

Proposal for a routing system on the Adriatic sea

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The safety of navigation and protection of the sea from pollution are the basic determinants of modern maritime activities. The harmful consequences of maritime accidents compel governments of littoral states to undertake expansion of the safety level of navigation and pollution prevention as basic assignments of their maritime policies. In this sense the efforts of the governments of the Republic of Italy, the Republic of Slovenia and the Republic of Croatia are understandable in their striving to keep navigation on the Adriatic Sea, their common heritage, as safe as possible. In addition to safety of life at sea, the protection of the sea and shore against pollution

from ships in navigation is of particular importance for coastal states. Generally speaking, the measures that are available to the states with regard to protection against pollution are divergent in the light of their aim: are they intended as an endeavour to lessen the quantity of pollution from ships in navigation, which are recorded as minor pollution of greater frequency, or is their aim to prevent large-scale pollution in case of maritime accidents?

There are several characteristics of the Adriatic Sea that impose special attention to pollution on a large scale in case of maritime accidents.

The Adriatic Sea is a deeply indented arm into the European continent. It is a wholly enclosed sea and therefore a unique ecological system within the Mediterranean setting. Any large-scale pollution on the Adriatic would cause exceptional damage to the sea and coast, as a rule far greater than, for example, pollution on the high seas. A specifically unfavourable circumstance in case of large-scale pollution is the limited depths of the Adriatic, chiefly in its northern part.

The second important characteristic of the Adriatic Sea results from its geographical and traffic position. All the main ports, in particular those that perform the greatest part of the transport of liquid cargoes, are located in the northern part of the Adriatic Sea, thus most of the maritime traffic is done lengthwise, along the entire stretch of the Adriatic Sea.

Fortunately, the Adriatic has so far not had any maritime accidents with large-scale pollution. In view of the volume of maritime traffic, in the near future and especially after the ending of military conflicts on the Balkans, one should expect a notable increase in maritime traffic due to the anticipated industrial development of some littoral states. Since an increase in traffic is at the same time an increase in the number of ships in navigation and in the volumes of cargo, especially of dangerous cargoes and pollutants, one may also expect an increase of the risk of maritime accidents, thus the risk of large-scale pollution.

For the above mentioned

reasons, it is necessary for the states located along the shores of the Adriatic to undertake accessible measures for the purpose of preventing maritime accidents that may result in large-scale pollution.

In the light of internationally accepted instruments, a basic measure of pollution prevention in cases of accidents of ships that may be considered is the establishment of the Adriatic Sea as a particularly sensitive area. In this sense, this paper deals with the routing system on the Adriatic, the application of which would enable a significant increase of the level of safety of maritime navigation, thereby also of the level of protection against the consequences of maritime accidents.

Legal foundation

The first traffic separation scheme was established in 1967 in the Dover Strait at the suggestion of J. Garcia-Frias, as well as L. Oudet (Beattie¹, Cotter²), in the beginning as a recommendation, later as an officially accepted measure. After familiarizing masters and mates with the new principles of navigation in the course of a few years, the number of collisions significantly decreased, especially between ships sailing in opposite courses.

Since 1968 the routing of the ships in international waters has been taken over by the Inter-Governmental Maritime Consultative Organization (IMCO, today the International Maritime Organization - IMO), and the first

The paper illustrates the need to introduce a consistent routing system on the Adriatic Sea for the purpose of preventing maritime accidents with large-scale pollutions. The grounds for international legislation for introducing the routing system have been established too, as well as the basic principles that should be adhered to on the occasion of determining the routing system. Furthermore, a proposal for a routing system is given and the reasons in favour of such a choice.

measure under the supervision of IMCO was established by the IMCO Resolution A.161 in the approach to the port of New York and Delaware Bay. The mentioned Resolution also sets up the conditions, definitions and general principles of establishment, and within the next few years it enables the introduction of a number of routing systems. Along with the development of maritime navigation, a necessity for the advancement of accepted standards emerged, so that the conditions, definitions and general principles subsequently underwent changes (A.378, A.428, A.572³). Some of the accepted measures of ships' routing, especially the traffic separation schemes, under the supervision of IMO, are separately quoted in some resolutions and printed in a dedicated IMO publication (Ships' Routing).

