



MINE WARFARE AND DIVING

SUMMER/AUTUMN 2024 #MAD2024 FOR THE DIVING AND MINEWARFARE COMMUNITY, ROYAL NAVY AND DEFENCE



**PREPARING THE UK UNDERWATER
EXPLOITATION AND CLEARANCE DIVING
FORCE FOR 2030**

EDITORIAL

Sponsor:

Cdr R Hurman & D Herridge RN

Editor-in-Chief:

Lt Cdr D Bailey RN

Editor:

Lt A Wharton RN

Editorial Office:

**MCM2 SQUADRON
Cochrane Building
HMNB Portsmouth
PO1 3LS**

The Mine Warfare and Diving magazine is published by SURFLOT Staff to serve the Mine Warfare and Diving Communities, but also to raise awareness across the wider Royal Navy and Defence as to the incredible contribution made by this deeply specialist capability. This has been brought to you by COMSURFLOT MCM2 staff and we would be interested in any feedback of further editions.

Thanks must go to the many contributors that have made this magazine possible. Designed and printed by Navy Graphics, Whale Island with our sincere thanks.

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WELCOME TO THE ANNUAL MCM CONFERENCE 2024.

The 2024 MW Conference will be held in Collingwood Hall, HMS COLLINGWOOD on 28 Nov 24. The event offers a valuable opportunity for members of the MW community to gather and discuss current issues and the future trajectory of MW. It also serves as a platform to welcome our friends from the Diving and Hydrography communities to discuss our further integration in the broader context of Underwater Exploitation (UX) and Seabed Warfare (SBW).

Rig for all attendees is RN PCS/RIG22.

TIME	ACTIVITY	LEAD SPEAKER
0800 - 0820	Conference set up	MTXG CoS
0820 - 0850	Registration and Welcome Coffee (Branch WOs to be available to welcome people in and promote discussion ahead of the conference)	All
0845	COMOPS arrives at HMS COLLINGWOOD	All
0850	All personnel to be seated	All
0855 - 0900	Arrival of VIP party - Conference photo	Lt Cdr Stone
0900 - 0910	Introduction	Capt Pressdee
0910 - 0930	Keynote Address	COMOPS
0930 - 1000	MCM Intelligence Update	MIFC
1000 - 1030	Technological Innovations in MCM	WO2 Wilson
1030 - 1100	Stand easy	All
1100 - 1130	Optimising MW & UX	Lt Cdr Bainbridge/Lee Contreras
1130 - 1200	Priority Initiative: WF Management and Steady-state Training Solution.	Lt Cdr Chandos-hall
1200 - 1230	MW & UX Short-term Strategy Conventional, Interim & Diving	Warrant Officer Forum
1230 - 1330	Lunch/Opportunity for discussion with partners from industry	All
1330 - 1400	Future Concepts and Capabilities	Cdr Stait
1400 - 1430	Current & Projected Operations	Lt Bonham
1430 - 1500	Future MW&UX Medium/Long-term Strategy	Group CO's
1500 - 1530	Structured MCM Q&A Session	PUXD Cdr's
1530 - 1545	COMOPS leaving address	COMOPS
1545	COMOPS departs at HMS COLLINGWOOD	All
1545 -1615	Open Forum Discussion	As Nominated
1615 - 1630	Closing remarks	Capt Pressdee

As we look to the future of the Royal Navy's Future Underwater Exploitation Force, it is clear that we are on the verge of a significant transformation.

The annual MCM Conference has been a cornerstone for a number of years for exchanging knowledge, advancing capabilities, and aligning our efforts with the operational requirements. However, this year's Conference marks a pivotal shift to define the next decade as we evolve from the traditional to the broader and more complex domains.



By 2030, we will have built an Underwater Exploitation Force that not only safeguards Homeland Defence and UK Strategic Aims but is also prepared to meet the diverse challenges posed by Seabed Warfare (SBW). The introduction of the Exploitation Groups signifies a critical move towards a more agile, adaptive, and technologically advanced force. Embracing autonomy, integrating hybrid solutions and blending the manned and unmanned, the Royal Navy will be equipped to operate with greater precision, greater reach, and greater resilience.

In the interim, our continued reliance on Hunt Class MCMVs will be complemented by cutting-edge Unmanned Underwater Vehicles (UUVs) and Remote Operated Vehicles. As we look to integrate the Block 1 Mine Hunting Capability (MHC) into our operational fleet, this transition underscores the Royal Navy's commitment to maintaining readiness and ensuring that our maritime interests remain protected.

Alongside our progress, the Sailor must be considered. This transformation will not only reshape our operational capabilities but also redefine career pathways and leadership opportunities for those in our clearance diving, hydrography, and mine warfare communities. The future force will depend on personnel capable of leading dynamic, mission-focused teams, empowered to operate in the most challenging environments.

We stand at the forefront of an exciting and challenging era for the Royal Navy, one that demands innovation, collaboration, and an unrelenting focus on excellence. Together, through the discussions and insights shared at this conference, we will continue to shape the future of Underwater Exploitation.

PUXD

Capt SIMON PRESSDEE

ISCM – MAINTAINING THE MOMENTUM (BUT KEEPING IT REAL)

By Cdr BEN STAIT

War may seem like a grand performance, but (it) is the gritty, backstage crew making it all happen.

Lt Gen E. T. Cook, USMC (1990)

The MCM In-Service Capability Management (ISCM) team, are here to ensure that the capabilities we have, meet the readiness and performance levels that are required for their service life. We set out the activities and costs to meet the Navy's Mine Countermeasures (MCM) requirements laid out in the Royal Navy Command Plan. The SURFLOT Operating Model Optimisation brought all the ISCMs closer to the frontline and under COMSURFLOT's command. This allows Capt PUXD to control the support plan and budget, as well as the Squadrons as a single Class Generating Authority.

If you read the 2023 edition of this magazine, my predecessor wrote about the Interim MCM programme and the successes we had made with bridging the gap between the MCMV and MHC transition. The past 12 months has continued to build on this work, but the emphasis has shifted towards getting these technologies into the 'ready use' tool kit. It has also been a year of anticipation as we take delivery of components of the Mine Hunting Capability (MHC). Director Naval Acquisition and DE&S are delivering ground breaking capabilities, but the challenge is balancing user requirements (what we want), industrial capability (what is possible) against budgets (what we can afford) and programme (when we need it).

MCM autonomy transition is accelerating, and we are on that journey together. We know you are going to get better at using the kit and be more demanding as your proficiency increases. The ISCM's responsibility is to prioritise the money and staff resources to keep up.



MCMVs

It is a challenging period for the MCMV fleet, and we recognise the frustration felt by the Crews keeping these aging platforms operational. BANGOR is undergoing repairs in Bahrain, following the collision with CHIDDINGFOLD. As the final in-service Sandown, BANGOR remains a valuable MCM asset and critical to bridge the transition to MHC. The Hunt Class are midway through their Support Period (Docking) (SP(D)) programme to recertify them until their Out of Service Date (OSD) at the end of the decade. There are many reasons for the lengthy overrun of SP(D) projects; many of you will be impacted by the regeneration and recommissioning challenges. DE&S are addressing these issues with a restructuring of the Complex Warship Support Programme. From 2026 we will move to shorter recertification, maintenance or capability insertion periods. This new approach will improve Hunt Class availability, capability, reduce obsolescence and reduce pressure on Crews and budgets.

Hunt Plus is in the concept phase with a series of feasibility studies. These studies will provide an assessment on where investment can improve Hunt availability until OSD. Areas being investigated include, mitigating the reliance on auxiliary hydraulics, improving the cold/cool rooms and habitability. Not all these improvements will be value for money or implemented for all platforms. This is targeted capability management that aims to make small, but notable gains.

Other capability enhancements include the replacement of the NAUTIS combat management system with ORCA offering the MCMV command team better information display, user interfaces and data management. This will be installed in the Mine Warfare School in 2025. We have also rolled out 0.5" Heavy Machine Gun to the MCMVs, offering improved protection.

MINE HUNTING CAPABILITY - UNCREWED UNDERWATER VEHICLES

The delivery of five REMUS 300 is the second part of an investment into lightweight Uncrewed Underwater Vehicles (UUVs) taking the fleet size to 11. The provision of Synthetic Aperture Sonar (SAS) and camera payloads provide the vehicles with enhanced seabed survey capabilities to 300m. MTXG is leading the development of tactics and configuration plans.

The integration of UUVs into core MCM2 and MTXG activity is building momentum. In the Gulf, MIDDLETON and CHIDDINGFOLD have successfully embarked and operated REMUS 300, then reacquiring contacts with Seafox. An MCMV operating UUVs, Seafox and a Clearance Diving Element, is able to provide a search, classify, reacquire, identify and neutralise capability, independent of the ship's sonar.

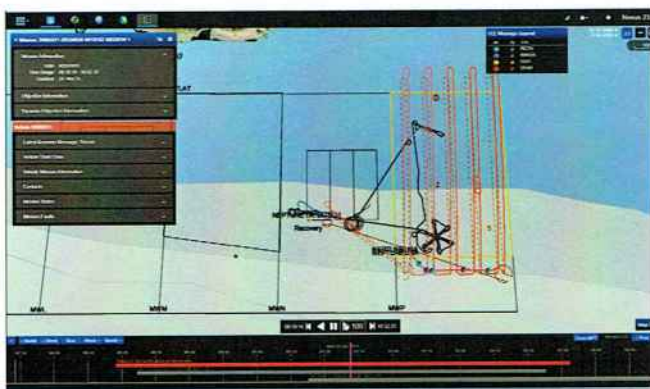


LEDBURY will soon be ready to embark the Persistent Operational Deployment System (PODS). With base plates fitted where the sweep gear winches were once housed, these two 10 foot PODS provide a dedicated UUV workshop and operations room. UUV PODS is not a funded programme, so successfully demonstrating the capability will reinforce the requirement. MCMV are not the only platform to operate MCM UUVs, with OPVs and P2000s both proving their versatility to deploy these vehicles.

Zulu Squadron are routinely operating IVER3 and REMUS UUVs in support of Clyde route survey. The imminent delivery of three IVER4 will improve Zulu Squadron's ability to search deeper, for longer. Videoray Defender Remotely Operated Vehicle (ROV) is the backbone of both MTXG and DTXG's ability to identify underwater objects. These 300m depth rated vehicles are a rapid deployable system. ISCM is working with Navy Develop to provide these ROVs with a mine and ordnance neutralisation system.

The recent delivery of six Atlas Elektronik SEACAT Medium UUVs to MTXG is an exciting capability development. Equipped with a range of swappable heads offering side scan sonar, forward looking sonar and SAS, these UUVs can operate 'over the horizon' as a squad, for up to 20 hours, collecting vast swathes of data. Deployable from the ARCIMS motor boats or the beach, Yankee and X-ray squadron are operating SEACAT in the UK and Gulf.

