

J R C T E C H N I C A L R E P O R T S

Maritime Piracy Incident Reporting

A Technical Feasibility Study

Application of the ECCAIRS Reporting System into the domain of maritime piracy

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1 Introduction

Maritime piracy presents a significant threat to the global shipping industry. In the first six months of 2012, IMB¹ received reports of 177 incidents worldwide. In this period, 20 vessels were actually hijacked with 334 crew members taken hostage, and 80 vessels were boarded, 25 vessels were fired upon and 52 vessels reported attempted pirate attacks. Five African countries along the African continent's sea coast have been listed by the IMB as risky areas for the movement of vessels and ships due to attacks by pirates. The countries are Somalia, Nigeria, Benin, Guinea and Cameroon, which are - besides Somalia - all in the Gulf of Guinea of West Africa. Ships in this region, including oil and chemical tankers, are increasingly being attacked with automatic weapons and rocket propelled grenade launchers. The Gulf of Guinea region is seen as the next piracy hotspot after Somalia².

Among different initiatives to counter piracy in the Gulf of Guinea region, the European Parliament has in 2010 requested additional attention for the fight against piracy. By addressing improved maritime governance capacities and improved safety and security at sea in the Gulf of Guinea region, PMAR-GOG³ aims to implement this Parliament's request. The general objective of PMAR-GOG is to identify and assess technical means and practices that can be used in the near and medium future by the stakeholders of the Gulf of Guinea region to contribute to their maritime awareness, chiefly by supporting the gathering and sharing of information. Specifically, in the Gulf of Guinea region, one of the main problems is the lack of good quality information on piracy attacks and there is no formal system to gather information on piracy attacks. Furthermore, no formal system of information exchange exists between States or organizations in the Gulf of Guinea region.

Therefore, JRC developed a software system to collect and store information on piracy incidents with a functionality to share this information with other States or organizations. This prototype called PIRATES⁴ is an extension within ECCAIRS⁵ which was developed by JRC to monitor transport safety in Europe. ECCAIRS enables the collection and analysis of accident and incident data for three different public transport modes: aviation, maritime and railway.

The ECCAIRS reporting system in the transport domain is provided free of charge to the competent transport authorities worldwide. Within the European Union, the European Commission is providing technical support, training and data exchange services to these organisations, all free of charge. Outside the European Union, these services need to be provided by third parties.

Since ECCAIRS already provides a reporting system allowing data collection and data exchange, it was suggested to study from a technical point of view if ECCAIRS could be a suitable system for addressing the above mentioned issues in the Gulf of Guinea region. The technical feasibility study is relevant for JRC because the possibility to apply ECCAIRS to another domain than transport safety was studied. Furthermore, this study was conducted to research the time and effort needed to develop a new extension within ECCAIRS.

¹ International Maritime Bureau Piracy Reporting Centre

² Baldauf, S. (2012) "Next pirate hot Spot: The Gulf of Guinea", Christian Science Monitor, 28 February 2012, <http://www.csmonitor.com/World/Africa/2012/0228/Next-pirate-hot-spot-the-Gulf-of-Guinea>

³ Pilot Project on Piracy, Maritime Awareness and Risks – Gulf of Guinea

⁴ Pirate Incident Reporting And informaTion Exchange System

⁵ European Coordination Centre for Accident and Incident Reporting Systems

2 Software

The mission of ECCAIRS is to assist National and European transport authorities and accident investigation bodies in collecting, sharing and analysing their safety information in order to improve public transport safety. The ECCAIRS Reporting System has been developed to support occurrence reporting in civil aviation. The system has been in use since 1998 in various different versions.

2.1 ECCAIRS Common Framework

In 2008, ECCAIRS was made suitable to support aviation as well as maritime and other transport sectors. This so called ECCAIRS Common Framework (ECF) can provide the complete collection, exchange and analysis infrastructure to be used by reporting environments for each of the supported transport sectors. The transport dependent parts of the final reporting systems are concentrated in so called domain-specific extensions (see also Figure 1 below).

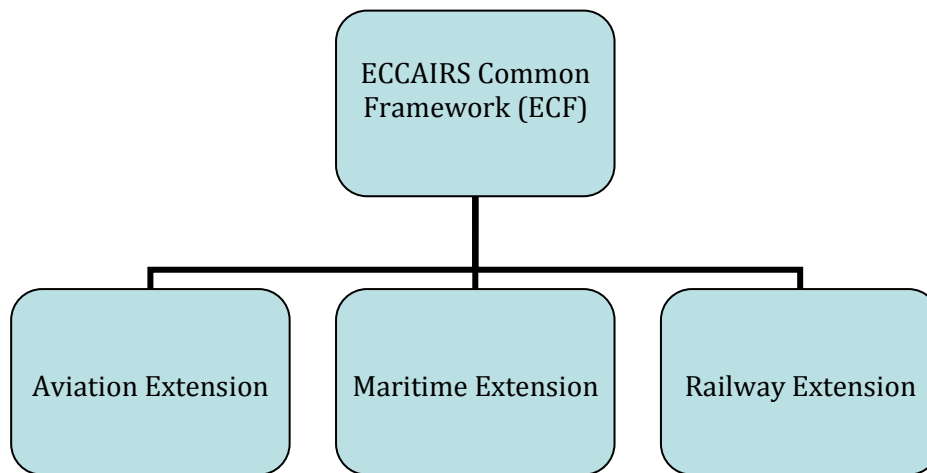


Figure 1: ECCAIRS Common Framework and Domain-specific Extensions

The philosophy of an ECCAIRS Common Framework with replaceable Extensions is shown in Figure 2 where the user-interface components and the taxonomy have been extracted from the system and the remaining parts together form the ECF. The extension is formed by the combination of the Taxonomy contents and the User Interface where obviously the user interface part strongly depends on the taxonomy. All other tools, used for analysis, data exchange and data-integration are part of the ECF and can be applied without limitations for each Extension in the same manner.

