No day too long, no task too arduous

100 Years of making shipping safer - a century of achievements of the Royal Australian Navy Hydrographic Service

By SUE MCDONOGH*

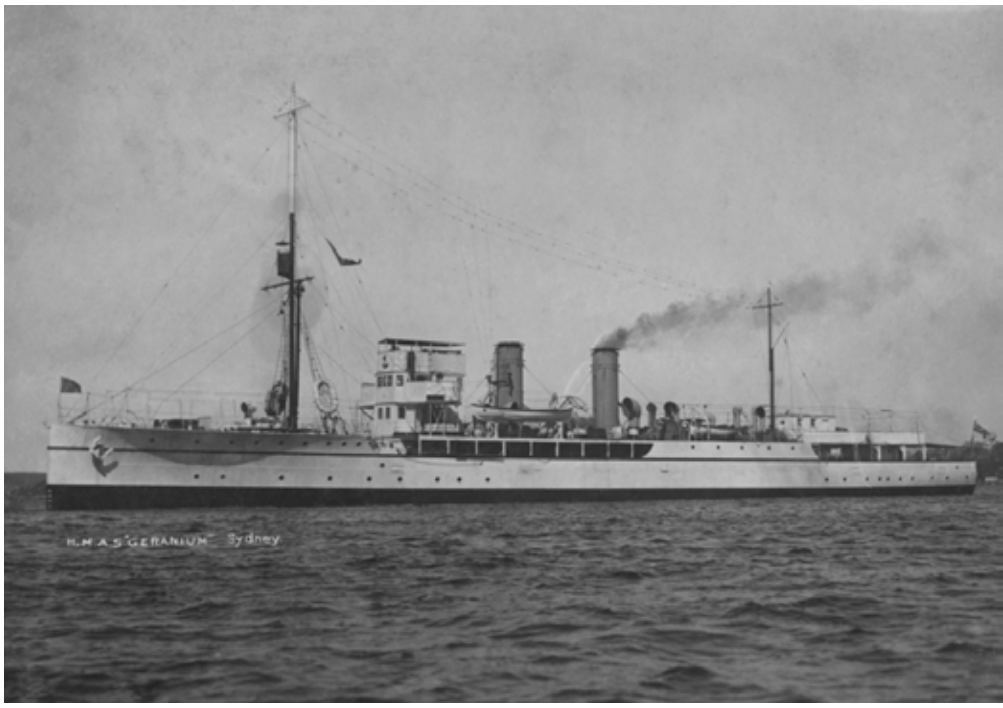
Shipping is the lifeblood of the modern world. Ninety per cent of all goods traded, travel around the globe carted by ships at sea. Hydrographers make safe shipping possible. Without national hydrographic services providing navigation data and services there would be no safe trade routes, and seafaring would be a very dangerous occupation at best.

October 2020 marks the 100th Anniversary of the Australian Hydrographic Service.

As an island nation, our Hydrographic Service was born out of obvious necessity, and has developed into a world-leader in hydrographic advances and technology.

Mainland Australia has one of the longest coastlines on Earth, measuring almost 32,255 nautical miles (59,736 kilometres). Add to this, the islands and territories for which Australia has charting responsibility, the total charting area encompasses an astounding 13 million square nautical miles. Comprising around ten per cent of the world's oceans.

Before Federation and up until the outbreak of World War I, British Navy survey ships carried out surveys in remote areas of Australian waters and nautical charts were produced by the British Admiralty Hydrographic Office. For large scale surveys, for example - approaches to harbours, the British Admiralty supplied surveying officers who joined local crews on boats provided by the individual States, through agreements drawn up by the



HMAS Geranium – Australia's first hydrographic survey ship *Image: Department of Defence*

Royal Navy Hydrographer.

Following the Great War, the British Government encouraged its Dominions to establish their own hydrographic services. From this directive, the Australian Hydrographic Service (AHS) was born.

On 1 October 1920 Captain John Robins, formerly of the Royal Navy, was appointed Hydrographer RAN. The Hydrographic Department RAN was established in Melbourne, and HMAS *Geranium* was commissioned as Australia's first survey ship.

From taking soundings using a lead weight on a graduated line, lowered to the seabed - to using satellite imaging and lasers to collect data. From hand engraving copper plates to produce paper charts, to the computer-based Electronic Chart Display and Information System (ECDIS), which supersedes paper – hydrography has come a long way in the past 100 years.

