

AMSA's Vessel Tracking Programme – a focus for safety and protection of the environment

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Background

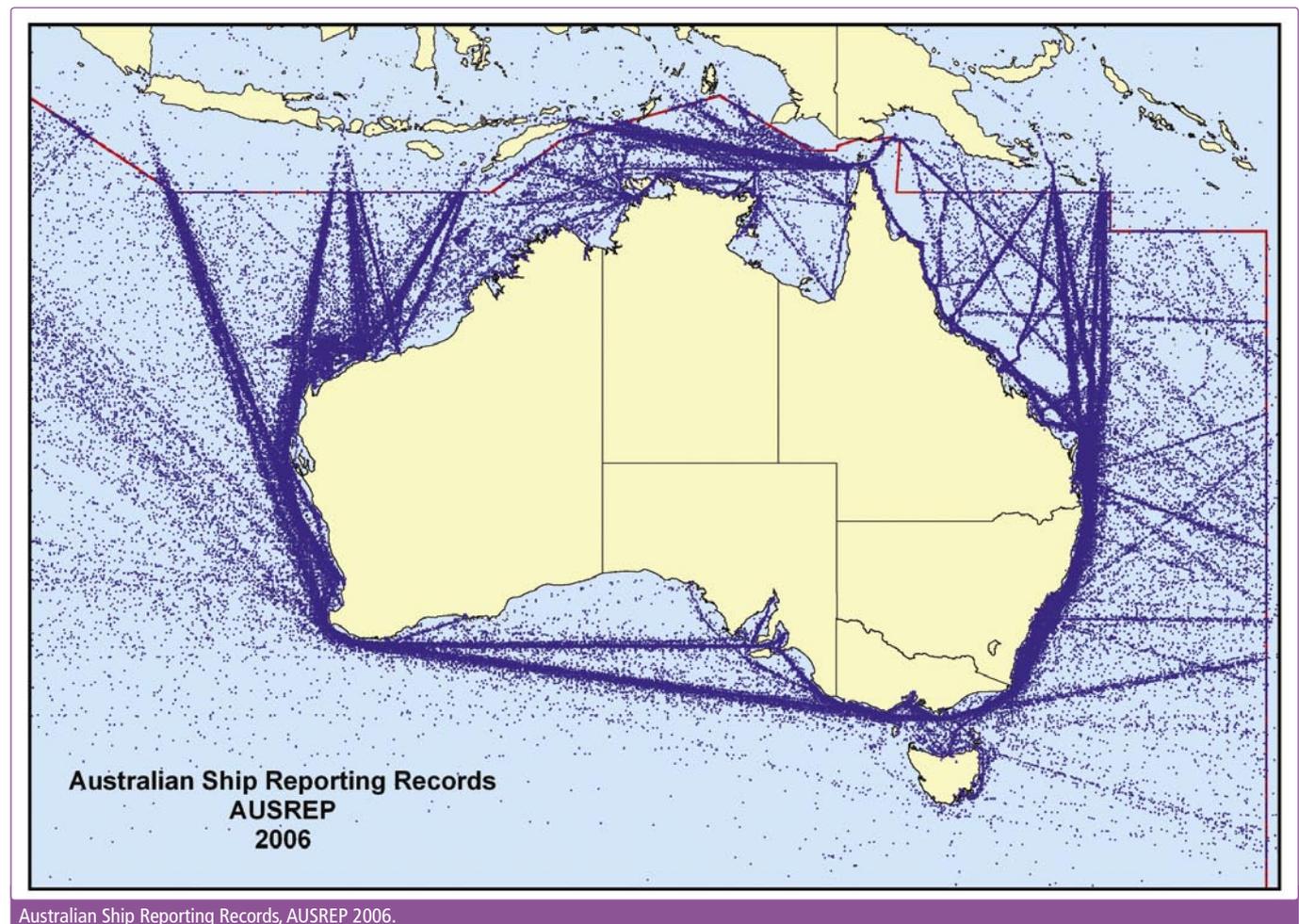
The realities of modern shipping, with larger and less manoeuvrable ships, localised areas of traffic congestion, varied hazardous cargoes, environmental and security concerns has pressured competent authorities to take sophisticated measures to reduce risks. In recent years there have been significant developments in maritime technology, including the introduction of the Automatic Identification System (AIS) and the concept of 'e-navigation.' The Australian Maritime Safety Authority functions under the AMSA Act of 1990 (as amended) and has at its core safety of navigation, the provision of search and rescue services and protection of the environment.

