Activity 4 – Sub-Activity 4.6

Final Report on Training on SAR and Mass Rescue Operations

Document No: MONALISA 2.0_D4.6.1

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

Project: MONALISA 2.0 Securing the chain by intelligence at sea
Founded by: The Trans-European Transport Network (TEN-T) of the European Union
Activity: Operational Safety
Sub-activity: 4.6 Training
Document No: D 4.6.1
Title: Final Report on Training on SAR and Mass Rescue Operations

Authors

José Manuel Díaz Pérez (JMD) Spanish Maritime Safety Agency
Carlos Fernández Salinas (CFS) Spanish Maritime Safety Agency
Gracia Albuquerque (GA) Spanish Maritime Safety Agency
Sergio Velásquez Correa (SVC) Support Staff Spanish Maritime Safety Agency
Natalia Mazas Pinto (NMP) Support Staff Spanish Maritime Safety Agency

History

<table>
<thead>
<tr>
<th>Version</th>
<th>Date</th>
<th>Initials</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>01</td>
<td>15/07/2015</td>
<td>CFS</td>
<td>New document</td>
</tr>
</tbody>
</table>

DISCLAIMER: Use of any knowledge, information or data contained in this document shall be at the user's sole risk. The authors of this report accept no liability or responsibility, in negligence or otherwise, for any loss, damage or expense whatever sustained by any person because of the use, in any manner or form, of any knowledge, information or data contained in this document, or due to any inaccuracy, omission or error therein contained. This document reflects the authors view and the European Commission is not liable for any use that may be made of the information contained therein.
Foreword

This final report is the result of MONALISA 2.0 project sub-activity 4.6.1, Training on SAR and MRO. MONALISA 2.0 is a European project, which includes 39 partners from 10 different countries. The partnership involves the cooperation of private, public and academia sectors, and it is co-financed by the European Union. The main purpose of the training within the MONALISA 2.0 project is to implement a practical set of courses covering operational safety with special focus on passenger vessels’ crisis, in order to get a standardized and certified master program.

This document also includes the experience gained during the Mass Rescue Operation Exercise SAREX 25-15 that was held in Valencia between the 14th and 16th of June of 2015.

As we will attempt to demonstrate, the human factor can be considered the most valuable tool to avoid accidents, and, in case that these eventually may happen, the only one capable of reducing damage or even eliminate it completely. In this context, “training” is the key word.
List of contents

1 Introduction to SAR and Mass Rescue Operations ..................................................... 5
2 Purpose of MONALISA 2.0 MRO Training ................................................................. 6
3 Training Content ......................................................................................................... 6
   3.1 Methodology ..................................................................................................... 7
   3.2 General Syllabus .......................................................................................... 7
   3.3 SAR and MRO Training Delivery and Management Plan .................................. 9
   3.4 Trainer Qualifications .................................................................................. 11
   3.5 Course Timetable ......................................................................................... 12
   3.6 Training Place and Facilities ......................................................................... 15
   3.7 Evaluation Process ....................................................................................... 17
4 Who Can Attend the Training? Training Selection ..................................................... 18
   4.1 Course Target Trainees ............................................................................... 18
   4.2 Trainees Selection ....................................................................................... 19
5 Training Delivery and Results ................................................................................... 21
   5.1 Training Attendance ................................................................................... 21
   5.2 Evaluation and Results ............................................................................... 22
   5.3 Evaluating the Training Effectiveness .......................................................... 25
6 On The Field Evaluation ............................................................................................ 26
   6.1 Exercise Area of Performance ..................................................................... 27
   6.2 Trainees Selected to Attend and Role Within The Exercise ............................ 27
   6.3 Key Performance Indicators Matrix ............................................................... 29
   6.4 Final Assessment .......................................................................................... 31
7 Conclusions .............................................................................................................. 32
   7.1 Added Value to the Staff’s Improvement Skills ............................................. 32
   7.2 Added Value to the Improvement of SAR and MRO ..................................... 33
   7.3 Potential Impact in a Future Master of Science in Maritime Safety Training ........................... 33

ANNEXES ....................................................................................................................... 35
Annex 1: List of Documents Contained in DVD .......................................................... 35
Annex 2: Abbreviations ............................................................................................ 36
Annex 3: References .................................................................................................. 37
Annex 4: Pictures ....................................................................................................... 37
1 Introduction to SAR and Mass Rescue Operations

IAMSAR Volume II defines *mass rescue operation* (MRO) as one search and rescue service that involves the need for immediate assistance to large numbers of persons in distress such that capabilities normally available to search and rescue (SAR) authorities are inadequate.

From the origins of navigation there have been shipwrecks and groundings involving a great number of people. MROs are relatively rare compared to normal SAR operations, but major incidents leading to the need for MROs have not been infrequent on a worldwide basis, and can occur anywhere at any time. We could quote some examples such as Titanic (1912), Andrea Doria (1956), Doña Paz (1987), Herald of Free Enterprise (1987), Estonia (1994), Costa Concordia (2012), Sewol (2014), Norman Atlantic (2014), Eastern Star (2015) or Sorrento (2015). Note that many of them have occurred in European waters.

![Picture 1: Ferry Costa Concordia after grounding in Giglio Island (Italy). 4197 people were evacuated.](image)

MRO does not only deal with ship incidents. Flooding, earthquakes, terrorism, casualties in the offshore oil industry, accidents involving releases of hazardous materials and major aircraft incidents are examples which (because of their magnitude), may need to use the same resources as would be needed to carry out mass maritime rescue operations. For example, the Malaysian Airlines Flight 370, disappeared in March 2014, or the typhoon Hagupit in December 2014, where about 1 million people were evacuated.
2 Purpose of MONALISA 2.0 MRO Training

As mentioned above, in the last years there have been a number of relevant accidents where passenger ships have been involved. Despite the technology available (which was highly developed in terms of equipment), these accidents demonstrated a gap in the decision making processes, showing at the same time crisis management deficiencies from the shipside as well as difficulties to coordinate the response actions between the Coast Guard services and the crew. The human factor is still considered the main cause of incidents, despite the fact that the ships and equipment now are safer and better developed.

