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ADVANCE FORCE MINE COUNTER MEASURE OPERATIONS

By WOCD Christopher Wright

Introduction

"We have lost control of the seas to a nation without a navy, using pre–World War I weapons, laid by vessels that were utilized at the time of the birth of Christ."
Rear Admiral Allen E. Smith, 1950, after Wonsan landings were delayed due to enemy mining.

As the RAN increases its focus on operations in task groups and the ADF begins to conduct more joint training exercises in the complex littoral environment the use of Anti-Access/Area Denial (A2/AD) to restrict a ship or unit's ability to manoeuvre or slow its advance can have dire consequences on the overall success of the operation.

Anti-Access/Area Denial (A2/AD)

A2. Action intended to slow deployment of forces into a theatre or cause forces to operate from a distance further from the focus of conflict than they would otherwise prefer. A2 effects movement into a theatre.

AD. Action intended to impede operations within an area where an adversary cannot or will not prevent access. AD affects ability to manoeuvre within a theatre.

THE THREAT

Mine fields can be laid by air, surface or subsurface assets. Ground mines on the sea bed, buoyant mines moored in deep water, surface floaters drifting or moored and self-propelled or smart positioning mines pose a credible threat to international shipping lanes or any military force attempting to establish a maritime presence in an area. Australia's near peer adversaries with access to modern sea mine inventories would challenge the best equipped and trained nations MCM forces.

Nations with less advanced sea mine laying capabilities may use merchant vessels, fishing boats or small leisure craft to lay mine fields. Intelligence indicating that a vessel of this type was in an area brings the possibility of mining into the tactical picture and a Commander should consider that they may be denied the ability to manoeuvre assets as desired resulting in tactical or even strategic consequences.

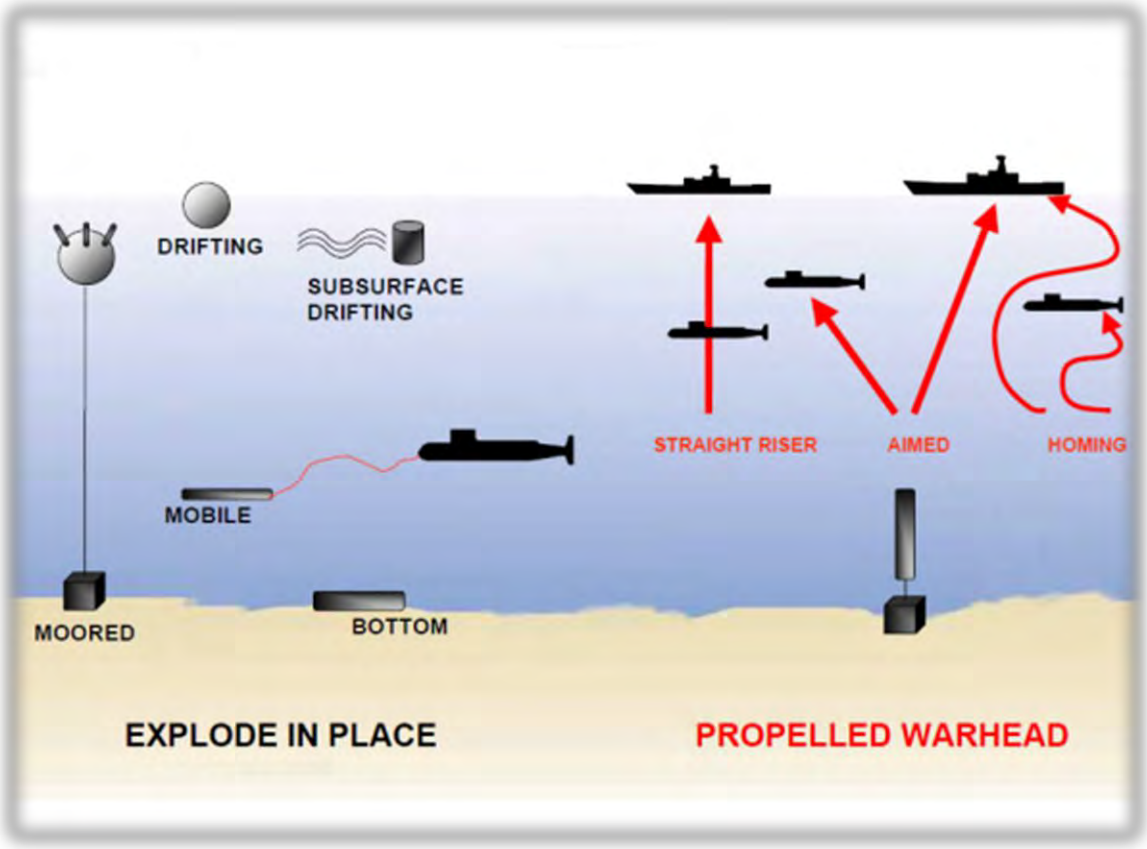
HMAS Ballarat's embarked MH-60R helicopter flies over HMAS Anzac in the South China Sea.
Photographer: ABMPO Rikki-Lea Phillips