Responding to the need to ensure safe and efficient navigation, AMSA has recognised that various sensors used to assist in the monitoring of Vessels through the existing Australian Reporting System (AUSREP) and the joint AMSA/Maritime Safety Queensland ReefVTS are developing at a rapid pace. The

definition of Maritime Domain Awareness – MDA – provides indication of the key concerns when looking at the maritime arena:

Maritime Domain Awareness – The effective understanding of any activity associated with the maritime environment that could impact on the security, safety, economy or environment.

Within AMSA, as within many organisations, the increased demand for vessel location information, and its integration with other information, is highlighted in various elements ranging from promoting the use of the Automatic Identification System (AIS) to coordinating information sharing measures. The aspects of 'safety' and 'environment' within the definition of MDA are directly linked to the role of AMSA. To respond to the many developments, and provide a cohesive and coordinated approach to the use of vessel track data for safety and protection of the environment, AMSA has been moving forward on a number of Vessel Tracking aspects, including the development of a section within Maritime Standards Division – Vessel Tracking.



Australian Ship Reporting Records, AUSREP 2006.

Developments in Vessel Tracking

2005 – 2006 was a very active time for vessel tracking/vessel monitoring. In November 2005, IALA held a seminar on ‘Global Tracking’ as a follow-up to the 2004 seminar ‘Tracking all the Way?’, and in May 2006 the IMO adopted an amendment to SOLAS Chapter V introducing new obligations for ships regarding Long Range Identification and Tracking (LRIT), which will come into force on 1 January 2008.

These aspects occurred in addition to the ongoing development of AIS. The regional implementation of vessel tracking in the Baltic Sea, through the Helsinki Commission (HELCOM) framework, and other regional developments for information sharing, led to questions at the international level on the legalities of information sharing. ‘AIS Live’ (www.aislive.com) forced international discussion, and brought the overall concept of information sharing and data management to the forefront.

At the national level in Australia, concern over security has led to the development of the Australian Maritime Identification System (AMIS) – a system that will be designed specifically to protect Australia from the seven defined maritime threats.

At the State and port level, interest has been shown in the provision of AIS Base Stations and AIS aids to navigation (AtoN). The acceptance of international testing standards for AIS Class B-CSTDMA has led AMSA and some States and Ports to investigate possible benefits in the carriage of AIS Class B on work and charter craft.

AMSA continues to move forward on a number of Vessel Tracking aspects, including the roll-out of AIS in identified high-priority areas around the Australian coast; participating in the whole-of-government approach to vessel tracking through the Australian Maritime Identification System (AMIS); promoting vessel tracking through presentations and information sessions; and identifying specific uses for vessel track data, both real-time and historic within AMSA.

What is Vessel Tracking and why track vessels?

What exactly is ‘Vessel Tracking’? The term has been developed to ensure that the concept is separate to VTS (Vessel Traffic Services) and VMS (Vessel Monitoring System) and to accurately reflect what AMSA is doing.

Vessel Tracking – providing the ability to monitor the movement of vessels, both in real time and from a statistical/historic perspective to respond to differing requirements.

Vessel Tracking, in this sense, does not provide the concept of ‘managing’ vessel traffic, nor does it imply the 24/7 operational concept of a fused image.

To date, effort has focused on the collection and display of independent data sources of vessel tracking data, with an emphasis on AIS data. The data sources that could be included in Vessel Tracking are identified in Table 1.

Within AMSA a variety of requirements for vessel track data have been identified. These include increased situational awareness for SAR and pollution response; additional information provided to support Vessel Traffic Services; post-incident analysis; actual waterway use monitoring and analysis; route planning; aids to navigation program analysis and planning; and many other related aspects.

