

Offshore Codes
DNV-OS-E101 (revision)

PROPOSAL
No.: RP 2006-15 Rev.1
Date: 2006-06-28
Dept. sign.:TNCNO726/783
Ref. Sig.: KJEHOG/LTHA

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DRILLING PLANT

Motives

Reason for proposal

The “Drilling Plant” standard is now 5 years old, and a revision of the standard is needed as the industry is moving forward.

Scope of the proposal

There is a substantial amount of changes made to the standard, from editorial changes e.g. correction of “typing errors”, to changes that will have implication on the design of equipment.

Main changes

The highlights are as follows:

- Workover and well intervention equipment is included.
- The requirements for Charpy energy impact values for bolting has been changed.
- BOP accumulator capacity requirements have been clarified.
- The requirements for lifting lugs for maintenance lifting has been modified.
- The requirements for emergency power has been clarified.

Planned date of publication: *October 2006*
Planned entering into force date: *As from date of publication*

*The Offshore Standard DNV-OS-E101 “Drilling plant” is proposed amended as follows.
Only areas where changes are made are shown, where nothing is said in this “change proposal” the text remain as is today.
Existing text is shown in the left hand column and new text is shown in the right hand column.
Comments – in italic font - have been added for clarification.*

CHAPTER - 1

SECTION 1 - GENERAL REQUIREMENTS

Existing text

New text (where changed)

Existing text

New text (where changed)

A General

A 100 Introduction

Existing text

New text (where changed)

104 Table A1

Table A1 DNV Offshore Standards (DNV-OS) and other DNV references	
Reference	Title
DNV-OS-A101	Safety Principles and Arrangement
DNV-OS-B101	Metallic Materials
DNV-OS-C101	Design of Offshore Steel Structures, General (LRFD method)
DNV-OS-C102	Structural Design of Offshore Ships
DNV-OS-C103	Structural Design of Column Stabilised Units (LRFD method)
DNV-OS-C104	Structural Design of Self Elevating Units (LRFD method)
DNV-OS-C105	Structural Design of TLPs (LRFD method)
DNV-OS-C106	Structural Design of Deep Draught Floating Units
DNV-OS-C401	Fabrication and Testing of Offshore Structures
DNV-OS-D301	Fire Protection
DNV-OS-E201	Hydrocarbon Production Plant. (Only applicable for well testing)
<	<<
DNV-OS-A201	Standard Documentation Types
DNV-OS-A202	Documentation of Offshore Projects
<<	>><< Rules for Certification of Lifting Appliances
<<<	>><<<
Standard for Certification No 2.4*	Environmental Test Specification for Instrumentation and Automation Equipment
Standard for Certification No 2.9*	Approval Programme No. 201 - Approval of Hydraulic Cylinders
Classification Note 6.1	Fire Test Methods for Plastic Pipes, Joints and Fittings
Classification Note 30.5	Environmental Conditions and Environmental Loads
Classification Note 45.1	Electromagnetic Compatibility
* Previously called Certification Notes.	

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DNV-OS-C106	Structural Design of Deep Draught Floating Units
DNV-OS-C401	Fabrication and Testing of Offshore Structures
DNV-OS-D301	Fire Protection
DNV-OS-E201	Hydrocarbon Production Plant. (Only applicable for well testing)
<DNV-OS-F201	<<Dynamic Risers
Deleted	Deleted
Deleted	Deleted
<< DNV "Lifting appliances"	>><< Rules for Certification of Lifting Appliances
<<< DNV-RP-A203	>><<< Qualification Procedures for New Technology
Standard for Certification No 2.4*	Environmental Test Specification for Instrumentation and Automation Equipment
Standard for Certification No 2.9*	Approval Programme No. 201 - Approval of Hydraulic Cylinders
Classification Note 6.1	Fire Test Methods for Plastic Pipes, Joints and Fittings
Classification Note 30.5	Environmental Conditions and Environmental Loads
Classification Note 45.1	Electromagnetic Compatibility
* Previously called Certification Notes.	

