

**JÓZEF URBAŃSKI**, WACŁAW MORGAŚ, ANDRZEJ FELSKI

Polish Naval Academy

## NATIONAL MARITIME SAFETY AND SECURITY NETWORK — GENERAL OUTLINE

### ABSTRACT

In this paper, an attempt has been made to present the first, i.e. the lowest level of maritime safety and security management. The importance of the National Network for ensuring the maritime safety and security has been increased immensely as the result of the outbreak and waging the global war on world terrorism. The national level of marine safety and security management is for some years (since 2002) the subject of many thorough and radical changes. However, there exist many reasons to conclude that process of transformation of national level of maritime safety and security will be continued, even in the much more firm manner.

### Keywords:

maritime safety, security management.

### INTRODUCTION

As first, the following questions should be shortly explained:

- why the term ‘network’ will be applied in this paper instead of the traditional term ‘system’;
- the objectives and tasks of maritime safety and security;
- the place of the national network for ensuring the maritime safety and security.

The term ‘network’ is more and more frequently applied instead of the term ‘system’. However, it is not only the matter of using the more fashionable words. The term ‘network’ is much more suitable for describing the situation that is not fully known and predictable. With such situation we have to do in process of ensuring the maritime safety and security, but mainly maritime security on national level of management.

We assume that in our case, the term ‘network’ means a group, system, etc. of interconnected and/or cooperated individuals.

The main components of the National Network for Ensuring the Maritime Safety and Security can constitute the following kinds of components:

- other kinds of networks, especially surveillance and information networks;
- different kinds of operational systems;
- particular maritime institutions, especially, the national maritime services, and others.

The main objective of ensuring the maritime safety constitutes the following two tasks [3, 4]:

- 1) ensuring the safety of life and property at sea from the geographic and operational hazards (underwater obstacles, collision, harms and damages caused by the unfavorable weather conditions, etc.)
- 2) ensuring the protection of maritime environment from pollution generated by the ships.

The objective of ensuring the maritime security constitutes realization one, or some or all of the following tasks [2, 5]:

- 1) ensuring the antiterrorist security of the economic, political or military assets, but at least security of shipping industry;
- 2) ensuring the security of the sea lines of communications from piracy, hijacking the ships, etc.;
- 3) interdiction of the realization at sea all the illegal activities such as:
  - pollution of maritime environment,
  - illegal exploitation of sea resources,
  - illegal immigration,
  - smuggling the drugs, illegal goods, weapons, terrorists and all the other illegal materials but especially these that can be used for terrorist activities;
- 4) crisis management of maritime safety and security on the national maritime areas and in the coastal zone.

The national Network for Ensuring the Maritime Safety and Security constitutes the lowest level of the safe maritime safety and security management. The higher level of ensuring the maritime safety and security constitutes the regional level, i.e. the level of the European Union. However, the highest level of ensuring the maritime safety and security constitutes the International level of management performed by the International Maritime Organization (IMO) being the specialized agency of the United Nations Organization (UNO).

However, it should be stressed that only the National Network for ensuring the maritime safety and security must realize almost all the tasks of the maritime security, except the task 2. Below there are presented the following issues:

- International Maritime Safety and Security System;
- system (network of ensuring the maritime safety and security of the European Union);
- National Network for ensuring the maritime safety and security.

### **INTERNATIONAL MARITIME SAFETY AND SECURITY SYSTEM**

International Maritime Safety and Security System is the set of international, national and regional organizations, institutions, systems and services operated and cooperated according to the International Regulatory Framework — whose main objective is maintaining the proper level of maritime safety and security on the world-ocean areas.

The main objective of the International Maritime Safety and Security System is ensuring the maritime safety and security of shipping industry. The main component parts of shipping industry are the following:

- transportation of goods and people on sea;
- sea tourism and similar activities;
- servicing the ships' traffic by ports and their facilities.

Process of ensuring the maritime safety and security comprises the realization of the following objectives:

- safety of people and property at sea;
- safety of marine environment from pollution by ships;
- antiterrorist security of ships and port facilities.