The early days of the AHS saw a close collaboration with the British Admiralty Hydrographic Office, and while Australia carried out its own hydrographic surveys, our charts were printed in the United

The best fit is the one tailored for you

Bespoke services to help you stand out

With 14 strategically located offices, GAC Australia has what it takes to serve your shipping needs for all types of cargoes and vessels, at all ports and offshore terminals throughout the country. From traditional ship agency to specialised services for bunkers, husbandry and crews, we measure and match our services to create the best fit for your business strategy. Our continuous investment in new services and technologies keeps you buttoned up to stay ahead of competitors.

gac.com/australia

Gulf Agency Company (Australia) Pty Ltd
T: +61 02 8028 2400
F: +61 02 9279 0457
E: shipping.australia@gac.com

Our offices:
Sydney (Main Office) I Port Kembla I Melbourne I Adelaide I Fremantle I Dampier I Port Hedland I Darwin I Townsville I Mackay I Gladstone I Brisbane I Newcastle I Geelong

fb.com/GACgroup linkedin.com/company/gac-group

GAC
Delivering your strategy.

Kingdom. The onset of World War II, and interrupted supply lines, highlighted the disadvantage of having our charts printed half-way around the world and the Royal Australian Navy (RAN) assumed the responsibility for production of our own charts in 1942.

Legislative basis

For such a fundamental national navigation safety service continuing to meet Australia's needs and its international obligations, it is ironic that for 90 years there was no legislative basis for the Australian Hydrographic Service. It was not until 1946, following the war, that the Australian Federal Cabinet declared that the surveying and charting of Australian waters would become the responsibility of the Commonwealth Naval Board and that the cost of providing the service would be shared among the States of Australia. In 1988 the Richardson Review was conducted to determine the demarcation of responsibilities for land and ocean surveying and mapping between the Royal Australia Navy, National Mapping Department and the Australian Survey Office. Prime Minister Hawke adopted the Richardson Review recommendation that the RAN continue responsibility for providing hydrographic services to Australia, and the Australian Survey Office take all responsibilities for land mapping. The National Mapping Department was disbanded.

The Navy's hydrographic responsibility was finally written into legislation in the 100-year review of the *Navigation Act 2012*. Section 223 now defines the Australian Hydrographic Service and specifies its functions including: collecting hydrographic data, disseminating hydrographic information, and being responsible for the provision of hydrographic services and navigation safety products required by the Safety Convention (SOLAS).

In 2017, a further review saw the Australian Hydrographic Office and the Strategic Intelligence and Policy Group (SP&I) amalgamate to become the Australian Geospatial-Intelligence Organisation, with the Hydrographic Survey Force remaining in the RAN. Navy and the SP&I now share responsibility for delivering hydrographic services required by the *Navigation Act 2012*.

Key milestones

The RAN Hydrographic School

Prior to 1966, training of specialist seamen to undertake survey operations (Survey Recorders) was carried out on-the-job at sea, whilst prospective surveying officers were sent to the United Kingdom to be trained. On 10 February 1966, it was announced a Hydrographic School would be established at HMAS *Penguin* in Sydney. The 'School' opened on 14 March 1966 under the instruction of Chief Petty Officer Survey Recorder Petrass. Allocated one classroom, and one survey motorboat, berthed at *Penguin* for instructional purposes, CPOSR Petrass was supported by the personnel from the AHS supplementing the School during course times.

Laser Airborne Depth Sounder – de Havilland Dash 8 aircraft 2017 *Image: Department of Defence*

Today, in a vastly extended facility, the School continues to train both RAN and international students, under co-operation programmes from many countries. Graduates of the School are valued in the commercial world of hydrographic surveying. The courses cater for various levels of hydrographic surveying and are certified under the National Accreditation via ACT Registration and Accreditation Council and the International Board for Standards of Competence for Hydrographic Surveyors.

Hydrographic surveying in Antarctica

Collection of hydrographic and oceanographic data in Australia's Antarctic territories has been conducted by the RAN and the AHS from its early days. Captain MH Moyes RAN was appointed survey officer, at the request of Douglas Mawson, on his Antarctic expedition in RRS *Discovery* in 1929-30. In recognition of his work operating an echosounder, taking sights and drawing charts, Moyes' was awarded Polar medals and a Bronze Clasp.

This type of collaboration between RAN personnel and Antarctic expeditions collecting hydrographic data to enable compilation of nautical charts and sailing direction by the AHS continued for around 60 years.

