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“Sustainable Knowledge Platform for the European Maritime and Logistics Industry”



e-Maritime Overview

Gráinne Lynch (NECL)

SKEMA Periodic Study: e-Maritime Task 1 Report

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Checked by Quality Manager	Antti Permala	8/02/10
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Introduction: The EU e-Maritime concept

e-Maritime is aimed at supporting the development of sustainable maritime transport in Europe through the development of a framework that will be based on the latest information, communication, and surveillance technologies. In line with EU transport policy objectives, e-Maritime solutions must offer a holistic approach that extends beyond pure transport services addressing logistics, customs, border control, environmental and fishing control operations. e-Maritime must be considered in its broadest sense as it promises to provide interoperability between all maritime administrative functions, with important applications in commercial operations.

Task 1 provides an overview of the objectives and the challenges in the attainment of each. It also identifies existing policy instruments which relate to the e-Maritime initiative. Finally it examines the various reporting requirements contained in current legislation in relation to movement in and out of port, highlighting commonalities, differences and opportunities to rationalise in order to facilitate a 'single window approach'.

Structure of this document

This document is divided into 4 sections relating to the sub tasks of Task 1 as identified in the e-Maritime Periodic Study Implementation Plan¹.

- 1.1 Challenges to be addressed by e-Maritime
- 1.2 e-Maritime Objectives
- 1.3 Identifying the policy instruments
- 1.4 Conflicts in reporting requirements

The e-Maritime challenges will be identified in section 1.1.

The e-Maritime Objectives in section 1.2 will be defined in terms of specific quantifiable examples that illustrate the problem that the objectives will seek to address, in addition to measurable indicators and expected benefits. The functional definition of e-Maritime will be analysed and supported with simple examples, facts and figures grouped in concrete application domains where benefits can be easily appreciated. For the purposes of the study we have grouped these application domains as follows:

- Administration Domain Applications;
- Improved Shipping Operations;
- Improved Port Operations;

¹ SKEMA_e-Maritime_Plan_08Sept2009, Gráinne Lynch (NECL)

- Integration into Logistic chains;
- Promote seafaring profession and sea-shipping.

The policy instruments both EU and National, which impact on real-time electronic data reporting, are identified in section 1.3.

Section 1.4 identifies conflicts in reporting requirements from various directives. A very detailed analysis of these issues is available in soft copy (Annex 1.4 1a and Annex 1.4b)

Section 1.5 will draw together the results and conclusions from Task 1.

Background

In May 2009 SKEMA produced a draft report on e-Maritime, namely: “Scoping the EU e-Maritime initiative” (v1.0C)². The work is ongoing and a new set of tasks have been devised with the ultimate goal of further developing policy options, defining the e-Maritime framework and proposing a roadmap for 2020.

A draft document entitled “e-Maritime: Concept and Objectives” (dated 26th March 2009)³ was presented by DGTREN to a preliminary meeting of the Inter Service Group on 31st March 2009 in order that e-Maritime be introduced and taken for consideration by the representatives of the various DGs present.

Context

1. Maritime transport is the prominent mode for trade between EU and third-countries carrying approximately 40% of internal market freight flows and 90% of EU external trade. Increased pressure is placed upon transport operators particularly EU ports as well as on administrations in charge of various controls (safety, security customs, immigration, etc) to increase the efficiency and quality of their services while respecting increasing socioeconomic and environmental demands.
2. However, the EU maritime transport industry is lagging behind other sectors in adopting modern ICT technologies, which hinders progress towards efficiency and quality improvements and prevents its development into a knowledge-based economic sector. For example, in the rail and inland navigation sectors, the development of coherent EU frameworks for information flows in an interoperable manner supported the deployment of

² e-MaritimeStudy_v1.0C_26May09.docx by Dr Takis Katsoulakos, 18th May 2009

³ “e-Maritime: Concept and objectives” by Christos Pipitsoulis, Project Officer, European Commission, DG Energy and Transport, 26 March 2009

the European Rail Traffic Management Systems (ERTMS)⁴ and the River Information Services (RIS)⁵ respectively.

3. More than half of EU ports have no dedicated system for communicating with Administration or the transport operators. The few port information systems that are fully developed in Europe have produced considerable quality and efficiency gains.
4. The maritime industry by its very nature is highly competitive particularly in a number of segments. Consequently, information is often not freely available due to commercial sensitivities, or because the cost of making it available is prohibitive. Even when information is made available, it is often not in a usable format and is not harmonised particularly from the regulator's viewpoint. These traditional, fragmentary features could be seen as a way that the industry and hence the States protect confidential information creating glass barriers that cannot easily be brought down.
5. Commonly valuable information exists in isolated pockets of single groups of users or within the confines of single Administrations; such information needs to be integrated if the vision of a European transport system is to be realised.
6. The maritime transport as a whole is served by comparatively more costly satellite communications.
7. The value of tracking technologies such as the Automatic Identification System (AIS) and Long-Range Identification and Tracking (LRIT) can only be optimised in an EU context if integrated on the European-wide basis, through SafeSeaNet.

SafeSeaNet (SSN) is already operational and is already demonstrating its potential to be a trusted and secure system for the management of information in the safety, counter pollution and security fields. Recent developments of SafeSeaNet (SSN) proved that the integration of AIS and LRIT into SSN is technically feasible. The objective is to transform SafeSeaNet into a real-time vessel tracking system used by the Member States on routine operations (not only as an emergency tool as initially planned). SafeSeaNet and EMSA's expertise are assets that need to be fully utilised within the e-Maritime initiative.

4. <http://ec.europa.eu/transport/rail/interoperability/>

5 Directive 2005/44/EC of the European Parliament and of the Council of 7 September 2005 on harmonised river information services (RIS) on inland waterways in the Community [Official Journal L 255, 30.9.2005]. <http://europa.eu/scadplus/leg/en/lvb/l24239.htm>

1 Task 1: e-Maritime Overview

1.1 Challenges to be addressed by e-Maritime

The following challenges are to be addressed by e-Maritime:

1. The simplification and automation of message exchanges between Administrations and maritime operators to achieve quantum improvements in maritime safety, security, customs control and environmental protection;
2. The facilitation of commercial transactions in the maritime industry, including the transformation of intermodal networks into efficient open networks with risks distributed amongst operational participants.

e-Maritime aims to achieve standardisation, security and interoperability of information exchanges between Administrations and maritime operators in Europe. The freeing up of information exchanges arising from e-Maritime will result in a simplification and automation of messages, resulting in real-time digital information becoming available to Administrations – enabling them to improve their safety, security, customs controls and environmental protection functions. It will also enable them to convey helpful information readily and selectively to maritime operators. Similarly, e-Maritime will reduce the workload on ships' personnel through extensive automation of message exchanges between themselves and Administrations.

It is expected that the ICT infrastructure that will be developed to facilitate information exchanges between Administrations and maritime operators will be available for use by operators to facilitate commercial transactions. The scope for such transactions is virtually limitless. One application would be the transformation of intermodal networks into efficient open networks with risks distributed amongst operational participants and without having to incur the major costs of ICT infrastructure for each network.

1.2 e-Maritime Objectives

Task 1.2 of the SKEMA Periodic Study is concerned with aligning the problem definition of e-Maritime, considering the following five domains:

1. Improved Administration Domain Applications (section 1.2.1);
2. Improved Shipping Operations (section 2);
3. Improved Port Operations (section 1.2.31.2.5);
4. Integration into Logistic chains (section 2 1.2.4);
5. Promotion of seafaring profession and sea-shipping (section 1.2.5)

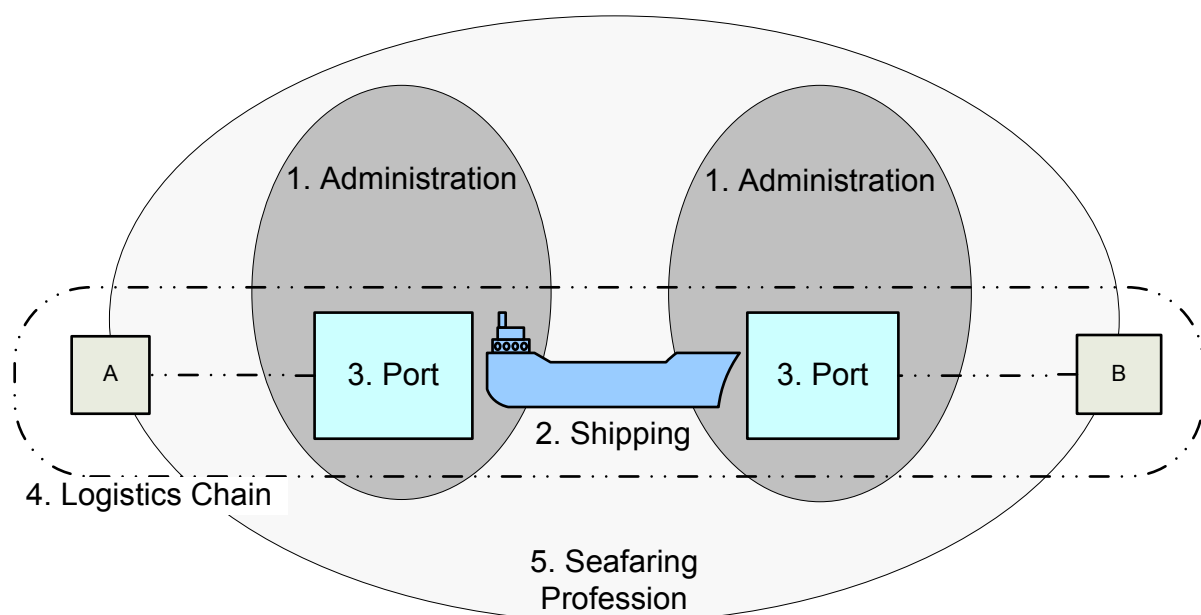


Figure 1 Integrated view of-Maritime domains

The scope of the EU e-Maritime initiative is illustrated in Figure 1. An application view is shown in Figure 2.

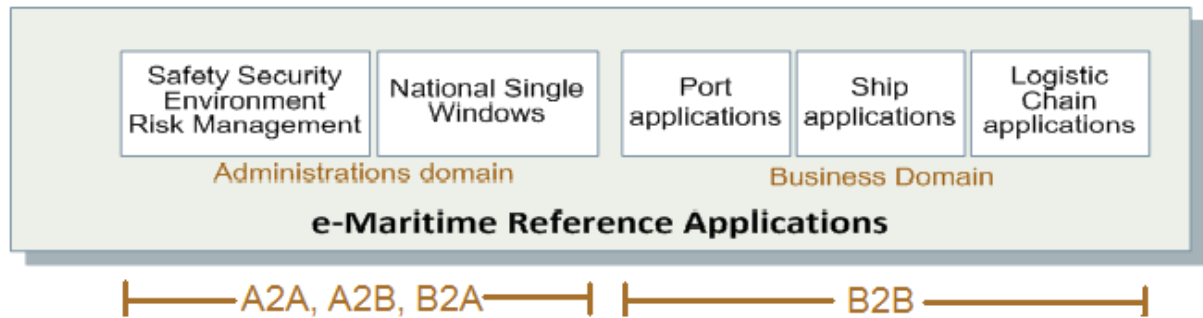


Figure 2 e-Maritime Reference Applications

1.2.1 Administration Domain Applications

The purpose of this section is to reflect on the underlying problem definition of so-called “Administration Domain Applications”, in particular with regard to those aspects identified under e-Maritime as well as additional aspects not yet identified or elaborated upon.

1.2.1.1 Problem Definition

Some problems that could be addressed by e-Maritime are:

1. Administrative procedures are complex and time-consuming and are even today often paper transactions. Differing interpretations of regulations and standards create additional inefficiencies. When carried out electronically, the systems are non-harmonised and differ from State to State, region to region.
2. Efficient port and ship security and safety increasingly requires integrated surveillance/monitoring systems, incorporating adequate ‘intelligence’ for proactive and remedial operations; spanning across collaborating authorities and transport stakeholders and regions. Pan-European operational systems are therefore needed.
3. Maritime transport is insufficiently integrated in the logistics chain and in particular, the electronic exchange of messages and data is not well developed, hampering efficiency over the whole chain.
4. Lack of interoperability entails increased costs because several systems co-exist without real economies of scale. Integration costs affect particularly SMEs.
5. Lack of interoperability creates barriers to establishing transport networks able to acquire data, handle it, exchange it and share it in the most efficient way amongst a great variety of stakeholders based at different geographic locations.
6. In addressing the short supply and standards of qualified seafarers, the support offered by distance learning is currently under-utilised.

7. Many research and development projects have simply concluded that there needs to be more information exchanged using IT technologies. This does not move the debate forward at all, because those that have the information will not provide it without a clear legal mandate. That mandate will not be made available until it is known why information is required and that only those that need it receive it when they need it.
8. National or regional policies without legal requirements may not always produce interoperable transport solutions that work optimally together in cross-border operations within Europe.
9. The transport of dangerous goods is strictly regulated at sea. But the transport of non-bulk, packaged or containerised dangerous goods is costly and complicated at sea due to the additional precautions to deal with the concentration of goods, with or without passengers, under the broad scope of maritime conditions and risk. The transition from land to sea and visa-versa is very complicated.
10. The lack of a common maritime language creates another source of inefficiencies, as some authorities in ports refuse ship manifests and certificates in languages other than their own.
11. Electronic manifests are not universally accepted by all ports in the EU. Only 55% of ports use electronic systems for handling ship and cargo information, with the use of fax and telephone still common.
12. Only a few Member States have a national single window approach. The linkage between the SafeSeaNet and the port networks is very limited, and data exchange happens when the national authorities ask for it. The exchange of electronic messages between ports is practically non-existent.

1.2.1.2 Specific Aspects / Indicators for Administration Domain Applications

In the document “Scoping the EU e-Maritime initiative” (v1.0C), SKEMA has identified the following aspects as falling within “Administration Domain Applications”:

- Improved administration procedures:
 - National Single Windows (NSWs) for ship and cargo reporting;
 - Management of inspections and other measures relating to conditional clearance;
 - Synchronisation of NSWs with SSN and related developments;
 - Integration of NSWs with other mode platforms and e-customs;
 - Monitoring co-modality trends: statistical information on utilisation factors, modal split trends, etc.;
 - Co-operation in policy development.

- Improved safety, security and environmental protection:
 - Integrated safety, security and environmental risk management processes of ships in EU coastal waters (assessment, mitigation, response, recovery including enforcement of regulations);
 - Improved integration of functions currently allocated to SSN, AIS and LRIT systems;
 - Development of e-Navigation support infrastructure including integration of GALILEO and AIS, VTS systems;
 - Exchange of information between authorities for collaboration in safety, security and environmental risk management;
 - Co-operation between authorities in dealing with SAR and oil pollution identification and response measures;
 - Co-operation between Maritime Assistance Services and Emergency Response services tools used by classification societies;
 - Monitoring of movements of high risk vessels by authorities in different regions using co-ordinated surveillance technologies; support for uniform application of directives enforcement under specific conditions;
 - Monitoring CO2 footprint of maritime transport based corridors;
 - Investigation of oil spills and response co-ordination;
 - Monitoring pollution incidents;
 - Integration of networked sensors with terrestrial and national surveillance systems for environmental measurements.
- Improved working conditions / competence development:
 - Improved co-ordination of education and national training schemes between member states;
 - EU level knowledge management systems to provide interactive public digital libraries on policy, regulations, state of the art reports on business practices and technologies;
 - Lifelong Learning Management for people in the maritime transport and logistics industry who may wish to be kept informed of new research findings and developments as well as policy and regulatory developments in their specific areas of interest. Areas that will be particularly useful are regulatory, safety, security and environmental protection requirements.

