



Study on Maritime Security Financing

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Final Report



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EXECUTIVE SUMMARY

In December 2002, the IMO Diplomatic Conference adopted the International Ship and Port Facility Security (ISPS) Code. This Code comprises maritime security regulations in order to address measures against terrorist activities. The European Union fully agreed with its contents; Regulation (EC) Nr. 725/2004 of the European Parliament and the Council transposes in Community Law the associated rules. It extends certain provisions thereof to Member States' sea-going maritime traffic and to Member States' security controllers. At the first of July 2004, the ISPS Code entered into force in the European Union.

In practice, this means that all operating ships and port facilities should have international security certificates issued by (or on behalf of) the Government as a prove of sufficient compliance with the ISPS Code. To obtain the minimum required level of compliance, port facilities and shipping companies have to implement technical as well as organisational measures that will bring additional costs to European maritime industries.

Study objective and research questions

With the present study, the European Commission will be provided with the information and analysis necessary for developing potential legislative actions at the EU level with regard to transparency and harmonisation of the application of maritime security measures, particularly with a view on its financing.

The aim of this study has been to identify costs related with maritime security measures and to provide the European Commission with accurate information on the ways they are financed (how and by whom).

Although there are various interesting questions for policy makers that might arise while considering the overall subject of this study – maritime security - from legal, economic and technological viewpoints, this study addressed in particular the following two research questions:

1. What are the additional costs associated with the implementation of Regulation (EC) Nr. 725/2004 (and port security Directive 2005/65/EC) for the European maritime industries?
2. How are these additional costs being recovered?

The present study addressed further the issue of potential government contributions (subsidies) in the cost recovery.

Applied methodology



The methodology as applied for this study is based on 1) data collection with questionnaires, and 2) data analysis with a modelling approach. The combination of different parties involved (Competent Authorities, Port Facilities and Shipping Companies), potential differences between geographical regions in Europe (Northern, Central and Southern Europe) and various port facility and shipping company types (container, Ro/Ro, dry bulk, etc.) strongly characterize the issue of maritime security financing and has therefore been incorporated in the methodology.

Questionnaires have been the main vehicle to collect all relevant data. The questionnaires have not only been sent to the addressees, also some oral interviews were held by using the questionnaire as a guideline in order to be able to ask for some explanation. As starting date for having made security investment by port facilities and shipping companies, *1 January 2004* has been used in the questionnaires, because:

- maritime industry – as any industry - is usually postponing investments to the latest possible date; so, 1 January 2004 is sufficiently before the deadline of 1 July 2004 when the relevant security regulations came into force; and
- 1 January 2004 is clear in mind of maritime industries' representatives.

From the first beginning it was obvious that the study would rely on sensible information (e.g., on costs of and financing by private companies), respondents could use their right to raise concerns on if and to whom they should give the information. Difficulties faced with in order to get information varied from not responding at all (particularly Competent Authorities) to giving answers that could reasonably not be true according to judgement based on experience (particularly in case of some Shipping Companies). Therefore, attention was given to the way of obtaining proper responses, which was solved by 1) some oral interviews (particularly Port Facilities; see above), 2) using Introduction Letters of the EU and ESPO, 3) sending reminders by email, and 4) phone calls after sending reminders by email.

In the modelling approach to analyse the collected data, a distinction has been made between an approach for the Competent Authorities and an approach for the Port Facilities and the Shipping Companies.

The results from the Competent Authorities gave particularly insight in funding practices (public and/or private) regarding maritime security in the different member states of the EU.

The results from the questionnaires for the Port Facilities and Shipping Companies have been analysed with similar approaches. Both are commercial



players with physical assets and have to deal with similar aspects of the ISPS Code and associated EU regulations. The results from the Port facilities and Shipping Companies should be considered as in-depth supplement to the more general funding information obtained from the Competent Authority-questionnaires. Particular details on costs and expenditures associated with security measures can be obtained then.

For the Port Facilities, key indicators have been derived for investment and running costs. These indicators can be used to extrapolate the results of the questionnaires to EU-level.

The present study can be characterized as an explorative study. Such a study can be distinguished from a more in-depth study in terms of:

- scope (the present study considers Competent Authorities, Port Facilities and Shipping Companies instead of only one party involved),
- number (the present study is based on a limited sample survey instead of questioning all companies and institutions involved), and
- geographical area (the present study considers the whole European Union instead of one or a few Member States).

Consequently, some restrictions have to be accounted for with regard to the level of detail of the study. On the other hand, explorative studies such as the present one fit well within the requirements for policy research that aim at obtaining an overall view on specific effects of specific regulations for a specific sector.

Regarding the response on the questionnaires, it has been observed that 100% of the addressed Port Facilities cooperated by completing and sending back the questionnaire. This relatively high response rate for the Port Facilities may be explained by the fact that many facilities have the idea that they have little or no possibilities to pass on maritime security costs to their customers, which should be addressed at EU-level.

The response rates for the Competent Authorities and Shipping Companies were substantially lower: 79% and 73%, respectively. Particularly the Shipping Companies were hardly willing to cooperate; no time for filling in the questionnaire and again being confronted with paper works associated with maritime security were main arguments for not willing to cooperate.

The overall response rate of the questionnaires was 88%, which is a relatively high response rate for questionnaires in general.



The quality of the response on the questionnaires differed strongly. The quality of the received Competent Authority-questionnaires was sufficient enough to use them all for analysis of the funding of maritime security measures. The resulting list of selected Port Facilities for further analysis comprises 27 terminals and 7 ports, which represents 89% of all completed Port Facility-questionnaires. The quality of the completed Shipping Company-questionnaires was much lower than the quality of the completed Competent Authority- and Port facility-questionnaires.

Observations and Conclusions

The present explorative empirical study on maritime security financing has led to the following findings regarding 1) Competent Authorities, 2) Port Facilities, and 3) Shipping Companies:

Findings regarding Competent Authorities

It has been observed that the port facilities are funding the port security measures themselves. In 6 countries (Germany, Iceland, the Netherlands, UK, Malta and France), the Competent Authorities have a relative small budget for coordination and inspection.

Regarding ship security, it can be concluded that also the shipping companies are funding the security measures themselves. In 6 countries (France, UK, the Netherlands, Cyprus, Portugal and Spain), the Competent Authorities play a role but hardly any budget is mentioned.

The question whether competent authorities pass on their costs to port facilities and shipping companies has not been addressed in present study. Further research on this question is however recommended with a view on passing on costs to maritime industries.

Findings regarding Port Facilities

It has been observed from the results of the questionnaires for the Port Facilities that:

- The average level of compliance at 1 January 2004 was about 70% indicating that a relatively limited effort had to be made by the port facilities to obtain 100% compliance.
- The average investment cost (i.e. per facility) due to security regulations was about € 464,000, and the average running cost is about € 234,000.



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Average investment cost	€ 464,000
Average running cost (i.e. costs per annum)	€ 234,000

- In order to recover security costs, introduction of a separate ISPS tariff is mostly applied. To what extent it contributes to security cost recovery could not be deducted from the obtained data, because there is a strong indication that not all customers of port facilities have to pay for security measures taken by the facilities.

Source for cost recovery	Description	Amount
Increase of tariffs	Percentage of facilities that increased tariff	19 %
	Revenues per facility	€ 10,000 – 750,000
Separate ISPS tariff	Percentage of facilities that introduced a separate ISPS tariff	55 %
	Revenues per facility	€ 22,000 – 1,000,000
Subsidy	Percentage of facilities that received subsidy	23 %
	Revenues per facility	not indicated

- Only the facilities in Lithuania (6 facilities) among the respondents indicated that they receive subsidy. It should however be noted that they gave no insight in the amount of subsidies.
- The cost category Landside – accesses and entrances has the largest share in the investment costs (44%), followed by investments in Electronic systems (34%) and Seaside access (14%). The categories Landside – railways and roads and Inspections and insurances count for 4% and 3%, respectively. Personnel counts for only 1% of the investment costs. Regarding the running costs, it has been observed that Personnel costs (with 57%) have by far the largest share in total running costs. Inspections and insurances count for only 2% of total running costs.
- Ro/Ro and Container facilities show relatively low investment costs (€ 101,000 and € 74,000, respectively), while Multi-Purpose facilities revealed relatively high investment costs (€ 798,000). The latter can possibly be explained by the fact that multiple commercial activities at one facility may consequently lead to less conveniently arranged security, which requires relatively high investments to improve. Notable is also the relatively high investment costs for cruise facilities (€ 430,000). Regarding the average running costs, it has been observed that Ro/Ro and Container facilities show also relatively low running costs (€ 69,000 and € 108,000, respectively). Multi-Purpose facilities reveal also relatively high running costs (€ 409,000).
- Port facilities in Northern and Southern Europe particularly invested in the cost categories Landside – accesses and entrances Electronic systems, while facilities in Central Europe (more in particular: the Netherlands)



invested particularly in Landside – accesses and entrances and Seaside access. The cost category Personnel has in the three geographical regions (by far) the largest share in the running costs.

- The total initial costs to get facilities recognised ('acknowledged') is € 179,000. One facility in the Netherlands, six in Spain and four in Lithuania indicated they actually made this investment. The associated average cost for these facilities were € 20,000 for the Dutch facility, € 4,200 for the Spanish facilities and € 33,325 for the Lithuanian facilities. The overall average (i.e. over all respondents that actually made this investment) is estimated at € 16,272.
- Three facilities in the Netherlands, one in Spain and three in Lithuania indicated they had to make costs for approval ('endorsement'). The resulting average costs for these facilities are € 13,333 for the Dutch facilities, € 640 for the Spanish facility and € 37,000 for the Lithuanian facilities. Due to the limited number of facilities that indicated to be approved by a RSO (6), a systematic difference in approval costs between Designated Authorities and RSO's or combined with the different geographical regions could not be determined.
- The average running cost for Inspections and insurances is € 5,000 per annum. For this cost, significant differences between geographical regions or countries have not been observed.
- For total investments, a cost of € 62,000/ha has been estimated. For total running costs, a cost of € 760/vessel served has been estimated. Despite the substantial spreading among the respondents, using these key indicators is attractive with a view on obtaining some insight in total costs associated with maritime security at EU-level. The values of the key indicators for the complete ports are substantially lower. This may be caused by economies of scale due to cost sharing between different facilities within the same port. With a view on the limited number of analysed complete ports (7), further study on the issue of economies of scale due to cost sharing is recommended.

Findings regarding Shipping Companies

The quality of the completed Shipping Company-questionnaires was much lower than the quality of the completed Competent Authority- and Port facility-questionnaires, possibly due to less willingness to cooperate and therefore less accuracy in filling in the questionnaires. One shipping company (from the Netherlands) did not provide cost information on individual measures and has been left out for analysis of the Shipping Company-results. Other respondents gave total running costs instead of running costs per vessel. Consequently, some assumptions had to be made on the running costs. This, in addition to the limited number of Shipping Company-questionnaires (7) that can be used for further analysis, gives reason to be careful in interpreting the results for the shipping companies.



It can be observed from the results of the questionnaires for the Shipping Companies that:

- The average level of compliance at 1 January 2004 was about 56% indicating that a substantial effort had to be made by the shipping companies to obtain 100% compliance.
- The average investment cost per vessel associated with security regulations was about € 98,109.

Average investment cost per vessel	€ 98,109
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- The security investment cost per vessel varies however between € 3,000 and € 218,000. This large range is caused by the fact that the investment cost differ strongly per vessel type; particularly cruise vessels required substantial security investments.
- An important question is whether the average security investment cost per vessel is high or not. The new building price for a vessel (in 2005 prices) varies between US\$ 25 million (for a 8000 GT reefer) and US\$ 400 million (for a 110,000 GT cruise vessel), so the average security investment cost per vessel is much less than 1% of the new building price of a vessel. On the other hand, the perceived height of the average security investment cost depends also on the (price elasticity of the) shipping market, which determines to what extent security costs can be past on to the customers.
- The average running cost per vessel associated with security regulations is about € 25,000.

Average running cost per vessel	€ 25,000
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- The security running cost per vessel varies however between € 1,000 and € 80,000. This large range is caused by the fact that also the running cost differ strongly per vessel type.
- The shipping companies used none of the three sources (increase of tariffs, separate ISPS tariff or subsidy) to recover security costs. Obviously, the shipping companies finance their maritime security costs out of the revenues from the regular tariffs.
- The cost category Accesses and entrances has by far the largest share in the investment costs (83%), followed by investments in Personnel (28%) and Electronic systems (2%) and Seaside access (14%). The category Inspections and insurances count for only 1%. Regarding the running costs, it has been observed that Personnel costs (with 78%) have by far the largest share in total running costs. Electronic systems count for only 3% of total running costs.



- The average cost to get a shipping company recognised ('acknowledged') and approved ('endorsed') is € 7,000. The average Personnel cost is about € 19,000 per vessel per annum.
- The average running cost for Inspections and insurances is € 3,000 per vessel per annum.

Recommendations

There is a range of possibilities to widen the scope of studies on maritime security financing. The reflections as discussed above have triggered some thoughts about a number of topics that fit into this wider scope and that should receive particular attention with a view on future EU regulations on maritime security. The following three topics can be mentioned:

Best practice

This explorative study has been focused on the additional initial and running costs associated with security measures in the EU and the ways to recover them. From the viewpoint of (the cost of) monitoring, enforcement and maintenance of port security, it could be worthwhile to assess the different EU ways of these activities in order to start a discussion together with the port industry on a harmonized (legal) system of best practice.

Competition

The results of this study indicate that port facilities and shipping companies have found their own ways to cover their additional security cost. However, particularly from the viewpoint of a strong international competitive EU and the permanent discussion of a level playing field, it could be interesting to initiate further long-term analysis on the effects of security measures on the competitive positions of seaports within the different EU port ranges (Baltic, Hamburg-Le Havre, Mediterranean, etc.).

Training

Since running costs comprise about 50% of the initial cost and the major part of these annual returning running cost will be investments in personnel, the EU could start a discussion on a new professional certificate and training course for port security labour. The relevance of such discussion is highlighted by the observation made in the present study that all port facilities and shipping companies that have responded on the questionnaires introduced a security training/awareness program for their personnel.



1 INTRODUCTION

1.1 Maritime Security

Since the terrorist attacks of September 11, 2001 ('9/11') in the US, maritime industries have revealed that measures, regulated in the 1974 Safety of Life at Sea Convention (SOLAS), are not sufficient to ensure a safe way of operating. In addition to 'safety' rules, detailed 'security' rules are required to resist the increasing threat of any terrorist activity.

In December 2002, the IMO Diplomatic Conference adopted the International Ship and Port Facility Security (ISPS) Code. This Code comprises maritime security regulations in order to address measures against terrorist activities. The European Union fully agreed with its contents; Regulation (EC) Nr. 725/2004 of the European Parliament and the Council transposes in Community Law the associated rules. It extends certain provisions thereof to Member States' sea-going maritime traffic and to Member States' security controllers. At the first of July 2004, the ISPS Code entered into force in the European Union.

In practice, this means that all operating ships and port facilities should have international security certificates issued by the Government as a prove of sufficient compliance with the ISPS Code. To obtain the minimum required level of compliance, port facilities and shipping companies have to implement technical as well as organisational measures that will bring additional costs to European maritime industries.

Major questions are therefore: what are the additional costs associated with the implementation of Regulation (EC) Nr. 725/2004 for the European maritime industries? And: how are these additional costs being recovered? An other but inter-related question is: are there any government contributions (subsidies) involved in the cost recovery?

This report presents the background, methodology and approaches as well as the results of an (explorative) study on Regulation (EC) Nr. 725/2004-related costs and their financing in Member States of the European Union.

1.2 Motivation and Aim of the Study

1.2.1 Motivation

During the inter-institutional legislative process, both the European Parliament and the Council have expressed the opinion that the effective and standard



application of measures under this policy raises important questions in relation to its funding. It is emphasised that the funding of implementation and running of the ISPS Code should not act as a factor of influence on distortion of competition. In addition, a second piece of European legislation – directive 2005/65/CE of the European Parliament and of the Council, on enhancing port security is adopted. Its implementation will also be affected by the way security measures are funded.

IMO rules, to which all Member States are signatories but which are applied with different degrees of thoroughness in each country, will certainly lead to additional costs. However, the recently adopted Directive 2005/65/CE will certainly lead to additional action, which will also have an extra cost itself. It is not nevertheless clear to identify and break down these costs in a coherent way.

Moreover, there already exist several forms of security taxes and charges levied either in ports or on passengers and freight operators either nationally, or by individual ports. However, neither a clear picture of either the levels of charges is made on a port-by-port basis, nor on how this money is actually spent as the responsibilities for the security measures differ from country to country and even from port to port.

1.2.2 Aim

With the present study, the European Commission is being provided with the information and analysis necessary for developing potential legislative actions at the EU level with regard to transparency and harmonisation of the application of maritime security measures, particularly with a view on its financing.

The aim of this study is to identify costs related with maritime security measures and to provide the European Commission with accurate information on the ways they are financed (how and by whom).

1.3 Research Questions

Although there are various interesting questions for policy makers that might arise while considering the overall subject of this study – maritime security - from legal, economic and technological viewpoints, this study addresses in particular the following two research questions:

1. What are the additional costs associated with the implementation of Regulation (EC) Nr. 725/2004 (and port security Directive 2005/65/EC)¹ for the European maritime industries?

¹ See Appendix C of this report for an interesting finding regarding port security Directive 2005/65/EC.



2. How are these additional costs being recovered?

The present study addresses further the issue of potential government contributions (subsidies) in the cost recovery.

The answers on these questions will be found by means of an explorative study. Such a study can be distinguished from a more in-depth study in terms of:

- scope (the present study considers Competent Authorities, Port Facilities and Shipping Companies instead of only one party involved),
- number (the present study is based on a limited sample survey instead of questioning all companies and institutions involved), and
- geographical area (the present study considers the whole European Union instead of one or a few Member States).

Consequently, some restrictions will have to be accounted for with regard to the level of detail of the study. On the other hand, explorative studies such as the present one fit well within the requirements for policy research that aim at obtaining an overall view on specific effects of specific regulations for a specific sector.

1.4 Approach and Geographical Area

1.4.1 Approach

The focus of this study is to prepare for an as complete and transparent as possible picture of maritime security costs and financing in the EU. The collection and analysis of empirical data is crucial to make this study successful.

The data collection has been carried out by means of questionnaires. The answers on the questions in the questionnaires are particularly given in a written way and partly in an oral way. To obtain sufficient and correct data, relevant questions had to be defined and representative addressees had to be identified. For both, an extensive desk study has been carried out.

Data analysis has been based on a modelling approach. The modelling approach included selection (based on selecting the questionnaires that are filled in complete and correct) and statistical analysis of the data obtained with the questionnaires.

1.4.2 Geographical Area

The geographical area covered with the questionnaires focuses on the EU27 (EU Member States as of May 1, 2004 + Bulgaria and Romania) plus EEA

countries. Within this geographical area, the additional costs associated with maritime security will be considered according to that Competent Authorities, Port Facilities and Shipping Companies to which Regulation (EC) Nr. 725/2004 applied at July 1, 2004.

1.5 Project Team

The project team that carried out this study included the following experts:

- Dr. H. Stevens (Rotterdam Maritime Group, project leader)
- Dr. S. Dekker (Rotterdam Maritime Group, deputy project leader)
- Mr. R. de Bree BSc (Rotterdam Maritime Group, data analyst)
- Mr. R. Scheepbouwer MA (Rotterdam Maritime Group, financial expert)
- Mr. J. Carbajosa (CETEMAR, maritime expert)
- Mrs. F. Breuil (CETEMAR, maritime expert)
- Mr. P. Lundqvist (Swedish Maritime Administration, maritime expert)
- Mr. C. Green (Swedish Maritime Administration, maritime expert)

1.6 Outline of this Report

The remainder of this report is divided into seven chapters. Chapter 2, *Maritime Security Regulations*, describes the background of the project. In this chapter, the need and development of maritime security regulations will be discussed at a global and, more in particular, at EU level. Recent developments are reviewed, but also a brief perspective on potential future maritime security regulations in the EU is provided.

Chapter 3, *Methodology for Data Collection and Analysis*, discusses the approaches being used for data collection (questionnaires) and data analysis (modelling based on statistical analysis). Also the identification of the addressees for the questionnaires is explained in this chapter.

Chapter 4, *Response on the Questionnaires*, presents the response rates and the quality of the response on the questionnaires. Attention will be paid to the quality of the responses on the questionnaires for Competent Authorities, Port Authorities and Shipping Companies, respectively.

Chapters 5, 6 and 7 present the outcome of the survey on maritime security costs and financing in the European Union. Chapter 5, *Findings regarding Competent Authorities*, pays attention to the results from the questionnaires for Competent Authorities. Chapter 6, *Findings regarding Port Facilities*, and



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Chapter 7, *Findings regarding Shipping Companies*, present the results from the questionnaires for Port Facilities and Shipping Companies, respectively.

The last chapter of this report, *Reflections and Recommendations*, is Chapter 8. It reflects on the main findings of this study and gives some recommendations for EU policy-making in the field of maritime security.



2 MARITIME SECURITY REGULATIONS

2.1 Introduction

Shipping is not only one of world's greatest and most international industries, it's also considered as one of the most dangerous. To keep this industry at a safe level, existence and development of international regulations followed by all shipping nations is needed. The International Convention for the Safety of Life at Sea (SOLAS) has always been the most important of all treaties dealing with maritime safety. The amendments to the SOLAS convention are mandatory to all member states of the International Maritime Organisation (IMO).

At the 1st of July 2004, a new amendment to the SOLAS convention came into force, which contains regulations concerning maritime security. The European Parliament and the Council adopted the amendment and made some additional regulations. EC Nr. 725/2004 enshrines these maritime security regulations and got into force at the 1st of July 2004. This EU legislative affect maritime industries, because they have to comply with the regulations that lead to additional costs.

The remainder of this chapter is divided into four sections. Section 2.2 gives a summary of background and contents of the SOLAS Convention, which served as a stimulus for global development of maritime security regulations. Section 2.3 focuses on present maritime security regulations in the European Union, while Section 2.4 gives a further perspective on developments in the field of EU maritime security. Section 2.5 summarises the findings of this chapter.

2.2 SOLAS Convention

Until the last years, the regulation issues considered by the SOLAS Convention concerned mainly safety; the 'security' focus was restricted to piracy and armed robbery (Kallinen, 2003). The terrorist attacks of 9/11/2001 in the United States made the shipping industry aware of the worldwide threat of terrorism. To ensure the required level of safety, new instruments concerning 'security' were needed.

2.2.1 Development of Maritime Security Provisions

In February 2002, IMO started with the development of maritime security prescriptions. On 12 December 2002, after a five-day Diplomatic Conference, IMO adopted an amendment to the SOLAS convention. In particular a new chapter entitled "Special measures to enhance maritime security" and an International Ship and Port Facility Security (ISPS) Code were adopted. The Contracting Governments and the world fleet of trading ships have accepted the



amendment to the SOLAS Convention on 1 January 2004. The result was that the ISPS code, implemented through Chapter XI-2 of the Convention SOLAS (Special measures to enhance maritime security), entered into force on the 1st of July 2004.

2.2.2 Contents of Chapter XI-2

The amendment of the convention is mandatory for all 148 contracting parties to SOLAS. The provisions are a comprehensive set of measures to enhance the security of ships and port facilities with regard to international shipping. The provisions practically apply to passenger ships, cargo ships of 500 gross tonnage and upwards, port facilities and mobile offshore drilling units. The contents of Chapter XI-2, 'Special measures to enhance maritime security' is discussed below. The most important regulation is stated in Chapter XI-2/2; it describes the ISPS code.

- Regulation XI-2/2 of the new chapter enshrines the most far-reaching regulation, which is the actual International Ship and Port Facilities Security code (ISPS code). This code comprises detailed security-related requirements in a mandatory section (Part A), in addition to a series of guidelines (Part B) about how to meet these requirements. It should be noted that treatment of Part B differs between the IMO States, which means that none, some (in the EU) or all aspects of Part B have been made mandatory in national implementation. Objective of the ISPS Code is to establish an international framework involving co-operation between Contracting Governments, Government agencies, local administrations and the shipping and port industries in effort to assess security threats and take preventive measures against security incidents affecting ships or port facilities used in international trade.
- Regulation XI-2/3 provides for a set of active and passive security measures based on three security levels (normal, increased, high), their implementation being linked to a risk assessment. Both ship and port has to set a security level. Prior to entering a port, or whilst in a port, within the territory of a Contracting Government, a ship has to comply with the requirements for the security level set by that Contracting Government, if that security level is higher than the security level set by the Administration for that ship.
- Regulation XI-2/6 includes the requirement for a ship to have a ship security alert system for spreading the alarm in the event of hostile action against the ship.
- Regulation XI-2/8 confirms the role of the Master in exercising his professional judgement over decisions necessary to maintain the security of the ship. It says he shall not be constrained by the Company, the charterer or any other person in this respect.
- Regulation XI-2/10 includes the requirement to appoint people responsible for carrying out the security measures (ship, company and port facility



security officers), to prepare security plans taking account of the risk assessment (ship and port facility) and to issue an international ship security certificate, as well as arrangements for personnel training and exercises. All according to the ISPS code.

Other regulations in the chapter cover the provision of information to IMO, the control of ships in ports (including measures such as the delay, detention, restriction of operations including movement within the port, or expulsion of a ship from port), and the specific responsibility of Companies.

The maritime security regulations prevent both ships and ports to be used as a weapon of mass destruction in various ways. The related terrorist activity can be split up in the following categories (Kallinen, 2003):

- Attacks of or hijacking on ships,
- Transport of weapons or terrorists by ships,
- Use ships as a weapon,
- To use ship activity as a source of financing terrorism,
- Using ports as a location of attack against the ship,
- Attacks of ports, and
- Using ports to attack people in its vicinity.

2.3 Maritime Security in the European Union

Maritime transport is vital to the economic and commercial performance of the EU. The total value of EU exports in 2003 represented about \$1.109 trillion and imports \$1.123 trillion (source: The World Factbook), both keep growing. The maritime logistics system of the EU accounts for over 2/3 of this trade. It is essential to take security measures to ensure the continuity of the maritime transport world and maintain economic development.

The market share of the fleet controlled by European ship-owners has stayed at around 40% of the world tonnage for the last ten years. This fleet consists of about 41,110 vessels (300 GT or more) at 944.5 million dwt (source: ISL Market Analysis 2006).

The EU has 65,000 km of coastline and more than 1,200 seaports that count about 3700 port facilities. Sea-born shipping plays an essential role in the EU economy; 90% of all oil trade with the EU is sea-borne, while almost 70% of EU imports pass the shores of Brittany and the English Channel.



2.3.1 Contents of Regulation (EC) Nr. 725/2004

The European Commission considered security with regard to terrorism already before 9/11; for instance, cruise passenger security was already addressed in the 'Transport White Paper'. This paper considers that, in future, there is a need to enhance security of the entire maritime transport logistics chain from supplier to consumer.

The EU needs global solutions with regard to security in a global economic context and therefore supports any work at international level that produces results. From this point of view, it is no surprise that the Commission fully agreed with the contents of the SOLAS amendment.

The European Commission cannot allow maritime security to become a factor making for unfair competition between ports, especially within the Community (EC Nr. 725/2004, 2004). To realise a harmonised interpretation and implementation of the security measures, and as well to increase the security level, the commission decided to make some elements of Part B of the ISPS Code also mandatory.

Regulation (EC) Nr. 725/2004 of the European Parliament and of the Council on enhancing ship and port facility security, of 31 March 2004, transposes in Community Law the new rules associated with maritime security adopted by the International Maritime Organisation in December 2002. It extends certain provisions thereof to Member States' maritime sea-going traffic and to Member States' security controllers. According to the SOLAS convention, the ISPS Code entered into force at 1 July 2004. By then, all operating ships and port facilities should have international security certificates issued by the Government as a prove of sufficient compliance.