Integration and interoperability with Allies are key if we are to be a credible MCM force. At NATO's REPMUS exercise in 2023, we proved our investment into autonomous integration software, with an international first. RN, US Navy and the Royal Netherlands Navy REMUS vehicles were tasked to search a minefield. Using SeeByte's Neptune software, the three vehicles collaborated autonomously underwater to search and reacquire contacts of interest. This technology is game changing, allowing a significant reduction in time to achieve MCM effect. We intend for our UUVs to be fitted with this capability.



Our investment into UUVs over the past two years has allowed us to progress our knowledge and trust of operating autonomous systems. We are starting to see that investment pay off, but as proficiency improves, we are revealing availability and integration issues that challenge both technology and affordability. This is expected and should not stop us being proud of our achievements.



MINE HUNTING CAPABILITY - UNCREWED SURFACE VESSELS

The introduction of Uncrewed Surface Vessels (USVs) has been more protracted than UUVs. We are working with the Defence Maritime Regulator to certify both the Atlas Elektronik 11m ARCIMS and Thales 12m ASVs for uncrewed operations. This is taking time and the interim solution is to have a small crew embarked. This in turn requires us to resolve issues including navigation systems, habitability, safety and force protection. However, we should remember that these are deploying game changing payloads, whether it is Towed Side Scan Sonars (TSSS), UUVs or the Influence Sweep system, we are exposing less personnel to the threat and using significantly better sensors.

The WILTON equipment set has assimilated into MTXG. HEBE and HYDRA continue to conduct route survey operations on the Clyde, using Klein TSSS and UUVs. X-ray Squadron's deployment to the Gulf has seen them operating HARRIER with TSSS and more recently HUSSAR with SEACAT. There have been challenges in performance and availability, but we are at the forefront of MCM transformation. It is not just about the sensor, but about operating cycles, supply chains, engineering and contractor support. With the ARCIMS motor boats approved for Level 2 Autonomy (Remote controlled, but crewed), valuable experience in conducting MCM from small boats is being gained and this will accelerate over the next 12 months.



COMMAND AND CONTROL

Integrated Command and Control (C2) and data management solutions will be the backbone of MCM. A common user interface across the fleet of UUVs and USVs is key to reducing operator complexity. Our investment in SeeByte's SeeTrack planning and Post Mission Analysis (PMA) tool, is the common interface for in-service UUVs. Neptune collaborative autonomy for squadded UUVs has proved itself as an effective tool for reducing mission time. SeeTrack and Neptune are increasingly used by our NATO allies, allowing our systems and data to be interchangeable. These tools continue to be refined.



CONCLUSION

The next 12 months will continue to maintain the pace of delivery of MHC systems into service, including:

- Atlas Elektronik influence SWEEP system delivery
- Thales Maritime Mine Countermeasures (MMCM) Mission System delivery.
- Integration of MHC into RFA STIRLING CASTLE.

And the enablers:

- Upgrading our mine targets.
- Developing a lightweight Mission Team sonar target.
- Rewriting BRd 9464 as the MHC Classbook.
- Introducing UUV logbooks.

Discussions at the recent NATO MW Conference revealed that the issues that the Belgium/Netherlands replacement MCM programme face, chime with MHC. Introducing cutting-edge autonomous mine countermeasures systems is really hard to do, but there are many envious Allies.



Cdr Ben Stait is an MCDO with 25 years of Mine Warfare and Diving experience, and broader Naval and Defence assignments. He previously was the Mine Warfare and Diving Capability Sponsor and is now the Mine Warfare and Patrol Vessel Capability Manager.

MTXG UPDATE – THE CHANGING FACE OF MINE WARFARE

By Lt CALLUM BURNS

Following 57 years of continuous service, 39 operational Mine Countermeasures Vessels (MCMVs), 17 years on OP KIPION and King Charles III himself commanding one of its vessels, the 1st Mine Countermeasures Squadron decommissioned in June of this year and has been replaced by the Mine & Threat Exploitation Group (MTXG), bringing Mine Warfare into the 21st century through a radical shift in how the core business of hunting and prosecuting seabed contacts is conducted in the Royal Navy.

While conventional mine hunters continue to conduct valuable operations in support of OP KIPION and UK Homeland Defence until the early 2030s, the bulk of the work is increasingly turning to the new Mission System Teams (MSTs) which are equipped with cutting-edge autonomous survey equipment with the aim of truly 'taking the person out of the minefield'. Roughly analogous to an MCMV in terms of workforce footprint, these modular teams are capable of containerising and transporting their impressive capability for use from home port, a self-sufficient Forward Operating Base, or even afloat on a mothership.

"Impetus for Change" - Why change?

As conventional mine hunters age and despite a recent Command System update, it was apparent that systems such as MCM sonar, the propulsion plants and other systems were becoming more and more outdated with the civilian sector outstripping the capability of the Royal Navy. Workforce considerations across all departments made MCMVs difficult to staff and cramped living conditions made them a generally uncomfortable alternative to other more modern vessels such as River-class Offshore Patrol Vessels, Queen Elizabeth-class carriers or Type-45 destroyers. These issues were mitigated by the hard work and ingenuity of the MCM community who despite these challenges, have ensured that the MCMVs have delivered on all fronts for over 5 decades, both at home and abroad. However, new technology present in modern MTXG teams will improve upon the still-impressive conventional MCM performance, delivering incredible fidelity of data and operational speed of advance, and generally contributing to the safety and effectiveness of MCM operations.

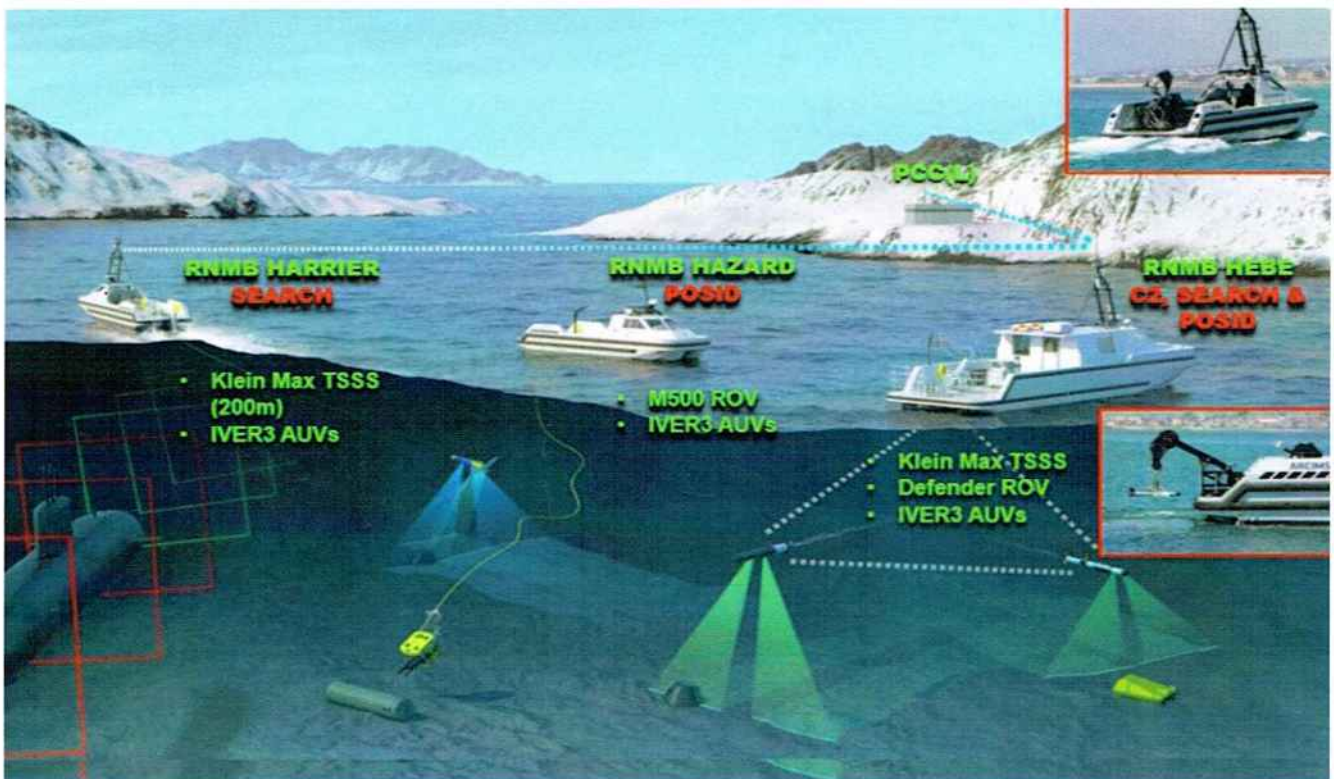


Figure 1 - C2 & equipment graphic for envisioned MST operations using MST3 assets.

The global geopolitical stage has changed considerably over the life-span of the Hunt and Sandown Class Mine Hunters, with the rise of non-state actors and asymmetric warfare increasingly coming to the forefront. This has necessitated a diversification of MCM assets to cope with the increasingly urban littoral environment as well as the provision of a lighter footprint for operations necessitating rapid reactions. When fully operationalised, the new MSTs will be able to deploy with minimal notice and a footprint which is tailored to suit the operation, utilising local infrastructure as available. With new and advanced Autonomous Underwater Vehicles (AUVs), two junior rates can be sent to conduct area survey from a RIB for an entire day – a task which would have taken 40+ sailors embarked in a warship just a few years ago.

“N3 – Current Operations” - what does it look like right now?

Currently, MTXG operates a trials team (Maritime Autonomous Systems Trials Team (MASTT)), an operational Homeland Defence team, and two deployed teams trialling and operationalising autonomous equipment in an active theatre, soon to become operational. This represents over 100 trained-strength personnel able to mix-and-match their skillsets to provide diverse capability to their respective Commands.

In the Arabian Gulf, MSTs 1 & 2 have been working in a four-month rotation pattern to integrate their equipment and capabilities into the existing infrastructure, providing a smooth transition from legacy MCMVs to the new way of working utilising the Afloat Forward Support Base (RFA CARDIGAN BAY) as a mothership to be launched from. Despite challenges each team has completed a full rotation gaining significant experience along the way, with MST1 in the Gulf on their second rotation at time of publication. During off-watch periods, the MSTs take some well-earned rest before generating, training and assuring for another deployment.

Based in Portsmouth but working across the UK, MASTT are continuing research and development not only on the equipment itself, but the Standard Operating Procedures (SOPs) and doctrine of the kit. The team are collaborating not only with senior officers in the Develop and Acquire spaces, but directly with industry partners and DE&S to identify and exploit opportunities to deliver the most advanced and capable equipment to front line operations.