(No further changes proposed in A General)

Existing text

New text (where changed)

B. Definitions

B 300 Abbreviations

301 Table B1

<

< Add new reference

EUC	Equipment Under Control
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No further changes proposed in B Definitions

C. Normative References

C 100 General

103 Table C1

The existing table is kept with the additions specified:

Marine risers	API Spec 16R	Marine Drilling Riser Couplings
	API RP 16Q	Design, Selection, Operation and Maintenance of Marine Drilling Riser Systems
	API Bul 16J	Comparison of Marine Drilling Riser Analyses
	<	<<

Marine risers	API Spec 16R	Marine Drilling Riser Couplings
	API RP 16Q	Design, Selection, Operation and Maintenance of Marine Drilling Riser Systems
	API Bul 16J	Comparison of Marine Drilling Riser Analyses
	<DNV-OS-F201	<<Dynamic Risers

Pressure vessels, fired units and heat exchangers	TBK 1-2	Generelle regler for trykkbeholdere (General Rules for Pressure Vessels)
	ASME Boiler and Pressure Vessel Code	Section VIII, Division 1 and 2, Rules for Construction of Pressure Vessels
	ASME Boiler and Pressure Vessel Code	Section IV, Heating Boilers
	ASME Boiler and Pressure Vessel Code	Section I, Power Boilers
	< BS 5500	Unfired Fusion Welded Pressure Vessels

In system " Marine Risers" above the following reference and title is added

Pressure vessels, fired units and heat exchangers	TBK 1-2	Generelle regler for trykkbeholdere (General Rules for Pressure Vessels)
	ASME Boiler and Pressure Vessel Code	Section VIII, Division 1 and 2, Rules for Construction of Pressure Vessels
	ASME Boiler and Pressure Vessel Code	Section IV, Heating Boilers
	ASME Boiler and Pressure Vessel Code	Section I, Power Boilers
	< PD 5500	Unfired Fusion Welded Pressure Vessels

Existing text

	BS 5045	Transportable gas containers
	TEMA	Tubular Exchangers Manufacturers Association standards
	API Std 530 <>	Calculation of Heater Tube Thickness in Petroleum Refineries
	DNV	See Table A1

New text (where changed)

	BS 5045	Transportable gas containers
	TEMA	Tubular Exchangers Manufacturers Association standards
	API Std 530 </ ISO 13704 >	Calculation of Heater Tube Thickness in Petroleum Refineries
	DNV	See Table A1

Lifting appliances in general, and lifting appliances for BOP and burner boom.	DNV	< See Table A1
	ILO Form No. CG3	Certificate of test and thorough examination of loose gear

Lifting appliances in general, and lifting appliances for BOP and burner boom.	DNV	< DNV Rules for certification of lifting appliances
	ILO Form No. CG3	Certificate of test and thorough examination of loose gear

<

< *New row inserted between row "lifting appliances..." and "piping"*

Work over and well intervention equipment	ISO 13628-7	Design and operation of subsea production systems - Part 7 Completion/workover riser systems
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Corrosion - hydrogen sulphide	NACE MR0175 <>	Sulphide Stress Cracking Resistant Metallic Material
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Corrosion - hydrogen sulphide	NACE MR0175 </ISO 15156>	Sulphide Stress Cracking Resistant Metallic Material
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Miscellaneous	EEMUA publication 107	Recommendations for the protection of diesel engines for use in zone 2 hazardous areas
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(EEMUA standard is withdrawn, and is deleted)

No further changes proposed in C Normative References

CHAPTER - 2 - TECHNICAL PROVISIONS

SECTION 1 – DESIGN PRINCIPLES

Existing text

New text

A. General

No changes proposed

B. Overall safety principles

No changes proposed

C. Arrangement and layout

No changes proposed

D. Fire and Explosion

No changes proposed

E. Control and Monitoring, system configuration

E 200 Field instrumentation

207 As an example, the output circuits from safety systems being able to shut down the systems given in [Table B1](#) shall be configured as per the principles given in [Table < B2](#).

< E1.

Table B2

< Table B2 Safest conditions and corresponding output circuit configuration			
System	Safest condition in case of failure to the shutdown system		Output circuit configuration ²⁾
	Drilling	Fixed to bottom operations (e.g. well testing)	
Well control system	Operational	Operational ¹⁾	NDE / NDE
Emergency mixing and circulation of drilling fluid	Operational ³⁾	N/A	NDE / -
Main hoisting systems facilitating well disconnection	Operational ⁴⁾	Operational ⁴⁾	NDE / NDE
Heave compensation during fixed to bottom operations	Operational ⁵⁾	Operational ⁵⁾	NDE / NDE
<			
Well testing facilities (blowdown systems)	N/A	Operational	- / NDE
Well testing facilities (excluding/blowdown systems)	N/A	Shutdown	- / NE
Notes:			
1) See well control systems as applicable for well testing. (Last two items of this table.)			
2) See DNV-OS-A101 Sec. 5 for definitions and general requirements.			
3) See Sec.5 G102 for details.			
4) See Sec.5 E203 for details.			
5) See Sec.5 D102 for details.			
NDE = Normally de-energised, NE = Normally energised			

