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Caroline Reuker

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CHAPTER XI
Combating piracy - Legal and technical solutions

Caroline REUKER
Research Associate, Assessor iuris 5

Résumé : Environ 71% de la surface de la Terre est recouverte d’eau. C’est la raison pour laquelle nous l’appelons la « Planète Bleue ». Compte tenu de cela, il n’est pas surprenant que les océans jouent un rôle important pour la vie sur Terre, non seulement comme source de nourriture, mais aussi en raison de leur grande importance concernant le commerce mondial. En période de globalisation, le transport maritime est devenu de plus en plus essentiel, en particulier en ce qui concerne l’approvisionnement de la population en produits vitaux. Ceci est confirmé par le fait que 90% du commerce mondial sont transportés par mer. Cependant, le transport sans friction est menacé par un certain nombre de risques qui trouvent leur origine dans l’espace maritime, comme par exemple les événements de mer, le terrorisme maritime ou la piraterie sur laquelle cette contribution se focalise. Elle considère ainsi les dommages potentiellement graves résultant des actes de piraterie, phénomène menaçant les enjeux économiques et écologiques en présence et pouvant porter atteinte à la vie et à l’intégrité physique des individus en mer. Bien que la piraterie soit aussi vieille que les marins eux-mêmes, ce phénomène se transforme continuellement. La piraterie moderne ne peut plus être assimilée à la piraterie romantique du passé. Les attaques sont plus brutales et leurs effets sur la sécurité maritime semblent plus importants.
Abstract: About 71% of the Earth’s surface is covered by water. That’s the reason why we call it the "Blue Planet". Taking this into account, it’s not surprising that the oceans play a significant role for life on Earth, not only as a major source of food, but also because of its great importance regarding the global trade. In times of globalization the sea transport has become more and more essential, especially with respect to the population’s supply with vital goods. This is further confirmed by the fact that 90% of the world’s trade is carried by sea. However, the frictionless transport is threatened by a number of risks which have their origin in the maritime area, e.g. ship accidents, maritime terrorism or piracy. Since it has the potential for causing serious damage in view of economical and ecological matters but also referring to people’s life and physical integrity, the contribution will focus on the last-mentioned field of illegal activities at sea. Although piracy is as old as the seafaring itself it is subject to a continuous change. Modern piracy can no longer be equated with the romantic piracy of the past. The attacks are more brutal and its effects on the maritime security even larger.

2) Apart from this, there are many other aspects which lead to the conclusion that life without oceans wouldn’t be possible.
4) According to Art. 101 of the United Convention on the Law of the Sea (UNCLOS) piracy consists of any illegal acts of violence or detention or any act of depredation, committed for private ends by the crew or the passengers of a private ship, any act of voluntary participation in the operation of a ship with knowledge of facts making it a pirate ship and any act of inciting or of intentionally facilitating such an act.
I. Development of piracy

1. History of piracy

Maritime piracy has a long history. Evidenced by the Greek origin of the term "pirate" ("peira") piracy can be traced to Antiquity. In the 17th century, when piracy reached its climax and the interest of the great powers in a safe sea trade gradually became greater governments took first measures to combat the problem. From now on pirates were outlawed and had to fear the States' persecution. This development and new technologies in the seatransport sector, especially the invention of steamships, led to the decreasing of piracy.

2. Current situation

After the temporary decline in maritime piracy, the Strait of Malacca became a feared piracy area in the 20th century but close monitoring turned out as a suitable solution to the problem so that illegal actions of pirates were contained again. However, it is still a serious matter in other waters such as the Gulf of Ades which is one of the main routes for the transport of raw materials with approximately 16,000 ship movements per year. This fact and several other circumstances – in particular weaknesses in the legal and governmental structures - promote piracy in this area. But it also has to be stated that in the first quarter of 2015 no piracy attacks were reported, which can be attributed to the actions of the international naval forces.
and the use of armed guards on merchant ships.\textsuperscript{13}

Other areas which should be mentioned in respect of maritime piracy are the Gulf of Guinea and Southeast Asia.\textsuperscript{14} This shows that even if effective actions are undertaken to combat piracy in one area the issue will occur in other territories, so that there is a shift to the problem. Therefore, piracy is still a major challenge in the field of maritime security.