The bottom of this diagram groups all basic functionalities of the system in a system library accessible via an internal ECCAIRS Application Programming Interface (API). Functions provided by this basic software implement access to data, security, user authentication and access to the taxonomy used to encode the stored information. On the top in the diagram the several rectangles represent a non-exhaustive list of ECCAIRS tools and utilities making the functionality available to the end-users. In the above architecture the majority of functions implemented are independent from the transport mode in which the system could be used. The transport dependent parts could be found in the Taxonomy (completely depending) and in both browser applications which depend only for a small part (the user-interface) on the transport mode.

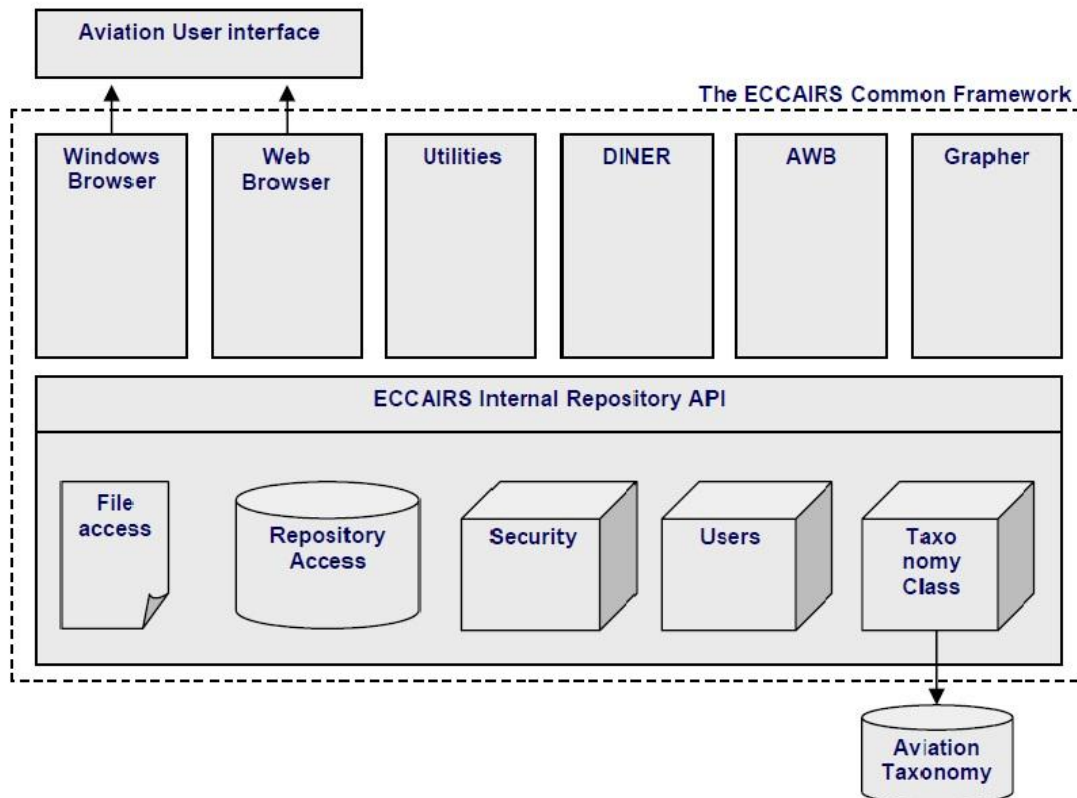


Figure 2: The simplified software architecture for ECCAIRS

2.2 ECCAIRS Taxonomy

The taxonomy of ECCAIRS is the catalogue of information describing what information can be stored in the ECCAIRS Repository and how this information is (possibly) encoded in the data fields. To design the taxonomy for maritime piracy, an analysis of reported piracy incidents was conducted. Due to different definitions and interpretations of what piracy and armed robbery at sea is, there were found some differences in the reporting of piracy incidents. Whereas in the definition of UNCLOS⁶ the location of incidents plays an important role, ONI⁷ is focusing on the type of attack and the status of the ship in their definition of maritime piracy. According to the IMB, besides the type of attack, a hostile intent has to be present and of course this is not easy to measure. Next to these differences in definitions, there are differences in categories as well. For instance, the IMB uses four types of attack (attempted, boarded, fired upon and hijacked), whereas the UKMTO⁸ also has a category “suspicious vessel”. And ReCAAP⁹ uses categories for the significance level of the reported incident (very significant incident, moderately significant incident, less significant incident), and has a different category for attempted attacks.

During the taxonomy design for maritime piracy, the above mentioned issues were taken into account. Further, the taxonomy design was based on the EMCIP taxonomy for ship types to avoid “reinventing the wheel” and to use the IMO reporting formats on harmonised procedures for reporting marine casualties and incidents (see figure 3).

⁶ United Nations Convention on the Law of the Sea

⁷ Office of Naval Intelligence

⁸ United Kingdom Maritime Trade Organisations

⁹ Regional Cooperation Agreement on Combating Piracy and Armed Robbery against Ships in Asia