It should be noted that the item “Improved working conditions/competence development” now falls under the domain “Promote seafaring profession and sea-shipping” and as such this paper only considers “Improved administration procedures” and “Improved safety, security and environmental protection”.

1.2.1.3 Relation to other initiatives

The EC “Communication and action plan with a view to establishing a European maritime transport space without barriers” {COM(2009) 10 final} drafted by DGTREN sets out a number of potential measures for the improvement of the internal market for Short Sea Shipping and an action plan thereto. The concept of “European maritime transport space without barriers” is very much an integral part of e-Maritime and as such shares many of the aims of e-Maritime related to the improvement of administrative procedures.

Likewise, many of the challenges regarding Administration Domain Applications have been recognised in the proposal for a Directive on reporting formalities for ships arriving in or departing from ports of the Member States of the Community and repealing directive 2002/6/EC {COM(2009) 11 final}.

The International Maritime Organization (IMO) are currently developing an e-Navigation strategy wherein the aim is to develop a vision for e-Navigation, to integrate existing and new navigational tools, in particular electronic tools, in an all-embracing system that will contribute to enhanced navigational safety while simultaneously reducing the burden on the navigator. The emergence of e-Navigation will have consequences for e-Maritime with respect to what information is to be exchanged between shore-vessel-shore and how. There is a need to closely monitor e-Navigation developments so that optimal solutions in regard of e-Maritime may be sought.

1.2.1.4 Administration Domain Applications - Information and Systems

With reference to reporting requirements contained with EU Directives, it has been shown⁶ that there is often duplication in requirements for certain data to be reported to certain authorities or administrations. In the main this duplication manifests itself in the number of times the same item of data is to be reported to an authority/administration. In considering administration domain applications it is important to ascertain the what, why, where, when and how of information provision today and foreseen needs in the future.

e-Maritime puts forward the argument for strengthening the capabilities in Europe to interchange information between relevant stakeholders in order to increase safety, efficiency, security and environmental protection within maritime transport as well as improve links to the rest of the logistic chain. When requesting, processing or distributing information it is necessary to consider what information is required, why, where, when and how.

⁶ EUMIS study, performed on request of DGTREN under the MarNIS project.

What

According to present EU Directives there are more than twenty reports that have to be submitted by the master, agent or operator of a vessel to “an” authority, either directly or indirectly, before that vessel may enter or leave an EU port, or in some cases sail in EU waters. This is aside from reports that are required through Directives to be provided to other shore-based organisations. Of these reports, dangerous goods, general cargo and passenger data are requested on more than one occasion, as are certain voyage related data.

The reporting burden on the “master” is well documented, however due to the present fragmentation in systems between authorities and member States, the burden remains. In total approximately 200 separate data items are to be reported to the various authorities and administrations.

Reporting requirements can be divided into three main areas: ship reporting documents (usually related to port authority), declaration and clearance of cargo (usually related to customs) and routine checks or inspection.

Data can be categorised under:

- Ship Identification
- Class and Certificates
- Ship Contacts
- Ship Particulars
- Security Data
- Voyage Data
- Cargo Data
- Dangerous Cargo Data
- Passenger Data
- Crew Data
- Waste Data
- Vessel Operation Data

Data may be referred to as static, semi-dynamic or dynamic. The majority of the data to be reported may be classed as static, i.e. the information does not change from one visit to the next.

Why

Authorities and Administrations require data prior to a vessel entering or leaving a specific area for a variety of reasons. They may be linked to safety, security, environmental protection, customs, health, phytosanitary etc. and used for planning, monitoring, surveillance or inspection purposes.

A number of the statements in the Impact Assessment conducted in light of the proposed Directive to replace Directive 2002/6/EC⁷ are also valid here:

- With a few exceptions in the Customs, veterinary and phytosanitary domains, the administrative procedures applicable to intra-EU maritime transport of goods are comparable to those in force for international sea transport.
- A number of administrative procedures are set up when vessels arrive or depart from ports. These administrative procedures involve a wide set of EU and international legislations. They range from Customs and taxation rules to immigration, trade, statistics, environment, waste, phytosanitary veterinary and health protection, security and safety regulations. These regulations are not coordinated with each other, thus sometimes leading to redundancies and heavy time consumption.
- Maritime voyages from one port of an EU Member State to another, even without calling at any intermediate non-EU port or free-port or meeting another ship en-route, are normally considered international. This is the case irrespective of the types of goods that the vessel carries.
- Inspections are carried out by different services, which are not necessarily coordinated, and it follows that delays caused by inspections may be much longer than necessary.

Where

The Authorities requiring information from maritime traffic and transport are numerous and fall under the traditional maritime authorities, such as port, coastal, search and rescue and pollution, or other authorities such as security, customs, immigration, health and border control. Each currently makes use of their own means for maritime information management and could benefit from increased access to data and interoperability.

Directives often indicate that reports should be provided to the “competent Authority”, and due to different organisational structures in the member States this can lead to similar reports, with the same data elements, being reported more than once to the same authority. An authority with more than one role, or task, may indeed be faced with multiple reports.

In light of the principle of subsidiarity it is correct that Directives do not specifically name an Authority, more than it being the competent authority; however this inevitably leads to different solutions for different member States. Member States have evolved their systems for reporting in

⁷ 2002/6/EC <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2002:067:0031:0045:EN:PDF>

different ways and, whilst there is a need to recognise these systems and the considerable investment made, solutions need to be sought in facilitating

With respect to maritime governance most member States follow a decentralised approach whilst a few countries follow an integrated approach, i.e. France, The Netherlands, Italy and Slovenia. Some Member States have set up bodies or specific procedures for coordination of Maritime Affairs whilst others have dominant lead ministries who cover a majority of subjects related to maritime affairs⁸.

When

Under current requirements reports should be submitted anywhere from 72hrs before arrival up to the moment of entry. Certain information is required on or prior to departure irrespective of the voyage time to the port of destination, whilst other information is required prior to entry in EU waters.

For a vessel that has a previous port of call in an EU port it should be noted that much, if not all, the static data has already been submitted and could, or should, be made available to any subsequent EU port of call in order to relieve the master with this additional burden in reporting. Any changes to static data, i.e. due to a refit, should be updated in the next port of call notification.

Provisions for ensuring information on Dangerous Goods is available, or at least the contacts are known, are covered by existing legislation, and available through SSN. The route a vessel follows is based on the (initial) intended port of call. Trade well may determine a new port of destination for a vessel mid-voyage, however this can be simply updated and the relevant authorities informed. There are arguments for making this information available to coastal monitoring stations before a vessel enters into difficulties in the interests of proactive vessel traffic management.

To this end the ability to provide coastal States along the intended route of a vessel with pertinent data in order to make a considered judgement in the interests of nautical safety and security as well as the interests in protecting the environment should be considered. This may involve an extension of SSN and/or forwarding of information from local and national systems concerning the intended visit of a vessel.

How

Each member State has their own method for collecting the data required to satisfy their authorities and/or administrations requirements. These may range from national Single Window applications through to dedicated local systems for an individual authority.

Reports are received through electronic data (e.g. EDIFACT, XML, etc.), e-mail, fax and/or telephone using either dedicated applications, internet or reporting points. This results in much data not being

⁸ Background paper No. 11 on national approaches to maritime affairs, EC member State Expert Group on Maritime Affairs, SEC(2006)689

available “online” in a manner that is readily accessible to all applications. Electronic notifications or declarations are not commonly accepted across the EU, i.e. not all member States recognise an electronic cargo manifest.

At present the master, agent or operator is obliged to provide certain data to the local and national competent authorities as prescribed by the individual member State, which may or may not include electronic data transmission, in accordance with international, European and national legislation. The local and national competent authorities are obliged to provide the data included in the four SSN notifications electronically to SSN. Whilst this data is available to any authorised user, there are as yet no common arrangements for use by other authorities such as customs, immigration, health and border control authorities. Separate reports, and often means, are required by these authorities whilst much of the information is already available in local or national systems, or even in SSN.

If the objective to reduce the administrative burden is to involve e.g. the single entry of data it is necessary that common protocols be agreed upon for the further distribution of data to the eventual authority tasked with safety, security or protection of the environment.

Single Windows are by definition intended for reporting to, from and between authorities, whereby business to business reporting is not included. Allowance has to be made for the considerable investment that ports and their communities have made in systems aimed at the facilitation of information exchange and to this end any proposed solutions should investigate the interoperability of these systems.

1.2.1.5 Administration Domain Systems

SafeSeaNet

The EU Directive “establishing a Vessel Traffic Monitoring and Information System” (2002/59/EC) required member States and the Commission to co-operate to establish computerised data exchange systems.

Central to SafeSeaNet is the European Index Server; a European Platform for Maritime Data Exchange between member States' maritime authorities based on the concept of a distributed databases. Further SafeSeaNet comprises Local Competent Authorities (LCA) and National Competent Authorities (NCA). The index server allows the authorized user to find information on notifications, cargo manifests, voyage history and incident history. Basic data is held within the SSN system whilst contact points are provided for further information on for example dangerous or hazardous goods.

Further SSN comprises the AIS data repository and links to external databases. The STIRES system has been conceived as an enhancement to the SafeSeaNet system for facilitating relaying and exchanging information between the EU Member States, Norway and Iceland. Further, the EU LRIT Data Centre became operational in June 2009.

With respect vessel calls, there are four separate reports that the national SSN applications should forward to SSN:

- Port Notification;
- Ship Notification;
- HazMat Notification;
- Security Notification.

In implementing the required systems on national and local levels member States have the “freedom” to utilise systems that best meet their own needs, whether based on existing systems or, as is the case in some member States, new dedicated applications. Dedicated software is used to communicate with the EIS. The implementation of this software and its updates is a problem area at present, with different versions being used at any one time. At a national level, SSN national nodes are essentially software applications using different implementation approaches which create interoperability difficulties likely to increase in the future, exacerbating delays in agreeing changes and slowing down the realisation of intended benefits.

The role of SafeSeaNet should be expanded and strengthened to include the generation of notifications to coastal authorities on ships likely to pass through their areas of jurisdiction as well as facilitate the consolidation of reports to all authorities.

Single Windows

A Single Window is a facility that allows parties involved in trade and transport to lodge standardized information and documents with a single body to fulfil all import, export, and transit-related regulatory requirements. If information is electronic, then individual data elements should only be submitted once.

Prominent examples of Single Windows already developed, such as in Finland, Norway and Spain, have been developed to meet particular reporting requirements, bringing together the requirements of certain authorities, although not necessarily the same in each case. Further, developments towards a Customs Single Window are advanced and therefore it should be noted that the Single Window concept as it is presently being deployed will not necessarily lead to a major reduction to the reporting burden. There is a need for dialogue between the various authorities in order to ensure duplication is avoided where possible.

e-Maritime has the opportunity to coordinate these efforts through defining protocols and agreements between the various authorities and their systems. Recognising existing systems, ranging from Single Windows through to Port Community Systems and local dedicated applications, e-Maritime should facilitate the interoperability of the various systems whilst safeguarding the notion of reduction in administrative burden. There is a need to clearly define not only the information requirements of individual authorities but also that data that should be available to authorised users, i.e. common data required for safety, security and environment whether it be for monitoring, surveillance, enforcement or inspection.

Port Community Systems

Port Community Systems are covered in detail in Task 2.5 of this e-Maritime Periodic Study. The team involved in Task 2.5 have compiled the reporting transactions carried out by a group of European Sea Ports using their electronic data processing systems, such as Port Community System (PCS) and Port Single Window (PSW). Information about performance and how the stakeholders interact with them has also been gathered, in order to develop a wide knowledge of current technologies in use at European Sea Ports and provide an overview and detailed information of the management of these electronic data processing systems.

1.2.1.6 Considerations for Application Domain Applications

General Considerations

Administrative Burden

Masters, agents and shipping operators are obliged to provide certain data prior to entry, passing or departure from a port, inland waterway or, in some cases, along the coast, according both international (through IMO conventions and resolutions) and European (through EU Directives) reporting requirements. Aside from this, there are also “local” reporting requirements specific to individual ports, waterways, coastal and/or flag States that oblige the master, agent or operator to provide additional information.

There is a need to consider the appropriateness of the reports as required today in line with the actual roles and tasks of those authorities requesting the information. E-Maritime should facilitate single reporting whereby all information required by an administrative or authoritative body is available “online” and can be exchanged between the respective authorities. Requests for additional data may be kept to a minimum as that data would be available through the Single Windows/SSN infrastructure.

Distributed Databases

Further, the EU Directive for establishing a Vessel Traffic Monitoring and Information System (2002/59/EC) and amendment (2009/17/EC) have led to the development of the SafeSeaNet (SSN) system thereby providing a European platform for maritime data exchange between EU maritime Administrations. SafeSeaNet includes an European Index Server (EIS) which is operated by the European Maritime Safety Agency (EMSA), with member States each having their own SafeSeaNet applications.

Whilst the emergence of SafeSeaNet has undoubtedly improved the nature in which information is made available to maritime administrations, it has also encountered its fair share of teething problems as well as been confronted with other developments such as Single Windows. SafeSeaNet is based on the concept of distributed databases and to this end it is necessary to consider the role of SafeSeaNet and Single Windows, together with the local and national applications.

Inspection Regimes

Not only the individual authorities may benefit from timely information of an intended visit, in organising their e.g. inspection regimes, but ultimately the port requires to optimise the use of its resources in servicing a vessel wishing to enter or depart that port.

The main delay in port is related to the formalities concerning the goods rather than the vessel itself and therefore the move towards a European maritime transport space without barriers should ease this. Customs, veterinary and phytosanitary controls on vessels and cargo sailing between two EU ports, with the exception of regular direct links between ports, are considered as international voyages and therefore subject to all the related formalities. As such this has placed maritime transport at a disadvantage with respect to other transport goods operating on an internal market regime without additional controls.

However, where pre-information gained from reports, together with improved monitoring and validation of e.g. ETAs, inspection regimes will be better placed to manage resources. With the overall goal to coordinate any planned inspection activities so that the inspection regime is conducted as efficiently as possible this may include inspections be conducted simultaneously by one or more inspectors.

Benefits may be gained through reduction in the costs that are associated with administrative delays, frequent or regular controls and the time spent preparing documentation and procedures (estimated at 3 – 3.5% of transport cost)⁹.

Differing interpretations of regulations and standards

- Reporting requirements as set out in EU Directives are often subject to individual interpretations by Member States or even ports with respect to how information is to be provided;
- The differing interpretations create additional inefficiencies;
- The EU Directives are sometimes inconsistent themselves in terminology with respect to whom a report is to be made or vice versa, or what is to be reported;
- It is evident that member States have differing approaches and interpretations with regard to the “monitoring” of vessel traffic;
- Additional data requirements on the national and local levels may create differing information sets and quality criteria;
- Member States often require administrative procedures to be carried out in their local languages.

