The Adriatic sea: a particularly sensitive area

Pavao Komadina
ASSOCIATE PROFESSOR OF MEANS OF MARITIME TRANSPORT, SHIP MANOEUVRING, SHIP STABILITY AT THE FACULTY OF MARITIME STUDIES - RIJeka

Damir Zec
ASSOCIATE PROFESSOR OF MEANS OF SAFETY AT SEA AT THE FACULTY OF MARITIME STUDIES - RIJeka

L’articolo tratta della possibilità di dichiarare il Mare Adriatico un’area di particolare sensibilità, secondo la definizione data della Convenzione MARPOL 73/78. Ai fini di incrementare i livelli di sicurezza della navigazione e di proteggere l’Adriatico da inquinamenti a larga scala, vengono discusse proposte per l’introduzione di varie misure, quali un sistema di guida e un sistema di sorveglianza del traffico navale. Nel testo vengono presentate le caratteristiche essenziali dei due sistemi e viene posto l’accento sulla necessità di una stretta cooperazione fra stati rivieraschi confinanti, nel caso la Repubblica Italiana, la Repubblica Slovena e la Repubblica Croata.

Communications of the Republic of Croatia also has initiated a higher level project with fundamental aim to outline the desirable future organization of a marine traffic in the Adriatic Sea and particularly in the coastal waters of the Republic of Croatia. Therefore, this paper presents the preliminary results foreseen in the present stage of the project’s development.

2. Principles of pollution protection of sea and coast

According to MARPOL 73/78 the internationally recognized measures for marine environment can be assigned to two basic concepts: the concept of special areas “where for recognized technical reasons in relation to its oceanographical and ecological conditions and to the particular character of its traffic, the adoption of special mandatory methods for the prevention of sea pollution by oil is required” and the concept of particularly sensitive areas “which need special protection through action by IMO because of its significance for recognized ecological or socioeconomic or scientific reasons and which may be vulnerable to damage by maritime activities”. In special areas the main goal is achieved through discharging limitations, while in particularly sensitive areas the predominant measures are those that indirectly assist protection of the marine environment by preventing casualties. As the Mediterranean Sea area has already been declared as a special area, a further step to increase the level of protection of the Adriatic Sea is its declaration as a particularly sensitive area.

The criteria for establishment an area as a particularly sensitive area are grouped into three categories: the ecological criteria, social, cultural and economic criteria, and scientific and educational criteria, as defined in the IMO Assembly resolution A.720 [1]. In order to acquire an international recognition of the Adriatic Sea as a particularly sensitive area these criteria should be checked against different characteristics of the Adriatic Sea.

Regarding ecological criteria it can be deemed that the Adriatic sea met as the most important the criterion of integrity and vulnerability. Since the Adriatic Sea is a
relatively closed sea, deeply indented into the European continent, it may be considered a unique ecological system within the Mediterranean setting. Limited depths of the northern Adriatic present a specifically unfavorable condition. As a consequence, any large-scale pollution on the Adriatic would cause exceptional economic and ecologic damage to the sea and coast, as a rule far greater than, for example, pollution on the high seas.

The social, cultural and particularly economical criteria seem to have an even more important role in recognizing the Adriatic Sea as a particularly sensitive area. The significant number of inhabitants, particularly in the Republic of Italy and Republic of Croatia links its existence for different activities related to various marine technologies, and particularly to tourism. The recreational activities and tourism are of particular importance for the Republic of Croatia which declared them as being of strategic national economical interest. In that sense the littoral states on the coasts of the Adriatic Sea have to pay a special attention to large-scale pollution prevention because this type of pollution can result with much higher economic and ecological damages than, for example operational pollution from ships or physical damage to marine habitats or organisms. This, however, does not in any way diminish the importance of development of a system of protection against minor pollution from vessels in navigation, the most important being a development of a appropriate port facilities for the acceptance of oil-polluted waters.