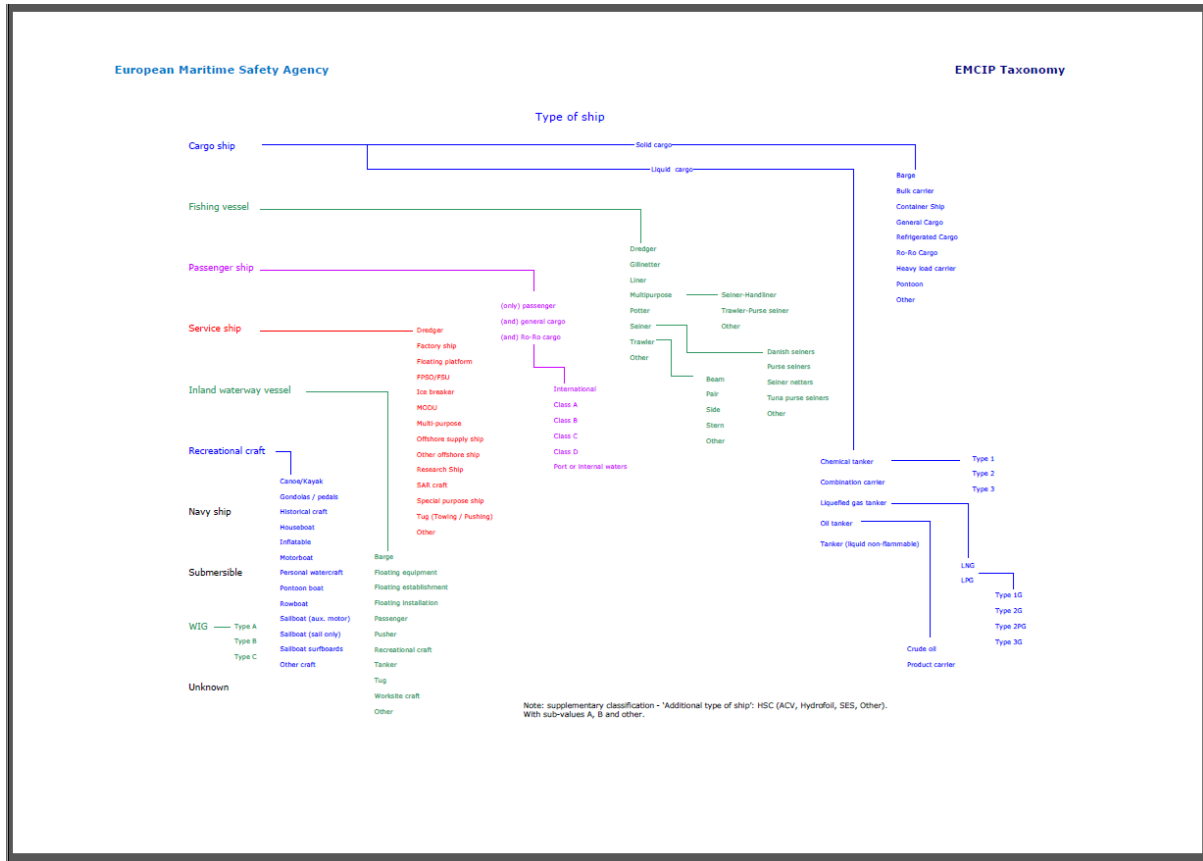


Figure 3. EMCIP Taxonomy for type of ship

To build the maritime piracy taxonomy for PIRATES, piracy incidents were described by their so called attributes, for instance the “name of the ship” that was attacked or the “location of the piracy incident”. Then, the attributes were grouped together in so called sections for visualisation and editing purposes. The section designer in ECCAIRS was used for the design of these sections. See next page (figure 4) for the sections and attributes that were defined in the final taxonomy of PIRATES to report a piracy incident.

2.3 ECCAIRS Interface Design

For the reporting of a piracy incident in PIRATES, different organisations are using different forms and reports. In ECCAIRS, it is possible to design the various forms and reports as wished for, however the structure of the underlying data has to be respected. The design of the reporting of piracy incidents in PIRATES can be seen on the next page as well (figure 5).

Section 1: Identification

Attributes: Reporting entity, Date entered, Incident number, Incident Sort, Incident Type, Status of report, Report last modified.

Section 2: DTG and Location

Attributes: Incident date, Incident Time, Time Zone, Period of day, Latitude, Longitude, Country of incident, Area of incident, Location of incident, Position of incident

Section 3: Ship Characteristics

Attributes: Ship name, IMO number, MMSI number, Call sign, flag of ship, Length of ship, Type of ship, DWT of ship

Section 4: Ship Circumstances

Attributes: Last port of ship, Next port of ship, Nearest port, Status of ship, Speed of ship, Wave height, Wind speed, Freeboard of ship, Security on board, Citadel, Safe-Room, Ships Security Level, Visibility

Section 5: Details of Attack

Attributes: Number of attackers, Type of attackers, Violence used, Number of boats, Type of boats, Weapons used, Mitigating actions, Ship entered by, Attackers killed, Attackers injured, Attackers arrested, Length of Attack

Section 6: Victims

Attributes: EU Citizenship, Victims killed, Victims injured, Victims missing, Victims assaulted, Victims kidnapped, Victims taken hostage, Victims threatened

Section 7: Narrative (free format description of the incident)

Section 8: Post Incident Details

Attributes: Consequences for the victims, Victims used as human shield, Victims used to crew mothership, Authorities reported to, Ransom paid (and if yes, how much), Vessel raided, Estimated costs, Days held in captivity, Date of ship released if hijacked

Section 9: Photos and reports

Attributes: Photo of incident, Report of incident

Figure 4: sections and attributes defined in the final taxonomy of PIRATES

The screenshot displays the PIRATES reporting interface, organized into sections corresponding to the taxonomy. The 'Identification' section includes fields for Entity (International Organisations, IMB-PRC), Date entered (11/26/2012), Incident Number (232-12), Incident sort (Actual), Incident type (Hijacked), Status of report (Final report), and Report last modified (11/29/2012 2:51:29 PM). The 'DTG and Location' section includes Incident date (10/4/2012), Incident time (8:30 PM), Timezone (UTC), Period of day (Twilight), Country of incident (TOGO), Position of incident (Around 80nm south of Lome), Location of incident (In international waters), Area of incident (West Africa), Latitude (4:48:48 North), and Longitude (1:25:06 East). The 'Ship characteristics' section includes Ship name (Example), IMO number (9255799), MMSI number (38745083), Call sign (ABXB3), Flag of ship (LIBERIA), Type of ship (Cargo ship, Liquid Cargo, Oil tanker, Product carrier), Length of ship (99 m), and DWT of ship (8241 t). The 'Ship circumstances' section includes Last port of ship (Annaba (Ex Bone)), Next port of ship (Bridgetown), Nearest port (Cotonou), Status of ship (Steaming), Speed of ship (3 kt), Freeboard of ship (2 m), Security on board (PCASP), Citadel/Safe-Room (Yes), Ships Security Level (Level 2), Visibility (Moderate), Wind speed (12 kt), and Wave height (3 m). The 'Details of attack' section includes Type of attackers (Pirates), Number of attackers (11), Type of boats (Skiff), Number of boats (2), Length of attack (30 Minute(s)), Attackers arrested (0), Attackers injured (0), and Attackers killed (0).

