall be exclusively subject to the jurisdiction of the courts of England and Wales.

Foreword

This specification was prepared under Joint Industry Programme 33 (JIP33) "Standardization of Equipment Specifications for Procurement" organized by the International Oil & Gas Producers Association (IOGP) with the support from the World Economic Forum (WEF). Companies from the IOGP membership participated in developing this specification to leverage and improve industry level standardization globally in the oil and gas sector. The work has developed a minimized set of supplementary requirements for procurement, with life cycle cost in mind, resulting in a common and jointly agreed specification, building on recognized industry and international standards.

Recent trends in oil and gas projects have demonstrated substantial budget and schedule overruns. The Oil and Gas Community within the World Economic Forum (WEF) has implemented a Capital Project Complexity (CPC) initiative which seeks to drive a structural reduction in upstream project costs with a focus on industry-wide, non-competitive collaboration and standardization. The CPC vision is to standardize specifications for global procurement for equipment and packages. JIP33 provides the oil and gas sector with the opportunity to move from internally to externally focused standardization initiatives and provide step change benefits in the sector's capital projects performance.

This specification has been developed in consultation with a broad user and supplier base to realize benefits from standardization and achieve significant project and schedule cost reductions.

The JIP33 work groups performed their activities in accordance with IOGP's Competition Law Guidelines (November 2020).

Table of Contents

Foreword.....	1
Introduction	4
1 Scope	6
2 Normative References.....	6
3 Terms, Definitions, Acronyms, and Abbreviations	7
3.1 Terms and Definitions	7
3.2 Acronyms and Abbreviations	7
4 System Configuration (How to Use This Standard to Specify an Oil System)	8
6 Design	8
6.2 System Selection	8
6.3 Pressure Design Code	10
6.4 Welding	10
6.5 Baseplates.....	11
6.6 Oil Reservoirs.....	11
6.7 Pumps and Pump Drivers	13
6.8 Lube-oil Heat Exchangers.....	15
6.9 Filters.....	17
6.10 Transfer Valves	18
6.11 Accumulators.....	18
6.12 Overhead Tanks.....	20
7 Piping.....	20
7.1 General.....	20
7.2 Lubricating, Control, and Seal-oil Piping.....	23
7.3 Instrument Piping and Tubing	24
8 Instrumentation, Control, and Electrical Systems	24
8.1 General.....	24
8.2 Alarm, Shutdown, and Control Systems	25
8.3 Instrumentation.....	25
8.4 Electrical Systems	28
8.5 Control Panels.....	28
8.6 Grounding.....	28
9 Inspection, Testing, and Preparation for Shipment	28
9.2 Inspection	28
9.3 Testing.....	29
9.5 Package Markings and Shipping Documentation	30
10 Vendor's Data	30
10.1 General.....	30

10.2 Documentation30

10.4 Contract Data30

10.5 Nameplates and Tagging31

Bibliography32

List of Tables

Table 12—Lube-oil Cooler Materials for Salt or Brackish Water Service.....16

Table 3—Minimum Requirements for Piping Materials—Auxiliary Process Fluid.....20

Table 5—Minimum Requirements for Piping Materials—Cooling Water20

Table 13—Minimum Piping and Tubing Materials for Lubricating and Control-oil Systems in Offshore and Coastal Locations21

Introduction

The purpose of the IOGP S-744 specification documents is to define a minimum common set of requirements for the procurement of lubrication and oil-control systems and auxiliaries in accordance with API Standard 614, 6th Edition, February 2022, Lubrication, Shaft-sealing, and Oil-control Systems and Auxiliaries for application in the petroleum and natural gas industries.

The IOGP S-744 specification documents follow a common structure (as shown below) comprising a specification, also known as a technical requirements specification (TRS), a procurement data sheet (PDS), an information requirements specification (IRS) and a quality requirements specification (QRS). These four specification documents, together with the purchase order, define the overall technical specification for procurement.



JIP33 Specification for Procurement Documents Supplementary Technical Requirements Specification (TRS)

This specification is to be applied in conjunction with the supporting PDS, IRS and QRS as follows.

IOGP S-744: Supplementary Specification to API Standard 614 for Lubrication and Oil-control Systems and Auxiliaries

This specification defines the technical requirements for the supply of the equipment and is written as an overlay to API 614, following the API 614 clause structure. Clauses from API 614 not amended by this specification apply as written.

Modifications to API 614 defined in this specification are introduced by a description that includes the type of modification (i.e. Add, Replace or Delete) and the position of the modification within the clause.

NOTE Lists, notes, tables, figures, equations, examples and warnings are not counted as paragraphs.