In figure 1, there are shown the main components of the International Maritime Safety and Security System of Shipping Industry. The main kinds of international maritime systems and services constitute the following ones:

- Global Navigation Satellite Systems (GNSS);
- Global Maritime Distress and Safety System (GMDSS);
- World-Wide Navigational Warning Service (WWNWS) and others.

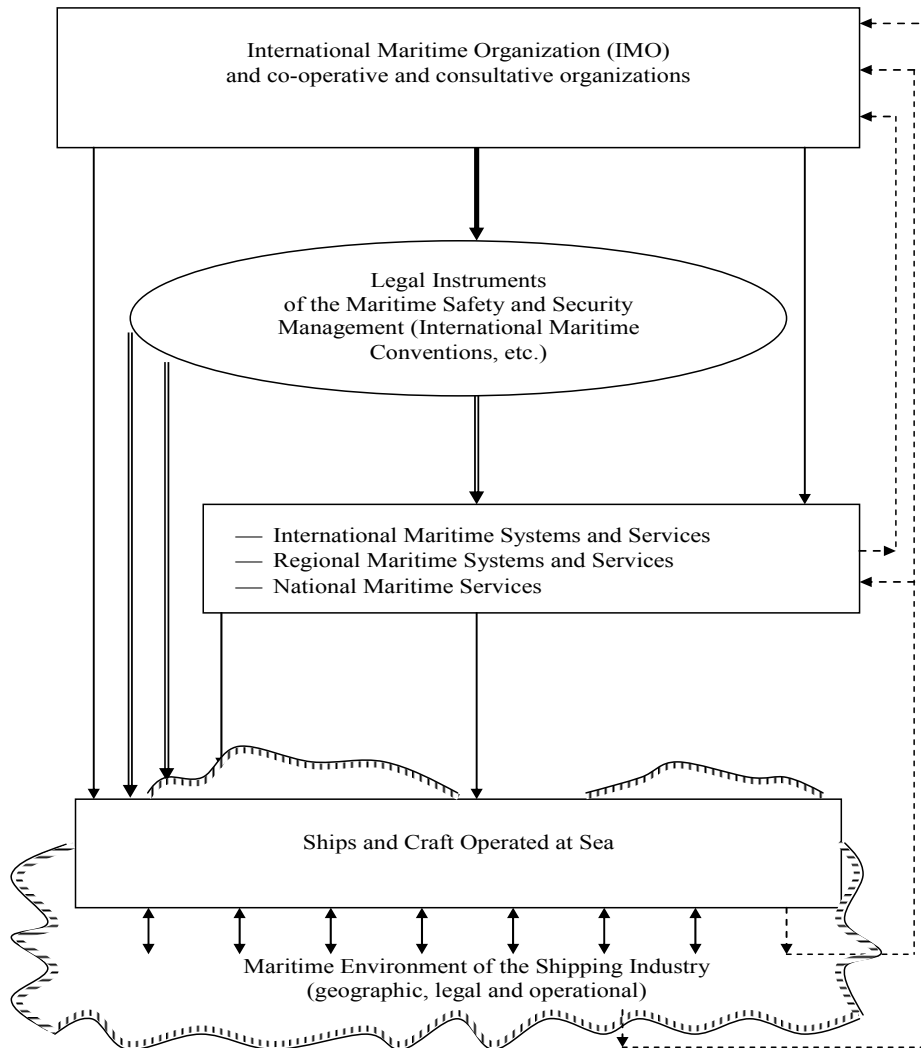


Fig. 1. The Organizational Structure of the International Maritime Safety and Security System of the Shipping Industry

### MARITIME SAFETY AND SECURITY SYSTEM NETWORK OF THE EUROPEAN UNION

Maritime areas of the European Union, because of their importance, need indispensably much higher level of safety and security than other world's regions. Therefore, already in 2002 the proper maritime safety and security systems of European

Union has been started to be established. It was the well-known Vessel Traffic Monitoring and Information System (VTMIS). In 2008, this system will be fully operated [1, 6, 7]. The main objectives of the VTMIS system are the following:

- considerably increase the safety of maritime environment from pollution by ships;
- considerably increase the maritime security of shipping industry, mainly security from terrorism;
- considerably improve the conditions for realization of the interdiction of all the illegal activities on maritime areas of Member States of the European Union.