\section*{II. Piracy and its modified structures}

Given the fact, that piracy causes immense economical damage\textsuperscript{15} there is a need to find a solution to this problem. In this context it's important to first understand the differences between modern and former pirates, because it can be assumed that the formerly used methods of combating piracy nowadays won't have the same effects. The reason is that the pirates have changed their practices fundamentally not just in respect of better weapons and more brutal attacks but also towards a more strategic approach. Traditionally, pirates have operated from small skiffs near the coast, waiting there for vessels to attack. Now they use big trawlers as motherships which are able to carry small and manoeuvrable speed boats. This allows them to attack ships far away from the coast. Furthermore pirates rapidly adapt to actual conditions and it even seems that they avail the technologies used against them which leads us to the topic.

\section*{III. Technologies to combat piracy, especially the automatic identification system (AIS)}

In the fight against piracy it is primarily important to know where the pirates are located. Due to that there are special tracking systems which can be used to identify their position. One of these systems is the automatic identification system, which was originally developed for navigation purposes.\textsuperscript{16} The technology ensures a constant

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\textsuperscript{15} According to estimates of the International Chamber of Commerce, the worldwide ecological damage caused by maritime piracy, amounts to more than 13 billion euros per year. Fischer-Lescano A./Tohidipur T. (2009), Rechtsrahmen der Maßnahmen gegen die Seepiraterie, Neue Juristische Wochenschrift, 1243-1246, at 1243.
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exchange of nautical vessel information (e.g. position, course, speed and port of destination) between suitably equipped vessels as well as between vessels and shore stations.17 Because AIS ensures the determination and presentation of vessel positions, it serves not only the on-board navigation, but also the land-based traffic monitoring so that the competent authorities of the coastal states are in the position to detect anomalies in the maritime traffic and give appropriate warnings to the threatened ships.

1. Disadvantages of the automatic identification system

But the transmitted vessel position data are essentially derived from GNSS-Data (Global Navigation Satellite System) and herein lies the problem because the last-mentioned technology isn't insusceptible to interferences.18 For in the wake of loss of GNSS it could come to dysfunctions of other systems such as the automatic identification system or in the worst case AIS could totally collapse.19 In this event it would be difficult to locate the pirates so that they should have a certain interest in jamming the GNSS. Another scenario could be that pirates feed the automatic identification system with false information which could lead to the same effect as jamming.20 Thus, the vulnerability of tracking systems is a major problem in the field of maritime piracy. In the area of technologies to combat piracy a further issue lies in the unreliability of exchanged data. In particular the limited range of AIS-devices (20 to 30 nautical miles)21 has negative impacts on receiving the needed information by the land-stations.22 Outside of this range vessel traffic surveillance requires a reliance on satellite-based monitoring systems. However, the data collected in this form are also found to be inaccurate, because too many signals are received at the same time. In the consequence they overlay and disturb each other.23 With respect to a safe shipping it is hence crucial to remedy these problems, so that the main question is how this aim can be achieved.

17) BT Drs. 16/7415, at 23 et seq.
22) BT-Drs. 16/7415, S. 23 f.
2. Possible solutions

One solution could be the use of a long-range airborne AIS capturing system that would allow to compare the information recorded by AIS-satellites with air- and landbased collected data. The satellite data could thus be critically reviewed and verified. Such an approach would have the added value, that with the aid of satellite technology it would be possible to observe a large area.24 Furthermore the comparison of the different data would in the end lead to a more exact information about the maritime traffic. Depending on whether the ship is located inside or outside the VHF range of shore stations, the satellite data would be compared with the land-based or airborne collected AIS-data. This could create an optimized situational awareness, which would be very important for increasing maritime safety and security. Nevertheless the problem of jamming would still persist, so it is also necessary to eliminate the susceptibility of satellite systems. These challenges had been accepted by the research-Consortium of the BMBF-funded project real-time services for the maritime security ("EMSec"). The team of EMSec has set itself the task to explore, how to enable a complex real-time situational awareness by fusing various marine-related information of the different data-collection-technologies. Another research focus is to protect these technologies from external interferences like jamming. But previously, the Consortium itself must collect the data to find out how to merge them the best. This, however, could be accompanied by data protection concerns.