Figure 5: Screenshot of the interface design of piracy incident reporting in PIRATES

3 Piracy data sources

To test the piracy reporting software PIRATES, internet research was conducted to collect information on piracy incidents and to fill the PIRATES database with these data. A number of piracy data sources provide data about reported incidents related to maritime piracy. Since there are many (public) sources of information of piracy incidents available, only the most relevant for this study are described here.

3.1 IMB

The International Maritime Bureau (IMB), part of the International Chamber of Commerce (ICC), runs the Piracy Reporting Centre (PRC) web portal which provides the most recent piracy attacks and armed robbery incidents worldwide. Each “live piracy report” consists of:

1. Attack number
2. Date/Time
3. Type of Vessel
4. Attack position on a map (Google Maps)
5. Latitude/Longitude
6. Location detail (area of attack)
7. Type of Attack
8. Narrations (description of the incident)

The PRC wants to provide a free 24/7 service to the seafarer. The main objective of the PRC is to be the first point of contact for the shipmaster to report any incident of piracy and armed robbery at sea. The incident reporting through the PRC should be done through the Piracy & Armed robbery attack report of the IMB, available at their website (www.icc-ccs.org). The information requested through this attack report concerns among other things:

1. *Vessel details*
 - a. Name of ship
 - b. IMO number
 - c. Flag of ship
 - d. Type of Ship
 - e. Tonnages
 - f. Owner information
2. *Incident details*
 - a. date and time of incident
 - b. location of incident
 - c. nearest country
 - d. status of ship
 - e. weather during attack
 - f. type of attack
3. *Details of raiding party*
 - a. number of pirates
 - b. physical appearance
 - c. language spoken
 - d. craft used
 - e. violence used
4. *Details of weapons used*
5. *Damaged caused*
 - a. weapon type
 - b. details of damage
6. *Other details*
 - a. action taken by master and crew
 - b. anti-piracy measures employed
 - c. private security team embarked
 - d. number of crew and nationality

Furthermore on the website of the IMB, an overview of all 2012 piracy incidents is displayed on a “live piracy map” (see figure 6).

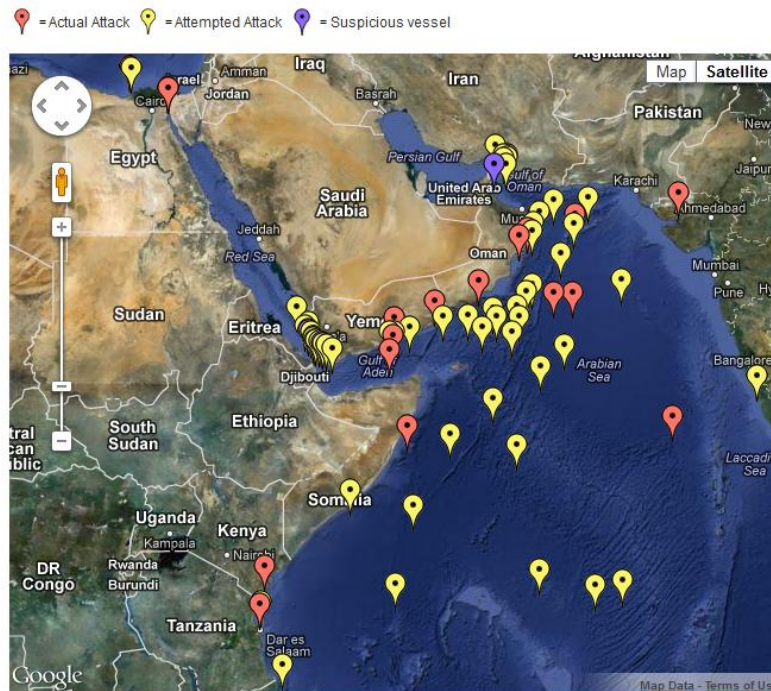


Figure 6. Overview of all 2012 piracy incidents displayed on IMB’s “live piracy map”

3.2 IMO

To assist in anti-piracy measures, the International Maritime Organization (IMO) issues reports on piracy and armed robbery against ships submitted by Member Governments and international organizations. The reports, which include names and descriptions of ships attacked, position and time of attack, consequences to the crew, ship or cargo and actions taken by the crew and coastal authorities, are now circulated monthly, with quarterly and annual summaries. Figure 7 shows a screenshot of piracy incidents as part of a monthly incident report of the IMO.

ANNEX 1
Acts of piracy and armed robbery allegedly committed against ships reported by
Member States or international organizations in consultative status