The Vessel Traffic Monitoring and Information System (VTMIS) is composed of many component systems. In table 1, the mainly component systems of the VTMIS are given. In figure 2, there are shown the main component systems of the VTMIS.

Table 1. Main Components of the VTMIS of the European Union

No.	Name of the VTMIS's components	Note
1	Vessel Traffic Services (VTS) systems	
2	Automatic Identification System (AIS)	
3	Ships Reporting Systems (SRS)	
	Maritime Assistance Services (MASs) system, including:	
4	— Ports of Refuge	
	— Emergency Towing Vessels (ETVs)	
5	Long Range Identification and Tracking (LRIT) System	
6	Computerized Data Exchange Centres (SafeSeaNet System)	

The European Union is also the maritime power. Its importance is growing permanently. Now (2007) the European Union has begun to working out and implementing the new Integrated Maritime Strategy of the European Union. One of the main programmes of this strategy provides to establish during next 5–7 years the European Network for Maritime Surveillance (ENMS). Such Network will replace existing today VTMIS system.

The European Network for Maritime Surveillance (ENMS), similar as VTMIS system will be the maritime safety and security system of European Union. The objectives and tasks of such system were mentioned above. The establishing the European Network for Maritime Surveillance (ENMS), means that the VTMIS will be transformed into ENMS [8].