⁹ Proposal for a Directive on reporting formalities for ships arriving in or departing from ports of the Member States of the Community and repealing directive 2002/6/EC {COM(2009) 11 final}

(Non-) Harmonisation

- Electronic exchange of messages and data is not well developed, hampering efficiency over the whole chain;
- Authorities with the same roles and tasks in different member States require varying data sets, often in different formats, according local and national regulations as well as existing system capabilities;
- Software updates for SSN are implemented at different times by member States creating the potential for inefficiencies in the system;
- Only a few Member States have a national single window approach.

Lack of interoperability

- Several systems co-exist without real economies of scale;
- The linkage between the SafeSeaNet and the port networks is very limited, and data exchange happens when the national authorities ask for it. The exchange of electronic messages between ports is not common place;
- Electronic manifests are not universally accepted by all ports in the EU. Only 55% of ports use electronic systems for handling ship and cargo information, with the use of fax and telephone still common;
- Creates barriers to establishing transport networks able to acquire data, handle it, exchange it and share it in the most efficient way amongst a great variety of stakeholders based at different geographic locations;

Proactive and Remedial operations

- There is no common understanding of what “monitoring” should entail;
- There is no uniform agreement as to which data is required by coastal monitoring services;
- Regional Agreements (e.g. HELCOM) exist for the exchange of data for remedial actions;
- Legislation in member States for Territorial Seas and beyond is not consistent with respect the powers of the coastal to intervene “proactively”;
- There is no mechanism in place for the proactive monitoring of vessels on a pan-European basis, including availability of data to support this task;
- Reports from coastal monitoring stations on vessel behaviour may be used by authorities in assessing risk related to safety, security, environment, customs, immigration, health and border control.

Improved administration procedures

e-Maritime is centred on the improvement of administration procedures. The Impact Assessment for the proposal for a new EU Directive replacing EU Directive 2002/6/EC [5] foresaw, amongst others, the following benefits in this initiative:

- Free circulation within the EU ports;
- Less administrative burden, lower costs;
- Faster turnaround times for vessels in ports; enhanced maritime safety; lower waiting times; less costs;
- Faster and more rational administrative operations. Lower administrative costs for Shipmaster;
- To speed up loading/unloading and waiting times of vessels in ports;
- Promotion of maritime transport as a viable alternative to road and rail.

Single Windows

- Single Windows are for A2B, B2A and A2A transactions. Account is to be made of existing investments in systems and means sought whereby i.e. Port Community Systems are seamlessly integrated where authority-bound information is concerned;
- The phenomenon of multiple Single Windows should be avoided where possible through appropriate consultation and agreement of all authorities involved in maritime transport so that any potential negative effects for business is kept to a minimum. Due consideration is to be made of the Customs Single Window and efforts sought to eliminate duplication of reporting between this and any eventual Single Window for maritime administrations;
- There is a requirement to ensure the effectiveness of SSN through ensuring that all required¹⁰ data be available “online”, through the appropriate synchronisation of Single Windows with SSN;
- There is a need to make a clear distinction between data included in ship reporting documents and that for the declaration and clearance of cargo. Data for routine checks or inspection may be derived from these.

Clearance procedures

- There is a need to reduce the time required to fulfil all reporting formalities;
- There is a need to coordinate inspection activities to achieve a reduction in time lost;

¹⁰ Non-superfluous data required by an authority to perform their task

- There is a need to level the playing field between transport modes by recognising intra-EU shipping movements as internal movements and not subject to the status of “international voyage”, thereby reducing the burden placed by i.e. customs, immigration, health and phytosanitary controls.

SafeSeaNet

There is an opportunity to increase the effectiveness of SafeSeaNet through value-added services in i.e. facilitating the flow of information between (local and national) authorities, via national applications, of different member States in order to reduce the reporting burden on-board as well as providing information to coastal monitoring stations along the route of a vessel in EU waters where required in the interest of safety, security or protection of the environment.

Statistics

- Through Single Windows and their eventual integration into SafeSeaNet, it is necessary to recognise data that is commercially sensitive or authority sensitive.
- However, commercial operators should be encouraged to make information available for statistical purposes in the interest of strengthening the maritime transport sector as a whole;
- Statistics gained on vessel and cargo movements should be made available to assist coastal States in assessing the risk profiles in EU waters and thereby enhance proactive monitoring.

Improved safety, security and environmental protection

Development of e-Navigation support infrastructure

Vessels have more than 60 systems and sources of information on-board for assisting in navigation and communications, ranging from position devices to ship operation indicators and logs. Much information is to be gained from shore-based organisations whilst other information is to be reported from the vessel to a shore-based installation. e-Navigation, as under development by the IMO, aims to integrate existing and new navigational tools, in particular electronic tools, in an all-embracing system that will contribute to enhanced navigational safety while simultaneously reducing the burden on the navigator.

e-Maritime, in setting up procedures and The emergence of e-Navigation will have consequences for e-Maritime with respect to what information is to be exchanged between shore-vessel-shore and how. There is a need to closely monitor e-Navigation developments so that optimal solutions in regard of e-Maritime may be sought. This may include automatic reporting through vessels to coastal stations via i.e. AIS, resulting in less position reports being sent by the master and thereby reducing the reporting burden.

Exchange of information between authorities

Each member State has their own method for collecting the data required to satisfy their authorities and/or administrations requirements. These may range from national Single Window applications through to dedicated local systems for an individual authority. Much of the data required by one authority is the same as that required by another, whilst each maintains their own system for collecting and processing the data. In other examples authorities are reliant on the verification of certain data before their own processes can begin. Enabling the exchange of data between authorities may:

- reduce the reporting burden placed on the master;
- lead to explicit or implicit “verification” of data thereby optimising the processes and leading to gains in time and costs.

Co-operation between authorities in dealing with SAR and oil pollution

- Enabling proactive monitoring of vessels in EU waters by i.e. coastal monitoring stations, authorities can better evaluate the potential risk posed by a vessel or its cargo;
- Designation of risk values with regard to safety of life, pollution and material damage as well as i.e. customs and border control;
- Subsequent monitoring of movements of high risk vessels by authorities;
- Facilitating integration of functions towards a strategy for integrated safety, security and environmental risk management as well as facilitate functions related to customs and border control from one (virtual) centre.

1.2.2 Improved Shipping Operations

The purpose of this section is to reflect on the underlying problem definition of “Shipping Operations”, in relation to the improvements that e-Maritime could introduce to this domain.

e-Maritime aims to improving shipping operations and improve port operations by and integrating them into D2D logistics chains. The resultant improvements in efficiency to the commercial organisations involved in these sectors will be the main B2B benefit of e-Maritime.

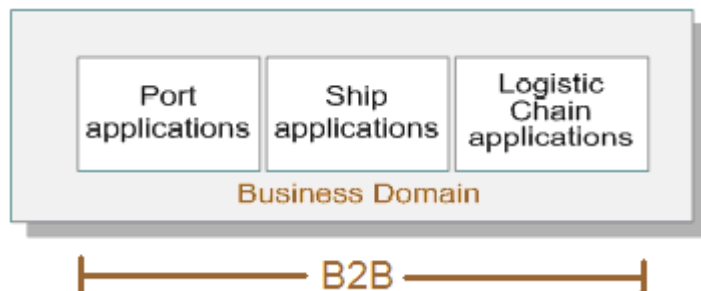


Figure 3 e-Maritime B2B

1.2.2.1 Problem Definition

The problems associated with shipping operations pertaining to e-Maritime are:

1. Inefficiency due to complexity of operational requirements compounded by human error.
2. Non-integrated nature of competitive shipping operations.
3. Lack of visibility with regard to costs for shipping services.
4. Lack of ability to ‘deliver to promise’ with regard to delivery times.
5. D2D tracking throughout the transport chain is far less than ubiquitous.
6. The changing nature of international, EU and national regulatory requirements means that shippers can get caught unawares by data being compliant with one regulation and not with many more, thus causing non-compliance and potential delay in the transport chain.
7. Over reliance on antiquated IT systems.

1.2.2.2 Expected Benefits

In the short / medium term (looking at 10 years onwards) the most promising development for maritime transport is e-Maritime, which is becoming the focus for the simplification and cohesion of administrative requirements and procedures, with a spill-over into commercial applications.

From the perspective of transport chains, e-Maritime will provide standardisation, interoperability and security of information exchanges that will set the foundations for cooperative networking strategies in intermodal operations. The implications of this are far-reaching:

1. Efficient functioning of intermodal networks, even for interregional services, without incurring massive IT infrastructural costs;
2. A balanced distribution of risk amongst operating participants;
3. The possibility of inter-network linkages becoming feasible;
4. Increased reliability and security of deliveries with reduced unit costs becoming a reality.

e-Maritime has the potential to dramatically change maritime transport and its integration into logistic chains. Those who will take advantage of this opportunity are likely to realise strategic advantages while those that miss out are likely to find themselves lagging behind. Thus, being part of the development of e-Maritime is important for the operators in this domain, commercial and public alike.

Overall e-Maritime should eventually lead to the emergence and consolidation of commercial and public e-services resulting in:

1. Improvements in the European Transport system, resulting in trade facilitation through efficiency gains, greater flexibility and quality maritime transport services;
2. Cost-effective solutions for addressing safety, security and environmental concerns;
3. The long term competitiveness of the European maritime industries.

1.2.2.3 The beneficiaries of the e-Maritime capabilities

A list of the transport stakeholders and the target benefits that e-Maritime is aimed to deliver for each group is given below.

1. *Transport users (shippers, freight forwarders, etc)* will benefit from:
 - support to identify and use transport services most suited for their purpose;
 - easy access to clear explanations on regulatory requirements and compliance services;
 - ability to establish strategic alliances with other stakeholders to match trade patterns with improved utilisation of maritime transport resources;
 - improved transparency on shipment plans including the estimated carbon footprint;
 - efficient on-line services for financial and contractual transactions for D2D services;
 - ability to exchange experiences on e-maritime developments with other shippers and to voice improvement requirements.
2. *Transport integrators* will benefit from:
 - services to design and monitor intermodal corridors;
 - web based tools for setting up or joining networks including SMEs and managing service level agreements;
 - services to plan and monitor shipments with automated reporting facilities.
3. *Ship operators and agents* will benefit from:
 - facilities to provide information on their service offerings and exchange information electronically with all participants in planning, executing and completing transport operations;

- services to support regulatory compliance utilising efficiently the latest e-Government offerings at regional, national and EU levels;
 - standards and tools for interoperability in intermodal / co-modal networks;
 - access on evaluation reports for emerging technologies (e.g. Internet of Things, semantic web technologies, ITS, etc) and innovative applications ;
 - easy web based access to specialist services that will enable the European industry to achieve best-in-class in co-modal transport;
 - access on e-learning services specifically designed for EU shipping crews.
4. *European port authorities* will benefit from:
 - services to facilitate the best possible use of the complete port infrastructure and to provide transport users with information on available infrastructure and how to use it;
 - services for compliance and collaboration with authorities on security management;
 - facilities, particularly for Small to Medium Ports, to assess potential benefits from Single Window solutions;
 - services to facilitate upgrading Port Community Systems in line latest software engineering developments and to integrate third party services;
 - supports for e-training of port community people and knowledge sharing with other ports.
 5. *Research and Educational / Training organisations* will benefit from:
 - co-ordinating offerings on maritime transport courses and e-learning services;
 - managing requirements surveys and establishing collaborative networks with policy makers.
 6. *Seafarers* will benefit from:
 - improved access to professional development e-training services;
 - improved communication facilities and infotainment services;
 - improved safety in the working environment and better access to e-medicine.
 7. *Systems Developers and Consultants* will benefit from:
 - publishing their services so that could be used on demand;
 - upgrading their platforms / applications to match e-Maritime standards;
 - developing new innovative e-Maritime services.
 8. *Industry Associations* will benefit from:
 - influencing the specification of the e-Maritime Framework in line with membership interests
 - easy access to evaluation reports
 9. *Transport and Trade Administrations and Classification Societies* will benefit from:
 - automating compliance reporting;
 - exchange information with other authorities for safety, security and environment risk management.
 10. The *European Commission and national transport ministries* will benefit on a number of counts, principally from an ability to assess the potential impact of policies on improvements in European transport competitiveness and sustainability issues.

1.2.3 Improved Port Operations

1.2.3.1 Port Community Systems

Sea routes in Europe are basically short distance shipping. Short Sea shipping carries notable % of goods traffic with a steady growth rate. In terms of energy consumption, transport on water is much more efficient compared to other modes of transport. With the same input of fuel the weight of cargo, which can be carried is at a minimum 2.5 times higher. This has also a positive impact in environmental respect - less fuel, less pollution. Container ships for the deep Sea, River and Seagoing River vessels, RoRo ferries for Trucks and Rail ferries are typical vehicles of the 'motorways of the sea'. RoRo Vessels for short distances are effective and helping to bypass congested roads and helping to overcome difficult border crossings. Experiences made with rail ferries in the Baltic Sea crossing waters to link railway systems, short sea traffic between North and Baltic Sea as well as in the Mediterranean Area provide good reasons to implement the concept of "Motorways of the Sea". The North European Ports in the Hamburg, Antwerp range are all connected to large inland waterways. Considerable part of cargo arriving or departing these ports is loaded from Sea going vessels into river vessels and vice versa. For some trades e.g. Baltic Sea / Rhine River area River-Sea Vessels are in use. The River Systems of the Danube and the Dnepr approaching the Black Sea are best suited for intermodal services and "Motorways of the Sea". In the Caspian Sea, Rail Ferries are linking the Ports of Baku, Aktau and Turkmenbashi on a regular basis. (extract from „Motorways of the Sea")

EU sea ports are very advanced and sophisticated in most cases today. Management of all activities are supported by ICT (Information and Communication Technology). ICT port domain applications are different depending on financial and technical possibilities of the port. ICT in ports are supporting maritime economy like maritime safety agency, harbour master office, shipping industry and business partners.

There is a number of EU supported projects related to Port Community Systems like ITAIDE¹¹, Motorways of the Sea (MoS) for Black Sea and Caspian Sea¹², INTEGRITY¹³, EURIDICE¹⁴, FREIGHTWISE¹⁵, RISING¹⁶, ROADIDEA¹⁷, SmartCM¹⁸ and Smartfreight¹⁹.

¹¹ ITAIDE addresses issues related to eCustoms: How can customs documents and procedures be redesigned and supported by ICT? What are the drivers and barriers for adoption? <http://www.itaide.org/>

¹² Project Fiche for Motorways of the Sea (MoS) for Black Sea and Caspian Sea http://ec.europa.eu/europeaid/where/neighbourhood/regional-cooperation/enpi-east/documents/annual_programmes/regional_ap_2006_pf_motorways_of_the_sea_en.pdf

¹³ INTEGRITY is intending to significantly improve the reliability and predictability of door-to-door container chains. <http://www.integrity-supplychain.eu/index.php>

¹⁴ The basic concept of Euridice is to build an information services platform centred on the individual cargo item and on its interaction with the surrounding environment and the user. <http://www.euridice-project.eu/>

¹⁵ FREIGHTWISE supports the co-operation of the Transport Management, Traffic and Infrastructure Management and Administration sectors to develop suitable intermodal transport solutions. freightwise.info

¹⁶ RISING has the overall objective of identifying, integrating and developing River Information Systems (RIS) in order to efficiently support Inland Waterway Transport (IWT) and logistics operations. <http://www.rising.eu/>

Activities, that normally taking place in ports could be categorized this way:

- Harbour activity: Management of maritime and river traffic (ships, arrivals, manoeuvres, departures), cargo traffic, port events;
- Finance, Accounting: Financial Management, Financial Accounting, Cost Control Management, Budgets, Fixed Assets, Inventories;
- Commercial Activity: Contracts, Litigations, Ships Refunds, Rental Refunds, Invoicing;
- Maintenance: Equipment Maintenance/Repairs, Infra- and Superstructure Maintenance, Interface with Cost Estimates computing packages, Material Stocks for Maintenance/Repairs, Materials procurement for Maintenance/Repairs, Monitoring the fuel consumption for ships and heating stations;
- Services: Services for re-providing communications, electric energy, thermal energy, water; miscellaneous services;
- General Stock Management;
- Overall Procurement Management;
- Investment: Investment Plans, Public Acquisitions (investments, equipment acquisition, repair works), Management of the Cost Estimates;
- Human Resources, Payroll: Employee Records, Recruiting, Performance Evaluation, Training, Evaluation Centre, Payroll;
- Access Control: Management of the Port Access Information;;
- E-mail: E-mail Management, Registration of Source/Destination Data;
- Management Informational System: Analysis of the financial-accounting indicators, Analysis of the purchase orders, Analysis of the equipment availability and of repair costs, Analysis of the investment achievement, Analysis of the port traffic.

