RUSSIAN MARITIME REGISTER OF SHIPPING

CIRCULAR LETTER **No. 391-06-1216c** dated 12.04.2019

Re:

amendments to the Rules for the Classification and Construction of Subsea Pipelines, 2017, ND No. 2-020301-005-E

Item(s) of supervision:

subsea pipelines, risers

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Appendices:

Appendix 1: information on amendments introduced by the Circular Letter

Appendix 2: text of amendments to Parts I "Subsea Pipelines" and II "Risers"

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Text of CL:

We hereby inform that based on the results of the scientific research, 2017 – 2018, and experience of technical supervision during design, construction and operation of subsea pipelines, the Rules for the Classification and Construction of Subsea Pipelines shall be amended as specified in Appendix 2 to the Circular Letter. The above amendments will be introduced into the Rules at their re-publication.

It is necessary to do the following:

1. Bring the content of the Circular Letter to the notice of RS surveyors and interested persons in the area of RS Branch Offices' activity.

2. Apply provisions of the Circular Letter.

List of the amended and/or introduced paras/chapters/sections

Part I: paras 1.1.1, 1.2, Table 1.3.3, paras 1.4.5.5, 1.5.16, 4.3.8.3.4, Table 4.3.9.1, paras 4.5.3.2, 6.1.7, 6.2.2.2, 6.2.2.3, Table 7.4.3.3, paras 8.2.1.12, 8.2.3, 8.2.4, 8.5.3, 8.5.4.4, 8.5.5.6, 8.6.1.3, 8.6.2.1, 8.6.9

Part II: para 1.3.3, 6.10

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Appendix 1 to Circular Letter
No. 391-06-1216c dated 12.04.2019

Information on amendments introduced by the Circular Letter
(for inclusion in the Revision History to the RS Publication)

Nos.	Amended paras/chapters/sections	Information on amendments	Number and date of the Circular Letter	Entry-into-force date
1	Part I, para 1.1.1	Type of transported media has been specified. Reference to the cancelled RS normative document has been deleted	391-06-1216c of 12.04.2019	12.04.2019
2	Part I, para 1.2	Definitions "Subsea pipeline", "Pipeline construction", "Transported media", "Pipe-layer" have been specified	391-06-1216c of 12.04.2019	12.04.2019
3	Part I, Table 1.3.3	Type of transported media has been specified	391-06-1216c of 12.04.2019	12.04.2019
4	Part I, para 1.4.5.5	List of conditions when the Classification Certificate becomes invalid has been specified	391-06-1216c of 12.04.2019	12.04.2019
5	Part I, para 1.5.16	Reference to the Rules for Technical Supervision during Construction of Ships and Manufacture of Materials and Products for Ships and name of Certificate as per form 6.8.5 have been specified	391-06-1216c of 12.04.2019	12.04.2019
6	Part I, para 4.3.8.3.4	Requirements for acceptance criteria of ultrasonic testing have been specified	391-06-1216c of 12.04.2019	12.04.2019
7	Part I, Table 4.3.9.1	Requirements for type of transported media have been specified	391-06-1216c of 12.04.2019	12.04.2019
8	Part I, para 4.5.3.2	Chapter has been supplemented with the requirements for mechanical properties of the base metal and metal of pipe welded joints	391-06-1216c of 12.04.2019	12.04.2019
9	Part I, para 6.1.7	Formula (6.1.7) has been specified	391-06-1216c of 12.04.2019	12.04.2019
10	Part I, para 6.2.2.2	Requirements for raw materials for concrete manufacture have been specified	391-06-1216c of 12.04.2019	12.04.2019
11	Part I, para 6.2.2.3	Requirements for concrete aggregates have been specified	391-06-1216c of 12.04.2019	12.04.2019