Discussions began in 1983 to develop a cooperative approach between the AHS and the Australian Antarctic Division in order to improve charting in the vicinity of the Australian Antarctic Territory and Australian Sub-Antarctic bases.

In 1989, the Hydrographic Office Detached Survey Unit (HODSU) first deployed to Mawson Station aboard a resupply vessel of the Australian Antarctic Division. HODSU consisted of a survey motorboat and two half shipping containers of surveying, charting equipment and spares. The unit had previously been deployed to foreign countries on contract to conduct surveys.

This cooperation has continued and Australia's new Antarctic support vessel *Nuyina*, due to arrive in Australia this year, was designed with a full hydrographic survey capability.

Airborne laser hydrography

In 1972, under instruction from the then Hydrographer RAN, Captain JHS Osborn, the Weapons Research Establishment (now Defence Science and Technology Organisation), based in Adelaide, was tasked to investigate the development of laser technology for the acquisition of hydrographic data.

On 8 October 1993, the Laser Airborne Depth Sounder (LADS) Flight was commissioned into the RAN by Lieutenant Commander Rod Nairn. Leading the world in this technology, from October 1993 to October 2019, LADS conducted national charting surveys in shallow and hazardous areas where ships could not initially enter.

LADS was able to collect enormous amounts of data compared to conventional plotting from a survey ship, achieving over 3500 square nautical miles in a single year. Following an upgrade of the system in 2008, increased density of soundings and depths down to 70 metres could be collected. Further upgrades of the aircraft and the survey system in 2009 and 2016 allowed improved efficiency with higher sounding density with faster transit times, as well as faster turn times.

After 18 years of continuous service, LADS was decommissioned on 6 November 2019, having flown more than 3000 sorties in 186 surveys and collected


INTERMODAL
SERVICES
MEDITERRANEAN SHIPPING CO
msc
OUR DOOR-TO-DOOR
SOLUTIONS BRING
THE WORLD CLOSER.
Building on decades of experience, MSC aims to deliver a seamless journey for your cargo, serving all industries worldwide. We keep expanding our inland network and offer integrated truck, train and barge services to meet your supply chain requirements.
msc.com/intermodal
MOVING THE WORLD, TOGETHER.
msc

HMAS Leeuwin *Image: Department of Defence*

more than 50,000 square nautical miles of data. A sad day for many.

Hydrographer's Passage

There have been many shorter and safer shipping routes discovered, surveyed and charted by the Australian Hydrographic Service over the last 100 years. It is fitting that one very significant new passage through the Great Barrier Reef off the coast of Mackay was given the name Hydrographer's Passage. The survey and delineation of Hydrographer's Passage by the Australian hydrographic ship HMAS *Flinders* in 1981, under the command of hydrographer, Commander James Bond, won the recognition of the Royal Geographical Society and highlighted the valuable work of our modern-day explorers in the AHS. This 60-mile-long passage shortens the round-trip shipping route for vessels carrying Australian coal from the ports of Hay Point and Abbot Point through the Great Barrier Reef bound for Asia, by 500 miles. A valuable and permanent benefit to Australia's coal export trade.

New ships and multi-crewing

In 2000, the AHS commissioned two new Leeuwin Class survey ships, HMAS *Melville* and HMAS *Leeuwin*. Each ship carries a compliment of 56 crew, ten officers and 46 sailors, with the added space for up to five trainees. At the time, economic pressure coupled with personnel satisfaction led the AHS to introduce a new regime of crewing. Navy had limited the days that crew members could spend at sea each year, but the ships were designed for high utilisation and maximising economic efficiency meant keeping them at sea for the longest possible time each year.

During the final stages of the ship build, Commander Nairn, refined a crewing system where three crews would share operational duties rotating through the two new ships. The proposal was approved by Navy, and Nairn set about the more difficult task of changing a long-held paradigm of crew loyalty to a ship, into one of rallying behind the banner of a squadron.

In a unique event, three Commanding Officers, Commander's Kafer, Nairn and Lieutenant Commander Hardy, leading three Hydrographic Ship Crews (HS) Red, White and Blue, jointly commissioned HMA Ships *Leeuwin* and *Melville* on 27 May 2000. The crews rotated through the ships to provide both maximum operational efficiency and improved crew respite. The Australian Hydrographic Service became the first branch of the RAN to adopt and successfully implement multi-crewing on its ships. What became known as 'The Nairn Plan' was later adapted to the patrol boat fleet.