An emergency in a passenger ship, which at the present time can transport more than 7,000 people, is an impressive challenge to any Maritime Authority. Current resources (no matter where it happens) have proved to be clearly insufficient to recover thousands of people from rafts and lifeboats in open sea quickly and safely. Since MROs are relatively low-probability but high-consequence events, States must be prepared to carry out an MRO operation. However, the fact that the MRO incidents happen from time to time and in very different geographical locations makes it very difficult for SAR organisations to gain the necessary experience to deal with these events. So both theoretical and practical training is required.

Although there has recently been a significant increase in the movement of passengers by sea and those recurrent accidents that have previously been described; there is not yet an international standard on MRO response training, not even a model course that a Competent Authority could use as guidance. This is precisely the aim of the MONALISA 2.0 sub-activity 4.6.1, Training on SAR and MRO; to cover the gap between the current situation and the industrial real needs. Training is the best way to reduce accidents and, when they are unavoidable, competent professionals, supported by technology, may drastically reduce the number of victims, as well as the damage caused to the environment and goods. This innovative course, designed by Jovellanos Centre within the scope of MONALISA, synthesises the knowledge and skills that any stakeholder should acquire to effectively respond in an MRO scenario.

3 Training Content

The five modules of the course have been based on the following documents, adapting their contents to mass evacuation and critical situations management on large passenger ships:

- MSC/Circ.1079, Guidelines for preparing plans for Co-operation between Search and Rescue Services and passenger ships.
- IMO and ICAO IAMSAR Manual.
• IMO Model course 3.13, Maritime Search and Rescue Administration.
• IMO Model course 3.15, SAR on Scene Coordinator.

Other important sources are:
• GMDSS (SOLAS chapter IV and ITU regulations).
• IMO Model Course 1.28, Crowd management, passenger safety and safety training for personnel. Providing direct services to passengers in passenger spaces.
• IMO Model course 1.29, Proficiency in crisis management and human behaviour training including passenger safety, cargo safety and hull integrity training,
• Papers and lectures from relevant institutions, magazines, web sites and congresses, especially the International Maritime Mass Rescue conference series, held in 2010, 2012 and 2014 in Gothenburg and developed by the International Maritime Rescue Federation (IMRF).

The full bibliography is showed in the training delivery and management plan, section 3.3 (Bibliography and support references).

3.1 Methodology

The methodology of the course is based on the teaching-learning procedure. It consists of five modules, with a theoretical part together with corresponding practical exercises to apply the abstract concepts. New areas of knowledge are progressively added, developing the whole content in an intuitive way.

Theoretical subjects take into account the lessons gathered from the latest MROs, trying to avoid the past errors and to learn from them. For practical exercises the full set of simulators at the Jovellanos Centre and its training pool are used, specifically, the following ones:
• GMDSS simulator (1 exercise).
• VTS simulator (2 exercises).
• Navigation simulator (1 exercise).

The training pool was used for the simulation of the evacuation of a passenger ship. During this exercise 18 Red-Cross volunteers played the role of passengers.

3.2 General Syllabus

Module 1: Communications and new technologies

SAR and MRO terminology.
Distress alert: DSC, EPIRB, VHF, satellite, mobile phone, and other means.
Communications before, during and after the MRO.
Using VTS/MRCC simulators for MRO training.
New technologies and unregulated systems: virtual reality, mobile apps.
Training the passengers on evacuation with ICT’s.

Practical exercise: Communications using GMDSS simulator of Jovellanos Centre.

Module 2: Units

Air SAR units: aircrafts and helicopters.
Maritime SAR units: tugs, ships and rescue boats.
Underwater SAR units and underwater operations.
Cruise ships as SAR support unit.
New prototypes: unmanned ships, drones.


Module 3: Castaways’ evacuation, recovering and reception

Safety measures to avoid the ship’s evacuation.
Methods and devices to counting passengers.
Safe areas: inside and outside the ship.
Massive evacuation.
Recovering and transferring castaways.
MRO and illegal immigration.

Practical exercise: Evacuation and castaways’ reception at the wave pool and the exercises field of Jovellanos Centre.

Module 4: Operations

Planning the MRO.
MRO Coordinator.
The weather’s effect on SAR and MRO. Searching procedures.
Other particular MROs.

Practical exercise: Basic MRO coordination using VTS simulator at the Jovellanos Centre.

Module 5: Strategies and management

MRO strategies, regional agreements on SAR teamwork.
Remote areas, polar waters.
Relations with media.
Ship owners and MRO, involving all the stakeholders in the MRO.
MRO drills.
Lessons learned.

Practical exercise: Advanced MRO coordination using VTS simulator of Jovellanos Centre.

### 3.3 SAR and MRO Training Delivery and Management Plan

<table>
<thead>
<tr>
<th>Management Aspect</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Course Delivery Methods:</strong></td>
<td>Theoretical part: classrooms with multimedia facilities. Practical part: Navigation simulator, VTS simulator, GMDSS simulators and training pool.</td>
</tr>
<tr>
<td>Course intake limitations:</td>
<td>9 trainees per course.</td>
</tr>
<tr>
<td>Staff Requirements: Qualifications of Instructors and Trainers, IMO certified, experience, etc.</td>
<td>10 years of experience as SMC responsible for maritime SAR operations. 10 years of experience as VTS operator or supervisor in a VTS, holding IALA V-103/1 or V-103/2 Certificate. 5 years of experience as Instructor of Navigation/ship-handling maritime simulators. 5 years of experience as instructor of GIS and SAR applications. 5 years of experience in relationship with media. 5 years of experience as SAR Manager. 5 years of experience as commander of Rescue Helicopter. 5 years of experience in maintenance of SAR Units. 3 years of experience on Firefighting and Survival at Sea techniques. 2 years of experience as Instructor of GMDSS. 2 years of experience in serious game.</td>
</tr>
<tr>
<td>Teaching facilities and equipment:</td>
<td>The simulators have scenario projectors, ECDIS, steering position, communication equipment (VHF/MW DSC), VTS screens with radar/AIS/RDF signal integrated, and debriefing devices, among other ones. The training pool for survival exercises has rescue boats, life rafts and lifeboats, among others. Red Cross volunteers play the role of passengers during the exercise. The classrooms are equipped with screen projectors, digital board and internet connection.</td>
</tr>
<tr>
<td>Teaching Aids</td>
<td>Description</td>
</tr>
<tr>
<td>--------------</td>
<td>-------------</td>
</tr>
<tr>
<td>A3</td>
<td>Keynotes and presentations.</td>
</tr>
<tr>
<td>A4</td>
<td>Videos.</td>
</tr>
<tr>
<td>A5</td>
<td>SARMAP and OILMAP applications.</td>
</tr>
<tr>
<td>A6</td>
<td>Access to national AIS network.</td>
</tr>
</tbody>
</table>