N°	Ship Name Type of Ship Flag Gross Tonnage IMO Number	Date Time	Position of the incident*	Details of the incident	Consequences for crew, ship, cargo	Action taken by the master and the crew	Was the incident reported to the coastal authority? Which one?	Reporting State or international organization	MSC/A/Doc.1/88 ANNEX.1 Coastal State Action Taken
1	2	3	4	5	6	7	8	9	10
IN INTERNATIONAL WATERS									
1	CREST ATLAS Tug Singapore 247 9329978	26/01/2011 04:45 LT	MALACCA STRAIT Off Tanjung Piai Malaysia 01° 14.00' N 103° 33.00' E	Seven armed pirates boarded the tug underway. The pirates entered the bridge and hit the Master with a long knife. Another pirate went into the accommodation and took the C/O, 2/E, 3/E and AB hostage and tied their hands up. The pirates stole ship's property and crew's personal belongings and cash before escaping.	Master was hit with a long knife, the C/O, 2/E, 3/E and AB were held hostage and their hands tied up, and the bridge was ransacked. Ship's property and crew's personal belongings and cash stolen.	-	Yes Singapore VTIS and Coast Guard, Malaysia Navy and Coast Guard	ICC-IMB Piracy Reporting Centre Kuala Lumpur	-
2	SAVINA CAYLYN Tanker Italy 58418 9489285	08/02/2011 04:50 UTC	INDIAN OCEAN Approx. 400NM NW of Minoy Island India 12° 07' 00" N 066° 35' 00" E	Five pirates in a skiff armed with automatic weapons hijacked the ship taking 22 crew members hostage.	Ship was hijacked and 22 crew members were taken hostage.	-	Yes UKMTO and Coalition Forces	ICC-IMB Piracy Reporting Centre Kuala Lumpur	-
3	IRENE SL Tanker Greece 161175 9285823	09/02/2011 09:26 UTC	EAST AFRICA Approx. 200 NM WNW of Ras Al Hadd Oman 21° 27' 00" N 063° 18' 00" E	Armed pirates hijacked the ship taking 25 crew members hostage.	Ship was hijacked and 25 crew members were taken hostage.	-	Yes Coalition Forces	ICC-IMB Piracy Reporting Centre Kuala Lumpur	-
4	SININ Bulk carrier Malta 30054 9274941	12/02/2011 12:18 UTC	EAST AFRICA Approx. 280 NM SE of Ras al Hadd Oman 20° 15' 43" N 064° 10' 00" E	Pirates hijacked the ship underway. The owners received a distress alert from the ship and informed the Coalition Forces. A coalition aircraft was sent to the location, which noticed two suspected pirate skiffs on board the ship. Pirates sailed the ship to the Somali coast.	Ship was hijacked and crew taken hostage.	Sent distress message	Yes Coalition Forces	ICC-IMB Piracy Reporting Centre Kuala Lumpur	-
5	QUEST Yacht United States	18/02/2011 13:23 UTC	ARABIAN SEA approx. 340 NM NE of Sakaa, Oman 18° 00' 00" N 061° 02' 00" E	Pirates hijacked the yacht underway taking 4 of the crew members hostage.	Yacht was hijacked and 4 crew members were taken hostage.	-	Yes Coalition Forces	ICC-IMB Piracy Reporting Centre Kuala Lumpur	-
6	DOVER Bulk carrier Panama 22069 7433634	28/02/2011 06:00 UTC	ARABIAN SEA Approx. 205NM NE of Sakaa Oman 18° 46' 00" N 060° 23' 00" E	Armed pirates attacked and boarded the ship underway. They hijacked the ship and took 24 crew members hostage.	Ship hijacked and 24 crew members taken hostage.	-	Yes MRCC Mumbai and Coalition Forces	ICC-IMB Piracy Reporting Centre Kuala Lumpur	-

Figure 7. Screenshot of piracy incidents as part of a monthly incident report of the IMO

Further, the IMO has opened a "piracy and armed robbery" module on the Global Integrated Shipping Information System (GISIS) in order to improve the timeliness of reporting of incidents and to enable users to generate their own search criteria and produce customizable reports. This database is now configured for public, read-only access and is searchable. Reports can be compiled in GISIS directly by Member States and registered public users. These reports can now include follow-up information, for example, dates of release of hijacked ships. Given that the new functionality in GISIS allows for user-defined piracy reports, the Committee agreed that the practice of publishing quarterly summaries was no longer warranted and would be discontinued with effect from May 2011. The total number of acts of piracy and armed robbery against ships reported to the Organization is 6,060, as of 8 August 2011. Figure 8 shows a screenshot of the details of a piracy incident on the GISIS (<http://gisis.imo.org>).

