

# **WHO ARE THE ROLE PLAYERS IN THE ECDIS WORLD AND WHAT ARE THESE ROLES**

by Rear Admiral Neil R. GUY<sup>1</sup>

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## **Introduction**

Before a consideration of the world of ECDIS can be made the scene must be set as, while ECDIS is a great innovation and possible boon to the mariner and his navigator, this is not a process that started yesterday. It is obvious that seas, lakes or any other water on which vessels travel have the potential to conceal dangers that an equivalent land traveler would not experience. Mariners have relied therefore, through the centuries, on information that they have obtained themselves, usually by bitter experience, or from other sources. Some of this data may have been collected as part of the normal passage of a vessel and some as a result of specific surveys or expeditions being undertaken.

During the 15th to 19th centuries this type of information was vital to successful trading by nations or companies. This information was not in the public domain and was exclusive to the interests of those who held that information. Some of the major trading nations of this period were the Portuguese, Dutch, Spanish, English and other European nations that were involved either in colonisation or trade. Some of the companies of this time were the Dutch East India Company and the East India Company. The risks involved in not being aware of dangers, or even just the configuration of a coast, were high and this meant that distinct advantages were held by those who held this knowledge. A parallel exists today in the fishing industries where particular information related to the seabed is kept secret by a fishing company for its own use and in some cases by the skipper of the vessel himself.

<sup>1</sup> Director, International Hydrographic Bureau, Monaco.

Sketches were drawn by early navigators but more often a written log was kept in which as much information of use to the mariner was recorded. The number of participants involved in this process was small and usually comprised either the mariner and his navigator, or the mariners within a particular company or State. Later as the art of nautical cartography developed this would include a surveyor and a cartographer. An indication of the importance of this information is the fact that between 1780 and 1820 the English alone had 19 major survey expeditions spread around the world from Canada to Australia. Famous names such as Vancouver, Flinders, Cook and Bligh were synonymous with these efforts.

### INTERNATIONAL DEVELOPMENTS

At the start of the 20th century it became obvious that greater cooperation in this field was necessary. In many instances the majority of the vessels that pass the coast of a State are foreign and little or no control may be exerted on them. As the "right of innocent passage" became established in international law it meant that, providing a vessel was in continuous passage and that that passage was deemed to be innocent then that vessel could pass through the territorial waters of a coastal State. For many years the "cannon shot rule", subsequently adopted as the "three mile limit", was accepted as the breadth of territorial seas. A vessel therefore, provided that it did not enter the internal waters of a coastal State, could pass as close to the coast in innocent passage as it deemed safe. Outside of territorial waters, innocent passage was not a requirement and need not be established. A vessel was, therefore, free to stop, anchor and engage in other activities provided that these activities did not lead to confrontation with the coastal State.

Later coastal States, in the interest of safe navigation, became amenable to the exchange of data, but this was initially undertaken on a bilateral basis between friendly States. Conferences such as the Washington Conference, 1899, and the St Petersburg Conference, 1912, endeavoured to extend this cooperation into the international arena. It was, however, only after the First World War that, as a result of the new technology that was developed during the war becoming commercially available and the upsurge in maritime trade, at the London Conference in 1919, it was agreed to form a permanent mechanism for the exchange of vital navigational data. The International Hydrographic Organization was formed in 1921 by 24 States with the following objectives:

- a) The coordination of the activities of national Hydrographic Offices
- b) The greatest possible uniformity in nautical charts and documents
- c) The adoption of reliable and efficient methods of carrying out and exploiting hydrographic surveys:
- d) The development of the sciences in the field of hydrography and the techniques employed in descriptive oceanography.

The provision of nautical charts, publications and the various temporary and permanent updates to these products is expensive and as such these services are

regarded as being a responsibility of a coastal State. The potential to recover costs has been a consideration for many years and efforts have been made to evaluate the costs and to devise methods of either recovering them or reducing them. Without exception it has been found that the cost of the provision of these services is of the order of four times the current and equitable sale price of these services and this does not take into consideration survey costs which are even greater. As a result to ensure that the mariner receives the best information with the shortest delay, it has been internationally accepted that this should remain a service provided by a State and that the recovery of costs was of a secondary nature.