**Bibliography and support references, textbooks, etc.**

- MSC/Circ.1079, *Guidelines for preparing plans for Co-operation between Search and Rescue Services and passenger ships*.
- IMO and ICAO IAMSAR Manual.
- IMO Model course 3.15, *SAR On-Scene Coordinator*.
- IMO Model Course 1.28, *Crowd management, passenger safety and safety training for personnel. Providing direct services to passengers in passenger spaces*.
- IMO Model course 1.29, *Proficiency in crisis management and human behaviour training including passenger safety, cargo safety and hull integrity training*.
- IMO Model course 3.13, *SAR Administration*.
- IMO Model course 3.15, *SAR on Scene Coordinator*.
- GMDSS legislation (SOLAS chapter IV and ITU regulations).
- Papers and lectures from relevant institutions, magazines, web sites and congress, especially the International Maritime Mass Rescue conferences series, held in 2010, 2012 and 2014 in Gothenburg and developed by the International Maritime Rescue Federation (IMRF).

**Certification:**

At the end of the course, students who pass the assessment receive a course certificate. At present, this certificate is neither approved nor required by the Maritime Competent Authority.

**Balance between theoretical and practical classes:**

30/10

Theoretical: 30 hours divided into 5 modules of 6 hours.
Practical: 10 hours divided into 5 exercises of 2 hours, one per module.
3.4 Trainer Qualifications

Training in SAR and MRO covers a compendium of bizarre disciplines that requires actual specialists in order to guarantee an optimal teaching-learning procedure. The trainers chosen to teach in the SAR and MRO course have professional backgrounds in:

- SAR as officer/supervisor/responsible for maritime SAR operations
- VTS in coastal and port traffic procedures
- Navigation/ship-handling maritime simulators
- GMDSS simulators
- On-board fire fighting
- Survival at Sea techniques
- Mass evacuation strategies
- GIS and SAR applications
- Relationship with media
- SAR air/maritime rescue units.

The full requisites of the trainers’ qualifications are showed in the training delivery and management plan, section 3.3 (Staff requirements). All the instructors had to design and make ad hoc presentations for the course. They are included in the DVD that accompanies this document. Jovellanos Centre has an instructor’s induction manual that explains all the rules of access to their facilities.

This is a brief curriculum of the instructors involved in MONALISA 2.0 4.6.1 Training on SAR and Mass rescue operations.

<table>
<thead>
<tr>
<th>Instructors</th>
<th>Present occupation</th>
<th>Previous occupation</th>
</tr>
</thead>
</table>
| Carlos Fernández Salinas | VTS Head of Area Jovellanos Centre.  
VTS IALA Expert.  
| VTS Supervisor, SAR Mission Coordinator. |
| Fernando Martínez Cano | Press manager Dirección General de la Marina Mercante.  
<p>| Communication and medias. |
| Alejandro Busto        | Spanish National MRCC Manager.                                                     | VTS Supervisor, SAR                                       |</p>
<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
<th>University/Specialization</th>
</tr>
</thead>
<tbody>
<tr>
<td>González</td>
<td>Mission Coordinator.</td>
<td></td>
</tr>
<tr>
<td>Germán Erostarbe Alcano</td>
<td>Navigation Instructor of Jovellanos Centre.</td>
<td>Technician in SAR special operations.</td>
</tr>
<tr>
<td>Bárbara Altares Díaz</td>
<td>Sea Survival instructor of Jovellanos Centre.</td>
<td>Professional seaman.</td>
</tr>
<tr>
<td>Emir Iglesias Fernández</td>
<td>Inspection Head of Area SAR units.</td>
<td>Maritime engineer.</td>
</tr>
<tr>
<td>Santiago Martín González</td>
<td>Professor Sc.D. University of Oviedo.</td>
<td>Industrial engineer.</td>
</tr>
<tr>
<td>Javier Menéndez Vázquez</td>
<td>E-learning Head of Area Jovellanos Centre.</td>
<td>Master mariner.</td>
</tr>
<tr>
<td>Antonio Lista Martín</td>
<td>Navigation Head of area Jovellanos Centre.</td>
<td>VTS Supervisor, SAR Mission Coordinator.</td>
</tr>
<tr>
<td>Covadonga Suárez Antón</td>
<td>VTS Supervisor, SAR Mission Coordinator.</td>
<td>Master mariner.</td>
</tr>
<tr>
<td>Juan Iglesias Barbón</td>
<td>VTS Supervisor, SAR Mission Coordinator.</td>
<td>Master mariner.</td>
</tr>
<tr>
<td>Jesús Pérez Fernández</td>
<td>Communication Head of Area Jovellanos Centre.</td>
<td>VTS Supervisor, SAR Mission Coordinator.</td>
</tr>
</tbody>
</table>

