RULES

PUBLICATION 52/P

UNDERWATER INSPECTION OF MOBILE OFFSHORE DRILLING UNITS IN LIEU OF DRYDOCKING

June
2001

Publications P (Additional Rule Requirements) issued by Polski Rejestr Statków complete or extend the Rules and are mandatory where applicable.

GDAŃSK

Publication 52/P – Underwater Inspection of Mobile Offshore Drilling Units in Lieu of Drydocking – June 2001 was approved by the PRS Director General on 4 January 2001 and enters into force on 1 June 2001.

* *Polish Register of Shipping means Polski Rejestr Statków S.A., seated in Gdańsk, al. gen. Józefa Hallera 126, 80-416 Gdańsk, Poland,* registered in the Register of Entrepreneurs of the National Court Register, under entry number 0000019880. Polish Register of Shipping, its affiliates and subsidiaries, their respective officers, employees or agents are, individually and collectively, referred to as Polish Register of Shipping or as PRS for short.

PRS/HW, 01/2001

CONTENTS

Page

1 GENERAL

1.1 Scope of Application and General Requirements

1.1.1 The requirements of this *Publication* apply in case the survey of the underwater part of the Mobile Offshore Drilling Units is carried out in the water, without dry-docking.

1.1.2 Performing the survey as specified in this *Publication* requires PRS' acceptance.

1.1.3 Requirements specified in this *Publication* define the minimum scope of the survey. This scope may be extended in the case of identification of significant corrosion defects and/or structural failure of the underwater part of the Mobile Offshore Drilling Unit.

1.1.4 This *Publication* does not contain requirements for the organizing of the underwater works, their safety aspects, as well as the qualifications and health conditions of divers carrying out the survey – this terms are covered by applicable requirements of the place of the survey State.

1.2 Definitions

The following definitions are implemented by this Publication, as a supplementary ones to those adopted in *Part I – Classification Regulations* of the *Rules for the Classification and Construction of Mobile Offshore Drilling Units*.

1.2.1 *Close-up examination combined with material analysis* – a close-up examination supplemented by analysis of materials, to detect existing and hidden damages that may initiate the process of destroying the underwater part of the structure. To carry out the examination, initial cleaning of the surveyed areas is required.

1.2.2 *Critical areas* – locations which have been identified from calculations or from the service history of the subject unit, similar or sister unit, to be subject for detailed examination due to being sensitive to cracking, buckling or corrosion which would impair the structural integrity of the unit.

1.2.3 *Areas of control* – areas subject to survey, including all critical areas, suspect areas and areas of underwater part of the unit selected for survey.

1.2.4 *Provision of construction* – full information, descriptive or supplemented by plans, defining critical and suspect areas, containing records of surveys, allowing analysis construction of the underwater part of the unit.

2 SURVEY PLANNING

2.1 The survey should be carried out in accordance with a programme developed by the Owner and agreed with PRS. In developing the programme, provision of construction should be considered.

This program should include:

- **.1** a list of critical and suspect areas, with their location;
- **.2** a list of methods and equipment used to carry out the required underwater survey;
- **.3** a list with location of areas of control and then identification methods. Bottom drawings, indicating the distribution of controlled areas and map of control, showing the route of moving the equipment used for survey, are required;
- **.4** procedures for the survey of selected areas of underwater part of the unit and technical forms documenting the survey;
- **.5** information concerning participation and responsibility of persons representing the Owner;

.6 list of means to ensure safety during the survey.

2.2 The areas of control should include areas of high stress and high wear down, with particular consideration of fatigue. In determining the scope of the survey of self-elevating mobile offshore Drilling units, the general requirements for selection of construction areas of control are to be considered, see the Chapter 7.

Areas of control should include:

.1 all areas of the structure exposed to corrosion, including:
- bottom plates located above the water, exposed to the atmosphere conditions with condensation, formation and sedimentation of salt and moisture at high oxygen content,
- wind and water strake,
- underwater part of the support columns,
- platform's foot flushed in the seabed;

.2 all areas where static stress can achieve acceptable maximum, and all areas of the high stress, variable and dynamic, which can cause fatigue damage of the structure.

