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**Protection Measures for Merchant Ships**

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**Project partners:**

- 1 – FLIR – FLIR Systems LTD - EN
- 2 – CMRE – Nato Science and Technology Organisation - BE
- 3 – WMU – World Maritime University - SE
- 4 – UoA – University of the Aegean-Research Unit - GR
- 5 – SAMI – Security Association for the Maritime Industry Limited - EN
- 6 – UNR – Uniresearch B.V. - NL
- 7 – TNO – Nederlandse Organisatie voor Toegepast Natuurwetenschappelijk Onderzoek - NL
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- 9 – Oldendorff – Oldendorff Carriers GMBH & Co KG - DE

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## Executive summary

### Introduction

This report scope is limited to the PROMERC Deliverable (D) 1.2 “Scenario report” that documents the results of Task 1.2 scenario development. The purpose of the scenarios is to ensure that the combined database that is being produced in WP3 is an accurate reflection of real life piracy situations. The scenarios will be used with stakeholders to help articulate the range of parameters that the PROMERC WP3 and WP4 need to consider. Specifically, they will support:

- WP 3.2 Cost-benefit study : the scenarios will be used to test and tune the logic for the databases
- WP 3.3 Cost function : each counter-measure will have a cost function defined for each scenario
- WP 4 Tactical decision aid : the scenarios will be used to design and develop the functionalities of the tactical decision aid (TDA), which will include historical information, actualized weather and piracy information, and time critical information from the vessel data recorder and detections of suspect vessels

The scenario development occurred along two paths, specifically those of historical event analysis as well as expert-based input. Each one supported the other, as the numerical analysis ensured that the chosen scenarios were not only possible but also likely to occur, and the expert-based input ensured that the numerical analysis was a reflection of the concerns most greatly felt by the merchant community.

The historical event analysis began with a literature review that was conducted to determine the extent of previous research and analyses on the topic of piracy events. This guided the building and analysis of a database of piracy attacks in order to build up a body of knowledge and understanding so that the scenarios chosen by the experts represented a sufficiently representative portion of the attack situations.

The expert-based input was developed during a workshop in Malmo, Sweden, on 15 May 2014, where subject-matter experts were asked to provide input on what the merchant community felt are their most likely or most problematic piracy threats.

### Piracy Event Data

When developing the database to catalog piracy events, a number of sources were considered. These included the International Maritime Organisation (IMO) and International Maritime Bureau (IMB).

It was decided to go with the IMO / IMB data source as it was the most complete, detailed, and open-source database. Within this database, the merchant shipping events from 1995 to 2013 number 5647 in total, of which 2281 are when the ship is steaming and 3054 are at anchor or berth. The analysis in this report was limited to the events from 1995 to 2013, as years prior to and after these dates are incomplete. The tugs, dhows, yachts, and fishing vessels were not included in the analysis as the deliverables for PROMERC are focused specifically on merchant vessels.

Similar analyses have been done by other groups, however the analysis reported in this document is for a broader range of dates and locations, and where possible it aims to provide recommendations based on quantitative analysis, including the determination of causality rather than merely correlation where possible.

### Piracy Event Analysis Results

The results of this work are the foundation for the scenario development and choices made in Section 4. The analysis is also aimed at assessing if there are trends in piracy attacks, for example within specific regions or types of piracy, in order to determine if there are improvements that can be made to the shipping industry to both reduce the number of piracy attacks as well as lower the success rate of pirates.

A wide variety of factors were analysed, including the region in which the events took place, the outcome (approach, boarding, etc) of the attack, ship status (steaming or at anchor), jurisdiction (territorial or international waters), time of day, ship size, the number of events per year, as well as the use of the most prevalent counter-measures.

### PROMERC Scenarios

In developing the scenarios for PROMERC, a number of factors about piracy events were considered. These included physical factors about the ship, as well as factors that vary with each voyage.

The physical factors include:

- Size of ship (in gross tonnes)
- Potential maximum speed of ship
- Height of ship freeboard
- Ship type (cargo, tanker, etc)

Factors that vary with each voyage include:

- Jurisdiction (international or territorial waters)
- Preparations made prior to voyage (which CMs were included for the voyage)
- Ship status (steaming or at anchor / drifting)
- Region
- Pirates were easily deterred or prone to violence

The final result, of the analysis and expertise decisions during the workshop, is the following scenarios:

#	Scenario Title	Ship Size	Speed	Freeboard	Ship Type	Ship Status	Region
1	Large Target	Large	High	High	Container	Steaming	Far East & HOA
2	Medium Target	Medium	Medium	Medium	Bulk	Steaming	HOA
3	Small Target	Small	Slow	Low	Tanker	Steaming	West Africa
4	Anchor or Drifting	Small	Stopped	Low	Cargo	At anchor	Far East

## Acronym List

AIS	Automatic Identification System
BMP4	Best Management Practices (version 4)
CM	Counter-Measure
CSO	Company Security Officer
D	Deliverable
EI	Essential Elements of Information
HOA	Horn of Africa
HRA	High Risk Area
IMB	International Maritime Bureau
IMO	International Maritime Organization
ISPS	International Ship and Port Facility Security
NVG	Night Vision Goggle
PEESLE	Political-Economic-Ethical-Social-Legal-Environmental
PROMERC	Protection Measures for Merchant Ships
RPG	Rocket Propelled Grenade
SME	Subject Matter Expert
SOP	Standard Operational Procedure
SSAS	Ship Security Alert System
T	Task
TDA	Tactical Decision Aid
VLCC	Very Large Crude oil Carrier
UKMTO	UK Maritime Trade Operations
WMU	World Maritime University
WP	Work Package
WS	Work Shop