### 3.5 Course Timetable

The class schedules were strictly observed to assure that all content was taught in its entirety. There was no delay that forced any planned activity to be cancelled. At the beginning of the class, each instructor was presented by the coordinator of the course, as well as the purpose of their lessons. At the end of the class, the instructors made a short review, highlighting the most relevant aspects. At the end of all the practical exercises a debriefing was held between all the actors involved.
<table>
<thead>
<tr>
<th>Time</th>
<th>Session</th>
<th>Presenter(s)</th>
</tr>
</thead>
</table>
| Monday, 4th | **0800 – 1000**  
SAR and MRO terminology  
Distress alert  
Communications | Jesús Pérez                                      |
|             | **1000 – 1030 Break**                                                 |                                                  |
|             | **1030 - 1130**  
MRO strategies and regional agreements  
Relations with the media (1) | Carlos Fernández Salinas  
Fernando Martínez Cano |
|             | **1230-1300 Break**                                                 |                                                  |
|             | **1300-1500**  
Relations with the media (2) | Fernando Martínez Cano                          |
|             | **1500-1600 Lunch**                                                 |                                                  |
|             | **1600-1800**  
Practical exercise:  
Communications using GMDSS simulator | Jesús Pérez, Carlos Fernández Salinas |
| Tuesday, 5th| **0800 – 1000**  
Planning the MRO  
SAR mission coordinator (SMC) | Alejandro Busto                                 |
|             | **1000 – 1030 Break**                                                 |                                                  |
|             | **1030 - 1230**  
MRO Coordination  
The weather’s effect on SAR and MRO | Alejandro Busto                                 |
|             | **1230-1300 Break**                                                 |                                                  |
|             | **1300-1500**  
Searching procedures  
Other particular MROs | Alejandro Busto                                 |
|             | **1500-1600 Lunch**                                                 |                                                  |
|             | **1600-1800**  
Practical exercise:  
Basic MRO coordination using VTS simulation | Antonio Lista, Germán Erostarbe, Covadonga Suárez, Carlos F. |
<table>
<thead>
<tr>
<th>Time</th>
<th>Topic</th>
<th>Speaker(s)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wednesday, 6th</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0800 – 1000</td>
<td>Safety measures to avoid the ship’s evacuation and passengers’ counting methods</td>
<td>Bárbara Altares</td>
</tr>
<tr>
<td></td>
<td>1000 – 1030 Break</td>
<td></td>
</tr>
<tr>
<td>1030 - 1230</td>
<td>Safe areas</td>
<td>Bárbara Altares</td>
</tr>
<tr>
<td></td>
<td>Massive evacuation</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1230-1300 Break</td>
<td></td>
</tr>
<tr>
<td>1300-1500</td>
<td>Lesson learned</td>
<td>Germán Erostarbe</td>
</tr>
<tr>
<td></td>
<td>1500-1600 Lunch</td>
<td></td>
</tr>
<tr>
<td>1600-1800</td>
<td>Practical exercise: Evacuation and castaways’ reception</td>
<td>Tomás González, Bárbara Altares, Carlos Fernández,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Salinas</td>
</tr>
<tr>
<td>Thursday, 7th</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0800 – 1000</td>
<td>Air SAR units</td>
<td>Jorge Fernández</td>
</tr>
<tr>
<td></td>
<td>1000 – 1030 Break</td>
<td></td>
</tr>
<tr>
<td>1030 - 1230</td>
<td>Maritime SAR units</td>
<td>Emir Iglesias</td>
</tr>
<tr>
<td>1230-1300 Break</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1300-1500</td>
<td>MRO search of casualties</td>
<td>Javier Menéndez</td>
</tr>
<tr>
<td></td>
<td>1500-1600 Lunch</td>
<td></td>
</tr>
<tr>
<td>1600-1800</td>
<td>Practical exercise: MRO manoeuvres using navigation simulator</td>
<td>Antonio Lista, Germán Erostarbe, Carlos Fernández,</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Salinas</td>
</tr>
<tr>
<td>Friday, 8th</td>
<td></td>
<td></td>
</tr>
<tr>
<td>0800 – 1000</td>
<td>Underwater SAR units and operations</td>
<td>Germán Erostarbe</td>
</tr>
<tr>
<td></td>
<td>Cruise ships as SAR support unit</td>
<td></td>
</tr>
<tr>
<td></td>
<td>New prototypes</td>
<td></td>
</tr>
<tr>
<td></td>
<td>1000 – 1030 Break</td>
<td></td>
</tr>
<tr>
<td>1030 - 1230</td>
<td>Training the passengers on evacuation with ICT’s</td>
<td>Santiago Martín</td>
</tr>
</tbody>
</table>
Students were given all the slides presented by the instructors as well as a course manual. The manual, which has 128 pages, is included in the DVD that accompanies this document.

### 3.6 Training Place and Facilities

The course was imparted at the Jovellanos Centre, which belongs to the Spanish Maritime Safety Agency. Inaugurated in 1993, ISO 9001 certification has been given to Jovellanos Centre from Det Norske Veritas (DNV). The building is located in the town of Gijon. Facilities cover an area of 143,000 square metres. The training field has a wave pool with 14 million litres of water. It is able to simulate 16 different types of waves. It also has firefighting scenarios (aircraft, LNG, flash over, HUET, among others). The
administrative offices, cafeteria, classrooms and the marine simulators are located in the main building.

Picture 3: View of Jovellanos Centre's facilities.

To reproduce real scenarios, the starting procedure of the marine simulators needs the interconnection of more than 70 simulators. Specifically, Jovellanos Centre has four marine simulators:

- **Navigation and manoeuvre simulator.** It has four fully equipped physical bridges. One of them is a “Full Mission” simulator with 360° scenario; the other two ones simulated tugs (azimuthal and Voith-Schneider propulsion) with 360° scenario and the last one a high-speed craft (water jet propulsion). In addition, it has two virtual bridges to simulate towed vessels, planes and helicopters. More than 50 different models of ships, from 17 metres length up to bulk carriers of more than 400.000 GRT, can be simulated in the bridges.

- **VTS simulator.** It is able to reproduce any vessel traffic service scenario contemplated in IMO resolution A 857 (22) and in IALA recommendations and guidelines, as INS, TOS and NAS services. The trainee area has 3 radar/AIS screens with communication equipment and meteorological station. It can work autonomously or in connection with the rest of simulators.

- **ECDIS simulator.** It consists of 3 ECDIS screens and coning positions where trainees can learn all the concepts regarding electronic nautical charts and displays, including the new syllabus introduced by 2010 Manila amendments to STCW convention. This simulator is connected to the Navigation simulator. That means the exercises can be exported to the ECDIS consoles of the bridges, so trainees are able to practice in a visual scenario the path and tracks designed in the ECDIS simulator.

- **GMDSS simulator.** This simulator consists of 6 radio stations and one instructor station. The main purpose of this simulator is to practice the communication
protocols contemplated in ITU regulations and SOLAS chapter 4. The range of the radio signal, interferences and loss of quality by atmospheric phenomena, are reproduced in a realistic way.

3.7 Evaluation Process

In order to obtain the course certificate, all trainees must attend ninety per cent of the lectures. During practical exercises with simulator absences are not permitted.

Total assessment:

\[ T.A. = 0.4\, Q + 0.6\, C.A. \]

- \( T.A. \) = Total assessment
- \( Q \) = Quiz (Examination of knowledge)
- \( C.A. \) = Continuous assessment

Continuous assessment assesses the work developed during practical lessons using the following criteria:

- Depth and breadth of knowledge demonstrated
- Quality to think according to evidence.
- Quality of communication.
- Leadership skills developed.