As a rule, examinations should include underwater part of the hull and construction of support columns or stabilized columns.

2.3 All material tests shall be carried out in accordance with PRS agreed underwater test procedures. This applies particularly to specific analysis of non destructive testing enabling:

.1 location of tubes' surface cracking including their connections,
.2 identification of a depth of the cracks,
.3 identification of internal corrosion pits,
.4 determination of wall thickness of corroded structural elements.

3 MANAGEMENT OF SURVEY

The Owner is obliged to designate representative person responsible for the preparation and organization of the survey in accordance with the agreed programme.

This person should be authorized to make, on behalf of the Owner, decisions agreed with PRS Surveyor carrying out the survey, concerning immediate measures in case they need to be taken due to progress or the outcome of the survey.

4 EQUIPMENT AND METHODS

4.1 Equipment and methods used in the survey are subject of agreement between the PRS and the Owner.

4.2 During selection of the equipment and methods, following elements should be taken into account:

.1 load status, location and accessibility of areas of control and the probability of damage occurrence,
.2 type of examination of areas of control provided by the survey programme,
.3 technical parameters of recording and examination control equipment.

4.3 External and close-up examinations should be carried out using the approved method, such as underwater TV camera or remote operated vehicle (ROV) operated by:

.1 divers – PRS Surveyors,

.2 divers – recognized by PRS; in this case, the survey should be carried out in the presence of PRS Surveyor.

Records on videotape or color photographs should be attached to the reports from the survey, as a supplement.

Examination records of the construction made without presence of the PRS Surveyor can not be accepted.

4.4 A diver who is not PRS Surveyor may carry out close-up examinations combined with material tests, such as non-destructive testing, taking samples and carry out measurements in areas of control while maintaining the following conditions:

.1 examinations should be carried out exclusively in areas where, due to requirements of the survey programme, other means of control may not be applied;
.2 PRS Surveyor should have possibility for checking diver's competence to perform the examination and monitoring his work (two-way communication, direct supervision using underwater TV camera);
.3 the diver, immediately after the diving should report results of the examination to PRS Surveyor;
.4 PRS Surveyor may decide to perform additional diving to repeat, or carry out supplementary, examinations of selected areas of underwater construction.

4.5 In the case of mobile offshore drilling units, it is recommended to install control equipment recording the following parameters:

If the unit is equipped as described above, the records should be filed so to enable their analysis and should be attached to the provision of the construction.

5 SURVEY

5.1 Preparing for Survey

.1 check the control equipment provided by the survey programme of the underwater inspection,
.2 check the schedule, the availability and validity of the survey programme, especially the survey procedures of selected areas of control with route plan of the diver/ROV with TV camera,
.3 establish the terminology to be used during the survey and in reports,
.4 agree the way of communication of PRS Surveyor with a diver.

5.2 Order of the Survey

The survey should be carried out in accordance with the agreed survey programme, in the following order:

.1 external examination in order to evaluate general condition of the underwater construction and to identify additional suspect areas, if any. On the basis of these examinations immediate evaluation has to be effected for selection of areas for close-up examinations or for close-up examinations combined with material tests;
.2 close-up examinations of the areas of control, set in the survey programme and those selected in result of close-up examinations. On the basis of these examinations, immediate evaluation is to be made for the selection of areas for close-up examinations combined with material tests.
.3 close-up examinations combined with material tests set in the survey programme and areas of control selected after close-up examinations. Analysis of these examinations is the

basis for more detailed examination, carried out by other methods or other control equipment.

6 REPORTING AND EVALUATION OF THE SURVEY

6.1 In justified cases, PRS has the right to require the Owner to develop a summary report containing:

.1 the results of the construction examination carried out by the Owner,

.2 proposals for alterations to be made during developing survey programme for the next survey.

6.2 Survey report of the underwater part of the unit should include:

.1 the location and description of the examined construction,

.2 used methods and equipment,

.3 records of the examinations carried out by the Owner prior to the survey carried out by PRS.