IOGP S-744D: Procurement Data Sheet for Lubrication and Oil-control Systems and Auxiliaries (API)

The PDS defines application-specific requirements. The PDS is applied during the procurement cycle only and does not replace the equipment data sheet. The PDS may also include fields for supplier-provided information required as part of the purchaser's technical evaluation. Additional purchaser-supplied documents may also be incorporated or referenced in the PDS to define scope and technical requirements for enquiry and purchase of the equipment.

IOGP S-744L: Information Requirements for Lubrication and Oil-control Systems and Auxiliaries (API)

The IRS defines information requirements for the scope of supply. The IRS includes information content, format, timing and purpose to be provided by the supplier, and may also define specific conditions that invoke the information requirements.

IOGP S-744Q: Quality Requirements for Lubrication and Oil-control Systems and Auxiliaries (API)

The QRS defines quality management system requirements and the proposed extent of purchaser conformity assessment activities for the scope of supply. Purchaser conformity assessment activities are defined through the selection of one of four generic conformity assessment system (CAS) levels on the basis of evaluation of the associated service and supply chain risks. The applicable CAS level is specified by the purchaser in the PDS or in the purchase order.

The specification documents follow the editorial format of API 614 and, where appropriate, the drafting principles and rules of ISO/IEC Directives Part 2.

The PDS and IRS are published as editable documents for the purchaser to specify application specific requirements. The TRS and QRS are fixed documents.

The order of precedence of documents applicable to the supply of the equipment, with the highest authority listed first, shall be as follows:

- a) regulatory requirements;
- b) contract documentation (e.g. purchase order);
- c) purchaser-defined requirements (e.g. PDS, IRS and QRS);
- d) this specification;
- e) API 614.

1 Scope

Add to section

This specification covers the minimum requirements for lubrication systems, oil-control systems and auxiliaries for special-purpose (unsparred equipment in critical service) applications.

Requirements related specifically to oil-film type shaft sealing systems, dry gas seal systems and fuel systems have not been addressed or modified in this specification.

General-purpose lube-oil systems are covered by the system configuration codes in API 614, Table 2 supplemented with the PDS to address API 614 requirements starting with a bullet (●).

2 Normative References

Add to first paragraph

The following documents are referred to in this specification, the PDS (IOGP S-744D) or the IRS (IOGP S-744L) in such a way that some or all of their content constitutes requirements of these specification documents.

Add to section

API Recommended Practice 582, *Welding Guidelines for the Chemical, Oil, and Gas Industries*

ASTM A312/A312M, *Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipes*

ASTM A790/A790M, *Standard Specification for Seamless and Welded Ferritic/Austenitic Stainless Steel Pipe*

ASTM A815/A815M, *Standard Specification for Wrought Ferritic, Ferritic/Austenitic, and Martensitic Stainless Steel Piping Fittings*

EN 13445 (all parts), *Unfired pressure vessels*

IEC 60034-1, *Rotating electrical machines – Part 1: Rating and performance*

IEC 60085, *Electrical insulation – Thermal evaluation and designation*

IOGP S-703, *Supplementary Specification to IEC 60034-1 Low Voltage Three Phase Cage Induction Motors*

IOGP S-705, *Supplementary Specification to API Recommended Practice 582 Welding Guidelines for Welding of Pressure Containing Equipment and Piping*

IOGP S-715, *Supplementary Specification to NORSOK M-501 Coating and Painting for Offshore, Marine Coastal and Subsea Environments*

IOGP S-716:2021, *Specification for Small Bore Tubing and Fittings*

IOGP S-733D, *Procurement Data Sheet for Low Voltage Motors (IEEE Std 841)*

ISO 10474, *Steel and steel products — Inspection documents*

ISO 12944-2, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 2: Classification of environments*

ISO 12944-9, *Paints and varnishes — Corrosion protection of steel structures by protective paint systems — Part 9: Protective paint systems and laboratory performance test methods for offshore and related structures*

NEMA 250, *Enclosures for Electrical Equipment (1000 Volts Maximum)*

NFPA 70, *National Electrical Code*

3 Terms, Definitions, Acronyms, and Abbreviations

3.1 Terms and Definitions

3.1.30

observed

Delete term 3.1.30

3.1.56

witnessed

Replace definition with

Point, in the chain of activities, at which the vendor notifies the purchaser or purchaser's representative before the operation or process.

NOTE The operation or process may proceed without witness if the purchaser does not attend after the agreed notice period.

Add new term 3.1.57

3.1.57

onshore

Inland installations sited more than 1 km (0,6 miles) from shore.