2.3.2 Financial Aspects

To avoid disproportionate and unreasonably expensive measures and to make security policy effective, a risk analysis is involved. Players have to determine a security plan on base of the risk analysis of their facility or vessel. The resulting plan has to be approved by (National) Competent Authorities for maritime security.

The European Commission expects that the introduced measures to enhance maritime security do not simply represent an additional cost, but also have beneficial effects (European Commission, 2003) in terms of:

- Protection of ports,
- Protection of personnel and passengers,
- Security of strategic supplies,



- Indirect repercussions in terms of the action to combat all forms of trafficking, and
- Taxation and secure routing of freight transport.

In other words, these measures are expected to have a dissuasive effect as a result of the checks carried out and will facilitate actions to stamp out illicit trafficking and fraud. Finally, the new level of transparency of operations will undoubtedly make it possible to organise them in a more effective and efficient way for the benefit of qualified operators.

Interesting questions from the financial point of view are:

1. What are the additional costs associated with the implementation of Regulation (EC) Nr. 725/2004 for the European maritime industries?
2. How are these additional costs being recovered?

2.4 Further Perspective on EU Maritime Security

As indicated above, EU maritime security regulation entered into force at 1 July 2004 and only applies on sea going traffic. In the regulation is stated that after 1 July 2004 two extensions will be made to the domestic shipping part of the EU Member States. Firstly, at 1 July 2005 the amendments to SOLAS and Part A of the ISPS Code have been applied to domestic orientated passenger ships which belong to class A of article 4 of regulation 98/18/EG. Secondly, after an obligatory risk analysis regarding security there will be decided if additional security regulation regarding terrorism will be applied on all other domestic shipping activities, which is planned to enter into force at 1 July 2007.

Regulation (EC) Nr. 725/2004 stops at that part of the port, which represents the ship/port interface, i.e. the terminal. A *directive* on enhancing port security is lately adopted; the directive sees identified port security as a necessary second step that should secure both the port and the interface between the port and the hinterland. The need for protection extends to people working in or passing through ports, infrastructure and equipment, including means of transport.

A directive is the most appropriate legal instrument to introduce the required flexibility (e.g., large/small, privately/publicly owned and cargo ports, warehousing and transport facilities, environmental and conurbation areas), while establishing the common approach to implementing maritime security requirements and measures throughout the Community.

There is a dual purpose to the directive (European Commission, 2004). First, there is a need to enhance security in those areas of ports not covered by



Regulation (EC) Nr. 725/2004. Second, the directive should ensure that security measures implemented in application of Regulation (EC) Nr. 725/2004 benefit from enhanced security in adjacent port areas. The proposed directive has not the intention to - and does not - create new obligations in areas already covered by Regulation (EC) Nr. 725/2004.

The European Commission considers that the directive on 'enhancing port security' should achieve the following (European Commission, 2004):

- Guaranteeing and monitoring at Community level the achievement of a sufficient level of port security, by complementing and supporting the security measures applying to the ship/port interface,
- Ensuring harmonised implementation and equal conditions throughout the European Union so as not to create differences for the commercial port users, and
- Ensuring that necessary security measures covering the entire port can be implemented as far as possible by relying on already existing tools introduced by Regulation (EC) Nr. 725/2004, thereby achieving maximum security results through minimum additional burden for the ports.

The directive complements the security measures introduced by the regulation on enhancing ship and port facility security (EC Nr. 725/2004) by ensuring that, as a result, the entire port is covered by a security regime. The adopted directive covers any port, housing one or more of the port facilities, which is covered by Regulation (EC) Nr. 725/2004.

2.5 Summary

Regulation (EC) Nr. 725/2004 of the European Parliament and of the Council on enhancing ship and port facility security, which came into force at the 1st of July 2004, transposes in Community Law the new rules associated with maritime security adopted by the International Maritime Organisation (IMO) in December 2002. It extends certain provisions thereof to Member States' maritime sea-going traffic and to Member States' security controllers. According to the SOLAS convention, the ISPS Code came into force at 1 July 2004. By then, all operating ships and port facilities should have international security certificates issued by the Government as a prove of sufficient compliance.

To avoid disproportionate and unreasonably expensive measures and to make security policy effective, a risk analysis is involved. Players have to determine a security plan on base of the risk analysis of their facility or vessels. The resulting plan has to be approved by (National) Competent Authorities for maritime security.



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Interesting questions from the financial point of view are:

1. What are the additional costs associated with the implementation of Regulation (EC) Nr. 725/2004 (and port security Directive 2005/65/EC) for the European maritime industries?
2. How are these additional costs being recovered?

In order to be able to answer these two questions, the next chapter discusses the methodology for data collection and analysis.



3 METHODOLOGY FOR DATA COLLECTION AND ANALYSIS

3.1 Introduction

In this chapter, the proposed methodology for data collection and analysis is discussed. The combination of different parties involved (Competent Authorities, Port Facilities and Shipping Companies), potential differences between geographical regions in Europe (Northern, Central and Southern Europe) and various port facility and shipping company types (container, Ro/Ro, dry bulk, etc.) strongly characterize the issue of maritime security financing and should therefore be incorporated in the methodology.

As discussed in previous chapters, this study can be characterised as an explorative study. Consequently, some restrictions will have to be accounted for with regard to the level of detail of the study. On the other hand, explorative studies such as the present one fit well within the requirements for policy research that aim at obtaining an overall view on specific effects of specific regulations for a specific sector.

The remainder of this chapter is divided into four sections. Section 3.2 identifies the scope of the proposed methodology by describing the sampling approach and related aspects. In Section 3.3, the followed approach for data collection is discussed, particularly the structure and contents of the questionnaires. The modelling approach for the data analysis is explained in Section 3.4. Section 3.5 summarises the findings.

3.2 Scope of the Methodology

3.2.1 General

The data collection has been realised by means of questionnaires. These questionnaires itself reflect all relevant components (questions on costs and financing) for a complete and transparent study. The three relevant regulations (SOLAS, EC Nr. 725/2004 and the directive on port security) are scrutinised to get clear all relevant security measures, which could lead to additional costs; consequently, the measures are translated into questions for the questionnaires.

Because it is not realistic to interview all relevant parties, a selection of addressees has been made. In the selection, the geographical spreading,



activities and size ranges were important criteria to ensure the study to be representative for the whole scope of the project.

The geographical area to be covered has as focus the EU27 (EU Member States as of May 1, 2004 + Bulgaria and Romania) plus EEA countries. A research of all ports within the stated area would be a comprehensive study. A representative cross-section of 30 'top seaport' has been made.

3.2.2 Sample: Top 30 Seaports List

In order to create a responsible sample and workable list of seaports, the following approach was used:

1. A 'top seaport' was considered to be a port that has the largest number of calls (irrespective of international or domestic traffic) of vessels (falling under the Regulation), as opposes to the greatest cargo throughput. It is acknowledged that this figure is better a measure for the complexity for security issues than the number of tonnes of cargo. In practice, however, for the majority of countries this will not make a considerable difference.
2. The focus in the study is on the EU27 (EU Member States as of May 1, 2004 + Bulgaria and Romania) plus EEA countries. 20 of the EU countries, 2 of the EEA countries, Bulgaria and Romania have a coastline and ports with sea going maritime traffic. Other countries lack sea related ports but do have ships on their register and are flag states. For countries with a coastline, at least one port (that means 24 countries and 24 ports) was included in the seaports list. The EUROSTAT statistics have been used to determine the port per country.
3. In addition to the 24 ports, 6 'top seaports' were included, making-up the total of 30 ports as mentioned in the contract. These additional top seaports were chosen based on the number of vessel calls. The EUROSTAT statistics have also been used to select these top seaports.
4. Geographical spreading (leading to differences in, e.g., culture, market, labour costs, relevance of security measures) may affect implementation, costs and financing of the measures related with EC Nr. 725/2004. In order to be able to analyse the potential effect of geographical spreading, the 30 ports and the countries in which the ports are located, are divided into three regions:
 - Northern Europe: the ports in this region are mainly situated around the Baltic Sea,
 - Central Europe: the ports in this region are mainly situated around the North Sea, and
 - Southern Europe: the ports in this region are mainly situated around the Mediterranean Sea/Adriatic Sea/Black Sea.

Based on the above approach, the following list has been prepared (see Table 3.1).

Table 3.1 Top 30 seaports list

Country	Category	Geographic region	# of Ports in country	First port	Second port
Belgium	EU	Central Europe	2	Antwerp	Zeebrugge
Bulgaria	Cand EU	Southern Europe	1	Varna	
Cyprus	EU	Southern Europe	1	Limassol	
Denmark	EU	Northern Europe	1	Arhus	
Estonia	EU	Northern Europe	1	Tallinn	
Finland	EU	Northern Europe	1	Helsinki	
France	EU	Central Europe	2	Le Havre	Marseille
Germany	EU	Central Europe	1	Hamburg	
Greece	EU	Southern Europe	1	Piraeus	
Iceland	other EEA	Northern Europe	1	Reykjavik	
Ireland	EU	Central Europe	1	Dublin	
Italy	EU	Southern Europe	2	Genova	Trieste
Latvia	EU	Northern Europe	1	Riga	
Lithuania	EU	Northern Europe	1	Klaipeda	
Malta	EU	Southern Europe	1	Marsaxlokk	
Netherlands	EU	Central Europe	2	Rotterdam	Amsterdam
Norway	other EEA	Northern Europe	1	Oslo	
Poland	EU	Northern Europe	1	Gdansk	
Portugal	EU	Southern Europe	1	Lisboa	
Romania	Cand EU	Southern Europe	1	Constanta	
Slovenia	EU	Southern Europe	1	Koper	
Spain	EU	Southern Europe	2	Barcelona	Bilbao
Sweden	EU	Northern Europe	1	Goteborg	
United Kingdom	EU	Central Europe	2	Southampton	Felixstowe
24 Countries			30	Ports	

Considering maritime security, three different parties, dealing with the new security regulations, can be identified:

1. Competent Authorities,
2. Port Facilities, and



3. Shipping Companies.

Differences in identity, activity and responsibility between the three parties are considerable. They all need a separate approach and three specific questionnaires have been made.

3.2.3 Competent Authorities

National Authorities responsible for port facility/ship-security (National Focal Points), and Port Authorities are defined as '*Competent Authorities*'. These authorities have full knowledge whether a port facility or a shipping company complies with the security requirements. They can give also a good overview of activity of both the port facilities and shipping companies. Competent Authorities have a purely steering and monitoring function. Due to differences in responsibilities for either port facilities or shipping company, a distinction has been made to ship security authorities and port facility authorities.

The following data sources/databases were used to obtain the list of all Competent Authorities:

- For Member state representatives (i.e. the national focal points)
 - i. European Community Committee on Maritime security matters set up under article 10 of Regulation (EC) 725/2004
 - ii. IMO's Maritime Safety Committee
 - iii. IMO's Global Integrated Shipping Information System (GISIS)
The *ISPS* Database part of GISIS contains a list contact persons at IMO Member State level.
- For Port Authority representatives
 - i. IAPH - International Association of Ports and Harbours
 - ii. ESPO - European Sea Ports Organisation
 - iii. FEPORT – Federation of European Private Port Operators
 - iv. EHMA - European Harbour Masters Association
 - v. PROTECT - The co-operation of European port authorities around the North Sea (Le Havre, Southampton/London, Felixstowe, Antwerp, Rotterdam, Bremen and Hamburg)

Out of the list of all Competent Authorities, a cross section was chosen based on availability, the matching with the 'top seaports' list (see above) and at least one representative for each country.

3.2.4 Port Facilities

Port facilities are essential data sources in this study because they provide a good insight in which security measures are implemented and what the associated costs and revenues are. Two types of port facilities can be



distinguished: state-owned and private facilities. Many information regarding state-owned facilities were obtained from the Port Authorities. Questioning all private facilities of the listed ports would be too comprehensive. A representative sample had to be realised instead by selecting 30 facilities of the following different types:

- Dry bulk,
- Container,
- Passenger,
- Ro/Ro, and
- Liquid bulk.

The decision was made to choose facilities located in or in the vicinity of the home countries of the consortium members. This made it possible to visit (some of) the selected facilities by person. The two main reasons to visit the facilities by person were that it would 1) contribute significantly to the reliability of the data, and 2) make it possible to collect additional information on implementing maritime security measures that would otherwise not be obtained. The fact that the home countries of the three consortium members are located in different geographic regions (Northern, Central and Southern Europe; see above) supported an effective collection of the data.

Each of the consortium members have selected representative port facilities - subjected to Regulation EC Nr. 725/2004 - in consultation with the local authority, matching the following conditions:

- Choose facilities where the types of vessels as agreed will moor and where loading and/or discharging takes place (or embarkation or disembarkation),
- Choose facilities from the IMO list of certified port facilities (ISPS code Database) that is part of IMO's Global Integrated Shipping Information System (GISIS),
- Choose facilities which belong to the ports listed in the 'top seaports' earlier made, and
- Choose facilities with such a spreading that the sample is representative for the geographic region.

3.2.5 Shipping Companies

The following vessel types are included in the study (as meant in article 3 of (EC) Nr. 725/2004 and ISPS Code regulation 2) – engaged in international voyages:

1. cargo ships, including high speed craft, of 500 tonnes and upwards:
This type of vessel includes:



- a. tanker vessels,
 - b. container vessels, and
 - c. general cargo vessels
2. passenger ships, including high speed craft (and also including for *domestic* shipping Class A passenger ships) This type of vessel includes:
 - a. ferries, and
 - b. cruise ships

For each vessel type, 2 representative shipping companies are selected. The shipping companies are less suitable to categorise them to a certain region; they operate in a market of the scale of EU or beyond and, furthermore, they don't have a fixed working location.

To be representative, shipping companies have to be involved in international voyages and will consequently call on different European ports. Communication to the shipping companies is somewhat more difficult because of this moving behaviour. To minimise problems with communication, those shipping companies are selected whose origin is in the country of one of the consortium members. This selection is done in co-operation with the local authority.

3.3 Data Collection: Questionnaires

3.3.1 General

The questionnaires are the main vehicle to collect all relevant data directly. The questionnaires have not only been sent to the addressees, also oral interviews were held by using the questionnaire as a guideline (see above).

From the first beginning it was obvious that the study would rely on sensible information (e.g., on costs of and financing by private companies), respondents could use their right to raise concerns on if and to whom they should give the information. Difficulties faced with in order to get information varied from not responding at all (particularly Competent Authorities) to giving answers that could reasonably not be true according to judgement based on experience (particularly in case of some Shipping Companies). Therefore, attention was given to the way of obtaining proper responses, which was solved by 1) some oral interviews (particularly Port Facilities; see above), 2) using Introduction Letters of the EU and ESPO, 3) sending reminders by email, and 4) phone calls after sending reminders by email.

Below, the methodology followed to develop well-founded questionnaires is discussed.



3.3.2 Pre-Work by Desk Study

The questionnaires were developed to obtain the basic financial data on security implementation; the questions should provide insight in costs and revenues as well as on an overall as on a detailed base. First of all, the security requirements that may lead to additional costs, had to be inventoried.

The security requirements considered in this study are primarily the security measures issued in Regulation EC Nr. 725/2004. However, this Regulation is a take-over and an extension on the security regulations described in Chapter XI-2 of the SOLAS convention, which is mandatory for an important amount of states in the world. Furthermore, directive 2005/65/CE is adopted. This directive expands the provisions of EC Nr. 725/2004 to the whole port area. To get insight in these three regulations, they were all scrutinised for the purpose of this study.

Regulation EC Nr. 725/2004 and SOLAS regulation XI-2 both comprise regulations and a code (ISPS Code). The ISPS code contains two parts, for the SOLAS convention is Part A mandatory and Part B meant as a guideline for applying Part A. In EU regulation, legislation parts of part B are also mandatory. Regarding application of the code it can be observed that no differences in measures to be implemented exist between both legislations; only in the field of obligatory inspections and procedures are some differences.

Directive 2005/65/CE on enhancing port security makes use of the same measures like the ones in EC Nr. 725/2004. The difference will lie in the scope on which the legislation is applicable.

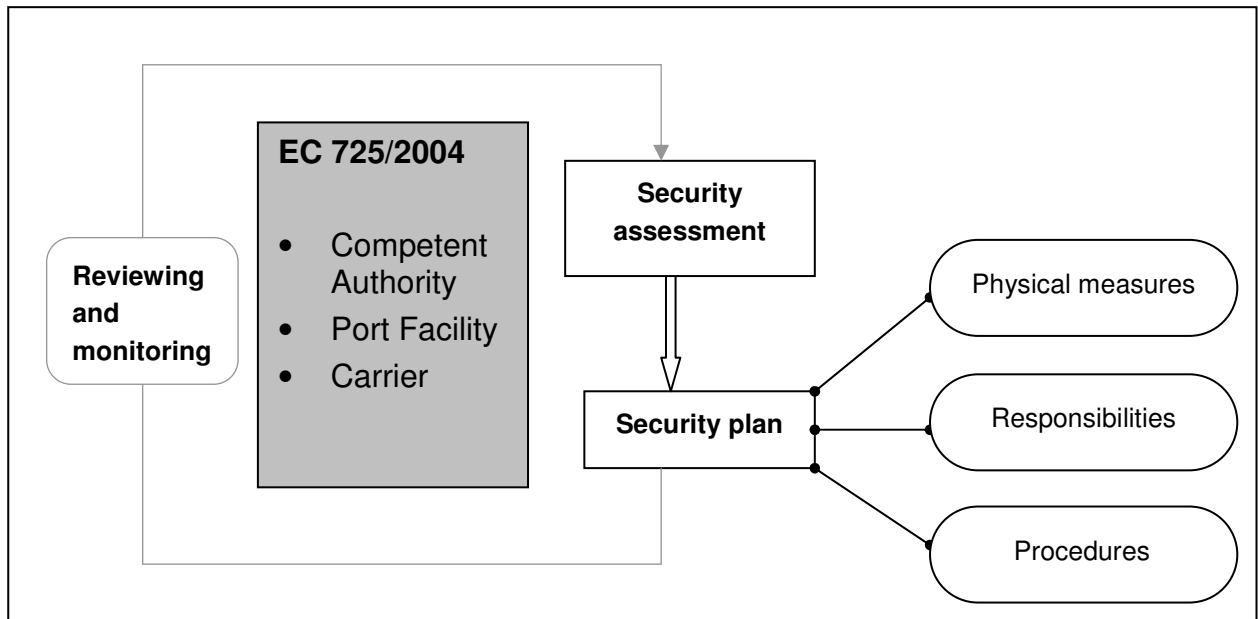
Table 3.2 Overview of regulations regarding maritime security

	SOLAS Regulation XI-2	→ Take over and extension	(EC) Nr. 725/2004	→ Expansion	Directive 2005/65/CE
Entering into force	1st of July 2004	=	1st of July 2004	≠	15 June 2007
Scope	All Areas directly related to sea going international maritime transport	=	All Areas directly related to sea going international maritime transport	≠	Port area's adjacent to area's on which (EC) Nr. 725/2004 is applicable
Contents	SOLAS Regulation XI-2	≠	SOLAS Regulation XI-2	=	In Co-operation with Regulation (EC) Nr. 725/2004
	ISPS Code A: mandatory		ISPS Code A: mandatory		
	ISPS Code B: guideline		ISPS Code B: mandatory		

Table 3.2 summarises the contents and differences of the three regulations. The conclusion can be made that the framework of measures to be implemented in the framework of the SOLAS Convention, European Regulation EC Nr. 725/2004 and the directive on enhancing port security will be the same format for the three (framework summarised in figure 3.1):

1. A security assessment decides what measures are required, where and when;
2. A security plan outlines all measures and details for enhancing security;
3. The security plan will be monitored continuously
4. The security assessment will be reviewed periodically

Figure 3.1: Characteristics of the regulations



Out of the previous figure, the responsibilities can be distributed to the three levels of parties earlier mentioned:

Table 3.3 Overview responsibilities of stake holders

	Security assessment	Security plan			Reviewing and monitoring
		Physical measures	Responsibilities	Procedures	
Competent Authorities	Advise and approve	Approve and testing	Approve and test	Approve and test	Periodically approve
Port Facilities	Apply	Implement and maintain	Distribute to personnel	Implement and carry out	Monitoring
Shipping Companies	Apply	Implement and maintain	Distribute to personnel	Implement and carry out	Monitoring

3.3.3 Structure of the Questionnaires

The structure of the questionnaire consists of three main elements:

- General questions,
- Questions to identify costs, and
- Questions to identify revenues.



General questions

Within this category, questions are developed with the aim to get insight in the different ranges exist according to geographical area, responsibility, economic impact, location, activities and related work areas.

Questions to identify costs

The questionnaire is further enhanced with specific questions to identify the related additional *costs* generated by implementing maritime security regulations. It is noted that the questions are intended to present the order of magnitude of the security related costs. Checking the details against the financial bookkeeping details or balance sheets falls beyond the scope of the study.

1. Implementation costs for:
 - a. Planning, organisation of security awareness in the port,
 - b. Preparation, implementation of port security plan
 - c. Assessment of port facilities
 - d. Modification of vessel reporting procedures and the port's IT systems (for VTS/VTMIS and port management)
2. Assessment and certification costs for port facilities
 - a. Modification cost for port facilities:
 - i. Physical constructions (fences, lighting equipment)
 - ii. Camera's or CCTV (closed circuit television) and surveillance/ systems
 - iii. Security personnel and training, drills and exercises
 - iv. Costs for Passes/IDs
 - v. Communications equipment
 - b. Consultations and Procedures between Port Facility Security Officer (PFSO) and Port Security Officer (PSO).
 - c. Assessment, modification and certification costs for shipping companies to obtain the International Ship Security Certificates (ISCC)
 - d. Initial and operating costs for staffing, manning of security personnel on board a ship
3. The questionnaire further contains the required questions to obtain insight on details on security responsibilities, services and costs done by external subcontracting
4. As not all countries will have implemented the ISPS Code at the same level of detail and at the same pace, questions are add to get some insight in this respect (year of investment, percentage of compliance).

Questions to identify revenues

1. The income flow of the questioned parties.
2. The breakdown of incomes that identifies income dedicated to security.
3. Request for the way of presenting increased tariffs due to ISPS to their client

3.3.4 Identification of Correct Questions

The questionnaires contain information with respect to general information, cost specifications and revenues. Due to the three different positions of the actors involved (Competent Authorities, Port Facilities and Shipping Companies) in the present study topic and accordingly different responsibilities and activities, three versions of the questionnaires were developed. The responsibilities shown in Figure 3.1 are translated into questions. Two sources were used to identify the specific responsibilities. A short description of these sources will be given. The questionnaires itself are attached in Appendix A.

The following main sources of information were used:

- IMO's 'Interim Guidance on voluntary self-assessment by SOLAS Contracting Governments and by port facilities (MSC/Circ.1131)'.
• The guidance is designed to assist members in getting insight in the level of implementation of the requirements of ISPS Code and SOLAS XI-2 Amendments at port facilities. It is a method for designated port officials (Port Security Officers) to assess whether the facility complies with the requirements.
- Port Facility Security Toolkit, a software package developed on initiative of the Port of Rotterdam. This package is designed to assess the security situation and produce a report of the security action plan.

It is noted that the Port Facility Security Toolkit getting international recognition as it is already in use to determine port facility security measures and security plans in an increasing number of ports. The following ports, countries and terminals are among others already using the Toolkit:

- 18 Dutch ports, Port of Rotterdam and Port of Amsterdam,
- Belgium port, Port of Antwerp,
- Port of Le Havre (GEMO-members),
- Klaipeda State Seaport, Lithuania,
- Tanzania Harbours Authority,
- Terminals in Turkey, Gabon, Suriname, Guyana etc.



3.3.5 Approach to receive Completed Questionnaires

The data required to obtain a clear picture of maritime security financing in the EU, is to be obtained from Competent Authorities and the implementers themselves (Port Facilities and Shipping Companies). The implementers of maritime security measures are mostly players in competitive markets; with a view on confidentiality, companies are expected to give little or no insight in their financial details.

To make the companies willing to complete the questionnaires, the data has to be treated confidential. Therefore, none of the Port Facilities and Shipping Companies will be mentioned by name or specified by location. Another stimulus to complete (and send back) the questionnaires is the promise to send a copy of the PhD-thesis 'Port Investment – Towards an Integrated Planning of Port Capacity', which deals with planning issues of port investment in general.

3.4 Data Analysis: Modelling Approach

3.4.1 General

In this section, the modelling approach to analyse the collected data is elaborated. A distinction is made between an approach for the Competent Authorities and an approach for the Port Facilities and the Shipping Companies.

The results from the Competent Authorities should give particularly insight in funding practices (public and/or private) regarding maritime security in the different member states of the EU.

The results from the questionnaires for the Port Facilities and Shipping Companies can be analysed with similar approaches. Both are commercial players with physical assets and have to deal with similar aspects of the ISPS Code and associated EU regulations. The results from the Port facilities and Shipping Companies should be considered as in-depth supplement to the more general funding information obtained from the Competent Authority-questionnaires. Details on costs and expenditures associated with security measures are obtained with the questionnaires for the Port Facilities and Shipping Companies. This is also relevant with a view on the derivation of key indicators, which can be used to extrapolate the results of the questionnaires to EU-level.

3.4.2 Approach for Competent Authorities

The results from the Competent Authorities should give particularly insight in funding practices (public and/or private) regarding maritime security in the different member states of the EU. This can be performed by a country-by-country comparison of:



- Responsibilities, and
- Budgets.

This can further be done for the different categories of measures taken for the competency regarding Port Facilities as well as Shipping Companies.

3.4.3 Approach for Port Facilities and Shipping Companies

In addition to identification of the way of funding maritime security measures, the aim of the present study is identification of the costs. More in particular: identification of the *additional* costs for Port Facilities and Shipping Companies due to implementation of Regulation (EC) Nr. 725/2004 (and port security Directive 2005/65/EC).

First, the completed and received questionnaires have to be analysed and selected on basis of their usefulness. An important criterion is if all questions are answered. Particularly the questions on the detailed costs are important, because these questions should give insight in which category of measures required the largest investment efforts and had thus the largest impact on funding requirements. Furthermore, outliers² in the data set (e.g., extremely large port facilities in terms of dry area, which may have disproportional costs compared to the other facilities due to, for instance, cost sharing) may have to be removed from the main data set.

Second, the selected (i.e. useful) questionnaires can be used for further analysis of maritime security costs. Following the questions in the questionnaires, this comprises the following three subsequent steps:

1. Analysis of general characteristics such as service and physical characteristics,
2. Analysis of levels of compliance, total costs and funding of maritime security measures, and
3. Analysis of the detailed costs.

In step 3), the detailed costs are analysed by distinguishing costs per:

- Category of measures (for Port Facilities and Shipping Companies),
- Commercial activity (only for Port Facilities)³,
- Geographical region (only for Port Facilities)⁴, and

² Outliers in a dataset are unexpected high or low outcomes.

³ For the Carriers, this is less appropriate with a view on the limited number of respondents (see Chapter 4).

