MINEWARFARE & DIVING

2005 Edition

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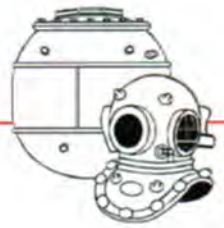


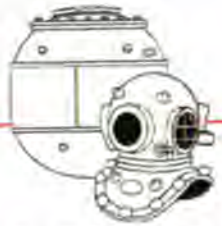
From Captain N P Stanley M.Phil, MNI Royal Navy
Captain Minewarfare & Patrol Vessels, Fishery Protection and Diving

I am delighted to be able to write the introduction to this current edition of MAD Magazine. Its appearance on the streets coincides with my own departure from the front-line, returning to MOD after two and a half years at the Waterfront but well placed to present something of a haul down report to the community; a reflection of the last few years and a look ahead to what we have on the horizon.

Starting with people: it has clearly been a demanding period. Operational challenges such as TELIC and a host of other less-newsworthy commitments have been met with traditional professionalism, confirming our status as world leaders in the business of conducting MCM operations for real – with bullets flying, live mines and the many demands of the joint, coalition environment which is now part and parcel of our business. Organisational pressures on our people have been more debilitating; frankly speaking, we have been playing 'Fantasy Topmast' in the MM community and I am also acutely aware of the similar pressures upon members the Fleet Diving Squadron. We are, I believe, turning a significant corner at sea where manning pressures are about to ease, although divers are likely to remain under pressure (pun intended) until we have recovered from the significant diving equipment setbacks that have hamstrung us over the past 3 years. I anticipate an improvement here over the next 12 months.

Despite significant resource pressures, there have been some real 'wins' in terms of equipment. CDBA, however, has not been a success story and I am fully of the view that we hold at 42m pending arrival of its replacement. There is no mileage in forcing it beyond this depth other than for exceptional, SofD sanctioned operations and none of these are on the horizon. From my own conversations with CinC, I am confident that the requirement to dive deeper in the future is recognised and supported at the highest level. CDLSE will deliver this for us. In the meantime, it is vital that divers continue to get time in the water in CDBA and thus continue to rebuild confidence in the set. Elsewhere within the diving community, there has been some progress in getting FDU01 better supported for its tasks and growing realization of the needs of the other FDUs if they are to genuinely deliver in support of the JRRF.

The highlight of the past few years for the MW community is clearly 2193 – it does exactly what it says on the tin. With all 'Hunts' now fitted with this sonar, emphasis must now shift to Tactical development and Operational Analysis; every 'Hunt' has an important role to play in this area if we are to get the very best from this sonar and its associated command system. Whilst singing the praises of 2193, we should be wary of ignoring the achievements of 2093 of late; specifically designed for deep-water tasks it has proved its wider utility in the KAA and during



Op ROCOCO route survey operations in the very shallow rivers and ports around the UK. UUVs will represent an increasingly important capability over the coming years and results from the relatively simple REMUS system have been hugely encouraging here. It has all the hallmarks of a genuine force-multiplier and I have been particularly impressed by the speed with which diving units have adapted to the system; picking up on the knowledge and skills of the Fleet UUV Unit and self-tasking to considerable effect during recent JMCs Shifting towards the 'kill' aspect of our business, One Shot Mine Disposal System remains the way ahead, with the acquisition process continuing apace.

Organisational change has been significant. We are now 3 years on from Fleet First and, from my perspective, the MW & D communities have been very well served by this step which has put warfare, engineering and personnel divisions alongside DD/FF and other contemporaries in the Fleet HQ. As a result, the profile of our core professional business is much higher and the support that can be generated for MCM issues carries much more weight. At the same time we have preserved the squadron structure which so effectively furnishes guidance, leadership, advice and direction from the Waterfront perspective and operational command and control in the Mine Warfare Battle Staff role. In this capacity, the Squadrons have made great strides in aligning their processes with those of the larger Fleet Battle Staffs and, subject to continued provision of CIS support, are increasingly well placed to go about their business in the operational environment. Within the diving community, the creation of a stand alone post for CO FDS has freed SofD's hands to allow him to focus more easily upon policy and equipment issues and the creation of Diving Safety Management System has been an important 'win' from this evolving process.