12	Part I, Table 7.4.3.3	Design parameters for galvanic anodes have been specified	391-06-1216c of 12.04.2019	12.04.2019
13	Part I, para 8.2.1.12	Requirements for subsea pipeline crossings have been specified	391-06-1216c of 12.04.2019	12.04.2019
14	Part I, para 8.2.3	Requirements for subsea pipeline crossings including by electrical cables have been introduced	391-06-1216c of 12.04.2019	12.04.2019
15	Part I, para 8.2.4	Requirements for subsea pipeline crossings with the shoreline have been introduced	391-06-1216c of 12.04.2019	12.04.2019
16	Part I, para 8.5.3	Process flow scheme of pipeline laying has been specified	391-06-1216c of 12.04.2019	12.04.2019
17	Part I, para 8.5.4.4	Requirements for pipeline pulling winches have been introduced	391-06-1216c of 12.04.2019	12.04.2019
18	Part I, para 8.5.5.6	Requirements for pipeline pulling winches have been introduced	391-06-1216c of 12.04.2019	12.04.2019
19	Part I, para 8.6.1.3	Chapter has been supplemented with the requirements for subsea pipeline pressure testing	391-06-1216c of 12.04.2019	12.04.2019
20	Part I, para 8.6.2.1	Data to be contained in operation manual has been specified	391-06-1216c of 12.04.2019	12.04.2019
21	Part I, para 8.6.9	Para heading has been specified	391-06-1216c of 12.04.2019	12.04.2019
22	Part II, para 1.3.3.2	Type of transported media has been specified	391-06-1216c of 12.04.2019	12.04.2019
23	Part II, para 6.10	Data to be contained in operation manual has been specified	391-06-1216c of 12.04.2019	12.04.2019

RULES FOR THE CLASSIFICATION AND CONSTRUCTION OF SUBSEA PIPELINES, 2017, ND No. 2-020301-005-E

PART I. SUBSEA PIPELINES

1 GENERAL

1.1 SCOPE OF APPLICATION

1 **Para 1.1.1** is replaced by the following text:

"**1.1.1** Requirements of the present Part of the Rules for the Classification and Construction of Subsea Pipelines (hereinafter referred to as "the SP Rules") cover the pipelines designed, constructed and operated offshore, subsea crossings of sections of shore main pipelines to the isolation valves nearest to the shoreline conveying liquid, gaseous and multi-phase hydrocarbons as well as other media capable of being transported through the pipelines.

In addition to the SP Rules during performance of the technical supervision Russian Maritime Register of Shipping (hereinafter referred to as "the Register") also applies the Guidelines on Technical Supervision during Construction and Operation of Subsea Pipelines (hereinafter referred to as "the SP Guidelines"), the standards and rules of the national technical supervisory bodies.".

1.2 TERMS AND DEFINITIONS

2 Definition "Subsea pipeline" is replaced by the following text:

"Subsea pipeline means the part of the pipeline transporting system, which is located below the water level, including the pipeline itself with protective coatings, technical devices and equipment providing transportation of media under given operational conditions including:

infield pipeline means a pipeline between the offshore facilities including fixed offshore platforms and/or subsea production systems (SPS);

interfield pipeline means a pipeline between the offshore facilities of various fields;

offloading pipeline means a pipeline to transport products from the onshore or offshore facilities to the export terminal/quay;

export pipeline means a pipeline to transport products from the offshore facilities to onshore facilities;

subsea section of main pipeline means a section of the main pipeline laid across the sea water area.".

3 Definition "Pipeline construction" is replaced by the following text:

"Pipeline construction means a set of operations related to manufacture, laying, burial/backfilling (if applicable), connection and testing of a subsea pipeline.".

4 Definition "Transported media" is replaced by the following text:

"Transported media means liquid, gaseous and multi-phase hydrocarbon flows and other media capable of being conveyed through pipelines. Depending on transported medium, subsea pipelines are subdivided as follows:

gas pipeline means a pipeline intended for gas transportation;

oil pipeline means a pipeline intended for degassed oil transportation;

multi-phase pipeline means a pipeline intended for wellstream transportation (liquid and gaseous hydrocarbon phase, water fraction, e.g. aqueous solution of hydrate formation inhibitor);

gas-lift pipeline means a pipeline to transport gas intended for gas-lift operation of oil wells;

water pipeline means a pipeline to transport water intended for injection.".