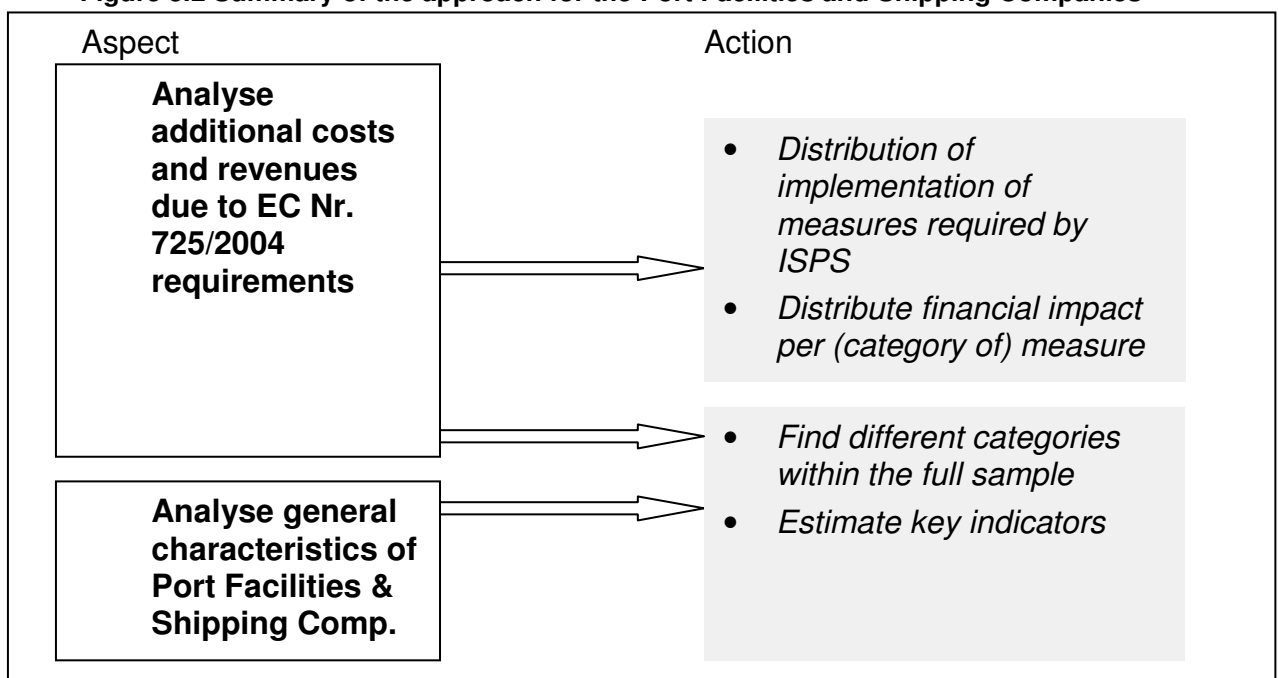
⁴ For the Carriers, this is less appropriate because they visit ports all over Europe making differences among different

- Individual measure (for Port Facilities and Shipping Companies).

For the Port Facilities, this is followed by determination of key indicators in order to be able to estimate maritime security costs (investment and running) at EU-level. For the Shipping Companies, this is less appropriate with a view on the limited number of respondents (see Chapter 4).

The approach for the Port Facilities and Shipping Companies is summarised in Figure 3.2.

Figure 3.2 Summary of the approach for the Port Facilities and Shipping Companies



3.5 Summary

In this chapter, the proposed methodology for data collection and analysis has been discussed. The combination of different parties involved (Competent Authorities, Port Facilities and Shipping Companies), potential differences between geographical regions in Europe (Northern, Central and Southern Europe) and various port facility and shipping company types (container, Ro/Ro, dry bulk, etc.) strongly characterize the issue of maritime security financing and should therefore be incorporated in the methodology.

geographical regions less obvious.



The questionnaires are the main vehicle to collect all relevant data directly. The questionnaires have not only been sent to the addressees, also oral interviews were held by using the questionnaire as a guideline (see above).

From the first beginning it was obvious that the study would rely on sensible information (e.g., on costs of and financing by private companies), respondents could use their right to raise concerns on if and to whom they should give the information. Difficulties faced with in order to get information varied from not responding at all (particularly Competent Authorities) to giving answers that could reasonably not be true according to judgement based on experience (particularly in case of some Shipping Companies). Therefore, attention was given to the way of obtaining proper responses, which was solved by 1) some oral interviews (particularly Port Facilities; see above), 2) using Introduction Letters of the EU and ESPO, 3) sending reminders by email, and 4) phone calls after sending reminders by email.

In the modelling approach to analyse the collected data, a distinction has been made between an approach for the Competent Authorities and an approach for the Port Facilities and the Shipping Companies.

The results from the Competent Authorities should give particularly insight in funding practices (public and/or private) regarding maritime security in the different member states of the EU.

The results from the questionnaires for the Port Facilities and Shipping Companies can be analysed with similar approaches. Both are commercial players with physical assets and have to deal with similar aspects of the ISPS Code and associated EU regulations. The results from the Port facilities and Shipping Companies should be considered as in-depth supplement to the more general funding information obtained from the Competent Authority-questionnaires. Particular details on costs and expenditures associated with security measures can be obtained then.

For the Port Facilities, key indicators will be derived. These indicators can be used to extrapolate the results of the questionnaires to EU-level.

In the next chapter, the results of the questionnaires are presented. The underlying analysis is based on the methodology as discussed in the present chapter.

4 RESPONSE ON THE QUESTIONNAIRES

4.1 Introduction

The previous chapter discussed the methodology for data collection (by questionnaires) and data analysis (by a modelling approach). In the present chapter, the response on the questionnaires is presented. This presentation is based on distinguishing the response of 1) Competent Authorities, 2) Port Facilities, and 3) Shipping Companies.

The remainder of this chapter is divided into five sections. Section 4.2 discusses the overall response of the questionnaires. In Section 4.3, the quality of the response of the questionnaires for the Competent Authorities is discussed. Sections 4.4 and 4.5 include similar contents for the Port facilities and Shipping Companies, respectively. Section 4.6 summarizes the main findings of this chapter.

4.2 Overall Response

The questionnaires have been sent to 28 Competent Authorities, 38 Port Facilities and 11 Shipping Companies. The numbers of respondents and the associated response rates are provided in Table 4.1.

Table 4.1 Response on the questionnaires

	Addressed	Responded	Response rate
Competent Authorities	28	22	79%
Port Facilities	38	38	100%
Shipping Companies	11	8	73%
Total	77	68	88%

It can be observed from Table 4.1 that 100% of the addressed Port Facilities cooperated by completing and sending back the questionnaire. This relatively high response rate for the Port Facilities may be explained by the fact that many facilities have the idea that they have relatively limited possibilities to recover maritime security costs with subsidies, and argue that maritime security regulations lead particularly to additional paper works, which should be addressed at EU-level.



Remark 4.1

Some interviewed port facilities in the Netherlands indicated that passing on maritime security costs to their customers is hardly possible with a view on their competitive position.

The response rates for the Competent Authorities and Shipping Companies are substantially lower: 79% and 73%, respectively. Particularly the Shipping Companies were less willing to cooperate; no time for filling in the questionnaire and again being confronted with paper work associated with maritime security were main arguments for not willing to cooperate.

Remark 4.2

Some shipping company representatives argue that they already have too much paper work associated with, for instance, international maritime security regulations.

The overall response rate is 88%, which is a relatively high response rate for questionnaires in general.

4.3 Quality of the Response by Competent Authorities

The questionnaire for the Competent Authorities was sent to 28 authorities in 24 countries. As mentioned above, 79% of the sent questionnaires were completed and sent back. To be more specific: 22 authorities from 19 countries completed the questionnaire. The quality of the received questionnaires was sufficient enough to use them all for analysis of the funding of maritime security measures.

Table 4.2 gives the details on the response of the questionnaire for the Competent Authorities.



Table 4.2 Details on the response of the questionnaire for the Competent Authorities

Nr.	Country	Port facility and/or ship security?	Name of authority	Received back?
1	Belgium	Port facility and ship	DG Maritime Transport	YES
2	Bulgaria			NO
3	Bulgaria			NO
4	France	Port facility and ship	DG de la Mer et des Transport	YES
5	Germany	Port facility	Waterways Police Hamburg	YES
6	Greece	Port facility and ship	Ministry of Mercantile Marine	YES
7	Iceland	Port facility and ship	Icelandic Maritime Administration	YES
8	Ireland			NO
9	Netherlands	Port facility and ship	Ministry of Transport, Public Works and Water Management	YES
10	Netherlands	Port facility	Harbour Master Port of Rotterdam	YES
11	Romania			NO
12	United Kingdom	Port facility and ship	Department of Transport	YES
13	Denmark	Port facility	Danish Coastal Authority	YES
14	Estonia	Port facility and ship	Estonian Maritime Administration	YES
15	Finland			NO
16	Latvia	Port facility and ship	Maritime Administration of Latvia	YES
17	Lithuania	Port facility	Klaipeda State Seaport Authority	YES
18	Lithuania	Port facility	Butinge oil terminal	YES
19	Norway	Port facility	Norwegian Coastal Administration	YES
20	Poland	Port facility and ship	Maritime office in Gdynia	YES
21	Poland	Port facility and ship	Maritime administration office in Szczecin	YES
22	Sweden	Port facility and ship	Swedish Maritime Administration	YES
23	Cyprus	Port facility and ship	Ministry of Communications and works	YES
24	Italy			NO
25	Malta	Port facility and ship	Malta Maritime Authority	YES
26	Portugal	Port facility and ship	Instituto Portuario e dos Transportes Maritimos	YES
27	Slovenia	Port facility and ship	Slovenian Maritime Administration	YES
28	Spain	Ship	Subdireccion General de Seguridad Maritima	YES



4.4 Quality of the Response by Port Facilities

The questionnaire for the Port Facilities was sent to 38 port facilities in 8 countries. As mentioned above, 100% of the sent questionnaires were completed and sent back.

The quality of the received questionnaires differs however strongly. Some port facilities were not able to provide cost information on individual measures, while others were not willing to provide this information with a view on confidentiality. Furthermore, first analysis of the results made clear that some respondents (7) comprise complete ports (Oslo in Norway, Helsinki in Finland, Tallinn in Estonia, Barcelona in Spain, Koper in Slovenia, Larnaca in Cyprus and Limasol in Cyprus), which will be analysed separately (see Appendix C).

The resulting list of selected Port Facilities for further analysis in this study (see Table 4.3) comprises 27 terminals and 7 ports. The terminals are specialised in different commercial activities and located in 6 ports (Klaipeda in Lithuania, Rotterdam and Amsterdam in the Netherlands, Lisbon in Portugal, Barcelona and Bilbao in Spain) in 3 geographical regions in Europe (Northern, Central and Southern Europe).

Table 4.3 List of 27 Port Facilities selected for further analysis in this study

Geographical Region	Port Facility number	Country	Port	Commercial activity
Northern Europe	1	Lithuania	Klaipeda	Multi-Purpose
	2	Lithuania	Klaipeda	Multi-Purpose
	3	Lithuania	Klaipeda	Multi-Purpose
	4	Lithuania	Klaipeda	Liquid Bulk
	5	Lithuania	Klaipeda	Dry Bulk
	6	Lithuania	Klaipeda	Container
	7	Lithuania	Klaipeda	Multi-Purpose
	8	Lithuania	Klaipeda	Liquid Bulk
	9	Lithuania	Klaipeda	Multi-Purpose
	10	Lithuania	Klaipeda	Liquid Bulk
	11	Lithuania	Klaipeda	RoRo
Central Europe	12	Netherlands	Rotterdam	Container
	13	Netherlands	Rotterdam	Liquid Bulk
	14	Netherlands	Rotterdam	RoRo
	15	Netherlands	Rotterdam	Liquid
	16	Netherlands	Rotterdam	Dry Bulk
	17	Netherlands	Amsterdam	Passenger
	18	Netherlands	Amsterdam	Container
Southern Europe	19	Portugal	Lisbon	Passenger
	20	Portugal	Lisbon	Passenger
	21	Portugal	Lisbon	Passenger
	22	Spain	Barcelona	Passenger
	23	Spain	Barcelona	Liquid Bulk
	24	Spain	Barcelona	Container
	25	Spain	Barcelona	Container
	26	Spain	Barcelona	Multi-Purpose
	27	Spain	Bilbao	Multi-Purpose
Complete Ports	28	Norway	Oslo	-
	29	Finland	Helsinki	-
	30	Estonia	Tallinn	-
	31	Spain	Barcelona	-
	32	Slovenia	Koper	-
	33	Cyprus	Larnaca	-
	34	Cyprus	Limasol	-

4.5 Quality of the Response by Shipping Companies

The questionnaire for the Shipping Companies was sent to 11 shipping companies in 5 countries. As mentioned above, 8 of the sent questionnaires were completed and sent back.

The quality of the completed Shipping Company-questionnaires was much lower than the quality of the completed Competent Authority- and Port facility-questionnaires. One shipping company (from the Netherlands) did not provide cost information on individual measures and has been left out for further analysis. Other respondents gave total running costs instead of running costs per vessel. Consequently, some assumptions had to be made on the running costs. This, in addition to the limited number of Shipping Company-questionnaires (7) that can be used for further analysis, gives reason to be careful in interpreting the results for the shipping companies.

Table 4.4 provides the resulting list of selected Shipping Companies for further analysis. The shipping companies are specialised in different commercial activities and located in 5 countries (Sweden, Finland, the Netherlands, Portugal and Spain) in 3 geographical regions in Europe (Northern, Central and Southern Europe).

Table 4.4 List of 7 Shipping Companies selected for further analysis

Geographical region	Shipping Company number	Home country	Commercial activity
Northern Europe	1	Sweden	Multi-Purpose
	2	Finland	RoRo
Central Europe	3	Netherlands	General Cargo
	4	Netherlands	Cruise
Southern Europe	5	Portugal	Liquid Bulk
	6	Spain	Liquid Bulk
	7	Spain	Ferries

4.6 Summary

It has been observed that 100% of the addressed Port Facilities cooperated by completing and sending back the questionnaire. This relatively high response rate for the Port Facilities may be explained by the fact that many facilities have the idea that they have little or no possibilities to pass on maritime security costs to their customers, which should be addressed at EU-level.



The response rates for the Competent Authorities and Shipping Companies are substantially lower: 79% and 73%, respectively. Particularly the Shipping Companies were hardly willing to cooperate; no time for filling in the questionnaire and again being confronted with paper works associated with maritime security were main arguments for not willing to cooperate.

The overall response rate is 88%, which is a relatively high response rate for questionnaires in general.

The quality of the response on the questionnaires differs strongly. The quality of the received Competent Authority-questionnaires was sufficient enough to use them all for analysis of the funding of maritime security measures. The resulting list of selected Port Facilities for further analysis comprises 27 terminals and 7 ports, which represents 89% of all completed Port Facility-questionnaires.

The quality of the completed Shipping Company-questionnaires was much lower than the quality of the completed Competent Authority- and Port facility-questionnaires. One carrier (from the Netherlands) did not provide cost information on individual measures and has been left out for further analysis. Other respondents gave total running costs instead of running costs per vessel. Consequently, some assumptions had to be made on the running costs. This, in addition to the limited number of Shipping Company-questionnaires (7) that can be used for further analysis, gives reason to be careful in interpreting the results for the shipping companies.

5 FINDINGS REGARDING COMPETENT AUTHORITIES

5.1 Introduction

The previous chapter discussed the response on the questionnaires. In the present chapter, the results of the questionnaires are presented. This presentation is based on distinguishing the results from 1) Competent Authorities, 2) Port Facilities, and 3) Shipping Companies.

Analysis of the results from Competent Authorities is interesting with a view on the funding of security measures, while analysis of the results from Port Facilities and Shipping Companies (see Chapter 6 and 7, respectively) is particularly interesting with a view on the costs due to specific security measures. Combining the findings from the different analyses may lead to some insight in maritime security costs and the ways they are financed (how and by whom).

The remainder of this chapter is divided into two sections. In Section 5.2, the results and observations regarding the completed questionnaires for the Competent Authorities are presented. Section 5.3 summarizes the main findings of this chapter.

5.2 Results and Observations Competent Authorities

5.2.1 General

This section pays particularly attention to the funding of maritime security measures, which is dealt with in the *Questions 2.8-2.10* and in the *Questions 3.6-3.8* of the questionnaire for the Competent Authorities. The first group of questions (*Questions 2.8-2.10*) refers to Port Facility Security; the second group of questions (*Questions 3.6-3.8*) refers to Ship Security. The presentation of the results for the Competent Authorities in this section is based on the data collected with these questions.

5.2.2 Funding of Port Facility Security

In *Question 2.8*, the Competent Authority was asked to indicate who is responsible for funding port facility security. In 14 cases (70%) the answer was that the port facility was the only one responsible for funding. In one case, the question was not answered.



Combinations were indicated for 5 cases:

Central Europe:

- In the *Netherlands*, the port facility measures are funded by a combination of:
 - port facilities,
 - national authority,
 - Port of Rotterdam Authority,
 - sea port police, and
 - customs.
- In *Belgium*, the port facility measures are funded by a combination of the Competent Authority, other authorities and the Port Facilities.
- In *France*, the port facility measures are funded by a combination of the Competent Authority and other authorities.

Southern Europe:

- In *Malta*, the security measures are funded by a combination of the Competent Authority and the Port Facilities.
- In *Greece*, the Ministry has funded the security measures of public port facilities; private port facilities have to cover their own expenses.

Spain did not give an answer; the competence of the authority is only for ship security.

In *Question 2.9*, the Competent Authority was asked to indicate the annual budget for Port Facility Security if security is funded by the competent Authority or any other authority/government institution.

The 14 cases in which the port facility was indicated as the only one responsible for funding of security measures, the Competent Authority obviously should not have a budget for these expenses since it is not its responsibility. This was indeed filled in for 12 cases. So, there are 2 exceptions:

1. The *Iceland* Authority indicated that the port facilities were the only one responsible for funding the security measures, and yet indicated that their annual budget for these measures were € 10 million.
2. The *German* Authority indicated that the port facilities were the only one responsible for funding the security measures, and yet indicated that their annual budget for these measures were € 2,8 million.



The following indications on the budgets were given:

Central Europe:

- For the *Netherlands*, a budget of € 0.75 million was indicated for the year 2006.
- In *Belgium*, no specific budget was allocated, but the certification and monitoring efforts by the different authorities involved are free of charge for the facilities.
- In *France*, the Ministries of Transport and Interior jointly delivered once a subsidy of € 2.4 million, which was shared between the 22 seaports in France.

Southern Europe:

- *Malta* indicated to have a budget, but figures were not available.
- For *Greece*, it was indicated that the investment cost for public port facilities was € 300 million and the annual running costs for public port facilities was € 40 million. Investments and running costs seem to regard all port facility measures and not only port facility *security* measures. The given indication appears to have no value for the analyses.

In *Question 2.10*, the Competent Authority was asked to indicate the annual budget for each group of Port Facility Security measures if the Competent Authority funds these.

In 7 cases, the questions were not answered and in 8 cases it was indicated that no funding took place. For all of these cases this was in line with *Question 2.9* where no overall budget was indicated, with the exception of Greece (there was an very high overall budget, but the questions were not answered).

In 8 cases, budgets were filled in for categories of security measures. The associated results are presented in Table 5.1.

Table 5.1 Budgets for the different groups of security measures

€* 1000	Germany	Iceland	Nether-lands (1)	Nether-lands (2)	UK	Latvia	Malta	France
<i>Investment costs</i>								
land side access	0	0	0	0	0	0	125	
land side railways and roads	0	0	0	0	0	0	0	
sea side	0	0	0	0	0	0	0	
electronic systems	0	0	0	250	0	0	400	
personnel	0	0	0	0	0	0	5	
Inspections	200	1000	0	0	YES	0	2	YES
<i>Running costs</i>								
Land side access	0	0	0	0	0	0	250	
land side railways and roads	0	0	0	0	0	0	0	
sea side	0	0	0	0	0	0	0	
electronic systems	0	0	0	0	0	0	n.a.	
Personnel	0	0	0	0	0	24000 Is	8	
Inspections	100	200	YES	300	YES	0	8	YES

Notes: Netherlands (1) = Harbour Master of Rotterdam; Netherlands (2) = Ministry of Transport etc.; n.a. = not available

For *France*, the investment and running costs are public funded, but no amount was indicated. It can further be observed that the port facilities are funding the port security measures themselves. In 4 countries (Iceland, The Netherlands, Germany and Malta), the Competent Authorities have a relatively small budget for coordination and inspection. In 3 countries (UK, France and the Netherlands) the Competent Authorities indicated to be responsible for inspections but gave no indication on the associated budget.

5.2.3 Funding of Ship Security

In *Question 3.6*, the Competent Authority was asked to indicate who is responsible for funding ship security.

In 5 cases, no answer was given. In 13 cases, it was indicated that it was the sole responsibility of the shipping companies. In 3 cases, it was indicated that also other organisations had a responsibility:

- In *Portugal*, ship security is a combined responsibility of the Ministry and the shipping company. The budgets for investments in accesses and electronic systems are for 100% for the Competent Authority, but no amount is given. For training of personnel, a budget of € 45,000 is indicated.



- For *Spain*, ship security is indicated to be a responsibility of the Competent Authority; however, no budget is given.
- For *Cyprus*, ship security is indicated to be a responsibility of the Competent Authority; however, no budget is given.

It can be concluded that the shipping companies are funding the ship security measures themselves. In 6 countries (France, UK, the Netherlands, Portugal, Spain and Cyprus), the Competent Authority plays a role for inspections but hardly any budget is mentioned.

5.3 Summary

It has been observed that the port facilities are funding the port security measures themselves. In 6 countries (Germany, Iceland, the Netherlands, UK, Malta and France), the Competent Authorities have a relative small budget for coordination and inspection.

Regarding ship security, it can be concluded that also the shipping companies are funding the security measures themselves. In 6 countries (France, UK, the Netherlands, Cyprus, Portugal and Spain), the Competent Authorities play a role but hardly any budget is mentioned.

The question whether competent authorities pass on their costs to port facilities and shipping companies has not been addressed in present study. Further research on this question is however recommended with a view on passing on costs to maritime industries.

6 FINDINGS REGARDING PORT FACILITIES

6.1 Introduction

The previous chapter presented the findings regarding the Competent Authorities. In the present chapter, the findings from the questionnaires for the Port Facilities are presented.

The remainder of this chapter is divided into three sections. In Section 6.2, the results and observations regarding the completed questionnaires for the Port Facilities are presented. Section 6.3 presents key indicators for the investment and running costs associated with maritime security measures as revealed by port facilities. Section 6.4 summarizes the main findings of this chapter.

6.2 Results and Observations Port Facilities

6.2.1 General

This section pays particularly attention to the costs of maritime security measures taken by port facilities. Subsection 6.2.2 presents the service and physical characteristics of the port facilities that completed the questionnaires and were selected for further analysis. Level of compliance, total costs and funding of maritime security measures are discussed in Subsection 6.2.3, while Subsection 6.2.4 provides some insight in the details of the costs.

6.2.2 Service and Physical Characteristics

The Port Facilities were asked to provide a brief description of service (*Question 1.2*) and physical characteristics (*Question 1.3*), which can potentially be used to derive key indicators for port facility security costs (see Section 6.3). Table 6.1 presents the figures for the service characteristic *number of vessels served* and the physical characteristics *total dry area*, *total quay length*, *total length at landside* and *number of landside entrances*.



Table 6.1 Service and physical characteristics of port facilities

	Range		average
	minimum	maximum	
Number of vessels served (vessels/year)	18	1320	436
Total dry area (ha)	0.85	425	39
Total quay length (m)	204	6000	1527
Total length at landside (m)	225	16,000	3245
Number of landside entrances	1	42	4

A wide range for the characteristics of the port facilities can be observed from Table 6.1. This depends largely on differences between the size of terminal operation (more vessels served means usually a longer total quay length) and differences between the different commercial activities performed. Dry and Liquid Bulk facilities, for instance, have relatively large dry areas (85.6 ha and 93.9 ha, respectively, on a average base) compared to, for instance, Cruise terminals (1.94 ha on a average base). Note also the extremely wide range for the number of landside entrances; only one facility (a petrochemical facility) indicated 42 entrances (including safety exits), the rest about 1-7 entrances (main entrances).

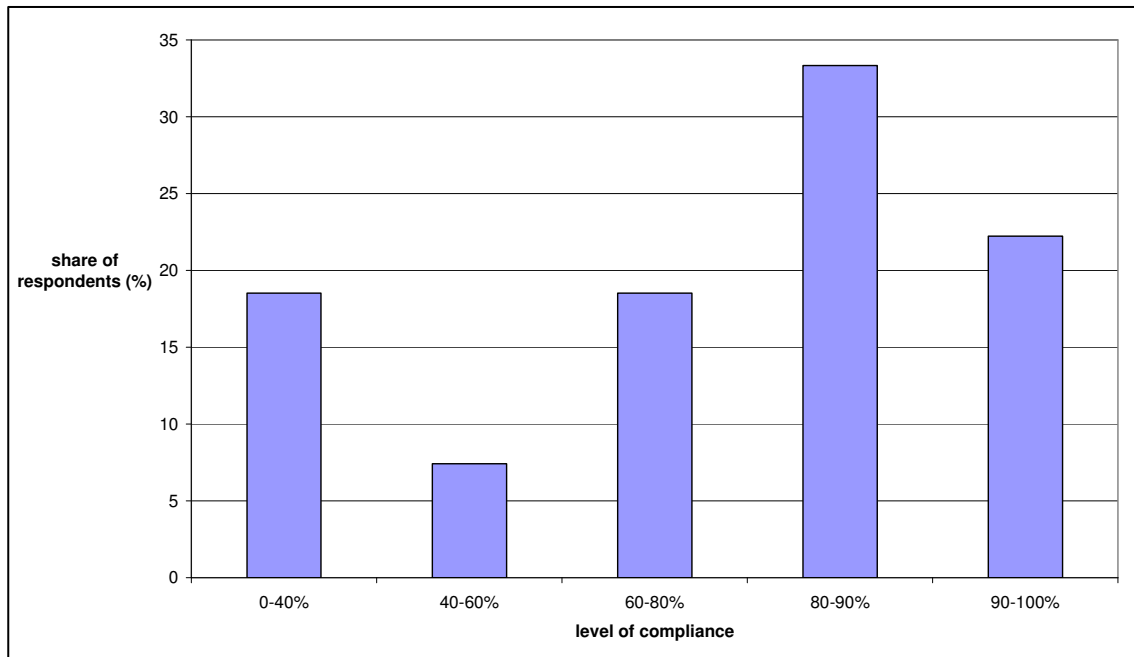
6.2.3 Level of Compliance, Total Costs and Funding

Question 2.1 relates to the level of compliance regarding EU/ISPS maritime security regulations at 1 January 2004, which has been considered representative for Port Facilities. The date *1 January 2004* has been chosen for this study (also for the Shipping Companies; see Chapter 7), because:

- 1) maritime industry – as any industry - is usually postponing investments to the latest possible date; so, 1 January 2004 is sufficiently before the deadline of 1 July 2004 when the relevant security regulations came into force; and
- 2) 1 January 2004 is clear in mind of maritime industries' representatives.

Figure 6.1 gives the distribution of level of compliance (over all facilities that have responded and have been selected for further analysis).

Figure 6.1: Level of compliance at 1 January 2004



It can be observed from Figure 6.1 that 22% of the facilities was almost or fully compliant at the reference date of 1 January 2004. The average level of compliance at that date was about 70% indicating that a relatively limited effort had to be made by the port facilities to obtain 100% compliance.

In *Questions 3.1* and *3.2*, the Port Facility was asked to provide overall information on security costs (*Question 3.1.1* and *3.1.2*) and security cost recovery (*Questions 3.2.1-3.2.3*).

Table 6.2 presents the *total* investment and running costs due to Regulation (EC) Nr. 725/2004. It should be noted that these costs represent 1) *additional* investment and running costs due to security regulations, and 2) the *sum* of all additional investment and running costs made by all facilities that have responded and have been selected for further analysis.

Table 6.2 Total costs due to security regulations

Total investment cost	€ 12,533,000
Total running cost (i.e. costs per annum)	€ 6,307,000

Table 6.3 presents the *average* investment and running costs (i.e. per facility) due to Regulation (EC) Nr. 725/2004. It should be noted that these costs represent 1) *additional* investment and running costs due to security regulations, and 2) arithmetic *averages* of additional investment and running

costs determined over all facilities that have responded and have been selected for further analysis.