Based out of HMNB CLYDE, MST3 (formerly Project WILTON) have completed their transition from a trials unit to an operational MST. Currently the only MST engaged in operational delivery, MST3 has taken over much of the responsibility for Homeland Defence from the conventional MCMVs, and now surveys the Clyde in support of the UK's Continuous At-Sea Deterrent (UK CASD). MST3's suite of vessels includes RNMB HEBE, a 15m Towed Side Scan Sonar (TSSS) equipped prototype modified Vahana-class, capable of being utilised as an afloat Remote Command Centre (RCC) for the 11m Uncrewed Surface Vessels (USV) such as RNMB HYDRA. HYDRA itself is an 11m ARCIMS-class vessel also equipped with TSSS and able to be operated remotely from RNMB HEBE or a containerised RCC ashore. RNMB HELLCAT, an 11m Vahana workboat, operates as an AUV & ROV platform. Finally, two Pacific 22 RIBs can act as an AUV platform.



Figure 2 - RNMB APOLLO with adaptable payloads.

RNMB HEBE departing Ardrossan Marina. TSSS (yellow) prominent on stern.



“Scheme of Operations” – how we do what we do.

Having covered the teams, where they are and what they do, some attention should be given to the actual operation of this equipment. TSSS returns detailed, high resolution and real-time sonar images to an operator on the vessel. Area survey can be completed through this method in concert with AUVs for maximum concurrent effort. Currently operating with MST3, IVER3 AUVs are capable of running 8 hours of mission time independently, with a truly autonomous output. With sophisticated subsurface anti-collision technology and accurate Inertial Navigation Systems for metre-precise contact returns, these reliable AUVs return imagery comparable with the TSSS. The general survey data is compiled from both systems into Post Mission Analysis software, displaying survey data cross referenced over nautical charts. From this system, analysis of the data takes place with contacts being marked based on a number of criteria familiar to anyone in the Mine Warfare world; shape, size, structure, shadow and return. Contacts requiring Visual Identification (VISID) can be kept in-house and transferred to the internal ROV teams, or promulgated to other units including legacy MCMVs or mine clearance diving teams.

Although the above may seem exhaustive, several benefits are immediately apparent – with the large suite of vessels available to MST3, for example, concurrent activity is the name of the game! Multiple AUVs can be launched to survey different areas, RNMB HEBE and RNMB HYDRA can conduct simultaneous TSSS operations, and RNMB HELLCAT can bring up the rear with an ROV team, VISID'ing either previous contacts or HEBE's real-time contacts. With all equipment in an operational state, SOA improves exponentially from legacy MCMVs. Another benefit is redundancy of equipment – if one boat is defective, another will take its place. If TSSS is down on RNMB HEBE, RNMB HYDRA can be used to fill the gap.



RFA STIRLING CASTLE operating with the ARCIMS (centre and left)



MST3 IVER Course '23 in San Diego, IVER3 AUV prominent in foreground.

“Longcast” – the future.

MTXG is by no means out of its infancy at the time of writing, with a single team operational and the rest engaged in trials, but progress is continuing every single day. In the Gulf, 2024 is expected to see RNMB HARRIER go operational, delivering area survey data to UKMCC. In early 24, MST3 and MASTT will complete initial trials on RFA STIRLING CASTLE (STCL) with the former gaining the ability to project beyond the confines of the Firth of Clyde using STCL as a mothership. MSTs 4, 5 and 6 will stand up in the coming years, forming a final people footprint for the organisation and utilising new and continually improving systems. Training packages will come online allowing a sharp uptick in operational capability and less time conducting unit-level training. The Sandown-class will decommission entirely in 2026, followed by the Hunt-class early next decade. With a new generation of frigates entering service in the coming years, the modularisation of this capability will continue towards MTXG teams deploying in a flexible and agile way.

From a personnel perspective, the future is bright for the MW cadre. The days of MWs spending most of their time maintaining an MCMV are over, replaced by a new generation of intelligent, responsible and capable ABs who spend most of their time delivering high-tempo operational output. These ABs will become competent, specialised SRs with a deep understanding of the equipment they use and the confidence to use them, and so the wheel turns.



“Wash-up” – Conclusion

The aim of this article was to give an abridged snapshot of the changing face of the mine warfare world. The main takeaways – faster, more modern and reliable equipment, more skills for the people who use them.

It's time to embrace the new. The MSTs are poised to deliver better-quality capability faster and in better conditions than any MCMV. Although still in the 'walk' phase, it's only a matter of time before they start running – sprinting ahead of their contemporaries and bringing in a new autonomous age of mine warfare capability, and paving the way for broader employment of Maritime Autonomous Systems in the Royal Navy.

MTXG RE-ORG

By Lt CALLUM BURNS

Mine & Threat Exploitation Group (MTXG) have had a busy couple of months operationalising new autonomous and remote Mine Counter Measures Equipment.



Zulu Squadron, which is Clyde-based, is currently participating in BALTOPS '24, a multinational exercise taking place in the Baltic Sea. Utilising their IVER 3 - Autonomous Underwater Vehicle (AUV) and VideoRay Defender - Remotely Operated Vehicle (ROV), a detached element is providing high-resolution imagery of the seabed in support of the Exercise. Embarked on HMS PUNCHER, an Archer-class inshore patrol vessel, they are proving the interoperability of MTXG equipment with other RN assets.

Yankee Squadron, usually Portsmouth based, have been conducting Medium Autonomous Underwater Vehicle (MAUV) trials in preparation for taking part in Exercise SEA BREEZE, another multinational exercise in the vicinity of the west coast of Scotland. They will work alongside the Ukrainian Sandown-class vessels Chernihiv (ex HMS GRIMSBY) and Cherkasy (ex HMS SHOREHAM), as well as other NATO partners. Ex SEA BREEZE is part of the ongoing UK commitment to enhancing the capabilities of the Ukrainian Navy and familiarising them with operating in concert with other NATO navies.

RFA STIRLING CASTLE has come into Service and will play a crucial role in MTXG business, acting as a mothership for a myriad of embarked Maritime autonomous systems (MAS). Due to start training in the coming months, RFA STIRLING CASTLE will initially embark Zulu Squadron on the Clyde to prove the concept of operations and usher in a radical change in the Royal Navy's mine hunting operations.



MAUV being moved to launch position, Binclives, Weymouth.



Two sailors recovering an IVER3 on a P2000.

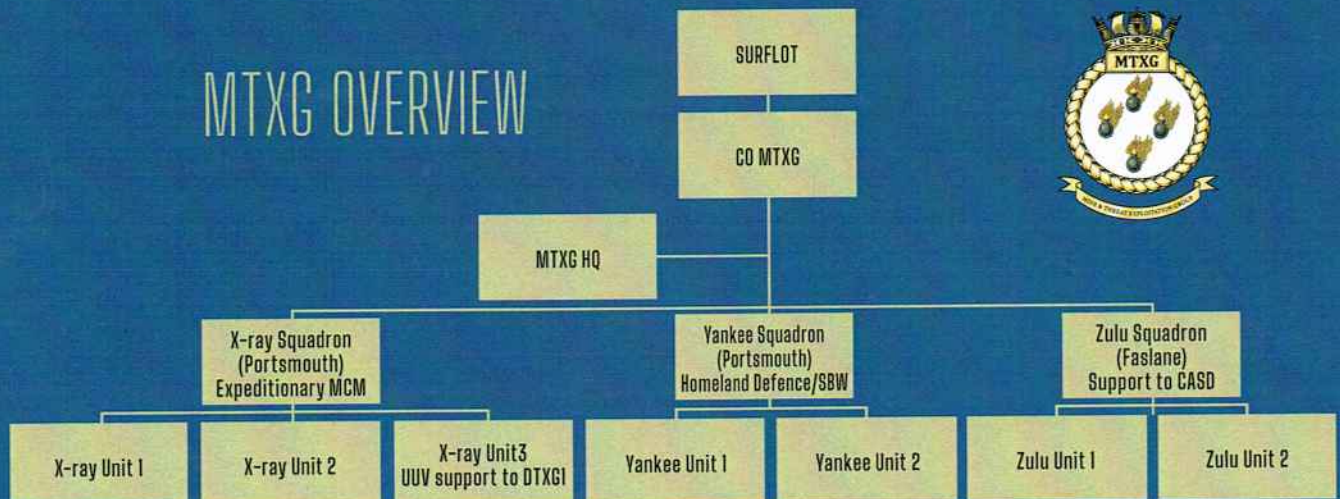


Towed Side Scan Sonar (TSSS) operations from RNMB HEBE.



RFA STIRLING CASTLE, mothership for embarked MTXG assets.

MTXG OVERVIEW



THE OPERATIONAL ADVANTAGE CENTRE – NEW BADGE, SAME...

By Lt Cdr J BAINBRIDGE



Following on from our last article for MAD magazine, the Maritime Warfare Centre (MWC) has now been re-badged as the Operational Advantage Centre (Maritime Warfare). This has not changed our task and we still remain an organisation where:

The OAC brings together the community of experts alongside advanced analytical techniques and front-line experience to provide operational commanders digestible tactics and knowledge to defeat their enemy specific to their environment.

Also, with the move to OAC we are now in the same chain of command as the Naval Warfare Publications (NWP) which has proven highly beneficial in how we work, especially as we move forward with new systems.

It has been an extremely busy time with the need to support MCMVs, diving and the obvious bow wave that is Minehunting Capability (MHC) but we hope we are achieving this despite the churn of manpower and gap of the PO(MW) post. Our small but 'perfectly formed' team comprises Lt Cdr John Bainbridge and ACP0 David 'Waxy Crayon'. The MW department comes under the Under Water Warfare (UWW) pillar which sees us working closely with Submariners, Anti Submarine Warfare (ASW) and Hydrography (HM) specialisations. It does make for some interesting collaborations not least the MW and HM specialisations currently being the OAC(MW) Seabed Warfare points of contact.

Our main aim is to provide realistic, easily understood doctrine to either re-enforce existing tactics or establish new ways of working smarter. This applies to both current and future systems and in many ways the two complement each other, with advances in one being relevant to the other. We thank anyone who has sent feedback and your efforts in

assisting with this despite busy programmes is invaluable. We request you please keep this up. Basically, if you think an SOP or tactic does not work, or you think there is a better way to do it, keep letting us know. This is better done by the correct processes of an S2022, DLIM or post deployment report (PDR) but at the very least you can contact this office by phone or E-mail, it is always good to hear from you. Our contact addresses are at the base of this article.