5 Definition "Pipe-layer (pipe-laying vessel/barge)" is replaced by the following text:

"Pipe-layer means the special purpose vessel/barge intended for laying of subsea pipelines.".

6 **Table 1.3.3**. The header of the table is replaced by the following:

"

Operational reliability level	Type of transported medium	
	Liquids and multi-phase flows	Gas

".

1.4 SCOPE OF SURVEYS

7 **Para 1.4.5.5** is replaced by the following text:

"**1.4.5.5** The Classification Certificate of Subsea Pipeline becomes invalid in the following cases:

upon the expiry of its validity;

if the subsea pipeline and its components are not submitted for periodical survey in terms with regard to the delays provided for periodical surveys in the SP Rules;

after repair conducted without the RS supervision or replacement of the components covered by the SP Rules;

in case the subsea pipeline is not in fit technical condition providing its safety;

operational conditions different from those indicated in the class notation;

there is no Oil Spill Response Plan (emergency response plan) approved by the supervisory bodies and technical means for its implementation (or valid contracts with relevant specialized organizations).".

1.5 TECHNICAL DOCUMENTATION

8 **Para 1.5.16** is replaced by the following text:

"**1.5.16** The calculations necessary for determination of the parameters and values regulated by the SP Rules shall be made in compliance with the provisions of the SP Rules or according to the procedures agreed upon with the Register. The procedures and methods used for calculations shall provide an adequate accuracy of the problem solution. Software used for calculations shall have a Type Approval Certificate for Software (form 6.8.5). The Register may require performance of check calculations with the aid of any programme. The Register does not check the correctness of computing operations in calculations. The basic regulations regarding approval of software and the calculation procedures are specified in 12.1, Part II "Technical Documentation" of the Rules for Technical Supervision during Construction of Ships and Manufacture of Materials and Products for Ships.".

4 MATERIALS

4.3 PROCEDURES OF TESTING PIPES AND STEEL ROLLED PRODUCTS

9 **Para 4.3.8.3.4** is replaced by the following text:

"**4.3.8.3.4** The criteria for acceptance of ultrasonic testing when detecting delaminations in the pipe body and near-edge zones shall comply with Table 4.5.5.3-1 or acceptance level U0 in compliance with ISO 10893-8, unless otherwise specified in the documentation approved by the Register.".

10 **Table 4.3.9.1** is replaced by the following:

"Table 4.3.9.1

Nomenclature of special tests for steel of subsea pipelines

Type of transported media	Operational reliability level			
	Basic **L, G**	Advanced **L1, G1**	For corrosive media conveying **L2, G2**	For seismically active regions and ice- resistant standpipes **L3, G3**
Liquids and multi-phase flows (L)	Not required	CTOD	Corrosion tests, CTOD	DWTT, NDT, CTOD,-T_{kb}
Gases (G)	DWTT	DWTT, NDT, CTOD,-T_{kb}	Corrosion tests, DWTT, NDT, CTOD,-T_{kb}	DWTT, NDT, CTOD, T_{kb}
Notes: 1. Corrosion tests include the tests specified in 4.3.9.5. 2. The DWTT requirements are mandatory only for steel grade PCT36 and above, for pipes with diameter of 500 mm and above.				

".

11 New **para 4.5.3.2** is introduced reading as follows:

"**4.5.3.2** Requirements for mechanical properties of the base metal and metal of welded joints of the pipes that exceed the dimensions specified in Table. 4.5.3.1 may, upon agreement with the Register, comply with the requirements of ISO 3183 or GOST 31444 for steels of similar strength categories.".

6 BALLASTING OF SUBSEA PIPELINES

6.1 GENERAL

12 **Formula (6.1.7)** is replaced by the following formula:

"$Q_b \geq \frac{F_g}{f_{fr}}\, k_{st} + (F_v + q_u + q_s)k_e - \, Q_p$".