Table 6.3 Average costs (i.e. per facility) due to security regulations

Average investment cost	€ 464,000
Average running cost (i.e. costs per annum)	€ 234,000

In *Questions 3.2.1-3.2.3*, the approached Port Facilities could indicate one out of three sources to recover the costs of security measures; indicating a combination of sources was also possible. The results from these questions are presented in Table 6.4. For each source for maritime security cost recovery, a percentage is given that represents the share of the respondents that made use of the specific source. Furthermore, the ranges of the revenues per facility are given because the amount of revenues differs strongly per facility.

Table 6.4 Funding of maritime security costs

Source for cost recovery	Description	Amount
Increase of tariffs	Percentage of facilities that increased tariff	19 %
	Revenues per facility	€ 10,000 – 750,000
Separate ISPS tariff	Percentage of facilities that introduced a separate ISPS tariff	55 %
	Revenues per facility	€ 22,000 – 1,000,000
Subsidy	Percentage of facilities that received subsidy	23 %
	Revenues per facility	not indicated

It can be concluded that introduction of a separate ISPS tariff is mostly applied and resulted in a higher amount of revenues per facility than application of an increase of (handling) tariffs. To what extent increase of tariffs or introduction of a separate ISPS tariff contributes to cost recovery could not be deducted from the obtained data, because there is a strong indication that not all customers of port facilities have to pay for security measures taken by the facilities.

Remark 6.1

A representative of a container terminal in the Netherlands indicated that his regular customers do not have (or are not willing) to pay the separate ISPS tariff of about € 3.50 per box.

Only facilities in Lithuania (6 facilities) indicated that they receive subsidy. It should however be noted that they gave no insight in the *amount* of subsidies. So, a further break down of subsidy information cannot be indicated.

Remark 6.2

Port facilities in Rotterdam indicated that the preparation of implementing maritime security measures (information, initial training, etc.) has been paid for by the Rotterdam Port Authority. Some facilities considered this as 'subsidy in a non-financial way'.

A number of port facilities that completed the questionnaires was not able (2 facilities) or not willing (2 facilities) to give any information on their revenues at all; confidentiality was indicated to be the main reason for not willing to give any information.

6.2.4 Information on Measures and Costs

The answers on the *Questions 4.1.1-4.6.5* provide more detailed information on maritime security measures and associated costs. This information is presented below and based on distinguishing costs per 1) category of measures, 2) commercial activity, 3) geographical region, and 4) individual measure. The results will be used in the next subsection to derive key indicators for total investment and running costs.

Costs per Category of Measures

In the questionnaire for Port Facilities, the questions on the different individual measures (see further) have been clustered into six categories, namely:

1. Landside - accesses and entrances (*Questions 4.1.1-4.1.6*),
2. Landside – railways and roads (*Questions 4.2.1-4.2.2*),
3. Seaside (*Questions 4.3.1-4.3.2*),
4. Electronic systems (*Questions 4.4.1-4.4.10*),
5. Personnel (*Questions 4.5.1-4.5.4*), and
6. Inspections and insurances (*Questions 4.6.1-4.6.5*).

Table 6.5 presents the total costs per category of measures.

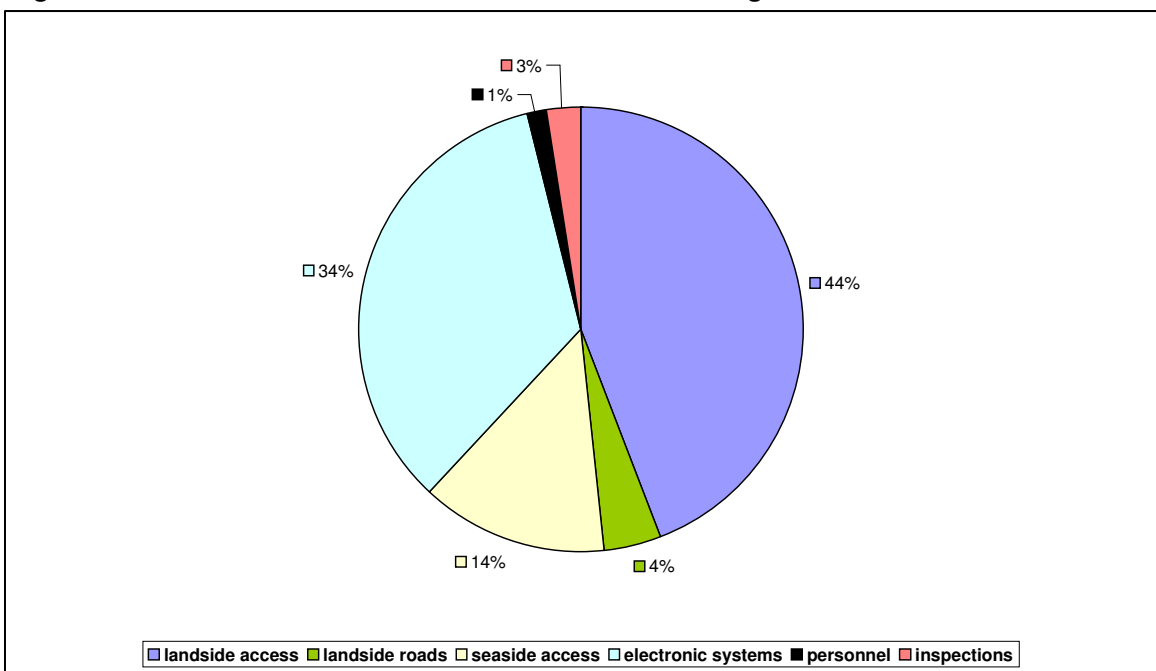
Table 6.5 Total costs per category of measures

	Total investment costs (* 1000 €)	Total running costs (* 1000 €)
Landside – accesses and entrances	5,545	1,139
Landside – railways and roads	498	473
Seaside	1,719	192
Electronic systems	4,266	836
Personnel	175	3,542
Inspections and insurances	330	126
Total	12,533	6,307

Further discussions with reference to the figures in Table 6.5 are provided below.

The pie chart in Figure 6.2 represents the distribution (in %) of the total *investment* costs over the six categories of measures.

Figure 6.2: Distribution of total investment costs over categories of measures



It can be observed from Figure 6.2 that the category Landside – accesses and entrances has the largest share in the investment costs (44%), followed by investments in Electronic systems (34%) and Seaside access (14%). The

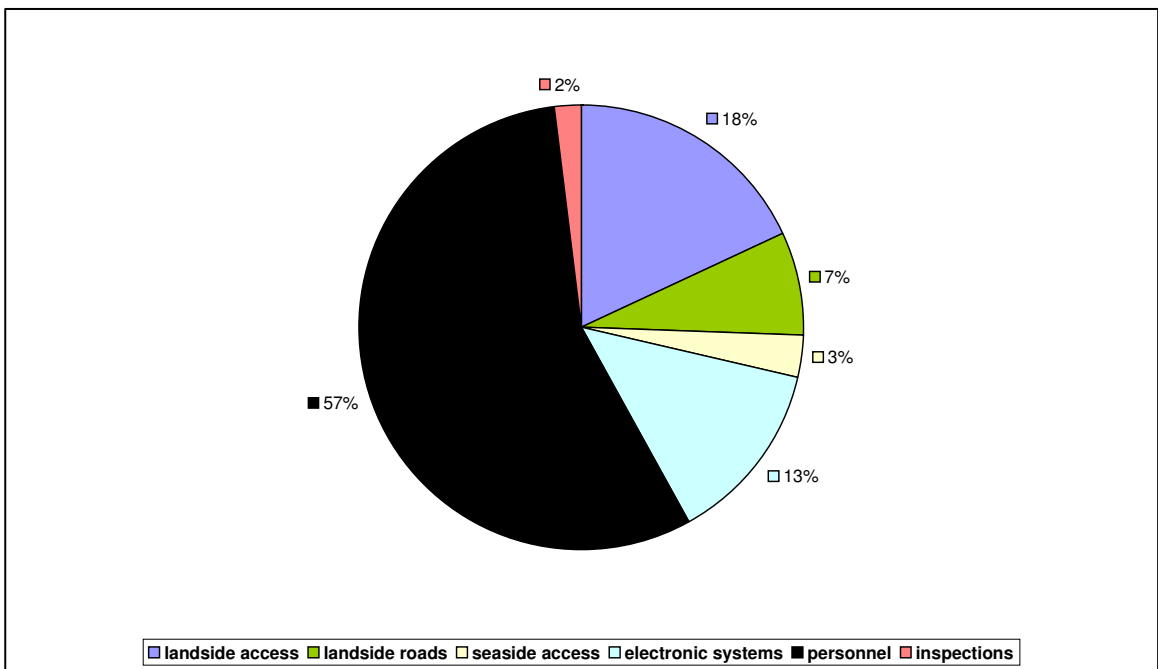
categories Landside – railways and roads and Inspections and insurances count for 4% and 3%, respectively. Note that Personnel counts for only 1%.

Remark 6.3

Some terminals in the Netherlands argued that hardly any specialised security personnel have been added to the existing personnel; existing employees mostly perform security tasks in addition to their regular duties.

The pie chart in Figure 6.3 represents the distribution (in %) of the total *running* costs over the six categories of measures.

Figure 6.3: Distribution of total running costs over categories of measures



It can be observed from Figure 6.3 that Personnel costs (with 57%) have by far the largest share in total running costs. Attention should also be paid to the cost category Inspections and insurances, which counts for only 2% of total running costs.

Remark 6.4

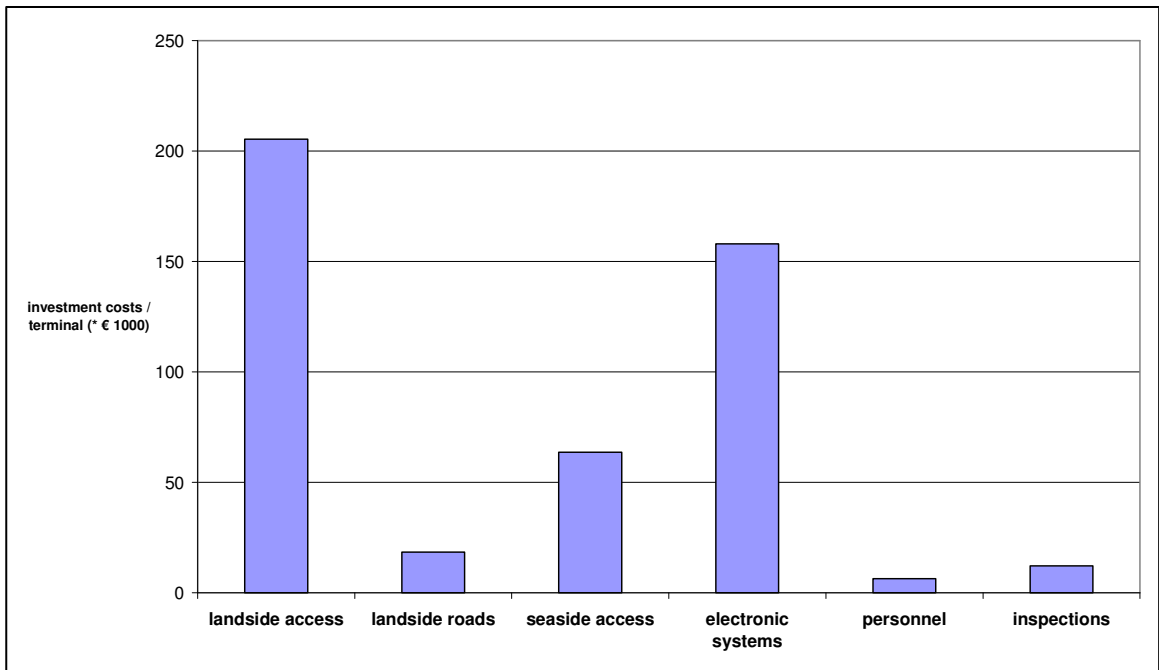
Many respondents indicated that the running costs associated with maritime security measures are difficult to differentiate from other running costs.

Below, some information is given on *average* investment and running costs per category of measures. These figures represent the arithmetic averages of the costs per category determined over all facilities that have responded and have

been selected for further analysis. Although this information should be treated carefully (not every facility implemented all categories of measures and, if so, to the same extent), studying average costs is however interesting with a view on getting some indication on maritime security costs at terminal level.

Figure 6.4 provides information on the average *investment* costs per category of measures.

Figure 6.4 Average investment costs per category of measures



It can be observed from Figure 6.4 that the categories Landside – accesses and entrances and Electronic systems have by far the highest average investment costs (€ 205,000 and € 158,000, respectively).

Special attention should be paid to the cost category Inspections and insurances, which comprises the average costs for getting a port facility recognized ('acknowledged') and approved ('endorsed') by a Designated Authority⁵ or Recognised Security Organisation (RSO)⁶ on its behalf. This average cost is estimated to be € 12,000.

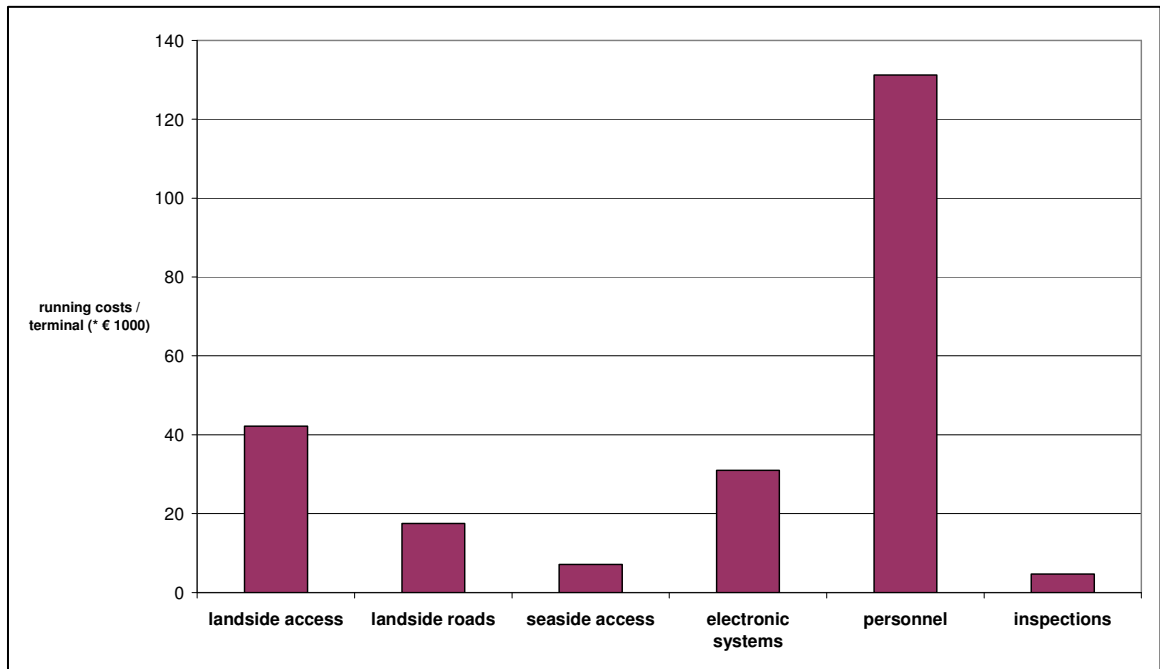
A similar conclusion can be drawn for Figure 6.5. This figure provides information on the average *running* costs (i.e. averaged over the number of

⁵ A Designated Authority is an authority that is authorised to assess, approve, audit and enforce security plans.

⁶ With a Recognised Security Organisation (RSO) is meant in this study a bureau that performs certain security tasks e.g. inspections) on behalf of the Designated Authority.

responded facilities) per category of measures. Note in particular the average personnel costs (€ 131,000 per annum).

Figure 6.5 Average running costs per category of measures



The running costs for Inspections and insurances comprise € 5,000 per annum. For this cost, significant differences between geographical regions or countries have not been observed (see further).

Costs per Commercial Activity

A distinction can be made between costs for different commercial activities. A distinction has been made between costs for:

- Dry Bulk,
- Liquid Bulk,
- Ro/Ro,
- Container,
- Cruise, and
- Multi-Purpose.

This distinction between commercial activities is generally applied in the maritime sector. Table 6.6 presents the total costs per commercial activity.



Table 6.6 Total costs per category of measures

	Number of selected respondents	Total investment costs (* 1000 €)	Total running costs (* 1000 €)
Dry Bulk	2	505	353
Liquid Bulk	6	2,631	662
Ro/Ro	2	202	138
Container	4	294	431
Cruise	4	1,722	1,040
Multi-Purpose	9	7,179	3,683
Total	27	12,533	6,307

To account for differences in numbers of (selected) respondents, further discussions on costs per commercial activity are based on average costs. The term 'average' refers here to averaged over the number of responded and selected facilities per commercial activity.

Table 6.7 summarizes the findings for the comparison based on the different commercial activities as mentioned above. This summary comprises differences in average level of compliance at 1 January 2004, average investment costs and average running costs.

Table 6.7 Comparison based on different commercial activities

	Dry bulk	Liquid bulk	Ro/Ro	Container	Cruise	Multi-Purpose
Average level of compliance at 01-01-2004 (%)	45	89	78	68	46	77
Average investment costs (*1000 €)	253	439	101	74	430	798
Average running costs (*1000 €)	177	110	69	108	260	409

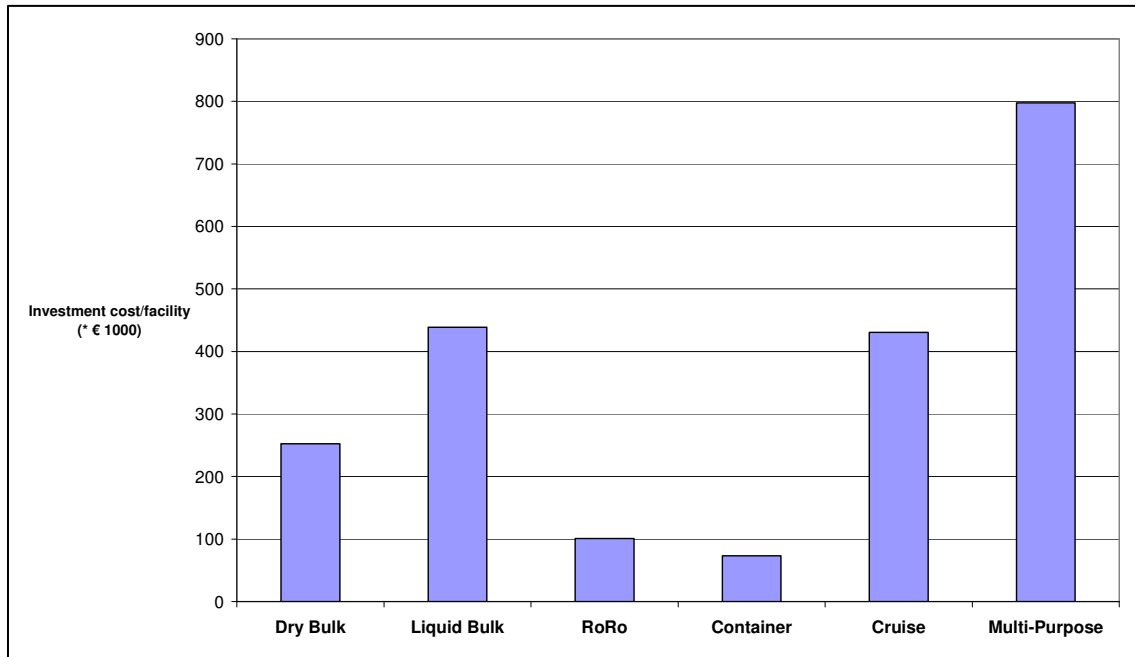
Note the relatively high level of compliance for the Liquid Bulk facilities. It is obvious that this is caused by the relatively high level of safety that had already been maintained before security regulations came into force.

One would expect that a relatively high level of compliance at 1 January 2004 leads to relatively low investment costs and vice versa. Analysis of the data did however not show such a consistent relationship. Other factors such as the

focus of the measures taken and the level of safety/security applied (particular relevant for liquid bulk facilities; see above) may differ per commercial activity and may, consequently, be the cause of the observed differences.

The average investment costs per commercial activity are shown in Figure 6.6.

Figure 6.6 Average investment costs per commercial activity



It can be observed from Figure 6.6 that the average investment costs differ strongly per commercial activity. Particularly Ro/Ro and Container facilities show relatively low investment costs (€ 101,000 and € 74,000, respectively), while Multi-Purpose facilities revealed relatively high investment costs (€ 798,000). The latter can possibly be explained by the fact that multiple commercial activities at one facility may consequently lead to less conveniently arranged security, which requires relatively high investments to improve.

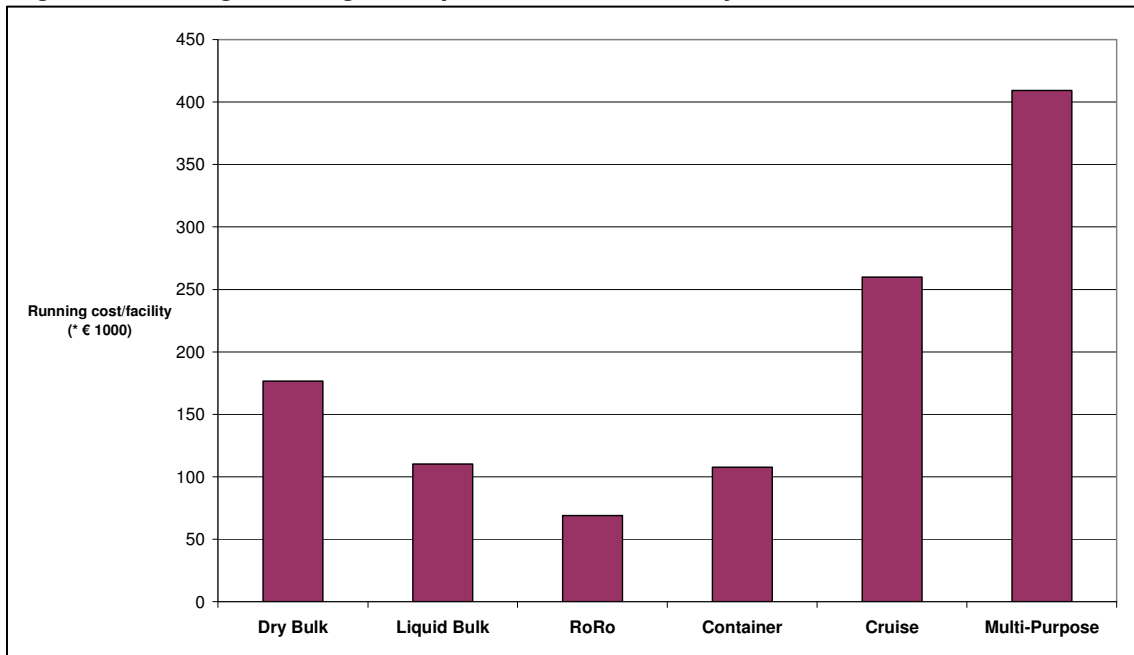
Notable is also the relatively high investment costs for cruise facilities (€ 430,000).

Remark 6.5

The director of a cruise terminal told during the interview that his terminal and not the visiting cruise carriers invested in X-ray equipment for the scanning of luggage. The cruise carriers indicated, according to the director of the terminal, that if the terminal would not invest, the carriers would not visit the terminal. So, substantial investment costs for the carriers are passed on to the cruise terminal.

The average running costs per commercial activity are shown in Figure 6.7.

Figure 6.7 Average running costs per commercial activity



Regarding the average running costs, it can be observed from Figure 6.7 that they also differ strongly per commercial activity. Similar to the above observations for the average investment costs, Ro/Ro and Container facilities show relatively low running costs (€ 69,000 and € 108,000, respectively). Note here also that Multi-Purpose facilities reveal relatively high costs (€ 409,000).

Costs per Geographical Region

A further distinction can be made between costs in different geographical regions in Europe. For the purpose of this study (see Chapter 3), a distinction has been made between costs in:

- Northern Europe (number of selected respondents: 11),
- Central Europe (7), and
- Southern Europe (9).

Which country belongs to which region has been discussed in Chapter 3 (see in particular Table 3.1).

Table 6.8 presents the total costs per geographical region and per category of measures.

Table 6.8 Total costs per geographical region and per category of measures (* 1000 €)

	Northern Europe		Central Europe		Southern Europe	
	Invest.	Run.	Invest.	Run.	Invest.	Run.
<i>Landside – accesses/entrances</i>	2,881	591	488	92	2,176	457
<i>Landside – railways and roads</i>	199	131	95	0	204	342
<i>Seaside</i>	848	110	378	32	493	52
<i>Electronic systems</i>	1,770	406	212	13	2,285	417
<i>Personnel</i>	60	872	61	536	54	2,135
<i>Inspections and insurances</i>	244	49	60	33	26	44
Overall total	6,003	2,158	1,293	704	5,237	3,446

Figure 6.8 shows pie charts that represent the distribution of total investment (left) and total running (right) costs over the different categories of measures for Northern Europe.

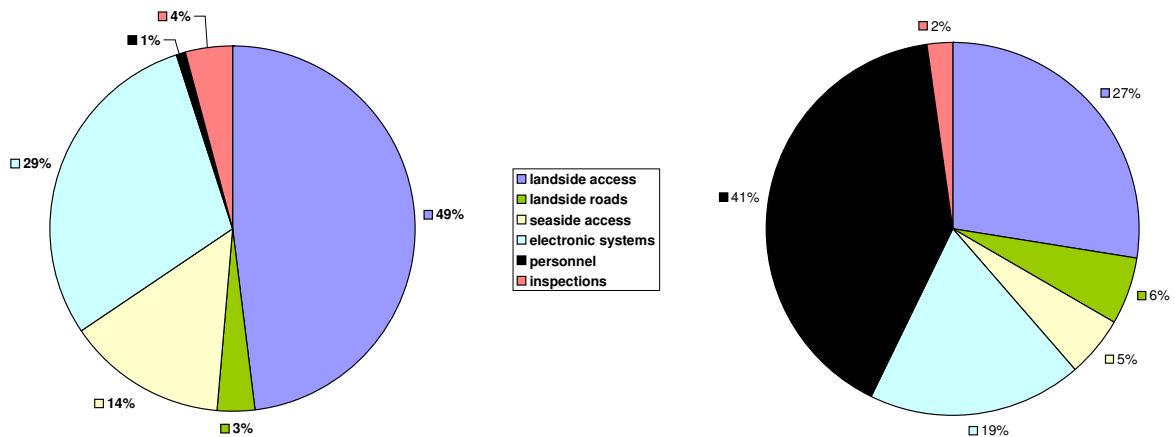


Figure 6.7 Distribution of total investment (left) and running (right) costs for Northern Europe

It can be observed from Figure 6.8 that Northern Europe particularly invested in the category Landside – accesses and entrances (49 % of total investment costs), being followed by investments in Electronic systems (29%). Investments in Personnel accounted for only 1%. Within total running costs, the category Personnel has the largest share: 41%.

Figure 6.9 shows pie charts that represent the distribution of total investment (left) and total running (right) costs over the different categories of measures for *Central Europe*.

