



GUIDE FOR BUILDING AND CLASSING

OFFSHORE FISH FARMING INSTALLATIONS

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Foreword

This Guide provides class requirements for the design, construction, installation and survey of non-self-propelled, sited offshore fish farming installations, so as to obtain the classification notation **Offshore Fish Farm Installation, Manned** or **Offshore Fish Farm Installation, Unmanned**. It addresses three major elements: the fish farming hull structure, the mooring system or foundation, and onboard machinery, equipment and systems that are not part of the aquaculture systems.

Aquaculture systems installed in the offshore fish farming installations under the jurisdiction of local authorities are not within the scope of classification and are not covered by the Guide.

This Guide is to be used in conjunction with the *ABS Rules for Building and Classing Floating Production Installations (FPI Rules)*, the *ABS Rules for Building and Classing Offshore Installations (OI Rules)*, the *ABS Guide for Building and Classing Floating Offshore Wind Turbine Installations (FOWT Guide)*, the *ABS Guide for Building and Classing Bottom-Founded Offshore Wind Turbine Installations (BOWT Guide)* and applicable Statutory Regulations.

This Guide becomes effective on the first day of the month of publication.

Users are advised to check periodically on the ABS website www.eagle.org to verify that this version of this Guide is the most current.

We welcome your feedback. Comments or suggestions can be sent electronically by email to rsd@eagle.org.



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SECTION 1 General

1 Application

This Guide is applicable to non-self-propelled, sited offshore fish farming installations defined in 1/8.1. The types of installation covered by this Guide are listed below.

- i) Spar-type floating fish farming installation
- ii) Column-stabilized type floating fish farming installation
- iii) Ship-shape floating fish farming installation
- iv) Non-buoyant fish farming installation

Other types will be considered on a case by case basis.

2 Classification

The requirements for conditions of classification are contained in the separate, generic *ABS Rules for Conditions of Classification – Offshore Units and Structures (Part 1)*.

Additional requirements specific to offshore fish farming installations are contained in the following Sections.

2.1 Scope

The classification of an offshore fish farming installation addresses three major elements which are subject to the requirements of this Guide:

- i) The offshore fish farming hull structure
- ii) The mooring system/foundation
- iii) Onboard machinery, equipment and systems that are not part of the aquaculture systems

Classification of additional equipment and systems may be offered if requested by the Owner.

Aquaculture systems installed in the offshore fish farming installations under the jurisdiction of local authorities are not within the scope of classification and are not covered by the Guide. Examples of aquaculture systems include:

- i) Fish net pens and associated equipment
- ii) Fish feeding and production facilities
- iii) Feedstock facilities
- iv) Fish escape prevention apparatus

2.2 Classification Symbols and Notations

The following class notations apply to the offshore fish farming installation, as defined in 1/8.1.

2.2.1 Installations Built under ABS Survey

Installations built and constructed to the satisfaction of ABS Surveyors and to the requirements of this Guide or to their equivalent, where approved by ABS for service for the specified design environmental conditions, are to be classed and distinguished in the *ABS Record* by the following symbol for the intended service and hull type given below:

☒ A1 Offshore Fish Farm, Manned (hull type)**☒ A1 Offshore Fish Farm, Unmanned (hull type)**

The Maltese cross symbol (☒) signifies that the installation was built, installed and commissioned to the satisfaction of the ABS Surveyors.

The intended service for manned or unmanned installations is defined in 1/2.3, and the relevant requirements provided in this Guide are to be complied with. The service notation will be appended by one of the following: **Spar-Type**, **Column-Stabilized Type**, **Ship-Shape** or **Non-Buoyant** to indicate the hull type. The hull structural configurations of these installations are described in 1/8.1.

Examples of notations for installations are:

Offshore Fish Farm, Manned (Spar-Type)**Offshore Fish Farm, Manned (Column-Stabilized Type)****Offshore Fish Farm, Manned (Ship-Shape)****Offshore Fish Farm, Unmanned (Non-Buoyant)****2.2.2 Installations Not Built under ABS Survey**

Installations not built under ABS survey but submitted for classification, are subject to special consideration. Where found satisfactory, such installations may be classed with the below notations:

A1 Offshore Fish Farm, Manned (hull type)**A1 Offshore Fish Farm, Unmanned (hull type)****2.2.3 New Construction**

Site-specific environmental data will be indicated by the (S) qualifier following the basic notation of 1/2.2.1 or 1/2.2.2. The qualifier will then to be followed by a descriptor of the site. For example,

☒ A1 Offshore Fish Farm, Manned (hull type) (S) Mississippi Canyon Block 779.

2.3 Manned or Unmanned Installations

A manned fish farming installation is one with permanent occupied living accommodations or one that requires the continuous presence of personnel for more than 12 hours in successive 24-hour periods.

An unmanned fish farming installation is intended to be designed to have a safety level considering that operation can be shut-in during the design environmental event, equivalent to the medium exposure level (L2) as defined in ISO 19904-1.