IV. AIS from a data protection perspective

To determine whether these concerns are justified, one must first take a look at the data protection framework referring to the automatic identification system. In this respect, the relevant legal bases of international and supranational law have to be regarded.

1. International Law

Relating to the international law, the standards of the International Maritime Organization (IMO) should be emphasized. On 5 December 2000, the automatic identification system was inserted in the International Convention for the Safety of Life at Sea (SOLAS) by adoption of the resolutions MSC.99 (73) and MSC.100 (73). The concomitant amendments to the SOLAS Convention came into force at 1 July 2002. According to Regulation V/19 (2.4) of the Convention all ships of 300 gross tonnage and upwards engaged on international voyages and cargo ships of 500 gross tonnage and upwards not engaged on international voyages and passenger

ships irrespective of size should be fitted with an automatic identification system from 1 July 2002, provided that they have been built on or after that date. Due to further amendments in 2002 these ships are additionally obliged to keep the system continually in operation.\textsuperscript{25} This means that, apart from special exceptional situations where it is allowed to turn off the system, ship data are constantly transmitted.

According to SOLAS Regulation V/19 (2.5) the automatic identification system shall

- "provide automatically to appropriately equipped shore stations, other ships and aircraft information, including the ship's identity, type, position, course, speed, navigational status and other safety-related information";
- "receive automatically such information from similarly fitted ships";
- "monitor and track ships" and
- exchange data with shore-based facilities.

However, this list isn’t exhaustive, so that further information can be transmitted by the automatic identification system. From the resolution adopted by the IMO "Guidelines for the onboard operation of automatic identification systems (AIS)\textsuperscript{26}" it follows, what information are transferred in detail. These are static, dynamic and voyage-related data as well as security-related short messages. This will be discussed later.\textsuperscript{27}

### 2. European Law

In terms of the supranational law, the European Directive 2002/59 EC of 27 June 2002 (Ship Reporting Directive)\textsuperscript{28} should also be taken into account, since Article 3 refers explicitly to the SOLAS Convention and the relevant resolutions of the IMO. According to Article 1, the purpose of the Directive is to promote the enhancing of safety and efficiency of maritime traffic in the Community through the establishment of a joint vessel traffic monitoring and information system. In this context the automatic identification system is of major importance. Article 6 (1) of the Directive regulates so far that any ship calling at a port of a Member State must be fitted with an automatic identification system which meets the performance standards drawn up by the IMO. In addition, Article 6 (2) decrees, that ships fitted with such a system, shall maintain it

\textsuperscript{25} Cf. SOLAS Regulation V/19 (2.4.7) in conjunction with Paragraph 21 of the Guidelines for the onboard operation of automatic identification systems (AIS): IMO Resolution A.917(22) adopted on 29 November 2001.

\textsuperscript{26} See footnote 21.

\textsuperscript{27} Paragraph 11 of the Guidelines for the onboard operation of automatic identification systems (AIS).

in operation at all times except where international agreements, rules or standards provide for the protection of navigational information.

3. Data protection framework

Following on from the foregoing explanations, the European data protection standards are to be discussed.

a) The right to the protection of personal data

Therefore it is reasonable, to first ask the question, whether the EU Charter of Fundamental Rights a priori precludes the AIS-data-collection, since in accordance with Art. 8 (1) everyone has the right to the protection of personal data concerning him or her. Taking this into account, it is questionable, if the information transmitted by the automatic identification system are personal data in this sense. Article 2 letter b) of the European Data Protection Directive, which refers to the fundamental rights of natural persons and especially to their right to privacy with respect to the processing of personal data (see Article 1 (1)), defines the term "personal data" as any information relating to an identified or identifiable natural person.

aa) Are AIS-data personal data?