When we talk only about cargo flow, Port Authorities daily are linked and interlinked with a number of other institutions. They are:

- Port Authorities;

¹⁷ ROADIDEA studies the innovation potential of the European ITS sector by analysing available data sources, revealing existing problems and bottlenecks for data utilisation and service build-up. <http://www.roadidea.eu>

¹⁸ SMART-CM aims to make trade and transport more efficient, secure, visible and competitive across the world in a global intermodal context <http://www.smart-cm.eu/>

¹⁹ SMARTFREIGHT aims to make urban freight transport more efficient, environmentally friendly and safe by answering to challenges related to traffic and freight management. <http://www.smartfreight.info/>

- Forwarding companies;
- Ships agents;
- Stevedoring services;
- Transport companies;
- Railway;
- Customs;
- Customs brokers;
- Sanitary and Phytosanitary Inspection;
- Border Guards;
- Coast Guard.

Different ports may have different applications in use within one Member State (MS). Usually applications are not compatible to others and moreover ports are not motivated to share their commercial data. However integration is taking place regionally. For example „Port Infolink” of the Port of Rotterdam and „PortNET” of the Port of Amsterdam have one integrated system now. Some kind of Implementation of a Data Communication System for the Adriatic-Ionian Sea Area ports is under way. Other regional integration of PCS is taking place.

Concluding the overview on Port Community Systems, there is available summary of the best Port Community System revealed by Port Authorities themselves. It was written by Santiago G. Mila, Chairman of the IAPH Committee on Trade Facilitation and Port Community Systems, Head of Delegation of the IAPH at the UN/CEFACT (United Nations Centre for Trade Facilitation and Electronic Business), and also Chairman of the Logistics and Intermodal Committee at the ESPO (European Sea Ports Organisation) in his Article from May, 2009:

The IAPH (International Association of Ports and Harbours) and its Committee on Trade Facilitation & Port Community Systems undertook a report in 2007 on the main features of PCS running at member ports. For that, a questionnaire was prepared and sent to all IAPH members with the objective of clarifying the models of PCS currently running and identifying best practices.

Resulting PCS model would be a PCS implemented before 1995 by the Port Authority — a Public Administration — and currently owned and/or run by a private company. Its use would not be mandatory, it would be acting as a single window and it would be connected to other similar portals or other PCS. Regarding services offered, the model of PCS would be offering information services and documentary exchange services (after a process of re engineering of processes). Its use would be charged and the technology used for messages would be EDI and/or XML. The programming technology would be Java and the PCS would be integrated to the legacy systems of its users. A step forward for PCS would be extending their services and capabilities including: business processes

(Importer/exporter contracts, ePayment, eInsurance, etc); processes automation; interoperability and track-and-tracing with whole logistics chain (users should have the possibility to trace their freight through the co - operation/connection among different PCS. Document exchange and comparison among different PCS should be possible as well) and adoption of new ICT solutions (eLearning, use of mobiles and PDA, etc). Interoperability among PCS and the connection of all actors of the logistics chain are the key for future development of PCS. Both issues require the adoption of technical standards, such as XML and ebXML, and business processes standards to understand and to make clear the benefit for each company in a very long transport chain. The success in connecting different PCS and extending through the logistics chain is based on the adoption of the same standard by all the actors of the chain. It will happen only if there will not be the necessity to invest money for changing the actual systems and if all the information available could be reused in the future.”

1.2.3.2 Dedicated Systems

The following Services have their own non commercial applications:

- SAR Services – SAR Convention, IAMSAR Manual;
- Emergency Oil Pollution Combating System;
- AIS;
- VTS/VTMIS;
- Surveillance systems – Border Guards will develop European Border Surveillance System (EUROSUR);
- Customs – The European Commission has adopted two proposals to modernise the EU Customs Code and to introduce an electronic, paper-free customs environment in the EU²⁰;
- Sanitary and phytosanitary measures.

²⁰ See [IP/05/1501](#), [MEMO/05/453](#) full texts [COM/2005/608](#) and [COM/2005/609](#)

1.2.4 Integration into Logistic chains

A recent SKEMA Periodic Study titled “Weathering the Economic Crisis”, had the objective of identifying actions that may be taken by the Commission to help the European maritime industry to weather the current economic crisis and to be in good condition to avail of opportunities in the recovery.²¹

Twelve remedial measures for the European maritime industry were presented at a meeting of the Short Sea Shipping (SSS) and Motorways of the Sea (MoS) Focal Points and the Short Sea Promotion Centres (SPCs) in July 2009. One such measure was to ‘Stimulate rethinking on new technologies and ways of organising logistic chains’. The current recession shows up weaknesses in previously accepted practice such as:

- Decision making based on the prevailing collective wisdom,
- The underestimation of risk,
- Extrapolations from past experience in terms of market growth, service design, cost escalations and pricing.

The report suggests that the most promising emergent technological development for dealing with these weaknesses is e-Maritime. From the perspective of logistics chains, e-Maritime is expected to provide standardisation, interoperability and security of information exchanges that will provide the foundation for cooperative networking strategies in intermodal operations. The implications of this are far-reaching:

- Efficient functioning of intermodal networks, even for interregional services – without incurring massive IT infrastructural costs;
- A distribution of risk amongst operating participants;
- The possibility of inter-network linkages becoming feasible;
- Increased reliability and security of deliveries with reduced unit costs becoming a reality.

²¹ “Weathering the Economic Crisis”, Periodic Study, 30th Oct 2009, G Trant, M Liddane, plus SKEMA Contributors

1.2.5 Promote seafaring profession and sea-shipping

With reference to the "Maritime transport strategy for 2008-2018", e-Maritime is aimed at supporting:

1. European shipping in globalised markets;
2. Human resources, seamanship and maritime know-how;
3. Quality Shipping as a key competitive advantage:
 - a. Improving the environmental performance;
 - b. Maritime transport safety;
 - c. Maritime transport security;
 - d. Maritime surveillance;
 - e. Maritime transport as a key element of EU energy security.
4. Working together on the international scene;
5. Exploiting the potential of Short Sea Shipping;
6. Europe as world leader in maritime research and innovation.

This section is primarily focused on #2. 'Human resources, seamanship and maritime know-how' taking into account #4. 'Working together on the international scene', since these issues are most in line with the subject of the study 'promote seafaring profession and sea-shipping'.

Firstly this section illustrates the problem definition and it stands to reason to align the problem definition of human resources, seamanship and maritime know-how with the current economical circumstances which may distract the problem shortfall of maritime officers.

Furthermore, global initiatives that have been taken to tackle the shortage of seafarers shall be looked at along with measures that can be taken to improve working conditions on board. Finally, issues that can be taken into account with respect to e-Maritime shall be discussed.

1.2.5.1 Problem Definition

Problem Definition, as it recently was perceived

The shipping industry is very much dependent on working together to launch and coordinate international initiatives which deal with the dramatic shortfall of officers in the global shipping fleet to be some 34,000, against a total requirement of 498,000. These figures and facts were based on a report by Drewry Shipping Consultants. Taking into account their fleet growth projections in

combination with the assumption that officer supply will only increase at the current rate, the report predicts that, by 2012, the global officer shortfall will have grown to 83,900.²²

It is clear that most actors in the shipping industry are aware of the fact that the global shortage of seafarers especially officers have already reached significant proportions and are now a source of genuine concern to all involved in the industry. A related challenge is that due to the above mentioned shortage the pool of persons with a specific maritime background required for onshore functions are rapidly decreasing as well. Everybody is 'fishing in the same pond'. Outside the shipping industry itself, the wider public has little conscious perception of the vital role that shipping plays in everyday life in general and in the transport chain in particular.

- Global shortage of Seafarers, especially officers;
- Expected increase of shortfall of officers;
- Little conscious perception of wider public with respect added value of shipping in their day-to-day life;
- Coordination of international initiatives which deal with the dramatic current shortfall

Problem Definition, under the current economic circumstances

Currently there are other sounds with respect to the shortfall of seafarers, like Nasdaq-quoted LPG StealthGas President and Chief Executive Officer, Harry Vafias, recently stated in an interview: 'that if the current economic crisis continues as it has done, the crew shortage problem could be over within a year.' However, the problem may worsen again in the future if the global economic circumstances will improve.

The International Shipping Federation (ISF) has been working closely with the International Maritime Organization (IMO) and the International Labour Organization (ILO) in tackling the issues facing seafarers, and given the current global economic crisis, is extremely concerned about the consequences for the shipping industry in the near future.

The ISF also stressed: 'the difficulties posed by the current economic situation and the need for safeguarding jobs for seafarers'. Due to the global economic crisis, the shipping industry and shipbuilding markets have collapsed after a long period of high demand. In the four months to April 2009, the order intake of e.g. Ship Power plunged to 86% down against the corresponding period a year earlier.

There is less immediate pressure to find crew members than there was a year to 18 months ago, as there are currently more people available in the market than there were previously. Aside from the

²² "A review of some solutions to the shortage of maritime skills", B Lewarn, Maritime Transport Policy Centre, Australian Maritime College, 2009 https://www.amc.edu.au/system/files/MTPC+Occasional+Paper+1_0.pdf

'positive' outcomes of economic collapse there is still an intrinsic problem in terms of crewing. While short-term relief may be experienced in the crewing sector as the shipping industry takes a nap, it will eventually wake up ravenous for competent officers as newer tonnage enters the market.

Clearly at the moment, things are tight out there and the first priority for the ISF and the International Transport Workers' Federation (ITF) is to secure jobs, but having said that, both the ISF /ITF are very mindful that there will be still a growing shortage of officers, and the real danger to the industry is if people cut back on training in the current climate to save costs.

Although it is not so much of an issue right now, it could potentially cause a big demographic time bomb when the market situation improves. The emphasis on training can never be too clearly felt as now, when the inclination to cut costs is fierce and the proclivity towards investment is thin on the ground, something the ISF and the ITF are keenly aware of. Owners should certainly not stop training to save costs – they should continue to invest in training. The first thing that tends to go in an economic downturn is training.

To further emphasise the continuing nature of the shortage of officers, in June 2008 there were 11,931 ships on order from shipyards, which highlights the fact that shipyard output expanded nearly 300% between 2000 and 2010 (according the figures of Maritime Transport Policy Centre 2008, appendix 1). However, because of the current global financial crisis and the consequent slowdown in economic activity, the magnitude of this projected expansion is already rapidly reducing. Whilst some commentators have suggested that global recession might lead to a surplus of qualified officers, the alternative view is that even in slump conditions a shortfall of up to 60,000 is still likely unless action is taken to rectify the situation.

Thus, this shortage of seafarers is still a matter of worldwide concern because many of the skill sets needed in the broader maritime sector require seafaring skills. The nature of the maritime sector is such that seafaring has traditionally been viewed as the starting point which can lead to a range of shore-based maritime careers. Seafaring skills and experience are viewed as being of direct use and importance for a range of maritime shore-based careers including maritime pilots, marine surveying, terminal/cargo operations, port operations, ship management, marine administration, and within the field of maritime education and training. It is indicated that sea-related employment provides about 5 million jobs across Europe, of which some 70% are onshore, in shipping, shipbuilding, and related services and fields, ranging from cargo handling and coastal tourism to offshore energy fields, fishing and aquaculture. A recent survey of 229 serving seafarers indicated that approximately one third intended to make seafaring a lifelong career, while two thirds indicated they would move ashore as soon as circumstances permitted (Shiptalk Ltd Gateshead, 2008, life at Sea Survey 2007/8 – Seafarer attraction & retention survey report).

This flow of seafarers from ship to shore is important, as it ensures that relevant skills and experience are not lost to the maritime industry. It is generally accepted that a majority of ex-seafarers remain within the shore-based maritime industry; however, if there are insufficient new seafarer entrants, there are ultimately insufficient skilled seafarers to move to shore employment.

- Global shortage of Seafarers, especially officers and expected increase of shortfall has to be seen in the current global economical circumstances;
- Need to secure seafarer's jobs;
- Tendency to save costs on training and education in an economic downturn;
- When the market situation improves the need for well educated and trained crews will dramatically increase on short notice;
- Ultimately insufficient skilled seafarers to move to shore employment.

1.2.5.2 Problem Definition, with respect to Maritime Education and Training

In the previous paragraph it was mentioned that first thing that tends to go in an economic downturn is training. One of the positive initiatives which were implemented in Europe is the regime of inspections at Maritime Education and Training (MET) Institutions conducted by European Maritime Safety Agency (EMSA). It is noted that there is still discrepancy in the way MET is carried out in the various countries, in some cases even in different institutions of one country, though IMO's International Convention on Standards of Training, Certification, and Watch keeping for Seafarers (STCW) is the principal legislation in and outside the EU.

Like the EMSA stated in various documents, there are significant differences between education and training schemes in the EU. From 2007, EMSA has also been given the job of verifying the levels of implementation of Community legislation relating to the education, training and certification of seafarers inside the EU. This means that Agency experts carry out inspections of education and training procedures and establishments in the Member States. In addition to the continuous inspection process, EMSA also sends its experts to non-EU countries when EU Member States ask to have their national systems evaluated for recognition in order to be able to employ their seafarers on EU registered ships. Only after a thorough evaluation of the country's ability to implement the requirements of the STCW Convention can it be recognised at Community level.

- Discrepancy in the way Maritime Education and Training is carried out by various institutes;
- Significant differences between Maritime Education and Training schemes in the EU;
- Positive role of EMSA with respect to inspection of MET matters in and outside Europe
- Tendency to save costs on training and education in an economic downturn.

1.2.5.3 Global Initiatives on the Shortage of Seafarers

Go to Sea!

Mutual initiatives by international organizations, such as the International Maritime Organization (IMO) and the International Labour Organization (ILO) to promote seafaring profession and sea-shipping are certainly in line with EU policy. In November 2008 a special campaign 'Go to sea!' was launched to attract entrants to the shipping industry. This on-going campaign is organized to address the previous mentioned global shortage of seafarers, especially officers, which threatens the very future of the international shipping industry. Amongst specific calls for action in the campaign document, the shipping industry is urged to take the lead and to promote itself through the media, in particular the electronic media.

According to IMO, ILO and associates the shipping industry should continue to provide support for and endorse campaigns aimed at improving its image and use some key industry figures as examples of career progression. It is also urged to do more to make life on board and away from home more akin to the life enjoyed by others ashore. Another issue is to encourage women to work in the seafaring profession and this could also be achieved by promoting the industry at non maritime-related events.