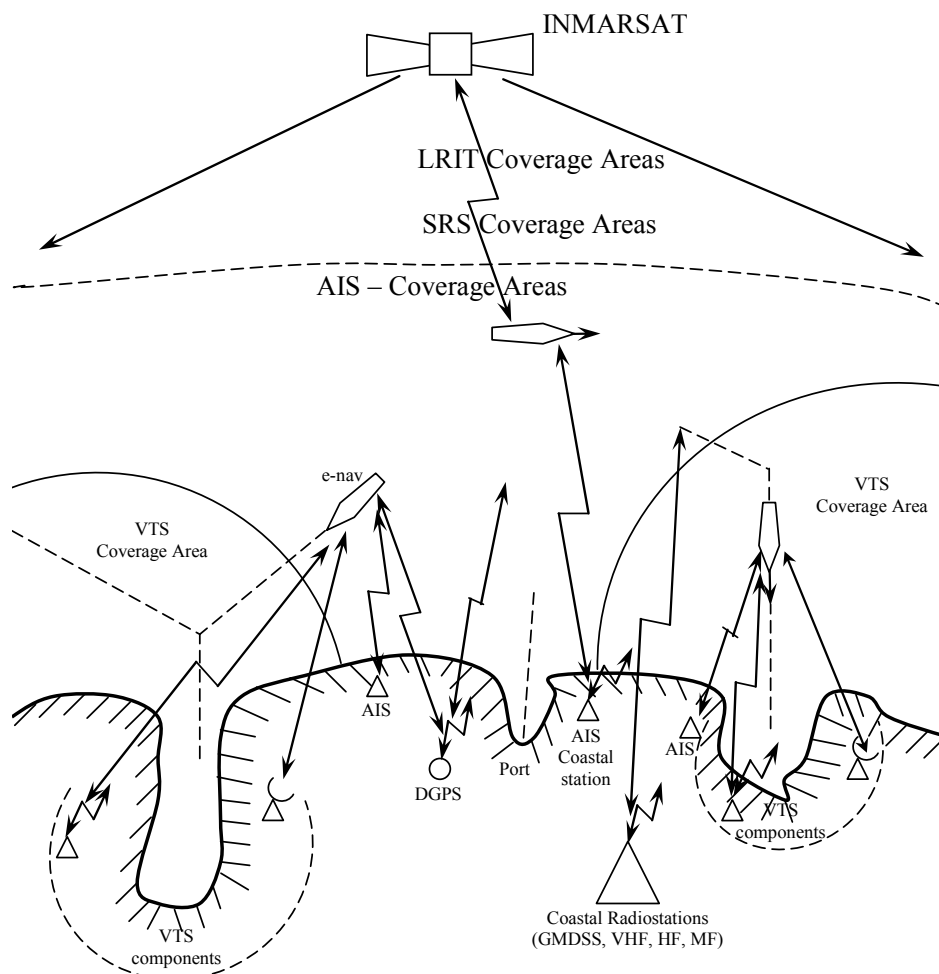


Fig. 2. VTMIS and its four component systems (VTS, AIS, SRS, LRIT) and its assistance systems (DGPS, INMARSAT and coastal radiostations VHF, HF, MF)

Transformation of the VTMIS into ENMS will be achieved mainly by the means of realization of the following undertakings:

- applying the new and modern space monitoring segment, i.e. the Global Monitoring for Environmental and Security (GMES) segment [9, 10, 12];
- accomplishing the far reaching changes in the law-enforcement services of all the Member States of EU, in order that these services in each Member State of EU should have the similar organizational structure and similar competences. The above regards as first, the Coast Guard services of EU [8].

The Global Monitoring for Environment and Security (GMES), space segment of the European Network for Maritime Surveillance (ENMS) is being now developed by the European Space Agency (ESA) and the European Union. Both these institutions cooperate also very closely with the European Organization for Exploitation of the Meteorological Satellites (EUMETSAT) [11].

In figure 3, there is shown the main space segment of ENMS, i.e. the Global Monitoring for Environment and Security (GMES) segment.

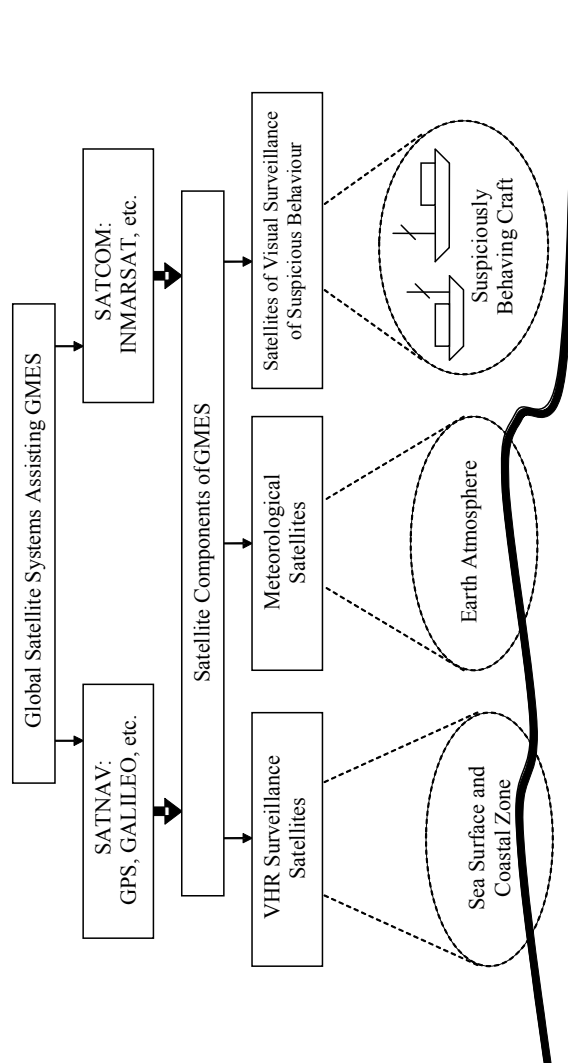


Fig. 3. The Main Components of the Global Monitoring for Environment and Security (GMES) segment

In figure 4, there are shown the main components of, being now established, the European Network for Maritime Surveillance.

