ISO 18647:2017-08 (E)

Petroleum and natural gas industries - Modular drilling rigs for offshore fixed platforms

Contents

Page

Foreword vi

Introduction vii

1 Scope 1

2 Normative references 1

3 Terms and definitions 2

4 Abbreviated terms 4

5 Overall considerations 6
5.1 General 6
5.2 Functional equipment 6
5.2.1 Hoisting system 6
5.2.2 Rotary system 6
5.2.3 Circulation and solids control systems 6
5.2.4 Power and electrical systems 6
5.2.5 Well control system 7
5.2.6 BOP handling system 7
5.2.7 Cementing system 7
5.2.8 Pipe handling system 7
5.2.9 Instrument communication system 7
5.2.10 Auxiliary system 7
5.3 Layout 7
5.3.1 General 7
5.3.2 Drilling equipment set 8
5.3.3 Drilling support module 8
5.3.4 Drilling utilities 8
5.4 Health and safety considerations 8
5.4.1 General 8
5.4.2 Escape and alarms 8
5.4.3 Hazardous areas and storage of hazardous goods 9
5.4.4 Fire and explosion protection 9
5.4.5 Safety equipment 9
5.5 Operational considerations 9
5.6 Corrosion control 9
5.7 Structural considerations 9
5.8 Removal and abandonment 10

6 Design 10
6.1 General 10
6.2 Rig rating 10
6.3 Drilling equipment set 11
6.3.1 General 11
6.3.2 Derrick/Mast 12
6.3.3 Maximum hook load 12
6.3.4 Drill floor clearance 12
6.3.5 Top drive system 12
6.3.6 Well control equipment 12

6.3.7 BOP handling system 12
6.3.8 Circulation and solids control system 13
6.4 Drilling support equipment 13
6.4.1 Power of the mud pump set 13
6.4.2 Mud tank volume 13
6.4.3 Generator set 13
6.4.4 Electrical equipment and cabling 14
6.4.5 Emergency power supply 14
6.4.6 UPS 14
6.4.7 Fuel tank 14
6.4.8 P-tanks and pipework 14
6.4.9 Auxiliary systems 15
6.4.10 Other requirements 15
6.5 Interfaces 16
6.5.1 Seawater 16
6.5.2 Fresh water 16
6.5.3 Fuel 16
6.5.4 Compressed air 16
6.5.5 Discharge system 16
6.5.6 Electrical interface 16
6.5.7 Instrument communication interface 16
6.5.8 Well control system interface 16
6.5.9 Safety system interface 17
6.5.10 Flowback system interface 17

7 Structural design 17
7.1 General 17
7.2 Structure simulation 17
7.3 Design checks 17
7.4 Material selection 17
7.5 Skid rail strength analysis 17

8 Construction and assembly 17
8.1 General 17
8.2 Planning 18
8.3 Equipment and materials handling 18
8.3.1 Arrival inspection of materials and equipment 18
8.3.2 Storage and tracking of materials and equipment 18
8.4 Structural steelwork fabrication 18
8.4.1 Cylindrical tubular members 18
8.4.2 Non-cylindrical sections 18
8.4.3 Skid rail fabrication 19
8.4.4 Tolerance for skid rail installation 19
8.5 Welding and inspection 19
8.5.1 Basic requirements 19
8.5.2 Visual inspection 20
8.5.3 Non-destructive inspection 20
8.5.4 Additional inspection requirement 21
8.6 Prefabrication and installation of the piping 21
8.7 Outfitting 21
8.7.1 Heat insulating materials 21
8.7.2 Penetrations 21
8.7.3 Fire doors 21
8.7.4 Installation of ladders and guardrails 22
8.8 Corrosion control 22
8.9 Installation of equipment 22
8.9.1 General 22
8.9.2 Hoisting equipment 22
8.9.3 Rotating equipment 22
8.9.4 Circulation and solids control equipment 22
8.9.5 Power and electrical equipment 24

8.9.6 Well control equipment 24
8.9.7 Pipe handling equipment 24
8.9.8 Fire and gas detection equipment 24
8.9.9 Drilling instrument communication system 25
8.9.10 Boiler and steam system 25
8.10 Weighing 25

9 Pre-commissioning 26
9.1 Pre-commissioning scope 26
9.2 Pre-commissioning preparation 26
9.3 Hoisting equipment 27
9.4 Rotating equipment 27
9.5 Circulation and solids control equipment 28
9.6 Power and electrical equipment 28
9.6.1 Diesel generator set 28
9.6.2 Transformer 28
9.6.3 Medium voltage switchboard, low voltage switchboard and motor control centre 29
9.6.4 UPS 29
9.6.5 Electric control system equipment 29
9.7 BOP handling equipment 29
9.8 Cementing equipment 29
9.9 Pipe handling equipment 30
9.10 Fire and gas detection system equipment 30
9.11 Instrument 30
9.11.1 Drilling instrument 30
9.11.2 P-tank instrument 30
9.12 Hydraulic system 31
9.13 Skidding equipment 31
9.14 HVAC equipment 31

10 Installation, hook up and commissioning 31
10.1 Loadout and marine transportation 31
10.2 Installation 32
10.3 Hook up 32
10.3.1 Equipment hook up 32
10.3.2 Piping system hook up 32
10.3.3 Electrical hook up 33
10.4 Commissioning 33
10.4.1 General 33
10.4.2 Preparations before commissioning 33
10.4.3 System function testing 35
10.4.4 System load testing 39

11 Quality control, quality assurance and documents 40

12 In-service inspection and integrity management 40

13 Reuse 41

Annex A (informative) Additional information and guidance 42

Annex B (informative) Guidance for load and resistance factor design/working stress design method 84

Annex C (informative) List of typical fabrication design drawings and documents 91

Annex D (informative) Typical loadout and seafastening design documents 96

Annex E (informative) Typical acceptance report for an MDR on an offshore fixed platform 97

Annex F (informative) Typical completion acceptance document and record for an MDR on an offshore fixed platform 100

Annex G (informative) Typical in-service inspection plan for an MDR on a fixed offshore platform 102

Bibliography 113