Picture 4: Practical exercise at the main bridge of Navigation and manoeuvre simulator.
This is the form that we used for practical training:

<table>
<thead>
<tr>
<th>Assessment form MRO practical training</th>
</tr>
</thead>
<tbody>
<tr>
<td>Date:</td>
</tr>
<tr>
<td>Name of trainee:</td>
</tr>
<tr>
<td>Instructor:</td>
</tr>
<tr>
<td>Exercise</td>
</tr>
<tr>
<td>GMDSS communications</td>
</tr>
<tr>
<td>MRO and illegal immigration / Gibraltar Strait</td>
</tr>
<tr>
<td>Passenger ship evacuation in training pool</td>
</tr>
<tr>
<td>High Sea MRO / Canary Islands</td>
</tr>
<tr>
<td>MRO in port areas / Bilbao scenario.</td>
</tr>
<tr>
<td>Global Assessment:</td>
</tr>
</tbody>
</table>

Continuous assessment parameters: (KD) depth and breadth of knowledge demonstrated, (QT) quality to think according to evidence, (QC) quality of communication, (LS) leadership skills developed.

Assessment Code: (1) Low Standard (2) Standard (3) Upper-standard (4) Outstanding

4 Who Can Attend the Training? Training Selection

4.1 Course Target Trainees

The course is oriented (the list is not exclusive) to:

- MRCC SAR mission coordinators,
- SAR unit teams,
- Crews of passenger vessels
- Ship company staff
- VTS operators
- Port authorities
- Policemen, firemen, emergency medical personnel
- Any other stakeholders that could be involved in an MRO scenario.

Picture 5: MRO exercise in Bilbao Port using Navigation simulator on May, the 8th. The ferry has been evacuated and the trainees, playing the role of masters and skippers of SAR units, are trying to recover survivors.

4.2 Trainees Selection

In this pilot course the Spanish Maritime Safety Agency (SASEMAR) chooses volunteers within the background mentioned in paragraph 4.1. As a result of this selection, the following trainees finally attended the course.

- One Maritime Rescue Coordinator manager
- Four SAR Missions Coordinators (SMC)
- One Fleet manager of a passenger ship company
- One inspector of maritime units
- One helicopter commander
- One skipper of patrol boat.
All the trainees who were chosen had relevant experience in their duties, showed a good disposal for learning, were open minded, knew how to work in a team and were willing to attend the course. The name and filiation of trainees were the following ones:

<table>
<thead>
<tr>
<th>Name</th>
<th>Company</th>
<th>Rank</th>
<th>Experience</th>
</tr>
</thead>
<tbody>
<tr>
<td>Álvarez Matías, Fernando</td>
<td>SASEMAR</td>
<td>SMC</td>
<td>22</td>
</tr>
<tr>
<td>Allegue Bueno, José Manuel</td>
<td>SASEMAR</td>
<td>SMC</td>
<td>18</td>
</tr>
<tr>
<td>Fernández Alonso, Jorge</td>
<td>HELIPSA</td>
<td>Commander</td>
<td>12</td>
</tr>
<tr>
<td>Gantes Rodríguez, Gerardo</td>
<td>SASEMAR</td>
<td>SMC</td>
<td>15</td>
</tr>
<tr>
<td>Iglesias Fernández, Emir</td>
<td>SASEMAR</td>
<td>Inspector</td>
<td>12</td>
</tr>
<tr>
<td>Martínez Karashe, Carlos</td>
<td>SASEMAR</td>
<td>Skipper</td>
<td>5</td>
</tr>
<tr>
<td>Padial Sayas, Antonio</td>
<td>SASEMAR</td>
<td>Manager</td>
<td>10</td>
</tr>
<tr>
<td>Prendes Díaz de la Novel, José</td>
<td>SASEMAR</td>
<td>SMC</td>
<td>18</td>
</tr>
<tr>
<td>Tablón Vega, Alberto</td>
<td>ACCIONA</td>
<td>Fleet manager</td>
<td>5</td>
</tr>
</tbody>
</table>

Picture 6: Trainees dressing for the evacuation and castaways’ reception at the wave pool on May the 6th.
5 Training Delivery and Results

5.1 Training Attendance

All trainees attended the total of both theoretical and practical lessons. Trainees had to sign in the attendance sheet at the beginning and at the end of the day.

This is a copy of the attendance sheet of the second day of training.

All attendance sheets are included in the DVD that accompanies this document.
5.2 Evaluation and Results

The Quiz includes 25 multiple-choice/true-false/short answer questions regarding theoretical contents on MRO. This is an extract of the Quiz:

13. What does the acronym ROV mean?
   a) Random Origin Vector.
   b) Remoted operated vehicle.
   c) Rapid Operated Voyager.

25. What is the most suitable method to localize an object when its last position is well known and the area is small?
   a) Track line search.
   b) Sectors search.
   c) Creeping line search.

The theoretical quizzes of the trainees are included in the DVD that accompanies this document.

All the trainees passed the theoretical quiz.
The scripts of the five practical exercises are:

<table>
<thead>
<tr>
<th>Scripts of practical exercises</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Practical Exercise day 1 (Monday, 4th of May):</strong> Communications using GMDSS simulator. The trainees were sailing along different scenarios. Meanwhile, they received alert and distress messages from other vessels. They had to respond following the current legislation and protocols. In the resolution of any emergency communication is an essential aspect, so this exercise prepared the trainees for the exercises of days 2, 4 and 5.</td>
</tr>
<tr>
<td><strong>Practical Exercise day 2 (Tuesday, 5th of May):</strong> Basic MRO coordination using VTS simulator. Scenario: Gibraltar Strait. Four trainees were located in an MRCC Centre. One of them played the role of supervisor/SMC, and the other three were operators. They had communication facilities, radar/AIS screen. The other five trainees were located in bridges of the Navigation simulator. One bridge was a passenger vessel, other a SAR tug unit, and another two were SAR rescue boats. In the scenario there were two «pateras» (small illegal craft with near 100 hundred people each other). The position of the «pateras» was uncertain. Trainees located in the VTS simulator had to determine a search area and deploy units to locate them.</td>
</tr>
<tr>
<td><strong>Practical exercise day 3 (Wednesday, 6th of May):</strong> Evacuation and castaways' reception at the wave pool. The trainees had to coordinate the evacuation of 18 passengers (volunteers of Red Cross) of a ferry in distress. The trainees played the role of the crew. The ferry in distress had one survival raft, one lifeboat and one rescue boat. During the evacuation one passenger was lost and another one suffered a hysteria/panic attack.</td>
</tr>
<tr>
<td><strong>Practical exercise day 4 (Thursday, 7th of May):</strong> Approach and rescue manoeuvres using Navigation simulator. Scenario: Canary Islands. All trainees were located in three bridges. One of them was a passenger vessel, another one was a SAR rescue boat and the last one was a LNG vessel. They received the order from MRCC Las Palmas to assist a factory fishing vessel with 89 POB that had a serious leakage. When they arrived, the factory vessel started to sink. One of the ships was named OSC. The ships had to give lee and rescue the people who were abandoning the factory fishing vessels in survivals rafts.</td>
</tr>
<tr>
<td><strong>Practical exercise day 5 (May, 8th of May):</strong> Advanced MRO coordination using VTS simulator and Navigation simulator. Scenario: Port of Bilbao. This exercise reproduces an MRO in port areas. Two Trainees were located in MRCC Bilbao. The other trainees were located in ship bridges of the navigation simulator. One bridge is a tug involved in the manoeuvre of a ship, and the other two were SAR rescue boats that were looking for a man who had disappeared inside port waters. A passenger vessel that is entering Bilbao Port suffered an engine failure just in the middle of the entrance, so she got aground. Some minutes later she sunk.</td>
</tr>
</tbody>
</table>
Picture 7: Evacuation exercise in the wave pool on May the 6th. The trainees coordinated the evacuation of 18 Red Cross volunteers who played the role of passengers.

The practical evaluation forms of the trainees are included in the DVD that accompanies this document.

All the trainees passed the practical evaluation.
5.3 Evaluating the Training Effectiveness

At the end of the course all the trainees fulfilled the following evaluation form:

<table>
<thead>
<tr>
<th>Training evaluation form</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name (optional):</td>
</tr>
<tr>
<td>Organisation:</td>
</tr>
<tr>
<td>Date:</td>
</tr>
<tr>
<td>Location:</td>
</tr>
<tr>
<td>Have you attended a MRO training program before? Yes No</td>
</tr>
</tbody>
</table>

JOVELLANOS Center is always aiming to improve the training services we provide, therefore, we would appreciate your comments confirming the points that have met your expectations and the areas where you feel improvements could be made. Please help us to improve and be excellent.

<table>
<thead>
<tr>
<th>Please evaluate the following questions by placing a ✔ in the relevant box</th>
<th>Poor</th>
<th>Fair</th>
<th>Good</th>
<th>Very Good</th>
<th>Excellent</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location and facilities</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Relevance to your job place</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The quality of presentations and teaching material used</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>The relevance/usefulness of questions and discussions following the presentations</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>What did you think of the format of the training course?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Improvement and updating of your skills/knowledge/promotion</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>And the trainer?</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Course duration?</td>
<td>Too short</td>
<td>Just right</td>
<td>Too long</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Please use the following section to give your opinions, good or bad and overall assessment of the training course. Use short sentences whenever possible.
The following graphic shows a summary of the results of all the evaluation forms.

**SUMMARY OF TRAINEE SATISFACTION**

As it can be seen, the results of trainee satisfaction were very high, since in most cases they have chosen the "Excellent" option (47/63).

All training evaluation forms of the trainees are included in the DVD that accompanies this document.

6 On The Field Evaluation

This section is referred to as the assessment of the training course during the MRO exercise. The evaluation has been performed by the trainers and the trainees selected during the training delivery process. Some key performance indicators have been tested during the exercise.
6.1 Exercise Area of Performance

SAREX 25-15 aims to simulate a massive rescue operation of passengers from a ferry, so it was a unique opportunity to check if the SAR and MRO course contents fit to real needs. For this reason three trainees who had previously attended the SAR and MRO course, were invited to participate in the exercise, as well as their coordinator. During the exercise the trainees were placed in the area of coordination and decision-making support. The next section will describe the role played by each member.

6.2 Trainees Selected to Attend and Role Within The Exercise

The following trainees, who previously attended the course, were selected to carry out the SAREX 25-15 exercise:

- Antonio Padial Sayas
- Gerardo Gantes Rodríguez
- José Manuel Allegue Bueno
The reasons for the choice were the availability, proximity and wilfulness. Carlos Fernandez Salinas, course coordinator, also attended the exercise.

The roles of the above-mentioned participants were:

<table>
<thead>
<tr>
<th>Name</th>
<th>Role</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antonio Padial Sayas</td>
<td>Manager of MRCC</td>
</tr>
<tr>
<td>Gerardo Gantes Rodríguez</td>
<td>SAR Mission Coordinator (SMC)</td>
</tr>
<tr>
<td>José Manuel Allegue Bueno</td>
<td>Geographic Information System (GIS) Technician</td>
</tr>
</tbody>
</table>

Carlos Fernandez Salinas was placed as an observer in MRCC Valencia.

After the exercise, the trainees made the following notes and remarks.

<table>
<thead>
<tr>
<th>Notes and remarks of the trainees</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antonio Padial Sayas</td>
</tr>
<tr>
<td>“I played the role of manager of MRCC Valencia. Inside the crisis cabinet, I was assigned to the Cell of Maritime Operations as responsible for assessing the impact of the Plan of Operations in maritime units. In this sense, I had to identify equipment needs, staff reliefs, maintenance, work overloading, etc. I had to keep the crisis director well informed about all the operations performed by maritime units. I think that the MONALISA SAR and MRO course that I had attended in May was really very useful to understand the difficulties of this kind of operations. I want to point out that On Scene Co-ordinators (OSC) would need a special training in MRO, especially if they have to be mobilised by helicopters to the ship in distress.</td>
</tr>
<tr>
<td>Gerardo Gantes Rodríguez</td>
</tr>
<tr>
<td>“During MONALISA 2.0 SAREX 25-15 exercise I was in MRCC Valencia as SAR Mission Co-ordinator (SMC). I have to point out that this is the role that I usually perform in real life; however, the difficulties encountered during an operation of this magnitude prevented me from doing my job as I would have liked. Another difference with a normal SAR operation is that on this occasion the operating room was full of observers, and so operators and SMCs felt “observed” all the time. In addition, I was interrupted on many occasions by the observers, who continuously demanded information. I think that it is very important that the operating room will be reserved to the staff responsible for providing immediate response to the emergency. The observers can be located in an adjoining room. The SAR and MRO course that I attended at Jovellanos Centre was very useful, especially the practical exercises, where you can practice skills that you do not use in normal situations.</td>
</tr>
<tr>
<td>José Manuel Allegue Bueno</td>
</tr>
<tr>
<td>“My task was to collect information from air and maritime departments. This information was processed in order to present it to the crisis director and advisors. The information consisted of a graphical representation of the state of the emergency, the units deployed...”</td>
</tr>
</tbody>
</table>
and the evolution of the numbers of people rescued. Communications between my department and MRCC Valencia was saturated, so the exchange of information had to be done by alternative sources. I found the SAR and MRO course, which I attended a month before the SAREX exercise, very useful to understand the scope of such emergencies and to provide effective solutions to overcome them. Particularly, I found very interesting the analysis of real MROs and the introduction of new technologies”.