< Table E1

< Table E1 Safest conditions and corresponding output circuit configuration			
System	Safest condition in case of failure to the shutdown system		Output circuit configuration ²⁾
	Drilling	Fixed to bottom operations (e.g. well testing)	
Well control system	Operational	Operational ¹⁾	NDE / NDE
Emergency mixing and circulation of drilling fluid	Operational ³⁾	N/A	NDE / -
Main hoisting systems facilitating well disconnection	Operational ⁴⁾	Operational ⁴⁾	NDE / NDE
Heave compensation during fixed to bottom operations	Operational ⁵⁾	Operational ⁵⁾	NDE / NDE
<i>< (New row inserted)</i>			
Integrated main hoisting and heave compensation systems	Operational ⁵⁾	Operational ⁵⁾	NDE / NDE
Well testing facilities (blowdown systems)	N/A	Operational	- / NDE
Well testing facilities (excluding/blowdown systems)	N/A	Shutdown	- / NE
Notes:			
1) See well control systems as applicable for well testing. (Last two items of this table.)			
2) See DNV-OS-A101 Sec. 5 for definitions and general requirements.			
3) See Sec.5 G102 for details.			
4) See Sec.5 E203 for details.			
5) See Sec.5 D102 for details.			
NDE = Normally de-energised, NE = Normally energised			

No further changes proposed in E Control and monitoring, system configurations

No changes proposed

No changes proposed

F. Design principles, response to failures

G. Design principles, maximum unavailable time

H. Design load conditions

306 Wind loads

.2 Unless otherwise specified, 100-year storm values for the intended geographical location shall be used for evaluation of survival condition.

>

>

Guidance note:

For typical wind speeds ref. DNV-OS-E301 Ch.2 Sec. 1 B300 Wind
---e-n-d---of---G-u-i-d-a-n-c-e---n-o-t-e---

No further changes proposed in CH. 2 Section 1

SECTION 2 – Materials and welding

Existing text

New text

A. General

No changes proposed

B. Specific requirements

B100 General

105

< Materials for piping and pressure retaining components are required to have documented Charpy impact values of minimum 27 J if part of one of the following high pressure piping systems::

- choke and kill system
- high pressure mud system
- well test system
- cement system.

Guidance note:

Recognised piping standards such as ANSI B31.3 is considered not to fully cover the high pressure systems listed above due to special design conditions normally not present in standard process piping, e.g. water hammering effects and choking (Joule Thompson) effects. For such conditions, proper impact properties are considered important.

---e-n-d---of---G-u-i-d-a-n-c-e---n-o-t-e---

>

106 Bolting material documented Charpy impact properties shall be consistent with the system where it is applied, see 104 and Table B1 if applied for structural and mechanical components and 105 if applied in piping and pressure retaining components included in the systems referred to. <

109

Impact test specimens shall be sampled from a location:

- 2 mm below the surface for thickness ≥ 50 mm, or
- $t/4$ for thickness > 50 mm.

< .1

>.2 For drilling and workover risers the following Charpy impact value requirement shall apply:

- For materials with higher yield than 270 MPa the impact energy values (in J) shall be no less than 10% of the yield strength at MDT.

<See also B700

> ≤ 50 mm, or

No further changes proposed in B100

B 700 Bolting material

702

Guidance note:

<Low alloy or alloyed steel is (% Cr + % Mo + % Ni) = 0.50.

--e-n-d---of---G-u-i-d-a-n-c-e---n-o-t-e---

< Low alloy or alloy steels are considered to be those steels where one or more of the elements Cr, Mo and Ni comply with a specified minimum content of 0.40% (Cr), 0.15% (Mo) and 0.40% (Ni), respectively.

<

< *New item*

706 Documentation of Charpy-V notch energy absorption for bolting material used in structural and mechanical components

The assessment of Charpy documentation requirements shall be based on:

- nature of external loading and the resulting stress level in bolt, as a combination of tension, pressure and shear stress.
- whether the bolt is a primary load bearing element, or only considered as part of a connection clamping parts in place.
- consequences of failure.