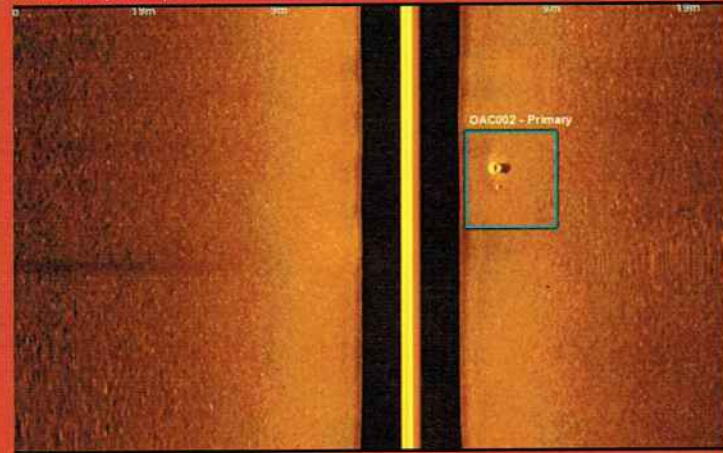
As stated above, the core of our work is dictated by MHC where tactics need to be developed and reviewed with each system that comes online. All of us are learning as we go along. All that said MCM remains detect, classify, ID and neutralise in the main part and in that the RN will always deliver, even in this time of transition. Our job at OAC is to find how we can do it better with whatever system we use. To do that we engage with other nations, MTXG, DTXG, the MHC project and obviously you, the operators on the ground. As we cannot be everywhere we use the Smart Tactical Initiative (STINT) to help you to help us in our aim. For those of you that do not know, a STINT is an outline of a trial that can be conducted by an MCMV or unit to inform OAC what we require to know to develop a tactic. The STINTS are sent out to all relevant squadrons, ships and units but all can be found on the index page of the OAC NWP Warfare, Allied and Administrative Publications App. (web. apps.royalnavy.rmil.uk/fpgo/Pages/Home.htm)

Below is an update of some of our major projects over the last year:

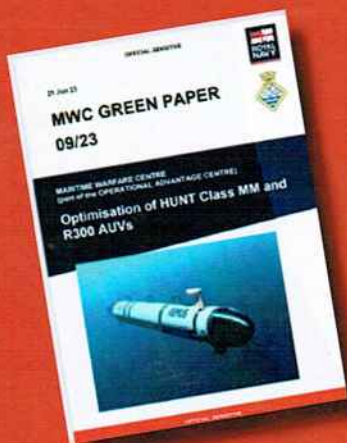
- Our primary aim is to fully understand the performance of the new Maritime Unmanned Systems (MUS) specifically Side Scan Sonars (SSS) and Synthetic Aperture Sonars (SAS) so that we develop the optimum way in how they are employed and tasked. Specifically, the most efficient way to search an area and understanding our confidence in the residual risk following MCM operations. Recent trials with Yankee and Zulu Squadrons and PC trials out in theatre have been invaluable with initial findings encouraging but there is still much to be learnt.
- With HMS LEDBURY being fitted out to take the new pods for Remus 300 (R300) and R300 now in operation in the gulf with Hunt class MCMVs working with Xray squadron, tactics are now being developed on how we use MCMVs and UUVs to best effect. This will improve on the Green Paper 09/23- Optimisation of HUNT Class MM and R300 AUVs, released last year with HMS CHIDDINGFOLD and MIDDLE TON already providing some extremely informative feedback.
- As with Hunt and R300 integration, command and control of all MCM systems, new and old is extremely important. Green Paper 10/22 Integration of Off-Board MCM systems still remains a key document but with your feedback and in our attending trials we are building on this to inform future doctrine.

- As we forge ahead with the new systems the need for a classbook, similar to BRd 8413 and 8513 is essential. This will enable Standard Operating procedures (SOP) to be detailed along with common doctrine for all systems. The classbook (BRd 9464 Vol 1 - 5) will soon be in draft following the arrival of the new MW naval author, Carolyn Richards. With much work to be done it will be some time before this publication hits the streets but we will move ahead as fast as we can.
- In collaboration with Dstl work is being conducted to validate the safety ranges for neutralisation of near surface or free floating mines. An outcome of this could be a reduction in safety ranges but of most importance is the safety considerations in understanding what happens with the fragmentation of these types of mine.
- MCM SWEEP is still a new concept with regards our expertise in the MCM community with only the MASTT team really having experience of this system. Work is underway to look at doctrine for SWEEP and again, how best we can use its effect.
- As always RTSV remains central to our business and we are working closely with Mine Warfare Data Centre (MWDC) to understand how we manage data and review practices using the new generation of Side Looking Sonars (SLS).
- Unfortunately, due to our support of current and future MCM our ability to assist DTXG in developing tactics and doctrine is limited but we engage where we can and are here to assist as required.
- In looking at the above and any other emergent work we will make every effort to come to sea with you, not only to conduct trials but also talk through any issues. This is not always possible so will therefore continue to release STINTS to benefit from you independently conducting trials, to provide invaluable information to assist us to develop the tactics we need.
- At OAC we are in a unique position to enhance how we do our business but we unable to do our job without engagement with the front line so thank you for all your work in supporting us as required. We look forward to meeting with you when we get chance to come on trials and please keep your feedback coming.

Klein Sonar optimum performance trials on an old Mk 10 sinker



Seacat launch and recovery trials



MCM2 OVERVIEW – REVIEW, REFORM AND RE-PRIORITISATION

By Cdr RICHARD HURMAN

The last 12 months have proven to be some of the most testing for MCM2 Crews in recent times. Without sounding like a broken record 2023 – 2024 has been another 12 months of maintenance overruns, equipment obsolescence, delays to the introduction of new systems, and workforce challenges, overlaid with some of the most operationally challenging environments and threats for MCMs since Libya. This has unfortunately seen significant strain on FGen and maintenance of readiness for Operations both in support of DSO and KIPION Dual Crewing. Notably this has resulted in a significant gap in supporting NATO, something which we are endeavouring to recover not only to support the strategic will and priorities but also to increase the lived experience and variety for you, our people. However, I remain impressed with the resilience and determination of the extremely talented individuals from across the whole MCM2 community who generate for and deliver on operations across the globe every day of the year.

Despite the continued tensions in the Middle East focus is increasing shifting to UK Sensitive Water and more NATO focused activity. A number of proposals are in development and review regard how the MCM forces will be used and deployed in the future. These range from reduction of numbers to a full return from OP KIPION. Whatever the decision the intent is to maintain the Dual Crew Model for our Globally Deployable Expeditionary MCM Force and high readiness assets to maintain stability, operational capability, lethality, and readiness. Whether this is around the UK, supporting NATO, or conducting expeditionary MCM in the Gulf or Black Sea is yet to be confirmed, but it provides operational choice for the RN with a flexible and assured MCM capability ready when need. At the time of writing our focus remains generation and deployment to the Middle East in support of OP KIPION.

Supporting this is a review into how SURFLOT, FOST, and MCM2, support and generate you and your ships. Taking your experience from the frontline, using the lessons learnt and feedback from the challenges encountered and overcome we are updating and refining how we generate to ensure you are ready for operations.

We have welcomed MCM1 Crew 1 and 5, becoming MCM2 Crew 9 and 10, and HMS BANGOR into the MCM2 fold, increased the MCM2 Squadron to seven Warships, ten crews, and circa 580 personnel, consolidating the surface MCM capability to provide efficiencies in the FGen and support to what currently remains the only fully assured detect to destroy and deep water MCM capability within the RN.

As you will see though we continue to contribute to the transition to autonomy and working with the newly structured MTXG we work closely together to develop the SoPs and tactics required to ultimately move to fully assured autonomous MCM capability.

This has been seen more so in the deployment and operation of the R300 capability on MIDD and CHID as an interim deep-water capability while BNGR is recovered following the allision. Working with MTXG, utilising equipment sourced from our US counterparts, the teams have exploited the opportunity created to accelerate R300 to an operational status, developing and refining the SoPs and tactics, growing SQEP and ultimately learning the lessons MTXG and the MHC project required to achieve the autonomous aspiration. When BROG and LEDB complete their respective refits, we will see a leap forward in the deployment and operation of these systems as they are integrated into the HUNT capability. The accelerating and increasing roll out of the HUNT PLUS proposals across the whole HUNT force will also contribute to greater availability and reliability, while enhancing operational capability and improved N1 and N4 experience and sustainability.

In summary, this year has been challenging for the whole MCM force for a multitude of reasons, however, the talented sailors under my Command continue to deliver on operations whilst maintaining an upbeat and positive approach to life at the vanguard of the Mine Counter Measure Force. The pace of operations in 2025 is expected to continue and I look forward to delivering the capability on behalf of the Royal Navy and UK, whether at home in support of the nuclear deterrent, or in support to deployed operations.



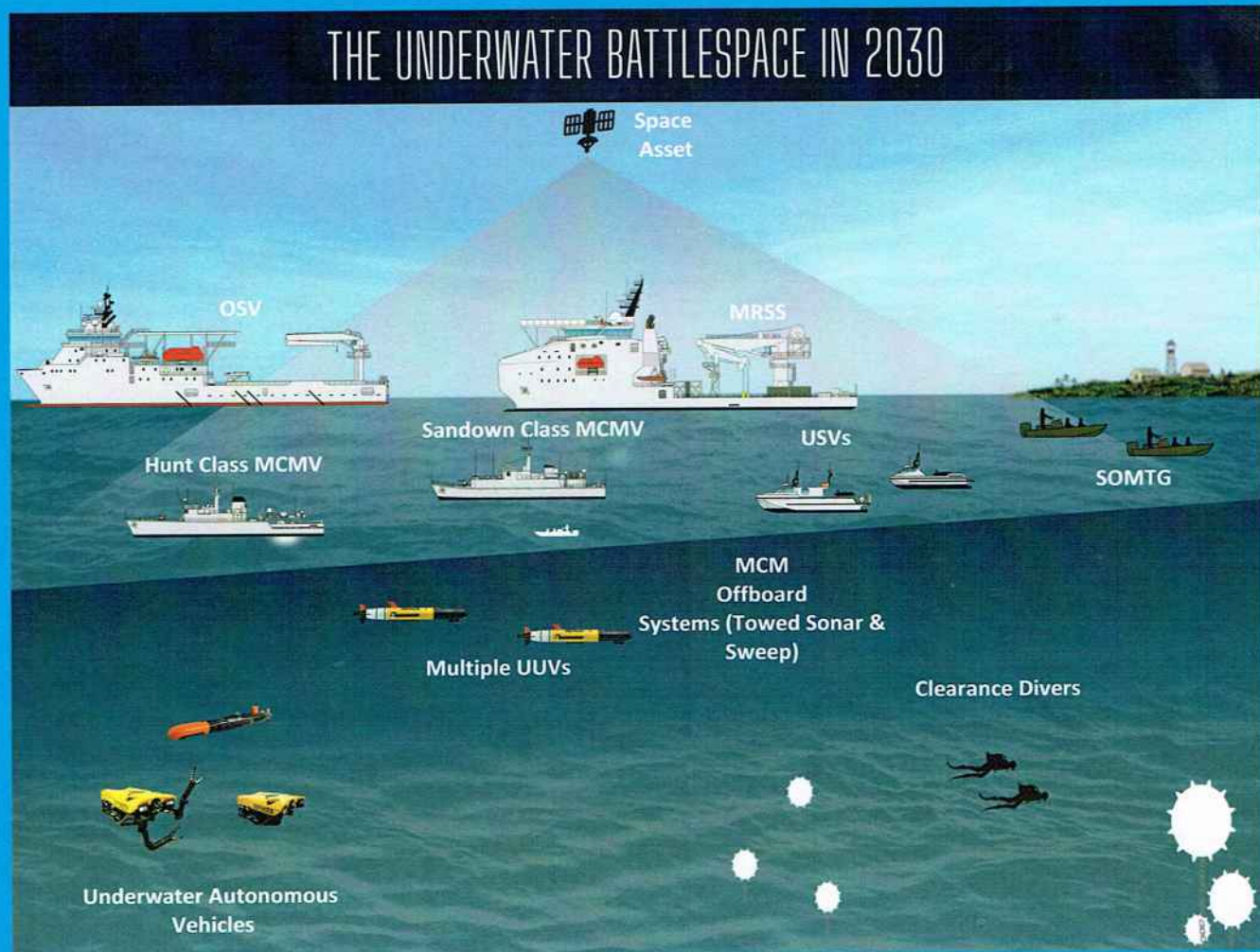
Panoramic shot of KIPION force onboard a BAY Class Vessel in the Arabian Gulf.