The acceptance of the IMO as the sole organization qualified to approve the Traffic Separation Scheme is explicitly cited in rule 1(d) of the International Regulations for Preventing Collisions at Sea, 1972. The principles of navigation in the Traffic Separation Scheme are stipulated in rule 10.

IMO's status in reference to routing systems changes with the acceptance of the SOLAS 1974 Convention according to which (rule V/8(b)) this organization is explicitly quoted as the sole international body authorized to establish and accept all routing measures and areas to be avoided. The shortcoming of the SOLAS 1974 Convention is that adherence to the measures continued to be a recommendation, and not an obligation, in spite of the fact that even previously (IMO Resolution A.228) states were encouraged to undertake measures against vessels that failed to adhere to the recommended measures.

Ships' routing in territorial waters of a littoral state is regulated in the UN Convention on the Law of the Sea, 1982. According to the Convention the littoral state has the right, among other things, to set up regulations that refer to navigational safety (article 21.1(a)). The foreign vessel using the right of innocent passage is liable to adhere to these provisions. In paragraph 3.(a), in conformity with the SOLAS Convention, littoral states are called upon to follow the recommendations of competent international organizations when establishing these measures, which is no doubt a reference to IMO.

A fundamental change of the status in the Routing System measures was enforced in 1995 with the decision of the Maritime Safety Committee (Resolution MSC.46(65)⁴). The essential change is quoted in paragraph 1 of the amended rule V/8 of the SOLAS Convention which underlines that the routing measures, besides safety of life at sea and safety of navigation, are also utilized for the protection of the sea and coastline and can be compulsory for all types or for some types of vessels. Naval vessels are excepted from the obligation to adhere to the requirements of the rule (paragraph (c)) with a recommendation that they also

should navigate in accordance with the accepted measures. Other vessels are allowed to disregard the routing measures only when there are justifiable reasons for this (paragraph (h)).

In compliance with the above mentioned, the acceptance of a resolution has been foreseen on the occasion of the regular session of the organization's assembly at the end of 1995 according to which the General Provisions on Ships' Routing are to be amended and coordinated with the amended rule V/8.

Principles for establishing the routing system

The basic goal of the routing system is to improve navigation safety in areas of converging or heavy traffic or in areas where the freedom of ship movement is lessened (Resolution IMO A.572 paragraph 1.1). The routing System may also have other aims and intents that are explicitly quoted (paragraph 1.2), among which special emphasis is placed on traffic separation of ships sailing in opposite directions, as well as on the organization and simplification of traffic routes.

The Routing System can be determined as a set of measures which includes the traffic separation schemes as the most important and most effective measure, two-way routes, recommended directions, areas to be avoided, inshore traffic zones, roundabouts, deep water routes and precautionary areas. Based on IMO practice so far, the traffic separation schemes are used to the greatest extent, followed, thereafter, by the precautionary areas. The other measures, like for example the roundabouts, are relatively infrequently used.

Bearing in mind the obvious need of the Adriatic coastline states to prevent large-scale pollution and to enhance the level of safety of navigation, it is necessary to consider certain basic principles for the establishment of the routing system that these states should follow for working out the proposal of the routing system.

1. Principle of the basic assignments of the Routing System

According to the original General Provisions (Resolution A.572) ships' routing is intended to prevent collisions at sea with strict regard to the general principles of preventing collisions at sea. Indirectly, one may conclude that the basic assignment of the routing system is to lessen the number of collisions, in which case the crucial factor is the level of navigational safety, i.e., the number of collisions and running aground and the density of maritime traffic. This is the basic principle that IMO has so far conformed to in its work.

With the acceptance of the amendments of the SOLAS Convention and the IMO resolution A.720⁵, the legal status of the routing system underwent essential changes. The area of application was now extended to pollution prevention (paragraph 1.2.6 of draft amendments to the resolution A.572) and this opened up possibilities of

further application in the areas in which, according to previous practice, it was not acceptable. In this case, the aim is to lessen the probabilities of collisions, particularly of certain types of vessels, or more exactly to remove the probable point of collision away from certain ecologically sensitive areas. A point of interest is that, in spite of the common attitude, the example of this approach has existed for years in the vicinity of Ushant Island where the outer lane of the traffic separation scheme clearly has the task of removing the passing tankers away from the coast.

The Routing System in the Adriatic that is being proposed in this paper is chiefly intended to enhance the level of protection of the sea against pollution and, therefore, the proposal in this paper should be understood in conformity with this aim.