The following scenarios have been presented to give context to this article. The first two are peace time and the last a war time. Each represents a situation where MCM forces would have great difficulty in rapidly deploying and conducting search and clearance without allowing subsequent operations to be impeded by the A2/AD environment.

1. A RAN task group is conducting a Freedom of Navigation Operations (FONOPS) transit as part of enhanced regional engagement activities within the Indo-pacific region. Intelligence is received that a nation not supportive of Australia's Naval presence may have supplied sea mines to an organisation with the ability and intent to mine the FONOPS area of operations.

2. A terrorist organisation has claimed responsibility for severely damaging two civilian merchant vessels, one being a petroleum tanker bound for Australia. The group claim to have mined the busy shipping channel with improvised ground mines and improvised drifting mines. The attack has created a huge environmental disaster and caused chaos for international shipping as well as threating Australia's fuel security.

3. Three beaches have been selected as possible targets for an amphibious landing. Before the landing can commence the target beaches and approaches must be searched and cleared if obstacles or sea mines are encountered.



Source: US Navy

CONVENTIONAL MCM VS ADVANCE FORCE MCM

Conventional MCM operations are those that are conducted in a non-contested environment when tactical superiority has been established over an operating theatre. Most of the RANs MCM assets are trained to conduct these operations.

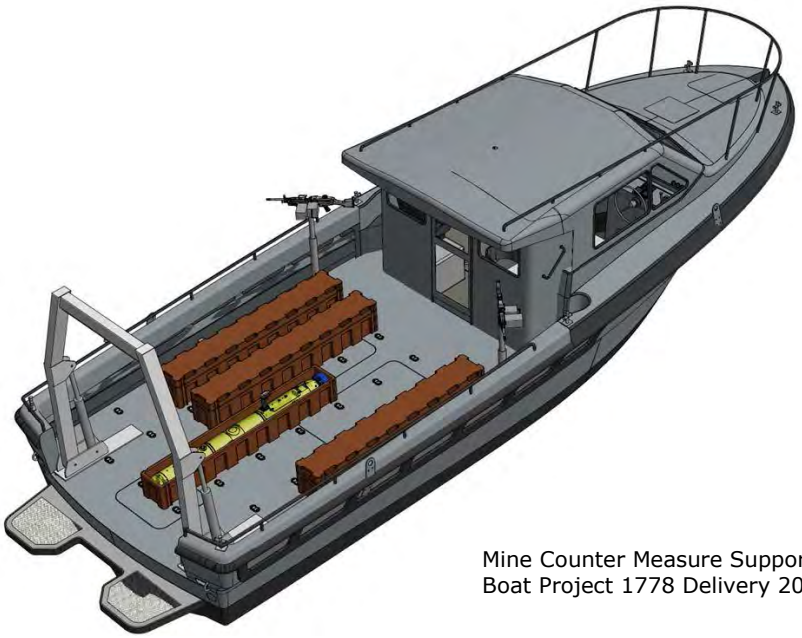
Mine Hunter Coastal (MHC) have a limited self-defensive capability and the vessels speed limitations make operating within a task group challenging. MHCs can clear transit lanes and mine fields with high probability for follow on forces involved in an amphibious operation.

Australian Clearance Diving Team (AUSCDT) Expeditionary Reconnaissance and Clearance (ERC) defence elements can clear out to sea once a beach head has been established or clear mines located by Unmanned Underwater Vehicles (UUV). These operations are conducted from a mother vessel or an expeditionary camp ashore.