In the leaflet 'Go to Sea!', governments are asked to give greater prominence to the maritime perspective, by doing more to support and encourage the shipping industry in any initiatives it takes to enhance its image and to remove adverse actions that may damage that image. Maritime training facilities need to be resourced adequately (both in financial and human resource terms) to ensure a supply of competent seafarers. Governments could do much to promote a wider take-up of a sea career through, e.g. training of unemployed persons and promoting the career for women.

- Mutual initiatives by international organizations, e.g. IMO and ILO to promote seafaring profession and sea-shipping are in line with EU policy;
- The shipping industry is urged to take the lead and to promote itself through the media, in particular the electronic media;
- Encourage women to work in the seafaring profession;
- Maritime training facilities need to be resourced adequately.

e-Maritime Initiative

The E-Maritime initiative should play a supporting role in this strive and objectives. Because some of the objectives of the E-Maritime initiative are related to Promoting Seafaring and Shipping Image, in particular:

- Improving the image of EU Shipping;
- Informing on the various professions in the maritime transport sector;
- Development of applied e-Learning and training courses for career development both at sea and in land;
- Establishment of communication and infotainments services for the well being of seafarers.

One could not imagine the existence of the shipping industry without its valuable workforce, seafarers. The impacts of the current economic circumstances are not foreseen in any of the prognosis as earlier stipulated by Drewry Consultants. It makes sense to align the related e-Maritime initiatives with the other major players in the field, like the ILO, IMO, ITF and branch organizations. More emphasis could be allotted to the applied e-Learning development and to improve life at sea by the stimulating the establishment of communication and infotainments services for the well being of seafarers. Now is the time to make use of the available resources during the current economical circumstances to speed-up the implementation of the above mentioned issues.

After the Crisis

It is extremely important that the EU should consider the period after the current financial/economic crisis. The shortfall of EU seafarers impacts negatively the shipping industry as a whole, whereas both the on board and the on shore maritime related work posts face manning problems that may directly threaten the existence of the shipping activity and the sustenance of maritime know-how in Europe.

Thus, in line with the e-Maritime initiative recruitment attempts should try to:

- Improve the image and re-establish the status of the maritime profession;
- Improve its popularity and develop momentum;
- Promote the positive aspects (academic status, secured professional development, conditions of work, remuneration);
- Address potential recruits at schools.
- Introduce advertisement campaign which must be continuous and consistent.

1.2.5.4 Improvement working conditions onboard

The impact of on-board environmental conditions

Unfavourable on-board ambient environmental conditions can take a toll on the daily performance of crew members. By increasing physical and mental fatigue, these conditions may lead to human errors. Recent reports by the International Maritime Organization (IMO) have publicized the fact

that crew member fatigue and human error are increasingly being recognized as major factors in maritime accidents. With reductions in staffing and increases in the complexity of on-board systems, it is vital that crew members maintain enhanced levels of mental and physical fitness while working.

To maintain such fitness, crew members should be provided with supportive accommodation designs that promote reliable human performance by reducing the potential for fatigue and human error.

Habitability

“Habitability” can be defined as the acceptability of conditions on-board a ship or offshore installation in terms of vibration, noise, indoor climate and lighting, as well as physical and spatial characteristics, according to prevailing research and standards for human efficiency and comfort.

The on-board living and working conditions to which the crews of ships and offshore installations may be subjected are often unique and, under some circumstances, harsh.

By living at their workplaces, crew members at sea can be subjected to motions such as pitching, rolling and slamming as well as less than favourable ambient environmental conditions involving vibrations, noise, lighting and indoor climate. In the past, little attention was given to systematically designing an on-board living and working environment that supported mariners or offshore workers in the conduct of their daily activities. While some habitability issues are addressed through the

International Labour Organization’s (ILO) Conventions, information relating to design has concentrated on the ships’ or installation’s structure and machinery.

Recently, the role of human error in accidents has encouraged the maritime industry to assess what can be done to reduce the potential for human errors. One realization is that by improving on-board conditions, crews can be less fatigued and thus less prone to errors.

Technical Developments

The objective of designing for crew habitability is to apply criteria or limits that provide the best overall shipboard or offshore installation conditions, given design constraints and budget. These should support effective human performance, mental alertness and basic levels of comfort that promote the general well-being of crew members.

Design emphasis should be paid to the accommodations where the crew lives and works as well as to the ambient environmental conditions.

Whole-Body Vibration

Proper vibration control is necessary to establish a safe and satisfactory working and living environment. The human response to excessive vibration can include motion sickness, task interruptions, decreased levels of performance and basic comfort issues. Designers should be primarily concerned with vibration transmitted to the body through supporting surfaces, such as the buttocks or feet.

Noise

Excessive noise can cause performance degradation during vigilance tasks, complex mental tasks, and tasks involving complex motor skills. Excessive or improper amounts of noise may also interfere with speech and other communication tasks.

Indoor Climate

Indoor climate encompasses temperature, relative humidity levels and air velocity rates. The objective in crew habitability is to provide a satisfactory environment that supports good human performance. To achieve this, indoor climate variables should be controlled within a tight band of acceptable conditions.

Illumination

Early design consideration for proper lighting selection and placement is essential to attain satisfactory illumination levels. The objective is to optimize lighting levels in crew accommodation spaces to facilitate effective and efficient visual task performance and take into account visual comfort. Improperly designed lighting systems have been reported to contribute to eye fatigue, increase human error and mishap rates, and delay crew member response or reaction time.

Social Communication by Broadband Onboard

Inmarsat has introduced some new programmes designed to improve the social communication by broadband. From October 1st 2009, seafarers onboard vessels that are using FleetBroadband will be able to enjoy cheaper phone calls with the introduction of Enhanced Super Quiet Time (ESQT) low-cost calling. Super Quiet Time crew calling rates have been a popular feature with crews using previous Inmarsat services, and vessel operators have been eagerly requesting a similar set-up on FleetBroadband since the service was launched in November 2007.

This service has evolved over the years, starting from being a few hours a day when initially launched to being extended to include periods of high crew demand.

“This is our way of giving something back to the industry especially in a time when the shipping industry is suffering from the effects of the economic downturn,” said Inmarsat maritime marketing manager, Kartik Sinha. “We know that cheaper cost calls make a significant contribution in improving crew morale and we hope that this offering will help shipping companies in their crew retention strategy.”²³

²³ Article: Inmarsat Launches 24-hour Low-Cost FleetBroadband Calling Service
http://www.viasatellite.com/broadband/headlines/Inmarsat-Launches-24-hour-Low-Cost-FleetBroadband-Calling-Service_32054.html

1.2.5.5 Issues which were taken into account with respect to e-Maritime

Comment on the scope and the approach presented

In many cases human factor issues are often considered in a later stage. The e-Maritime initiative addresses the human factors and elements in a very positive manner, pro-active so to say. The focus is put on the main elements of human factor issues which are important for shipping industry and it shows a correct level of awareness that action is required on short notice and that those actions ought to be coordinated within the EU.

Identify the potential risks for this initiative

The potential risks are that too many issues will be addressed in a non-coordinated manner. It would be recommended to focus on the various aspects of human factors and work together with the major players and stakeholders in the shipping industry and port community, including the relevant Labour organizations. Outside the shipping industry itself, the wider public has little conscious perception of the vital role that shipping plays in everyday life in general and in the transport chain in particular.

State the most important drivers for change

It is clear that most actors in the shipping industry are aware of the fact that the global shortage of seafarers especially officers have already reached significant proportions and are now a source of genuine concern to all involved in the industry. A related challenge is that due to the above mentioned shortage the pool of persons with a specific maritime background required for onshore functions are rapidly decreasing as well. Everybody is 'fishing in the same pond'. There should be sufficient fish left to catch!

State the e-Maritime should be focussed from your own business perspective

In an earlier stage nautical and maritime education and training institutes should be made aware of the existence of the EU e-Maritime initiative. Teachers, lecturers, students and trainees could be informed while the initiative is still in progress and under further development. Special seminars and workshops could be organized to increase the level of awareness amongst the players in the maritime field.

Identify alternatives for achieving "e-Maritime" aims other than the presented approach

As stipulated here above it would recommended to organize well prepared special seminars and/or workshops with the sole item e-Maritime and how this would affect the maritime business and shipping industry. The objective would be to promote generating ideas and alternatives to coop and address the major issue and threat to the shipping industry 'the global shortfall of seafarers' and in that sense also the shortage of maritime skills in other maritime related occupations.

How one could establish a better understanding of the different practices between the different EU actors?

Allot a certain budget to develop a promotion campaign in line with the suggestions of the “round-table” of shipping organizations, IMO, ILO, BIMCO, ICS/ISF, INTERCARGO, INTERTANKO and the ITF/ETF. Request the governments of the member states to give greater prominence to the maritime perspective and address this issue directly with the various coordinators of the EU and ask their support.

1.3 Identifying the policy instruments – (EU and National) which impact on real-time electronic data reporting.

The objective of European e-Maritime initiative is to promote “coherent, transparent, efficient and simplified solutions in support of cooperation, interoperability and consistency between member States, sectors, business and systems involved in the European Transport System”²⁴.

The European Commission has introduced a number of policy measures and initiatives which facilitate a move towards an e-Maritime Policy. Some of these initiatives are concerned with creating an environment which is conducive to e-Maritime systems, namely a common approach to policy and decision making and the reduction of barriers. Other direct policy is already exploring electronic systems, specifically in navigation and vessel tracking, the collection of maritime data, and customs documentation. This section focuses on those policy instruments which have an impact on e-Maritime both directly and indirectly and relate to the four areas of Administration, improved Shipping Operations, improved Port Operations and integration into logistic chains. The first section examines the policies which create the necessary platform on which e-Maritime systems can be developed, the second then addresses specific e-Maritime initiatives, the third analyses some of the challenges faced in achieving the e-maritime objectives, and the fourth identifies the areas where more work is needed.

1.3.1 Providing the right environment for e-Maritime

An effective e-Maritime system requires common policy and systems which can then be developed or integrated into electronic processes. The Commission is pursuing a number of policies which provide the necessary platform for such development, namely the Integrated Maritime Policy²⁵, Integrated Maritime Governance in Member States²⁶ and the European Maritime Transport Space Without Barriers²⁷.

1.3.2 EU Integrated Maritime Policy

An aspiration of an EU Integrated Maritime Policy²⁸ is to change the way in which policy is made and decisions taken to create the necessary interaction between the various sectors and to ensure that common tools are developed.

²⁴ European Commission (EC) Green Paper “Towards a future Maritime Policy for the Union”
http://ec.europa.eu/maritimeaffairs/policy_en.html

²⁵ COM 2007 575 Final : An Integrated Maritime Policy for the European Union
<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2007:0575:FIN:EN:PDF>

²⁶ Integrated Maritime Governance in Member States
http://ec.europa.eu/maritimeaffairs/governance_memberstates_en.html

²⁷ COM 2009 11 Final: Communication and action plan with a view to establishing a European maritime transport space without barriers
<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2009:0010:FIN:EN:PDF>

²⁸ COM 2007 575 Final : An Integrated Maritime Policy for the European Union
<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2007:0575:FIN:EN:PDF>

The Commission proposes an Integrated Maritime Policy for the European Union, based on the clear recognition that all matters relating to Europe's oceans and seas are interlinked, and that sea-related policies must develop in a joined-up way if we are to reap the desired results'.(p.2)

To this end, integrated maritime policy guidelines have been issued to Member States which include recommendations for setting up a maritime governance system based on international good practice. Member States have, in turn, made a commitment to make information available on a website which detail the way in which maritime strategies have been developed and the dialogue with stakeholders.

Within the Integrated Maritime Policy two areas have direct relevance to e-Maritime- Maritime surveillance and Data development. Here the Commission have committed to:

- promote improved cooperation between Member States' Coastguards and appropriate agencies;
- take steps towards a more interoperable surveillance system to bring together existing monitoring and tracking systems used for maritime safety and security, protection of the marine environment, fisheries control, control of external borders and other law enforcement activities;
- take steps towards a European Marine Observation and Data Network, and promote the multi-dimensional mapping of Member States' waters, in order to improve access to high quality data.

1.3.3 Integrated Maritime Governance in Member States

As part of the Action Plan of the Integrated Maritime Policy, the Commission adopted Guidelines to Member States on an Integrated Approach to Maritime Policy. These guidelines are based on common elements observed around the world and are aimed at encouraging Member States and other players to take steps towards adopting an integrated approach to sea-related affairs within their governance frameworks. ²⁹

It aims to achieve greater coherence between different policy areas and approaches, taking particular account of:

- the need to avoid duplication of regulatory powers of different national or regional authorities in the Member States and to create a one-stop-shop approach in each Member State
- the need for reliable and comparable statistics to inform maritime policy making on all levels

²⁹ COM 2008 395 Final, Guidelines for an Integrated Approach to Maritime Policy: Towards best practice in integrated maritime governance and stakeholder consultation
http://ec.europa.eu/maritimeaffairs/pdf/com08_395_en.pdf

- the need to facilitate closer coordination on maritime surveillance between, and within, Member States.

Such coherence would facilitate the e-Maritime process.

1.3.4 European Maritime Transport Space Without Barriers

Another initiative which creates the necessary environment for an e-maritime system is the European Maritime Transport Space Without Barriers³⁰. This concept recognises that Europe's shipping industry is at a disadvantage compared with the other modes in terms of Intra EU services. More specifically it looks to simplify the administrative and customs formalities for intra-EU maritime services.

The complexity of procedures imposes an administrative burden on maritime transport making it less attractive than other modes for the movement of Internal Market goods. These include customs and transport rules, veterinary and plant protection regulations and formalities for vessels arriving in or departing from ports.

Within the European Maritime Transport Space Without Barriers concept are a series of measures to improve this situation. Some of these have a direct relevance to the development of e-Maritime. Indeed, the Communication and Action plan specifically address the e-Maritime issue.

'These systems will create a sounder basis for the introduction of an e-Maritime environment for goods and for navigation which will in turn make the sector more competitive and provide alternative solutions to the current administrative controls and documentation checks' (Section 3.2 COM(2009)11 Final)

More specifically the focus is on vessel monitoring and harmonisation of administrative procedures between Member States and ports.

The carriage of an Automatic Identification System (AIS) is mandatory for almost all categories of ships.³¹ Vessel Traffic Services/Vessel Traffic Information and Management Systems (VTS/VTMIS) use information from AIS, radars and radio communication to monitor traffic. In addition, the EU adoption in January 2009 of the IMO SOLAS Convention to make Long Range Identification and Tracking of Ships of 300 GT and upwards (LRIT) has improved vessel tracking.

In terms of administration, it is recognised that only 55% of ports use electronic systems for handling ship and cargo information. Furthermore, only a few Member States have a national single window approach (see Section 1.3.10) and the linkage between vessel and port networks is very limited. Data

³⁰ COM 2009 11 Final: Communication and action plan with a view to establishing a European maritime transport space without barriers

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2009:0010:FIN:EN:PDF>

³¹ Directive 2002/59/EC

http://eur-lex.europa.eu/LexUriServ/site/en/oj/2002/l_208/l_20820020805en00100027.pdf

exchange takes place happens when the national authorities ask for it and the exchange of electronic messages between ports is practically non-existent.