2. *The principle of following the existing (usual) sailing routes*

This principle starts from the general assumption (resolution IMO A.572 paragraphs 5.2.3 and 5.2.4) according to which the measures that are introduced must follow to established sailing directions. The basis of this principle is the necessity to introduce the Routing System measures for a certain area into navigational practice, as painlessly as possible, and within a shortest possible time of adaptation.

According to IMO practice so far, in accepting the Routing System measures, this principle has proved to be the basic one. There is practically no example in which this principle was not regarded and it may well be expected to be dominant in the future as well. However, it is possible to assume that after an accident resulting in a larger pollution of the sea, a state under public pressure would decide to apply the measures that would essentially change the existing traffic routes that would disregard the inherited traffic pattern.

As regards the proposal of the Routing System of navigation on the Adriatic, the existing routes allow a relatively consistent application of this principle.

3. *The principle of navigational coverage*

This principle finds a foothold in the fundamental prerequisite for navigational safety, i.e. in the demand that

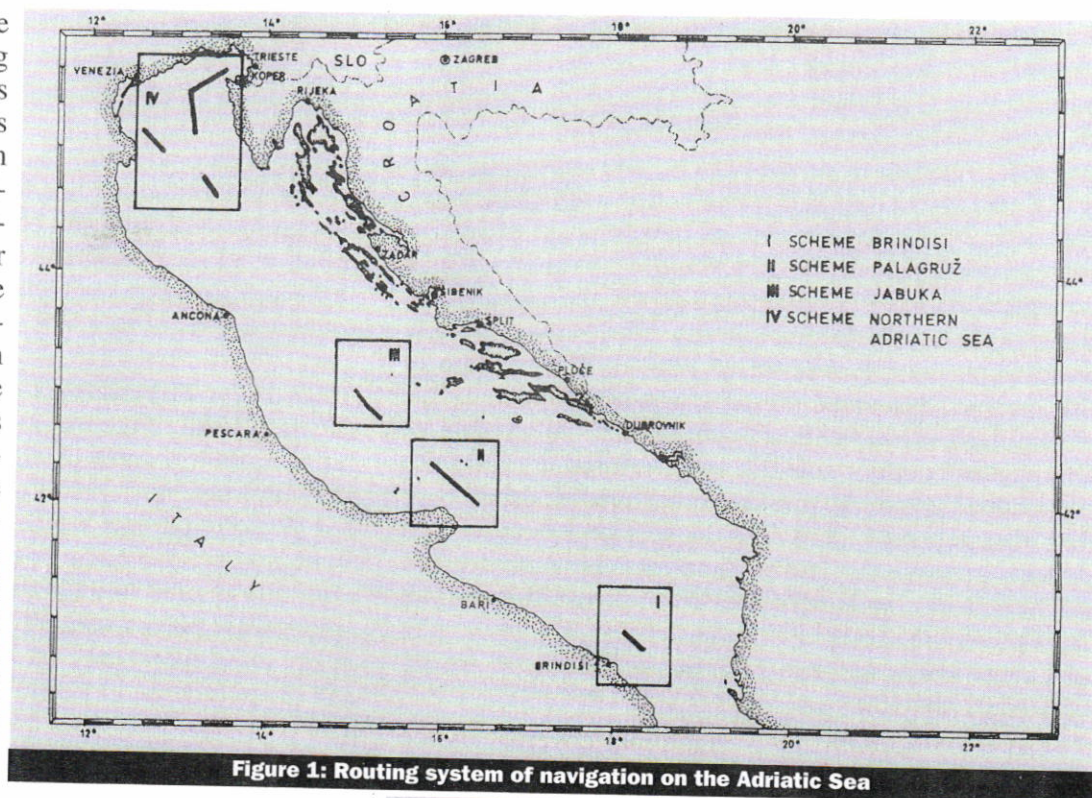


Figure 1: Routing system of navigation on the Adriatic Sea

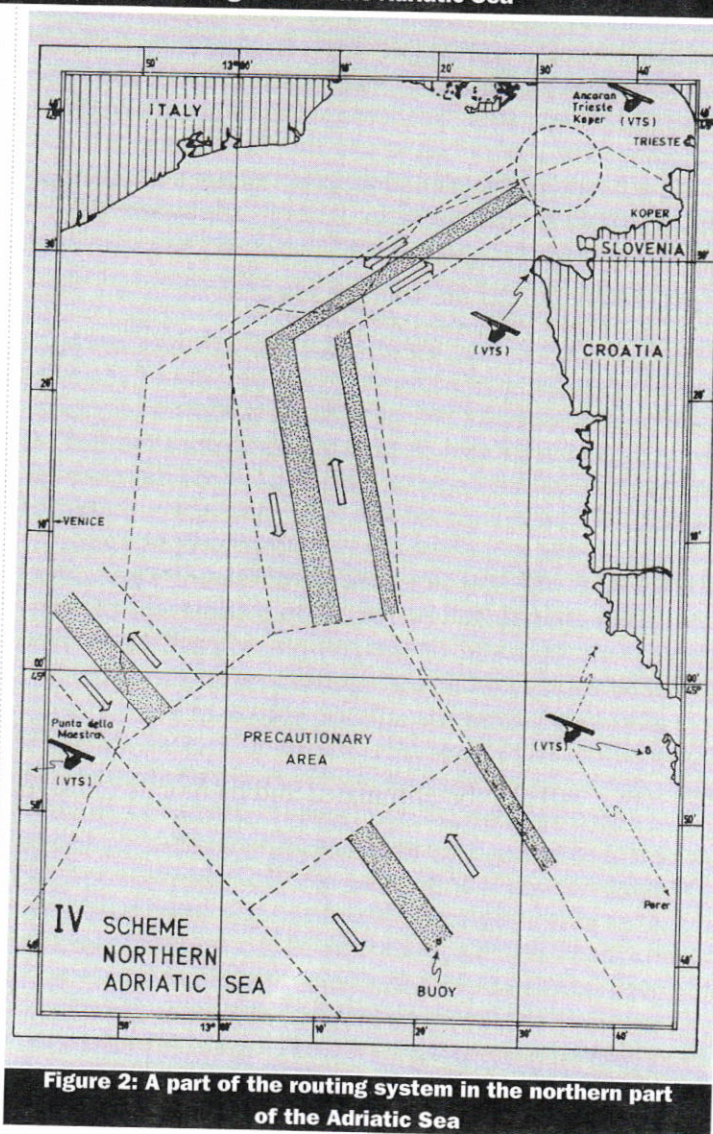


Figure 2: A part of the routing system in the northern part of the Adriatic Sea

the ship's officer can determine the ship's position at all times during navigation. Following this principle most of the traffic separation schemes are located along the coast. Thanks to new navigational systems, primarily to the GPS system and especially its differential variant, ships are enabled to know their positions during navigation even at greater distances from the shore. In favour of this is the proposal quoted in the draft of the amendments of the General Provisions (paragraph 6.11.1.4) in which radio-navigation facilities are brought on a par with visual and radar observations.