Table B3				
Documentation requirements for bolts produced from low alloy or alloyed steel:				
<i>Cat.</i>	<i>Load condition</i>	<i>> 0°C</i>	<i>0°C -20°C</i>	<i>< -20°C^{*1}</i>
A	No tension from external load. Connection relying on friction	2.2 certificate	2.2 certificate	3.1. certificate
B	Tension from external load is considered secondary and small compared to the bolts capacity. Some redundancy required, e.g. no single point of failure of bolt shall cause risk of failure of the structure.	2.2 certificate	2.2 certificate	3.1. certificate Certificate to show compliance with Charpy values in Table B1.
C	Bolts subject to external load in non-redundant application e.g. slewing ring bolts on cranes.	3.1 certificate	3.1.certificate Charpy impact / fracture mechanic properties to be consistent with the system where it is applied.	3.2 certificate Charpy impact properties to be consistent with the system where it is applied.
	All Bolts are as a minimum to be in accordance with ISO 898-1. Specific impact test requirements apply for some categories as indicated above. Certificates to be according to EN 10204, October 2004			
<p>^{*1} Bolts intended for use below -20C to be subject to special consideration. In general, bolts intended for temperatures below – 20°C should be of austenitic stainless steel or equivalent. Impact tests of bolts with austenitic stainless steel are normally not required. See B 108.</p> <p>Bolts with diameter less than 16mm shall not be used for load bearing purposes in structure considered as special and primary.</p>				

C. Corrosion

No changes proposed

D. Material Certificates

D100 General

101

< ~~Guidance note:~~

~~3.1b according to EN 10204 or equivalent.~~

~~Bolting material is normally accepted based on documentation of typical values, i.e. 2.2 according to EN 10204 or equivalent.~~

~~---e-n-d---o-f---G-u-i-d-a-n-c-e---n-o-t-e---~~

101

< **Guidance note:**

3.1 according to EN 10204 or equivalent.

For bolting material reference is made to **B706**.

~~---e-n-d---o-f---G-u-i-d-a-n-c-e---n-o-t-e---~~

No further changes proposed in Ch. 2 Section 1

SECTION 3 – PIPING

Existing text

New text

A. General

No change in this sub-section

B. Piping Design

B100.....through.....B200

No change proposed in these sub-section elements

B300 Flexible piping

301.....through.....306

No change

~~307 < Flexible hoses and non-metallic expansion joints for hydrocarbon systems shall qualify a fire endurance test according to Classification Note No. 6.1 (test method B) or equivalent. The flexible hose shall maintain integrity and functional properties for the same period as required for the total piping system and components.~~

< Flexible hoses and non-metallic expansion joints for flammable fluids systems have to qualify a fire endurance test according to IMO Res. A.753(18) or equivalent. The flexible hose has to maintain its integrity and functional properties for the same period as required for the total piping system and components. Ref. also DNV-OS-D101 Ch.2 Sec.2 B500.

No further changes proposed in Ch.2 Sec.3

SECTION 4 – ELECTRICAL, INSTRUMENTATION, CONTROL AND MONITORING SYSTEMS AND COMPONENTS

Existing text

New text

A. General

No changes proposed

B. Electrical systems and components

<

New item

< **104** For dynamically positioned drilling units the following shall apply:

- The drilling plant shall have the possibility to receive power from redundant and independent power sources.
- The load shedding system shall be designed to ensure that the in case of reduced power output from the generators, the drilling plant has enough available power to perform emergency operations as specified in 105.

<

New item

< **105** In case of main power failure it shall be possible to secure the well using emergency power. It shall be possible to perform the following functions on emergency power in relevant combinations:

- Mix, transfer and circulate drilling fluids (ref. Ch. 2. Sec. 5 G102)
- Recharge BOP control system accumulators
- If the BOP has only one shear ram, not capable of shearing tool joint and sealing the well, it shall be possible to hoist and lower the main hoisting system to be able to shear the work-string (ref. Ch.2 Sec.5 C201 .3)
- Adjust riser tension and heave compensation system

No further changes proposed in B100

C. Instrumentation, control and monitoring systems

No changes proposed

D. System design, general requirements

No changes proposed

E. Computer based systems, general requirements

No changes proposed

F. System design, System elements

F 400 Safety

402

When the safety system element stops an < EUC, the EUC shall not start again automatically.

< Equipment Under Control (EUC),

No further changes proposed in Ch. 2 Section 4

SECTION 5 – DRILLING SYSTEMS AND EQUIPMENT

Existing text

New text

A. General

A400 Hydraulic and pneumatic systems

401

<

<

New item

- .14 Hydraulic cylinders for lifting or other critical purposes shall be in compliance with Standard for Certification 2.9 Type approval program 5-778.93 "Hydraulic Cylinder" with the following addition: The Charpy impact requirements specified in OS-E101 Sec. 2, table B1 shall apply.