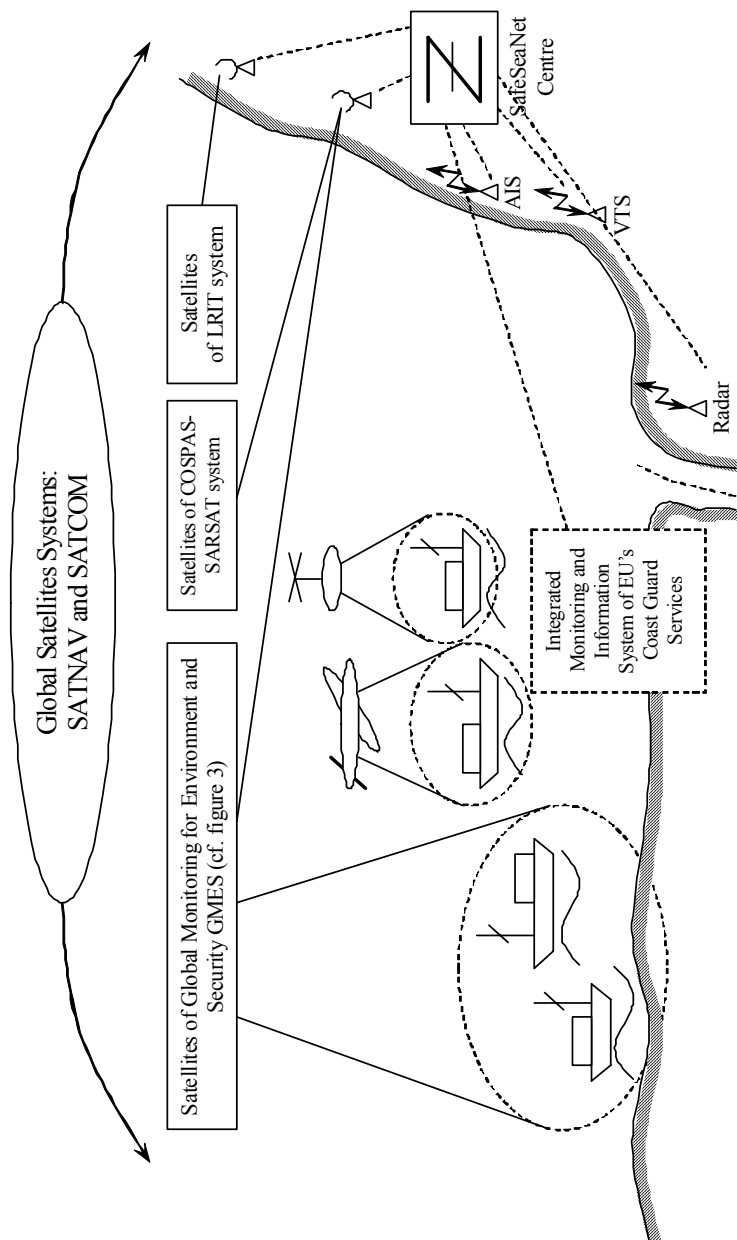


Fig. 4. The Main Components of the European Network for Marine Surveillance (ENMS)



It is assumed that the European Network for Maritime Surveillance (ENMS) i.e. the future maritime safety and security system of the European Union will constitute the following component systems:

- VTS systems;
- AIS systems;
- surveillance radars;
- Maritime Assistance Services (MASs) system;
- Long Range Identification and Tracking (LRIT) System;
- Global Monitoring for Environment and Security (GMES) space segment (cf. fig. 3);
- COSPAS-SARSAT System;
- surveillance aircraft and helicopters;
- integrated monitoring system of the national Coast Guards;
- European and National Computerized Data Exchange Centres (SafeSeaNet system).