Mine sweeping with drone boats or ships or craft of opportunity (COOP) configured for sweeping can also contribute to the reduction of risk in transit lanes and any other areas as part of an amphibious operation or follow on from a task group transit.

Mine Warfare Team 16 can utilize UUVs to search large areas of the ocean seabed for ground mines and buoyant mines that have their payload tethered below the surface. The RANs UUV family will soon consist of three different classes, the Autonomous Underwater Vehicle (AUV), Remotely Operated Vehicle (ROV) and Expendable Mine Neutralization System (EMNS).

AUVs can use a combination of side scan sonar, cameras and a magnetometer during their preprogramed missions to aid in the identification of mine like objects. The targets can then be verified by using an ROV which is controlled from the surface via a tether and then disposal of a verified mine can be done by the EMNS. The Mine Warfare Team will soon have Mine Counter Measure Support Boats (MCMSB) which can deploy from a ship within a task group, deploy UUVs to search, verify and dispose of mines. Whilst these boats can deploy ahead of a task group these operations cannot be considered true advance force operations due to the limited range, self-protection capabilities and the need for the task group to halt while search operations, post mission analysis (PMA) and mine clearance operations are conducted.



Mine Counter Measure Support
Boat Project 1778 Delivery 2020

Advance Force MCM

Advance force MCM assets need to be flexible and able to deploy rapidly well in advance of other ADF or Allied assets to clear or confirm the presence of a mine or mine field. Advance force MCM operations must shape the A2/AD environment to enable concurrent or follow up operations to continue without delay or queuing the adversary to the landing forces to follow.

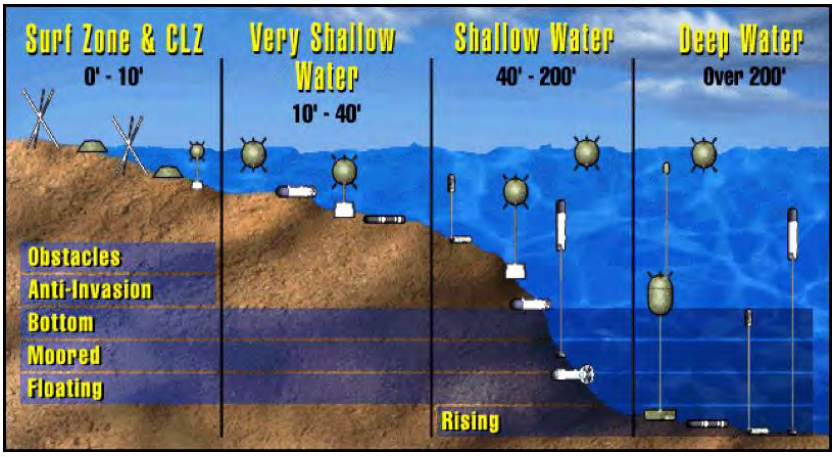
AUSCDT ERC teams can conduct disposal of floating drifting mines or moored floating mines by jumping from a rotary wing aircraft, swimming to the mine and attaching an explosive disposal charge. These operations can be carried out to the maximum range of the aircraft.

AUSCDT ERC teams also have the capability to insert reconnaissance teams ashore ahead of a landing force. Long range clandestine insertion by boat, aircraft or submarine allows these teams to confirm the disposition of enemy assets within a proposed amphibious landing area including the presence of small attack craft, artillery and land based missile systems which may allow an adversary to shape the A2/AD picture against a landing force.

AUSCDT ERC teams can conduct Very Shallow Water (VSW) search and clearance operations of a proposed landing site or beach. After launch from a mother craft or submarine, insertion by a combination of small boat and swimmer delivery vehicle can be conducted clandestinely under the cover of darkness with search and clearance operations being conducted subsurface.

THE GAP

There currently exists a gap in ADFs MCM assets to clear ground mines and deep water buoyant mines in advance of a task group, amphibious landing force or to rapidly clear vital Sea Lines of Communication (SLOC). Current MCM publications are dated and do not support current fleet task group operations. They focus on conventional MCM and follow on clearance and exploitation operations from the shore out to sea. Tactical development needs to be conducted so that SOPs can be created for teams to be able to identify and clear threats well in advance of the force in the shallow water and deep water zones.



Source: Taking Mines Seriously Scott C Truver.

