

## ELECTRONICS

# What technology can improve shipping security?

The first day of *Digital Ship's* London conference in November looked at how technology can improve security in the maritime industry. There was some interesting discussion

"THE SUBJECT OF SECURITY in shipping is of concern to all," said Kamar Zaman of Drewry Shipping, opening the day one of the *Digital Ship* conference (November 4-6) in London.

The following speakers certainly agreed with him on this part, even if different takes resulted in a passionate debate at the end of the day.

Mr Zaman, of course, referred to September 11, 2001 as somewhat of a turning point in shipping security policy. The picture he painted was not a nice one: Suddenly, seafarers weren't allowed off their ships in US ports anymore; armed guards were coming onboard.

While it is understandable that measures have to be implemented, there have to be limitations to how people are being treated, he said.

Furthermore, he mentioned issues which have proven problematic for shipping companies to arrange, and have caused a lot of debate recently: Visas are difficult to arrange if ships change destination; there was "uproar all around" about the Seaman's identity card. Yet, Mr Zaman said, "We are being monitored anyway," so why not have the country of origin issue ID cards. The information would have to be stored both on the card as well as on the master's computer in order to detect manipulations. Encryption would be necessary, too.

However, only a certain kind of information would have to be stored, it was of no interest to the master whether or not a seaman had a criminal record. That was an issue to deal with before employing someone, said Mr Zaman. Those ID cards could be used as "smart cards", permitting or restricting access to certain areas of the ship.

The data, of course, would have to be stored in a central database, i.e. at the marine department of the particular country of origin. They could, or should, also be made available on a secure international, internet-based platform. Mr Zaman referred to an IMO meeting in December where details of the ID card are going to be discussed.

## The Human element

Len Holder, chairman of Videotel responded to the question of whether

Brian Mullen



ships would be required to have a full-time security officer onboard in the near future. His answer was: "probably not." Rather, he suggested that this task would be assigned to an existing crewmember. However, it will become mandatory eventually to have a trained security officer



Anders Bergström

onboard, he predicted.

The functions of a security officer would be "threat precaution; routine monitoring; contingency plans co-ordination with crew and shore-based fleet," Mr Holder said. "He must be aware of the risks and needs onboard and what to do in case of a security breach. He needs to know the theoretical basics and the real threats, procedures and consequences."

Picking up on a number of legislative issues, Steve Harding of 3gmarine pointed out that "security threats change with time. Security itself is a political construct; it is dynamic due to space and time; so should be legislation. At the moment it is perceived that more legislation is good and little is bad, but that's not right necessarily."

It was important to establish what legislation, in regards to security, is supposed to achieve, he continued. First of all, existing legislation should be facilitated. Mr Harding also said, that "developing detailed procedures at the highest level is a waste of time and effort." It was more important for the highest level to release general rules and regulations as guidelines or principles and control individual measures in terms of their compliance with those rules.

He particularly referred to the principle of ethics, relating to some of the current US measures that discriminate against seafarers from particular backgrounds. Any measure, even if it serves homeland security, should be required to be democratic and ethical, he

said. This issue is more of a political than technical nature and caused opinions to differ in the afternoon debate.

To protect and keep track of crew moving around a 300-meter long vessel is a slightly different, yet no less important, issue. Michael Christensen of G-O Technologies introduced a wireless "dead man alarm" device to the audience. It facilitates UHF technology and can be connected to any means of communications onboard in order to send data to the shore.

The self-contained system features a master unit and up to eight mobile units that can float around the ship. Data messages can be sent back and forth via paging. On large vessels, repeaters have to be implemented to provide ship-wide coverage. Mr Christensen said that as far as he could tell, there was a need for "owners to monitor people working at rough sea, as well as a need for an increased exchange of information between ship and shore."

## Protecting cargo

An entirely different issue was raised by Mark McGlade of Savi. Mr McGlade's suggestions on how much commercial shipping could learn from the military were certainly much debated afterwards.

Savi specialises in tracking facilities for containers, providing end-to-end tracking. He said, "it is important to keep assets visible and track their status: where is it?; and what is in it?; has it been opened?" He spoke about an "inefficient use of resources - lost and delayed shipments."

Savi uses a combination of different technologies to keep track of containerised assets: both cellular and satellite GPS, tags, labels and other devices that are interfaced to one another and provide "best possible visibility" at land, at sea and in the air.

Mr McGlade referred to CSI (Container Security Initiative) and C-TPAT (Customs-Trade Partnership against Terrorism), both of which came into being after September 11, 2001. He said that those who comply with the rules imposed by US initiatives could very well gain a competitive advantage.