MCM VISION THROUGH 2030

By 2030 our current programmes will deliver:



SURFLOT Mine Counter Measure Vision: Integration of conventional and future capabilities to deliver assured intermin MCM capability aligned to the future operational requirements, **in order to deliver Mine Warfare lethality today and tomorrow**



SURFLOT Naval Military Diving Vision:

A threat-focused EOD and naval special operations capability centred around world class divers enabled and enhanced by robotic and autonomous systems (RAS).

LETHALITY

HOMELAND DEFENCE AND NATO



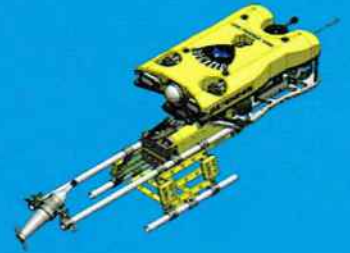
Improve concentration of force creating a sustainable and future-proof UK Surface MCM Capability.

DEEP WATER CAPABILITY

Providing interim Deep Water MCM Capability.



WEAPONISED REMOTE SYSTEMS



AUTONOMY

Autonomous system Integration, learning From experience and shaping the future



EO RECONNAISSANCE BY UXV



AUTONOMY

Specialist FINISH capabilities within a network-enabled kill chain.



REDUCING THREAT

Utilising unmanned Methods to reduce the risk to personnel

TRIALS & EVALUATION/OP ANALYSIS

HUNT OPTIMISATION

Installation of PODS and R300 integration to transition MCMVs in to DW MCM



RAPID LfE

Embedded scientific advice enabling LfE from contemporary operating environments.



DIVING LIFE SUPPORT EQUIPMENT REFRESH

Trials and rollout of replacement air and mixed gas diving equipment



PEOPLE TRANSITION & OPTIMISATION

AN ENDURING NEED FOR DIVERS

Enhanced (not replaced) by RAS, military divers can:

- Adapt to novel scenarios.
- Interpret, assess and act on changes to the environment.
- Provide unmatched dexterity.



WORK FORCE TRANSITION

Utilising autonomous and future equipment, along with conventional systems, across all ranks and rates, thus allowing ease of transition in to future MCM.

LIVED EXPERIENCE

Improve the lived experience for the whole MCM Force by providing varied and demanding tasking and deployments. Increase investment in individual skills.

MCM2 CREW UPDATES

By Lt Cdr DAVE BAILEY

MCM2 Crew 1

MCM2 Crew 1 brought HMS CATTISTOCK (CATT) from refit, regenerating the hull and force generating in readiness to deploy as required globally.

The journey began in August 2023 as CATT left her dry docking period. Although the project was behind schedule and without the majority of accommodation, domestic services, or essential systems, the crew worked intensely to complete SARC and trials to be finally ready to sail for UK operations.

Ongoing equipment trials during UK heavy winter weather were interspersed periods of Op PIKE, UK defence engagement, MCMG training, as well as aiming to find time to integrate off-board systems, work with NSOC and conduct TACDEV to modernise seabed warfare. Regular consultation with multiple different agencies made small steps of progress, concurrently with keeping CATT at operational notice without relief. Some of these were demanding periods for the crew as they drove to maintain the hull and understand her limitations in some testing segments of tasking.

In terms of lived experience, some unusual national tasking has provided the Crew with operational focus, in addition to interesting and enjoyable port visits around the UK. Visits to CATT's affiliated port town of Poole for November Ceremonies and later for the Freedom of the Town were very well received, hosting affiliates not only from Poole but from the nearby village of Cattistock and renewing connections with the maritime community.



Accompanying the Second World War veterans out of Portsmouth on their way to Normandy for D-Day 80, CATT also crossed the Channel to join in marking the anniversary, sailing through Pegasus Bridge and representing the Royal Navy at international functions with French, Norwegian and other NATO allies in addition to UK Parachute Regiment commemorations. Long-term preparations for BOST were brought to bear in June and July while training for Op KIPION, followed by an alongside Families' Day in base port and leave.





CATT later embraced the role of Guardship for the Dartmouth Royal Regatta, hosting civic dignitaries, race committees and members of the public for various visits and tours, hosted by Crew 1 to great applause. Ashore the crew enjoyed a number of events from hosted precession's to (legit above board) trolley-racing along the quay. The officers revisited well-known elements of the town and reminisced about mostly fondly about the naval college, helped along by meeting CO BRNC on board CATT at a Reception and Capability Demonstration.

Interlacing final elements of pre-deployment training, CATT visited Antwerp to mark the 80th anniversary of the liberation of Belgium, renewing and cementing diplomatic ties at many levels. An RCD on board marked the start of cordial engagement and ceremonial events throughout the weekend, including the provision of an armed Guard from CATT by honorary dispensation as well as social events and a great run ashore.

Maintaining UK force-flow has been a key priority for CATT and Crew 1, to keep the Ship serviceable, train and augment operational capability and provide availability to COMOPS for contingent tasking, DE and as a training platform for others. Generating for KIPION has provided extra operational focus for Crew 1, ready for the next phase and keen to progress.

MCM2 Crew 2

See article 'A Job Well Done' on Page 28.

MCM2 Crew 3

See article 'From Offices to OST' on Page 32.

MCM2 Crew 4

See article 'HMS Ledbury Gearing Up For The Fight!' on Page 35.

MCM2 Crew 5

Over the last 15 months MCM2 Crew 5 has concluded a two-year OP KIPION rotation, with highlights including support to the British Embassy Kuwait on the occasion of the King's Coronation, Capability Demonstrations in Qatar and continued tasking under OP Neptune Sceptre in the Central and Southern Gulf. Having RIP'd from HMS CHIDDINGFOLD for the last time in March the crew has returned to the UK to re-generate and refit HMS HURWORTH. The refit of HMS HURWORTH is proceeding well, with its priority the upgrade to the ORCA Mine Warfare system, along with an increase in lethality with the addition of HMG mountings to replace the now out of service Mk 44 Minigun. This working period in the UK has been very positive for the crew, with good time found for PDEV, education and training.



MCM2 Crew 6

The crew have been regenerating themselves before recently deploying into HMS MIDDLETON, relieving Crew 8 on OP KIPON. Currently on their K3 rotation, conducting R3000 integration and DWC training in preparation for taking on the role once HMS BANGOR comes to the end of her service.

On completion of their K3 they will fall into the UK Operations cycle, continuing to build integration and ensuring that the crew are able to remain fighting fit for any future Ops.

MCM2 Crew 7

MCM2 Crew 7 took responsibility for HMS BROCKLESBY May 23 as she entered her Support Period (Docking). Since then, Crew 7's primary focus has been working closely with industrial partners to support BROCKLESBY's refit at the same time as maintaining individual and team-level skills and experience for future operations. For the majority of the last year, Crew 7 has been ably led by their XO and Senior Naval Officer Lt Matt Bowden RN; in July, Lt Cdr Rob Garner RN assumed duties as Commanding Officer. Looking ahead, Crew 7 are preparing to handover BROCKLESBY to Crew 2 and takeover HMS CATTISTOCK in order to get back to sea in the autumn.

A key feature of the last 12 months has been maintaining links with BROCKLESBY's affiliates in north Lincolnshire. Members of the Crew have visited Cleethorpes to represent the Royal Navy on Remembrance Sunday and support Armed Forces Day celebrations. Most recently, Crew 7 hosted members of RNA Cleethorpes in Portsmouth, touring HMS VICTORY and HMS LEDBURY during their visit.

In July 24, Captain PUXD held a ceremony for personnel receiving the King's Coronation Medal in Vernon Complex.

Over the past twelve months Crew 7 personnel have supported Royal Navy Tactical Development programmes. This included sending Mine Warfare personnel to support REPMUS 24, a NATO exercise held in Portugal, testing and trialling new autonomous mine countermeasures technology.

A significant number of personnel have departed and joined the Crew over the last year; this has required constructive and adaptive leadership to maintain morale, cohesion and skills levels. Training opportunities have been exploited onboard other minehunters and patrol vessels in harbour and at sea. There has been a steady footprint of Crew 7 personnel deploying forward to Bahrain to support and augment the MCM Crews on OP KIPION; taking August 2024 as a snapshot, Crew 7 deployed a Lt, a PO(D) and an ET(ME) to conduct training and backfill ships in the Gulf.

The use of the Firefighting Training Unit (FFTU) and Damage Repair Instructor Unit (DRIU) has been vital to deliver continuation training to personnel and enhance Operational Capability looking ahead to the future programme. A range of simulators were utilised to maintain skills levels, in particular the use of the Sea Fox Deck (Mine Warfare) and Mantle Hall (Gunnery) at HMS COLLINGWOOD, and the Hunt Class Ship Control Centre simulator at HMS SULTAN. Thus, enabling progression across the Crew's professional development and achieving their taskbooks.

MCM2 Crew 7 is eagerly anticipating returning to sea in autumn 2024, training hard so we can quickly fulfill operational taskings and be ready to deploy on operations in 2025.





MCM2 Crew 8

Since summer 2023, Crew 8 have generated for Operation KIPION, deployed for two of their three planned rotations and are at time of print the VERNON # Crew, on their second Regeneration Period before re-deploying next year.

Having taken over HMS HURWORTH from Crew 6 in May 23, Crew 8 were routinely running out of Portsmouth, focussed on regaining core skills after being attached to ships deep in their Docking Support Periods for the previous 14 months.

With this time in refit had come the natural, large turnover of personnel and Crew 8 were essentially generating from scratch with a new Commanding Officer, Lt Cdr Tom Lindsey, having relieved Lt Cdr Jonny Campbell (now of Crew 1) in November 22. Between FOST Regeneration Assurance Visits and Ready To Train Assessments, Crew 8 and HURWORTH conducted several phases of Op PIKE in the Clyde area and were able to enjoy port visits to Glasgow and Dublin ahead of their BOST in parallel with HMS PENZANCE Aug-Sep 23.