The proposal is to introduce short and medium terms measures to simplify customs and administrative formalities and promote electronic data transmission.

1.3.5 Specific Initiatives

As well as providing the right environment in which e-Maritime systems can operate, the Commission is directly addressing the issues of standardisation and electronic transmission in the areas of maritime surveillance, cargo tracking, data collection and customs procedures.

1.3.6 Maritime Surveillance

One of the elements of the integrated Maritime Policy for the European Union that the Commission is pursuing is enhanced interoperability and integration between existing maritime surveillance and monitoring systems, across the different maritime sectors.

Maritime surveillance is of the paramount importance in ensuring the safe use of the sea and in securing Europe's maritime borders. It is recognised that the improvement and optimisation of maritime surveillance activities, and interoperability at the European level, are important to meet the challenges and threats relating to safety of navigation, marine pollution, law enforcement, and overall security.

Surveillance activities are currently performed by Member States but most of the activities and threats that they address are of a transnational in nature. Furthermore, within most Member States surveillance activities concerning fisheries, the environment, policing of the seas or immigration fall under the auspices of several different enforcement agencies operating independently from each other. The Commission is proposing the need for a higher degree of coordination on maritime surveillance through greater cooperation within and among the Member States.

The gradual move towards an integrated network of vessel tracking and e-navigation systems for European coastal waters and the high seas, including satellite monitoring and long range identification and tracking (LRIT), would also provide an invaluable tool in this process of surveillance.

As part of the Integrated Maritime Policy the Commission will:

- promote improved cooperation between Member States' Coastguards and appropriate agencies;
- take steps towards more interoperable surveillance system to bring together existing monitoring and tracking systems used for maritime safety and security, protection of the marine environment, fisheries control, control of external borders and other law enforcement activities.

The SafeSeaNet system will be the sole medium for all electronic exchanges of maritime data between the Member States. SafeSeaNet V1 is a system to exchange information between MS

maritime authorities to help prevent pollution and accidents at sea. Norway and Iceland also cooperate. It should use telematics, be 24/7 available and respect confidentiality. It handles messages with static info (on ships) and dynamic info (on ship traffic). The way it works is that all data about vessels and traffic are stored in MS databases. SSN V1 is now being introduced in all the 22 maritime MS of the EU plus Norway and Iceland; by October 2007, 17 of the 24 states were on-line, with a total of 224 users registered³².

A European centre for long-distance vessel monitoring will also be established together with a common method of investigation of accidents and the creation of a solid database. This will make it possible to draw on the lessons learnt to prevent future accidents.³³

Specific legislation applies to the transportation of hazardous materials (HAZMAT)³⁴. Article 14 calls for cooperation between Member States to ensure interconnection of the national HAZMAT systems with electronic data exchange that can handle all HAZMAT message information 24 hours a day. In a wider sense, Article 23 asks that Member States should develop appropriate telematic links between coastal stations and Port Authorities and between coastal stations, with a view to exchanging ship traffic data, improving the monitoring of ships in transit and streamlining the reports required from ships en route.

E-Maritime is therefore a key part of vessel tracking and surveillance as Member States and the Commission cooperate to improve the information system with a view to enhanced identification and monitoring of ships.

1.3.7 Data and Information

Availability and easy access to a wide range of data is essential for strategic decision-making on maritime policy. At present, there is a vast array of data collected and stored all over Europe for a wide variety of purposes. The Integrated Maritime Policy calls for the establishment of an appropriate marine data and information infrastructure. Data should be compiled in a comprehensive and compatible system, and made accessible as a tool for better governance, expansion of value-added services and sustainability.

The Commission is taking steps towards a European Marine Observation and Data Network, and promoting the multi-dimensional mapping of Member States' waters, in order to improve access to high quality data.

The European Marine Observation and Data Network (EMODNET) calls for cross border cooperation relating to marine data. At present most data collection is focused on meeting the needs of a single

³² Integrated Maritime Policy For The EU Working Document III On Maritime Surveillance Systems European Commission / Joint Research Centre Ispra, Italy 14 June 2008

http://ec.europa.eu/maritimeaffairs/pdf/maritime_policy_action/maritime-surveillance_en.pdf

³³ On 11 March 2009 the European Parliament finally approved the third package of measures for maritime safety after the agreement reached in conciliation last December and approval by the Council.

³⁴ Directive 2002/59/EC2

http://eur-lex.europa.eu/LexUriServ/site/en/oj/2002/l_208/l_20820020805en00100027.pdf

purpose - as part of a regulatory requirement, for operational purposes or to further scientific understanding. The challenge is to develop a system that will allow a better identification of what is being collected, that will facilitate access to coherent data sets, that will permit the recognition of data gaps and that will shape a data collection and monitoring infrastructure directly suited to multiple applications.

Eurostat has also started a cross-sectoral work programme on socio-economic statistics covering maritime sectors and coastal regions; Member States have an interest to work with Eurostat towards comparable and reliable statistics.

1.3.8 e-Freight and Intelligent Transport Systems (ITS)

The European Commission in line with one of the main measures of the 2007 Freight Transport Logistics Action Plan, wants to establish a roadmap for the development of an integrated electronic application that is capable of following the movement of goods into, out-of and around the European Union.

This concept 'e-Freight' and will operate within and across all freight transport modes. Through e-Freight there will be a paper-free, electronic flow of information associated with the physical flow of goods. The system will allow tracking of freight along its journey across transport modes and automate the exchange of content-related data for regulatory and commercial purposes.

A necessary condition for this is that standard interfaces within the various transport modes are in place and their interoperability across modes is assured.

The implementation of a system for the maritime exchange of information from ship to shore, shore to ship and between all stakeholders, using services such as SafeSeaNet, LRIT (Long-range Identification and Tracking) and AIS (Automatic Identification System), will facilitate safer and more expedient navigation and logistics operations, thereby improving maritime transport's integration with other transport modes.

1.3.9 e-Customs

While all Member States have electronic customs systems, they are not inter-connected. The Commission considers that, if customs legislation were simplified, customs processes and procedures streamlined and IT systems converged, traders would save money and time in their business transactions with customs. In addition to improving safety and security checks, this would contribute to the competitiveness of European business.

The European Commission has adopted two proposals³⁵ to modernise the EU Customs Code and to introduce an electronic, paper-free customs environment in the EU. The first proposal aims to

³⁵ COM/2005/608

<http://finance.gov.mt/image.aspx?site=CUST&ref=Modernised%20Customs%20Code%20Commission%20proposal%20Nov%202005>

simplify and streamline customs processes and procedures. The second proposal is designed to make Member States' electronic customs systems compatible with each other; introduce EU-wide electronic risk analysis and improve information exchange between frontier control authorities; make electronic declarations the rule; and introduce a centralised customs clearance arrangement . The result should be to increase the competitiveness of companies doing business in Europe, reduce compliance costs and improve EU security.

The proposal for a Regulation to modernise the Customs Code would simplify legislation and administration procedures both from the point of view of customs authorities and traders. It would

- simplify the structure and provide for more coherent terminology, with fewer provisions and simpler rules;
- provide for radical reform of customs import and export procedures to reduce their number and make it easier to keep track of goods;
- rationalise the customs guarantee system; and
- extend the use of single authorisations (whereby an authorisation for a procedure issued by one Member State would be valid throughout the Community);

The proposal is for electronic customs systems of Member States' to be compatible with each other and to create a single, shared computer portal. This would facilitate communications between traders and customs and would allow for faster and better exchange of information between European customs authorities. Electronic declarations would become compulsory, with paper-based declarations becoming the exception. The proposal also suggests the setting up of an electronic "Single Window" whereby traders of proven trustworthiness ("authorised importers") would only have to deal with one body instead of several frontier control authorities as happens at present. Customs and other policy-related information relating to any given import consignment would then only have to be sent once. The goods would then be controlled by customs and other authorities (e.g. police, border guards, veterinary and environmental authorities) at the same time and at the same place under a 'One Stop Shop' arrangement.

1.3.10 A National Single Window

The Commission defines a single window 'a system that allows traders to lodge information with a single body to meet all import or export-related regulatory requirements' (Section 5.2.3 COM(2009) 11 Final).

Currently, vessels need to interface with several parties in ports in order to carry out all the administrative procedures. This has a substantial effect on costs, the speed of goods handling and the system's overall reliability. Establishing a single desk, where all paperwork will be dealt with, will

COM/2005/609

http://ec.europa.eu/taxation_customs/resources/documents/common/legislation/proposals/customs/COM609_F_en.pdf

be highly beneficial. Indeed, administrative formalities will be processed electronically or in coordination between entities.

A first step has been accomplished with Decision No 70/2008/CE³⁶ introducing a single window for goods-related formalities. Measures aimed at ensuring that all information necessary for port authorities are lodged once will be developed in cooperation with the various stakeholders.

This measure will be coupled with the electronic data transmission one, whereby information will, as far as possible, be exchanged between vessels and authorities in an electronic format.

Another measure for simplifying administrative procedures will be to clarify the use of IMO/FAL harmonised forms through a proposal to the European Parliament and the Council for a directive replacing Directive 2002/6/EC³⁷ on reporting formalities for ships arriving in and/or departing from ports. The proposal will require the use of electronic data transmission systems for data exchange and paper-based documents will be abandoned at the latest in 2013. It will pave the way for a single window arrangement, whereby all administrative procedures will be processed in a co-ordinated fashion amongst the various entities, using electronic data transmission.

1.3.11 Issues to be taken account in the move towards e-Maritime

1.3.11.1 *Standardisation – Physical and ICT*

The existence of multiple single windows and their lack of integration presents a challenge in achieving a uniform e-system. There is further complicated by the insufficient standardisation of the respective information exchanges.

For surveillance systems and border security, the picture varies widely between almost non-existent cooperation in some countries, via different authorities using the same surveillance system, to relatively advanced integrated systems to which several authorities contribute. However, all countries have plans to start or further develop the integration.

The standardisation process is made more complicated by the fact that controls performed in ports do depend on the nature of the transported goods and on their origin. Dangerous goods, for example, are subject to stricter regulations.

1.3.11.2 *Acceptance of Electronic manifests*

Electronic manifests not universally accepted. There will have to be further use of electronic data transmission (either through EDI or through a web-based solution); new detection systems for checking containers; electronic document registrations and single window systems; a trans-European Port Information Network to exchange information about vessels and goods. The use of

³⁶ DECISION No 70/2008/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 15 January 2008 on a paperless environment for customs and trade

<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:023:0021:0026:EN:PDF>

³⁷ 2002/6/EC <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2002:067:0031:0045:EN:PDF>

electronic data transmission and the single window concept would speed up data transmission, improving efficiency and avoiding duplication of work.³⁸

1.3.11.3 Impact on SMEs

There is always a danger that the small operators are disadvantaged by the change. The air cargo industry has saved \$4.9 billion by paperless systems since their introduction in 2000 but that there were challenges for smaller operators.³⁹

1.3.11.4 Safety issues

Eliminating or reducing the administrative procedures may have negative impacts. It is important that no risk should be taken on health and safety issues. Some stakeholders pointed out that some procedures (such as the ones for Dangerous Goods) should not be reduced too much. Moreover, the reduction of border controls may impose security risks (drugs, smuggling, arms, etc.)⁴⁰.

1.3.11.5 Competitive positioning

Industry actors are focussed on commercial considerations.⁴¹ It is therefore important to make the benefits of e-Maritime very visible to companies. Reassurance about confidentiality of certain information may be required (see below).

1.3.11.6 Confidentiality of information

Legal requirements may also hamper the use of ICT. In addition, data security and privacy issues must be taken into account.

1.3.11.7 Areas which have not been addressed

Although vessel monitoring, cargo tracking, data collection and e-customs have been specifically addressed in various initiatives, the area which has received little attention from an e-maritime perspective is maritime labour. More is needed to improve working conditions such as:

- Supporting e-learning for maritime transport industry professionals focusing on seafarers
- Developing e-maritime transport knowledge sharing facilities and regional centres of maritime excellence.

1.3.12 Conclusions

Work has already begun on the e-Maritime initiative with EU Policy directed towards an environment of common approaches and integration. Furthermore electronic systems are already being developed for vessel monitoring, cargo tracking through e-freight, e customs and data

³⁸ The Commission launched an open consultation on a "European maritime space without Barriers" reinforcing the internal market for intra-European maritime transport.

³⁹ Frederic Leger from IATA, Report on the launch of the EU e-Freight programme, 25 February 2009 <http://www.ciltuk.org.uk/pages/newsarticle?0F7AAD61-835A-4BDC-B75E-3B9035152D40>

⁴⁰ The Commission launched an open consultation on a "European maritime space without Barriers" reinforcing the internal market for intra-European maritime transport.

⁴¹ SKEMA Stakeholder workshop November 2008

collection. So far, however, the education and training has not been addressed through e-learning programmes.

Clearly there are a number of challenges ahead in that:

- Electronic systems differ from region to region
- There is a lack of integration of some surveillance systems
- Maritime transport is as yet not sufficiently integrated into the logistics chain to allow for efficient electronic information flow
- Commercial and confidentiality issues need to be addressed.

1.4 Conflicts in reporting requirements

There are numerous legislative acts adopted by the European Union requiring pre-notification formalities at the entry into ports or prior to departure. The on-going progress in electronic data processing presents an opportunity to harmonise procedures and address the conflicts between some of this legislation⁴².

1.4.1 Method of Identifying conflicts in reporting requirements

The following directives and regulations shall be compared:

- Directive 2002/6/EC⁴³
- Directive 2002/59/EC⁴⁴
- Directive 2000/59/EC⁴⁵
- Directive 2009/16/EC⁴⁶
- Regulation (EC) No 725/2004⁴⁷
- Regulation (EEC) No 2454/93⁴⁸
- Regulation (EC) No 562/2006⁴⁹

Directive 2002/6/EC shall be taken as the base directive for reporting requirements as reflects the broadest spectrum of the information requested by the authorities. Each directive or regulation listed above will subsequently be compared to Directive 2002/6/EC.

1.4.2 Directive 2002/6/EC

Directive 2002/6/EC of the European Parliament and of the Council of 18 February 2002 on reporting formalities for ships arriving in and/or departing from ports of the Member States of the Community. The Directive applies to the reporting formalities, applicable to maritime transport within the Community for ships arriving in and ships departing from ports situated in Member States.

⁴² Proposal for a Directive of the European Parliament and of the Council on reporting formalities for ships arriving in and/or departing from ports of the Member States of the Community and repealing Directive 2002/6/EC

⁴³ 2002/6/EC <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2002:067:0031:0045:EN:PDF>

⁴⁴ 2002/59/EC http://eur-lex.europa.eu/LexUriServ/site/en/oj/2002/l_208/l_20820020805en00100027.pdf

⁴⁵ 2000/59/EC <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:32000L0059:EN:HTML>

⁴⁶ 2009/16/EC <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2009:131:0057:0100:EN:PDF>

⁴⁷ 725/2004 <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2004:129:0006:0091:EN:PDF>

⁴⁸ 2454/93 <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:1993R2454:20010701:EN:PDF>

⁴⁹ 562/2006 <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2006:105:0001:0032:EN:PDF>

The Directive requires Member States to accept certain standardised forms (“FAL forms”) in order to facilitate traffic, as defined by the International Maritime Organisation (IMO) Convention on Facilitation of International Maritime Traffic, adopted on 9 April 1965, as amended by the FAL Convention⁵⁰. The FAL forms are the internationally agreed paper format reporting forms for port clearance. There are seven forms in force at the moment.