## RESPONSIBILITIES

In accordance with related conventions such as SOLAS and the IHO Convention, all States Party are obligated to provide a safety of navigation service off their coasts. It is even considered that international customary law requires a coastal State to advise mariners of dangers off its coast. Inherent in this is the aspect of liability which tends to be disregarded. There is little doubt, and many well-known international cases such as those involving the vessels, TESIS, and URQUIOLA, have either substantiated this or drawn the attention to the possible consequences of misinformation. The providers of these services could without doubt, in spite of disclaimers, be held liable for damages through negligence.

## THE ESSENTIAL ELEMENTS OF DELICT (TORT)

It may serve a purpose and be of interest to list some of the dangerous rocks, albeit of a different kind, that may be hidden to those who would provide a service, whether it be for gain or not.

For delict to exist all the elements must be present and they are as follows:

a) Conduct: The conduct must be voluntary, in the sense that the action was subject to the actor's will. The causes of a particular consequence may be innumerable and because the last action was involuntary does not mean that this disqualifies other voluntary actions that meet the requirement.

Within this category are the two aspects of commission and omission. Commission is essentially any voluntary act whatever the intent. Omission, which is the failure to act, was for a long time not considered as being part of the requirement for the conduct element to be established. More recent precedents have held that they are.

b) Wrongfulness: This can be defined as "the infringement of a right or a breach of duty". What is normally applied to confirm the existence of this element is to equate the action against the following criteria;

i) would a reasonable man, in the same circumstances, have foreseen the possibility of harm to the plaintiff and if so,

ii) would a reasonable man have taken steps to guard against the occurrence of such foreseeable harm.

If these criteria are met then "duty of care" has been established and the conduct could be considered wrongful. Some justifications are found in law such as "statutory authority", "public office", both of which are relevant to the production of charts and "necessity", "self-defense", "provocation", "consent", and "parental authority", none of which have a bearing on the matter under discussion.

c) Fault: This is the main element and includes accountability. Fault is that element which induces the law to impute a man's wrongful conduct to him in the sense of holding him legally responsible. In the Aquilian action it is either intentional (*dolus*) or by negligence (*culpa*). As it is hardly likely that any provider will intentionally mislead a user the latter is the element of greatest interest. Negligence must be clearly established and is usually compared with the actions of the "reasonable man or expert" (*diligens paterfamilias*) in similar circumstances. Should the comparison be unfavourable then the actions of the defendant could be ruled as negligence. As the entire service is provided by personnel who could be considered as technical experts in their particular field the comparison would, I am sure be made with that of the "reasonable expert". Another factor that must be considered is the application of "strict liability". This could occur where an activity creates an unusual level of risk of harm to the community. The best example of this is the various conventions and fund-provision created to offset the dangers of oil spillage from the transportation of crude oil, much of which is then translated into national legislation.

d) Causation: This is not a straightforward element and is open to interpretation and to being case-specific. The presence of this element is determined by two actions. In the case of a deliberate act the action of the defendant is eliminated and in the case of an omission the act of a reasonable expert is inserted. If the result of either of these is that the harm would have occurred anyway then it is likely that the defendant's role could be ruled as irrelevant. An alternative method is just to apply common sense to the situation and to see how the man-in-the-street would have regarded it.

It is important to know whether the causal chain (*novus actus*) was unbroken between the action of the defendant and the damage or whether another subsequent action could have altered the situation and broken the link. This is referred to as the Direct Consequences Test. The Foreseeable Test looks at whether it could conceivably have been anticipated that a certain consequence was possible from a certain action.

e) Damages and/or Injury: This is the last of the essential ingredients and it is fairly obvious that it is unlikely that any party would resort to law if either of these two options had not occurred. It is important however to note the various types of damage

(*damnum*). Actual losses are assessed as *damnum emergens* and could include loss of financial benefits *lucrum cessans*. Injuries are classified and the remedy to the plaintiff for these damages is known as *actio iniuriarum*. A subtle difference in terminology exists in that "damage" is what a plaintiff may suffer, "damages" are what a court awards a plaintiff.

A last point of note is that contributory negligence could be awarded which would mean that more than one role player could be held liable.