3.2 Acronyms and Abbreviations

Add to section

CAS	conformity assessment system
IRS	information requirements specification
PDS	procurement data sheet
QRS	quality requirements specification
TRS	technical requirements specification

4 System Configuration (How to Use This Standard to Specify an Oil System)

4.8

Replace second sentence with

The lube-oil systems shall conform to the diagrams of typical complete lubrication and control-oil systems provided in Annex H and as listed in Table 2, as a minimum.

6 Design

6.2 System Selection

6.2.8

Replace "the purchaser" with

the vendor having unit responsibility

6.2.13

Delete "If specified,"

Add new section

6.2.13.1

Clearance between the outside rim of a valve handwheel or the end of a valve handle and an obstacle located within the field of travel of the handwheel or the handle shall be at least 75 mm (3 in.).

Add new section

6.2.13.2

For valves installed in ambient temperature applications below 0 °C (32 °F), clearance between insulated valves and other piping items shall be at least 50 mm (2 in.).

Add new section

6.2.13.3

Clearance between the back of the valve handle and insulation on the line shall be at least 75 mm (3 in.).

Add new section

6.2.13.4

Blind flanges heavier than 50 kg (100 lbs) shall be oriented vertically.

Add new section

6.2.13.5

Clearance around automated valve actuators shall be at least 300 mm (12 in.).

Add new section

6.2.13.6

Valve handles in the open position and in the closed position shall be between 150 mm (6 in.) and 1980 mm (6 ft 6 in.) from ground or platform level.

Add new section

6.2.13.7

Junction boxes shall be installed with the horizontal centerline of the box at least 1 m (40 in.) above ground level or above the permanent access platform.

Add new section

6.2.13.8

For equipment that requires removal using mobile hoisting equipment, vertical clearance and access shall be shown on the general arrangement drawing of the lube-oil skid.

Add new section

6.2.13.9

Clearance around components that require access for maintenance and inspection shall be at least 800 mm (30 in.).

Add new section

6.2.13.10

Equipment shall be accessible from ground level or from a permanent platform.

Add new section

6.2.13.11

Permanent access platforms with guardrails shall be supplied complete with the following:

- permanently installed stairs with guardrails; or
- permanently installed ladders with guardrails.

Add new section

6.2.13.12

The horizontal reach to access components from a platform shall be less than or equal to 510 mm (20 in.).

Add new section

6.2.13.13

Drain valve connections shall be provided with clearance for rodding out devices.

Add new section

6.2.13.14

Clearance between the outside surface of the piping insulation system and adjacent equipment or structural members shall be at least 75 mm (3 in.).

Add new section

6.2.13.15 Cleaning and flushing connections

6.2.13.15.1

Cleaning and flushing connections of strainers shall be provided with clearance for rodding out devices and for connections of hoses.

6.2.13.15.2

Cleaning and flushing connections of filters shall be provided with clearance for rodding out devices and for connections of hoses.

Add new section

6.2.13.16

A vertical clearance of at least 150 mm (6 in.) shall be provided between the bottom of the piping flange and the ground level or the top of the floor grating.

Add new section

6.2.25

The manual force required to operate valve handles at the MAWP shall not exceed 360 N (80 lbf).

6.3 Pressure Design Code

6.3.3

Add to section

Vessels smaller than the size and pressure required for a code stamp as per ASME *BPVC*, Section VIII, Division 1 shall be manufactured from piping components.

6.4 Welding

6.4.1

Add new section

6.4.1.1

Welding of pressure-containing parts for downstream applications shall be in accordance with API 582.

Add new section

6.4.1.2

Welding of pressure-containing parts for offshore applications shall be in accordance with IOGP S-705.

6.5 Baseplates

6.5.4

Delete "If specified,"

6.5.5

Delete "If specified,"

6.5.6

6.5.6.3

Replace section with

Permanently attached lifting lugs, pad eyes and trunnions shall pass 100 % radiographic or ultrasonic inspection in accordance with AWS D1.1/D1.1M or an alternative applicable code.

Add to section

Materials in the heat-affected zone that directly attach to lifting lugs, pad eyes and trunnions shall pass 100 % radiographic or ultrasonic inspection in accordance with AWS D1.1/D1.1M or an alternative applicable code.

6.6 Oil Reservoirs

6.6.2 Oil Connections and Internal Piping

6.6.2.10

Delete "If specified,"

6.6.3 Manways and Drains

6.6.3.1

Delete "If specified,"

6.6.3.3

Delete "If specified,"

6.6.4 Features

6.6.4.3

6.6.4.3.1

Delete "If specified,"

6.6.4.5

Delete "If specified,"

6.6.4.6

Delete "If specified,"

6.6.7 Capacity and Configurations

6.6.7.2

Delete section 6.6.7.2

6.6.7.3

Delete section 6.6.7.3

6.6.7.4

Delete "If specified,"

6.6.7.5

Delete "If specified,"

6.6.7.11

Delete "If specified,"

6.6.7.12

Delete "If specified,"

6.6.8 Heating

6.6.8.5

Delete "If specified,"

6.6.8.7

Replace first sentence with

Electric immersion heaters shall be installed for online removal for maintenance without interrupting operation of the oil system.