No further changes proposed in A 400

A 600 Emergency stops

601 Emergency stops shall be located at convenient locations on machinery for immediate use by personnel in the event of a hazardous situation occurring.

Guidance note:

~~Emergency stops shall be located at convenient locations on machinery for immediate use by personnel in the event of a hazardous situation occurring.~~

~~The requirement of emergency stop does not apply for machinery requiring continuous operation (R0 and R1) during defined operational modes.~~

~~—e-n-d-o-f-G-u-i-d-a-n-c-e-n-o-t-e-->~~

(Guidance note deleted)

No further changes proposed in A 600

B. Drilling related structures

B 100 General

104

For structures such as derrick, flare boom, BOP frames etc. the Charpy V-notch requirements given in *Rules for Certification of Lifting Appliances* shall apply.

~~However, the impact energy requirement need not be higher than the value given in [Sec.2](#).~~

Partially deleted

Existing text

New text

No further changes proposed in B 100

B600 Lifting of equipment

Existing text

New text

606 *Skids and lifting brackets intended for regular lifting*

.1 Skids and lifting brackets intended for regular lifting (including maintenance lifting) shall be provided with proper certification.

Guidance note:

ILO Form No. CG3 > is one scheme in accordance with international regulations, see e.g. Rules >, or equivalent, for Certification of Lifting Appliances for further details.

---e-n-d---of---G-u-i-d-a-n-c-e---n-o-t-e---

<

< For lifting brackets used for handling and maintenance lifting only the following approach may be used as an alternative:

i. Design factors:

a. For single point lifting brackets and skids the safety factor (SF) should be 5 against yield, and if not otherwise specified the dynamic factor should be taken as 1.5 (Giving a design factor (DF) of 7.5)

b. For multi point lifting brackets and skids the safety factor (SF) should be 3 against yield, and if not otherwise specified the dynamic factor should be taken as 1.5 (Giving a design factor (DF) of 4.5)

c. The lifting brackets shall be designed using the highest anticipated load from skew loading. The calculations shall also include the sling leg angle from vertical.

ii. The lifting brackets shall NOT be marked with SWL, but shall be marked with “Used for handling / maintenance lifting only. Bracket X of Y” (Where X is the bracket nr, and Y is the total number of lifting brackets used to perform the lifting operation.) Where multi point lifting is required it should be marked or otherwise clearly stated the max. allowed sling leg angle from vertical.

Guidance note:

If the above requirements are followed, and material properties and NDE is performed in accordance with the rules, it is not required to perform overload testing of the lifting brackets. Furthermore the brackets will be subject to renewal surveys only, i.e. it will not be required to perform annual surveys in accordance with lifting codes.

---e-n-d---of---G-u-i-d-a-n-c-e---n-o-t-e--- >

No further changes proposed in 606

No further changes proposed in B 600

Existing text

New text

C. Well control systems

C 100 General

103 The blowout preventer shall in general consist of the following, as a minimum:

- a BOP stack consisting of:
 - one bag-type or annular preventer
 - one blind ~~or~~ shear ram
 - two pipe rams
- necessary control equipment as stated in 204 and 300
- riser connector (LMRP, for floating installations only)
- wellhead connector

Partially deleted (errata)

C 200 Blowout prevention

201 Blowout preventer stack

.3 The shear rams shall be capable of shearing the thickest section of the heaviest drillpipe <, casing
< or landing string shear sub specified for use with the blowout preventers. If tool joints
can not be sheared, either 2 shear rams must be installed, or lifting or lowering of main
hoisting system shall be possible in all operational modes, including emergency operation.

204 Control and monitoring, blowout prevention

.11 The closing unit accumulators for surface and subsea BOPs shall as a minimum
meet the capacity requirements (volume and pressure) of API Spec 16D <.

< with the following addition: The accumulator capacity requirement shall be based on
the 4 larger rams (and not the 4 smaller rams as specified in API Spec 16D).

No further changes proposed in C 200

C 500 Marine riser system

Existing text

New text

501 Marine risers shall be designed to withstand applicable combined design loads for the application in the required water depth.

Guidance note:

Relevant loads to evaluate include:

- waves
- current
- riser tensional loads
- vessel motion
- drilling fluid specific gravity (SG)
- collapse pressure
- handling loads.

See < API RP 16Q or equivalent for further guidance.