To relate this to practical applications some of the more important aspects of the cases mentioned earlier have been abbreviated and are as follows:

a) In 1977, oil tanker, TSESIS, owned by the Latvian Shipping Company grounded en route around the Swedish island of Karingklubbe. It transpired that the vessel with a draught of 8.65 metres collided with a rock at a depth of 6 metres. The significant issue was that the existence of the rock was known to the Swedish authorities since 1969 but its position was unsure. As many such rocks existed in various channels around the islands it had been decided that vessels should stay outside of the 10 metre depth-contour and that all hazards outside of this contour should be shown on the charts. The numerous dangers inside of the contour would not be surveyed or shown due to the enormity of the survey task involved.

The position of the rock in question had at various times been placed inside and outside of the contour and was in fact outside but not shown on the chart. After a number of courts had tried or reviewed the case it was finally held that the surveyor involved in the 1969 survey had been negligent in not advising the relevant authorities of the danger and consequently the Administration to which his office belonged was required to pay full compensation to the owners of the vessel.

b) The Spanish tanker URQUIOLA sank after colliding with an uncharted rock in the approach channel to the port of Coruna. In addition the master of the vessel lost his life and enormous pollution of the surrounding environment occurred.

The Court held that the vessel was traveling in an acceptable manner when it struck an uncharted rock whose presence had been known to the Hydrographer for two years. Subsequent to the grounding the actions of the Port Authorities were considered responsible for another grounding, the loss of life of the master and the pollution. It is unclear in the documents available whether the second grounding was on the same reef or another uncharted one but proportional liability was determined for both the Hydrographer and the Port Authority. Over US\$ 40 million in compensation was paid by these administrations.

## NEW TECHNOLOGY

As with all things progress has brought with it new aspects to be dealt with. The Electronic Chart Display and Information System (ECDIS) has the greatest potential in a concept that hydrographers and navigators have had to consider in a very long time. It is now possible to provide the mariner with a sophisticated system which will contain all those many functions that were previously undertaken manually. Theoretically it gives the officer of the watch more information, faster, and more accurately. It also does not distract his attention from the main responsibility of an officer of the watch which must surely be that he must be free to assess situations involving his vessel and be able to react timeously and correctly. The danger with all systems of this nature is of course the risk that everything or too much is abdicated to the system and too much reliance is put on electronic devices that can fail or provide erroneous information. What has not been determined however is who does what and who accepts responsibility for what. New role-players have now entered the scene and what responsibility they carry has not been determined. Fortunately no accidents have occurred but where this does occur these responsibilities may be decided by a court or tribunal.

## ROLE PLAYERS

### Traditional Service

As stated previously the casual chain in the event of negligence to be apportioned was relatively short in the case of paper or traditional products. Should an accident occur and it was found that any of the following was responsible or contributed to the accident then it is possible that a provider of the service could be found proportionally liable.

a) The hydrographic surveyor undertakes the survey of an area. This includes the determination of the bathymetry of the area, the coastline, geographical and geological features, oceanographic and any other information that would serve the mariner in the interest of safe navigation. Some of the information may have been gathered by other agencies but it is his responsibility to ensure that this information is correct before he includes it in his survey which he is obliged to sign as his responsibility. This information is then passed to the cartographers at the Hydrographic Offices. It is regarded in international law that a responsibility rests with the hydrographer to ensure that, where possible, the latest methods and equipment is used. It is conceivable that a hydrographer could be held proportionally liable had he failed to do this.

b) The cartographer accepts the survey, compares it with data already held and confirms any discrepancies with the hydrographer before proceeding. The surveys and information from other sources are assessed by the cartographer and the chart or

publication is compiled. The cartographer is responsible for producing a chart that is accurate, clear and unambiguous and which should contain all information that the mariner may need. The decision as to what is vital is his and so is the method of depiction. He has the ability, as in the case of bathymetric contours, to smooth them providing that the final result shows that the contour is always indicating a minimum depth.

c) Corrections to charts and publications are made, depending on the urgency or permanency, by coastal radio signal and also some information is passed by signal over a wider area. This service does not include search and rescue activities which are considerations after an accident has occurred. This is illustrated by the fact that a man overboard is not of concern to a hydrographic service, but if he happens to be a solo sailor then the fact that his vessel is now unmanned and as such a danger to navigation makes it necessary for the hydrographic office to take the necessary radio signal action in regard to the unmanned vessel.

d) The transmission of urgent messages is usually undertaken by an agency on behalf of the hydrographic office. The responsibility for the accuracy of the data transmitted remains with the Hydrographic Office and they are expected to monitor the transmissions to ensure that this is so.