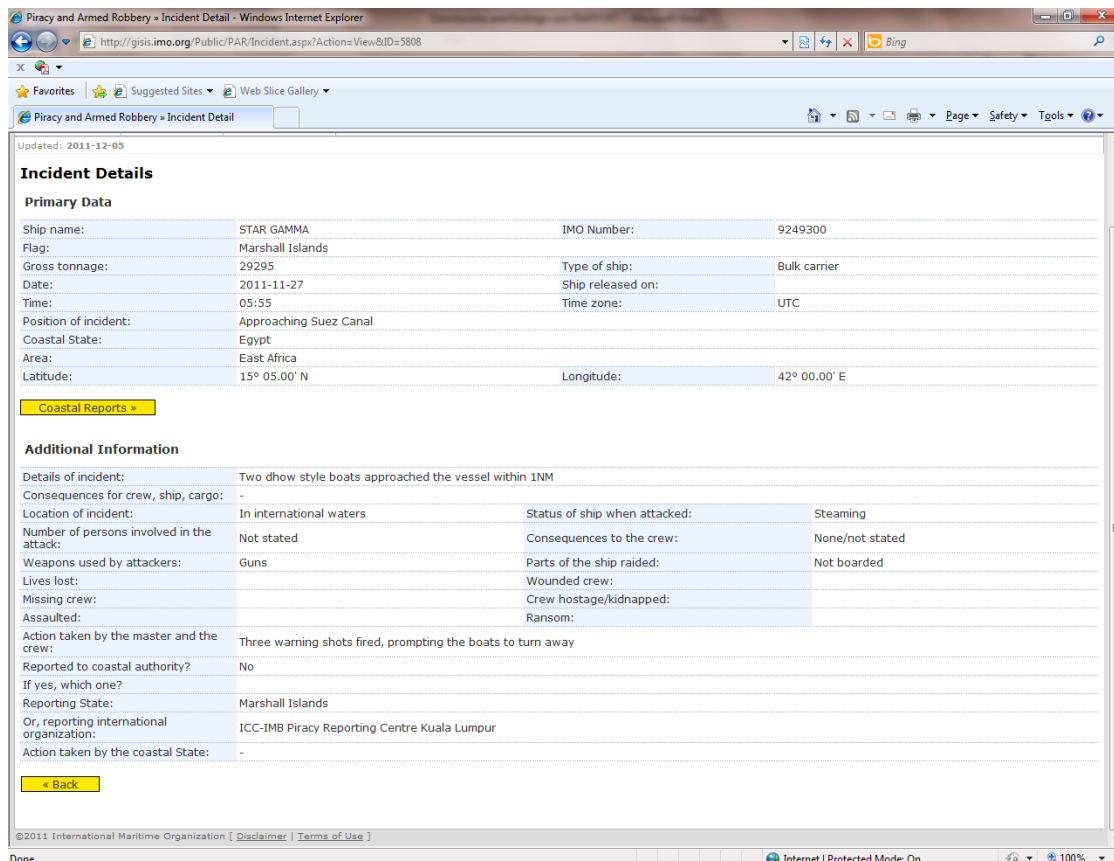


Figure 8. "piracy and armed robbery" module on the GISIS

3.3 UKMTO

The United Kingdom Marine Trade Operations (UKMTO) was deployed to the Middle East in 2001 as part of the UK response to the 9/11 terrorist attacks in the USA, with the principal purpose of providing a point of contact with industry and information on security issues in the region. Since April 2007 the UKMTO has moved its focus towards Anti-Piracy and Maritime Security Operations and is now the primary point of contact for merchant vessels in case of a pirate attack. The UKMTO supports the industry Best Management Practices (BMP) and is listed in the BMP as the primary point of contact for merchant vessels in case of a pirate attack. The IMB receives information on these pirate attacks directly from the UKMTO. Merchant vessels are strongly encouraged to send regular reports to UKMTO by the Voluntary Reporting Scheme, providing their position/course/ speed and ETA at their next port while transiting the region bound by Suez, 78°E and 10°S. The day-to-day interface between Masters and Naval/Military forces is provided by UKMTO which talk to merchant ships and liaise directly with the Maritime Security Centre – Horn of Africa (MSCHOA) and Naval Commanders at sea and ashore.

3.4 NATO

The North Atlantic Treaty Organization (NATO) has been engaged in counter-piracy missions off the Horn of Africa since October 2008 when forces from Operation Allied Provider which provided protection to World Food Programme vessels also helped deter acts of piracy. This mission was followed by Operation Allied Protector and since August 2009 by Operation Ocean Shield, which has been extended until December 2012. Operation Ocean Shield entails at-sea counter piracy operations using naval forces from the two Standing NATO Maritime Groups (SNMG1 and SNMG2). These operations include deterring, disrupting and protecting against pirate attacks, rendering assistance to ships in extremis as required, and actively seeking suspected pirates and preventing their continued activity through detention, seizure of vessels and property.

The NATO Shipping Centre (NSC) (www.shipping.nato.int) provides the commercial link with NATO's Maritime Forces and is NATO's primary contact point with the maritime community and is used to communicate and coordinate with other military actors engaged in counter-piracy operations. The NSC website provides piracy warnings and alerts with positional information on sighted pirates. In addition, the website informs the commercial shipping community on Best Management Practices (BMP) through online content, workshops and the possibility of personal contact. The NSC disseminates among other information about piracy incidents daily piracy updates and weekly assessments on their website. Also, the NSC provides a piracy alert map that can be found on their website (see figure 9).



Figure 9. NSC's piracy alert map

3.5 ONI

Established in 1882, the Office of Naval Intelligence (ONI) is America's longest continuously operating intelligence service, and provides maritime intelligence to the U.S. Navy and joint warfighting forces, as well national decision makers and other consumers in the Intelligence Community. ONI specializes in the collection, analysis and production of scientific, technical, geopolitical, military and maritime intelligence. ONI employs more than 3,000 military and civilian Intelligence Professionals including active and reserve officers and enlisted Sailors and Marines and contracted personnel at the modern National Maritime Intelligence Center facility in Washington, D.C., and at other strategic locations around the world. The Nimitz Operational Intelligence Center executes ONI's responsibility for Maritime Domain Awareness (MDA) and Global Maritime Intelligence Integration (GMII). The Nimitz Center ensures the production of intelligence to all fleet elements, including Maritime Operational Centers. On their website, ONI provides weekly unclassified Maritime Operational Intelligence Reports on Piracy in the Horn of Africa. The report includes a piracy analysis and piracy warnings. The report is a review of recent Somali piracy incidents and an outlook on threats around the Horn of Africa. See figure 10 for an example of the piracy threat level forecast in their report.