AMSA’s Vessel Tracking Programme

The ASMA-VT programme is the umbrella structure established in early 2007 to manage the related projects in vessel tracking. In broad terms the purpose of the programme is to:

- Provide overall direction, guidance and leadership for vessel tracking related projects
- Ensure each group dealing with related projects are communicating effectively
- Provide a central point of contact and focus for client and project teams
- Determine how individual projects should be defined to ensure all the work gets completed successfully

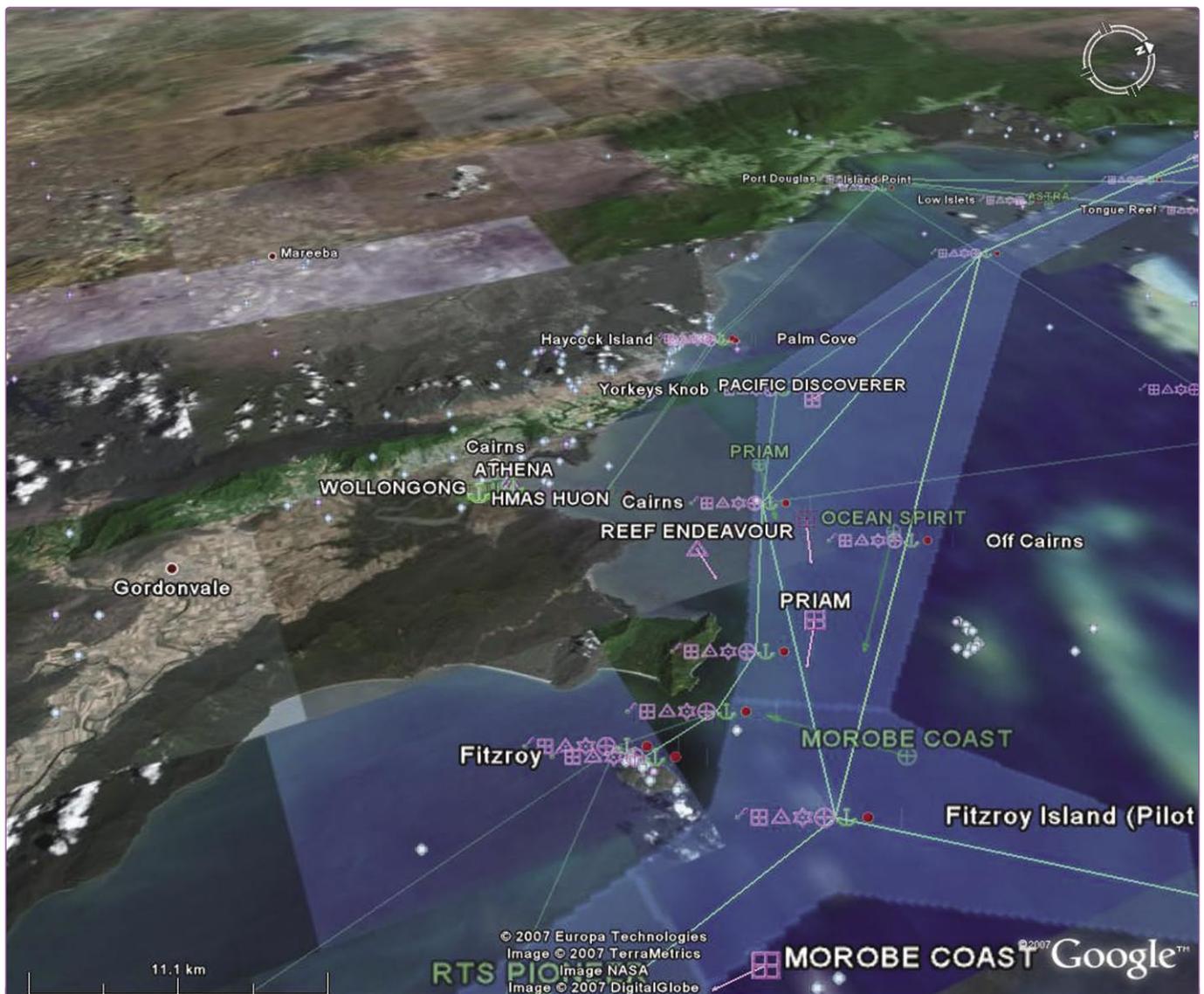
The AMSA-VT programme has been defined to support maritime safety and environmental protection, as identified in the AMSA Act (1990) Sect 6, Function of Authority and will enhance whole of government approach to Maritime Domain Awareness (MDA) through full support of the AMIS project.