Completing BOST in late Sep, Crew 8 returned HURWORTH to 2 Basin, were relieved by Crew 4 and packed their bags for their first Op KIPION rotation 'K1', from Oct 23-Feb 24. Taking over HMS MIDDLETON from Crew 6, K1 included Direct Support to CTF 152 operations and exercises, time in the Gulf of Oman, port visits to Oman and the UAE and work in company with HMS BANGOR, RFA CARDIGAN BAY and the embarked COMUKMCMFOR Battle Staff. Returning to the UK for Regeneration in Feb 24 including leave, IKAP and a week at NOCG, Crew 8 re-deployed to Op KIPION and MIDDLETON Jun-Oct for the Arabian summer. As well as maintenance and training activity, Crew 8 conducted port visits to Qatar, Saudi Arabia and the UAE, further work for CTF 152, Defence Engagement, REMUS integration and an MCM CLEANEX (see page ###) in a busy and rewarding period.

After a very busy 12 months, Crew 8 returned to the UK in October to regenerate and enjoy a Christmas at home. Lt Cdr Tom Lindsey will be handing over at the end of November to Lt Cdr Kyle O'Regan, formerly of FOST(Ships) for workup, AT, exercises and leave before Crew 8's third rotation to KIPION in Q1 2025.

MCM2 Crew 9 and Crew 10

See article 'Navigating Challenges - HMS BANGOR' on Page 34.

A JOB WELL DONE

By Lt Cdr C FOX



Ceremonial with Kuwait Naval Ship ISTIQAL. Building interoperability with regional partners is a key task for UK MCMVs.

In July of this year, Second Mine Countermeasures Squadron Crew 2 (C2) returned from their third and final Operation KIPION deployment in Bahrain, completing a highly successful, challenging, and rewarding deployment cycle. First deploying to HMS CHIDDINGFOLD (CHID) in November 2022, C2 rotated to and from the Gulf, completing three four-month-long rotations (commonly referred to as K1, K2, and K3). During these rotations, they supported international allies, conducted multi-national exercises, engaged in maritime security operations, and delivered world-class mine warfare and diving operations. During these deployments, C2 experienced several notable adventures, successes, and challenges. They visited many countries, including Bahrain, the United Arab Emirates, Kuwait, Saudi Arabia, and Oman, conducting regional engagement with partners in the Arabian Gulf.



Christmas 2022 on board HMS CHIDDINGFOLD whilst taking a short break from operations alongside in Bahrain

At the beginning of K1, CHID deployed in support of Operation SHADOWFOOT, a multi-national task force for the Qatar World Cup 2022. CHID provided around-the-clock maritime security, surveying, and support to the Qatar Emiri Navy, building relationships, and enhancing understanding of allies. Even being deployed at Christmas did not deter the Crew; hosting a Christmas dinner on board, prepared by the LH mess, and celebrated by the 48-strong Ship's Company; one member even remarked it was their best Christmas ever.

In K2, C2 conducted joint mine warfare operations with the U.S. Navy, including International Maritime Exercise 23, and a series of expeditionary Mine Countermeasures operations. Operating vast distances from their base port for up to six weeks, relying on the team's knowledge, skill and perseverance to ensure that CHID, a 40-year-old ship, sustained on operations and delivered for the operational commander.



One of fantastic sunsets Crew 2 have been spoiled with whilst deployed.



HMS CHIDDINGFOLD seen from the Dive boat at sunset ahead of night diving.

There was not time for a gentle return to operations at the start of the third rotation,, with the deployment starting with a change of command of CHID and C2 from Lt Cdr Matthew Teare RN to Lt Cdr Chris Fox RN. CHID immediately undertook a series of trials and a Fleet Operational Sea Training (FOST) period to ensure the Crew and Ship were ready and safe to deliver on operations, including firefighting, gunnery, and live demolitions. During this deployment, CHID, alongside Mine Threat Exploitation Group (MTXG), was the lead unit in the development of the Royal Navy's autonomous mine-hunting capabilities. They gathered valuable data and generated procedures to deploy, operate, and recover the REMUS 300 unmanned underwater vehicle from a HUNT-class MCMV for the first time. Where opportunities allowed, the Crew built enduring relationships with their partners in the Middle East, working with both the Royal Saudi Navy and the Kuwait Naval Force during K3, conducting fleet work and other drills that enhanced CHID's interoperability with regional navies and strengthened military relations.

During a brief stand down, members of C2 took the opportunity to run/cycle around the Abu Dhabi F1 circuit at sundown.



Throughout all their KIPION rotations, CHID was honoured to host a variety of high-profile visitors. During K3 alone, these included Commander Operations (COMOPS) Rear Admiral Edward Ahlgren OBE, Commodore Mark Anderson CBE, the UK's Maritime Component Commander (UKMCC), Brigadier General Abdullaheem of the Kuwaiti Navy, and members of the Armed Forces Parliamentary Scheme (AFPS). The AFPS visit allowed C2 to display their energy and charisma by showcasing CHID's capabilities and introducing UK parliamentarians of both houses to the realities of life on a deployed MCMV and the vital role undertaken by the UK MCM community in the Middle East.

By the end of K3, MCM2 C2 (C2) had been deployed for 381 days of 620, conducting nearly every task available to a HUNT-class MCMV, revelling in the opportunity to operate in the Middle East. Delivering on operations on behalf of Commander UK Mine Countermeasures Force and UKMCC, as well as supporting wider regional partners, was an honour for the Crew. The team have now returned to the UK for some well-earned leave and to begin generation for UK operations.

The finale. Crew 2 signing off from Op



FROM OFFICES TO OST

By Ltd Cdr CRAIG CLARK

When Crew 3 joined HMS HURWORTH on 10 Jan 24, they inherited a ship that was approaching its refit period and required considerable attention. Despite the challenges presented to a junior and relatively inexperienced crew, they immediately set to work, restoring the ship to a state ready to face the demands ahead. Their efforts paid off, allowing HURWORTH to successfully navigate the trials and tribulations of RAV and RTA in the first quarter of 2024, adapting to new challenges and situations that were unfamiliar to many on board.

Owing to poor weather and emergent defects, they only managed to achieve 16.5 days at sea prior to the transit north to Faslane, to start OST. Given the limited time at sea before this crucial training period, every moment was maximised to ensure they were fully prepared for what lay ahead.

While many on board had previously undergone multiple OST packages and were aware of the challenges they might face, the intensity of the next five weeks exceeded all expectations. The night of 15 April 24, brought an unexpected and profound loss to the crew with the tragic passing of ET(ME) Joshua Gayton. This loss deeply affected the entire Ship's Company, but it also served as a catalyst for unity and strength within the team.

In the wake of this tragedy, the Crew faced a period of uncertainty and grief. However, the support received from various quarters—including the chaplaincy and Faslane's command team—was exceptional. This, coupled with the grit and determination displayed by the entire Ship's Company, enabled them to navigate through a rigorous and intense OST package successfully, culminating in passing all summative assessments first time and being declared Ready for Operations. This achievement is a testament to the strong fellowship and bond among Crew 3, as well as their unwavering determination to succeed in every endeavour.

The experience of completing the OST package taught the Crew invaluable lessons, some of which were difficult but necessary. Despite the challenges, the period served to forge a crew that is not only willing to go above and beyond to achieve their goals but is also unshakably unified. This bond, formed through shared experiences, will remain long after each member has moved on to new assignments.

After the intensity of OST had settled, and Crew 3 were returned back to Portsmouth for some much needed rest bite. The next challenge for the crew then came into focus. Crew 3's first Op KIPION rotation began on 7 Jul 24 (in HMS CHIDDINGFOLD) amid a backdrop of regional instability. This new environment and operational theatre provided a new challenge in many different aspects, not least for personnel management in such intense heat, but an enormous uphill battle for the Marine Engineering department to climb to get the platform ready to perform at the level required. Their efforts in the first part of Crew 3's deployment in Bahrain earned them recognition by the RNRMC and rightly received a Herbert Lott award for their unwavering commitment to the crew and the ship.



The hard work from all on board continues, and with the mid way point of their first operational deployment as a crew creeping ever closer, Crew 3 are determined to finish as they started and provide the maximum operational output possible for both the UKMCMFOR and UKMCC as well as all region and international partners operating with the Arabian Gulf and further afield.



NAVIGATING CHALLENGES – HMS BANGOR

By Lt JOSS YOUNG

Over the last year MCM2 Crews 9 and 10, borne in HMS BANGOR, have faced a variety of challenges. The Sandown-class MCMV is deployed in the Arabian Gulf and based in Bahrain as part of continuing Royal Navy contribution to Operation KIPION in the region, and her Crews rotate on a 4-monthly basis.

In September 2023 MCM2 Crew 10 and HMS BANGOR, alongside MCM2 Crew 6 and HMS CHIDDINGFOLD, participated in joint training exercises with the Qatari Emiri Naval Force. This exercise was aimed at enhancing partnership and collaboration between the UK and Qatar, and included OOW Manoeuvres, Force Protection exercises, and operational exchanges with Qatari Emiri Naval Vessel SHERAOUH, the Qatari Emiri Navy's newest Offshore Patrol Vessel. These exercises and exchanges are critical for maintaining Maritime Security and Freedom of Navigation in the Gulf as well as ensuring the effective interoperability between partner nations in an increasingly unpredictable region. <https://www.armyrecognition.com/news/navy-news/2023/uk-two-royal-navy-s-minehunters-conduct-training-with-qatar-navy/>.

Following a handover between Crews, MCM2 Crew 9 then undertook a busy period of operations, starting their rotation by immediately conducting demanding and dynamic contingent operations throughout the Gulf. This was followed by a period of routine MCM operations in December, with the Crew achieving a successful SEAFXO Charlie (Combat) Round firing and being awarded the MCM Efficiency Pennant for a second year in a row. Some well-deserved respite followed in the form of Christmas alongside in Bahrain and a New Year's visit to Dubai.

A select number of Ships Company were able to represent the RN at the national Seychelles day parade



S/C of Crew 9 taking part in their own "Olympics"



Unfortunately, the New Year brought unexpected challenges, as HMS BANGOR was involved in an allision whilst alongside in Bahrain. Immediately following the allision, MCM2 Crew 9 demonstrated their core damage control skills, rapidly ensuring both the Ship and her Crew remained in a safe state alongside. Since then, MCM2 Crews 9 and 10 have worked tirelessly to ensure long-term hull integrity whilst liaising with BABCOCK for a repair plan.

HMS BANGOR's Crews remain focused on operations within the region, contributing to multinational operations through liaison with other units both in the region (not only fellow HM Ships but also COMUKMCMFOR, CTF 52 and CTF 59), as well as working on tactical development and diving operations. One particular highlight is Crew 9 having the opportunity to send members of the Ship's Company to take part in the National Seychelles day parade, much to the envy of those who were unable to attend.

Overall, HMS BANGOR and her Crews will continue to play a vital role in the Royal Navy's efforts to maintain maritime security and strengthen international partnerships in a strategically important region.



Crew 9 were presented their coronation medals during K2

LEDBURY GEARING UP FOR THE FIGHT!