6.6.8.8

Replace section with

The vendor having unit responsibility shall submit a report that validates the heater capacity to satisfy the heat-up timing requirements specified in 6.6.8.2.2.

6.6.10 Plugged Connections

6.6.10.1

Delete "If specified,"

Add to section

Plugs in reservoir connections shall be made from stainless steel.

6.6.11 Provision for Oil Conditioner

Add new section

6.6.11.4 Permanent or Mobile Oil Conditioner

6.6.11.4.1

If a permanent or mobile oil conditioner is specified, it shall be of filter coalescer or vacuum dehydrator type.

6.6.11.4.2

If a permanent or mobile oil conditioner is specified, it shall have a protective device that prevents loss of lube oil via the oil conditioner system.

6.6.11.4.3

If a permanent or mobile oil conditioner is specified, its capacity shall be at least 1 % of the normal flow rate through the oil reservoir.

6.6.11.4.4

If a permanent or mobile oil conditioner is specified, it shall have connections and accessory equipment to take oil from and return oil to the reservoir at equal flow rates in accordance with 6.6.11.1, 6.6.11.2 and 6.6.11.3.

6.6.13 Special Features

6.6.13.1

Replace section with

If the top of the oil reservoir contains equipment that requires routine operations or maintenance access and is higher than 2 m (6 ft), an accessible ladder with extended handrails shall be provided.

6.6.13.2

Replace section with

If the top of the oil reservoir contains equipment that requires routine operations or maintenance access and is higher than 2 m (6 ft), handrails shall be provided around the perimeter of the reservoir top.

6.6.13.3

Replace section with

If the top of the oil reservoir contains equipment that requires operations or maintenance access, a nonskid surface shall be provided on top of the reservoir.

6.7 Pumps and Pump Drivers

6.7.1

Add to section

Pump casings shall be steel or alloy steel, unless they are submerged.

6.7.1.3

Replace section with

One electric motor-driven standby pump designed for continuous operation shall be provided for start-up and main pump failure backup.

6.7.7

Replace section with

For the main oil pump, the type of pump driver shall be as specified in the pump data sheet.

6.7.18

Delete "If specified,"

6.7.20

6.7.20.1

Replace section with

Oil pump discharge PLVs shall be installed on vendor-supplied piping.

6.7.21

6.7.21.2

Add to section

Oil pump discharge PLVs shall be routed back to the oil reservoir through sight flow indicators.

6.7.22

6.7.22.4

Delete "If specified,"

6.7.22.7

Delete "If specified,"

Add to section

Manual bypass valves shall be of globe type in accordance with Annex C figures.

6.7.23

6.7.23.2

Replace section with

Bypass pressure-regulating valves shall be located downstream of oil coolers and upstream of oil filters.

6.7.28

6.7.28.5

Add to section

The design, location and arrangement of strainers shall permit removal of the internal basket or element without removing the strainer body.

6.7.30

Delete "If specified,"

6.7.41

Delete "If specified,"

Add to section

Couplings shall have a minimum transient torque service factor for induction motor-driven applications of 400 % of driver torque at 1.0 service factor.

6.7.45

6.7.45.1

Add new section

6.7.45.1.7

For offshore and coastal applications, mounting pads for the oil pump and driver shall be of noncorrosive material (i.e. 300 series stainless steel or equivalent).

6.8 Lube-oil Heat Exchangers

6.8.1 General

6.8.1.1

Add to section

For onshore applications, water-cooled heat exchangers shall be used.

6.8.1.2

Delete "If specified,"

6.8.1.15

Delete "If specified,"

6.8.1.15.3

Delete "If specified,"

6.8.1.15.6

Delete "If specified."

6.8.1.20

Delete "If specified."

6.8.1.22

Delete "If specified."

6.8.2 Shell-and-tube Heat Exchangers

6.8.2.4

Delete "If specified."

6.8.2.6

Add new section

6.8.2.6.3

Materials of construction for salt or brackish water cooling service shall be in accordance with Table 12.

