

SEMAPHORE

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WHY AUSTRALIA NEEDS A MINE WARFARE CAPABILITY

Mining can occur in any level of conflict and the sea mine represents a viable threat to Australia and its interests that cannot be ignored. The ability to counter the potentially serious threat to national security and trade posed by covertly laid sea mines requires an effective and balanced Mine Warfare (MW) capability incorporating a combination of minehunting, minesweeping, clearance diving, and mining capabilities. MW forces need to be capable of deploying throughout Australia's area of strategic interest to conduct mine countermeasures operations in order to ensure the safe transit of naval units and commercial shipping through mine threat areas. The Australian Defence Force (ADF) MW force must be able to conduct:

- mine surveillance and reconnaissance operations to establish the presence or absence of mines;
- timely clearance of ports, port approaches, off-shore resource installations, choke points and focal areas;
- hydrographic reconnaissance, survey and clearance of obstacles;
- protection of Sea Lines of Communication;
- explosive Ordnance Disposal (EOD), Improvised Explosive Device Disposal (IEDD), and demolition of ordnance and explosive devices; and
- offensive, defensive and protective mining.

The maritime mine is a cheap, effective weapon that can be used in a variety of ways to achieve different strategic or tactical objectives. Mines can be used in small numbers to sink ships, or in large numbers to blockade ports and deny sea areas to an adversary. They can be used at all levels of conflict, particularly in the early stages where political pressure can be exerted without fear of immediate higher level retaliation. They can be laid by aircraft, submarines and surface vessels, covertly and without advance warning. The low cost and highly effective nature of mines means that economically constrained countries or non-government groups may be able to employ a destructive capability out of all proportion to its cost. In the Australian geo-strategic environment, mines are a particularly effective method of interdicting sea communications in the archipelagic choke points of South-East Asia.

The use of naval mines and the need for effective mine countermeasures (MCM) has been one of the most notable features of naval operations in the post World War II era. Since the Corfu Channel incident in 1946¹ the threat of naval mines has been a regular feature of international conflict and crisis. In recent decades the use of naval mines has increased, and their potential use by terrorist and

criminal organisations has added another dimension to the threat. Incidents in the Arabian and Persian Gulfs since the 1980s have reinforced the need to be able to combat both low and high technology mines.

Early sea mines were relatively simple devices; however, modern mines are more technically advanced, versatile in their deployment and difficult to counter. Today, there are many types of mines available, each with their own delivery system and purpose. Mine actuation methods vary significantly, including the use of ships' magnetic, acoustic and pressure signatures, as well as contact or remote control. Therefore, a combination of minehunting, minesweeping and clearance diving is required to allow for the efficient and effective location, identification and disposal of sea mines and underwater obstructions.

Minehunting is a highly specialised operation that requires purpose built vessels equipped with mine detection and disposal equipment. It is a complex task that involves a slow, methodical search of the seabed and water volume using high definition sonar projected ahead of the minehunting vessel to detect moored and ground mines.² Once an object has been located and classified as a possible mine, a Mine Disposal Vehicle or a clearance diver is dispatched to positively identify the contact and, if necessary, dispose of the mine. Minehunting is the preferred method in areas where the seabed and sonar conditions are good, where pressure mines are part of the threat, and where intelligence indicates that MCM vessels may be targeted. Its major advantages are the speed of clearance and the fact that the MCM vessel does not have to pass over the mine to detect it.

Minesweeping involves using mechanical sweeps, which physically remove a moored mine by cutting the mooring wire, or influence sweeps, which emulate the magnetic or acoustic signatures of a surface or sub-surface vessel and explode the mine. Minesweeping can be carried out by non-purpose built vessels such as trawlers, and is the preferred method:

- against a known moored mine threat;
- when the percentage of undetectable mines is assessed as high;
- in areas where environmental conditions degrade sonar performance;
- to provide a level of protection to the higher value minehunter;
- in very shallow water; and



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- to increase the overall probability of clearance in combination with minehunting.

Clearance divers are used to augment conventional forces in confined or shallow waters where MCM vessels cannot easily gain access. Clearance divers use a variety of techniques to survey, detect, classify and dispose of mines and underwater obstacles.

Generally, mine clearance operations would commence with exploratory operations by minehunters to determine the extent of the minefield and the general bottom condition. A decision is then made to either clear a channel or divert vessels around the danger. If the clearance option is selected, both minehunting and minesweeping are usually required to achieve an acceptable level of safety to allow the transit of vessels through the area. In clearing a channel remote controlled drone boats would conduct precursor operations, using acoustic and magnetic influence sweeps, to provide a modicum of protection to the larger MCM vessels. The minesweepers would then conduct minesweeping operations with mechanical and influence sweeps configured to emulate the target vessels. Once the minesweepers have achieved a certain level of statistical clearance the minehunters would continue operations to raise the clearance to a level suitable for vessel transit.