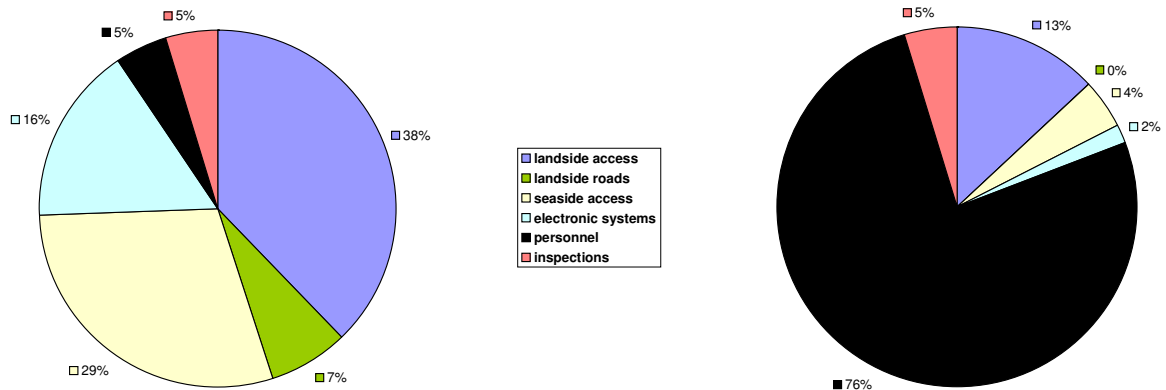


Figure 6.8 Distribution of total investment (left) and running (right) costs for *Central Europe*

It can be observed from Figure 6.9 that Central Europe invested also particularly in the category Landside – accesses and entrances (38 % of total investment costs), here being followed by investments in Seaside access (29%). Investments in Personnel and Inspections and insurances accounted for only 5%. Within total running costs, the category Personnel has also in Central Europe (by far) the largest share: 76%.

Figure 6.10 shows pie charts that represent the distribution of total investment (left) and total running (right) costs over the different categories of measures for *Southern Europe*.

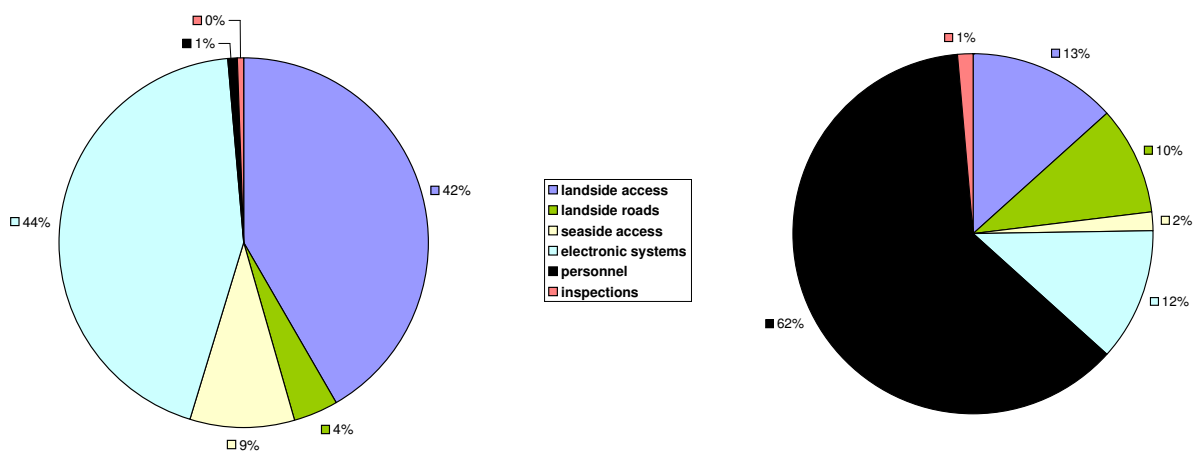


Figure 6.9 Distribution of total investment (left) and running (right) costs for *Southern Europe*

It can be observed from Figure 6.10 that Southern Europe invested also particularly in the categories Landside – accesses and entrances (42 % of total investment costs) and Electronic systems (44%). Investments in Personnel and Inspections and insurances accounted for only 1% and almost 0%, respectively. Within total running costs, the category Personnel has also in Southern Europe (by far) the largest share: 62%.

Regarding the total costs of maritime security measures, it can be concluded that similar distributions over the different categories of measures have been found for the different geographical regions in Europe.

To account for differences in numbers of (selected) respondents in the cost comparison between the different regions, Table 6.9 represents average costs. The term ‘average’ refers here to averaged over the number of responded and selected facilities in a geographical region.

Table 6.9 Average costs per geographical region

	Northern Europe	Central Europe	Southern Europe
Average level of compliance at 01-01-2004 (%)	80	64	62
Average investment costs (*1000 €)	546	185	582
Average running costs (*1000 €)	196	101	383

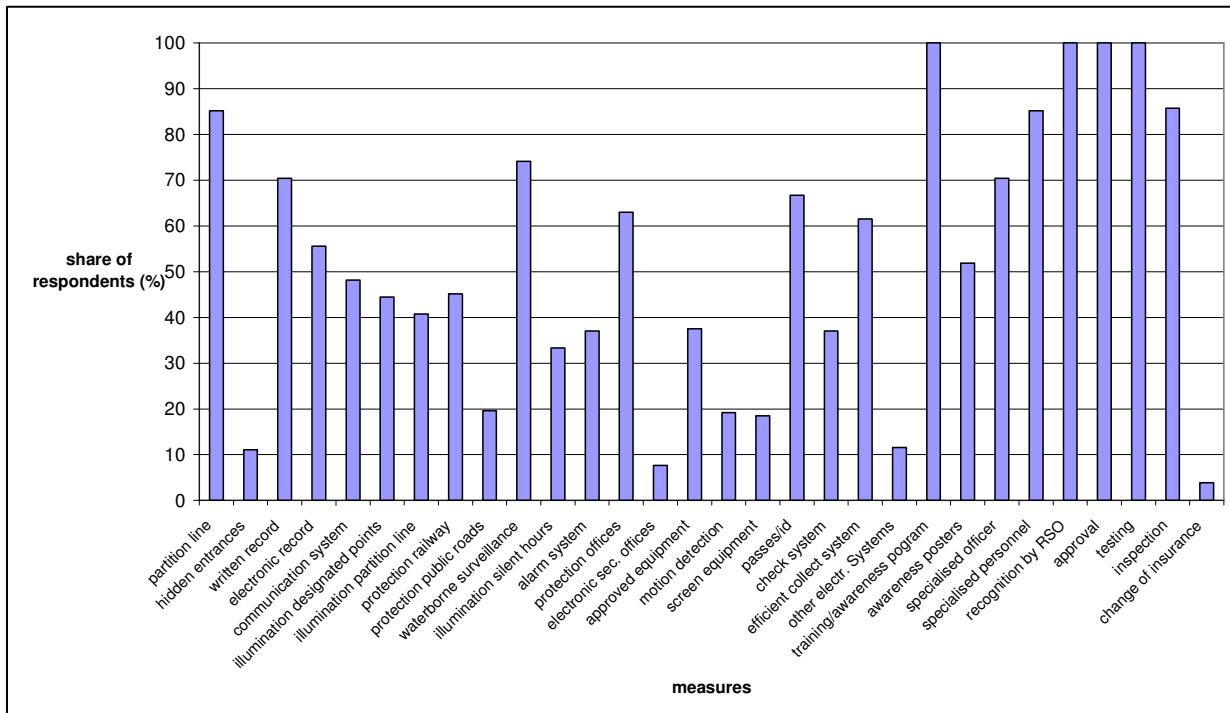
It can be concluded from the figures in Table 6.9 that Northern Europe had a higher average level of compliance at 1 January 2004 (80%) than Central and Southern Europe (64% and 62%, respectively). Furthermore, the average costs of Central Europe are significantly lower than those of Northern and Southern Europe. A main reason for this difference is that the sample from Central Europe (i.e. the facilities from Central Europe that completed the questionnaire and have been selected for further analysis) does not include Multi-Purpose facilities, which show relatively high average costs (see above). The samples from Northern and Central Europe, in contrast, include both 4 Multi-Purpose facilities (36% and 44%, respectively, of the samples).

Costs per Individual Measures

Implementation

Figure 6.11 gives for each individual measure an overview of the share of the respondents that implemented that measure.

Figure 6.10: Share of respondents that implemented individual measures



It can be observed from Figure 6.11 that more than 80% of the facilities implemented improvements of their partition lines (*Question 4.1.1*). Also the implementation of a written record of visitors, personnel, etc. (*Question 4.1.3*) and implementation of waterborne surveillance (*Question 4.3.1*) has been applied by a relatively large share of the respondents; more than 70% of the respondents applied these measures. It can further be observed that all respondents introduced a training/awareness program for their personnel (*Question 4.5.1*).

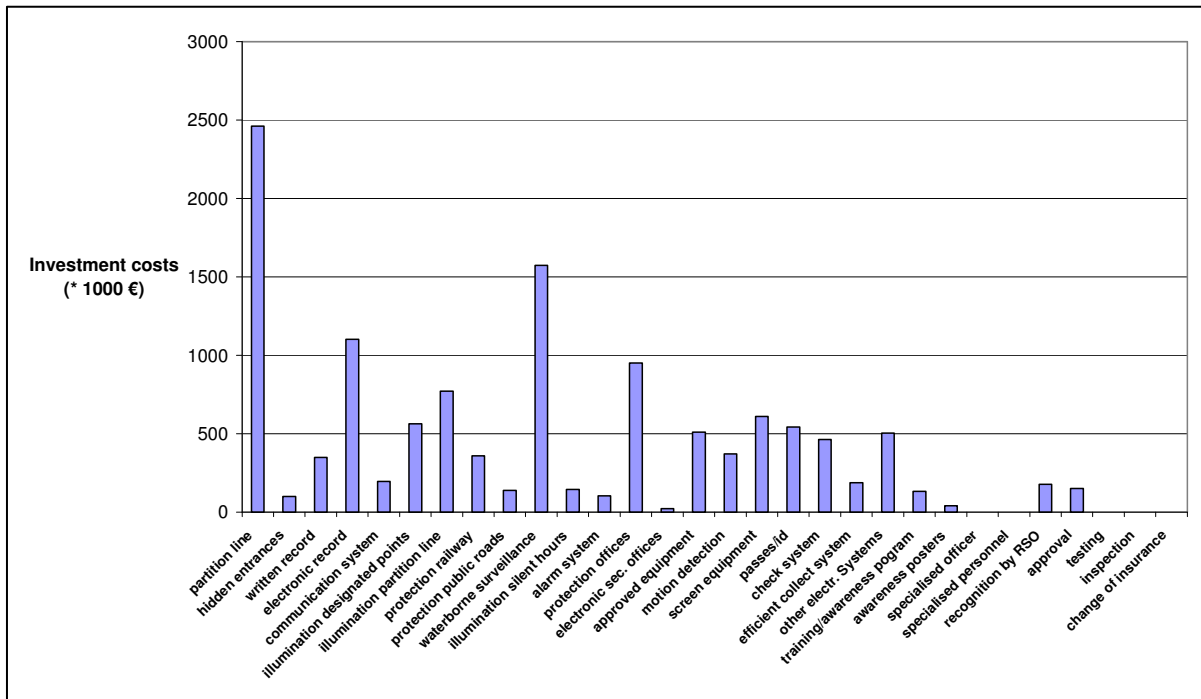
Quite obvious is the observation that all respondents were recognised and approved (*Questions 4.6.1* and *4.6.2*), because such recognition and approval is required for further operations. In 19 cases, the port facilities have been approved by a Designated Authority and in 6 cases (1 in the Netherlands, 3 in Spain and 2 in Lithuania) it has been indicated that the port facilities have been approved by a RSO (it has not been indicated *what* has been approved). In 2 cases, it has not been indicated at all who approved the facility.

All respondents indicated to perform regular security tests (*Question 4.6.3*).

Investment costs

Figure 6.12 gives for each individual measure the total investment cost.

Figure 6.11: Total investment costs of individual measures



It can be concluded from Figure 6.12 that investments in partition lines (e.g., perimeter fences; *Question 4.1.1*) required the largest expenses being followed by investments in waterborne surveillance capability (*Question 4.3.1*), electronic records of visitors, service personnel, vehicles, etc. (*Question 4.1.4*) and arrangements for protecting equipment in offices/premises (*Question 4.4.2*).

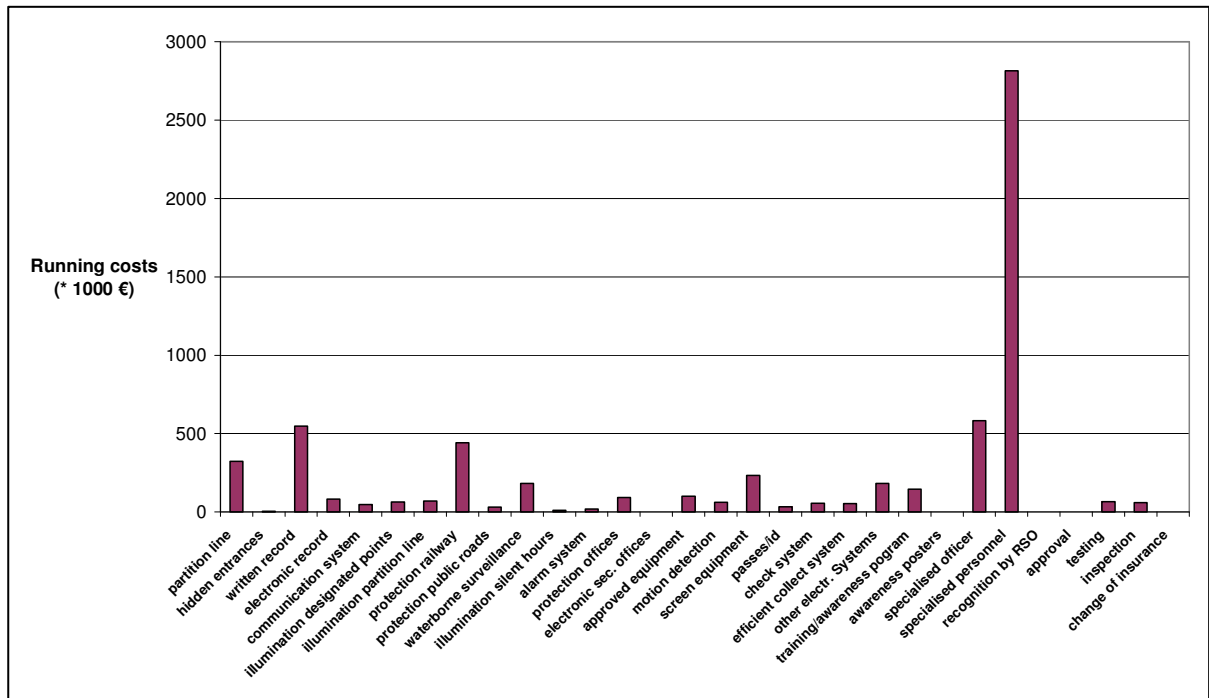
The total initial costs to get facilities recognised ('acknowledged') is € 179,000 (*Question 4.6.1*). One facility in the Netherlands, six in Spain and four in Lithuania indicated they actually made this investment. The associated average cost for these facilities were € 20,000 for the Dutch facility, € 4,200 for the Spanish facilities and € 33,325 for the Lithuanian facilities. The overall average (i.e. over all respondents that actually made this investment) is estimated at € 16,272.

Three facilities in the Netherlands, one in Spain and three in Lithuania indicated they had to make costs for approval ('endorsement'). The resulting average costs for these facilities are € 13,333 for the Dutch facilities, € 640 for the Spanish facility and € 37,000 for the Lithuanian facilities. Due to the limited number of facilities that indicated to be approved by a RSO (6), a systematic difference in approval costs between Designated Authorities and RSO's or combined with the different geographical regions could not be determined.

Running costs

Figure 6.13 gives for each individual measure the total running cost.

Figure 6.12: Total running costs of individual measures



It can be observed from Figure 6.13 that particularly specialised security personnel (*Question 4.5.4*) has led to an increase of running costs, namely, € 2,814,000⁷.

For further detailed information on the costs for the individual measures, the interested reader is referred to Appendix B of this report.

6.3 Key Indicators

With a view on the possibility to extrapolate the above-discussed results to EU-level, an attempt has been made to derive key indicators for investment and running costs associated with maritime security measures. Such key indicators should ideally be based on the ratio between (investment or running) costs and a (service or physical) characteristic of port facilities. The remainder of this subsection addresses the estimation of such key indicators.

Regarding the investment costs, it has been observed in the above discussions on individual measures that investment in the partition line is the main investment cost driver. A relationship between the investment cost and the total length at landside or the investment cost and the total dry area - both reflecting partition line requirements - is obvious then. Statistical analysis of a relationship

⁷ This seems to be in contrast with Remark 4.4. This remark concerns however only some terminals in the Netherlands and not all terminals in Europe.



between total investment costs and total length at landside indicates a R^2 of about 0.02⁸; statistical analysis of a relationship between total investment costs and total dry area leads to a R^2 of about 0.19. Therefore, key indicators based on the relationship between total investment cost and total dry area (at facility level) is recommended but a substantial spreading should be accounted for (see further).

Table 6.10 presents the resulting key indicators (average and standard deviation) for the total investment costs of maritime security measures. Note the relatively high standard deviation, which indicates a substantial spreading. Straightforward application of the average in order to extrapolate to the entire EU requires therefore considering the fact that a substantial spreading should be accounted for. Using the average is nevertheless attractive with a view on obtaining some insight in total investment costs associated with maritime security measures at EU-level.

Table 6.10 Key indicators for the total investment costs of maritime security measures

Average for total investment costs	€ 62,000/ha
Standard deviation for total investment costs	€ 95,000/ha

Regarding the running costs, it has been observed in the above discussions on individual measures that additional security personnel comprise the main running cost driver. A relationship between the running cost and the number of additional security personnel is obvious then. However, the questions that relate to personnel costs (*Questions 4.5.3 and 4.5.4*) do not lead to sufficient insight in the total number of security personnel (either hired or employed). Furthermore, the interviews with representatives of port facilities revealed that information on service and physical characteristics of port facilities is less difficult to obtain than information on the total number of security personnel. Therefore, statistical analysis of a relationship between total running costs and service and physical characteristics has been applied instead.

It appears that the relationship between total running costs and number of vessels served is statistically the most significant with an R^2 of about 0.18. The resulting key indicators (average and standard deviation) for the total running costs of maritime security are presented in Table 6.11. Note again the relatively high standard deviation indicating a substantial spreading. Using the average is nevertheless attractive with a view on obtaining some insight in total running costs associated with maritime security at EU-level.

⁸ R^2 is a correlation coefficient; $R^2=1$ indicates 100% correlation, $R^2=0$ indicates no correlation.

Table 6.11 Key indicators for the total running costs of maritime security measures

Average for total running costs	€ 760/vessel served
Standard deviation for total running costs	€ 650/vessel served

The (average) values of the key indicators for the complete ports are substantially lower (see Appendix C). This may be caused by economies of scale due to cost sharing between different facilities within the same port. With a view on the limited number of analysed complete ports (7), further study on the issue of economies of scale due to cost sharing (between different facilities within the same port) is recommended.

6.4 Summary

It has been observed from the results of the questionnaires for the Port Facilities that:

- The average level of compliance at 1 January 2004 was about 70% indicating that a relatively limited effort had to be made by the port facilities to obtain 100% compliance.
- The average investment cost (i.e. per facility) due to security regulations was about € 464,000, and the average running cost is about € 234,000.
- In order to recover security costs, introduction of a separate ISPS tariff is mostly applied. To what extent it contributes to security cost recovery could not be deducted from the obtained data, because there is a strong indication that not all customers of port facilities have to pay for security measures taken by the facilities.
- Only the facilities in Lithuania (6 facilities) among the respondents indicated that they receive subsidy. It should however be noted that they gave no insight in the amount of subsidies.
- The cost category Landside – accesses and entrances has the largest share in the investment costs (44%), followed by investments in Electronic systems (34%) and Seaside access (14%). The categories Landside – railways and roads and Inspections and insurances count for 4% and 3%, respectively. Personnel counts for only 1% of the investment costs. Regarding the running costs, it has been observed that Personnel costs (with 57%) have by far the largest share in total running costs. Inspections and insurances count for only 2% of total running costs.
- Ro/Ro and Container facilities show relatively low investment costs (€ 101,000 and € 74,000, respectively), while Multi-Purpose facilities revealed relatively high investment costs (€ 798,000). The latter can possibly be explained by the fact that multiple commercial activities at one facility may consequently lead to less conveniently arranged security, which requires relatively high investments to improve. Notable is also the relatively high



investment costs for cruise facilities (€ 430,000). Regarding the average running costs, it has been observed that Ro/Ro and Container facilities show also relatively low running costs (€ 69,000 and € 108,000, respectively). Multi-Purpose facilities reveal also relatively high running costs (€ 409,000).

- Port facilities in Northern and Southern Europe particularly invested in the cost categories Landside – accesses and entrances Electronic systems, while facilities in Central Europe (more in particular: the Netherlands) invested particularly in Landside – accesses and entrances and Seaside access. The cost category Personnel has in the three geographical regions (by far) the largest share in the running costs.
- The total initial costs to get facilities recognised ('acknowledged') is € 179,000. One facility in the Netherlands, six in Spain and four in Lithuania indicated they actually made this investment. The associated average cost for these facilities were € 20,000 for the Dutch facility, € 4,200 for the Spanish facilities and € 33,325 for the Lithuanian facilities. The overall average (i.e. over all respondents that actually made this investment) is estimated at € 16,272.
- Three facilities in the Netherlands, one in Spain and three in Lithuania indicated they had to make costs for approval ('endorsement'). The resulting average costs for these facilities are € 13,333 for the Dutch facilities, € 640 for the Spanish facility and € 37,000 for the Lithuanian facilities. Due to the limited number of facilities that indicated to be approved by a RSO (6), a systematic difference in approval costs between Designated Authorities and RSO's or combined with the different geographical regions could not be determined.
- The average running cost for Inspections and insurances is € 5,000 per annum. For this cost, significant differences between geographical regions or countries have not been observed.
- For total investments, a cost of € 62,000/ha has been estimated. For total running costs, a cost of € 760/vessel served has been estimated. Despite the substantial spreading among the respondents, using these key indicators is attractive with a view on obtaining some insight in total costs associated with maritime security at EU-level. The values of the key indicators for the complete ports are substantially lower. This may be caused by economies of scale due to cost sharing between different facilities within the same port. With a view on the limited number of analysed complete ports (7), further study on the issue of economies of scale due to cost sharing is recommended.

7 FINDINGS REGARDING SHIPPING COMPANIES

7.1 Introduction

The previous chapter presented the findings regarding the Port Facilities. In the present chapter, the findings from the questionnaires for the Shipping Companies are presented.

The remainder of this chapter is divided into two sections. In Section 7.2, the results and observations regarding the completed questionnaires for the Shipping Companies are presented. Section 7.3 summarizes the main findings of this chapter.

7.2 Results and Observations Shipping Companies

7.2.1 General

This section pays attention to the costs and funding of maritime security measures taken by shipping companies. It should be noted that the results in this sections should be interpreted carefully due to the limited number of (selected) respondents (7). Subsection 7.2.2 presents the characteristics of the shipping companies that completed the questionnaires and were selected for further analysis. Level of compliance, total costs and funding of security measures are discussed in Subsection 7.2.3, while Subsection 7.2.4 provides some insight in the details of the costs.

7.2.2 Characteristics

The Shipping Companies were asked to provide a brief description of their characteristics such as their number of vessels in service (*Question 1.2*). Table 7.1 presents the figures for the characteristics *number of shipping companies* and *average number of vessels per shipping company* per commercial activity.

Table 7.1 Characteristics of the selected carriers

	Liquid Bulk	RoRo	Cruise	Ferries	General Cargo	Multi-Purpose
Nr. of shipping companies	2	1	1	1	1	1
Average nr. of vessels per shipping company	5	7	2	26	2	22

The selected respondents are specialized in various commercial activities (Liquid Bulk, RoRo, etc.). Because the number of respondents per commercial activity is limited, further study on cost differences between commercial activities has not been performed. It can further be observed that among the respondents, the activity Ferries (1 shipping company) has the largest number of vessels being followed by the activity Multi-Purpose.

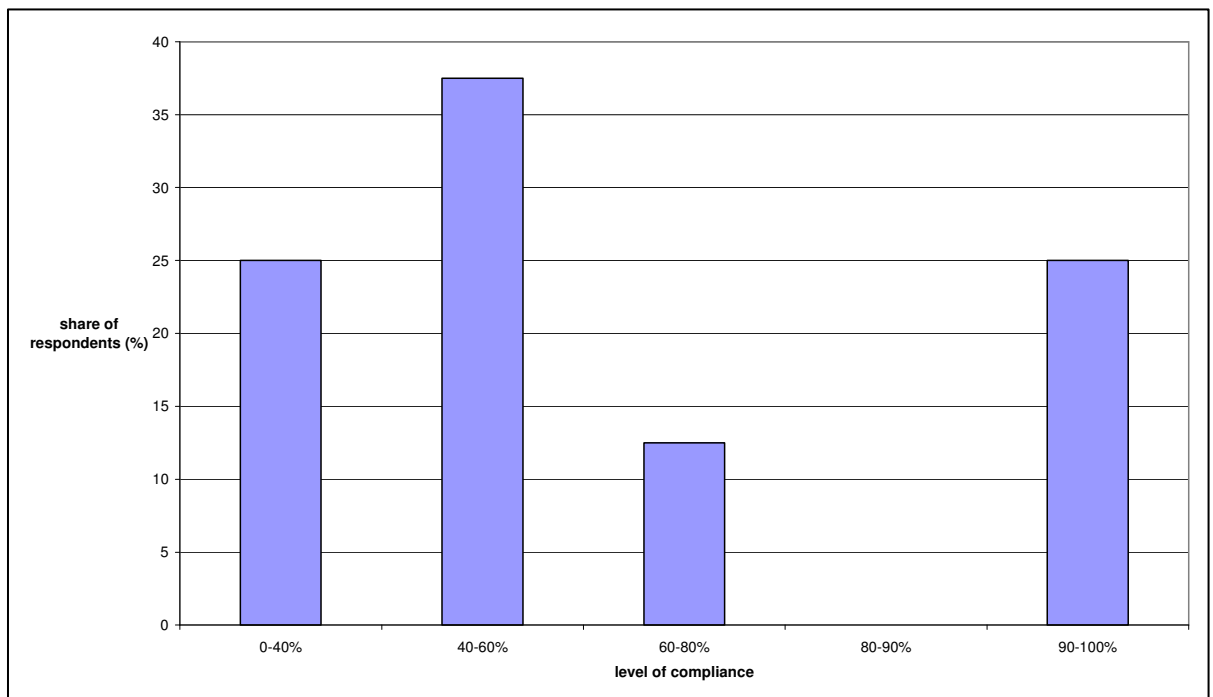
7.2.3 Level of Compliance, Total Costs and Funding

Question 2.1 relates to the level of compliance regarding EU/ISPS maritime security regulations at 1 January 2004, which has been considered representative for the Shipping Companies. The date *1 January 2004* has been chosen for this study (also for the Port Facilities; see Chapter 6), because:

- 1) maritime industry – as any industry - is usually postponing investments to the latest possible date; so, 1 January 2004 is sufficiently before the deadline of 1 July 2004 when the relevant security regulations came into force; and
- 2) 1 January 2004 is clear in mind of maritime industries' representatives.

Figure 7.1 gives the distribution of level of compliance (over all shipping companies that have responded and have been selected for further analysis).

Figure 7.1: Level of compliance at 1 January 2004





It can be observed from Figure 7.1 that 25% of the shipping companies was almost or fully compliant at the reference date of 1 January 2004. The average level of compliance at that date was about 56% indicating that a substantial effort had to be made by the shipping companies to obtain 100% compliance.

In *Questions 3.1* and *3.2*, the Shipping Company was asked to provide overall information on security costs (*Question 3.1.1* and *3.1.2*) and security cost recovery (*Questions 3.2.1-3.2.3*).

Table 7.2 presents the investment costs due to Regulation (EC) Nr. 725/2004. It should be noted that these costs represent *additional* investment cost due to security regulations. The total investment cost represents the *sum* of all additional investment costs made by all shipping companies that have responded and have been selected for further analysis. The average investment costs are arithmetic averages of the additional investment costs determined over all shipping companies that have responded and have been selected for further analysis (7), and the overall number of vessels (64) as indicated in the questionnaires, respectively.