Add new Table 12

Table 12—Lube-oil Cooler Materials for Salt or Brackish Water Service

Water Cooled Shell and Tube Heat Exchanger Components	Material ^a	Coating ^b
Shell (cooling media on tube side)	Carbon steel	Yes
Channels and covers	Super duplex or 90-10 Cu-Ni or 70-30 Cu-Ni	No
Tubesheets	Super duplex or 90-10 Cu-Ni or 70-30 Cu-Ni	No
Tubes	Super duplex or 90-10 Cu-Ni or 70-30 Cu-Ni or titanium	No
^a Refer to 6.8.2.6.3.1 to 6.8.2.6.3.6. ^b Refer to IOGP S-715.		

6.8.2.6.3.1

For filtered seawater, 90-10 Cu-Ni shall have a fluid velocity less than or equal to 2.5 m/s (8.3 ft/s).

6.8.2.6.3.2

For filtered seawater, 70-30 Cu-Ni shall have a fluid velocity less than or equal to 3.0 m/s (9.8 ft/s).

6.8.2.6.3.3

Super duplex stainless steel and CuNi parts shall not be mixed.

6.8.2.6.3.4

Super duplex stainless steel shall not be used in non-de-aerated seawater at temperatures above 30 °C (86 °F).

NOTE With crevices and depending on chlorination, this limit can be reduced.

6.8.2.6.3.5

Titanium tubes shall be used in non-de-aerated seawater above 30 °C (86 °F) without a velocity limitation.

6.8.2.6.3.6

Super duplex stainless steel used for filtered chlorinated seawater shall conform to IOGP S-716:2021, Table 2.

6.8.4 Air-cooled Heat Exchangers

6.8.4.4

6.8.4.4.1

Delete "If specified,"

6.8.4.4.5

Delete "If specified,"

Add new section

6.8.4.4.11

U-bends shall not be permitted in air-cooled heat exchangers.

6.9 Filters

6.9.1

6.9.1.8

Delete "If specified,"

6.9.1.10

Delete "If specified,"

6.9.1.12

Delete "If specified,"

Add new section

6.9.1.13

If specified, filter drain connections shall be piped to a convenient location at the skid edge.

6.9.6

Delete "If specified."

6.9.7

Replace list section e) with

- e) The number of filter cartridges in a stack shall be one (i.e. no multi-layer stacking allowed).

Delete list section f)

Add new list section h)

- h) The filter cartridge shall be retained by an internal hold-down mechanism, other than the filter housing cover, with stops.

Add new list section i)

- i) Inlets to filter housings and the fill/equalization line or orifice shall prevent direct impingement of oil jet onto the filter element.

Add new list section j)

- j) Seals or resilient seats for filter elements shall be part of the filter element (i.e. not be on the filter housing or head).

6.10 Transfer Valves

6.10.2

Delete first sentence

Replace second sentence with

Transfer valves shall be two three-way ball valves permanently aligned and joined with a single operating lever.

6.10.6

Delete "If specified."

Add new section

6.10.7

The transfer valve shall include a permanently affixed indication of the equipment in service.

6.11 Accumulators

6.11.1

Add to section

Lube-oil and control-oil systems shall be provided with an accumulator.

6.11.2

Replace section with

If the required accumulator capacity is less than 150 l (40 gal), a bladder-type accumulator shall be provided (see Figure C.18).

6.11.2

Add to section

If the required accumulator capacity exceeds 150 l (40 gal), a direct-contacting-type (i.e. bladderless-type) accumulator shall be provided (see Figure C.19).

6.11.3

Replace section with

Direct-contact-type accumulators shall have a manual pre-charge valve, a check valve and a 100 mesh stainless steel element Y strainer.

6.11.9

Delete "If specified,"

6.11.20

Add new section

6.11.20.1

For systems with motor-driven standby oil pumps, the accumulator shall provide constant lubrication and control-oil pressure for at least 5 seconds.

Add new section

6.11.20.2

For systems where the main equipment drivers are auto-start steam turbines with shaft-driven main oil pumps, the accumulator shall provide constant lubrication and control-oil pressure for at least 15 seconds.

Add new section

6.11.20.3

Direct-contact-type accumulators shall be equipped with flanged opening(s) to permit hand cleaning.

Add new section

6.11.21

A stainless steel nameplate with the following information shall be provided for bladder-type accumulators:

- a) required precharge pressure;
- b) normal operating oil pressure;
- c) MAWP.

6.12 Overhead Tanks

6.12.2 Lube-oil Rundown Tanks

6.12.2.1

Add new section

6.12.2.1.1

The atmospheric tank vent shall have a coarse 1 mm (U.S. Mesh 18) mesh screen.

Add new section

6.12.2.1.2

The atmospheric tank vent shall terminate in the downward facing direction.

Add new section

6.12.2.1.3

The allowable working pressure of atmospheric tanks shall be at least 35 kPag (5 psig).

6.12.2.6

Delete "If specified."