By Lt OTTO NELSON

Over the past 18 months HMS LEDBURY has been undergoing an intensive period of maintenance, ensuring that she is ready for operations, worldwide in 2025. During this period, she has had many systems refitted, the sweep equipment removed, and a new state-of-the-art mine hunting system which will comprise the ORCA command system paired with the REMUS 300 AUV housed in new Mission Pods on the Pod Deck (Sweep Deck of old). Ledbury is currently completing the final pieces of her Capability Insertion Programme (CIP) before at-sea generation. This training package will ensure the ship and crew are ready to deploy on operations anywhere in the world. On completion of the FOST training, Ledbury will return to her homeport for a short period of maintenance before deploying wherever the Royal Navy needs her most.

In addition to routine maintenance and training, HMS LEDBURY has utilised the time alongside to host a variety of visits to the ship. The Ship's affiliates include a number of local businesses and even the Town Council of Ledbury. Weston's Cider and Ledbury Real Ales were among the Ship's Company's favourites, where their representatives were treated to a tour of the ship and given briefs on the current and future capabilities of the ship. Ledbury Town Council then kindly invited the ship to take part in this year's Remembrance Service held in the Town Centre. The ship also hosted a number of Falkland veterans on board. These individuals were the original members of the crew who took her out of the Build Hall and sailed her to serve in the Falklands Conflict. This had a surreal impact on the Ship's Company who were able to share stories with retired service personnel having served in active combat. The effect this had on the veterans also spoke for itself, with some expressing that the visit is what they had been looking forward to most in the year and were overwhelmed with by seeing "The old girl" again. It was good to look back and remind the ship's company of the proud history of HMS LEDBURY as we look forward to the next period of operations.



CLEANEX IN THE CAG: POETRY IN MOTION

By Sub Lt JOE WILLIAMS

HMS MIDDLETON has been deployed to the Op KIPION JOA since 2021, not for her first time, as part of the UK's Continuous Forward Presence MCM effort which has been in place since 2006. Alongside HM Ships CHIDDINGFOLD and BANGOR she is under the Tactical Command of the deployed COMUKMCMFOR Mine Warfare Battle Staff.

As part of the continuous MCM activity in the Gulf, exercises are conducted throughout the year. To enhance realism and improve classification techniques, drill mine shapes are deployed to provide targets. These inert mines often have the same casing as the real thing, but are filled with cement and include ground mines and moored/buoyant mines. After each exercise, units are sent out to collect these drill mines from the seabed; that task fell to MCM2 Crew 8 in MIDDLETON in August of this year. Provided with a database of roughly 100 sonar contacts by the MCM Battle Staff, MIDDLETON was sent to investigate and classify those targets, recover any drill mines and clean up the seabed, this was CLEANEX 24.1.

CLEANEX was a great opportunity for Crew 8 to practice their core skills on realistic targets. The opportunity to measure the team's success in recovered mines was an exciting one, and a first for many. To provide extra diving capacity, and further allied integration, MIDDLETON embarked a team of five US Expeditionary MCM Company EOD divers. Led by a Senior Chief, this team brought their own air-breathing diving equipment and worked alongside Crew 8's Clearance Diving Element to the professional enjoyment of all involved, learning from each other along the way.

On task, MIDDLETON used S2193 sonar to work her way through the contacts provided, classifying the NOMBOS and the MILCOs and using Seafox for identification, keeping everyone busy. Conditions were by no means straightforward, with strong currents, fierce summer sun and some strong winds. Diving operations in particular required careful planning, timing the availability of the CDE with slack tidal windows and cooler parts of the day.

For CLEANEX, Petty Officer (Diver) Stu Ricketts was the Ship's Coxswain and Dive Manger. He is the primary Diving Supervisor for and is responsible for the successful and safe execution of the task in the often challenging conditions.

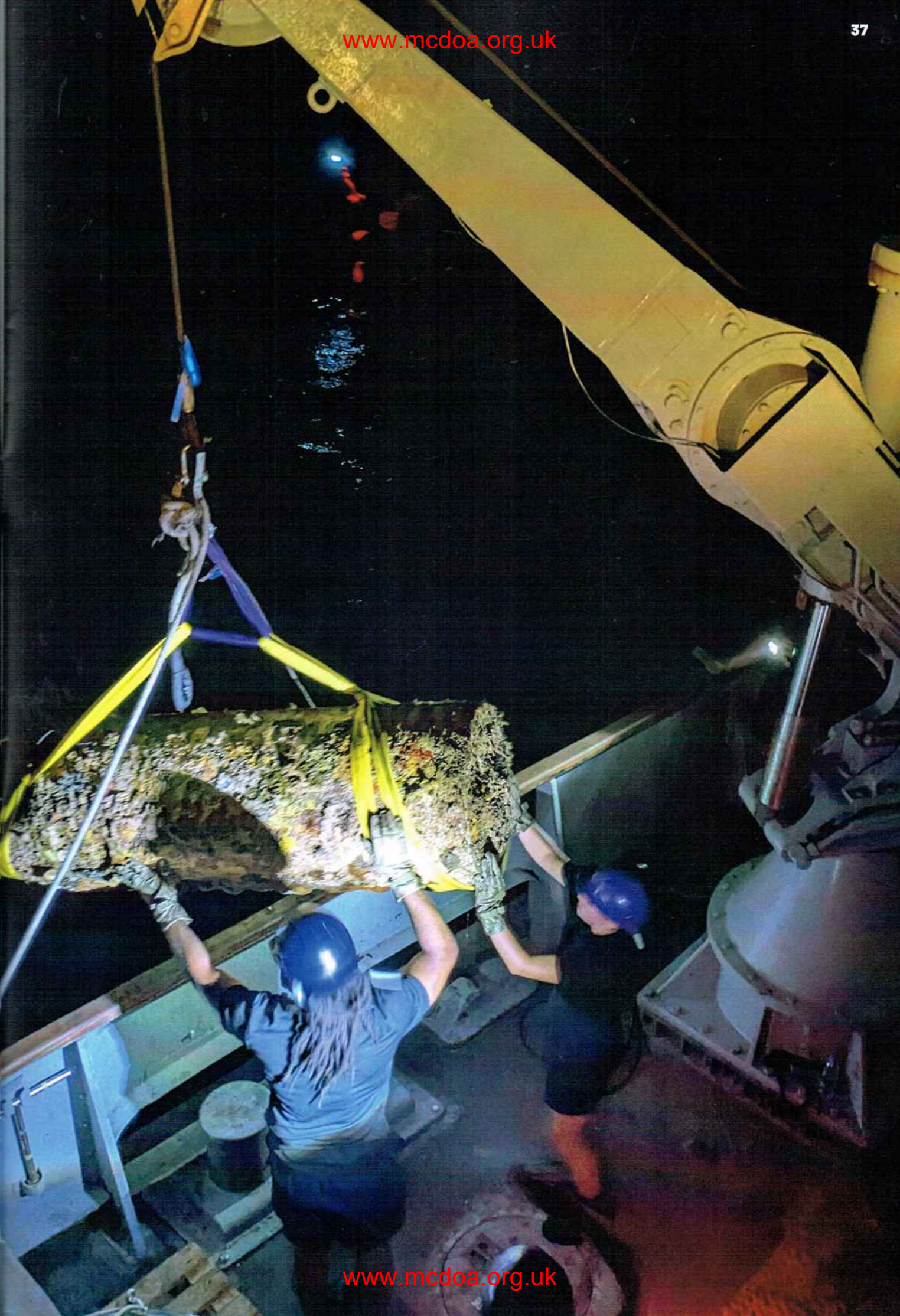
'During CLEANEX, once a mine had been identified by the Ship we would commit a diver to attach lifting strops so it could be connected to a recovery line. The diver would return to the surface after completing decompression so that we could call the ship in to lift the mine from the seabed using her windlass and davits. The process sounds simple in layman's terms but presents numerous challenges. The little world of the W525 dive boat becomes very crowded once loaded with personnel, diving sets, safety equipment, diving ancillaries, fuel and water, all requiring to be stowed to allow the dive site to function smoothly, particularly at night in rough seas.

The week started with difficult conditions due to high winds, some swell and short diving windows due to the extreme spring tides. Although the conditions seemed to improve throughout the week, a different set of challenges became apparent with increasing depths of the mines that we found. The CDE were recovering mines from depths down to 48 meters and having to complete in-water decompression stops right up to our peace time limit in order to complete the task.

It was great to witness how the US divers worked and although subtle differences were seen between our SOPs, extensive briefs prior to heading out to the targets allowed us to work well together. The two dive teams would alternate between dives, with Crew 8 crewing the dive boat for the US team. The first of the three drill mines recovered back on deck was completed by the American divers.

Working with the American divers and talking through different methods of mine recovery/disposal has been really useful. Sharing knowledge with each other can only make working together in the future better and essentially make us better EOD operators.'

The final of the three drill mines recovered during the CLEANEX was especially challenging: at 48m depth and weighing around 850kg, before taking into account the marine growth accumulated over time. The first of three night diving waves on the mine, all conducted on CDLSE, found that on laying, it had turned over so that the lifting eyes designed for recovery were facing down into the sand. Over a two hour window, three divers were able to dig around the mine and attach lifting strops, all done against the clock with each having only ten minutes to work before they reached their decompression limit. Each diver returned to the diveboat and briefed the next on what they had found and what needed doing in an excellent display of teamwork.





Meanwhile MIDDLETON stood by with her deck team at the short trail. Once the mines were ready for lifting, the ship was manoeuvred into position in over the recovery line, avoiding entangling shafts and propellers, and the mine was hoisted in board. As each mine was different, and some had been there for some time, there was a real sense of achievement bringing these shapes to the surface. As well as the interesting flora and fauna that were brought to the surface, the Mine Warfare ratings also had the satisfaction of checking their sonar classification skills, comparing the mines to the catalogue of shapes.

The bright lights from the numerous screens surrounding those same Ratings in the Operations Room can contrast heavily from the crowded world of the small island of head-torches and wet equipment that is the dive boat. However, the personnel who monitor the grainy-green picture from the sonar displays around the clock show equal levels of discipline to maintain concentration for the small flash that indicates a potential contact coming into view. Interpretation of the sonar image to discern between fishing pots and viable targets is a specialised art developed over years of practice. Lt George 'Soapy' Watson RN is Crew 8's Operations Officer, one of two Mine Clearance Diving Officers and one of two Mine Warfare Officers, a busy man on CLEANEX:

'Operating a veteran platform like MIDDLETON in the Arabian Gulf is not without its challenges. To achieve the task we adopted Defence Watches, and heat has a huge impact on both personnel and equipment, requiring careful management to sustain operations over longer periods. Even within the air conditioning boundary, propulsion and generation machinery, control and sensors equipment all generate a huge amount of heat. This puts a lot of strain on the teams working in these spaces and the upper deck, requiring a lot of discipline and motivation to remain focused on the task. MIDDLETON celebrated her 40th anniversary in commission this year and as well as recent upgrades like the ORCA Command System, a large proportion of her core equipment is still the original fit. Keeping her running effectively is a testament to our Engineers.'