3 Additional Class Notations**3.1 Notations for Automatic or Remote Control and Monitoring Systems for Manned Installations**

For automatic or remote control and monitoring systems of the machinery other than the propulsion machinery as referenced in 1/1 of the *ABS Guide for Remote Control and Monitoring for Auxiliary Machinery and Systems (other than Propulsion) on Offshore Installations*, ABS will consider additional classifications with symbols **☒ AMCC** or **☒ AMCCU**, as appropriate, provided that the applicable requirements of the *ABS Guide for Remote Control and Monitoring for Auxiliary Machinery and Systems (other than Propulsion) on Offshore Installations* are satisfied.

3.2 Design Life

Offshore fish farming installations designed and built to the requirements in this Guide and maintained in accordance with the applicable ABS requirements are intended to have a structural design life of not less than 20 years for a new build hull structure. Where the structural design life is greater than 20 years and the offshore fish farming installations are designed for uninterrupted operation on-site without any drydocking, the nominal design corrosion values (NDCV) of the hull structure are to be increased in accordance with

5A-3-1/1.7 of the ABS *Rules for Building and Classing Floating Production Installations (FPI Rules)* for ship-shape floating fish farming installations or an acceptable equivalent criteria for non-ship-shape installations. ABS will consider additional classification with the notation **HL(number of years)**, where **(number of years)** refers to a design life greater than 20 years (in 5-year increments).

3.3 Design Fatigue Life

Where an offshore fish farming installation's design calls for a minimum design fatigue life of 20 years or in excess of the minimum design life of 20 years, the design fatigue life is to be verified to be in compliance with the fatigue criteria in this Guide. The "design fatigue life" refers to the target value set by the owner or designer, not the value calculated in the analysis.

For example, if the design fatigue life is specified as 25 years, the fatigue calculations of hull structural components are to satisfy a fatigue life of $(25 \times \text{FDF})$ years. The fatigue calculations of the position mooring hull interface structures, hull mounted equipment interface structures, and position mooring system are to also satisfy a fatigue life of $(25 \times \text{FDF})$ years, where FDF are the fatigue safety factors specified in 3/2, for hull interface structures and Section 5 for mooring lines.

The required fatigue strength analysis of critical details and welded joints in offshore fish farming installations is to be in accordance with 3/2.

Only one design fatigue life value notation is to be assigned and published in the *Record* for the hull, hull interface structure, position mooring system and components. The hull interface structural requirements for ship-shape installations are described in 3/2.4 and the position mooring system requirements in Section 5. When spectral fatigue analysis of 3/2.4 for ship-shape installations or fatigue analysis of 3/2.1, 3/2.2 and 3/2.3 for non-ship-shape installations is performed for either unrestricted service wave environment or the transit and site specific wave environment, the class notation **SFA(number of years) Year** is assigned for ship-shape installations and **FL(number of years), Year** is assigned for non-ship-shape installations, where **Year** denotes the year of maturation of fatigue life in the defined site location. The fatigue life will be identified in the *Record* by the notation **FL(number of years), Year**; For example, the notation **FL(30), 2041** denotes an offshore fish farming installation built in 2011 with a specified minimum design fatigue life of 30 years.

The **(number of years)** refers to the design fatigue life equal to 20 years or more (in 5-year increments), as specified by the applicant. Where different design fatigue life values are specified for different structural elements within the installation, such as hull structure components, hull interface structures and position mooring system components, the **(number of years)** refers to the least of the target values.

3.4 Dynamic Loading Approach (DLA)

Where the system's hull structure has been built to plans reviewed in accordance with the procedure and criteria in the ABS *Guide for "Dynamic Loading Approach" for Floating Production, Storage and Offloading (FPSO) Installations (DLA Guide)* or ship-shape fish farming installations for calculating and evaluating the behavior of hull structures under dynamic loading conditions, in addition to compliance with other requirements of this Guide, the installation will be classed and distinguished in the *Record* by the notation **DLA**. The **DLA** notation will be placed after the appropriate hull classification notation.

The dynamic load components considered in the evaluation of the hull structure are to include the external hydrodynamic pressure loads, internal dynamic loads (fluids stored onboard, ballast, major equipment items, etc.) and inertial loads of the hull structure. The magnitude of the load components and their combinations are to be determined from appropriate installation motion response calculations for loading conditions that represent the envelope of maximum dynamically-induced stresses in the installation. The adequacy of the hull structure for all combinations of the dynamic loadings is to be evaluated using an acceptable finite element analysis method. In no case are the structural scantlings to be less than those obtained from other requirements in this Guide.

If the wave environment of the intended site is used during the analysis, the notation will include an **S** qualifier, followed by the design return period at the defined site. For example, if the 100-year return period was used, the following may apply: **DLA (S100)**. Transit conditions to the intended site are also to be included in the DLA evaluation.