#### **SAFETY AND SECURITY ON NATIONAL MARITIME AREAS; NATIONAL SAFETY AND SECURITY NETWORK**

National level of ensuring the maritime safety and security, although it is the lowest level, however, it is very important, especially now, when the threat from terrorism is permanently growing. There are some objectives to be achieved by the maritime safety and security on national areas. The most important of them are the following:

- 1) ensuring the proper level of maritime safety and security of shipping industry (cf. fig. 1 and explanations to it);
- 2) ensuring and maintaining the properly high level of safety of maritime environment from pollution by ships transporting the hazardous materials;
- 3) efficient interdiction of the realization of all the illegal activities on national maritime areas;
- 4) ensuring the efficient crisis management of maritime safety and security on national maritime areas.

It is evident that the above very different objectives of ensuring the maritime safety and security cannot be achieved by only one organizational structure responsible for maritime safety and security. Therefore, in the further our considerations we will discuss not the organizational structures but the functional structure, i.e. the tasks (functions) that must be realized in order to achieve the defined objectives.

In order to ensure the maritime safety and security of the shipping industry on national maritime areas it must be permanently fulfilled the proper requirements.

In table 2, there are given the basic requirements for ensuring the maritime safety and security of shipping industry (ships and craft operated on national maritime areas).

Table 2. Basic requirements for ensuring the safety and security of shipping industry on national maritime areas

No.	Main Requirements	Particular Requirements
1	Ensuring that the ships are properly built and equipped	— ships subdivision, stability, watertightness — ships fire protection — ships equipment and systems, etc.
2	Ensuring that ships are properly prepared for operation at sea	— certification of ships' equipment and systems — proper manning — proper competences of all crew members, etc.
3	Ensuring the basic navigational conditions for safe and secure operation of ships at sea	— proper establishing and operating the Aids to Navigation — provision the ships with navigational information, etc.
4	Performing the safe and secure operation of ships at sea by ships themselves	— maintaining the propulsion and energy supplying — ensuring the ships internal safety — safe and secure conducting the ships at sea, etc.
5	Ensuring the reliable alerting the ships being in distress situations and rendering them rescue assistance	— reliable and efficient operation of GMDSS and SAR Systems, etc.
6	Ensuring the antiterrorist security of ships and port facilities	— obeying the requirements of the International Ships and Port Facilities Security (ISPS) Code, etc.

The requirements shown in table 2 must be fulfilled by the ships' owners and ships themselves, being advised assisted and enforced by the national maritime services. In table 3, there are given the functions that are being realized by the national maritime services (cf. proper notices in figure 1). In figure 5, there is shown the functional structure of the National Network for ensuring the maritime safety and security of the shipping industry.

The second, i.e. the next objective of the National Network for ensuring the maritime safety and security on the national maritime areas is maintaining the high

level of safety of maritime environment from the pollution by the ships transported the hazardous materials (oil, liquid gas, chemicals, etc.). For realization of this function, has been established among other undertakings, the Maritime Assistance Services (MASs) System, including Ports of Refuge, Emergency Towing Vessel, etc.