Table 7.2 Investment costs due to security regulations

Total investment cost	€ 6,279,000
Average investment cost per shipping company	€ 897,000
Average investment cost per vessel	€ 98,109

The investment cost per vessel varies however between € 3,000 and € 218,000. This large range is caused by the fact that the investment cost differ strongly per vessel type; particularly cruise vessels required substantial security investments.

An important question is whether the average security investment cost per vessel is high or not. The new building price for a vessel (in 2005 prices) varies between US\$ 25 million (for a 8000 GT reefer) and US\$ 400 million (for a 110,000 GT cruise vessel), so the average security investment cost per vessel is much less than 1% of the new building price of a vessel. On the other hand, the perceived height of the average security investment cost depends also on the (price elasticity of the) shipping market, which determines to what extent security costs can be past on to the customers.

Table 7.3 presents the running costs due to Regulation (EC) Nr. 725/2004. Similar to the investment cost, it should be noted that these costs represent *additional* running costs due to security regulations. Because the respondents could only indicate the average running cost per vessel, the total running has been determined by multiplying the average running cost with the number of

vessels (64). The average running cost per shipping company has been determined by dividing the total running cost by the number of respondents (7) that have been selected for further analysis.

Table 7.3 Running costs due to security regulations

Total running cost	€ 1,600,000
Average running cost per shipping company	€ 228,571
Average running cost per vessel	€ 25,000

The running cost per vessel varies however between € 1,000 and € 80,000. This large range is caused by the fact that also the running cost differ strongly per vessel type.

In *Questions 3.2.1-3.2.3*, the approached Shipping Companies could indicate one out of three sources (increase of tariffs, separate ISPS tariff and subsidy) to recover the costs of security measures. Indicating a combination of sources was also possible.

It appeared that the respondents used none of the three sources to finance their maritime security costs. Obviously, the respondents finance their maritime security costs out of the revenues from the regular tariffs.

7.2.4 Information on Measures and Costs

The answers on the *Questions 4.1.1-4.4.7* provide more detailed information on maritime security measures and associated costs. This information is presented below and based on distinguishing costs per 1) category of measures, and 2) individual measure.

Costs per Category of Measures

In the questionnaire for Shipping Companies, the questions on the different individual measures (see further) have been clustered into four categories, namely:

1. Accesses and entrances of vessels (*Questions 4.1.1-4.1.6*),
2. Electronic systems of vessels (*Questions 4.2.1-4.2.4*),
3. Personnel (*Questions 4.3.1-4.3.6*), and
4. Inspections and insurances (*Questions 4.4.1-4.4.7*).

Table 7.4 presents the costs per category of measures. Special attention should be paid to the average running costs per vessel: it represents the running costs per vessel, which is determined by averaging the running costs per vessel over all shipping companies that completed the questionnaire and were selected for further analysis.

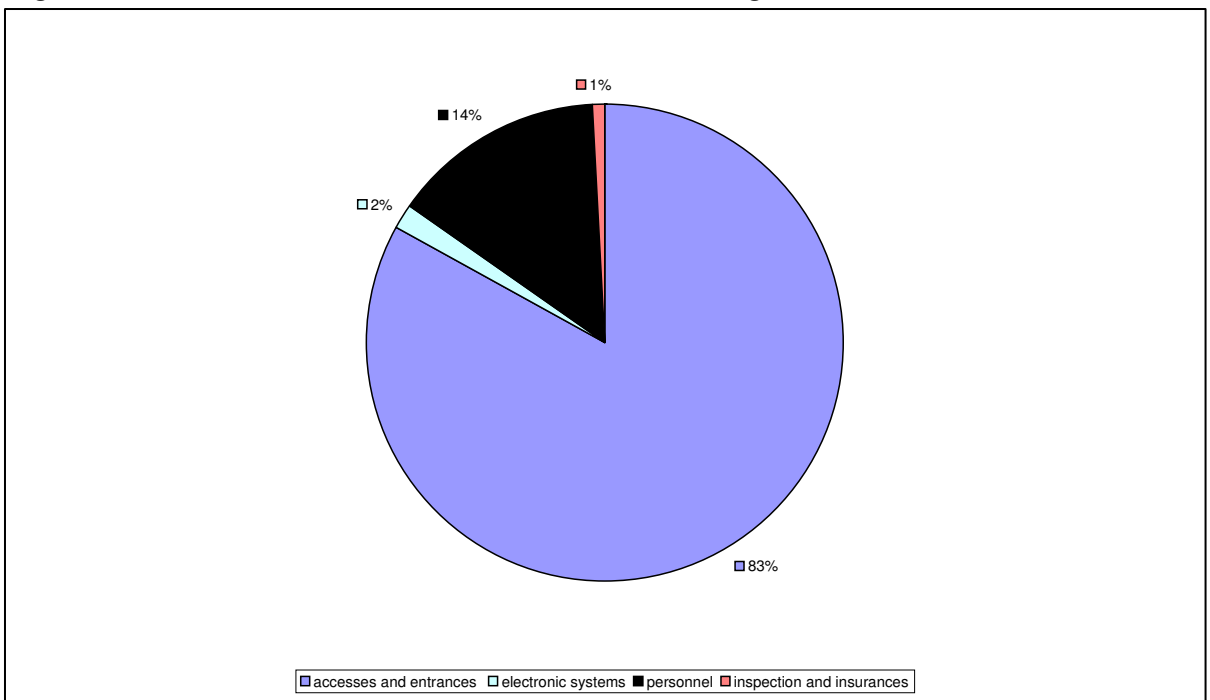
Table 7.4 Total costs per category of measures

	Total investment costs (* 1000 €)	Average running costs per vessel (* 1000 €)
Accesses and entrances of vessels	5,215	2
Electronic systems of vessels	104	1
Personnel	908	19
Inspections and insurances	52	3
Total	6,279	25

Further discussions with reference to the figures in Table 7.4. are provided below.

The pie chart in Figure 7.2 represents the distribution (in %) of the total *investment* costs over the four categories of measures.

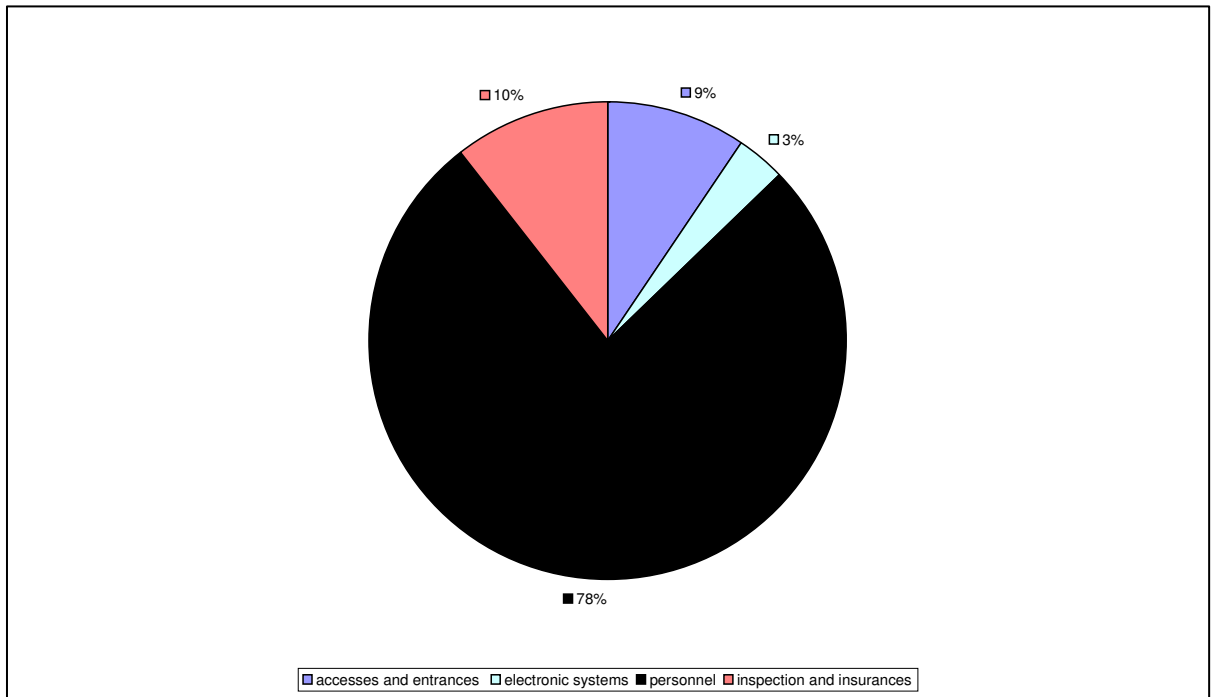
Figure 7.2: Distribution of total investment costs over categories of measures



It can be observed from Figure 7.2 that the category Accesses and entrances has by far the largest share in the investment costs (83%), followed by investments in Personnel (14%) and Electronic systems (2%). Obviously, the accesses and entrances of vessels appeared to be most sensitive component in the outcome of risk assessments. Note that the category Inspections and insurances counts for only 1%.

The pie chart in Figure 7.3 represents the distribution (in %) of the average *running* costs per vessel over the four categories of measures.

Figure 7.3: Distribution of average running costs per vessel over categories of measures



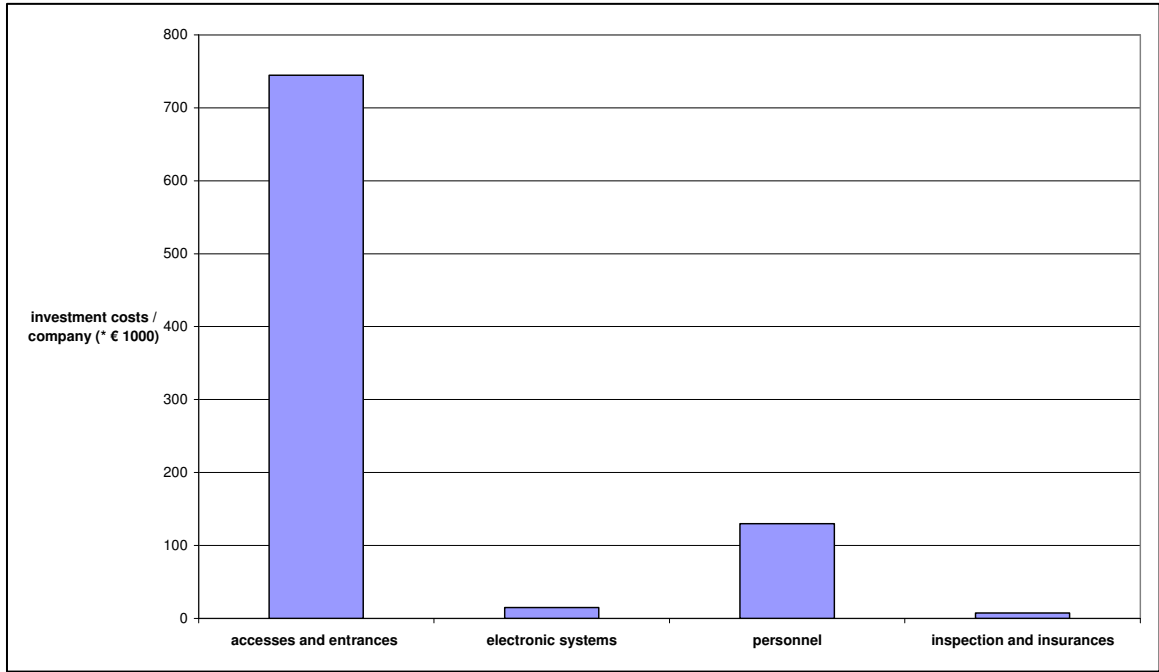
It can be observed from Figure 7.3 that Personnel costs (with 78%) have by far the largest share in total running costs, being followed by the categories Inspections and insurances (10%) and Accesses and entrances (9%). Attention should also be paid to the cost category Electronic systems, which counts for only 3% of total running costs.

Personnel costs are about € 19,000 per vessel per annum. The running costs for Inspections and insurances comprise € 3,000 per vessel per annum.

Below, some information is given on *average* investment costs (per shipping company) per category of measures. These figures represent the arithmetic averages of the investment costs per category averaged over all shipping companies that have responded and have been selected for further analysis. Although this information should be treated carefully (due to the limited number of respondents and not each shipping company implemented all categories of measures and, if so, to the same extent), studying average costs is however interesting with a view on getting some indication on maritime security costs at company level.

Figure 7.4 provides information on the average *investment* costs (per shipping company) per category of measures.

Figure 7.4 Average investment costs (per shipping company) per category of measures



It can be observed from Figure 7.4 that the category Accesses and entrances has by far the highest average investment costs (€ 745,000). This confirms the findings from the total investment costs (see above).

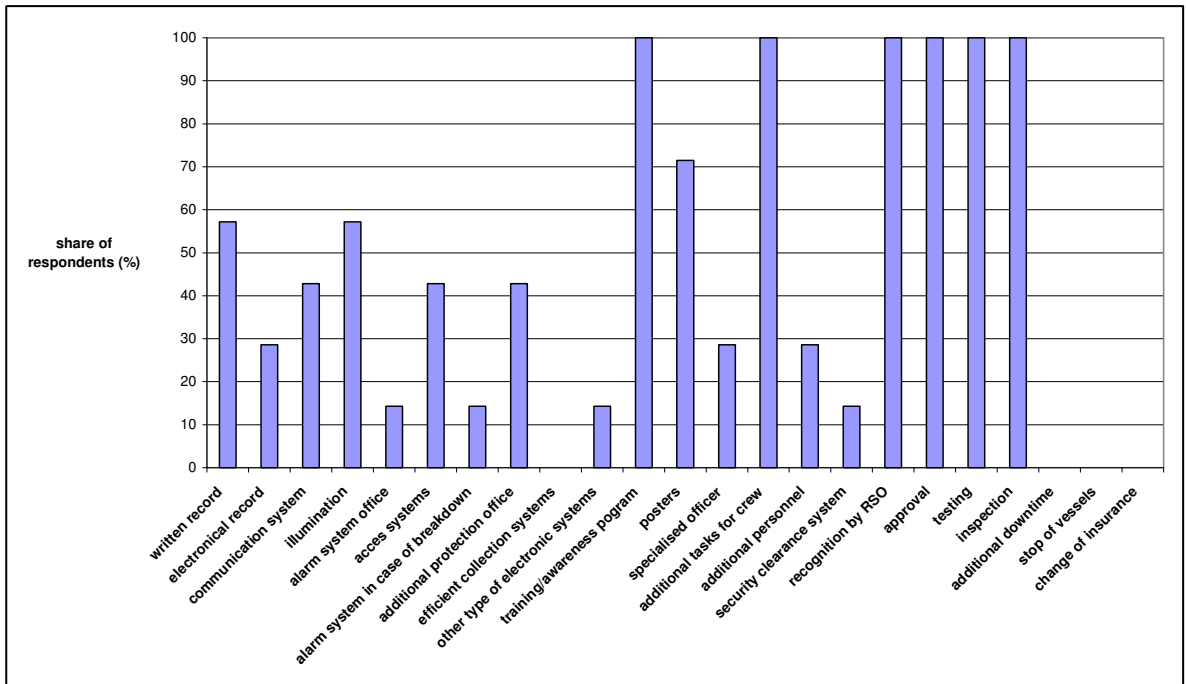
Special attention should be paid to the cost category Inspections and insurances, which comprises the average costs for getting a vessel recognized and approved by an Administration (i.e. the ‘Designated Authority’ for ship security) or Recognised Security Organisation (RSO) on its behalf. This average cost is estimated to be € 7,000.

Costs per Individual Measures

Implementation

Figure 7.5 gives for each individual measure an overview of the share of the respondents that implemented that measure.

Figure 7.5: Share of respondents that implemented individual measures.



It can be observed from Figure 7.5 that more than 55% of the shipping companies implemented a written record of visitors, personnel, etc. (*Question 4.1.1*) and invested in illumination at the designated points of access for silent hours and/or poor weather conditions (*Question 4.1.4*). It can further be observed that all respondents introduced a training/awareness program for their personnel (*Question 4.3.1*) and all respondents indicated that security tasks such security checks are additional tasks for existing crews (*Question 4.3.4*).

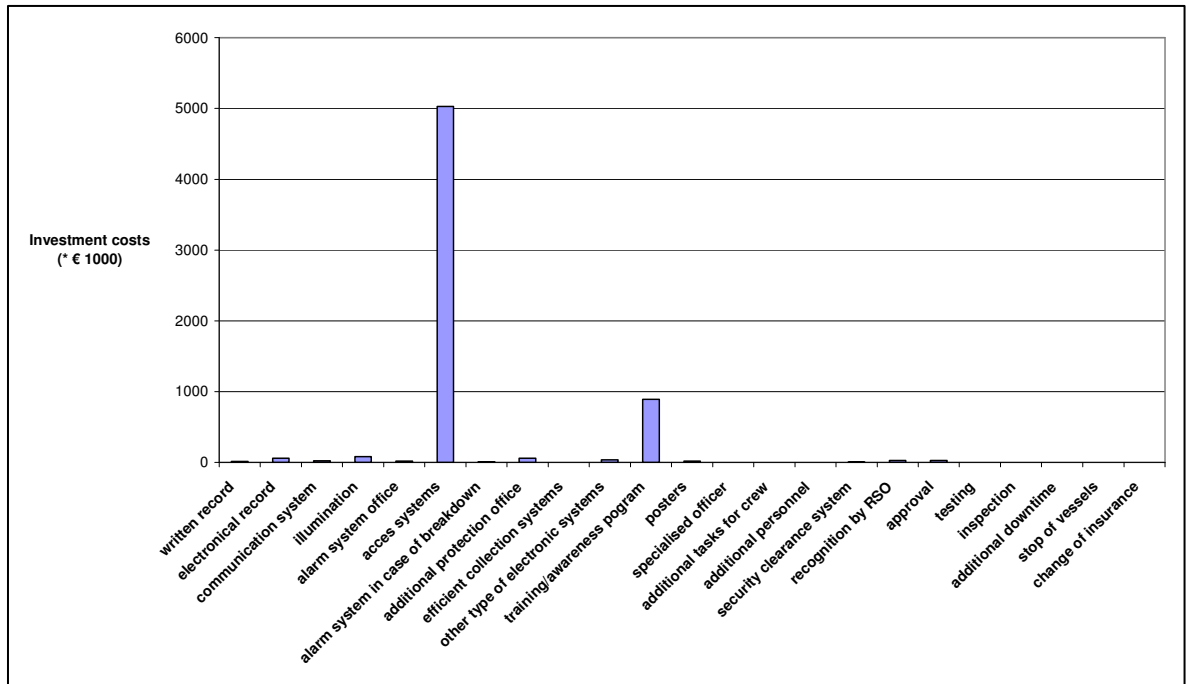
Quite obvious is the observation that all respondents were recognised ('acknowledged') and approved ('endorsed') (*Questions 4.4.1* and *4.4.2*), because such recognition and approval is required for further operations. In 3 cases, the shipping companies have been approved by an Administration and in 3 cases by a RSO. In 1 case, approval by an Administration and a RSO has been indicated.

All respondents indicated to perform regular security tests (*Question 4.4.3*) and are regularly inspected (*Question 4.4.4*).

Investment costs

Figure 7.6 gives for each individual measure the total investment cost.

Figure 7.6: Total investment costs of individual measures



It can be concluded from Figure 7.6 that investments in security access systems to prevent people from entering the vessels or secured areas on the vessels (e.g., automatic doors; *Question 4.1.6*) required by far the largest expenses being followed by the introduction of a security training or awareness program for crews (*Question 4.3.1*).

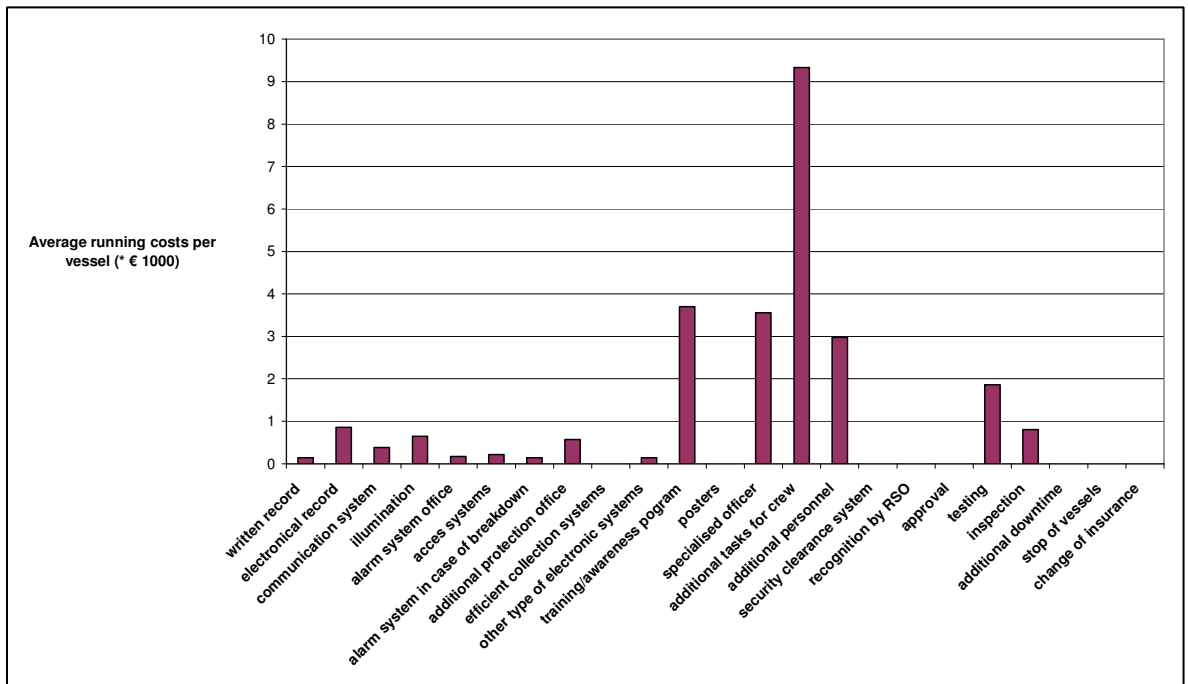
The average initial cost to get a vessel recognised ('acknowledged') is estimated to be € 4,000 (*Question 4.4.1*).

The average initial cost to get a vessel approved ('endorsed') is estimated to be € 3,000 (*Question 4.4.2*). Due to the limited number of shipping companies that completed the questionnaire and were selected for further analysis (7), a systematic difference in approval costs per vessel between Administrations and RSO's could not be determined.

Running costs

Figure 7.7 gives for each individual measure the average running costs per vessel.

Figure 7.7: Average running costs per vessel of individual measures



It can be observed from Figure 7.7 that particularly the additional security tasks for existing crews (*Question 4.3.4*) has led to an increase of running costs, namely, € 9,000 per vessel.

For further detailed information on the costs for the individual measures, the interested reader is referred to Appendix D of this report.

7.3 Summary

The quality of the completed Shipping Company-questionnaires was much lower than the quality of the completed Competent Authority- and Port facility-questionnaires, possibly due to less willingness to cooperate and therefore less accuracy in filling in the questionnaires. One shipping company (from the Netherlands) did not provide cost information on individual measures and has been left out for analysis of the Shipping Company-results. Other respondents gave total running costs instead of running costs per vessel. Consequently, some assumptions had to be made on the running costs. This, in addition to the limited number of Shipping Company-questionnaires (7) that can be used for further analysis, gives reason to be careful in interpreting the results for the shipping companies.

It can be observed from the results of the questionnaires for the Shipping Companies that:



- The average level of compliance at 1 January 2004 was about 56% indicating that a substantial effort had to be made by the shipping companies to obtain 100% compliance.
- The average investment cost per vessel associated with security regulations was about € 98,109.
- The security investment cost per vessel varies however between € 3,000 and € 218,000. This large range is caused by the fact that the investment cost differ strongly per vessel type; particularly cruise vessels required substantial security investments.
- An important question is whether the average security investment cost per vessel is high or not. The new building price for a vessel (in 2005 prices) varies between US\$ 25 million (for a 8000 GT reefer) and US\$ 400 million (for a 110,000 GT cruise vessel), so the average security investment cost per vessel is much less than 1% of the new building price of a vessel. On the other hand, the perceived height of the average security investment cost depends also on the (price elasticity of the) shipping market, which determines to what extent security costs can be past on to the customers.
- The average running cost per vessel associated with security regulations is about € 25,000.
- The security running cost per vessel varies however between € 1,000 and € 80,000. This large range is caused by the fact that also the running cost differ strongly per vessel type.
- The shipping companies used none of the three sources (increase of tariffs, separate ISPS tariff or subsidy) to recover security costs. Obviously, the shipping companies finance their maritime security costs out of the revenues from the regular tariffs.
- The cost category Accesses and entrances has by far the largest share in the investment costs (83%), followed by investments in Personnel (28%) and Electronic systems (2%) and Seaside access (14%). The category Inspections and insurances count for only 1%. Regarding the running costs, it has been observed that Personnel costs (with 78%) have by far the largest share in total running costs. Electronic systems count for only 3% of total running costs.
- The average cost to get a shipping company recognised ('acknowledged') and approved ('endorsed') is € 7,000. The average Personnel cost is about € 19,000 per vessel per annum.
- The average running cost for Inspections and insurances is € 3,000 per vessel per annum.

8 REFLECTIONS AND RECOMMENDATIONS

This chapter, which reflects on the main findings of this study and gives some recommendations, is divided into three sections. Section 8.1 gives a brief summary of the findings of this study. Section 8.2 elaborates on the findings by providing observations and conclusions. Section 8.3 discusses some specific recommendations for EU policy-making on Maritime Security.

8.1 Brief Summary of the Study

In December 2002, the IMO Diplomatic Conference adopted the International Ship and Port Facility Security (ISPS) Code. This Code comprises maritime security regulations in order to address measures against terrorist activities. The European Union fully agreed with its contents; Regulation (EC) Nr. 725/2004 of the European Parliament and the Council transposes in Community Law the associated rules. It extends certain provisions thereof to Member States' sea-going maritime traffic and to Member States' security controllers. At the first of July 2004, the ISPS Code entered into force in the European Union.

In practice, this means that all operating ships and port facilities should have international security certificates issued by (or on behalf of) the Government as a prove of sufficient compliance with the ISPS Code. To obtain the minimum required level of compliance, port facilities and shipping companies have to implement technical as well as organisational measures that will bring additional costs to European maritime industries.

With the present study, the European Commission will be provided with the information and analysis necessary for developing potential legislative actions at the EU level with regard to transparency and harmonisation of the application of maritime security measures, particularly with a view on its financing.

The aim of this study has been to identify costs related with maritime security measures and to provide the European Commission with accurate information on the ways they are financed (how and by whom).

Although there are various interesting questions for policy makers that might arise while considering the overall subject of this study – maritime security - from legal, economic and technological viewpoints, this study addressed in particular the following two research questions:



3. What are the additional costs associated with the implementation of Regulation (EC) Nr. 725/2004 (and port security Directive 2005/65/EC) for the European maritime industries?
4. How are these additional costs being recovered?

The present study addressed further the issue of potential government contributions (subsidies) in the cost recovery.

The methodology as applied for this study is based on 1) data collection with questionnaires, and 2) data analysis with a modelling approach. The combination of different parties involved (Competent Authorities, Port Facilities and Shipping Companies), potential differences between geographical regions in Europe (Northern, Central and Southern Europe) and various port facility and shipping company types (container, Ro/Ro, dry bulk, etc.) strongly characterize the issue of maritime security financing and has therefore been incorporated in the methodology.