13 **Para 6.2.2.2** is replaced by the following text:

"**6.2.2.2** Cement of domestic grades not less than 400 according to GOST 10178-85 and GOST 31108-2003, as well as cement of other similar grades complying with the requirements of EN 197, BS 12, ASTM C 150, DIN 1164 or other national and international standards may be used for the concrete coating upon agreement with the Register. In Portland cement, the tricalcium aluminate content ($3CaO{\cdot}Al_2O_3$) shall not exceed 8 %.".

14 **Para 6.2.2.3** is replaced by the following text:

"**6.2.2.3** Concrete aggregates shall comply with the requirements of the national standards or regulations used in manufacture of the continuous concrete coatings.

The aggregates shall not contain harmful constituents in such quantities that could affect the concrete strength, for example, in pipeline bending or cause corrosion of reinforcing materials in case of water permeability of the concrete.

Use of aggregates with alkali-sensitive constituents is not allowed.

The maximum grain size and grading[1] curve of the aggregate shall comply with EN 206, ASTM C 33 or other standards.

Properties of iron ore used as filler to obtain the required concrete density shall be not lower than the requirements of GOST R 52939 or its equivalent; in such case, the sulfur content shall not exceed 3 % by mass.".

7 CORROSION PROTECTION

7.4 ELECTROCHEMICAL PROTECTION

15 **Table 7.4.3.3** is replaced by the following:

"Table 7.4.3.3

Design parameters for galvanic anodes

Anode type	Anode surface temperature[1], in °C	Anode immersed in sea water		Anode buried into seabed soil	
		Potential Ag/AgCl/ sea water, in mV	Electrochemical capacity ε, in A· h/kg	Potential Ag/AgCl/ sea water, in mV	Electrochemical capacity ε, in A· h/kg
Aluminium	< 30	–1 050	2 000	–1 000	1 500
	60	–1 050	1 500	–1 000	800
	80[2]	–1 000	900	–1 000	400
Zinc	< 30	–1 030	780	–980	750
	30 – 50[3]			–980	580

[1] For the anode surface temperature between the set limits, current capacity shall he interpolated.

[2] For aluminium anodes, the anode surface temperature shall not exceed 80 °C, unless satisfactory performance is tested and documented.

[3] For zinc anodes, the anode surface temperature shall not exceed 50 °C, unless satisfactory performance is demonstrated in the tests and documented.

Notes: 1. Electrochemical capacity for this alloy is a function of temperature and the anode current density.
2. For the non-buried pipelines, the anode surface temperature shall be taken as the pipeline external temperature.

".

8 PIPELINE INSTALLATION AND TESTING

8.2 PIPELINE ROUTES AND SEABED SOILS

16 **Para 8.2.1.12** is replaced by the following text:

"**8.2.1.12** The requirements for subsea pipeline crossings including crossing with electrical cables (linear facilities of offshore fields) shall be specified in the design documentation on linear facilities to be installed along the routes that cross previously laid linear facilities. For newly constructed linear facilities, the crossing of their routes shall be avoided whenever possible.

Where crossings along the route of the designed subsea pipeline with previously laid linear facilities are required, the requirements of 8.2.3 shall be complied with.

When selecting the designed pipeline route, it is recommended, whenever appropriate, to take into account the crossings of the route by other potential pipelines/cables to be laid in the future. For example, it is recommended that a designed pipeline buried into the seabed soil shall be further buried at the point of a planned crossing to a depth not less than that specified in 8.2.3.3.4.".

17 Chapter is supplemented with new **paras 8.2.3** and **8.2.4** reading as follows:

"**8.2.3 Crossings of subsea pipelines including by subsea electrical cables.**

8.2.3.1 General.

8.2.3.1.1 Design solutions for crossings of subsea pipelines including by subsea electrical cables, shall eliminate the possibility of any damage to pipelines and electrical cables during construction of crossing installation, disturbance of their operation and maintenance conditions.

