

Sanha Mooring Master Training

Introduction

Cabinda Gulf Oil Company is a partnership operated by Chevron, producing Oil and Gas from fields offshore Cabinda, an enclave to the North of the mouth of the Congo River and part of Angola. The company has expanded its LPG operations by building the LPG FPSO 'Sanha' that has been installed in 2004 and is exporting LPG presently.

The FPSO 'Sanha' is turret moored to the seabed. The heading of the FPSO depends on the environmental conditions but can be adjusted/kept steady by its stern thrusters. LPG carriers of varying sizes will export the LPG from the FPSO. Currently offloading is in general performed side-by-side, but tandem offloadings will be more often acquired due to the increasing size of the LPG carriers. The FPSO and the LPG carriers will be assisted by tugs during operations. From 2004 onwards MARIN has provided the training for Sanha's Mooring Masters whereby the emphasis lies on side-by-side operations, but which also allows tandem offloading operations.

Objectives

The objectives of the Sanha training are to train the Mooring Masters in:

- Approaching, berthing, residence and departure procedures (normal and emergency).
- Carrying out these validated procedures in co-ordinated manoeuvres.
- Awareness of safety risks and the asset's value in the execution of commercial operations.

These objectives will be achieved mainly through simulation training, observation on the simulator bridges and debriefing. When requested, a Bridge Resource Management course is integrated in the training to increase the situational awareness of the Mooring Masters.



FPSO "Sanha"

Simulation set-up

Prior to the training a study is conducted at MARIN to set up and verify nautical procedures (normal and emergency) to approach, berth, residence and departure the FPSO 'Sanha' in a variety of environmental conditions with LPG carriers of varying sizes. Based on this study, different scenarios are chosen to train the applicability of the procedures in different operations. The following set-up is used to simulate the different scenarios:

- The FPSO is modelled as a free-floating vessel with the turret moored to 9 anchor chains.
- The FPSO has a stern thruster that can be automatically or manually controlled.
- Four LPG carriers varying in size from 3000 to 78000 m³.
- A hawser to connect the LPG carrier to the FPSO when tandem offloading.
- Three ASD tugs assisting the export tanker while berthing, unberthing and during offloading.
- A supply vessel to assist the FPSO.
- Environmental data like wind fields, wave fields and current including shielding effects for wind and current.

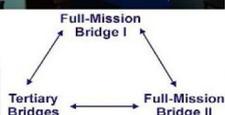
Full-Mission Bridge

The Sanha Mooring Master trainings are executed on the Full-Mission Bridge I simulator with a 360 degree visual projected image. The vessels are controlled in the following way:

- The LPG carrier on the Full Mission Bridge I, controlled by the Mooring Masters.
- Three instructor-controlled ASD tugs and one instructor-controlled conventional supply vessel.

The Full-Mission Bridge I is equipped with a bird's eye view presentation (simulated electronic chart), showing the LPG carrier, the FPSO, the free sailing ASD tugs and the supply vessel. It is also possible to equip the Full-Mission Bridges with a true ECDIS. In addition, an extra monitor is provided presenting the view alongside the ship in order to judge the distance to the FPSO better during berthing and unberthing manoeuvres. Also the hawser tension during tandem offloading scenarios is displayed.

If required, Tug Masters can participate in the training by controlling the ASD tugs on integrated bridges. This will provide mutual understanding of each other's profession which increase the situational awareness of the Tug Masters and Mooring Masters.



Possible bridge combinations

The training

Depending on the experience of the participating Mooring Masters in Bridge Resource Management (BRM), the training week exists of:

- A dedicated BRM course and Ship Handling training or
- 4 days of Ship Handling training including BRM aspects.

In the dedicated BRM course the Mooring Masters enhance their 'situational awareness', focusing on the possibility of 'human error' in their profession. In this dedicated BRM course the following aspects are treated:

- Situational Awareness.
- Cultural Awareness.
- Risk Assessment.
- Communications.
- Short Term Strategy.

The BRM aspects are treated through CBT (Computer Based Training), cases and discussions between the Mooring Masters. The cases are examples of nautical accidents in which human errors play a crucial part. Of each BRM aspect a case is discussed with the Mooring Masters.

In the Ship Handling training the Mooring Masters perform several manoeuvres under various environmental conditions. During these exercises the BRM aspects and official procedures are practiced. Special attention is paid to the "Challenge and Response" (communications) aspect and the use of parallel indexing (PI-lines). "Challenge and Response" means that the actions of the active Mooring Master are checked by a second Mooring Master.

The Mooring Masters are assessed throughout the course using an assessment form.



Approaching the FPSO "Sanha"

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