7 Piping

7.1 General

7.1.3

Table 3—Minimum Requirements for Piping Materials—Auxiliary Process Fluid

In sixth row "Flange gaskets", replace first and second paragraphs with

All ANSI piping classes shall have spiral wound gaskets.

Table 5—Minimum Requirements for Piping Materials—Cooling Water

Add to first row "Pipe"

For saltwater or brackish cooling water, super duplex stainless steel piping (ASTM A790/A790M UNS S32750 and UNS S32760) shall be used.

Add to second row "Pipe fitting"

For saltwater or brackish cooling water, the material for fittings shall be as per ASTM A815/A815M UNS S32750 or UNS S32760 Classes WP-S, WP-W and WP-X.

Add to section

Minimum requirements for piping and tubing materials in offshore and coastal locations shall conform to Table 13.

Add new Table 13

Table 13—Minimum Piping and Tubing Materials for Lubricating and Control-oil Systems in Offshore and Coastal Locations

Service	Temperature ^a		Material	Coating ^b
	°C	°F		
Lubricating and control-oil	< 60	< 140	Type 316L stainless steel	Yes
	60 to 120	140 to 248	Type 6 Mo stainless steel	Yes
	> 70	> 158	Super duplex stainless steel (25 % Cr)	Yes (coating under lagging only)
^a These temperatures represent the maximum oil temperature at the maximum ambient plus temperature increase due to heat gained in oil flowing through equipment bearings and any solar gains. ^b Refer to IOGP S-715.				

7.1.6

7.1.6.1

Add new section

7.1.6.1.1

Drain lines shall terminate with an isolation valve.

Add new section

7.1.6.1.2

Headers shall terminate with blind flanges.

7.1.8

Add new list section j)

j) hoses and bellows shall not be used.

7.1.9

Add to section

Blind flanges shall be installed at dead ends of all piping.

7.1.13

Add new section

7.1.13.1

Threaded connections shall not be used, except for instrument connections downstream of the root valve and for tubing systems.

Add new section

7.1.13.2

Tubing fittings shall have rolled threads.

7.1.20

Add new section

7.1.20.1

Tubing compression fittings shall be of two-ferrule design.

Add new section

7.1.20.2

Couplings in tubing systems shall be located at least 1 m (3.28 ft) from high-temperature equipment components such as turbine casings and steam piping.

7.1.21

Replace section with

Tubing size shall not exceed DN 25 (NPS 1).

7.1.25

Replace section with

Tapped openings shall be supplied with threaded, non-seal-welded, round-head, solid stainless steel plugs in accordance with ASME B16.11.

7.1.27

Add to section

Weld neck raised face flanges shall be provided on oil supply piping downstream of the oil filters.

7.1.28

Add new section

7.1.28.1

Flanges and valve internals in contact with oil shall be stainless steel ASTM A312 Type 304 or 316.

Add new section

7.1.28.2

For steam turbine applications, valves downstream of oil filters shall be stainless steel ASTM A312 Type 304 or 316.

7.1.30

Replace section with

Soft-seated-type and wafer-type check valves shall not be used.

7.1.37

Delete "If specified,"

Add new section

7.1.42

Vents to safe locations shall not be manifolded.

Add new section

7.1.43

Cadmium or zinc plated studs, bolts and nuts shall not be used.

Add new section

7.1.44

Valves larger than DN 50 (NPS 2) shall be flanged.

Add new section

7.1.45

Control valves up to DN 25 (NPS 1) in air or inert gas service shall be flanged or threaded.

Add new section

7.1.46

Control valves greater than DN 25 (NPS 1) shall be flanged.

7.2 Lubricating, Control, and Seal-oil Piping

7.2.1

In list section g), replace "have a minimum size of DN 40 (NPS 1 ½)" with

have lube-oil and control-oil drain lines with a line size of DN 50 (NPS 2) or greater

Add new section

7.2.7

For steam turbines supplied without turning gears for cooling down, a car-sealed open isolation valve shall be provided in the oil supply header.

7.3 Instrument Piping and Tubing

7.3.3

Add to section

Instrument tubing and fittings in coastal and offshore environments shall conform to IOGP S-716:2021, Table 2.

7.3.5

Replace section with

Heads of oil-actuated control valves shall be vented back to the oil reservoir through restriction orifices.

7.3.7

Replace second sentence with

Instrument valves shall be stainless steel ASTM A312 Type 304 or 316 with stainless steel stems.

7.3.13

Delete "If specified,"

8 Instrumentation, Control, and Electrical Systems

8.1 General

8.1.4

Replace section with

The instrument and control terminal box material shall be Type 316 stainless steel.

Add to section

Instrument and control terminal boxes shall be of bottom entry design.