As an observer in MRCC Valencia, Carlos Fernández Salinas could verify what simulation exercises conducted during the SAR and MRO course had demonstrated on numerous occasions: the risk of saturation of communications, both maritime (VHF) and terrestrial (emergency telephones). He also highlighted the need to mobilise additional personnel to strengthen the team on duty when such kind of emergencies happens.

6.3 Key Performance Indicators Matrix

This matrix evaluates the efficacy of the training module according to the experience acquired during the exercise. Key Performance Indicators are a series of measurements to check how the trained staff is applying in the short term, the training received in a previously stage. Operational managers use these indicators to find out how they are performing and what they can do to improve the operations in general. Training evaluators and assessors also use them to make decisions about improvements of the training program.

The matrix reflects the strength or weakness of different aspects of the knowledge acquired. Furthermore, it also aims to improve the performance and response carried out during the exercise. The values of the key performance indicators are:

- D – Disagree
- MA – Moderately agree
- A – Agree
- CA – Completely agree
- NA – No answer
## Key Performance Indicator

<table>
<thead>
<tr>
<th>Exercise is suited to the following situations:</th>
<th>D</th>
<th>MA</th>
<th>A</th>
<th>CA</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prerequisite knowledge sufficiency</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Target skills trained have considered the exercise requirements</td>
<td></td>
<td></td>
<td>X</td>
<td></td>
<td></td>
</tr>
<tr>
<td>The exercise setting has been easily replicated during training</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>The target skills involve real life situations</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Training tasks closely match tasks in the exercise</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
<tr>
<td>Enables to use new technologies/gadgets</td>
<td></td>
<td></td>
<td></td>
<td>X</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Exercise is not best suited to the following situations:</th>
<th>D</th>
<th>MA</th>
<th>A</th>
<th>CA</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>To develop the training received</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>To interact with different staff positions</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Situations designed restrict the efficient performance of skills</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Skills require more practice before this type of exercise</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Large numbers must be trained at the same time</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Measure the errors or time loses during response</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Exercise made possible to improve:</th>
<th>D</th>
<th>MA</th>
<th>A</th>
<th>CA</th>
<th>NA</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reducing the panic situations</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coordinate evacuation/rescue actions with crew members</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Coordinate actions with the port and land life protection agencies</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apply first aids</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Optimise the units operations</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Minimise errors and gain time</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Other considerations, please write your comments

A very positive aspect of the SAREX 25-15 exercise was the "debriefing" held on Tuesday, June 16th. The "debriefing" allows the participant to get an overall picture of what is actually happening during an exercise where they only have a partial view of the facts.

There was great similarity between SAREX 25-15 and one of the exercises performed during the SAR and MRO course, where it was simulated the stranding of a ferry vessel in the entrance of Bilbao port.
6.4 Final Assessment

The analysis and results from the KPI matrix reveal that on a large scale the course content meets the needs of a real MRO, and fill the gap between the knowledge of the trainee before attending the course and the skills the trainee will need in a real scenario. Similar problems that arise in different exercises are useful to detect problems that require new solutions. For example, in both the SAREX 25-15 exercise and the simulations carried out in the Jovellanos Centre, the emergency coordinators were overwhelmed by the high demand of information requested by all stakeholders. This reinforces the thesis that exercises and simulators are not only suitable for teaching new skills, but also to train those acquired in the past but rarely put into practice, as it happens with MROs.

Thanks to the SAREX 25-15 exercise we have detected that the course has areas for improvement too. In this sense, SAREX 25-15 was developed in four phases (Fire/SAR operations/Tug operations/Port operations). During the SAR and MRO course we have dealt with these four aspects, but the syllabus should be improved in terms of ship’s damage control and the execution of towing operation, especially in the case of large ships. In future courses it would be quite interesting if both firemen and medical personnel could attend the course in order to share experiences with them.

![Picture 9: The SAR tug “Clara Campoamor” approaching passenger ship “Juan J. Sister” to start towing operations on June, the 15th.](image)

It has been detected, both during the course and in MONALISA 2.0 SAREX 25-15Valencia exercise, a border line between maritime and aviation activities, possibly due to the great difference in protocols. During the course we had the opportunity to have an aircraft commander with a double trainee/instructor function. In addition to providing his invaluable point of view, he demanded the other participants (especially to SMC) some kind of information that was unknown to him. Given the fact that in MRO incidents
intervention teams (unaware air safety protocols) frequently have to embark on a helicopter, such exchange of experiences is fundamental. Another issue addressed during the SAR and MRO course and which later came up during the SAREX 25-15 exercise, was the relationship with the media, which requires a professional approach. The organisation responsible to respond should face the media providing objective and reliable information, which requires training. During the course there were three press conferences simulations where the trainees played the role of persons responsible for dealing with the crisis. This practice was highly valued. A video of one simulated press conference is included in the DVD that accompanies this document. As an improvement to the course, we think that the effect of “social networks” should be addressed more deeply.

To sum up, the SAREX 25-15 exercise was an exceptional opportunity to test the contents of SAR and MRO course, as well as its validity and efficiency. Thanks to this verification we found that the objectives of the SAR and MRO course adequately meet the needs of a real massive rescue operation. We believe that this type of training is essential for anyone who could be involved in such kind of accidents.