Questionnaires have been the main vehicle to collect all relevant data. The questionnaires have not only been sent to the addressees, also some oral interviews were held by using the questionnaire as a guideline in order to be able to ask for some explanation. As starting date for having made security investment by port facilities and shipping companies, *1 January 2004* has been used in the questionnaires, because:

- maritime industry – as any industry - is usually postponing investments to the latest possible date; so, 1 January 2004 is sufficiently before the deadline of 1 July 2004 when the relevant security regulations came into force; and
- 1 January 2004 is clear in mind of maritime industries' representatives.

From the first beginning it was obvious that the study would rely on sensible information (e.g., on costs of and financing by private companies), respondents could use their right to raise concerns on if and to whom they should give the information. Difficulties faced with in order to get information varied from not responding at all (particularly Competent Authorities) to giving answers that could reasonably not be true according to judgement based on experience (particularly in case of some Shipping Companies). Therefore, attention was given to the way of obtaining proper responses, which was solved by 1) some oral interviews (particularly Port Facilities; see above), 2) using Introduction Letters of the EU and ESPO, 3) sending reminders by email, and 4) phone calls after sending reminders by email.



In the modelling approach to analyse the collected data, a distinction has been made between an approach for the Competent Authorities and an approach for the Port Facilities and the Shipping Companies.

The results from the Competent Authorities gave particularly insight in funding practices (public and/or private) regarding maritime security in the different member states of the EU.

The results from the questionnaires for the Port Facilities and Shipping Companies have been analysed with similar approaches. Both are commercial players with physical assets and have to deal with similar aspects of the ISPS Code and associated EU regulations. The results from the Port facilities and Shipping Companies should be considered as in-depth supplement to the more general funding information obtained from the Competent Authority-questionnaires. Particular details on costs and expenditures associated with security measures can be obtained then.

For the Port Facilities, key indicators have been derived for investment and running costs. These indicators can be used to extrapolate the results of the questionnaires to EU-level.

The present study can be characterized as an explorative study. Such a study can be distinguished from a more in-depth study in terms of:

- scope (the present study considers Competent Authorities, Port Facilities and Shipping Companies instead of only one party involved),
- number (the present study is based on a limited sample survey instead of questioning all companies and institutions involved), and
- geographical area (the present study considers the whole European Union instead of one or a few Member States).

Consequently, some restrictions have to be accounted for with regard to the level of detail of the study. On the other hand, explorative studies such as the present one fit well within the requirements for policy research that aim at obtaining an overall view on specific effects of specific regulations for a specific sector.

Regarding the response on the questionnaires, it has been observed that 100% of the addressed Port Facilities cooperated by completing and sending back the questionnaire. This relatively high response rate for the Port Facilities may be explained by the fact that many facilities have the idea that they have little or no possibilities to pass on maritime security costs to their customers, which should be addressed at EU-level.

The response rates for the Competent Authorities and Shipping Companies were substantially lower: 79% and 73%, respectively. Particularly the Shipping Companies were hardly willing to cooperate; no time for filling in the questionnaire and again being confronted with paper works associated with maritime security were main arguments for not willing to cooperate.

The overall response rate of the questionnaires was 88%, which is a relatively high response rate for questionnaires in general.

The quality of the response on the questionnaires differed strongly. The quality of the received Competent Authority-questionnaires was sufficient enough to use them all for analysis of the funding of maritime security measures. The resulting list of selected Port Facilities for further analysis comprises 27 terminals and 7 ports, which represents 89% of all completed Port Facility-questionnaires. The quality of the completed Shipping Company-questionnaires was much lower than the quality of the completed Competent Authority- and Port facility-questionnaires.

8.2 Observations and Conclusions

The present empirical study on maritime security financing has led to the following findings regarding 1) Competent Authorities, 2) Port Facilities, and 3) Shipping Companies:

Findings regarding Competent Authorities

It has been observed that the port facilities are funding the port security measures themselves. In 6 countries (Germany, Iceland, the Netherlands, UK, Malta and France), the Competent Authorities have a relative small budget for coordination and inspection.

Regarding ship security, it can be concluded that also the shipping companies are funding the security measures themselves. In 6 countries (France, UK, the Netherlands, Cyprus, Portugal and Spain), the Competent Authorities play a role but hardly any budget is mentioned.

The question whether competent authorities pass on their costs to port facilities and shipping companies has not been addressed in present study. Further research on this question is however recommended with a view on passing on costs to maritime industries.



Findings regarding Port Facilities

It has been observed from the results of the questionnaires for the Port Facilities that:

- The average level of compliance at 1 January 2004 was about 70% indicating that a relatively limited effort had to be made by the port facilities to obtain 100% compliance.
- The average investment cost (i.e. per facility) due to security regulations was about € 464,000, and the average running cost is about € 234,000.

Average investment cost	€ 464,000
Average running cost (i.e. costs per annum)	€ 234,000

- In order to recover security costs, introduction of a separate ISPS tariff is mostly applied. To what extent it contributes to security cost recovery could not be deducted from the obtained data, because there is a strong indication that not all customers of port facilities have to pay for security measures taken by the facilities.

Source for cost recovery	Description	Amount
Increase of tariffs	Percentage of facilities that increased tariff	19 %
	Revenues per facility	€ 10,000 – 750,000
Separate ISPS tariff	Percentage of facilities that introduced a separate ISPS tariff	55 %
	Revenues per facility	€ 22,000 – 1,000,000
Subsidy	Percentage of facilities that received subsidy	23 %
	Revenues per facility	not indicated

- Only the facilities in Lithuania (6 facilities) among the respondents indicated that they receive subsidy. It should however be noted that they gave no insight in the amount of subsidies.
- The cost category Landside – accesses and entrances has the largest share in the investment costs (44%), followed by investments in Electronic systems (34%) and Seaside access (14%). The categories Landside – railways and roads and Inspections and insurances count for 4% and 3%, respectively. Personnel counts for only 1% of the investment costs. Regarding the running costs, it has been observed that Personnel costs (with 57%) have by far the largest share in total running costs. Inspections and insurances count for only 2% of total running costs.
- Ro/Ro and Container facilities show relatively low investment costs (€ 101,000 and € 74,000, respectively), while Multi-Purpose facilities revealed



relatively high investment costs (€ 798,000). The latter can possibly be explained by the fact that multiple commercial activities at one facility may consequently lead to less conveniently arranged security, which requires relatively high investments to improve. Notable is also the relatively high investment costs for cruise facilities (€ 430,000). Regarding the average running costs, it has been observed that Ro/Ro and Container facilities show also relatively low running costs (€ 69,000 and € 108,000, respectively). Multi-Purpose facilities reveal also relatively high running costs (€ 409,000).

- Port facilities in Northern and Southern Europe particularly invested in the cost categories Landside – accesses and entrances Electronic systems, while facilities in Central Europe (more in particular: the Netherlands) invested particularly in Landside – accesses and entrances and Seaside access. The cost category Personnel has in the three geographical regions (by far) the largest share in the running costs.
- The total initial costs to get facilities recognised ('acknowledged') is € 179,000. One facility in the Netherlands, six in Spain and four in Lithuania indicated they actually made this investment. The associated average cost for these facilities were € 20,000 for the Dutch facility, € 4,200 for the Spanish facilities and € 33,325 for the Lithuanian facilities. The overall average (i.e. over all respondents that actually made this investment) is estimated at € 16,272.
- Three facilities in the Netherlands, one in Spain and three in Lithuania indicated they had to make costs for approval ('endorsement'). The resulting average costs for these facilities are € 13,333 for the Dutch facilities, € 640 for the Spanish facility and € 37,000 for the Lithuanian facilities. Due to the limited number of facilities that indicated to be approved by a RSO (6), a systematic difference in approval costs between Designated Authorities and RSO's or combined with the different geographical regions could not be determined.
- The average running cost for Inspections and insurances is € 5,000 per annum. For this cost, significant differences between geographical regions or countries have not been observed.
- For total investments, a cost of € 62,000/ha has been estimated. For total running costs, a cost of € 760/vessel served has been estimated. Despite the substantial spreading among the respondents, using these key indicators is attractive with a view on obtaining some insight in total costs associated with maritime security at EU-level. The values of the key indicators for the complete ports are substantially lower. This may be caused by economies of scale due to cost sharing between different facilities within the same port. With a view on the limited number of analysed complete ports (7), further study on the issue of economies of scale due to cost sharing is recommended.



Findings regarding Shipping Companies

The quality of the completed Shipping Company-questionnaires was much lower than the quality of the completed Competent Authority- and Port facility-questionnaires, possibly due to less willingness to cooperate and therefore less accuracy in filling in the questionnaires. One shipping company (from the Netherlands) did not provide cost information on individual measures and has been left out for analysis of the Shipping Company-results. Other respondents gave total running costs instead of running costs per vessel. Consequently, some assumptions had to be made on the running costs. This, in addition to the limited number of Shipping Company-questionnaires (7) that can be used for further analysis, gives reason to be careful in interpreting the results for the shipping companies.

It can be observed from the results of the questionnaires for the Shipping Companies that:

- The average level of compliance at 1 January 2004 was about 56% indicating that a substantial effort had to be made by the shipping companies to obtain 100% compliance.
- The average investment cost per vessel associated with security regulations was about € 98,109.

Average investment cost per vessel	€ 98,109
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- The security investment cost per vessel varies however between € 3,000 and € 218,000. This large range is caused by the fact that the investment cost differ strongly per vessel type; particularly cruise vessels required substantial security investments.
- An important question is whether the average security investment cost per vessel is high or not. The new building price for a vessel (in 2005 prices) varies between US\$ 25 million (for a 8000 GT reefer) and US\$ 400 million (for a 110,000 GT cruise vessel), so the average security investment cost per vessel is much less than 1% of the new building price of a vessel. On the other hand, the perceived height of the average security investment cost depends also on the (price elasticity of the) shipping market, which determines to what extent security costs can be past on to the customers.
- The average running cost per vessel associated with security regulations is about € 25,000.

Average running cost per vessel	€ 25,000
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- The security running cost per vessel varies however between € 1,000 and € 80,000. This large range is caused by the fact that also the running cost differ strongly per vessel type.
- The shipping companies used none of the three sources (increase of tariffs, separate ISPS tariff or subsidy) to recover security costs. Obviously, the shipping companies finance their maritime security costs out of the revenues from the regular tariffs.
- The cost category Accesses and entrances has by far the largest share in the investment costs (83%), followed by investments in Personnel (28%) and Electronic systems (2%) and Seaside access (14%). The category Inspections and insurances count for only 1%. Regarding the running costs, it has been observed that Personnel costs (with 78%) have by far the largest share in total running costs. Electronic systems count for only 3% of total running costs.
- The average cost to get a shipping company recognised ('acknowledged') and approved ('endorsed') is € 7,000. The average Personnel cost is about € 19,000 per vessel per annum.
- The average running cost for Inspections and insurances is € 3,000 per vessel per annum.

8.3 Recommendations

There is a range of possibilities to widen the scope of studies on maritime security financing. The reflections as discussed above have triggered some thoughts about a number of topics that fit into this wider scope and that should receive particular attention with a view on future EU regulations on maritime security. The following three topics can be mentioned:

Best practice

This explorative study has been focused on the additional initial and running costs associated with security measures in the EU and the ways to recover them. From the viewpoint of (the cost of) monitoring, enforcement and maintenance of port security, it could be worthwhile to assess the different EU ways of these activities in order to start a discussion together with the port industry on a harmonized (legal) system of best practice.

Competition

The results of this study indicate that port facilities and shipping companies have found their own ways to cover their additional security cost. However, particularly from the viewpoint of a strong international competitive EU and the permanent discussion of a level playing field, it could be interesting to initiate further long-term analysis on the effects of security measures on the competitive positions of seaports within the different EU port ranges (Baltic, Hamburg-Le Havre, Mediterranean, etc.).



Training

Since running costs comprise about 50% of the initial cost and the major part of these annual returning running cost will be investments in personnel, the EU could start a discussion on a new professional certificate and training course for port security labour. The relevance of such discussion is highlighted by the observation made in the present study that all port facilities and shipping companies that have responded on the questionnaires, introduced a security training/awareness program for their personnel.



REFERENCES

The World Factbook, <http://www.cia.gov>

European Commission (2003). Regulation 725/2004 on ships and port facility security.

European Commission (2004). Port Security Directive 2005/65/EC.

ISL (2006). ISL Market Analysis 2006.

Kallinen, M. (2003). Port Security and VTS – Implementation of the ISPS Code in the VTS operation. MSc-thesis. Erasmus University, Rotterdam, the Netherlands.

IMO Chapter XI-2 SOLAS Convention.

IMO ISPS Code.

APPENDIX A QUESTIONNAIRES



Questionnaire for the Competent Authority

1. IDENTIFICATION, LOCATION AND SIZE OF RESPONSIBLE AREA

1.1 Please give the formal details of the Competent Authority.

name _____
address _____
contact person _____

1.2 Please indicate the origin of the mandate; if applicable: list the body by which the Competent Authority is mandated for this function.

name _____
address _____
contact person _____

1.3 Please check mark and describe the geographical area over which the Competent Authority holds responsibility.

- Entire country
 Regional, namely _____
_____ (region/province/etc.)

1.4 Please check mark whether your responsibility comprises

- port facility security (please answer questions 2.1 – 2.10)
 ship security (please answer questions 3.1 – 3.8)
 port facility security and ship security (please answer questions 2.1 – 3.8)

2. PORT FACILITY SECURITY

2.1 Please indicate how many individual port facilities are located / identified within your responsible area

- 1
 2-5
 6-10
 10-20
 20-50
 50-100
 100+



2.2 Please indicate the approximate number of sea-going arrivals per calendar year for your area of responsibility.

Arrivals from cargo vessels	_____
Arrivals from regular passenger lines (e.g. ferries)	_____
Arrivals from other passenger vessels (e.g. cruise)	_____

2.3 Please indicate the number of countries that host their port of origin (e.g. last port of call).

- less than 10
- 10-20
- 20-30
- 30-50
- 50-80
- 80-110
- over 110 different countries

2.4 Please indicate the relative distribution of cargoes (as % of the total annual volume)

- containerised cargo [___ %]
- oil / energy bulks [___ %]
- other liquid bulks [___ %]
- dry (agri) bulks [___ %]
- dry (other) bulks [___ %]
- conventional cargo [___ %]

2.5 Please indicate the annual number of passengers (for both cruise vessels and ferries)

--

2.6 Please indicate the month and year that you would consider as the starting moment for the implementation of the Port Facility Security measures within your region of responsibility

Month: _____ Year: _____

2.7 Please indicate if port facilities in your region of responsibility are still implementing measures that improve the minimum level of the ISPS code

- YES
please indicate the number of port facilities: _____
- NO
please comment: _____

2.8 Please indicate who is responsible for funding port facility security (more than one answer is possible)

- Competent Authority
- other authority/government body, namely: _____

- port facilities



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- 2.9** Please indicate the annual budget (in million euros/year) for port facility security (if port facility security is funded by the Competent Authority or any other authority/government body)

Please indicate whether the State (at whatever level) levy a security tax or charge to fund security

YES, date of introduction: _____ (month and year)

NO, why not _____

- 2.10** Please indicate whether the investment and running costs for each group of security measures (landside, seaside, etc.) are funded by the Competent Authority (or any other authority/government body) by circling YES or NO. Please give also – if YES and if available - the proportion of the costs (in %) that is funded by the Competent Authority (or any other authority/government body) and amount of subsidy provided (in million euros).

- ‘*Investment costs*’ comprise non-recurrent costs associated with implementation.
- ‘*Running costs*’ comprise continuous costs associated with operating, maintenance, salaries, etc.

Group of security measures	Public funding of investment costs	Public funding of running costs
Landside – accesses and entrances (fences, illumination, etc.)	YES / NO % of costs: _____ Amount: _____	YES / NO %: _____ Amount: _____
Landside – railways and roads (partition lines, illumination, etc.)	YES / NO %: _____ Amount: _____	YES / NO %: _____ Amount: _____
Seaside (illumination, etc.)	YES / NO %: _____ Amount: _____	YES / NO %: _____ Amount: _____
Electronic systems (computers, software, etc.)	YES / NO %: _____ Amount: _____	YES / NO %: _____ Amount: _____
Personnel (training, etc.)	YES / NO %: _____ Amount: _____	YES / NO %: _____ Amount: _____
Inspections and insurances	YES / NO %: _____ Amount: _____	YES / NO %: _____ Amount: _____



Please indicate whether the above-indicated public funding by the Competent Authority (or any other authority/government body) was different in the time before Regulation (EC) 725/2004 came into force

YES, please comment _____

NO

3. SHIP SECURITY

3.1 Please indicate how many vessels for each group of cargo or type of passenger transport are coming within your responsibility

- containerised cargo [number: _____]
- oil / energy bulks [number: _____]
- other liquid bulks [number: _____]
- dry (agri) bulks [number: _____]
- dry (other) bulks [number: _____]
- conventional cargo [number: _____]
- cruise vessels [number: _____]
- ferries [number: _____]

3.2 Please indicate the number of countries that host their last port of call

- less than 10
- 10-20
- 20-30
- 30-50
- 50-80
- 80-110
- over 110 different countries

3.3 Please indicate the average vessel size for each vessel type that occurs within your responsibility

- containerised cargo [_____ TEU]
- oil / energy bulks [_____ tons]
- other liquid bulks [_____ tons]
- dry (agri) bulks [_____ tons]
- dry (other) bulks [_____ tons]
- conventional cargo [_____ tons]
- cruise vessels [_____ passengers]
- ferries [_____ passengers]

3.4 Please indicate the month and year that you would consider as the starting moment for the implementation of the Ship Security measures within your region of responsibility

Month: _____ Year: _____



3.5 Please indicate if the vessels/companies in your region of responsibility are still implementing measures that improve the minimum level of the ISPS code

YES
please indicate the number of port facilities: _____

NO
please comment: _____

3.6 Please indicate who is responsible for funding ship security (more than one answer is possible)

Competent Authority
 other authority/government body, namely: _____

carriers

3.7 Please indicate the annual budget (in million euros/year) for ship security (if port facility security is funded by the Competent Authority or any other authority/government body)

--

Please indicate whether the State (at whatever level) levy a security tax or charge to fund security

YES, date of introduction: _____ (month and year)

NO, why not _____

3.8 Please indicate whether the investment and running costs for each group of security measures (accesses and entrances of vessels, electronic systems of vessels, etc.) are funded by the Competent Authority (or any other authority/government body) by circling YES or NO. Please give also – if YES and if available - the proportion of the costs (in %) that is funded by the Competent Authority (or any other authority/government body) and amount of subsidy provided (in million euros).

- *‘Investment costs’* comprise non-recurrent costs associated with implementation.
- *‘Running costs’* comprise continuous costs associated with operating, maintenance, salaries, etc.

Group of security measures	Public funding of investment costs	Public funding of running costs
Accesses and entrances of vessels (written records, illumination, etc.)	YES / NO %: _____ Amount: _____	YES / NO %: _____ Amount: _____
Electronic systems of vessels (computers, software, etc.)	YES / NO %: _____ Amount: _____	YES / NO %: _____ Amount: _____
Personnel (training, etc.)	YES / NO %: _____ Amount: _____	YES / NO %: _____ Amount: _____
Inspections and insurances	YES / NO %: _____ Amount: _____	YES / NO %: _____ Amount: _____

Please indicate whether the above-indicated public funding by the Competent Authority (or any other authority/government body) was different in the time before Regulation (EC) 725/2004 came into force

YES, please comment _____

NO

◀ **CLOSED** and **THANK YOU FOR YOUR CO-OPERATION**

Please give your name, organisation and position and address so that we can send you the book 'Port Investment – Towards and Integrated Planning of Port Capacity' as a token of our appreciation for your co-operation:

Name: _____

Organisation: _____ Position: _____

Address: _____



Questionnaire for Port Facilities

1. IDENTIFICATION, LOCATION AND SIZE OF PORT FACILITY OPERATION

1.1 Please, list the formal details of the facility

name	_____
address	_____
contact person	_____

1.2 Please, provide for each of the facility's main activities (dry bulk, liquid bulk, RoRo, container, cruise ships, ferries, etc.) (a) annual handling volume (tons, TEU's, people, etc.), (b) number of vessels per year, and (c) average gross tonnage per vessel (tons)

Activities	Dry bulk	Liquid bulk	RoRo	Container	Cruise
(a) annual volume (TEU, people, etc)						
(b) nr. of vessels per year						
(c) average gross tonnage per vessel						

1.3 Please, provide a brief description of the facility's (a) total area (square kilometres), (b) total quay length (meters), (c) total length at landside (meters), (d) number of landside entrances, and (e) overall gross revenues (in million euros/year)

(a) total area	_____
(b) total quay length	_____
(c) total length at landside	_____
(d) nr. of landside entrances	_____
(e) overall gross revenues	_____



1.4 Please list the (maximal 5) most important foreign ports to which vessels depart (include approximate annual number of vessels involved in the service)

	foreign port of depart	/	number of vessels involved in the service
(1)	_____	/	_____
(2)	_____	/	_____
(3)	_____	/	_____
(4)	_____	/	_____
(5)	_____	/	_____

1.5 Please list the (maximal 5) most important ports from which vessels are received (include approximate annual number of vessels involved in the service)

	foreign port of reception	/	number of vessels involved in the service
(1)	_____	/	_____
(2)	_____	/	_____
(3)	_____	/	_____
(4)	_____	/	_____
(5)	_____	/	_____

2. REFERENCE LEVEL OF READINESS / COMPLIANCE

2.1 What was the average level of readiness / compliance regarding EU/ISPS maritime security regulations that can be considered representative for your facility **at 1 January 2004?**

- less than 40%
- 40%-60%
- 60%-80%
- 80%-90%
- over 90% average compliance



2.2 Please indicate if your company is still implementing measures that improve the minimum level of the ISPS code

YES

please comment: _____

NO

please comment: _____

3. OVERALL SECURITY COSTS AND SECURITY COST RECOVERY

Notes:

‘in response to EU/ISPS regulations’ refers to EU/ISPS maritime security regulations (more in particular: Regulation (EC) 725/2004) as direct reason to implement security measures.

‘Investment costs’ comprise non-recurrent costs associated with implementation.

‘Running costs’ comprise continuous costs associated with operating, maintenance, salaries, etc.

3.1 OVERALL SECURITY COSTS

3.1.1 Please indicate the estimated overall investment costs (in 1000 euros) to get your facility 100% compliant to EU/ISPS maritime security regulations

Investment costs	
------------------	--

3.1.2 Please indicate the estimated overall running costs (in 1000 euros/year) to keep your facility 100% compliant to EU/ISPS maritime security regulations

Running costs	
---------------	--

3.1.3 Please indicate the proportion of overall security costs (in %) between own resources and external subcontracting/outsourcing (e.g., external consultancy: training, civil or computer engineering, assessments, etc.)

% own resources	
% external subcontracting/outsourcing	



3.2 SECURITY COST RECOVERY

3.2.1 Did you introduce/do you intend to introduce a separate security tariff to recover the costs of security measures since the introduction of EU/ISPS regulations?

- YES
 NO, why not _____

If YES, please indicate the height of the separate security tariff (e.g., euro/ton, euro/passenger, euro/TEU, etc.)

Height of separate security tariff	
------------------------------------	--

If YES, please indicate the extra revenues due to the introduction of the separate security tariff (in 1000 euros/year)

Extra revenues due to separate security tariff	
--	--

3.2.2 Did you increase/do you intend to increase your tariffs due to investments in security measures since the introduction of EU/ISPS regulations?

- YES
 NO, why not _____

If YES, please indicate the % increase of your tariffs

% increase of tariffs	
-----------------------	--

If YES, please indicate the extra revenues due to the increase of your tariffs due to investments in security measures (in 1000 euros/year)

Extra revenues due to increase of your tariffs	
--	--

If YES, please indicate the breakdown of the extra revenues into cargo, ferries and cruises (in %)

% cargo	
% ferries	
% cruises	

3.2.3 Did you receive/do you expect to receive any government subsidy for security measures since the introduction of EU/ISPS regulations?

- YES
 NO, why not _____

If YES, please indicate the government subsidy in % of the costs

% of overall investment costs	
% of annual overall running costs	

The next part of this questionnaire includes more detailed questions on security costs. Please provide this cost information if available.



4. DETAILS ON SECURITY COSTS

4.1 LANDSIDE – ACCESSES AND ENTRANCES

4.1.1 Did you invest/do you intend to invest in a partition line (e.g., perimeter fence, drain, culvert, depression) around your facility in response to EU/ISPS regulations?

- YES
 NO, why not _____

If YES, please indicate the estimated investment (in 1000 euros) and running costs (in 1000 euros/year)

Investment costs	
Running costs	

4.1.2 Did you invest/do you intend to invest in protection of sewage systems or any other hidden ways to enter your facility in response to EU/ISPS regulations?

- YES
 NO, why not _____

If YES, please indicate the estimated investment (in 1000 euros) and running costs (in 1000 euros/year)

Investment costs	
Running costs	

4.1.3 Did you introduce/do you intend to introduce a written record of all visitors, service personnel, vehicles, freight trains, cargo traffic (inbound/outbound) etc. in response to EU/ISPS regulations?

- YES
 NO, why not _____

If YES, please indicate the estimated investment (in 1000 euros) and running costs (in 1000 euros/year)

Investment costs	
Running costs	

4.1.4 Did you introduce/do you intend to introduce an electronic record of all visitors, service personnel, vehicles, freight trains, cargo traffic (inbound/outbound) etc. in response to EU/ISPS regulations?

- YES
 NO, why not _____

If YES, please indicate the estimated investment (in 1000 euros) and running costs (in 1000 euros/year)

Investment costs	
Running costs	



4.1.5 Did you implement/do you intend to implement communication systems in place for alerting staff/security patrol personnel in the event of an emergency and/or breach in security in response to EU/ISPS regulations?

- YES
 NO, why not _____

If YES, please indicate the estimated investment (in 1000 euros) and running costs (in 1000 euros/year)

Investment costs	
Running costs	

4.1.5 Did you implement/do you intend to implement illumination at the designated points of access for silent hours and/or poor weather conditions in response to EU/ISPS regulations?

- YES
 NO, why not _____

If YES, please indicate the estimated investment (in 1000 euros) and running costs (in 1000 euros/year)

Investment costs	
Running costs	

4.1.6 Did you implement/do you intend to implement illumination in the partition line area for silent hours and /or poor weather conditions in response to EU/ISPS regulations?

- YES
 NO, why not _____

If YES, please indicate the estimated investment (in 1000 euros) and running costs (in 1000 euros/year)

Investment costs	
Running costs	

4.2 LANDSIDE – RAILWAYS AND ROADS

4.2.1 Are there are any active/working railway tracks in use for inbound/outbound cargoes within the limits of the facility?

- YES
 NO

If YES, is/will be the protection of the railway operation undertaken by the facility in response to EU/ISPS regulations?

- YES
 NO

If YES, please indicate the estimated investment (in 1000 euros) and running costs (in 1000 euros/year)

Investment costs	
Running costs	



4.2.2 Are there any public roads within or along the perimeter of the port?

- YES
 NO

If YES, is/will be the protection of the roads undertaken by the facility in response to EU/ISPS regulations?

- YES
 NO

If YES, please indicate the estimated investment (in 1000 euros) and running costs (in 1000 euros/year)

Investment costs	
Running costs	

4.3 SEASIDE

4.3.1 Did you implement/do you intend to implement any waterborne surveillance capability (e.g. CCTV, vessel patrols, etc.) or other means of preventing access to your facility from seaside in response to EU/ISPS regulations?

- YES
 NO, why not _____

If YES, please indicate the estimated investment (in 1000 euros) and running costs (in 1000 euros/year)

Investment costs	
Running costs	

4.3.2 Did you implement/do you intend to implement illumination for the water adjacent to the facility for silent hours and/or poor weather conditions in response to EU/ISPS regulations?