In the traditional, pre-ECDIS, paper chart and publications service the possibility to apportion blame in the event of an accident would be between the mariner, the hydrographer, the cartographer and any agency responsible for the maintenance of the charts and publications.

## **Electronic Systems**

With the advent of digital charting a number of new conditions have to be considered.

a) The data held by the various Hydrographic Offices, in some instances going back nearly a hundred years, has to be converted into a format that can be used in the new medium. This is a lengthy process and the quality of the conversion has to be assured. The data has also to be in a format that meets international standards that have been developed to ensure the best display and to ensure that the system designer and supplier has a constant and standardised set of data to display.

b) The digital chart has to be compiled and its accuracy assured in the same manner as the paper chart. Whereas the circumstances in which a paper chart would be used were well known to all including the cartographic compiler the circumstances surrounding the display of the digital chart are not under his control. It is no longer possible for the chart compiler to be absolutely sure that what is displayed on the bridge is the same as that that he has compiled ashore. In addition the digital product, the electronic nautical chart or ENC, is only one data source in an ECDIS which is intended and capable of displaying other navigational information important to a mariner.

c) The system developer and supplier has been given standards to which his product must comply and ultimately the quality of these systems will dictate the success of the ECDIS concept. With the consequences of modern day accidents involving not only the vessels, their crews, the loss of potential earnings of the vessels, but damage to the environment and the destruction of resources the extent of claims against negligence may not be confined to product liability in the case of these suppliers. Again only a test-case will answer these questions.

d) The method of up-dating or information maintenance has been developed and it is possible for the digital products to be adequately maintained. The problem could be in the determination of the responsibility for the ethicality of this data as it can no longer be left to the Hydrographic Office to monitor this. Who will do this and will they accept the responsibility?

### **Conclusion**

The risk of liability is even greater now than it was twenty years ago. The responsibilities have not been tested in a court or tribunal of law. Pressure is on the mariner to deliver his cargo faster and cheaper and as in most things the balance-sheet rules. He therefore is looking for and needs the services of an ECDIS type system. For the first time in 400 years it is possible to make a profit out of the provision of these services and it is understandable therefore that private enterprise has stepped in and provided, in some instances, a substitute service for the mariner. What is not fully appreciated is that, whereas the traditional paper chart had State backing in regard to liability, where a company is contracting directly with the mariner the assurance of State support in the event of a claim for negligence is non-existent and a defense of product liability only may not be accepted by a court. Claims in recent cases have exceeded US\$ 40 million. Should the digital chart provider not be in a position to meet his liability it is conceivable that others who may have been attributed proportional liability, such as the shipping company and the system supplier, could find themselves in a situation where the claimant is looking to them for satisfaction.

### **Recommendation**

a) Coastal States are, or should be, party to the SOLAS Convention. These States are or should be Member States of the international organizations such as IHO, IALA and IAPH.

b) The present system of the supply of navigational data to the mariner is tried and tested. It has a long stable history backed up by the support of the governments of the coastal States concerned. The products used by vessels should therefore be the official products supplied by the Hydrographic Offices of the coastal States or their agencies.



c) Commercial enterprises should work through the governments of the coastal States and have official recognition by and support of these governments in the event of an accident.

### Bibliography

- BOBERG P.Q.R. *The Law of Delict*, Vol. 1 (2nd Ed) (1984).
- GUY N.R. *The Liability in Delict of the State Hydrography*, Vol. 10 Institute of Marine Law University of Cape Town (1989).
- International Hydrographic Bureau, Circular Letter 18/1983, 26 April 1983.
- MUNDELL A.R.G. "Causation in Delict" (1987) THRHR 379.
- NEILL R.M. "The Hydrographic Surveyor as an Expert" *Proceedings of the 5th Biannual Conference of the Hydrographic Society* (1986).
- NEWSON D.W. "Data Dissemination and Display", *The Journal of Navigation*, Vol. 41, No. 2, May 1988, pp. 222-226.
- OBLOY EJ "The Liability of the Electronic Chartmaker for Negligent Charting". *International Hydrographic Review*, Vol. LXVII, No. 2, July 1990.
- PASQUAY J.N. "Maritime Casualties and Nautical Liability of Hydrographic Offices". *IHO Reprint*, No 14, (1985).
- TROOP P.M. "The Legal Liability of the Chartmaker" *International Hydrographic Review*, Vol. LXII, No. 1, January 1985..