Since collisions and groundings of ships are the predominant causes of large-scale pollution, the measures for preventing such pollution are measures which in the first place aim at preventing maritime accidents of this kind. Consequently, in order to reduce the probability of the collision or grounding, a routing system in the Adriatic and subsequently a vessel traffic surveillance system should be established. The legal foundation for this has been reached through the acceptance of the IMO Assembly resolution A.720, recent amendments of rule V/8 of the SOLAS 1974 Convention [2] and, consequently, amendments to the IMO resolutions A.572 [3], which open the possibility of usage of a routing system for the purpose of decreasing the risk of pollution. It should be emphasized that these alterations open the possibility of applying traffic separation schemes and the routing system in a manner that hitherto been unacceptable according to previous IMO practice.

The objectives described in previous paragraphs cannot be met if the highest degree of co-operation between official authorities of neighboring states is not assured. Bearing in mind a somewhat slow pace of acceptance of internationally recognized measures regarding pollution prevention and agreed international procedure, the first step toward a higher level of pollution protection of the Adriatic Sea is joint preparation of proposal to establish the Adriatic Sea as a particularly sensitive area. In order to speed-up the necessary work as much as possible this proposal should be made by the joint expert committee. As a first step the joint committee should prepare a preliminary area delineation. After the preliminary delineation the gathering of data necessary for a proposal preparation and their evaluation coordinated by the committee is necessary. The next step should be the planning of appropriate routing measures, bearing in mind particularly the future development of marine traffic in the area and influence of a additional measures for pollution prevention such as Vessel Traffic Services and particularly regional VTS concept.

The last step in the proposal development would be a final definition and acceptance of proposal by the official authority of each coastal state, i.e. Republic of Italy, Republic of Croatia and Republic of Slovenia, and its submission to the IMO Sub-Committee on Safety of Navigation for adoption. It can be estimated that final acceptance of proposed routing system could be reached until the end of the century.

![Fig. 1 Preparation of the proposal of the routing system](image-url)
In the following paragraphs a broad outline of the most important measures as foreseen at this moment is shown.

3. Routing system as a pollution prevention measure in the Adriatic Sea

In order to increase the level of protection of the Adriatic Sea against large-scale pollution as a consequence of collisions and groundings, it is necessary to implement a number of traffic separation schemes and a routing system measures. The proposed measures should route maritime traffic in the Adriatic Sea area in such a way as to:

- reduce the possibilities of collision by means of:
  - simplification of traffic flow,
  - decreasing the number of close-quarter situations, especially of ships sailing on opposite courses,
  - dispersion of the anticipated positions of crossings to wider area, thus simplifying the traffic relations during collision avoidance maneuvering and
  - reducing the area density of maritime traffic;
  - reducing the probability of running aground by removing the traffic further away from the coast for the purpose of diminishing the influences of navigational errors and, also, giving more time to salvage teams to render assistance to ships in danger or in distress.

Since the basic assignment of the routing system in this case is to protect sea and coast from pollution, the choice and locality for measures of the routing system are founded on a number of principles, explicitly or implicitly established in the mentioned international documents, of which the most important are:

- that the chosen measures must, as much as possible, follow the existing flow of maritime traffic;
- that the navigation routes established through the routing system should provide for the least possible number of changes of course;
- that the suggested route along its entire length satisfies the required level of navigation coverage and hydrographic researches of the area of navigation;
- that the most important measures of the routing system must be implemented in areas in which surveillance from the shore is possible and in conformity with existing technological capabilities.

Based on the analysis of maritime traffic, especially of traffic routes towards the ports of the northern Adriatic, a united routing system consisting of four logical entities has been proposed [4]. According to that proposal they should be located east of the port of Brindisi, west of the island of Palagruža, west of the island of Jabuka and in the northernmost area of the Adriatic Sea.

Besides the basic measures of the routing system on the central route of navigation in the Adriatic, additional measures should be foreseen in the coastal waters of each littoral state, on the approaching waterways to each port. These measures should be developed and introduced by each littoral state according to their needs and potentials.