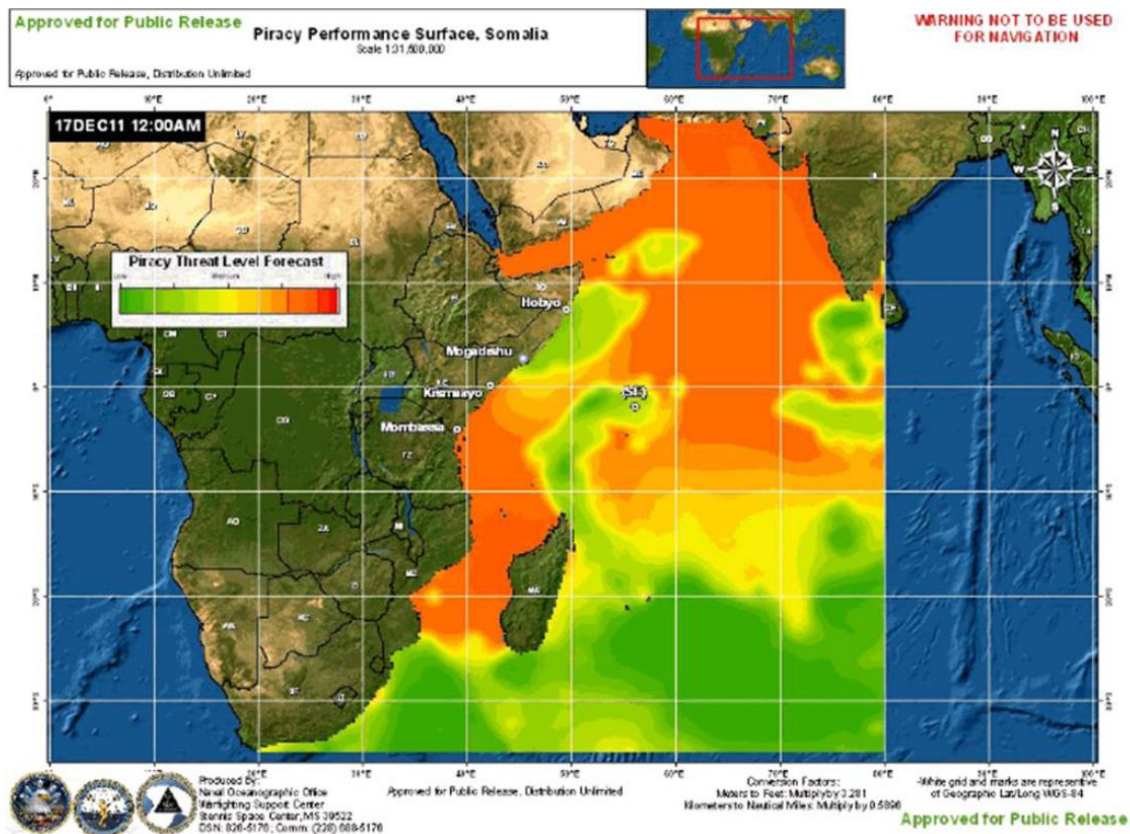


Figure 10. ONI's piracy threat level forecast

4 Piracy incident data

To test the piracy reporting software PIRATES, internet research was conducted to collect information on piracy incidents and to fill the PIRATES database with these data. A number of piracy data sources provide data about reported incidents related to maritime piracy. Since there are many (public) sources of information of piracy incidents available, only the most relevant for this study are described here.

4.1 Underreporting of piracy incidents

Since many piracy incidents are not reported at all, the problem of maritime piracy is far bigger than these data sources present. For example, the PRC estimates that more than 50 percent of the piracy incidents are not reported, and some experts think that this percentage is even higher due to the following reasons:

1. most ship owners are reluctant to alert authorities about piracy attacks on their vessels, since the consequences of reporting the incident means investigations and delays that result in costs for the shipping companies
2. an additional consequence of reporting is that maritime insurance premiums will raise for the ship owners, especially when shipping companies acknowledge that not all basic security measures are in place
3. also, intimidation of victims by pirates particularly in the case of kidnapping plays an important role in reporting an attack, and to a lesser extent also deaths of witnesses due to an attack
4. lastly, reputation damage can play a role in reporting piracy incidents since ports are fearful of being seen as having a piracy problem, and also shipping companies want to avoid a poor image.

However, over reporting might also occur since governments can get financial foreign aid to tackle piracy, although corrupt governments may profit more from the piracy attacks than from the financial foreign aid.

4.2 Categories of piracy incidents

Analysis of the reported piracy incidents of the different piracy reports shows some differences in the reported incidents, which are due to different definitions and interpretations of what piracy and armed robbery at sea is.

The following definition of piracy is contained in article 101 of the 1982 United Nations Convention on the Law of the Sea (UNCLOS): "Piracy consists of any of the following acts: (a) any illegal acts of violence or detention, or any act of depredation, committed for private ends by the crew or the passengers of a private ship or a private aircraft, and directed: (i) on the high seas, against another ship or aircraft, or against persons or property on board such ship or aircraft; (ii) against a ship, aircraft, persons or property in a place outside the jurisdiction of any State; (b) any act of voluntary participation in the operation of a ship or of an aircraft with knowledge of facts making it a pirate ship or aircraft; (c) any act inciting or of intentionally facilitating an act described in sub-paragraph (a) or (b)." Whereas in this definition the location of incidents plays an important role, the ONI is focusing on the type of attack and the status of the ship in their definition of piracy. According to the IMB, besides the type of attack, a hostile intent has to be present and of course this is not easy to measure.

Next to these differences in definitions, there are differences in categories as well used by these organizations. For instance, the PRC uses four types of attack (attempted, boarded, fired upon

and hijacked), whereas the UKMTO also has a category “suspicious vessel”. And the Regional Cooperation Agreement on Combating Piracy and Armed Robbery against Ships in Asia (ReCAAP) Information Sharing Center (ISC) uses categories for the significance level of the reported incident (very significant incident, moderately significant incident, less significant incident), and has a different category for attempted attacks. The following terms have been adopted by ONI to describe the range of criminal anti-ship activity and impediments to safe navigation in our worldwide reporting and analysis:

- 1) Attempted boarding (Close approach or hull-to-hull contact with report that boarding paraphernalia were employed or visible in the approaching boat)
- 2) Blocking (hampering safe navigation, docking, or undocking, of a vessel as a means of protest)
- 3) Boarding (Unauthorized boarding of a vessel by persons not part of its complement without successfully taking control of the vessel)
- 4) Firing upon (weapons discharged at or toward a vessel)
- 5) Hijacking (Unauthorized seizure and retention of a vessel by persons not part of its complement)
- 6) Kidnapping (Unauthorized forcible removal of persons belonging to the vessel from it)
- 7) Robbery (theft from a vessel or from persons aboard the vessel)
- 8) Suspicious approach (all other unexplained close proximity of an unknown vessel)

Next to these categories, there are differences in interpretations as well. As an example, when a person is shooting on board of a vessel, it can be a warning signal from a fishing vessel for the vessel approaching his fishing area or it also could be a pirate attack. Some organisations may report this incident as a pirate attack, while other organisations do not.