Add new section

8.1.11

8.1.11.1

Pneumatic-control valves shall have a filter.

8.1.11.2

Pneumatic-control valves shall have a pressure-reducing valve.

8.1.11.3

Pneumatic-control valves shall have a pressure gauge.

8.1.11.4

The filter body and regulator valve body (or combined filter-regulator body) shall be of metal construction.

8.2 Alarm, Shutdown, and Control Systems

8.2.1 General

8.2.1.1

Delete "If specified,"

8.2.1.3

Add new section

8.2.1.3.1

Shutdown sensing devices shall have isolation valves.

Add new section

8.2.1.3.2

Isolation valves for shutdown sensing devices shall be car sealed in the fully open position.

8.2.1.4

Replace section with

Hand-off-auto (HOA) starting switches that have a facility to be locked in the "off" position shall be provided for pump motors.

8.2.2 Alarm, Shutdown, and Trip Systems

8.2.2.6

8.2.2.6.8

Delete "If specified,"

8.3 Instrumentation

8.3.1 Instrument Installation and Gauge Boards

8.3.1.7

Add to section

Separate junction boxes shall be provided for the following types of systems:

- a) intrinsically safe analogue and digital;
- b) non-intrinsically safe analogue and digital;
- c) instrument power.

8.3.1.11

Add new section

8.3.1.11.1

Nameplates of instruments and switches shall be fixed on or adjacent to the device.

Add new section

8.3.1.11.2

Nameplates of instruments and switches shall show the process identification and service.

Add new section

8.3.1.11.3

Plugs and sockets used for instrument connections shall be labelled with the corresponding instrument identification.

Add new section

8.3.1.16

Instruments shall be pre-wired and terminated in a local terminal box.

Add new section

8.3.1.17

Local display of status and monitoring signals shall be repeated and transferred from the local control panel to the ICSS.

8.3.7 Level Instruments

8.3.7.1

Delete "displacers, floats"

Add new section

8.3.7.3

Level gauge glass shall be tempered borosilicate.

8.3.8 Pressure Indicators

8.3.8.2

Delete "If specified," and "in locations subject to vibration"

8.3.9 Oil Sight Flow Indicators

8.3.9.4

Add new list section g)

g) have positive mechanical flow indication (e.g. paddle wheel, rotating assembly or equivalent designs).

8.3.10 Solenoid Valves

8.3.10.1

Add after "class F insulation"

in accordance with IEC 60085

8.3.11 Pressure-limiting Valves and Pressure Safety Relief Valves

8.3.11.8

Delete "If specified,"

Add new section

8.3.11.11

8.3.11.11.1

PSVs and PLVs shall have isolation valves in the supply and outlet line.

8.3.11.11.2

PSV supply and outlet line isolation valves shall be car sealed in the fully open position.

Add new section

8.3.11.12

PSVs shall be installed in an upright vertical position above the highest oil level in the oil reservoir.

8.3.12 Control Valves and Regulators

Add new section

8.3.12.10

8.3.12.10.1

Control valves shall be supplied with isolation, bleed and bypass valves.

8.3.12.10.2

Bypass valves shall be of globe type as per Annex C figures.

Add new section

8.3.12.11

The control of oil system pressure or level shall be via self-regulating instrumentation.

8.4 Electrical Systems

8.4.7

Add new section

8.4.7.1

Terminal strips shall have block identification markers to indicate polarity and ground connections.

Add new section

8.4.7.2

Wiring at terminal blocks shall be tagged with permanent sleeve-type tags.

8.5 Control Panels

Add new section

8.5.29

Internal control panel wiring shall be run in plastic wire-way or wire ducting.

Add new section

8.6 Grounding

8.6.1

Earth bar ends shall have an earthing termination point.

8.6.2

Earth terminals shall be provided with M10 ($\frac{1}{2}$ in.) brass studs screwed into carbon steel bosses fillet welded to the equipment/structure.

8.6.3

Earthing studs shall be supplied with Type 316 stainless steel vibration-resistant washers and nuts.

9 Inspection, Testing, and Preparation for Shipment

9.2 Inspection

9.2.1 General

9.2.1.3

Delete "If specified,"

9.3 Testing

9.3.2 Hydrostatic Test

9.3.2.2

Replace first sentence with

The assembled and piped oil console or oil console subassemblies, inclusive of instrument tubing and fittings, shall be hydrostatically tested with compatible oil as per 9.3.2.1.

Delete second sentence

9.3.2.6

9.3.2.6.2

Add to section

If leaks or seepage occur, the test shall be repeated with the corrections made to eliminate the observed leaks or seepage.

9.3.3 Operational Tests

9.3.3.1

Add to section

The operational test procedure shall include a marked-up P&ID that indicates the location of temporary jump overs and of test flow and pressure instruments.