4. Regional Vessel Traffic Service - a step forward

Beside marine traffic routing the further and more effective measure to prevent collisions and groundings is the introduction of marine traffic surveillance system as the first step and after that the marine traffic control system. If applied in the coastal waters these systems presume a basic organization similar to the one applied within the framework of VTS services (as presented in [5]) in the near-coastal waterways or in port areas, i.e. they have to provide a data collection and evaluation, information service, navigation assistance service, traffic organization service and support for allied activities. There are several essential distinctions between traffic surveillance and control of coastal waters and vessel traffic service on waterways and port areas. On the one hand, surveillance of coastal waters calls for a far more complex technological support since the area of service is substantially larger, and ships are able to enter into the area under surveillance from various directions. On the other hand it is not directly linked to port operations and this greatly simplifies the basic task of the service. However, for efficient surveillance of coastal waters the crucial factors are the same as those of the VTS services. These are:

- technological support regarding position finding, identification and parameters of ship's movements in the area under supervision, and
- communications support of the system of vessel traffic surveillance.

Today the technological support of vessel traffic service relies on its greatest volume on radar stations along the waterways. The preliminary plan for the Adriatic foresees two main types of surveillance stations: stations for the high seas surveillance and coastal stations. The preliminary locations of stations for high sea surveillance must ensure a good radar coverage along the main navigating route in the Adriatic Sea (Figure 2.). The second phase of system development foresees locations of coastal surveillance stations which have to cover port approaches, in the first place for the ports in the eastern and northern part of the Adriatic Sea.

The required communication network is divided into three basic segments: the system of communication with ships in navigation, the internal communication and information system, and the communication and information links with the systems of the neighboring states.
The communication with ships passing by could be further divided into two components: one part is intended to satisfy communication requirements for safety of navigation and is based on the GMDSS system (the Republic of Croatia has ensured the coverage according to GMDSS requirements for the area A1 as of February 1, 1995), whereas the other part is directed towards the identification of ships in navigation. Since at the moment of project’s completion the GMDSS system will be in force on all SOLAS ships, this part of the communication network could be considered as already established.

Regarding the identification of ships in navigation, the main source of data, according to preliminary plans, could be ensured with the establishment of the Ship’s Reporting System (according to [7], [8]). Particularly, if VHF DSC system proves its effectiveness for a reporting purpose, a simple reporting procedure from ships entering the area under surveillance to the shore-based surveillance stations could be easily ensured. In view of gathering the necessary data on ships in departure from ports in the area, present plans foresee a direct access of the communication and information sub-system within the surveillance system to the information system of appropriate maritime authorities.

The internal communication and information sub-system itself could be partially accomplished by radio linkages from surveillance control stations to the communication junctions on the coast, while the mainland part of the communications are planned to be implemented as a part of the communication network of the maritime authorities. For the moment, there is no reason why data collected by the surveillance system should not be offered to commercial use.

Although in view of the interest of each Adriatic coastal state, the sole supervision of the their part of the Adriatic coast would be sufficient, a far higher level of supervision, i.e. the level of pollution prevention, would be attained through a joint system of surveillance between all three neighboring states. Consequently, in order to implement such a system the automated data exchange capabilities must be provided. Obviously, the system with such capabilities is very close to the concept of a regional VTS system as presumed by the COST 301 project.

The presented outline of the traffic surveillance system on the Adriatic can be deemed as a highly optimistic plan which can be activated after the year 2.000. It presumes a fairly complex system which requires several years for development, a high degree of co-operation between neighboring states and, above all, significant financial support. However, the recent experiences with large-scale pollution in ecologically sensitive areas, such as Exxon Valdez, have proved that financial damage of such accidents could reach enormous amounts, thus justifying the necessary expenses. It has to be emphasized that such a system could be built gradually, according to actual or near-future technological needs and developments.

8. Conclusion

The basic economic interests of the states on the coasts of the Adriatic Sea call for the significant advancement of protection of the sea and coasts from large-scale pollution and justify the establishment of a routing system on the Adriatic thus ensuring the most successful method of pollution protection in cases of collision or running aground.

The level of protection of the sea and coasts from pollution can be further increased with the establishment of a traffic surveillance system. Because of significant financial requirements the system should be planned for realization after the year 2.000, but its requirements should be considered during routing system planning. No matter what measures in respect of the routing system and/or traffic surveillance system are going to be implemented, the first step to be taken in order to acquire international recognition and to accelerate the work on the future improvement of pollution prevention and safety of navigation, is a full cooperation of all three states bordering the Northern Adriatic.
REFERENCES