- YES
 NO, why not _____

If YES, please indicate the estimated investment (in 1000 euros) and running costs (in 1000 euros/year)

Investment costs	
Running costs	



4.4 ELECTRONIC SYSTEMS

4.4.1 Did you implement/do you intend to implement an alarm system in your offices/premises in the event of a break in the electrical circuit caused by an illegal activity in response to EU/ISPS regulations?

- YES
- NO, why not _____

If YES, please indicate the estimated investment (in 1000 euros) and running costs (in 1000 euros/year)

Investment costs	
Running costs	

4.4.2 Did you implement/do you intend to implement arrangements for protecting equipment in offices/premises (e.g., back-up systems, key locks on filing cabinets, personal ID cards, motion detection systems) in response to EU/ISPS regulations?

- YES
- NO, why not _____

If YES, please indicate the estimated investment (in 1000 euros) and running costs (in 1000 euros/year)

Investment costs	
Running costs	

4.4.3 Did you implement/do you intend to implement another type(s) of electronic security/surveillance system(s) in your offices/premises in response to EU/ISPS regulations?

- YES
- What types of systems do you implement? _____

- NO, why not _____

If YES, please indicate the estimated investment (in 1000 euros) and running costs (in 1000 euros/year)

Investment costs	
Running costs	

4.4.4 Did you implement/do you intend to implement approved equipment on the rest of your facility to detect and prevent the introduction of criminals, stowaways, weapons or equipment, including weapons of mass destruction, by ships' crew, visitors, passengers, service providers, vehicle operators, etc. in response to EU/ISPS regulations?

- YES
- NO, why not _____



If YES, please indicate the estimated investment (in 1000 euros) and running costs (in 1000 euros/year)

Investment costs	
Running costs	

4.4.5 Did you implement/do you intend to implement a motion detection system on the rest of your facility in response to EU/ISPS regulations?

- YES
 NO, why not _____

If YES, please indicate the estimated investment (in 1000 euros) and running costs (in 1000 euros/year)

Investment costs	
Running costs	

4.4.6 Did you introduce/do you intend to introduce dogs or electronic detection equipment on the rest of your facility to screen baggage and provisions for explosives or illicit substances in response to EU/ISPS regulations?

- YES
 NO, why not _____

If YES, please indicate the estimated investment (in 1000 euros) and running costs (in 1000 euros/year)

Investment costs	
Running costs	

4.4.7 Did you introduce/do you intend to introduce passes/ID's to screen personnel and visitors of your facility in response to EU/ISPS regulations?

- YES
 NO, why not _____

If YES, please indicate the estimated investment (in 1000 euros) and running costs (in 1000 euros/year)

Investment costs	
Running costs	

4.4.8 Did you implement/do you intend to implement a security check system (e.g., entry permits) for all vehicles and freight trains entering/leaving the facility in response to EU/ISPS regulations?

- YES
 NO, why not _____

If YES, please indicate the estimated investment (in 1000 euros) and running costs (in 1000 euros/year)

Investment costs	
Running costs	



4.4.9 Did you implement/do you intend to introduce systems (radio-telecom systems, computers, software, etc.) to ensure an efficient collection and exchange of security-related information – not as an alarm system but to support decision making in case of incidents - in response to EU/ISPS regulations?

- YES
 NO, why not _____

If YES, please indicate the estimated investment (in 1000 euros) and running costs (in 1000 euros/year)

Investment costs	
Running costs	

4.4.10 Did you implement/do you intend to implement another type(s) of electronic system(s) on the rest of your facility in response to EU/ISPS regulations?

- YES
 What types of systems do you implement? _____

- NO, why not _____

If YES, please indicate the estimated investment (in 1000 euros) and running costs (in 1000 euros/year)

Investment costs	
Running costs	

4.5 PERSONNEL

4.5.1 Did you introduce/do you intend to introduce a security training or awareness program to educate employees on the importance of security and how to conduct operations in a more secure manner in response to EU/ISPS regulations?

- YES
 NO, why not _____

If YES, please indicate the estimated investment (in 1000 euros) and/or running costs (in 1000 euros/year)

Investment costs	
Running costs	



If YES, please indicate the breakdown of the costs for the different types of security training/awareness program (in % of investment and running costs as indicated before)

	% of investment costs	% of running costs
Training for Port Facility Security Officer (PFSO)		
Mandatory security training for personnel officers		
ISPS Code familiarization course		
.....		
.....		

4.5.2 Did you introduce/do you intend to introduce any security awareness posters, pamphlets or reminders on site to remind employees of possible threats and the importance of security measures in response to EU/ISPS regulations?

- YES
 NO, why not _____

If YES, please indicate the estimated running costs (in 1000 euros/year)

Investment costs	
------------------	--

4.5.3 Did you add/do you intend to add a specialized security officer to the staff of your facility responsible for implementing security measures and procedures in response to EU/ISPS regulations?

- YES
 NO, why not _____

If YES, please indicate how many security officers you added/you are intending to add

Number of security officers	
-----------------------------	--

If YES, please indicate the estimated total running costs (in 1000 euros/year)

Running costs	
---------------	--

4.5.4 Did you introduce/do you intend to introduce specialized security personnel (either by employing or hiring) to check and control personnel and vehicles, to patrol partition lines, to watch over berthing places, etc. in response to EU/ISPS regulations?

- YES
 NO, why not _____

If YES, please indicate the estimated running costs (in 1000 euros/year)

Running costs	
---------------	--



4.6 INSPECTIONS AND INSURANCES

4.6.1 Please indicate the estimated initial costs (in 1000 euros) to get your facility recognised by Recognised Security Organisations/the Designated Authority

Initial costs	
---------------	--

4.6.2 Please indicate the estimated initial costs (in 1000 euros) to get your facility approved by an Recognised Security Organisation/the Designated Authority according to EU/ISPS regulations

Initial costs	
---------------	--

Please indicate whether the approval is performed by the Designated Authority (e.g., a national authority) or by a Recognised Security Organisation on its behalf

- Designated Authority
- Recognised Security Organisation

4.6.3 Is the effectiveness of your facility’s security measures and procedures, as implemented in response to EU/ISPS regulations, regularly tested?

- YES
- NO, why not _____

If YES, please indicate the estimated annual number of tests

Annual number of tests	
------------------------	--

If YES, please indicate the estimated average downtime for commercial activities associated with one test (in hours)

Average downtime	
------------------	--

If YES, please indicate the estimated out of pocket costs associated with one test (in 1000 euro/test)

Out of pocket costs per test	
------------------------------	--

4.6.4 Are your facility’s security measures and procedures, as implemented in response to EU/ISPS regulations, regularly inspected by authorities, insurance companies, etc.?

- YES
- NO

If YES, please indicate whether the inspections are performed by the Designated Authority (e.g., a national authority) or by a Recognised Security Organisation on its behalf

- Designated Authority
- Recognised Security Organisation

If YES, please indicate the estimated total running (‘out of pocket’) costs (in euros/year)

Running costs	
---------------	--



If YES, please indicate the estimated annual number of inspections

Annual number of inspections	
------------------------------	--

If YES, please indicate the estimated average time associated with one inspection (in hours)

Average inspection time	
-------------------------	--

If YES, please indicate the estimated total labour costs of your own personnel associated with one inspection (in labour costs/inspection)

Own labour costs per inspection	
---------------------------------	--

4.6.5 Are your facility's annual insurance costs changed since the introduction of EU/ISPS regulations?

- YES
 NO

If YES, please indicate the change (increase: +; decrease: -) of the insurance costs (in 1000 euros/year)

Increase of insurance costs	
-----------------------------	--

◀ **CLOSED** and **THANK YOU FOR YOUR CO-OPERATION**

Please give your name, organisation and position and address so that we can send you the book 'Port Investment – Towards and Integrated Planning of Port Capacity' as a token of our appreciation for your co-operation:

Name: _____

Organisation: _____ Position: _____

Address: _____



Questionnaire for Carriers

1. IDENTIFICATION, LOCATION AND SIZE OF CARRIER OPERATION

1.1 Please list the formal details of the carrier

name	_____
address	_____
contact person	_____

1.2 Please provide for each of the carrier's main activities (dry bulk, liquid bulk, RoRo, container, cruise ships, ferries, etc.) (a) number of vessels, (b) average vessel size (tons), and (c) annual transport volume (tons, TEU's, people, etc.)

Activities	Dry bulk	Liquid bulk	RoRo	Container	Cruise
(a) nr. of vessels						
(b) average vessel size						
(c) annual transport volume						

1.3 Please give the overall gross revenues of your company (in million euros/year)

overall gross revenues	_____
------------------------	-------

1.4 Please, list the (maximal 5) most important EU ports at which your vessels call (include approximate annual number of calls for each port and the annual number of vessels involved in the service)

	EU port of call/ number of calls / number of vessels involved in the service
(1)	_____ / _____ / _____
(2)	_____ / _____ / _____
(3)	_____ / _____ / _____
(4)	_____ / _____ / _____
(5)	_____ / _____ / _____



1.5 Please, list the (maximal 5) most important non-EU ports at which your vessels call (include approximate annual number of calls for each port and the annual number of vessels involved in the service)

	non-EU port of call /	number of calls /	number of vessels involved in the service
(1)	_____ /	_____ /	_____
(2)	_____ /	_____ /	_____
(3)	_____ /	_____ /	_____
(4)	_____ /	_____ /	_____
(5)	_____ /	_____ /	_____

2. REFERENCE LEVEL OF READINESS / COMPLIANCE

2.1 What was the average level of readiness / compliance regarding EU/ISPS maritime security regulations that can be considered representative for your fleet **at 1 January 2004?**

- less than 40%
- 40%-60%
- 60%-80%
- 80%-90%
- over 90% average compliance

2.2 Please indicate if your company is still implementing measures that improve the minimum level of the ISPS code

- YES
please comment: _____

- NO
please comment: _____



3. OVERALL SECURITY COSTS AND SECURITY COST RECOVERY

Notes:

'in response to EU/ISPS regulations' refers to EU/ISPS maritime security regulations (more in particular: Regulation (EC) 725/2004) as direct reason to implement security measures.

'Investment costs' comprise non-recurrent costs associated with implementation.

'Running costs' comprise continuous costs associated with operating, maintenance, salaries, etc.

3.1 OVERALL SECURITY COSTS

3.1.1 Please indicate the estimated overall investment costs (in 1000 euros) to get your fleet 100% compliant to EU/ISPS maritime security regulations

Investment costs	
------------------	--

3.1.2 Please indicate the estimated average running costs per vessel (in 1000 euros/year) to keep your fleet 100% compliant to EU/ISPS maritime security regulations

Running costs	
---------------	--

3.1.3 Please indicate the proportion of overall security costs (in %) between own resources and external subcontracting/outsourcing (e.g., external consultancy: training, mechanical or computer engineering, assessments, etc.)

% own resources	
% external subcontracting/outsourcing	

3.2 SECURITY COST RECOVERY

3.2.1 Did you introduce/do you intend to introduce a separate security tariff to recover the costs of security measures since the introduction of EU/ISPS regulations?

- YES
- NO, why not _____

If YES, please indicate the height of the separate security tariff (e.g., euro/ton, euro/passenger, euro/TEU, etc.)

Height of separate security tariff	
------------------------------------	--

If YES, please indicate the extra revenues due to the introduction of the separate security tariff (in 1000 euros/year)

Extra revenues due to separate security tariff	
--	--



3.2.2 Did you increase/do you intend to increase your tariffs due to investments in security measures since the introduction of EU/ISPS regulations?

YES

NO, why not _____

If YES, please indicate the % increase of your tariffs

% increase of tariffs	
-----------------------	--

If YES, please indicate the extra revenues due to the increase of your tariffs due to investments in security measures (in 1000 euros/year)

Extra revenues due to increase of your tariffs	
--	--

If YES, please indicate the breakdown of the extra revenues into cargo, ferries and cruises (in %)

% cargo	
% ferries	
% cruises	

3.2.3 Did you receive/do you expect to receive any government subsidy for security measures since the introduction of EU/ISPS regulations?

YES

NO, why not _____

If YES, please indicate the government subsidy in % of the costs

% of overall investment costs	
% of annual overall running costs	

The next part of this questionnaire includes more detailed questions on security costs. Please provide this cost information if available.



4. DETAILS ON SECURITY COSTS

4.1 ACCESSES AND ENTRANCES OF VESSELS

4.1.1 Did you introduce/do you intend to introduce a written record of all visitors and service personnel in response to EU/ISPS regulations?

- YES
- NO, why not _____

If YES, please indicate the estimated investment costs (in 1000 euros) and average running costs per vessel (in 1000 euros/year), and the number of vessels to which applicable

Investment costs	
Running costs per vessel (average)	
Number of vessels to which applicable	

4.1.2 Did you introduce/do you intend to introduce an electronic record of all visitors and service personnel in response to EU/ISPS regulations?

- YES
- NO, why not _____

If YES, please indicate the estimated investment costs (in 1000 euros) and average running costs per vessel (in 1000 euros/year), and the number of vessels to which applicable

Investment costs	
Running costs per vessel (average)	
Number of vessels to which applicable	

4.1.3 Did you implement/do you intend to implement communication systems on your vessels for alerting staff/security patrol personnel in the event of an emergency and/or breach in security in response to EU/ISPS regulations?

- YES
- NO, why not _____

If YES, please indicate the estimated investment costs (in 1000 euros) and average running costs per vessel (in 1000 euros/year), and the number of vessels to which applicable

Investment costs	
Running costs per vessel (average)	
Number of vessels to which applicable	

4.1.4 Did you implement/do you intend to implement illumination at the designated points of access for silent hours and/or poor weather conditions in response to EU/ISPS regulations?

(Note: there may be more than one access point per vessel. Also within a vessel, certain compartments are secured and, in case of higher risk/security level, the access points of these compartments (e.g., cargo holds, engine room, bridge) are to be



checked by personnel and may need to be illuminated)

- YES
 NO, why not _____

If YES, please indicate the estimated investment costs (in 1000 euros) and average running costs per vessel (in 1000 euros/year), the number of vessels to which applicable, and the average number of points per vessel

Investment costs	
Running costs per vessel (average)	
Number of vessels to which applicable	
Number of points per vessel (average)	

4.1.5 Did you implement/do you intend to implement alarm systems on your vessels to warn the security offices/officer of the watch in case of the entrance of illegal visitors at sea in response to EU/ISPS regulations?

- YES
 NO, why not _____

If YES, please indicate the estimated investment costs (in 1000 euros) and average running costs per vessel (in 1000 euros/year), and the number of vessels to which applicable

Investment costs	
Running costs per vessel (average)	
Number of vessels to which applicable	

4.1.6 Did you implement/do you intend to implement security access systems to prevent people from entering the vessels or secured areas on the vessels (e.g., by automatic doors, key cards to open doors, and opening/closing control of the doors from a central point, voice connection to the bridge) in response to EU/ISPS regulations?

- YES
 NO, why not _____

If YES, please indicate the estimated investment costs (in 1000 euros) and average running costs per vessel (in 1000 euros/year), and the number of vessels to which applicable

Investment costs	
Running costs per vessel (average)	
Number of vessels to which applicable	

4.2 ELECTRONIC SYSTEMS OF VESSELS

4.2.1 Did you implement/do you intend to implement alarm systems on your vessels in the event of a break in the electrical or communications network caused by an illegal activity in response to EU/ISPS regulations?

- YES
- NO, why not _____

If YES, please indicate the estimated investment costs (in 1000 euros) and average running costs per vessel (in 1000 euros/year), and the number of vessels to which applicable

Investment costs	
Running costs per vessel (average)	
Number of vessels to which applicable	

4.2.2 Did you implement/do you intend to implement arrangements for protecting offices on the vessels (e.g., computer equipment, back-up systems, key locks on filing cabinets, personal ID cards, motion detection systems) in response to EU/ISPS regulations?

- YES
- NO, why not _____

If YES, please indicate the estimated investment costs (in 1000 euros) and average running costs per vessel (in 1000 euros/year), and the number of vessels to which applicable

Investment costs	
Running costs per vessel (average)	
Number of vessels to which applicable	

4.2.3 Did you implement/do you intend to introduce systems (communication systems, computers, software, etc.) to ensure an efficient collection and exchange of security-related information – only if investments are specific for security to support decision making in case of incidents, excluding AIS and other communication systems that are supposed to be installed for other aims - in response to EU/ISPS regulations?

- YES
- NO, why not _____

If YES, please indicate the estimated investment costs (in 1000 euros) and average running costs per vessel (in 1000 euros/year), and the number of vessels to which applicable

Investment costs	
Running costs per vessel (average)	
Number of vessels to which applicable	



4.2.4 Did you implement/do you intend to implement another type(s) of electronic security/surveillance system(s) on your vessels in response to EU/ISPS regulations?

YES

What types of systems do you implement? _____

NO, why not _____

If YES, please indicate the estimated investment costs (in 1000 euros) and average running costs per vessel (in 1000 euros/year), and the number of vessels to which applicable

Investment costs	
Running costs per vessel (average)	
Number of vessels to which applicable	

4.3 PERSONNEL

4.3.1 Did you introduce/do you intend to introduce a security training or awareness program to educate your crews on the importance of security and how to conduct operations in a more secure manner in response to EU/ISPS regulations?

YES

NO, why not _____

If YES, please indicate the estimated investment costs (in 1000 euros) and average running costs per vessel (in 1000 euros/year)

Investment costs	
Running costs per vessel (average)	

If YES, please indicate the breakdown of the costs for the different types of security training/awareness program (in % of investment and running costs as indicated before)

	% of investment costs	% of running costs
Training for Ship Security Officers (SSO)		
Training for Company Security Officers (CSO)		
Mandatory security training for personnel and crews		
ISPS Code familiarization course		
.....		
.....		



4.3.2 Did you introduce/do you intend to introduce any security awareness posters, pamphlets or reminders on site to remind your crews of possible threats and the importance of security measures in response to EU/ISPS regulations?

- YES
 NO, why not _____

If YES, please indicate the estimated investment costs (in 1000 euros/year)

Investment costs	
------------------	--

4.3.3 Did you add/do you intend to add specialized security officers to the staff of your company responsible for implementing security measures and procedures on your vessels in response to EU/ISPS regulations?

- YES
 NO, why not _____

If YES, please indicate how many security officers per vessel you added/you are intending to add to the staff of your company

Number of security officers	
-----------------------------	--

If YES, please indicate the estimated running costs (in 1000 euros/year)

Running costs	
---------------	--

4.3.4 Are security tasks on your vessels such as security checks performed by existing crewmembers?

- YES
 NO

If YES, please indicate the additional average working time per crewmember due to security tasks since the introduction of EU/ISPS regulations (in % of previous working time)

Additional working time per crewmember (average)	
--	--

If YES, please indicate the additional total labour costs due to security tasks since the introduction of EU/ISPS regulations (in 1000 euros/year)

Additional total labour costs	
-------------------------------	--

4.3.5 Did you introduce/do you intend to introduce additional personnel on your vessels (either by employing or hiring) to carry out security tasks (e.g., security checks) in response to EU/ISPS regulations?

- YES
 NO

If YES, please indicate the estimated average running costs per vessel (in 1000 euros/year)

Running costs per vessel (average)	
------------------------------------	--



4.3.6 Did you introduce/do you intend to introduce for all persons with access to the passwords aboard of your vessels a security clearance (i.e. background checks, government issued clearance, etc.) system in response to EU/ISPS regulations?

- YES
 NO, why not _____

If YES, please indicate the estimated investment costs (in 1000 euros) and average running costs per vessel (in 1000 euros/year)

Investment costs	
Running costs per vessel (average)	

4.4 INSPECTIONS AND INSURANCES

4.4.1 Please indicate the estimated average initial costs per vessel (in 1000 euros) to get your vessels recognised by Recognised Security Organisations/the Designated Authority

Initial costs per vessel (average)	
------------------------------------	--

4.4.2 Please indicate the estimated average initial costs per vessel (in 1000 euros) to get an ISPS/International Ship Security Certificate for your vessels by an Recognised Security Organisation/the Designated Authority to EU/ISPS regulations

Initial costs per vessel (average)	
------------------------------------	--

Please indicate whether the associated approval is performed by the Designated Authority (e.g., a national authority) or by a Recognised Security Organisation on its behalf

- Designated Authority
 Recognised Security Organisation

4.4.3 Is the effectiveness of your vessels' security measures and procedures, as implemented in response to EU/ISPS regulations, regularly tested?

- YES
 NO, why not _____

If YES, please indicate the estimated average annual number of tests per vessel

Annual nr. of tests per vessel (average)	
--	--

If YES, please indicate the estimated average downtime per vessel for commercial activities associated with one test (in hours)

Average downtime per vessel	
-----------------------------	--

If YES, please indicate the estimated average out of pocket costs per vessel associated with one test (in 1000 euro/test)

Average out of pocket costs per vessel per test	
---	--



4.4.4 Are your vessels' security measures and procedures, as implemented in response to EU/ISPS regulations, regularly inspected by authorities, insurance companies, etc.?

- YES
 NO

If YES, please indicate the estimated average running ('out of pocket') costs per vessel (in euros/year)

Running costs per vessel (average)	
------------------------------------	--

If YES, please indicate the estimated annual number of inspections per vessel

Annual number of inspections per vessel	
---	--

If YES, please indicate the estimated average time associated with one inspection of one vessel (in hours)

Inspection time of one vessel (average)	
---	--

If YES, please indicate the estimated total labour costs of your own personnel associated with one inspection of one vessel (in labour costs/inspection)

Own labour costs per inspection of one vessel (average)	
---	--

4.4.5 Do the security inspections cause additional downtime for commercial activities?

- YES
 NO

If YES, please indicate the estimated average downtime costs per vessel (in euros/year)

Downtime costs per vessel (average)	
-------------------------------------	--

4.4.6 Have some of your vessels been stopped due to lacks in ISPS rules?

- YES
 NO

If YES, please indicate the estimated average downtime costs per vessel (in euros/year)

Downtime costs per vessel (average)	
-------------------------------------	--

4.4.7 Are your fleet's annual insurance costs changed since the introduction of EU/ISPS regulations?

- YES
 NO

If YES, please indicate the change (increase: +; decrease: -) of overall insurance costs (in 1000 euros/year)

Increase of overall insurance costs	
-------------------------------------	--



MARITIME SECURITY FINANCING – FINAL REPORT

◀ CLOSED and THANK YOU FOR YOUR CO-OPERATION

Please give your name, organisation and position and address so that we can send you the book 'Port Investment – Towards and Integrated Planning of Port Capacity' as a token of our appreciation for your co-operation:

Name: _____

Organisation: _____ Position: _____

Address: _____

APPENDIX B PORT FACILITIES - COSTS PER MEASURE

Question number	Measure	EU		Northern Europe		Central Europe		Southern Europe	
		Average investment cost (*€1000)	Average running cost (*€1000)	Average investment cost (*€1000)	Average running cost (*€1000)	Average investment cost (*€1000)	Average running cost (*€1000)	Average investment cost (*€1000)	Average running cost (*€1000)
4.1.1	partition line	91	12	135	26	17	4	72	0
4.1.2	hidden entrances	4	0	5	0	0	0	4	0
4.1.3	written record	13	20	9	14	0	0	23	35
4.1.4	electronic record	41	3	45	5	9	1	47	1
4.1.5	communication system	7	2	11	4	1	0	5	1
4.1.6	illumination designated points	21	2	4	1	2	0	45	5
4.1.7	illumination partition line	29	3	52	3	15	3	3	0
4.2.1	protection railway	13	16	13	9	1	0	19	31
4.2.2	protection public roads	5	1	5	3	8	0	0	0
4.3.1	waterborne surveillance	58	7	69	9	34	3	39	5
4.3.2	illumination silent hours	5	0	8	1	0	0	5	0
4.4.1	alarm system	4	1	8	2	2	0	0	0
4.4.2	protection offices	35	3	11	2	7	0	68	7
4.4.3	electronic sec. offices	1	0	0	0	1	0	1	0
4.4.4	approved equipment	19	4	5	2	0	0	41	8
4.4.5	motion detection	14	2	17	4	4	0	13	1
4.4.6	screen equipment	23	9	0	0	0	0	55	21
4.4.7	passes/id	20	1	24	2	2	0	24	1
4.4.8	check system	17	2	38	5	4	0	1	0
4.4.9	efficient collect system	7	2	13	4	0	0	4	0
4.4.10	other electr. systems	19	7	45	16	0	0	0	0
4.5.1	training/awareness pogram	5	5	5	4	3	3	5	6
4.5.2	awareness posters	2	0	1	0	3	0	0	0
4.5.3	specialised officer	0	22	0	6	0	6	0	41
4.5.4	specialised personnel	0	104	0	69	0	40	0	147
4.6.1	recognition	7	0	12	0	2	0	2	0
4.6.2	approval	6	0	10	0	4	0	0	0
4.6.3	testing	0	2	0	3	0	2	0	2
4.6.4	inspection	0	2	0	2	0	1	0	2
4.6.5	change of insurance	0	0	0	0	0	0	0	0

APPENDIX C KEY INDICATORS FOR COMPLETE PORTS

First analysis of the results from the Port Facilities – questionnaires made clear that some respondents (7) comprise complete ports (Oslo in Norway, Helsinki in Finland, Tallinn in Estonia, Barcelona in Spain, Koper in Slovenia, Larnaca in Cyprus and Limasol in Cyprus). These ports will be analysed separately in this appendix in order to determine key indicators for complete ports. The results of this analysis may also be interesting with a view on port security Directive 2005/65/EC.

Regarding the investment costs, it has been observed in the main text on individual measures taken by terminals that investment in the partition line is the main investment cost driver. A relationship between the investment cost and the total length at landside or the investment cost and the total dry area - both reflecting partition line requirements - is obvious then. Therefore, key indicators based on the relationship between total investment cost and total dry area (at facility level) was recommended and will here also be applied to complete ports.

Table C.1 presents the resulting key indicators (average and standard deviation) for the total investment costs of complete ports. Note the relatively high standard deviation, which indicates a substantial spreading.

Table C.1 Key indicators for the total investment costs of complete ports

Average for total investment costs	€ 4,446/ha
Standard deviation for total investment costs	€ 4,079/ha

Regarding the running costs, it has been observed in the main text that the relationship between total running costs and number of vessels served was statistically the most significant for the terminals. The resulting key indicators (average and standard deviation) for the total running costs of the complete ports are presented in Table C.2. Note again the relatively high standard deviation indicating a substantial spreading.

Table C.2 Key indicators for the total running costs of complete ports

Average for total running costs	€ 189/vessel served
Standard deviation for total running costs	€ 158/vessel served

The observation that security cost indicators for complete ports seem to be lower than those for terminals highlight the potential benefit (lower unit costs) of treating ports as an entity. Evidence for this benefit should come from further



study, for instance, on the question whether security measures should be more administration-based measures than industry-based.

APPENDIX D SHIPPING COMPANIES - COSTS PER MEASURE

Question number	Measure	EU	
		Average investment cost (*€1000)	Average running cost (*€1000)
4.1.1	written record	2	0
4.1.2	electronical record	8	1
4.1.3	communication system	3	0
4.1.4	illumination	11	1
4.1.5	alarm system office	3	0
4.1.6	access systems	718	0
4.2.1	alarm system	1	0
4.2.2	additional protection office	8	1
4.2.3	efficient collection systems	0	0
4.2.4	other electronic systems	5	0
4.3.1	training/awareness program	127	4
4.3.2	posters	2	0
4.3.3	specialised officer	0	4
4.3.4	additional tasks for crew	0	9
4.3.5	additional personnel	0	3
4.3.6	security clearance system	0	0
4.4.1	recognition	4	0
4.4.2	approval	3	0
4.4.3	testing	0	2
4.4.4	inspection	0	1
4.4.5	additional downtime	0	0
4.4.6	stop of vessels	0	0
4.4.7	change of insurance	0	0