CLEANEX was a rewarding task for the whole Ship's Company, and the embarked US divers. It put into practice all of the planning, teamwork and sustainability which the teams train and generate for. It also proved that many of the techniques used in RN Mine Warfare are still relevant, and complement the progression to off-board Uncrewed Underwater Vehicles; the target database provided is the kind of output expected from the systems being operated by the Mine Threat Exploitation Group.

MIDDLETON was able to take that information, make an assessment of the conditions, contact locations and density and then proceed to locate, classify, identify and dive on them. Serials such as the Diver Conning Run, and Drill Mine Recovery which can seem outmoded when practiced routinely, were brought back to life for a new generation of Mine Warfare and Diving ratings when put into action. CLEANEX brought together the whole Ship's Company's efforts into a satisfying result, measured in the tonnes of drill mine recovered to the Sweep Deck which everyone was able to admire on the return transit.

CLEANEX also provided some poetic inspiration for Crew 8's Junior Rate divers:

*Once again back into the deep
Finding mines for us to keep
This time we brought our friends
Building relationships that have no ends
To our American brothers, I have this to say
Thank you for your professionalism every day.*

*Successful runs for Seafox and REMUS
Into the ops room, you've got to see this
Look at the screen, obvious ground mine
Recovery inbound, not much time
Tide is ripping, action diver
Never fear, heroes arrival.*

*Darkness descends, sea state three
Out in the dive boat for the CDE
Conning run, on, on, on
Marking error, 1 meter, spot on
Down the shot line, feel through the murk
5 bells, mine found, now to work.*

*Strops attached nice and swiftly
All lines clear, ascend from fifty
Report it in, another success
Over to Middleton to do the rest.
Haul up the mine, all hands in
Back onboard, tea and dancing.*



DIVING SAFETY MANAGEMENT SYSTEM AUDITS: TRENDS & AREAS OF CONCERN

By Lt JOHN 'YO-YO' RAVENHALL

During recent Diving Safety Management audits (DSMSA) conducted by the Defence Diving Standards Team (DDST) several trends have been highlighted particularly in the domain of First Party Assurance (1PA). 1PA refers to the audits conducted by the organisation themselves, a self-check. This extends beyond formal audits and encompasses the checks that are built into the system we all do to keep each other safe. Below are the main trends DDST has identified.

Diving Logs

The S1627 Diving Log is a legal document which serves as an essential tool for post-dive analysis and safety assurance. Recent audits have identified the 'Record of Diving Operations and Exercises' section completed by the diver often lacks the correct detail such as air mix, water temperature etc. More concerning is this isn't being identified at the first point of 1PA – where the supervisor signs the entry. DivO's additional assurance checks rarely highlight errors displaying a lack due diligence. For the DDST, poor logbooks are a big warning sign, if errors are created by the diver and unnoticed by the dive supervisor, or the DivO during 3-monthly checks, there is clearly systematic issue – likely to be present in other areas.

The impact of unnoticed errors and omissions in these logs could be large following an incident when called upon by medical or legal professionals. To address this issue, it is imperative to check logs thoroughly to ensure each log is accurate, complete, and reflects the actual dive conditions and outcomes. Supervisors signing each log must ensure that they meet the standard.



Diving Life Support Equipment Logbooks

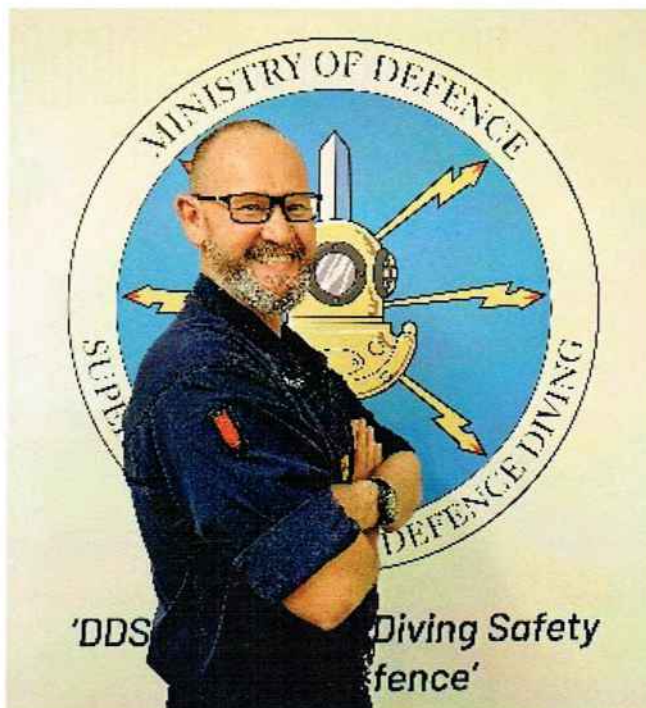
The Diving Life Support Equipment (DLSE) Logbooks are another critical component of the DSMS. These logbooks document the maintenance, inspection, and history of the equipment. Recent audits have highlighted a weakness in the 1PA of these logbooks, with inadequate checks not catching incomplete or inaccurate records. This is most likely due to a lack of understanding in the process by those conducting 1PA. Any oversight in the maintenance records could result in the use of unsafe equipment. Strengthening the assurance processes for these logbooks is essential, ensuring that all equipment is maintained to the highest standards and that any issues are promptly identified and rectified. If there are any concerns with completing DLSE Logbook Inspections reach out to the DDH cell or a member of the DDST.

Maintenance Concessions

DLSE concessions are issued to allow deviations from standard maintenance schedules or procedures under certain circumstances. However, the audits found that these concessions were being granted to the equipment maintainers from the Equipment Authority without the correct level of assurance or oversight from the Unit Engineers or Diving Officers. This lack of scrutiny when requesting EA concessions underscores the need for a more stringent review and approval process for maintenance concessions, ensuring that they are only granted when absolutely necessary. Additionally, there should be clear documentation and tracking of all concessions to maintain accountability and ensure that any risks associated with the concessions are fully understood and managed correctly by the requesting Units. DDST is working with the MDCC and EA to improve the concessions process.

Lifeline and Lazy Shot depth markings

The accuracy of depth markers on divers' lifelines and Lazy Shots is fundamental when planning and conducting safe diving practices. Audits have found these depth markings can be incorrect by a number of metres in the extreme cases. Conducting dives and decompression stops at an incorrect depth could lead to omitted decompression and potentially a DCI. Due to the property of the lines used, they tend to stretch over time under heavy use, they must therefore be checked regularly. It has also been witnessed that trainees and inexperienced divers have marked up lifelines without supervision leading to errors in markings. Good practice is to regularly check depth marking regularly. If in doubt, check and re-mark.



Conclusion

Strengthening the 1PA processes for logbooks, as well as ensuring rigorous oversight of maintenance concessions, are essential steps in enhancing the overall safety and effectiveness of military diving operations. Each check in the system is there by design to prevent potentially life-threatening incidents and it is essential that they are done correctly.

THE MINE WARFARE ASSOCIATION

By PO Stephen Cox

Leisurely sat in spice Islands beer garden, a cold pint in hand on a sunny summers day, spinning dits, some gen and some with poetic licence leveraged in. The dream of many a MW upon sailing from HMNB Portsmouth on a balmy winters afternoon to conduct MCM in the dreaded X5050.

The Mine warfare associations members regularly midweek pursue the former around the iconic 'jack' pubs in Portsmouth and further afield. DIT sessions are the MWs opportunity to get together regularly pull up a bollard and sink some wets with oppos both former and future.

The association is an annual membership at £1 a month, less than the cost of the NAFFI.

Better yet DIT sessions are a free run with no need to be a member, just the cost for your Leave pass.

Upcoming events can be found on the Mine warfare association facebook page with Ostend weekend currently planned for Oct 2024, a run ashore that many a senior MW and MWO have had the pleasure of sampling the finest beers Belgium has to offer and to celebrate 50 years of the MW branch, a reunion in Falmouth synonymous with anyone who's endured the dreaded Lands End TSS and Irish Sea, this is currently planned for the March 14th Weekend of 2025.



ROYAL NAVY CLEARANCE DIVERS ASSOCIATION

By RNCDA Chairman CPO(D) 'Waggy' Waghorn

We have a current total of 627 members and are always looking to reunite shipmates not only within the MW & Diving world but across the RN.

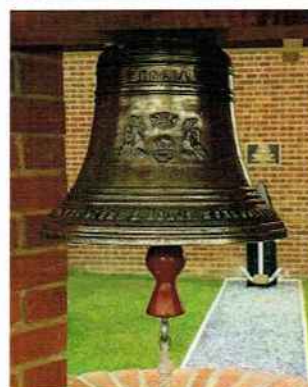
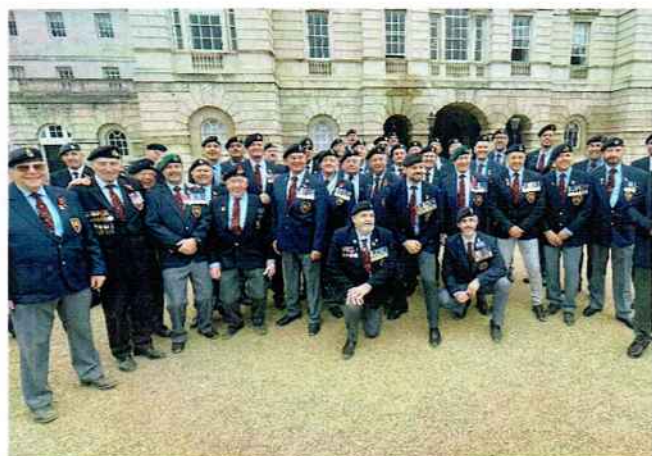
What have we been up to the past 12 months? We have enjoyed our annual Northern and Southern Divers gathering, had an amazing turn out for our annual golf tournament, enjoyed the company of 150 attendees at the annual RNCDA dinner (celebrating our better halves), collected money in London for remembrance and even had 54 divers march at this years Cenotaph march of remembrance. (We almost stayed in step for the duration).

We have also spent time and money on improvements to our garden of remembrance at Horsea Island, with the help of serving divers keeping the brass name plaques glistening. We also commissioned a travelling bell this year that can be requested to use as a mark of respect at fallen divers funerals, sounding '5 bells' our signal for diver down.

Poignant moments looking back in 2024 were the very humbling occasion of meeting Lt Boyd Salmon, a 100 year old former 'P' Party diver and being able to present him with a set of replica medals that he lost during the war and also two of our own Lt Cdr Balfour and PO (D) Cartwright-Taylor being awarded MBE's.

Next year we will enjoy all the previously mentioned events as well as again riding to the wall, the national memorial Arboretum in Staffordshire. A big one for the RNCDA calendar next year is the Army vs Navy rugby match at Twickenham, theme tbc and prizes for best dressed.

You can officially join the association at www.rncda.com/join and receive the coveted RNCDA coin to start coining your oppos around the world for wets. You can also get regular updates on what fellow bomb frogs are up to on the FB social media group name 'Ex & serving Clearance Divers'.



54 divers march at this years Cenotaph march of remembrance

Garden of remembrance

Lt Boyd Salmon,