Where possible, the above mentioned data problems were taken into account when setting up a piracy incident dataset for PIRATES.

4.3 PIRATES dataset

To fill the database with the available data sources as described before, a piracy incident dataset had to be built. In the Gulf of Guinea region, which is seen as a new hotspot for maritime piracy, there is no reporting centre or (centralized) reporting system and it is difficult to collect information on piracy incidents from this region.

Since the reported incidents collected by the PRC through the ship masters and ship owners cover almost all of the reported incidents worldwide, these data were the basis for the information used in the PMAR piracy incident dataset. The PIRATES piracy incident dataset currently consists of more than 2500 piracy attacks which have occurred worldwide between 1 January 2005 and 1 January 2013.

Among other information, the following data about piracy incidents is (partly) available in the PIRATES piracy incident dataset:

name of ship	latitude/longitude	number of pirates
IMO number	status of ship	sort of attack
flag of Ship	freeboard of ship	anti-piracy measures
next port	type of attack	private security embarked
nearest port	violence used	citadel/safe-room on board
last port	action taken master & crew	reported coastal authority
DWT of Ship	details of damage	reporting organization
type of Ship	speed of ship	action taken coastal state
area of incident	damaged caused	call Sign
date and time of incident	weapon type	length of attack
nearest country	details of weapons used	victim information
location of incident	craft used	narrative

5 Results

This technical feasibility study resulted in a functional prototype of the so called Piracy Incident Reporting And information Exchange System (PIRATES).

From the point of view of the PMAR-II project, the technical feasibility study shows that PIRATES can technically now be implemented for testing piracy incident reporting and information exchange by the relevant maritime stakeholders in the Gulf of Guinea region. The system was demonstrated to different local maritime authorities in Togo and Ghana and presented at a combating piracy conference in Ghana to find out the level of interest they have for PIRATES. The system was looked at as a very valuable instrument for the collection and sharing of piracy incident information in the Gulf of Guinea region.

From the point of view of JRC, the results of the project are related to the question whether or not ECCAIRS could be applicable to another domain than the already existing different transport safety domains (aviation, maritime and railway). It was the first time the ECCAIRS system was validated in the domain of security. The outcome of this technical feasibility study shows that the ECCAIRS system (both hardware/software and analysis and reporting tools) can support the domain of maritime piracy. Furthermore, this feasibility study shows that use of the ECCAIRS in a new domain can be done very efficiently in time and effort. The implementation of the different taxonomies in PIRATES proved to be possible at very low costs and with a very short development time.

6 Conclusions

The main deliverable of the technical feasibility study is a specific maritime piracy version of ECCAIRS, which is called PIRATES. The study shows that from a technical point of view the ECCAIRS software is applicable to the maritime piracy domain with a very short development time.

To address piracy, the maritime stakeholders in the Gulf of Guinea region need timely and accurate information on piracy incidents, not only to provide accurate and timely information on the safety of shipping, but also for statistics and trends. Furthermore, the sharing of this piracy incident information is essential to support law enforcement agencies in their counter piracy activities.

With PIRATES there is an opportunity for the maritime stakeholders in the Gulf of Guinea region to set up a formal system for reporting piracy incidents. Further, PIRATES supports information exchange exists between countries in the Gulf of Guinea region. The evaluation of PIRATES by maritime stakeholders in the Gulf of Guinea region was out of scope of this technical feasibility study, and a test implementation of the system is a logical next step within the PMAR-GoG project. It depends however largely on the willingness of the countries in the region to succeed in creating the ability of exchanging information between the states and also of establishing a (centralized) reporting system.

7 Recommendations

1. Increase the visibility of JRC by (test) implementing PIRATES in the Gulf of Guinea region to support the local maritime authorities to enhance their maritime awareness
2. Obtain agreements from the local maritime authorities to be involved in the (test) implementation of PIRATES
3. Organize training for the local maritime authorities for the (test) implementation of PIRATES. To facilitate the training a non-live version of PIRATES software and hardware should be provided
4. Research what improvements for PIRATES can be made after testing PIRATES in the Gulf of Guinea region. The (test) implementation of PIRATES has to be done with two or more agencies in two or more countries in the Gulf of Guinea region
5. Explore and research economic models for the (test) implementation of PIRATES. The same approach of the ECCAIRS reporting system concerning the costs and services could be a possibility for the (test) implementation of PIRATES
6. Coordinate closely with other initiatives in the region, like the European Commission's Instrument for Stability (IfS) program, when (test) implementing PIRATES
7. Explore ways to (test) implement PIRATES in other piracy affected areas around the world, like the Horn of Africa

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Abstract

To address maritime piracy, the maritime stakeholders in the Gulf of Guinea region need timely and accurate information on piracy incidents, not only to provide accurate and timely information on the safety of shipping, but also for statistics and trends. Furthermore, the sharing of this piracy incident information is essential to support law enforcement agencies in their counter piracy activities.

In the Gulf of Guinea region, no formal system of piracy incident reporting exists, and one of the main problems is the lack of good quality information on piracy attacks. Therefore, it is needed to collect and store information on piracy incidents in a (centralized) reporting system. Besides this, no formal system of information exchange exists between States or organizations in the Gulf of Guinea region.

Since the ECCAIRS software already provides a reporting environment allowing data collection and data exchange, it was suggested to study from a technical point of view if ECCAIRS could be a suitable system for addressing the above mentioned issues in the Gulf of Guinea region. The feasibility study shows that from a technical point of view the ECCAIRS software is applicable to the maritime piracy domain at very low costs and with a very short development time.

The main deliverable of this technical feasibility study is a specific maritime piracy version of ECCAIRS, which is called PIRATES (Piracy Incident Reporting And informaTion Exchange System). It was recommended to (test) implement PIRATES in the Gulf of Guinea region to support the local maritime authorities to enhance their maritime awareness.

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