In this regard it needs to be assessed, if the collected AIS-data allow any conclusions concerning these persons. As the members of the ship’s crew are natural persons and solely information about the vessel are transmitted via the automatic identification system, only the criterion "identifiable" has to be considered. An identifiable person is one who can be identified, directly or indirectly, in particular by reference to an identification number or to one or more factors specific to his physical, physiological, mental, economic, cultural or social identity (see last clause of Art. 2 letter a) Data Protection Directive). To determine the identifiability, all means that might be used to identify the persons must be taken into account. Therefore, the main questions are which type of data is received and whether there are any means available, allowing the identification of the ship crew’s members. As previously mentioned, AIS-data are static, dynamic and voyage-related information. Static data include, inter

29) Charter of Fundamental Rights of the European Union (C 303/1).
32) Static information is entered into the AIS on installation and need only be changed if the ship changes its name or undergoes a major conversion from one ship type to another, see first indent of Paragraph 11 of the Guidelines for the onboard operation of automatic identification systems (AIS).
33) Dynamic information is, apart from ‘Navigational status’ information, automatically updated from the
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alia, call sign and name of the ship, IMO Number, length and beam as well as the
type of the ship. Dynamic data is for instance the ship's position, course, speed and
navigation status. Finally, the voyage-related data comprise the draught of the ship,
the hazardous cargo, the port of destination, the estimated time of arrival and the
route plan of the ship. In this regard, primarily information about the ship as an
object are collected, with the result that, at first glance, an identification of persons
seems not to be possible. However, for the present of the criterion "personal data" it
suffices that by a synopsis of the factual information a reference to the identity of
persons can be made. By inspection of the ship's registry or through private sources
such as the Internet, it is smoothly possible to determine the command leading
master of a ship, so that his location can be ascertained via a targeted querying of
AIS-data. In addition, certain authorities may draw conclusions to the persons on
board because they have access to the passenger lists. Against this background,
AIS-data are information relating to an identifiable natural person and, consequently,
personal data within the meaning of the Data Protection Directive. This result does
not change even if there is only a small number of persons or close acquaintances
who are able to determine the location of the affected persons since the identifiability
of a person must not be made dependent on the number of persons that are capable
of such conclusions. When processing the AIS-information, e.g. during the collection
of data, the requirements of the aforementioned Directive must hence be complied
with.

ship sensors connected to AIS, see second indent of Paragraph 11 of the Guidelines for the onboard
operation of automatic identification systems (AIS).
34) Voyage-related information might need to be manually entered and updated during the voyage, see
third indent of Paragraph 11 of the Guidelines for the onboard operation of automatic identification
systems (AIS).
§ 3, Rn. 19.
37) E.g. "vesseltracker" [http://www.vesseltracker.com/app]. In this context it needs to be clarified whether
the publication of AIS-data is legitimate because Art. 24 of the Ship Reporting Directive provides that
the Member States adopt the necessary measures to ensure the confidentiality of the data, which are
collected on the bases of this Directive. Furthermore it follows from recital 6 Directive 2009/17/EC of the
Community vessel traffic monitoring and information system that the IMO "has recognised that the
publication for commercial purposes on the internet or elsewhere of AIS data transmitted by ships could
be detrimental to the safety and security of ships and port facilities and has urged its member governments,
subject to the provisions of their national laws, to discourage those who make AIS data available to
others for publication on the internet or elsewhere from doing so. The publication of AIS-data on sites
like "vesseltracker.com" is contrary to the foregoing considerations and thus takes place in an inadmissible
way".
38) Nehab T. (2013), Veröffentlichung von Schiffspositionen im Internet: Rechtliche Bewertung und
bb) Criteria for making data processing legitimate

The criteria for making data processing legitimate are described in Article 7 of the Data Protection Directive. According to Article 7 lit. f) personal data may be gathered only if the processing is necessary for the purposes of the legitimate interests pursued by the data controller, except where such interests are overridden by the interests for fundamental rights and freedoms of the data subject. It can be assumed that a legitimate interest exists because the data collection is necessary to further develop the technologies to combat piracy. In addition it has to be determined, whether the interest for fundamental rights of the data subject overweigh the interest of the data controller. On the part of the data subject particular attention should be placed on the right to the protection of personal data. But it also must be respected that the AIS-data aren't peculiar sensitive data like ones revealing racial or ethnic origin, political opinions, religious or philosophical beliefs, trade-union membership and such concerning health or sex life. Moreover, information are collected mainly about the ship, so that a reference to individuals is possible only in an indirect way. Then the fact should be considered, that the data subjects are likely to have an own interest in the collecting of AIS-data because they also benefit from the development of technologies which improve the maritime security. Finally the Charter of Fundamental Rights not only protects the data subject but also scientists because according to Art. 13 scientific research shall be free of constraint. This indicates, that the interest of the data controller overweighs the interest in data protection of the data subject. Thus, the processing of AIS-information is lawful.