9.3.3.4

Delete "If specified," from first sentence

9.3.3.10

Add to list section b)

PLVs shall be demonstrated to lift with an accumulation that does not exceed 110 % of the system design pressure.

Add new list section k)

k) The reservoir shall be drained to the low-level alarm point.

Add new list section l)

l) The filter differential pressure shall be measured and recorded at the minimum oil temperature with the normal system flow and pressure.

9.3.3.12

Delete "If specified."

9.5 Package Markings and Shipping Documentation

9.5.8

Delete "If specified,"

10 Vendor's Data

10.1 General

10.1.2

Replace section with

Proposals, contract documentation and vendor's data content shall be in accordance with IOGP S-744L.

10.2 Documentation

10.2.1

10.2.1.1

Replace section with

The vendor shall complete and forward the supplier's master information schedule to the address noted on the inquiry or order.

10.2.1.2

Replace "form" with

master information schedule

10.4 Contract Data

10.4.3 Technical Data

10.4.3.2

Delete "If specified,"

10.4.4 Progress Reports

Delete "If specified,"

Delete NOTE

10.4.6 Installation, Operation, Maintenance, and Technical Data Manuals

10.4.6.4 Technical Data Manual

10.4.6.4.2

Delete section 10.4.6.4.2

Add new section

10.5 Nameplates and Tagging

10.5.1 Nameplates

10.5.1.1

Nameplates shall be affixed with Type 316 stainless steel rivets or screws.

10.5.1.2

Nameplates shall be Type 316L stainless steel.

10.5.1.3

The nameplate information shall be stamped or engraved.

10.5.2 Tag Plates

10.5.2.1

Tag plates shall be Type 316 stainless steel.

10.5.2.2

Tag plates shall be affixed with Type 316 stainless steel rivets or screws.

10.5.2.3

The tag plate information shall be stamped or engraved.

Bibliography

Add to start of Bibliography

The following documents are informatively cited in the text of this specification, API 614, the PDS (IOGP S-744D) or the IRS (IOGP S-744L).

Add to Bibliography

- [33] API Specification 6D:2021 *, *Specification for Pipeline and Piping Valves*
- [34] API Specification Q2, *Specification for Quality Management System Requirements for Service Supply Organizations for the Petroleum and Natural Gas Industries*
- [35] ASTM E415, *Standard Test Method for Analysis of Carbon and Low-Alloy Steel by Spark Atomic Emission Spectrometry*
- [36] ASTM E1086, *Standard Test Method for Analysis of Austenitic Stainless Steel by Spark Atomic Emission Spectrometry*
- [37] EN 10204, *Metallic products - Types of inspection documents*
- [38] IEC 61355-1, *Classification and designation of documents for plants, systems and equipment – Part 1: Rules and classification tables*
- [39] IEC 60034 (all parts), *Rotating electrical machines*
- [40] IEC 62828-1, *Reference conditions and procedures for testing industrial and process measurement transmitters - Part 1: General procedures for all types of transmitters*
- [41] IEC 61508 (all parts), *Functional safety of electrical/electronic/programmable electronic safety-related systems*
- [42] ISO 3166-1, *Codes for the representation of names of countries and their subdivisions — Part 1: Country code*
- [43] ISO 9001, *Quality management systems — Requirements*
- [44] ISO 10005, *Quality management — Guidelines for quality plans*
- [45] ISO 10209, *Technical product documentation — Vocabulary — Terms relating to technical drawings, product definition and related documentation*
- [46] ISO 10418, *Petroleum and natural gas industries — Offshore production installations — Process safety systems*
- [47] ISO 13880, *Petroleum and natural gas industries — Content and drafting of a technical specification*
- [48] ISO 15664, *Acoustics — Noise control design procedures for open plant*
- [49] ISO/IEC 17000, *Conformity assessment — Vocabulary and general principles*
- [50] ISO/IEC 17025, *General requirements for the competence of testing and calibration laboratories*
- [51] ISO/IEC Directives, Part 2, *Principles and rules for the structure and drafting of ISO and IEC documents*

* Cited in IOGP S-744J only.

Registered Office

City Tower
Level 14
40 Basinghall Street
London EC2V 5DE
United Kingdom
T +44 (0)20 3763 9700
reception@iogp.org

Brussels Office

Avenue de Tervuren 188A
B-1150 Brussels
Belgium
T +32 (0)2 790 7762
reception-europe@iogp.org

Houston Office

15377 Memorial Drive
Suite 250
Houston, TX 77079
USA
T +1 (713) 261 0411
reception-americas@iogp.org

| www.iogp.org