7 Conclusions

7.1 Added Value to the Staff’s Improvement Skills

Because MRO incidents usually involve actors from different sectors (sea/port/air), we think that the real added value to the staff’s improvement skills was to design a course opened to a wide spectrum of trainees. Having focused exclusively on one sector (for example, personnel of maritime rescue units), it would have deprived the other trainees of the experiences provided by their colleagues with different background, such as shipping companies or air units, whose work philosophies are very different. When the group of trainees is heterogeneous, the exchange of experiences generates a positive atmosphere during the teaching-learning process, so the result of the training is more satisfactory. This becomes evident during the “debriefings”. In the SAR and MRO course, five practical exercises of 2 hours each were run. At the end of them, the corresponding “debriefing” was carried out, always following a strict procedure in which the word was given to all the trainees. As the trainees came from different sectors, shared experiences were priceless.
7.2 Added Value to the Improvement of SAR and MRO

As we have mentioned at the beginning of this document, despite the fact that there has recently been a significant increase in the movement of passengers by sea and in the number of accidents which involves this type of vessels, there is not an international standard on MRO response training, not even a model course that a Competent Authority could use as a guidance. This is the real added value of the sub-activity 4.6.1 to the improvement of SAR and MRO: to cover the gap between the current situation and the industrial real needs. Training is the best way to reduce accidents and when they are unavoidable, competent professionals may drastically reduce the number of victims, as well as the damage caused to environment and goods. The MONALISA 2.0 SAR and MRO course synthesises the knowledge that any stakeholder should acquire to effectively respond in an MRO scenario.

7.3 Potential Impact in a Future Master of Science in Maritime Safety Training

The introduction of the new technologies and the strategies in decision-making processes in maritime transport must be faced by means of training. Standardisation of training is a real need because of the global dimension of this industry. The MONALISA 2.0 SAR and MRO course is designed in such a way that the participants acquire knowledge and skills that they can apply directly in their professional lives. This should be the main goal in any
training activity, especially in a master program. In this sense, a significant part of the MONALISA 2.0 SAR and MRO course is based on simulation. Simulation plays an essential role in the acquiring/updating/improving of professional skills in a safe environment. Instructors are required to recreate atmospheres as close as possible to reality, which can only be achieved by living the activities that they intend to simulate. Jovellanos Centre belongs to an organisation in charge of responding to maritime incidents (SASEMAR), so the instructor is in a privileged position to identify training needs regarding maritime search and rescue. For this reason, MONALISA 2.0 SAR and MRO course could be one of the most valuable training tools inside the future Master of Science in Maritime Safety Training.
ANNEXES

Annex 1: List of Documents Contained in DVD

- Instructor’s Power Point Presentations.
- MRO Course manual.
- Course attendance sheets.
- Theoretical quizzes of the trainees.
- Practical evaluation forms of the trainees.
- Training evaluation forms of the trainees.
- Example of simulated press conference (video).
- Presentation video of Jovellanos Centre.
Annex 2: Abbreviations

ATM     Air Traffic Management
ECTS   European Credit Transfer and Accumulation System
EMSA    European Maritime Safety Agency
GMDSS   Global Maritime Distress Safety System
GPS     Global Positioning System
IALA    International Association of Marine Aids to Navigation and Lighthouse Authorities
IAMSAR  International Aeronautical and Maritime Search and Rescue
ICAO    International Civil Aviation Organisation
IMO     International Maritime Organisation
MARPOL  International Convention for the Prevention of Pollution from Ships
MET     Marine Education and Training
MRCC    Maritime Rescue Coordination Centre
MRO     Mass Rescue Operation
MSc     Master of Sciences
MST     Maritime Safety Training
OSC     On-Scene Co-ordinator
SAR     Search and Rescue
SASEMAR Spanish Maritime Safety Agency
SMC     SAR Mission Coordinator
SOLAS   International Convention for the Safety of Life at Sea
STCW    International Convention on Standards of Training, Certification and Watch keeping for Seafarers
STM     Sea Traffic Management
TKPI    Training key performance indicators
VTS     Vessel Traffic Service
Annex 3: References

MSC/Circ.1079, *Guidelines for preparing plans for Co-operation between Search and Rescue Services and passenger ships.*
IMO and ICAO IAMSAR Manual.
IMO Model course 3.15, *SAR on Scene Coordinator.*
IMO Model Course 1.28, *Crowd management, passenger safety and safety training for personnel. Providing direct services to passengers in passenger spaces.*
IMO Model course 1.29, *Proficiency in crisis management and human behaviour training including passenger safety, cargo safety and hull integrity training.*

Annex 4: Pictures

*Front cover photo: Jesús Pérez Fernández*
*Picture 1: Abaca USA/Empics Entertainment*
*Picture 2: Carlos Fernández Salinas*
*Picture 3: Spanish Maritime Safety Agency*
*Picture 4: Germán Erostarbe Alcano*
*Picture 5: Jesús Pérez Fernández*
*Picture 6: Carlos Fernández Salinas*
*Picture 7: Jesús Pérez Fernández*
*Picture 8: Sergio Velásquez Correa*
*Picture 9: Spanish Maritime Safety Agency*
*Picture 10: Screen capture from SAFE SCAPE serious game.*
39 partners from 10 countries
taking maritime transport into the digital age

By designing and demonstrating innovative use of ICT solutions
MONALISA 2.0 will provide the route to improved

SAFETY - ENVIRONMENT - EFFICIENCY

Swedish Maritime Administration • LFV - Air Navigation Services of Sweden • SSPA • Viktoría Swedish ICT • Transas • Carmenta • Chalmers University of Technology • World Maritime University • The Swedish Meteorological and Hydrological Institute • Danish Maritime Authority • Danish Meteorological Institute • GateHouse • Navicon • Novia University of Applied Sciences • DLR • Fraunhofer • Jeppesen • Rheinmetall • Carnival Corp. • Italian Ministry of Transport • RINA Services • D’Appolonia • Port of Livorno • IB SRL • Martec SPA • Ergoproject • University of Genua • VEMARS • SASEMAR • Ferri Industries • Valencia Port Authority • Valencia Port Foundation • CIMNE • Corporacion Maritima • Technical University of Madrid • University of Catalonia • Technical University of Athens • MARSEC-XL • Norwegian Coastal Administration

www.monalisaproject.eu

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