Better navigational coverage is of special significance in ships' routing for the purpose of pollution prevention. A direct consequence of enhanced navigational coverage is the possibility of establishing certain parts of the routing system over a larger area and at a greater distance from the shore. This directly lessens the traffic density, thereby decreasing the probability of collisions or running aground of vessels. Moreover, even in cases of large-scale pollution due to an accident, this gives more time for remedial actions.

Linked together with the navigational coverage is the hydrographic coverage of a certain area, as an essential condition for the establishment of any routing measure (resolution A.572 paragraph 6.7). It must be emphasized that hydrographic coverage does not represent any major difficulty of a technological nature, apart from the financial means.

4. The principle of supporting vessel traffic services

In resolution A.720 the routing systems are just a part of a set of measures for protection of the sea and environment being conducted by one or more neighbouring countries in an area. On the occasion of planning these measures it is also necessary to enable the application of other measures to improve safety of navigation. In the first place this refers to the ship position reporting systems and vessel traffic services - VTS.

The basic assignment of the ship position reporting systems (IMO resolution A.648⁶ and resolution MSC 43(65)⁷) is the data collection from ships passing by. The main obstacle for its wider use in some areas is due to the limitations of the existing maritime communication system. With a complete introduction of the GMDSS system, particularly the DSC system, as from February 1, 1999, this will also be eliminated and its more extensive application may be anticipated.

Vessel traffic systems (Resolution IMO A.578⁸) have so far been established only in port areas or in their immediate vicinity, but not along navigation routes. In light of the very intensive efforts of many countries within the IMO and the work of various professional associations (e.g. IALA⁹) regarding the legal and technical aspects of the VTS services, their much wider use in the foreseeable future may well be expected.