UUV Deployment

In 2020 MWT 16 will take delivery of two new classes of AUV, one being a two man portable model and the other a heavier model capable of extended missions. These AUVs can be preprogramed and once launched run their mission autonomously. Data for analysis can be transmitted during the mission if desired to a mother craft or aircraft. If the tactical situation does not permit data transmission the AUV must be recovered for PMA to be conducted. TAC DEV will need to be conducted and training for MW sailors to launch and recover these AUVs from available maritime assets including rotary wing COOP and possibly submarines.

The viability of using the EMNS from a helicopter also needs to be tested. This would only restrict search and clearance operations for ground and deep water buoyant mines to the range of the aircraft as is the case currently for floating moored and drifting mines. Launching AUV's from an aircraft or from a vessel which is part of a task group should not be considered advanced force MCM. True advanced force MCM forces should be deployed well ahead of a task group to a SLOC to confirm or deny the presence of mining or in preparation for an amphibious beach landing before the task force has sailed.

AUV-MP (Bluefin-9)

Rapid Deployable Advance Force MCM Team

To cover the Gap that exists in the deep water zone ahead of a task force, amphibious operation or for rapid clearance of SLOC, a well trained and equipped team that is flexible and able to operate independently with limited support is required. The team could be made up of MCDO's, CDs and MW sailors. When pre-stationed at a FOB or allied base they could deploy on an allied vessel or COOP to begin search and clearance operations using UUVs and diving. This team and equipment would need to be able to be flown at short notice from the FOB by C 17 or C 130 where they could deploy onto the provisional MCM platform to begin operations. Any platform from small coastal merchant ships, ocean going tugs, survey vessels or even fishing boats could be utilised by these small innovative teams.

In a war time scenario a small team with two inflatable boats could para load follow from an RAAF or allied aircraft into an area where mines are suspected well in advance of the main force and begin search operations to confirm or deny mining operations with man portable AUVs and an ROV. Combat rubber raiding craft (CRRC) are designed to be parachuted in with their engines, fuel and support equipment. They can be rapidly inflated and deployed within a few minutes. This team could then be picked up by a COOP, submarine or other unit. All of the

skills sets required to train and equip a team for this type of tasking are currently available within the ADF.

Submarines could also be potentially used to launch AUV's for search missions. CD's may need to be embarked for sub swimmer release to facilitate the clandestine recovery of AUV's at mission end. A submarine could also be used for float on off of CRRC to provide standoff for launching AUV's. A submarine could run multiple release and RV missions on target beaches reporting PMA results to the commander.

Advance Force Mine Exploitation

Any new mine technology that is found within a theatre needs to be exploited as soon as possible. Older mine shapes can be retro fitted with new smart mine sensor and target discrimination packages.
The exploitation of these mine settings allows an understanding of the adversary's intended target, gaining an information advantage over an adversary and minimising the adversary's effect in the A2/AD space.

The current method of mine exploitation is referred to as a Raise Tow Beach (RTB). To conduct this operation CD's perform a procedure on a ground mine or buoyant mine to render the electronics inside inoperable. The mine is then raised to the surface and towed to a beach where in depth exploitation of the weapon is undertaken. This can only be achieved as a follow on operation after tactical control has been established in the littoral area and relies on a suitable beaching site being available under allied control.
Developing an advance force mine exploitation capability would allow a mine to be rendered safe and towed to an inflatable platform or unmanned landing craft at sea where exploitation could commence. Once safe the mine could be transported back to a ship and then sent to a suitable location for a higher level diagnostic exploitation. This type of operation would allow mine exploitation to be done in all areas where mines are encountered in situations where limited tactical control has been established over a littoral area.

CONCLUSION

The Navy's mine warfare community has already made considerable advances in SOPs and bought new equipment in to service to greatly enhance capability in the last 10 years. New UUVs, boats and swimmer delivery vehicles will be delivered in 2020 under project 1778. Clearance Divers are now using computerised underwater navigation systems incorporating sonar to search for mines. However, we must always be looking ahead to further enhance capability and ensure we are supporting the fleet's mission and that "NO GAPS" exist in the ability to provide mobility and survivability for all who travel on the high seas.

As the new equipment from project 1778 is accepted into service tactics will need to be developed so it can be best utilised to support the fleet. As the continued integration of MCM forces in task group operations matures the RANs MCM capability will evolve ensuring the fleets freedom of movement and domination of the battle space.