



BunkerLogix

FLEXIBLE LNG BUNKERING
VALUE CHAIN IN THE SPANISH
MEDITERRANEAN COAST

Crew Training Assessment



Co-financed by the European Union
Trans-European Transport Network (TEN-T)

"The sole responsibility of this publication lies with the author. The European Union is not responsible for any use that may be made of the information contained therein."

INTRODUCTION

As part of the BunkerLogix project, a report addressing specific training needs for the crew of the vessel was developed together with DNV GL. The BunkerLogix Project is led by Repsol, and consists of the development of a LNG Bunkering value chain in the Spanish Mediterranean Coast. Two size vessels are considered:

- Bunker Tanker for Liquefied Natural Gas (LNG) with 5.000 m³ of cargo capacity, categorized as IMO Ship Type 2G and with two (2) independent cylindrical cargo tanks of IMO Type C
- Bunker Tanker for Liquefied Natural Gas (LNG) with 10.000 m³ of cargo capacity, categorized as IMO Ship Type 2G and with two (2) independent cylindrical cargo tanks of IMO Type C

The present report is providing a detailed study on suitable training for a crew of a LNG bunker vessel. The aim is to qualify a specialized crew and get them fit for purpose, which is the full operation of the vessel including bunker operations towards other vessels using LNG as fuel.

The report is taking different regulations and requirements into account. The focus is on international requirements arising from the International Maritime Organisation (IMO). In addition available industry recommendations with regard to the qualification of crews on board of gas carriers, preferably with special link to bunker operations have been reviewed.

The report is presented in three main elements:

- theoretical research
- guidance for crew training
- summary and conclusion

The research part is intended to take international regulations into consideration. This will be the Convention on Standards, Training, Certification and Watchkeeping (STCW) which forms the international basis for a ship's crew qualification. Furthermore interpretation from international bodies may be relevant.

Another core part of the analysis are industry standards and industry best practices from SIGTTO, OCIMF, Classification Societies etc. This format provides sufficient guidance for a training provider regarding the organisation of a course. The structure is including learning objectives, entry requirements to attend the course, course intake limitations, course duration, trainer or staff requirements, a detailed course outline and a course syllabus.

Overall this report is enabling decision makers to understand regulatory and recommended requirements and provide a possible solution for training of a specialised crew on board a bunker LNG vessel.

TABLE OF CONTENTS

- 1- INTRODUCTION
- 2- MANDATORY INSTRUMENTS
 - 2.1. Introduction to Maritime Safety
 - 2.2. International Instruments
 - 2.2.1. Conventions, Codes and Resolutions
 - 2.3. Safe Manning Basic Requirements
 - 2.4. STCW Convention
 - 2.4.1. Overview STCW 78
 - 2.4.2. STCW – 1995 amendments
 - 2.4.3. The Structure of STCW
 - 2.4.4. STCW - 2010 Amendments Overview
 - 2.4.5. STCW – Example of Competency Table
 - 2.4.5.1. STCW Code –part A, Section A / V 1-2
 - 2.4.6. IMO – Model Courses
 - 2.4.6.1 Example Advanced Training for Liquefied Gas Tanker Operation
 - 2.4.7. STCW – future developments
 - 2.4.7.1 New qualification for crew on ships subject to the IGF Code
 - 2.4.7.2 Interim Guidance on Training for Seafers on Ships using Gases or other Low-Flashpoint Fuels
 - 2.5. Responsibilities of Administrations
 - 2.5.1 Activities of the European Union
 - 2.6. Responsibilities of Maritime Academies
 - 2.7. Responsibilities of Companies
 - 2.7.1 Responsibility Overview
 - 2.8. Draft IGF – Code, Development of International Code of Safety for Ships using Gases or other low flash point fuels
 - 2.9. IGC Code- International Code for construction and equipment of Ships carrying Liquefied Gases in bulk
 - 2.10. IMO MSC.285 (86) - training requirements
- 3- BUNKERING OF LNG
 - 3.1 Summary
 - 3.2 Training principles for personnel involved in LNG bunkering
 - 3.3 Training requirements identified in Bunkerlogix project
 - 3.3.1 Bunkerlogix project
 - 3.3.2 Bunkerlogix HAZID
 - 3.3.3 Bunkerlogix HAZOP
 - 3.3.4 Bunkerlogix procedures
 - 3.3.4.1 Specific requirements on personnel education and training
 - 3.3.4.2 Bunkerlogix general information
 - 3.3.4.3 Bunkerlogix specific procedures
 - 3.4 Industry best practice
 - 3.4.1 Class Societies’ Rules

- 3.4.1.1. Class Rules for Liquefied Gas Carriers
 - 3.4.1.2. LNG fuelled vessel
 - 3.4.2 ISO OGP Draft 118683 (“Guidelines for systems and installations for supply of LNG as fuel to Ships”)
 - 3.4.3 Relevant reports from DNV GL, legacy DNV and legacy GL
 - 3.4.3.1 DNVGL Standard for Certification – DNVGL-ST-0026:2014-04,” Competence Related to the On Board Use of LNG as Fuel”
 - 3.4.3.2 DNVGL Standard for Certification – DNVGL-ST-0010:2014-08, “Competence of shipboard cargo operators for liquefied natural gas tankers”
 - 3.4.3.3 DNV GL Recommended Practice for Development and Operation of LNG bunkering facilities, 2014
 - 3.4.3.4 Liquefied Natural Gas (LNG) Bunkering Study for US Maritime Administration (MARAD), 2014
 - 3.4.3.5 DNV Report Modalities for the provisioning of LNG as shipping fuel in Flemish ports. PART II: Legal & Regulatory, 2012
 - 3.4.4. Norwegian Maritime Authority regulations
 - 3.4.5. The Society of International Gas Tanker & Terminal Operators (SIGTTO)
 - 3.4.5.1 Ship to Ship Transfer Guide for Petroleum, Chemicals and Liquefied Gases, 2013
 - 3.4.5.2 Liquefied Gas Handling Principles, 3rd ed. 2000
 - 3.4.6 The Oil Companies’ International Maritime Forum (OCIMF)
- 4 GUIDANCE FOR CREW TRAINING
 - 4.1 Gap Analysis based on requirements and recommendations
 - 4.1.1 Methodology
 - 4.1.2 Findings:
 - 4.2 Further Planning
 - 4.3 Broader view on trainings to be considered
 - 4.3.1 Training for safety attitude
 - 4.3.2 Special training on Ship to Ship Operation
 - 4.3.3 Communication for the crew
 - 4.3.4 Ship specific Familiarization
- 5 SUMMARY AND CONCLUSION
 - 5.1 Summary of Mandatory Instruments
 - 5.2 Summary of Industry Recommendations
 - 5.3 Summary of Training Recommendation