---e-n-d---of---G-u-i-d-a-n-c-e---n-o-t-e---

< DNV OS-F201,

D. Heave compensation and tensioning system

No changes proposed in D

E. Hoisting and rotating systems

E 100 General

104 Brakes relying on mechanical friction shall be properly shielded against possible dirt or spillage which may affect the performance of the brakes.

Guidance note added

<

< Guidance note:

For brake discs there shall also be a protection against spillage of oil from the brake callipers onto the brake disc.

---e-n-d---of---G-u-i-d-a-n-c-e---n-o-t-e---

No further changes proposed in E 100

E 200 Hoisting system

Existing text

New text

210 Control and monitoring, hoisting system

.3 For automatic hoisting operation, any system failure shall initiate alarm and automatically return to the fail-safe mode relevant for each particular mode of operation.

<

<Where braking is the fail state both primary and secondary brakes shall be activated.

Guidance note:

Examples

Tripping of el-motors caused by heat, overload etc. shall automatically activate brakes.

---e-n-d---of---G-u-i-d-a-n-c-e---n-o-t-e---

.5 The hoisting system shall be equipped with a readily identifiable and accessible emergency stop device for use in the event of main brake failure. The emergency stop device shall be independent of the control system and have functional capabilities to both stop and safely lower the load in the event of main brake failure.

<<

<< Guidance note:

If the draw-work is equipped with an electro magnetic brake system (Elmagco brake) the activation of the emergency stop shall also be hardwired to activate the electromagnetic brake at full power. To avoid overheating the coils it will be permissible to include a timer that releases the electromagnetic brake after a given time.

---e-n-d---of---G-u-i-d-a-n-c-e---n-o-t-e---

<<<>

<<<.8 Maximum expected dynamic loads when brakes are activated shall be identified and be used for dimensioning of hoisting system and the derrick.

No further changes proposed in E

F. BOP and pipe handling

F 100 General

Existing text

New text

F 105 Magnets

~~.4 > To ensure proper contact with the pipe lifted, lifting magnets shall be hinged to the yoke or element to which they are attached, and alignment of magnets shall be ensured.
.5 Battery back up shall be provided where necessary and alarm shall be initiated upon loss of back-up power.~~

.4 > Battery back-up shall be provided where necessary and alarm shall be initiated upon loss of back-up power.

(.5 index deleted, text new bullet .4)

No further changes proposed in F

No changes proposed in G

No changes proposed in H

G. Bulk storage, Drilling fluid circulation and mixing and cementing

H. Well testing and associated well control system

I. Other systems

I 300 Man riding equipment

I 304 Arrangement

<

I 304 Arrangement

New item

<.4 Man riding winches shall have a maximum SWL of 150kg.

I 305 Drum

~~.1 Spooling apparatus or clamp roller shall be fitted as necessary to ensure satisfactory spooling of wire rope and to prevent derailing of wire rope.~~

Partially deleted

I 307 Additional requirements for casing stabbing boards

<

New item

<.4 Means of safe return of personnel by override of local control from a remote operating position shall be installed.

<

New heading & text

< J. Workover and well intervention equipment and systems.

Existing text

New text

<

< J 100 General

101 For general requirements to workover and well intervention equipment end systems reference is made to DNV-OSS-101 Section 3.

102 The systems or components as described in F shall be regarded as essential.

No further changes proposed in Ch. 2 Sec. 5

SECTION 6 – MANUFACTURE, WORKMANSHIP AND TESTING

Existing text

New text

A. General

No changes proposed in A

B. Manufacture

No changes proposed in B

C. Non-destructive testing

C100 General

101.....through....107

No change proposed

<

< **108** NDE procedures and acceptance criteria should be according to DNV-OS-C401.

C200 Derrick, flare booms and BOP handling

No change proposed in this sub-section element

D. Testing

D100 Testing of weld samples

No change in this sub-section element

D 200 Pressure testing

201.....

No change

Existing text

New text

202 The test pressure shall be determined by the working pressure.
This shall be minimum 1.5 x maximum working pressure if not otherwise specified in applied codes and standards.

Guidance note:

This requirement may be waived for small bore piping for instrumentation etc. where justified and reviewed on a case-by-case basis. Aspects to consider are maximum operating pressure compared to design pressure, and experience with workmanship.

< ---e-n-d---of---G-u-i-d-a-n-c-e---n-o-t-e---

203.....through....205

D300 Load testing

301.....