However, beyond competition, there is also a common understanding of what needs to be done to keep ports safe, not just in the US. A number of big container terminal operators PSA, P&O and Hutchinson Whampoa for instance, are working on a container tracking solution from the port-side.

Purplefinder is developing interfaces between its long-range tracking system and AIS, VTMS and asset tracking facilities. All of which would contribute to tighten the security net in shipping. While tracking the own fleet via satellite was most of all a commercial issue for ship operators, it has become a security issue in recent years.

Steve Guest of Norcontrol spoke on harbour security systems. His company is specialising in "facilitating existing information for port users to be accessed." This data, for instance, originates from VTS

(vessel traffic systems) in near-by locations. Norcontrol's systems provide both surface and under-water surveillance of coastal areas.

The most essential thing, he said, is to have the information way before the ship is entering a port area. "It is important to keep track of and risk-assess events, i.e. prevent incidents from happening. There is no use to have information afterwards."

Mr Guest commented on the developments surrounding US ports. He said, "Terrorism is not the main issue to other parts of the world, so other issues have to be considered in a global context too, such as piracy, smuggling and theft." Thus, solutions have to respond to a more abstract threat, one that cannot be labelled by terrorism alone.

It is also important to combine surveil-



Vessel traffic system: Denbridge Digital's Colin Wright shows how to juggle efficiency, safety and security

lance media to get the full picture, so says Mr Guest, as one means alone couldn't do a good enough job. There are limitations to radar, for instance, and AIS (automation identification systems) "was originally developed for safety purposes. But it can be manipulated and not relied on 100 per cent, at least not as an exclusive source for information," he concluded.

## Automatic Identification

In reference to the use of AIS onboard, as it has become mandatory for certain types of ships this year, Anders Bergström of Saab TransponderTech pointed out that it is intended to be "a complementary system to others, for instance, radar." He also agreed that "one means of tracking what's going on around you is not enough. Visual sight may be limited and ice can distort radar, for instance."

AIS has the advantage of indicating exactly, and in real-time, how the ship moves. It delivers data on the ship's heading, direction and speed. As opposed to this, radar does not provide such detailed information. However, AIS needs to be

integrated with other means of surveillance in order for the ship to have the full picture of the surroundings. Interfacing ECDIS, radar and AIS seems a logical consequence. Also, AIS is a practical data source for VTS.

Mr Bergström reminded the audience that the implementation schedule for AIS has been accelerated by the IMO as a result of increased security awareness after September 11, 2001. Thus, it was suggested that by the end of 2004 "all ships on international voyage would be equipped with AIS," as it doesn't only fulfil a monitoring purpose but can send safety messages to the shore and assist with SAR procedures. It can also interface to long-range tracking devices.

As Mr Guest had pointed out before him, Mr Bergström emphasised "AIS was originally developed for collision avoidance, but it can be adopted for security purposes in the same way VTS can be extended."

Chris Courard of Iridium presented ideas about how his company could assist with long-range ship tracking. Providing global satellite coverage, Iridium is responding to the need for security solutions, which can act both as communication channels and tracking devices. The company is currently Beta-testing its short-burst messaging service to be introduced commercially at the beginning of next year.

The mobile handsets are predestined to function as remote equipment, hidden away from unauthorized access. Furthermore, GPS transponders can be integrated in order to allow for satellite tracking.

### Radar for shore-based tracking

Back to the shore-side, Colin Wright of Denbridge Digital spoke about its role in shore-side vessel monitoring. About those he said, "The issue is piecing together different data to get all the information needed. Efficiency, safety and security have to work together. Therefore, sensor fusion is the way to go."

However, Denbridge Digital has specialised in systems that use radar, which "can see around the corner." In practise, this means that a number of radars can be positioned at the best locations in the area, preferably on top of a hill etc, and be combined to deliver a fuller picture. As those systems are shore-based, landlines do the job of sending data from the

particular radars to a central place. The raw data does not use up much bandwidth anyway.

Mr Wright concluded, "Sending sensor data in one central, integrated database and recording it is essential as incidents can be replayed and causes, or blame, can be established more easily."

The overall message of this day was that

security is, of course, a main concern among port authorities and shipping companies. However, it also became clear that security is not only a concern in terms of terrorist activity. Generally, a need for more secure vessels could be sensed; both speakers and the audience referred to piracy and smuggling as major threats as well.

Integration was, again, a major theme

in most presentations. The combination of a number of security measures and devices was suggested to get the "full picture". Effective means to enforce existing rules and regulations as well as central databases that store and analyse essential data are needed to prevent incidents and deal with them in the most efficient way should they occur. **DS**

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