This principle imposes additional obligations on the lit-

toral state since it, in addition to its technological demands, imposes communication requirements, i.e., communications between all the control stations and ports of various countries must be connected into a consistent and reliable communication system.

Proposal for organizing a routing system on the Adriatic sea

Starting from the previously mentioned fundamental principles and other requirements, as a working proposal, we would propose a system that follows the existing main route on the Adriatic. This route is the shortest link between the North Adriatic ports and the Strait of Otranto, and stretches from the Strait of Otranto, between the islands of Palagruž and Pianosa, west of the island of Jabuka towards the central part of the northern Adriatic basin. Following the IMO practice so far and according to *the principle of the least possible extending of the traffic separation scheme*, the proposed routing system on the Adriatic can be divided into four areas, reading as follows (fig. 1):

- I. the Brindisi area
- II. the Palagruž area
- III. the Jabuka area, and
- IV. the area of the northern Adriatic (fig.2).

Although these areas, taken separately, represent well-rounded entities, when observed as a whole, they *unequivocally and congruently determine the united routing system* on the Adriatic. The following can be quoted in favor of the given proposal:

- the choice of this route *accomplishes navigation with the least changes of courses*, regardless of the port of destination; any other route would demand more course changes and in areas where visual position finding, even with the use of radar, is considerably more difficult;

- the full length of the proposed route *provides a satisfactory navigational coverage*; beside the utilization of the radar unit, visual position finding is also possible (especially by night) as well as RDF and the use of other electronic means; any other route would call for substantial supplementary equipping with facilities for visual and/or electronic position finding, yet would still not grant navigational coverage comparable to the one on this route;

- the full length of the chosen route *provides an adequately large enough area for manoeuvring and collisions prevention*; the location of the ports in the Adriatic presumes crossing of routes due to turnings towards the various ports and so manoeuvring to prevent collisions are a necessity; with the proposed traffic separation scheme, the anticipated crossings positions at small distances have been dispersed to larger expanses and in areas where there are no other navigational dangers, thus greatly increasing the degree of navigational safety;

- along the full length of the route *hydrographic characteristics enable safe navigation*; the only exception

is the extreme northeasterly arm of the route, on approaching the ports of Trieste and Koper where limited depths require sound hydrographic researching;
- the route, at sections where it comes close to the mainland or islands, enables good coverage with surveillance stations, primarily with radar units.

The drawback of the proposed routing system is that it cannot be coordinated with the positions of future installations for the exploitation of gas from the sea bed of the northern Adriatic because, for the time being, only the positions of the fields are known while the positions of the installations are yet to be determined.

Conclusion

Since the cooperation of the interested countries is needed for the acceptance of the routing system in the Adriatic, the proposal mentioned in this paper may represent a solid basis for a mutual coordination between the official bodies of the Republic of Italy, the Republic of Slovenia and the Republic of Croatia. The proposal meets the basic requirements of the maritime profession, as well as the basic demand for its introduction – the increase of the general level of navigational safety and reduction of the probabilities of maritime accidents that might cause large-scale pollution.

NOTES

¹ BEATTIE J.H., *Routing at sea 1857-1977*, The Journal of Navigation, 31/1978.

² COTTER C.H., *An early traffic scheme for the English channel*, The Journal of Navigation, 32/1979.

³ Resolutions were accepted under the title *General provisions on Ships' Routing*. Resolution A.572 was slightly supplemented with Resolution A.669.

⁴ Resolution MSC.46(65) *Adoption of Amendments to the International Convention for the Safety of Life at Sea*, 1974.

⁵ Resolution A.720 (17) of IMO Assembly, *Guidelines for the Designation of Special Areas and the Identification of Particularly Sensitive Areas*.

⁶ Resolution A.648(16) of IMO Assembly, *General Principles for Ship Reporting Systems and Ship Reporting Requirements, Including Guidelines for Reporting Incidents Involving Dangerous Goods, Harmful Substances and/or Marine Pollutants*.

⁷ Resolution MSC.43(64), *Guidelines and Criteria for Ship Reporting Systems*.

⁸ Resolution A.578(14) of IMO Assembly, *Guidelines for Vessel Traffic Services*.

⁹ *IALA Vessel Traffic Services Manual*, IALA, St. Germain en Laye, 1993.