302

Table D1 Test load for lifting appliances	
<i>SWL</i>	<i>Test load</i>
SWL ≤ 20 t	1.25 x SWL
20 t < SWL ≤ 50 t	SWL + 5 t
> 50 t	1.1 x SWL
<<	>>

<For hydraulic piping systems the test pressure need not exceed working pressure by more than 70 bar.

No change

No change

302

Table D1 Test load for lifting appliances	
<i>SWL</i>	<i>Test load</i>
SWL ≤ 20 t	1.25 x SWL
20 t < SWL ≤ 50 t	SWL + 5 t
> 50 t	1.1 x SWL
<<Man riding equipment	>>2 x SWL

No further changes proposed in Ch. 2 Sec. 6

CHAPTER - 3 - CERTIFICATION AND CLASSIFICATION

SECTION 1 – INTRODUCTION

Existing text

New text

A. General

A 300 Certification and classification principles

301 Drilling plants will be certified or classified based on the following main activities:

- design verification
 - < equipment certification
 - survey during construction and installation
 - survey during commissioning and start up. >
- < fabrication survey and equipment certification
 - survey during installation and commissioning >

SECTION 2 – DOCUMENTATION REQUIREMENTS

Existing text

New text

A. General

A100 General

101 For documentation requirements, see < ~~DNV-RP-A202, system 430~~ - "Drilling".

< Nauticus CIBS Documentation requirements, System 1200 - "Drilling and well intervention".

~~**103** For definition of applicable standard documentation types, see DNV-RP-A201.~~

(Deleted)

No further changes proposed in Ch. 3 Sec. 2

SECTION 3 – SYSTEM AND EQUIPMENT CERTIFICATION

Existing text

New text

A. General

A 300 Certification and classification principles

304 Categorisation of relevant systems and equipment is given in [Table A1](#) to [Table A11](#).

A12.

Table A1 Categories for drilling systems and equipment			
Relevant text	Material or equipment	DNV approval categories	
		I	II
Drilling structures (CIBS 434)			

Table A1 Categories for drilling systems and equipment			
Relevant text	Material or equipment	DNV approval categories	
		I	II
Drilling structures (CIBS <1210)			

304

Table A2 Categories for drilling systems and equipment			
Relevant text	Material or equipment	DNV approval categories	
		I	II
Well control systems (CIBS 432)			

304

Table A2 Categories for drilling systems and equipment			
Relevant text	Material or equipment	DNV approval categories	
		I	II
Well control systems (CIBS <1220)			

304

Table A3 Categories for drilling systems and equipment			
Relevant text	Material or equipment	DNV approval categories	
		I	II
Heave compensation and tensioning system (CIBS 433)			

304

Table A3 Categories for drilling systems and equipment			
Relevant text	Material or equipment	DNV approval categories	
		I	II
Heave compensation and tensioning system (CIBS <1230)			

Existing text

New text

304

Table A4 Categories for drilling systems and equipment			
Relevant text	Material or equipment	DNV approval categories	
		I	II
Hoisting and rotating systems (CIBS <434)			

304

Table A4 Categories for drilling systems and equipment			
Relevant text	Material or equipment	DNV approval categories	
		I	II
Hoisting and rotating systems (CIBS <1240)			

304

Table A5 Categories for drilling systems and equipment			
Relevant text	Material or equipment	DNV approval categories	
		I	II
BOP and pipe handling (CIBS <435)			

304

Table A5 Categories for drilling systems and equipment			
Relevant text	Material or equipment	DNV approval categories	
		I	II
BOP and pipe handling (CIBS <1250)			

304

Table A6 Categories for drilling systems and equipment			
Relevant text	Material or equipment	DNV approval categories	
		I	II
Bulk storage, drilling fluid circulation mixing and cementing (CIBS <436)			

304

Table A6 Categories for drilling systems and equipment			
Relevant text	Material or equipment	DNV approval categories	
		I	II
Bulk storage, drilling fluid circulation mixing and cementing (CIBS <1260)			

304

Table A7 Categories for drilling systems and equipment			
Relevant text	Material or equipment	DNV approval categories	
		I	II
Well test systems (CIBS <437)			

304

Table A7 Categories for drilling systems and equipment			
Relevant text	Material or equipment	DNV approval categories	
		I	II
Well test systems (CIBS <1270)			

Existing text

New text

304

Table A8 Categories for drilling systems and equipment			
Relevant text	Material or equipment	DNV approval categories	
		I	II
Other systems <(CIBS 439)>			
Winches	Winches for lifting purposes	X	
	Winches for non-lifting purposes		X