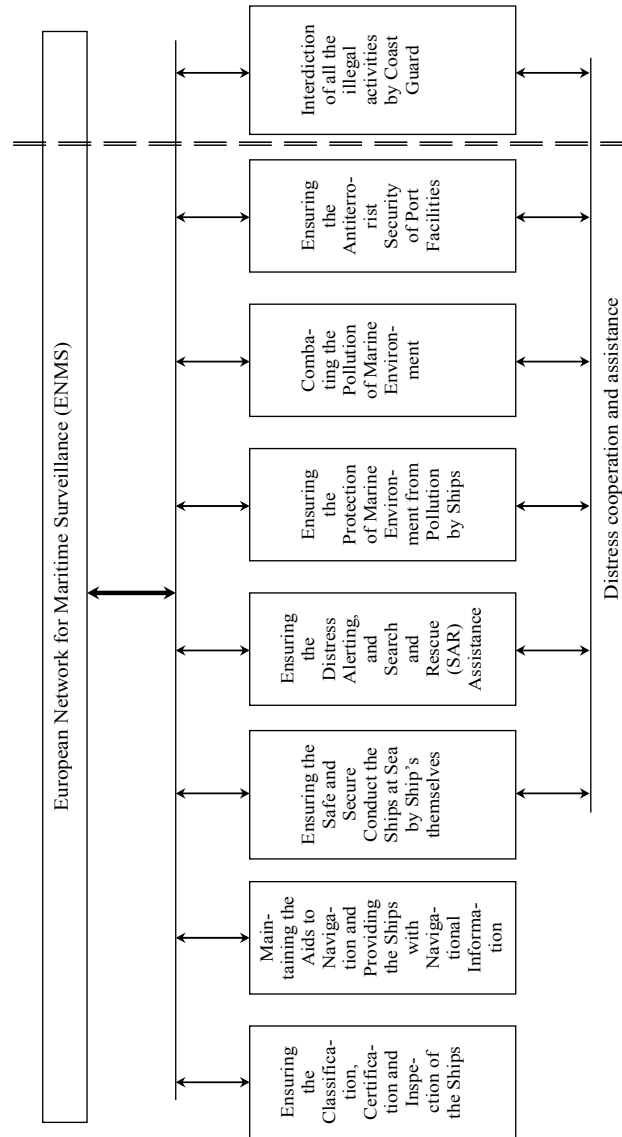


Fig. 5. The Functional structure of the National Network for ensuring the maritime safety and security of shipping industry

Table 3. Names of the basic functions of the national maritime services

No.	Names of Basic Functions of the National Maritime Services
1	Establishing and maintaining the Aids to Navigation
2	Rendering the hydrographic services
3	Ships classification
4	Ships survey and certification
5	Seafarers licensing
6	Ships inspection (Flag State Control, Port State Control, etc.)
7	Maritime accidents investigation
8	Search and Rescue (SAR) Service
9	Marine environment protection
10	Combating the marine environment pollution
11	Vessel Traffic Servicing and Navigation Assistance
12	Vessel Traffic Monitoring and Information Services
13	Ensuring the antiterrorist security of ports facilities
14	Interdictions' activities realized by Coast Guard and others

The next objective of the National Network for ensuring the maritime safety and security on national maritime areas is maintaining the efficient interdiction of realization of all the illegal activities (illegal immigration, smuggling drugs, illegal materials, weapons, terrorists, etc.). This function, as well as objective, is the basic objective of coast guard (or similar maritime law-enforcement services) of all Member States of EU. The proper component Network for interdiction of all the illegal activities on national maritime areas, have been partially shown in the figure 5 (cf. right side of this figure). For realization of this function (objective) Coast Guard uses now the Vessel Traffic Monitoring and Information System (VTMIS) of EU. In the nearest future, instead of VTMIS, for disposal of Coast Guard, will be the European Network for Maritime Surveillance (cf. figure 5 and figure 4).

The National Network for ensuring the maritime safety and security on the national maritime areas must be also able to realize the very important function, i.e. ensuring the maritime safety and security on national maritime areas in crisis situation. As follows from the announcement and realized programme regarding the European Network for Maritime Surveillance (ENMS), in the nearest future the possibilities of national Coast Guard Services regarding the interdiction function as well as crisis management ability will be permanently increased.

The above allow concluding that both functions, i.e. interdiction the illegal activities and management of the maritime safety and security in crisis situations on national maritime areas may be, should be and must be realized by the Coast Guard. These law-enforcement services, according to the programme of EU will be also much more integrated and efficient.

However, ensuring the maritime safety and security management in crisis situation on national maritime areas must be also assisted by the crisis response centers of the provincial and district levels.

In figure 6, there are shown the main component parts of the National Network for ensuring the maritime safety and security on the national maritime areas.

