

DIN EN ISO 19901-6:2012-03 (E)

Petroleum and natural gas industries - Specific requirements for offshore structures - Part 6: Marine operations (ISO 19901-6:2009 + Cor. 1:2011); English version EN ISO 19901-6:2009 + AC:2011, only on CD-ROM

Inhalt	Seite
Foreword	6
Introduction.....	7
1 Scope	8
2 Normative references	9
3 Terms and definitions	9
4 Symbols and abbreviated terms	22
4.1 Symbols.....	22
4.2 Abbreviated terms	25
5 General considerations.....	27
5.1 Introduction.....	27
5.2 Jurisdiction	28
5.3 HSE plan	29
5.4 Risk management.....	29
5.5 Job safety analysis.....	30
5.6 Environmental impact study	30
5.7 Manning, qualifications, job and safety training	30
5.8 Incident reporting	31
5.9 Personnel tracking	31
5.10 Approval by national authorities	31
6 Organization, documentation and planning	31
6.1 Introduction.....	31
6.2 Organization and communication	31
6.3 Quality assurance and administrative procedures	33
6.4 Technical procedures	33
6.5 Technical documentation	33
6.6 Certification and documentation	36
6.7 Systems and equipment	37
7 Metocean and earthquake requirements	39
7.1 Introduction.....	39
7.2 Weather-restricted/weather-unrestricted operations	40
7.3 Metocean conditions.....	40
7.4 Metocean criteria	42
7.5 Weather windows	43
7.6 Operational duration	44
7.7 Metocean forecast	44
7.8 Earthquake	45
8 Weight control	45
8.1 Introduction.....	45
8.2 Weight control classes	45
8.3 Contingencies for class A	46
8.4 Weight and CoG constraints	46
8.5 Weight control audits.....	46
8.6 Dimensional control	46
9 Stability.....	46

9.1	Introduction	46
9.2	General requirements.....	46
9.3	Stability calculations	47
9.4	Intact stability.....	47
9.5	Damage stability	49
9.6	Single-barge transports	52
9.7	Multi-barge transports.....	52
9.8	Classed vessels	52
9.9	Self-floating structures	52
9.10	Loadout operations	54
9.11	Watertight integrity and temporary closures	55
9.12	Inclining tests.....	55
10	Ballasting operations	56
10.1	Introduction	56
10.2	Ballast system.....	57
10.3	Protection against damage and deterioration	58
10.4	Prevention of progressive flooding in damage condition	59
10.5	Control and indicating systems	59
10.6	Pumps	60
10.7	Valve arrangements.....	60
10.8	Vent systems	60
10.9	Air cushion system capacity	60
10.10	System testing	61
11	Loadout.....	61
11.1	Introduction	61
11.2	Categories of loadout.....	62
11.3	Structure being loaded.....	62
11.4	Site and quay.....	63
11.5	Barge.....	63
11.6	Link beams, skidways and skidshoes	63
11.7	Moorings	64
11.8	Grounded loadouts.....	64
11.9	Pumping and ballasting	65
11.10	Loadouts by trailers, SPMTs or hydraulic skidshoes	67
11.11	Propulsion system design, redundancy and back-up	67
11.12	Float-on onto submersible barges or vessels	69
11.13	Barge reinstatement and sea fastenings	70
11.14	Tugs	70
11.15	Management and organization	71
11.16	Loadout manual	71
12	Transportation.....	71
12.1	Introduction	71
12.2	General considerations.....	71
12.3	Towline pull required, fleet composition and towing arrangement.....	73
12.4	Tow out from dry dock	75
12.5	Inshore tow	77
12.6	Offshore tow.....	77
12.7	Transport by dry tow or onboard a heavy transport vessel.....	78
12.8	Transport manual.....	80
13	Temporary mooring and stationkeeping for marine operations.....	80
13.1	Introduction	80
13.2	Environmental criteria.....	81
13.3	Determination of mooring response.....	82
13.4	Sizing of mooring lines	83
13.5	Sizing of anchors	84
13.6	Sizing of attachments.....	84
13.7	Sizing of mooring line components.....	85
13.8	Clearances under extreme conditions	85
13.9	Tensioning of moorings.....	85
13.10	Other stationkeeping means	86

14	Construction and outfitting afloat	86
14.1	Introduction.....	86
14.2	Structural strength and stresses	87
14.3	Construction spread	88
14.4	Welding.....	89
15	Float-over topsides installation	89
15.1	Introduction.....	89
15.2	Environmental considerations	89
15.3	Structural considerations	89
15.4	Clearances	90
15.5	Guidance systems for topsides set-down	91
15.6	Operational aspects	92
15.7	Float-over manual.....	94
16	Pre-laid mooring including foundation	94
16.1	Introduction.....	94
16.2	Installation planning.....	95
16.3	Fluke anchor installation	97
16.4	Plate anchor installation	98
16.5	Suction anchor installation	98
16.6	Anchor pile installation.....	100
16.7	Gravity anchor installation	101
16.8	Mooring system connectors	102
16.9	Chain.....	102
16.10	Steel wire rope	103
16.11	Synthetic fibre rope.....	104
16.12	TLP tendons.....	105
16.13	Mooring installation manual.....	106
17	Offshore installation operations	106
17.1	Introduction.....	106
17.2	Installation site	106
17.3	Actions on and motions of floating units	106
17.4	Systems and equipment	107
17.5	Launching	107
17.6	Float-off	109
17.7	Upending	110
17.8	Ballasting	111
17.9	Lifting and lowering by external means.....	111
17.10	Lowering by ballasting.....	112
17.11	Precise positioning on the sea floor by active and passive means.....	113
17.12	Skirt penetration	114
17.13	Underbase grouting	115
17.14	Piling	116
17.15	Attachment to pre-laid mooring system	118
17.16	Connection to a tendon system.....	119
17.17	Offshore completion	120
17.18	Installation manual	121
18	Lifting operations	121
18.1	Introduction.....	121
18.2	Rigging geometry	122
18.3	Actions and action effects.....	122
18.4	Strengths of slings, grommets and shackles.....	131
18.5	Design verifications	139
18.6	Lift point design.....	143
18.7	Clearances	144
18.8	Bumpers and guides	146
18.9	Heave compensated lifts	148
18.10	Lifts using DP	148
18.11	Practical considerations	148
18.12	Lifting operation manual.....	149

19	Decommissioning and removal	150
19.1	Introduction	150
19.2	Removal planning	150
19.3	Preparation for removal	153
19.4	Removal	154
19.5	Transportation and disposal	156
19.6	Site clearance	156
Annex A	(informative) Additional information and guidance	157
A.1	General	157
A.2	Guidance for 6.6.2: Required or recommended documentation	157
A.3	Guidance for 11.16: Loadout manual	159
A.4	Guidance for 12.8: Transport manual	161
A.5	Guidance for 17.18: Installation manual	162
A.6	Guidance for 18.8.4: Bumper and guide loads	163
Annex B	(informative) Regional information	167
B.1	Introduction	167
B.2	Canada	167
	Bibliography	171