The Directive defines the following prior notification obligations:

- a) at least twenty-four hours in advance; or
- b) at the latest, at the time the ship leaves the previous port, if the voyage time is less than twenty-four hours; or
- c) if the port of call is not known or it is changed during the voyage, as soon as this information is available.

The Directive does not apply to:

- a) warships;
- b) naval auxiliary or other ship owned or operated by a State and used, for the time being, only on government non-commercial service;
- c) fishing vessels of less than 24 metres in length;
- d) recreational craft not engaged in trade.

1.4.2.1 General Declaration (FAL-1)

In according to IMO FAL Recommended Practice, the authorities in the General Declaration should not require more than the following information:

1. Name and description of the ship
2. Nationality of ship
3. Particulars regarding registry
4. Particulars regarding tonnage
5. Name of master
6. Name and address of ships agent
7. Date and time of arrival, or date of departure
8. Brief particulars of voyage
9. Port of arrival or departure
10. Brief description of cargo
11. Number of crew
12. Number of passengers
13. Planned position of ship in the port

⁵⁰ Convention on Facilitation of International Maritime Traffic, 1965
http://www.imo.org/Conventions/contents.asp?topic_id=259&doc_id=684

1.4.2.2 Cargo Declaration (FAL-2)

In according to IMO FAL Recommended Practice, the authorities in the Cargo Declaration should not require more than the following information:

Incoming voyages (arrival)	Outgoing voyages (departure)
<ol style="list-style-type: none">1. Ship name and flag2. Name of master3. Previous port of call4. Place of reporting5. Container (if applies) identification; marks and numbers; number and kind of packages; description of the goods and quantity;6. Transport document numbers for cargo to be unloaded at the port of call7. Ports where cargo remaining on board will be discharged	<ol style="list-style-type: none">1. Ship name and flag2. Name of master3. Port of call4. Regarding goods loaded at the port of call: container identification; marks and numbers; number and kind of packages; quantity and description of the goods5. Transport document numbers for cargo loaded at the port of call

1.4.2.3 Ship stores Declaration (FAL – 3)

In according to IMO FAL Recommended Practice, the authorities in the Ship stores Declaration should not require more than the following information:

1. Ship Name
2. Flag
3. Port of arrival / departure
4. Date of arrival / departure
5. Port arrived from / Port of destination
6. Number of persons on board
7. Time to stay
8. Place / station/ terminal in port
9. Stores location onboard
10. Name of article (in store)
11. Quantity
12. Date of document and signature master, agent or officer

1.4.2.4 Crew's Effect Declaration (FAL – 4)

In according to IMO FAL Recommended Practice, the authorities in the Crew's effect Declaration should not require more than the following information:

1. Name of ship
2. Nationality of ship
3. Number in Crew list
4. Family name and given name of

- crew member
- 5. Rank or rating
- 6. Effects which are subject to prohibitions or restrictions (e.g. tobacco, spirits)
- 7. Signature of crew member
- 8. Date and signature of ship's master or authorised officer.

1.4.2.5 Crew list (FAL – 5)

In according to IMO FAL Recommended Practice, the authorities in the Crew list should not require more than the following information:

- 1. Ship Name and flag
- 2. Family name
- 3. Given names
- 4. Nationality
- 5. Rank / rating
- 6. Date and place of birth
- 7. Nature and number of crew member's identity document
- 8. Port and date of arrival

1.4.2.6 Passenger list (FAL-6)

In according to IMO FAL Recommended Practice, the authorities in the Passenger list should not require more than the following information:

- 1. Ship Name and flag;
- 2. Passenger Family name;
- 3. Passenger Given names;
- 4. Passenger Nationality;
- 5. Date and place of birth
- 6. Port of embarkation
- 7. Port of disembarkation

1.4.2.7 Dangerous Goods Manifest (FAL- 7)

In according to IMO FAL Recommended Practice, the authorities should not require more than the following information:

- 1. Ship Name, Voyage Reference, IMO number and ship flag;
- 2. Additional information;
- 3. Port of loading dangerous goods;
- 4. Port of discharge dangerous goods;

5. Destination/ port of call;
6. Agent, Operator/ sender of the goods and EM Telephone only where required;
7. Shipping marks;
8. Container type, identification/number, tank number;
9. Number and kind of packages; description of goods;
10. DG technical name;
11. IMO Hazard class;
12. UN Number;
13. Gross mass (kg) Net mass (kg) and/or m3
14. Total gross (kg) (m3)
15. Location on board
16. Name of authority created the declaration (company (agent) and/ or master);
17. Date and place of preparation of the notification.

1.4.2.8 Reporting analysis

Directive 2002/6/EC is the base directive and the other directives and regulations will be compared to this in the following sections.

1.4.2.9 Existing conflicts

The strictly defined paper formats limit the possibilities of fast implementation of the common electronic reporting systems. The Directive states that Member States should make provision for the use of electronic means of transmitting the data necessary for the reporting formalities in no later than five years after the date of transposition referred to in Article 11(1).

Directive 2002/6/EC of the European Parliament and of the Council of 18 February 2002 on reporting formalities for ships arriving in and/or departing from ports of the Member States of the Community, PART C "Technical specifications" page 1 states:

"The formats of the IMO FAL forms shall follow the proportions of the models shown in Annex II as closely as technically possible. They shall be printed on separate A4 size paper sheets (210 mm × 297 mm) with portrait orientation. At least one third of the verso side of the forms shall be reserved for official use by the authorities of the Member States. For the purposes of the recognition of IMO FAL forms, the formats and layouts of the standardised facilitation forms recommended and reproduced by the IMO based on the IMO FAL

Convention as in force on 1 May 1997 shall be considered equivalent to the formats reproduced in Annex II”.

Page 2 states stated: “The authorities of the Member State shall accept information conveyed by any legible and understandable medium, including forms filled in ink or indelible pencil or produced by automatic data processing techniques.”

Based on this, we are faced with two problems for the implementation of the electronic reporting systems:

- Currently, efforts to create an electronic reporting solution are often based on initiatives of coastal states or even single ports. Proposed provision for the use of electronic means of data transmission will apply to EU Member States only; other maritime communities will still use a “paper” formats as it is prescribed by IMO FAL Convention. This means than the information recipients in EU shall be able to accept both – “electronic report” and the “paper report”.
- Directive states than the “... authorities of a Member State shall accept [a general declaration, ship's stores declaration, crew's effects declaration, crew list, passenger list, passenger list] either dated and signed by the master, the ship's agent or some other person duly authorised by the master, or authenticated in a manner acceptable to the authority concerned”. This means than the authorisation of reports shall be done by signature (on “paper” form) or in other manner, acceptable by member state. In practice – the electronic signature could easy be implemented within member states. However, this is more difficult to implement in between EU member states and would be almost impossible worldwide.

The Directive also states that the electronic means must be interoperable, accessible and compatible with the SafeSeaNet system established in accordance with Directive 2002/59/EC, and with the objectives stated in Decision No 70/2008/EC⁵¹.

However, no technical proposal for wide common solution has been provided. This means that each Member State must decide on a suitable solution. This is a major reason that the implementation of the united EU electronic form is not achieved yet.

1.4.3 Directive 2002/59/EC

Directive 2002/59/EC of the European Parliament and of the Council of 27 June 2002 established a Community vessel traffic monitoring and information system. This directive repealed the Council

⁵¹ DECISION No 70/2008/EC OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL of 15 January 2008 on a paperless environment for customs and trade
<http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=OJ:L:2008:023:0021:0026:EN:PDF>

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Directive 93/75/EEC of 13 September 1993 concerning minimum requirements for vessels bound for or leaving Community ports and carrying dangerous or polluting goods⁵².

Directive 2002/59/EC applies to the reporting formalities, applicable to maritime transport within the Community for ships of 300 gross tonnage and upwards, unless stated otherwise, arriving in and ships departing from ports situated in Member States.

Directive states the following prior notification obligations:

- a) at least twenty-four hours in advance; or
- b) at the latest, at the time the ship leaves the previous port, if the voyage time is less than twenty-four hours; or
- c) if the port of call is not known or it is changed during the voyage, as soon as this information is available.
- d) ships coming from a port outside the Community and bound for a port of a Member State carrying dangerous or polluting goods, or a ship carrying dangerous or polluting goods and leaving a port of a Member State shall, at the latest at the moment of departure
- e) ship, irrespective of its size, carrying dangerous or polluting goods coming from a port located outside the Community and bound for a port of a Member State shall, at the latest upon departure from the loading port or as soon as the port of destination is known, if this information is unavailable at the moment of departure, provide the information.
- f) exemptions for scheduled traffic meeting specified conditions.

The Directive does not apply to warships, naval auxiliaries and other ships owned or operated by a Member State and used for non-commercial public service, fishing vessels, traditional ships and recreational craft with a length of less than 45 m., bunkers below 1000 tons, ships' stores and equipment for use on board ships.

1.4.3.1 Reporting analysis

To compare this Directive with the Directive 2002/6/EC, the following conflicts can be encountered:

Requirement	Directive 2002/6/EC	Directive 2002/59/EC	Reporting conflict
Applies to	Ships arriving in and ships departing from ports situated in Member	Ships of 300 gross tonnage and upwards, unless stated otherwise,	1) Directive 2002/6/EC does not define the precise frames of

⁵² Council Directive 93/75/EEC of 13 September 1993 concerning minimum requirements for vessels bound for or leaving Community ports and carrying dangerous or polluting goods (No longer in force) http://eur-lex.europa.eu/smartapi/cgi/sga_doc?smartapi!celexapi!prod!CELEXnumdoc&lg=EN&numdoc=31993L0075&model=guichett

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	States.	arriving in and ships departing from ports situated in Member States.	subjects of this directive ⁵³ . 2) Due to gross tonnage, vessels which must comply with Directive 2002/6/EC do not necessarily have to comply with Directive 2002/59/EC.
Exemptions	<p>a) warships;</p> <p>b) naval auxiliary or other ship owned or operated by a State and used, for the time being, only on government non-commercial service;</p> <p>c) fishing vessels of less than 24 metres in length;</p> <p>d) recreational craft not engaged in trade.</p>	<p>a) warships;</p> <p>b) naval auxiliaries and other ships owned or operated by a Member State and used for non-commercial public service;</p> <p>c) fishing vessels;</p> <p>d) traditional ships and recreational craft with a length of less than 45 m.;</p> <p>e) bunkers below 1000 tons;</p> <p>f) ships' stores and equipment for use on board ships.</p>	<p>1) Directive 2002/59/EC applies to vessels owned by (EU) Member State. Directive 2006/6/EC applies to "vessels, owned by State" without any reference on regional or any other political identity.</p> <p>2) Difference in stated size of fishing vessels – the Directive 2002/59/EC does not define any settlements⁵⁴.</p>
Reporting obligations	<p>a) at least 24 hours in advance;</p> <p>b) at the latest, at the time the ship leaves the</p>	<p>a) at least 24 hours in advance;</p> <p>b) at the latest, at the time the ship leaves the</p>	Differences in requirements related to reporting of dangerous or polluting goods.

⁵³ Directive 2002/6/EC conflicts with Directive 2002/59/EC as it does not define specific division of the reporters. In Directive 2002/6/EC the general phrase is given, "This Directive shall apply to the reporting formalities on arrival in and/or departure from ports of the Member States of the Community..." Whereas Directive 2002/59/EC states a subject is a vessel over 300 gross tonnes. In practice a vessel with a 299 gross tonnage shall be reported iaw Directive 2002/6/EC and not to be reported iaw Directive 2002/59/EC.

⁵⁴ Directive 2002/59/EC does not provide any settlements for the subject "fishing vessels". If the vessel is reported iaw Directive 2002/6/EC, it cannot be reported iaw Directive 2002/59/EC.

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	<p>previous port, if the voyage time is less than 24 hours;</p> <p>c) if the port of call is not known or it is changed during the voyage, as soon as this information is available.</p>	<p>previous port, if the voyage time is less than 24 hours;</p> <p>c) if the port of call is not known or it is changed during the voyage, as soon as this information is available.</p> <p>d) ships coming from a port outside the Community and bound for a port of a Member State carrying dangerous or polluting goods, or a ship carrying dangerous or polluting goods and leaving a port of a Member State shall, at the latest at the moment of departure</p> <p>e) ship, irrespective of its size, carrying dangerous or polluting goods coming from a port located outside the Community and bound for a port of a Member State shall, at the latest upon departure from the loading port or as soon as the port of destination is known, if this information is unavailable at the moment of departure, provide the information.</p> <p>e) exemptions for scheduled traffic meeting specified conditions.</p>	
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1.4.3.2 Existing conflicts

- All the reporting forms requested by the legislation (directives and regulations compared above) have a common part as well as differences. Differences generate the necessity to apply each of legislation separately which generate a reporting duplication;
- Encountered differences can cause a problems for the implementation of the complete single reporting form which could joined all the legislations as well as electronic data provision and exchange;
- Differences in the list of subjects are making a necessity to apply each of Directive on a separate group of subjects;
- Differences in the amount and importance of requested information shows on the subaltern meaning of information requested by Directive 2002/59/EC;
- Differences in terms of reporting can case a possibility of conflicts.

1.4.4 Directive 2000/59/EC

Directive 2000/59/EC of the European Parliament and of the Council of 27 November 2000 on port reception facilities for ship-generated waste and cargo residues applies on all ships, including fishing vessels and recreational craft.

- g) ships coming from a port outside the moment of departure
- h) ship, irrespective of its size, carrying, provide the information.

Reporting obligations: a ship, other than a fishing vessel or recreational craft authorised to carry no more than 12 passengers, bound for a port located in the Community must information:

- a) at least 24 hours prior to arrival, if the port of call is known;
- b) as soon as the port of call is known, if this information is available less than 24 hours prior to arrival;
- c) at the latest upon departure from the previous port, if the duration of the voyage is less than 24 hours.

The following exemptions are stated:

- a) Any warship;
- b) naval auxiliary;
- c) other ship owned or operated by a State and used, for the time being, only on government non-commercial service.

- d) scheduled traffic meeting specified conditions

The waste report includes the following information:

1. Port of destination
2. Name, call sign, IMO number;
3. Flag State;
4. Estimated time of arrival (ETA);
5. Estimated time of departure (ETD);
6. Previous port of call;
7. Next port of call;
8. Last port and date when ship generated waste was delivered;
9. Details of waste.

The Marine Environment Protection Committee, at its fifty-eighth session (6 to 10 October 2008), approved the standard format for the Waste Delivery Receipt (WDR) in accordance with the Committee Action Plan on Tackling the Inadequacy of Port Reception. In some ports, for logistical reasons, the providers of port reception facilities may require advance notification from the ship of its intention to use the facilities. With a view to enhancing the smooth implementation and uniform application of this requirement, the Marine Environment Protection Committee, at its fifty-eighth session (6 to 10 October 2008), approved the Advance Notification Form (ANF).