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Table A8 Categories for drilling systems and equipment			
Relevant text	Material or equipment	DNV approval categories	
		I	II
Other systems <deleted >			
Winches	Winches for >lifting purposes	X	
	Winches for non-lifting purposes		X

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Table A10 Categories for pressure vessels			
Relevant text	Material or equipment	DNV approval categories	
		I	II
Pressure vessels for	Poisonous liquids	X	
	Liquids with flash point below 100θ °C	X	
	Liquids with temperature above 220θ °C	X	
	Compressed gases, where pressure x volume (P x V) is above 1.5, where pressure (P) is in bar and volume (V) is in m ³	X	
Other <>	Pressure vessels that are not included in category I		X

304

Table A10 Categories for pressure vessels			
Relevant text	Material or equipment	DNV approval categories	
		I	II
Pressure vessels for	Poisonous liquids	X	
	Liquids with flash point below 100errata °C	X	
	Liquids with temperature above 220errata °C	X	
	Compressed gases, where pressure x volume (P x V) is above 1.5, where pressure (P) is in bar and volume (V) is in m ³	X	
Other	Pressure vessels that are not included in category I		X
< Cylinders	Cylinders for lifting purposes	X	
	Cylinders for non-lifting purposes		X >

2rows added above

304

<

New table A12

< Table A12 Categories for Workover and Well intervention systems and equipment			
<i>Relevant text</i>	<i>Material or equipment</i>	<i>DNV approval categories</i>	
		<i>I</i>	<i>II</i>
Wire Line	Wire line unit including power pack	X	
	Subsea wire line lubricator assembly	X	
	Wire line BOP	X	
	Grease injection skid for braided line and stuffing box for slick line	X	
	Line pressure control head	X	
	Wire line winch	X	
	Skids or carriers for handling of equipment	X	
	Umbilicals for subsea controls	X	
	Downhole tools including depth and weight indicator system	X	
Coiled tubing	Subsea coiled tubing lubricator	X	
	Coiled tubing BOP	X	
	Riser	X	
	Coiled tubing reel	X	
	Injector head	X	
	Coiled tubing	X	
Snubbing equipment	Jack	X	
	Guide tubing system	X	
	Circulating swivel	X	
General system and equipment	Surface flow tree including tension frame	X	
	Workover riser (mono or dual bore)	X	
	Lifting tower and well-servicing derrick	X	
	Lifting equipment	X	
	Skids or carriers for handling of equipment	X	
	High pressure pumping facilities (cement, well stimulation fluids, nitrogen)	X	
	Hydrocarbon handling	X	
	Emergency Disconnect Package (EDP)	X	
	Lower Riser Package (LRP)	X	
	Umbilicals for subsea controls	X	
Downhole tools including depth and weight indicator system.	X		
Control systems shall be considered according to table A11			

No further changes proposed in A

No changes proposed in B

B. Fabrication record

C. Documentation deliverables for certification of equipment

C 100 General

101 The following documentation will normally be issued by DNV for equipment and systems covered by certification activities (CMC):

a) Design verification report, (DVR)

- DVR will be issued by the design approval responsible for all equipment of category I, unless covered by a valid type approval certificate.
- In addition to each individual equipment, DVRs shall be issued for each system < (including control systems) < not covered by plan approval.

The DVR shall contain all information needed to be followed up by the surveyor attending fabrication survey and installation of the equipment, and as a minimum include:

- design codes and standards used for design verification
- design specification (e.g. temperature, pressure, SWL, etc.)
- follow-up comments related to e.g. testing, fabrication and installation of the equipment or system.

An approval letter may be issued instead of a DVR, however such a letter shall as a minimum contain the same information as listed above.

b) Inspection release note, (IRN)

- An IRN shall only be issued if the component is delivered prior to issuance of final product certificate (PC). A final PC shall not be issued if there are non-conformances to the equipment or system. The IRN shall be used with detailed description of the non-conformances, and shall always be replaced by a certificate when all non-conformances are closed.

c) Product certificate, (PC)

- PC should be issued for all category I equipment <<or systems <<and <> <(including control systems)>
- PC will be issued upon successful completion of design verification, fabrication survey and review of final documentation. As stated above, PC can not be issued if design verification or non-conformances are outstanding.

d) Survey report

- Survey report shall be issued for all category I equipment or systems <> upon satisfactory installation, survey and testing onboard. < (including control systems)>

A survey report may cover several systems or equipment installed. The survey report shall contain clear references to all DVRs and PCs on which the survey report is based, and shall state testing and survey carried out..

No further changes proposed in C

No further changes proposed in Sec. 3

End