Overall, the goals of the AMSA-VT Programme are to:

1. Enable vessel data, and information from different data sources to be compiled for the benefit of all authorized users
2. Significantly enhance awareness and understanding of vessel movements and activities in the Australian Search and Rescue Region (SRR)

TABLE 1: VESSEL TRACKING SENSORS

| Sensor/Technology | Status | Data Fields | Granularity | Range |
|--|--|--|--|---|
| Radar | Established – used in ReefVTS | Limited (indication of position) | High (real-time update rate, high confidence) | Short Range (12-18 nm) |
| Automatic Identification System (AIS)/VHF | Developing – Class A mandated for SOLAS vessels; Class B developing; AIS shore infrastructure developing | Extensive (data fields for static, dynamic and voyage related information) | High (near real-time update rate, high confidence) | Mid range, depending on antenna, location and propagation (20 – 100 nm) |
| APR (automatic position reporting)/Sat C Polling | Established – used in ReefVTS | Moderate (indication of vessel ID; date/time stamped position in lat/long) | Moderate (15 minute reports) | Long Range (satellite coverage) |
| Sat C AUSREP Polling | Established – used in AUSREP | Moderate (indication of vessel ID; date/time stamped position in lat/long) | Low (update rate 12 hrs) | Long Range (satellite coverage) |
| Sat C AUSREP Reporting | Established – used in AUSREP | Extensive (data fields reflect elements required for AUSREP reporting) | Low (update rate 24 hrs) | Long Range (satellite coverage) |
| Long Range Identification and Tracking (LRIT) | Developing – to be included in SOLAS Chapter V 1 Jan 2008, compliance from 31 Dec. 2008. | Moderate (indication of vessel ID; date/time stamped position in lat/long) | Low (update rate 6 hrs) | Long Range (satellite coverage) |



Vessel Tracking provides the ability to monitor the movement of vessels. AMSA uses a programme called EarthVTS, development by HSA Systems in Australia. In the above screen shot the squares represent radar tracking, the triangles AIS, and the stars Inmarsat-C automatic position reporting.

3. Coordinate and align the activities, data, and business processes for vessel track data use within AMSA to leverage strengths, reduce duplication and encourage a holistic approach
4. Provide better information and tools for collaborative decision-making to prioritise analysis, response and provision of aids to navigation activities

Looking to the future

The use of sensors to identify where vessels are is not a new concept; however a holistic approach to vessel tracking is new.

AMSA is leading the way in vessel tracking by providing a programme that will focus on a coordinated approach to vessel tracking, recognising not only the real-time value, but the historic value of the vessel track data.

What will the future hold? Only time will tell – the International developments of LRIT, ongoing developments in AIS and the inclusion of safety, environment, security and economic aspects in MDA indicate a growing need for vessel tracking. AMSA looks forward to these developments, and will make optimum use of the technology and resources to protect the environment and ensure safety of navigation.

ABOUT THE AUTHOR

A graduate of the Canadian Coast Guard College, with experience both afloat and ashore, **Jillian Carson-Jackson** joined AMSA in September, 2007 after spending 4 years as the Technical Coordination Manager for IALA. Jillian holds a Master of Education from the University of Toronto, is an Associate Member of the Nautical Institute and an Associate Fellow of the Royal Institute of Navigation.

ABOUT THE ORGANISATION

AMSA is a largely self-funded government agency with the charter of enhancing efficiency in the delivery of safety and other services to the Australian maritime industry.

AMSA is committed to continuous improvement in provision of its safety and environment protection services and maintaining constructive relations with our stakeholders in government, industry and the community.

ENQUIRIES

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