8.2.3.1.2 Design solutions for crossing of subsea pipelines and electrical cables shall specify the requirements concerning the following:

minimum separation between the pipeline and existing linear facilities;

parameters and technical conditions of the pipeline/electrical cable and their protective coatings;

parameters and conditions of galvanic anode systems;

data on pipeline/electrical cable burial;

coordinates of crossing and marking of existing linear facilities;

confirmation of actual position and orientation of existing linear facilities, lay-out and profile of crossing;

pipelayer anchoring when laying the crossing pipeline;

installation of supporting structures or gravel bed;

checking if free spans of pipelines are acceptable (if they are occurred in trenching or excavation of pits);

methods to prevent scour and erosion around supports;

methods to control and monitor construction;

tolerance requirements for linear facilities at crossing installation;

parameters and bearing capacity of seabed soils (surface soil or soil stripped in trenching or excavation of pits);

data on burial soil and protective supporting structures;

bathymetry and history of seabed mobility;

allowable parameters of waves and currents;

any other specific structural components of subsea pipeline crossing and technology applied in construction (e.g. winch anchoring for pulling a string, method of subsea trenching, excavation of pits and their profiling, etc.).

8.2.3.1.3 The design and detailed design documentation on crossing installation shall be agreed with the owner of the existing pipelines and cable lines and approved by RS. The owner of the utility to be crossed shall be notified of the time of the activities prior to mobilization of pipelaying and service vessels/barges.

8.2.3.1.4 Crossing between pipelines (clear distance taking into account the coatings applied to them) shall be kept separated by a minimum vertical distance of 0,3 m. The crossing angle shall be at least 60° and as close as possible to 90°.

8.2.3.1.5 Crossing between pipelines and electrical cables with voltage up to 35 kV and communication/monitoring cables shall be kept separated by a minimum vertical distance of 0,5 m (clear distance). The crossing angle shall be close to 90°.

8.2.3.1.6 Physical contact between the designed pipeline and existing cables shall be avoided. If necessary, supports, flexible concrete mats and other means of permanent separation shall be installed to avoid contact and to provide the design position of the crossing installation for the entire service life of the pipeline/electrical cable.

Generally, a new pipeline shall be laid using concrete supports at crossing of existing subsea pipelines and using flexible concrete mats at crossing of cable lines.

8.2.3.1.7 In the area of crossing, the designed pipeline shall be provided with magnetic markers and galvanic anodes, one each on the crossing side.

8.2.3.2 Crossing of pipelines/cables that are not buried into the seabed soil.

8.2.3.2.1 At crossing between the existing pipelines/cable lines that are buried and not buried into the seabed soil, the designed not-buried pipeline shall be installed over the existing utilities.

Vertical clear distance and crossing angle between new and existing pipelines/cable lines shall be taken at least as specified in 8.2.3.1.4 and 8.2.3.1.5.

8.2.3.2.2 Where the soil layer is of sufficient height and stable over the pipeline/cable line buried into the seabed soil, the pipeline to be laid may be installed without additional protection. In this case, a separation between the piping lines shall be calculated taking into account possible settlement of the designed piping line at the critical combination of external loads.

8.2.3.2.3 Where the soil layer is not sufficient over the pipeline/cable line buried into soil (bunded) and where the designed pipeline crosses the pipeline/cable line laid on seabed, the pipeline shall be laid by elevating its pipes from the bottom of the seabed surface using non- conductive materials (sandbags, rock dumping, concrete slabs, flexible concrete mats, etc.) or specifically designed arched concrete structure.

8.2.3.3 Crossing of pipelines/cables that are buried into seabed soil.

8.2.3.3.1 At crossing of the existing buried pipelines/cable lines, a new pipeline that is buried into the seabed soil shall be installed over the existing utilities.

Vertical distance and crossing angle shall be taken at least as specified in 8.2.3.1.4 and 8.2.3.1.5.

A separation between the pipelines/cable lines shall be calculated taking into account the possible settlement of the designed pipeline into the seabed soil at the critical combination of external loads.

8.2.3.3.2 In special cases, given the design justification, e.g. to maintain the required protective layer of seabed soil (burial depth) in areas with intensive ice gouging (refer to 8.3), the designed pipeline may be laid under the existing pipelines.