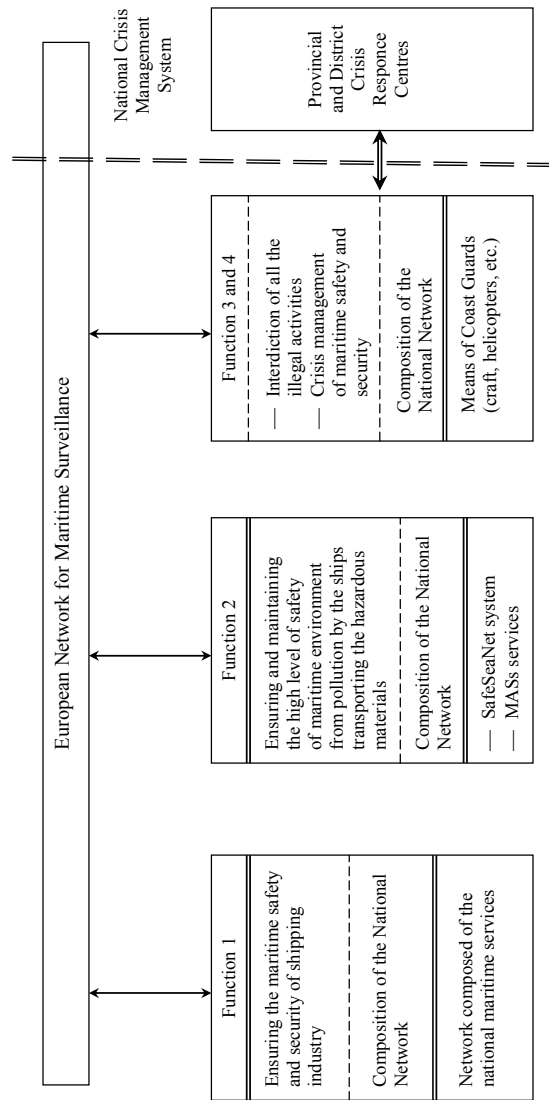


Fig. 6. Main Component Parts of the National Network for ensuring the maritime safety and security on national maritime areas

## CONCLUSIONS

In this paper, an attempt has been made to present and discuss the functions and tasks of the National Network for ensuring the maritime safety and security on the national maritime areas. All functions of the National Network have been discussed. Especially comprehensively has been presented the first, i.e. the basis function of the National Network. It is the function of ensuring the maritime safety and security of the shipping industry on the national maritime areas.

It must be stressed that the above statements and conclusions do not constitute the comprehensive picture of the most probable structure of the future National Network. However, the above data constitute the sufficient basis for working out of such Network.

## REFERENCES

- [1] Dyrzcz Cz., The terrorism of the beginning of XXI century as the international security threat, Gdynia 2005.
- [2] Jones S., Maritime Security. A practical guide, The Nautical Institute, London 2006.
- [3] Kopacz Z., Morgaś W., Urbański J., The Maritime Safety System; Its Main Components and Elements, Journal of Navigation, 2001, No. 2.
- [4] Kopacz Z., Morgaś W., Urbański J., Formal Safety Assessment (FSA) of Maritime Safety, Academic Lectures (in Polish), AMW, Gdynia 2006.
- [5] Petraiko D., The IMO E-Navigation Konzept, European Journal of Navigation, 2007, No. 5.
- [6] Urbański J., Morgaś W., Kopacz Z., The European Vessel Traffic Monitoring and Information System (VTMIS), Polish Journal of Environmental Studies, 2007, Vol. 16, No. 36.
- [7] Walczak A., Piracy and Maritime Terrorism (in Polish), Szczecin 2004.
- [8] [ec.europa.eu/maritime\\_affairs/](http://ec.europa.eu/maritime_affairs/)
- [9] [ec.europa.eu/enterprise/space/](http://ec.europa.eu/enterprise/space/)
- [10] [www.gmes.infor/](http://www.gmes.infor/)
- [11] [www.eumetsat.int/Home](http://www.eumetsat.int/Home)
- [12] [www.esa.int/esa](http://www.esa.int/esa)

Received January 2008  
Reviewed July 2008