Computer navigation systems – ECDIS and ENC

Among the most recent and most significant achievements of the modern AHS was the development of a full suite of Electronic Navigational Charts to support the IMO's move to compulsory carriage of Electronic Chart Display and Information System (ECDIS) in all commercial vessels.

The AHS pioneered computer chart production technologies from the 1970's, and was influential in the development of international ECDIS and ENC standards through the 1990's. By the early 2000's, the AHS had produced a raster chart series under the Seafarer brand. But the chart portfolio hadn't been modernised. Since 1972, a metric conversion programme had been ticking along but in the early 2000's our chart coverage was still entirely paper-based, much of it still contained data from old lead-line surveys and many charts were still in feet and fathoms.

This all changed within a period of seven years. The AHS underwent its greatest transition, changing the production paradigm from paper product based to a digital database of information. An ISO 9001 QMS was introduced, aggressive targets were set, key cartographic experts were focussed on assurance and in-house production capability was augmented by outsourced contractors. This was a massive effort to metricate, recompile and produce ENC. The result was to achieve complete Australian Electronic Navigational Chart coverage by June 2012, ten years ahead of original schedule and in time to meet IMO's mandatory carriage of ECDIS.

Women at Sea

The Australian Hydrographic Service had chalked up many notable achievements over the past 100 years but one that should not be overlooked is their leadership in equalising the employment opportunities for women.

In 1989, the AHS became the first branch of the RAN to post women to sea. Initially in the senior survey ship HMAS *Moresby*. There followed, further postings of female officers and sailors to the entire fleet of survey ships and survey motor launches.

In 1997, Commander Jenny Daetz became the first female commanding officer of an RAN ship when she was posted as CO HMAS *Shepparton*. Later in her career, Captain Daetz was also the first female to command a major navy ship, when posted as commanding officer of HS Red Crew in HMA Ships *Leeuwin* and *Melville*. Women serving in all positions at sea is now standard practice throughout the RAN.

Bravo Zulu

The face of today's Australian Hydrographic Service has changed many times over the first one hundred years. But the list of achievements is long. Certainly, the opening of new commercial ports, the discovery and charting of new passages and the high standard of coastal charting have been major contributors to Australia's economic prosperity, marine environment protection and effective border protection. These are the legacies of the Australian Hydrographic Service. BRAVO ZULU.

Acknowledgement
Source Information: Leadline to Laser, RJ Hardstaff; Through the Barrier Reef - The Hydrographers Passage Story, John CH Foley, and various articles written for the history of the AHS by Ian Halls, Michael DeRuyter and Kevin Slade.

**Sue McDonogh worked at the Hydrographic Chart Depot, Observatry Hill, and the Australian Hydrographic Office at Kent and William Streets in Sydney, Walker Street North Sydney and Burelli Street Wollongong.*

INCHCAPE
SHIPPING SERVICES

Port by Port and Ship by Ship, we provide full port agency services through our unique network. Our geographical coverage spans over 1500 different port locations, supporting over 2500 diverse clients. Our local knowledge enables us to deliver quality services where they are needed most, enabling our customers to ship smoothly and trade successfully.

Our services include:

- Port Agency
- Liner Agency
- Husbandry Services
- Marine Survey and Inspection
- Bio-Fouling and Underwater Inspection
- Offshore Support Services
- Bunker Coordination
- Ship Maintenance
- Spares and Supplies
- Provisions and Stores
- Cash to Master
- Marine Survey and Inspection
- Medical Assistance
- Crew Movements and Logistics
- Disbursement Accounting
- Bunker Duty and Freight Tax
- Coastal License

Australia

Inchcape Shipping Services
Ground Floor, 120 Christie Street,
St Leonards,
NSW 2065
Tel : +61 2 9410 8888
Email : australia@iss-shipping.com

New Zealand

ISS-Mackay Ltd
The Shipping Exchange
2 Akaroa Street, Parnell,
Auckland 1052
Tel : +64 9 3094 266
Email : auckland@iss-mckay.co.nz

Papua New Guinea

Inchcape Shipping Services
The Shipping Exchange
Level 5, Mogoru Moto Building
Champion Parade, Port Moresby 121
Tel: + 675 321 2599
Email : port.moresby@iss-shipping.com

CONNECT TO A SMOOTHER, SMARTER OCEAN

www.iss-shipping.com