8.2.3.3.3 In case of laying new pipelines under existing pipelines, the position of existing pipelines shall not be changed. Temporary supports, ground beds or buoyancy devices shall be used for existing pipelines in order to reduce or prevent their sagging after the ground underneath has been removed.

The stability of the temporary supports shall be checked for sliding and overturning moment.

8.2.3.3.4 At the crossing between new and existing pipelines, the vertical clear distance (taking into account the coatings applied to them and the overall dimensions of the equipment used) shall be determined based on the conditions of performance of construction and installation works and the technology used, but no less than the following:

1,0 m – in case of work performance applying the trench method and using pull heads to tighten a string of the new pipeline;

3,0 m – in case of work performance applying Horizontal Directional Drilling (HDD).

8.2.4 Crossings of subsea pipelines with the shoreline.

8.2.4.1 General.

8.2.4.1.1 When selecting a location of shoreline crossing, the following parameters of the planned section shall be taken into account:

geodetic and geological characteristics;

hydrometeorological parameters;

natural and environmental characteristics;

access to the pipeline during operation;

proximity to other facilities (utilities, residential areas, industrial enterprises, etc.).

8.2.4.1.2 In the landfall area, pipelines shall be buried. When calculating a burial depth and length of the subsea pipeline in the landfall area, seabed mobility such as scour, sandbanks, ice conditions, as well as erosion processes in the onshore area shall be considered. These characteristics are determined based on the results of engineering and geological surveys.

If necessary, additional measures may be taken to protect the pipeline such as applying concrete coating, increasing the thickness of anti-corrosion coatings or pipe wall thickness, increasing the trench depth, use of the pipe-in-pipe structure, etc.

8.2.4.1.3 The following methods of construction can be used for landfall:

open excavation works involving trenching;

open excavation works involving construction of sheet piles on the shoreline and in shallow water (cofferdam);

HDD method where the pipeline is pulled through a pre-drilled well in the coastal area.

8.2.4.1.4 Design landfall solutions shall be approved by the Register during review of subsea pipeline design.

8.2.4.2 Requirements for shoreline crossing methods involving trenching.

8.2.4.2.1 Landfall involving open excavation works with trenching shall be used in areas where the geological conditions of shore approach allow for excavation works to be carried out in shallow water without construction of sheet pile walls, and also where construction of sheet pile walls is impossible.

8.2.4.2.2 In the landfall area, dredging equipment shall be selected taking into account the type of soil based on the condition to provide the required burial depth of the pipes laid in soil on the shoreline and near it, as well as the water depth at the shore approach.

The need to protect the trench against the waves and currents using rock-fill dams shall be taken in accordance with the results of engineering and hydrometeorological survey.

8.2.4.2.3 A length of trenching is determined by a width of coastal strip starting from the seaward where the laying from vessels cannot be performed due to insufficient depth.

In addition to a number pipeline runs to be taken into account, a width of the subsea trench at the bottom shall be determined considering the following parameters:

outside diameter of the pipeline with protective and ballasting coatings and tolerance for deviation of the longitudinal pipeline axis from the design trench axis when laying the pipeline;

allowable deviations across the trench width (on both sides of the axis) in the process of trenching and the margin of bottom sediment accumulation in trench on the side of its upper slope.

8.2.4.3 Requirements for shoreline crossing methods involving cofferdam construction.

8.2.4.3.1 Landfall involving cofferdam construction shall be used in areas where the geological conditions of shore approach do not allow for excavation works to be performed in shallow water without construction of sheet pile walls, and also in areas exposed to heavy bottom sediment accumulation.

8.2.4.3.2 A length and width of a subsea trench involving cofferdam construction is determined according to 8.2.4.2.3.

8.2.4.4 Requirements for shoreline crossing methods using HDD.

8.2.4.4.1 The HDD method shall be used in the following cases:

in sections of shoreline with steep shores, as well as where the pipeline is necessary to be buried into seabed to large depths due to the risk of damage by ice;

shoreline with a large number of utilities to be crossed.

Restraints in performing works using the HDD method are difficult geological conditions (e.g. rocks with high strength characteristics), limited length and diameter of the well.