cc) The data subjects' right

But even though the processing is principally legitimate, the Data Protection Directive nevertheless contains certain rights for the affected persons. According to Art. 10 and 11, the data controller must give specific information to the data subject. In this context Art. 10 isn't relevant because it refers to data which are collected from the data subject, which means with his/her participation. In legal terms ships are obliged to keep the automatic identification system continually in operation. Only in certain exceptional cases the captain is entitled to disable the AIS. Although it would actually be possible to stop the data-transmission, this would entail a violation of rules of the law of the sea. Therefore the captain is de facto bound to keep the automatic identification system in operation. Because of this duty the crew can’t influence the transmission of information. In addition, it should be noted that the user will utilize the automatic identification system primarily for navigation purposes. Against this background, he/she is aware that he/she transmits the information of his/her ship to

other ships and shore stations, but he/she doesn’t expect that with the data collection others than navigation purposes are pursued. Therefore it can’t be assumed that a participation is taking place in the way that the crew itself determines to whom they reveal data and to which purpose. In this respect, AIS-data are information in the sense of Art. 11 of the Data Protection Directive which have not been obtained from the data subject, so that the data controller has to provide the affected persons with the information in the meaning of Art. 11 (1) of the Data Protection Directive. Regarding the amount of data which is transmitted this, however, may be difficult. Hence, the data controller is exempted from the information obligation where, in particular for processing for the purposes of scientific research, the provision of such information would involve a disproportionate effort. Due to the circumstance that the AIS-data aren’t peculiar sensitive information about the persons and according to the aforementioned it can be assumed that the information of the data subject would involve a disproportionate effort. Consequently, there is an exception from the basic obligation to provide information. But for the subsequent handling of the collected data, the Directive includes some further rights and obligations like the data subject’s right to object or the guarantee of confidentiality and security of the processing. If these requirements are met, the processing of AIS-data for research purposes doesn’t violate the right to protection of personal data.

V. Summary

Piracy is a worldwide problem which threatens the maritime security, in particular life and physical integrity of seafarers. But it is also accompanied by crucial economical damages. For combating piracy certain technologies are used, e.g. the automatic identification system. AIS enables the seafarers and the competent authorities of the coastal states to observe the maritime traffic. In this regard, it is problematic that the pirates adapt to this technology. By jamming the GNSS or feeding the automatic identification system with false information, they can smoothly identify their targets. At the same time the pirates themselves are not visible through the automatic identification system. Another problem is that outside of the limited range of the AIS a reliance on satellite-based monitoring systems is required. However, one of the major disadvantages of satellite systems is the amount of collected data since the signals are overlapping and disturbing each other. Thus, scientists and industry have to search for legitimate solutions to solve the aforementioned problems. But the development of new or optimized systems also means to collect data for research

41) See Art. 11 (2) of the Data Protection Directive.
purposes. In this case the relevant regulations of the Data Protection Directive are to be met, because AIS-data are personal data in the meaning of Art. 1. The processing of these information satisfy the requirements of Art. 7 lit. f) Data Protection Directive as the data controller has a legitimate interest in collecting the AIS-data. Furthermore the weighing of the mutual interests of the data controller and the data subject shows that the right of the affected persons to the protection of their personal data isn’t overridden through the processing. Nevertheless, the data controller has a duty to give the data subject certain information about the processing, see Art. 11 Data Protection Directive. In the event that the data are collected for research purposes there is an exemption to this rule, because the provision of such information would involve a disproportionate effort in the sense of Art. 11 (2) of the Data Protection Directive. Therefore the processing is legitimate even if the data controller does not inform the affected persons. But in a case like this it also has to be considered that there are several rights which protect the data subject, e.g. the right to object or the guarantee of confidentiality and security of the processing.

As a result the article shows that there is a need to evolve technologies for combating piracy, without losing sight of the legal preconditions. The solving of the issue of maritime piracy hence requires close interdisciplinary cooperation between industry and scientists.