6.3 Evaluation of the results of the survey is the basis for:

.1 updating the records of the construction,

.2 updating the survey programme.

7 GENERAL REQUIREMENTS FOR SELECTION OF SURVEYED CONSTRUCTION AREAS OF SELF-ELEVATING DRILLING UNITS

Selected areas of control	Possible damage	Possible causes of damage	Possible consequence of damage
General examination of the construction	– general damages which may impair the safety and integrity of the construction	– overload – collision, impact – weakening of the material	– progressive development of damage caused by changes in the distribution of forces – rapid deterioration of the structure condition
Area of the repair	– cracks of repaired material or weld	– manufacture low quality – inappropriate materials or repair process – unexpected stress concentrations	– rapid deterioration of the structure condition, corrosion – reduction of the load support – leaks
The lower part of the construction	– localized deterioration of the material quality – corrosion – deformations	– manufacture low quality – errors in the design process or during the assembly	– rapid deterioration of the material quality, corrosion – reducing the load support – leaks
Area of high stress	– cracks – corrosion – signs of the material flow	– improper geometry of the construction – unexpected concentration of stress – change in the balance of forces	– progressive development of: • cracks • corrosion • leaks – changes in the balance of forces
Area of cyclical changes of stress	– signs of fatigue – cracks and corrosion – local cracks in construction	– cyclic loads, mainly from the waves – vibration	– progressive development of cracks, corrosion and deformations of construction
Weld connections of steel plates of thick above 50 mm	– dissections – cracks	– material's localized defects – cyclic loading	– local and progressive cracking of construction

Selected areas of control	Possible damage	Possible causes of damage	Possible consequence of damage
		– poor quality of welding	
Cutouts, penetrations	– cracks – deformation of the openings	– overload – unexpected stress concentration	– local and progressive cracking of construction
Screw connections	– loose or missing screws – corrosion and deformations	– manufacture low quality – unsecured nuts – impact loading – overload	– loss of integrity construction – large deformation
Compressed elements of construction	– signs of buckling and excessive element's deformation	– overload	– destruction of the element of the construction
Foundation of construction	– scour and subsidence of seabed – bottom foot subsidence of support columns	– effects of the current and waves – overload	– excessive deformation of support columns – subsidence
Corrosion protection	– lost, eroded or covered anodes (anodes cables damage)	– unexpected current short circuit – nonfunctional anodes	– corrosion, general or local
Areas of material thickness measurement	– thickness reducing of the material	– erosion/corrosion internal and external	– reducing the load of support columns
Areas with signs of corrosion	– signs of corrosion on support columns and hull	– malfunction of corrosion protection system – fatigue stress concentration – damage of coatings	– reduction of quality and thickness of material – reducing the load of the support – initiating cracks of joints
Connections of construction, welds	– cracks – corrosion	– errors in the design process or during the assembly – manufacture low quality	– propagation of cracks – accelerated corrosion
The splash zone on construction	– corrosion – damage of material or protective coatings – signs of mechanical damage	– corrosive-erosion environment with cycles of wet/dry and freeze/thaw – mechanical damage	– accelerated corrosion/ erosion
Area of mechanical destruction	– deformation of the steel construction – corrosion	– abrasions caused by ropes, etc. – collision with floating objects, thrown and declining objects	– corrosion – reducing the load of the support
Protective coatings	– damage to the coating – chips and cracks – deterioration – puncture – adhesive tear	– manufacture low quality of coating – mechanical damage – chemical deterioration of quality	– general or local damage to the coating – accelerated corrosion and deterioration of coating material
Areas of suspected internal corrosion	– reducing the thickness of material – cracks of the material – local corrosion – pitting	– intergranular corrosion	– reducing the load of support – propagation of cracks
Areas of growths	– corrosion – increasing of weight and dimensions of the construction	– growth friendly environment	– increased wave forces acting on the structure – overloading the horizontal elements of the construction

Selected areas of control	Possible damage	Possible causes of damage	Possible consequence of damage
			– change in response due to weight increase