8.2.4.4.2 When constructing the pipeline by the HDD method, a pilot bore is drilled using bottom-hole tool; to drill out the pilot bore, the boring bit is replaced with a reamer. Drilling may be carried out both from the shore and from the sea (from the temporary backfilled cofferdam).

8.2.4.4.3 The pipeline shall be pulled with the minimum break after reaming and calibration of the drill channel have been completed. Prior to pulling, the assembled pipeline string shall be accepted and the preliminary hydraulic test shall be performed.

When pulling, the pulling force shall not exceed the maximum allowable values specified in the design documentation based on the condition of the pipe strength. Pipeline pulling shall be performed continuously except for cases when connections of new pipeline strings are technologically required.

Where necessary in difficult geological conditions, the pipeline is laid in pipe-in-pipe casings that shall be determined at the design stage.

8.2.4.4.4 When performing drilling operations, drilling mud discharge into marine environment is not allowed.

8.2.4.5 Connection of onshore and offshore sections of pipeline.

8.2.4.5.1 In addition to the process flow schemes specified in 8.5.3, the following schemes may be used for connection of the onshore and offshore pipeline sections:

pipeline string is made on the coastal assembly site and then pulled into the sea through a pre-drilled well using a pulling winch of the pipelayer;

pipeline string is made on the coastal assembly site and then pulled into the sea through a pre-drilled well using the HDD rig.

8.2.4.5.2 After laying the pipeline at the shoreline crossing involving trenching and cofferdam construction, the shore and the shore slope shall be protected against collapse when exposed to wave and ice loads, as well as against discharge of rainfall and melt waters.".

8.5 METHODS OF PIPELINE LAYING ON SEABED

18 **Para 8.5.3.7** (existing) is replaced by the following text:

"**.7** pipeline laying using the HHD method.".

19 New **para 8.5.4.4** is introduced reading as follows:

"**8.5.4.4** The winches used shall be provided with indication and recording devices to measure wire tension and their length. All instrumentation shall be calibrated.".

20 New **para 8.5.5.6** is introduced reading as follows:

"**8.5.5.6** The winches used shall be provided with indication and recording devices to measure wire tension and their length. All instrumentation shall be calibrated.".

8.6 SUBSEA PIPELINE TESTING BY PRESSURE

21 New **para 8.6.1.3** is introduced reading as follows:

"**8.6.1.3** In the case of connecting the subsea pipeline to the branch pipes of fixed offshore platforms (to the risers located inside the supporting block), the strength and tightness tests of the subsea pipeline shall be carried out simultaneously with the testing of the above risers making provision for cleaning, calibration and filling the risers and subsea pipelines with test medium using fixed or temporary subsea pig launchers and traps.

For preliminary testing of the linear part of the subsea pipelines (without spool pieces and risers inside offshore platforms), temporary subsea pig launchers and traps.".

22 **Para 8.6.2.1** is replaced by the following text:

"**.1** operation manual including the following:
pipeline filling with test medium;
method and rate of pressurization;
list of equipment/part of equipment to be isolated during a holding period;
method and rate of pressure relief;
removal of test medium;
drying of pipeline bore, if necessary;
emergency and safety procedures and precautions;".

23 Heading of **para 8.6.9** is replaced by the following text:

"**8.6.9** Removal of test medium and drying.".

PART II. RISERS

1 GENERAL

1.3 CLASSIFICATION

24 **Para 1.3.3.2** is replaced by the following text:

"**1.3.3.2** Distinguishing marks corresponding to the type of formation fluid produced/transported:

G – gas;

L – liquid or multi-phase transported medium, including water.".

6 RISER CONSTRUCTION, INSTALLATION AND TESTING

25 **Para 6.10** is replaced by the following text:

"**6.10** pressure tests are conducted in accordance with the program approved by the Register. The program shall include:

method and rate of pressurization;

description and arrangement diagram of measuring devices;

method and rate of pressure relief;

method of test medium removal and drying;

emergency and safety procedures and precautions.".