1.4.4.1 Reporting analysis

To compare this Directive with the Directive 2002/6/EC, the following conflicts can be encountered:

Requirement	Directive 2002/6/EC	Directive 2000/59/EC	Reporting conflict
Applies to	Ships arriving in and ships departing from ports situated in Member States	All ships, including fishing vessels and recreational craft.	
Exemptions	a) warships; b) naval auxiliary or other ship owned or operated by a State and used, for the time being, only on government non-commercial service; c) fishing vessels of less	a) warship; b) naval auxiliary; c) other ship owned or operated by a State and used, for the time being, only on government non-commercial service. d) scheduled traffic	The status of fishing vessels and recreational crafts is not stated in Directive 2000/59/EC.

	than 24 metres in length; d) recreational craft not engaged in trade.	meeting specified conditions	
Reporting obligations	a) at least 24 hours in advance; b) at the latest, at the time the ship leaves the previous port, if the voyage time is less than 24 hours; c) if the port of call is not known or it is changed during the voyage, as soon as this information is available.	a) at least 24 hours prior to arrival, if the port of call is known; b) as soon as the port of call is known, if this information is available less than 24 hours prior to arrival; c) at the latest upon departure from the previous port, if the duration of the voyage is less than 24 hours.	

1.4.4.2 Existing conflicts

The status of fishing vessels and recreational crafts is not stated in Directive 2000/59/EC.

1.4.5 Directive 2009/16/EC

Directive 2009/16/EC of the European Parliament and of the Council of 23 April on port State control applies on all ships.

Reporting obligations: No prior notification except for certain higher risk category vessels.

- a) at least three days before the expected time of arrival or;
- b) prior to leaving the previous port if the voyage is expected to take fewer than three days.

The following exemptions are stated:

- a) ships less than 500 gross tonnage (notice: Member States shall apply those requirements of a relevant convention).
- b) fishing vessels;
- c) warships and naval auxiliaries;
- d) wooden ships of a primitive build;

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- e) government ships used for non-commercial purposes;
- f) pleasure yachts not engaged in trade

1.4.5.1 Reporting analysis

To compare this Directive with the Directive 2002/6/EC, the following conflicts can be encountered:

Requirement	Directive 2002/6/EC	Directive 2009/16/EC	Reporting conflicts
Applies to	Ships arriving in and ships departing from ports situated in Member States.	Any ship.	
Exemptions	<ul style="list-style-type: none"> a) warships; b) naval auxiliary or other ship owned or operated by a State and used, for the time being, only on government non-commercial service; c) fishing vessels of less than 24 metres in length; d) recreational craft not engaged in trade. 	<ul style="list-style-type: none"> a) ships less than 500 gross tonnage (notice: Member States shall apply those requirements of a relevant convention). b) fishing vessels; c) warships and naval auxiliaries; d) wooden ships of a primitive build; e) government ships used for non-commercial purposes; f) pleasure yachts not engaged in trade 	<ul style="list-style-type: none"> 1) The status of wooden vessels is not stated in Directive 2002/6/EC. 2) The Directive 2009/16/EC applies only on the ships more than 500 GT to compare with any ships mentioned in Directive 2002/6/EC.
Reporting obligations	<ul style="list-style-type: none"> a) at least 24 hours in advance; b) at the latest, at the time the ship leaves the previous port, if the voyage time is less than 24 hours; c) if the port of call is not known or it is changed during the voyage, as 	<ul style="list-style-type: none"> a) at least three days before the expected time of arrival; b) prior to leaving the previous port if the voyage is expected to take fewer than three days. 	<ul style="list-style-type: none"> 1) Differences in report submission. 2) The possibilities of not pre-defined voyages are not explained in the Directive 2009/16/EC.

	soon as this information is available.		
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1.4.5.2 Existing conflicts

- Differences in report submission time can make conflicts of reporting in case of not pre-defined voyages where a next port of call temporary is unknown;
- Conflict in subjects - the Directive 2009/16/EC applies only on the ships of more than 500 GT to compare with any ships mentioned in Directive 2002/6/EC. This conflict requires a separate adjustment of directives.

1.4.6 Regulation (EC) No 725/2004

Regulation (EC) No 725/2004 of the European Parliament and of the Council of 31 March 2004 on enhancing ship and port facility security sets down a legal basis for an international shipping by the special measures to enhance maritime security of the SOLAS Convention⁵⁵ and Part A of the ISPS Code⁵⁶, in accordance with the conditions and with respect to the ships, referred to therein. In respect of domestic shipping, the SOLAS Convention and Part A of the ISPS Code to Class A passenger ships within the meaning of Article 4 of Council Directive 98/18/EC⁵⁷ of 17 March 1998 on safety rules and standards for passenger ships operating domestic services and to their companies, as defined in regulation IX-1 of the SOLAS Convention.

Regulation applies on ships over 500 gross tonnage.

Exemptions:

- a) warships and troopships;
- b) cargo ships of less than 500 gross tonnage;
- c) ships not propelled by mechanical means;
- d) wooden ships of primitive build;
- e) fishing vessels;
- f) vessels not engaged in commercial activities.

The Regulation states the following reporting requirements:

- a) at least 24 hours in advance;

⁵⁵ SOLAS Convention http://www.imo.org/Conventions/contents.asp?topic_id=257&doc_id=647

⁵⁶ ISPS Code http://www.imo.org/Safety/mainframe.asp?topic_id=897

⁵⁷ 98/18/EC <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CONSLEG:1998L0018:19980604:EN:PDF>

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- b) at the latest when the ship leaves the previous port if the voyage is less than 24 hours;
- c) as soon as the port of call becomes known.

Exemptions are stated for a schedule service on a territory of a Member State, when:

- a) the company provides up-to-date list of ships to the competent authorities;
- b) the required information of the security SOLAS Convention is maintained and made available by 24 hours.

Exemptions are also stated for international scheduled service when a Member State requests it.

A new form is going to be introduced in order to harmonise the presentation of the information required for the prior security declaration provided for by Regulation (EC) No 725/2004.

1.4.6.1 Reporting analysis

To compare this Directive with the Directive 2002/6/EC, the following conflicts can be encountered:

Requirement	Directive 2002/6/EC	Regulation (EC) No 725/2004	Reporting conflicts
Applies to	Ships arriving in and ships departing from ports situated in Member States	Ships over 500 gross tonnage	The Regulation (EC) No 725/2004 applies only on the ships more than 500 GT to compare with any ships mentioned in Directive 2002/6/EC
Exemptions	<ul style="list-style-type: none"> a) warships; b) naval auxiliary or other ship owned or operated by a State and used, for the time being, only on government non-commercial service; c) fishing vessels of less than 24 metres in length; d) recreational craft not engaged in trade. 	<ul style="list-style-type: none"> a) warships and troopships; b) cargo ships of less than 500 gross tonnage; c) ships not propelled by mechanical means; d) wooden ships of primitive build; f) fishing vessels; g) vessels not engaged in commercial activities 	
Reporting	a) at least 24 hours in	a) at least 24 hours in	

obligations	advance; b) at the latest, at the time the ship leaves the previous port, if the voyage time is less than 24 hours; c) if the port of call is not known or it is changed during the voyage, as soon as this information is available.	advance; b) at the latest when the ship leaves the previous port if the voyage is less than 24 hours; c) as soon as the port of call becomes known.	
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1.4.6.2 Existing conflicts

Conflict in reporting subjects - the Regulation (EC) No 725/2004 applies only on the ships of more than 500 GT to compare with any ships mentioned in Directive 2002/6/EC. This conflict requires a separate adjustment of legislation and makes problematical implementation of the single window reporting form.

1.4.7 Regulation (EEC) No 2454/93

Regulation (EEC) No 2454/93 of 2 July 1993 laying down provisions for the implementation of Council Regulation (EEC) No 2913/92⁵⁸ establishing the Community Customs Code.

Stated reporting obligations:

1. Entry summary customs declaration:
 - a) for containerised cargo at least 24 hours before loading at the port of departure;
 - b) for bulk/break bulk cargo (with some exemptions), at least 4 hours before arrival at the first port in the customs territory of the Community
 - c) for movement between Greenland, the Faeroe Islands, Ceuta, Melilla, Norway, Iceland or ports on the Baltic Sea, the North Sea, the Black Sea or the Mediterranean, all ports of Morocco, and the customs territory of the Community with the exception of the French overseas departments, the Azores, Madeira and the Canary Islands - at least 2 hours (4 hours if not reported electronically) before arrival at the first port in the customs territory of the Community;

⁵⁸ Regulation (EEC) No 2913/92 <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=CELEX:31992R2913:EN:HTML>

- d) for movement, other than stated in point (c), between a territory outside the customs territory of the Community and the French overseas departments, the Azores, Madeira or the Canary Islands, where the duration of the voyage is less than 24 hours, at least 2 hours (4 hours if not reported electronically) before arrival at the first port in the customs territory of the Community.

2. Exit summary declaration:

- a) Before departing the Community customs territory. (Note: No declaration needed for intra-community shipping.)

1.4.7.1 Reporting analysis

To compare this Directive with the Directive 2002/6/EC, the following conflicts can be encountered:

Requirement	Directive 2002/6/EC	Regulation (EEC) No 2454/93	Reporting conflicts
Applies to	Ships arriving in and ships departing from ports situated in Member States	Container careers (for containerised cargo) Bulkers (for bulk/break bulk cargo with some exemptions)	Regulation (EEC) No 2454/93 applies only on limited types of ships.
Exemptions	a) warships; b) naval auxiliary or other ship owned or operated by a State and used, for the time being, only on government non-commercial service; c) fishing vessels of less than 24 metres in length; d) recreational craft not engaged in trade.	Ships others than container careers and bulkers.	Regulation (EEC) No 2454/93 applies only on limited types of ships.
Reporting obligations	a) at least 24 hours in advance; b) at the latest, at the time the ship leaves the previous port, if the voyage time is less than	a) for containerised cargo at least 24 hours before loading at the port of departure; b) for bulk/break bulk cargo (with some	Regulation (EEC) No 2454/93 applies only on limited types of ships.

	<p>24 hours;</p> <p>c) if the port of call is not known or it is changed during the voyage, as soon as this information is available.</p>	<p>exemptions), at least 4 hours before arrival at the first port in the customs territory of the Community</p> <p>c) for movement between Greenland, the Faeroe Islands, Ceuta, Melilla, Norway, Iceland or ports on the Baltic Sea, the North Sea, the Black Sea or the Mediterranean, all ports of Morocco, and the customs territory of the Community</p>	
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1.4.7.2 Existing conflicts

1. Differences in the list of subjects are making a necessity to apply each of Directive on a separate group of subjects. This conflict requires a separate adjustment of legislation and makes problematical implementation of the single window reporting form.
2. Differences in terms of reporting can case a possibility of conflicts.

1.4.8 Regulation (EC) No 562/2006

Regulation (EC) No 562/2006 of the European Parliament and of the Council of 15 March 2006 establishing a Community Code on the rules governing the movement of persons across borders (Schengen Borders Code)

Appliance is not specified in the scope of the regulation⁵⁹.

As exemptions are stated a special conditions for cruise ships, pleasure boats, coastal fishing vessels and ferry traffic stated in annex 6th of Regulation.

1.4.8.1 Reporting requirements

- a) Crew and passenger lists to be provided latest upon arrival;
- b) The border guards must be notified in due time about the ships departure.

⁵⁹ W. Doc. SHIPPING 2009/81

- c) Cruise ship must notify the border guards of the ships itinerary and the programme at least 24 hrs before leaving the port of departure and before the arrival of the each port in EU.
- d) Cruise ship must transmit the nominal lists at least 24 hour before the arrival or immediately after the boarding is completed if the journey last less than 24 hrs.

1.4.8.2 Existing conflicts

- a) Even of common implications, the encountered differences generate a necessity to apply separately each of Directives;
- b) Encountered differences in reporting obligations can cause a problems for reporting unification;

1.4.9 Initiatives on harmonization

1.4.9.1 Directive 2002/6/EC

Proposal for implementation of the Directive of the European Parliament and of the Council on reporting formalities for ships arriving in and/or departing from ports of the Member States of the Community and repealing Directive 2002/6/EC is under the implementation procedure.

Additionally, there is stated necessity for *“widespread use of electronic means of data transmission for all reporting formalities as soon as possible and in order to facilitate such a development electronic systems need to be interoperable (3). The SafeSeaNet systems established at national and Community levels should facilitate the reception, exchange and distribution of information between Member States’ information systems on maritime activity (4).”*

Accordingly, a new reporting form will be introduced in order to harmonize the presentation of the information required for the prior security declaration provided for by Regulation (EC) No 725/2004.

1.4.9.2 Directive 2009/16/EC

The Directive 2009/16/EC on Port State Control has been recast as part of the 3rd Maritime Safety Package and entails a completely revised PSC methodology. The date of entry into force is stated 1st of January 2011. Related information has been published in the Official Journal on 28 May 2009 and analyses of provisions in the Directive have been adopted by the Paris MoU member States. The recast Directive on Port State Control (PSC) requires MSs to provide information on the actual time of arrival and departure as well as to forward pre-arrival information of ships calling any EU port and anchorage to THETIS through SafeSeaNet. This information will be used to effectively support the THETIS’ ships targeting process as well as to manage the ships inspections.

To achieve such objectives, THETIS will need to be continuously fed with reliable and consistent data from SafeSeaNet.

The implementation of database supporting the recast of Directive is under the activities of EMSA and is based on the following legislation: *“Member States shall take the appropriate measures to ensure that the information on the actual time of arrival and the actual time of departure of any ship calling at their ports and anchorages, together with an identifier of the port concerned, is transferred*

*within a reasonable time to the inspection database through the Community maritime information exchange system "SafeSeaNet" referred to in Article 3(s) of Directive 2002/59/EC. Once they have transferred such information to the inspection database through SafeSeaNet, Member States are exempted from the provision of data in accordance with Annex XIV, paragraphs 1.2 and 2(a) and (b)."*⁶⁰

1.4.10 Conclusions

A comparison of the various reporting forms requested by the various legislation revealed both common elements as well as differences. The presence of commonalities makes it possible to work on the implementation of single reporting form which could avoid duplication of data. Any existing differences such as reporting time, subjects of reporting as well as amount of information requested make implementation of the "single window" concept problematical.

Possible solutions would be provided by:

- The implementation of the complete single reporting form for all the legislations;
- An electronic data provision and exchange.

1.5 Task Summary

Task 1 highlights some challenges for the maritime industry and the way in which e-Maritime could address those challenges. The sector is:

- Heterogeneous and fragmented with
- Little investment in information systems.
- Heavily regulated with inconsistencies between international, regional and national legislation.
- Not attracting young people leading to a global officer shortage.

e-Maritime will address some of the challenges with its objectives of increasing safety and security, competitiveness, integration with the logistics chain and promoting seafaring.

Electronic systems will lessen the administrative burden and cost and lead to faster turnaround times in port. From the perspective of logistics chains, e-Maritime is expected to provide standardisation, interoperability and security of information exchanges that will provide the

⁶⁰ 1st SSN-WGT Meeting (27 January 2009) New PSC related messages into SafeSeaNet – v.1.0, 18th February 2009

foundation for cooperative networking strategies in intermodal operations. E-Learning may increase the efficiency and flexibility of training programmes which helps in the initial training and continuing professional education, In addition on board electronic entertainment systems may make seafaring life more attractive.

In terms of policy work has already begun on the e-Maritime initiative. Existing EU Policy is directed towards an environment of common approaches and integration. Furthermore electronic systems are already being developed for vessel monitoring, cargo tracking through e-freight, e customs and data collection. So far, however, the education and training has not been addressed through e-learning programmes.

Clearly the major challenges here is in the integration of some surveillance systems, integration into the logistics chain to allow for efficient electronic information flow, and confidentiality of information and the development of a single reporting form to avoid duplication of data and facilitate in the single window approach.