When faced with a threat of maritime mining, the most effective MCM operation is to prevent mines being laid in the first place. At the beginning of the 2003 Iraq War a boarding party from HMAS *Kanimbla* intercepted two Iraqi minelaying tugs, which were carrying over 80 mines between them. Had these mines been laid as intended then a substantial mine clearance operation would have been required to allow the safe passage of ships.

Adoption of an effective mining capability by the ADF could facilitate our ability to achieve strategic control of Australia's maritime approaches, whilst at the same time denying an adversary freedom of action in this area. Mines can be particularly effective in constraining the actions of an adversary, as was demonstrated with the US mining of Haiphong harbour during the Vietnam War, and the Allied mine blockade of the Japanese homeland and occupied ports and harbours in World War II. The opposite side of this capability is being able to conduct effective clearance operations to remove offensive and defensive minefields on completion of a conflict. The World War I mine blockades in the English Channel, North Sea and the Heligoland Bight employed approximately 300,000 mines. Some 700,000 mines were laid in the Atlantic, Mediterranean and Pacific Oceans during World War II.³ The Royal Australian Navy cleared mines from Australian and regional coastal areas continuously from 1945 until 1950.⁴ The US Navy Task Force 78 took 132 days in 1973 to clear Haiphong, Hong Gai and Cam Pha harbours and their approaches of mines.⁵

Mines could be deployed in the approaches to an adversary's forward operating bases, and focal areas in the vicinity of the major archipelagic straits, to constrain or deter adversary initiatives in mounting operations against Australia. Similarly, protective minefields could be laid in the vicinity of Australian port approaches and major choke points to contain the threat posed by adversary surface and

submarine forces, as was done in World War II, thus freeing high value ADF assets to contribute to other national tasks.

In many respects MCM is approaching a watershed in its development. Australia seeks to exploit decisive manoeuvre operations and high technology to achieve short, sharp campaigns with minimal attrition to our limited resource and asset base. Our forces must be capable of operating effectively in the littoral and open ocean environments with limited constraint from adversary operations. Additionally, regional countries will look to MCM-capable forces such as the ADF for assistance if non-state groups, including terrorist and criminal organisations, lay mines in their national maritime areas and international straits. While the ADF's current MCM capability is good in regional terms, the changing nature of ADF operations and the evolving regional mine threat will require ongoing assessment to ensure the capability is maintained at an appropriate level to meet the Government's future strategic directives.

Developments in mine technology, especially stealth technology, will make future mine clearance operations increasingly hazardous for crewed MCM vessels. The ADF will need to transition to systems that enable remote detection and clearance, with a greater use of remotely operated or airborne vehicles for high-risk operations.

In the future, an MCM capability is envisaged as being incorporated into Major Fleet Units and submarines, providing an inherent MCM capability to deploying Task Groups for operations in the littoral. Future MCM operations will begin with clandestine advance force operations by clearance divers in conjunction with remote unmanned systems conducting rapid environmental assessment and MCM. This would be followed by the arrival of a Task Group with onboard MCM systems providing a capability to conduct rapid mine clearance to an objective area through previously explored areas. Current MCM systems may follow the deployed Task Group to provide area expansion and further risk reduction through longer endurance MCM operations.

A Mine Warfare Force is essential to meet the needs of decisive manoeuvre operations, as well as being able to perform operations needed to ensure the sea lanes are safe from hostile mining. This capability will help ensure the mobility of maritime forces and the maintenance of commerce and trade, which are so important to Australia's diplomatic, economic and social interests.

1 On 22 October 1946 the cruisers HMS *Mauritius* and HMS *Leander* and the destroyers HMS *Saumarez* and HMS *Volage* were exercising innocent passage through Albanian territorial waters via the North Corfu channel, a strait used for international navigation. Both destroyers hit mines, killing 45 sailors and injuring 42. The International Court later ordered Albania to pay Britain £843,947 in damages.

2 Moored mines are suspended from the sea floor by cables or wires. Ground mines sit on the sea floor.

3 Fortin, E., 'Those Damn Mines', *United States Naval Institute Proceedings*, Vol. 118, No. 7, July 1992, p. 31.

4 The South West Pacific clasp for the Australian Service Medal 1945-1975 was issued for post-war minesweeping operations conducted in Australian and regional waters up to 16 August 1950.

5 Hunt, L.M., 'Mines remain the weapons that wait', *United States Naval Institute Proceedings*, Vol. 124, No. 5, May 1998, p. 50.