To conclude, I am aware that there are many areas that are part and parcel of our business that I have failed to address here, including the fine work of FOST and MWS staff. Also, I fully appreciate that much of the picture I have painted for you comes from the 'rosy' end of the spectrum. There are tough, real issues to be dealt with in the MCM world and almost all of them are linked to the fight for resources. However, whilst every aspect of Defence and Fleet business is under similar pressure, there is widespread, senior recognition of the importance of what we do and the skill with which we do it. This support, together with the sheer quality of our people and our unmatched ability to 'deliver' when H Hour arrives affords me significant confidence in the longer term capability and sustainability of the MW and Diving areas in support of the Future Navy.

Editor's Note

Your Magazine !

There has been a fantastic response by contributors this year and the magazine has many varied and interesting articles. Thank you to all.

The Purpose of the Magazine

The MAD MAG serves as an annual communications vehicle to globally update and inform the Royal Naval Mine Warfare and Diving personnel.

Since Fleet First and the dispersal and relocation of the CMFP organisation, the magazine now has a more important focus and responsibility for communicating with its branch.

Putting Things Into Perspective

The magazine has an immense Internal and External Public Relations potential and as such has meaningful articles from the key players and components of the branches as well as interesting and thought provoking issues from other contributors.

It has a wide and varied distribution from the Mess Square of an MCMV to the coffee tables of Flag Officers. There is no other annual publication, which can communicate visually the achievements and issues of the Diving and Mine Warfare Community.

Please Feel Free To Use It

Articles required for the 2006 edition, covering 2005 events, to be submitted by 20 Jan 06 for publication prior to Easter.

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DATES FOR YOUR DIARY

The 3rd Saturday in June will be the date of the Divers Social each year and it is open to all RN Divers and their friends.

27 May 05

MCDOA Ladies Night in the Wardroom at HMS Collingwood. A hot fork buffet dinner including wine on arrival, coffee and mints, for only £20.00 per head / £25.00 guests. Booking form can be downloaded via the 'Upcoming Events' page of the Members only area of the website below.

18 Jun 05

All-ranks RN Divers' Reunion organised by Association of RN First Class Divers starting at 1930 in the Main Ballroom of the Sailors' Home Club, Portsmouth. Cost £15 per head. The Home Club has now been booked for the next 3 years. Further annual reunions are planned for Sat 17th June 2006 and Sat 16th June 2007. 2007 will mark the 55th anniversary of the CD Branch. Application available on the website.

9 Jul 05

MCDOA Hog Roast at Horsea Island. Details to be announced in due course.

6 Sep 05

MW Branch Reunion at *HMS Collingwood*. Details to be announced in due course.

4 Nov 05

MCDOA AGM and Annual Dinner. Details to be announced in due course.

24 Feb 06

MCDOA Northern Dinner at *HMS Neptune*. 1900 for 1930 at a cost of £40 approx per head (negotiating with *Neptune*). This date will mark the 40th anniversary of the formation of the combined MCD Branch. Details to be announced in due course.

Web Sites

http://uk.msnusers.com/RoyalNavyClearanceDivers

rndivers@hotmail.com

www.mcdoa.org.uk

VIEW FROM 'OUR MAN IN MARBATSTAFF'

Lt Cdr John Graig RN

Why Mine Warfare matters.

Since taking over as SO2N3MW to COMUKMARFOR at the end of August 2004, I have served in roles as varied as SOO to the CO of HMS EXETER during Exercise Bersama Lima 04, Liaison Officer to the Commander Tenth Strike Group (in USS Harry S Truman) and Battle Watch Captain for Mustardian Forces during JMC 043, and the ROE advisor to COMUKAMPHIBFOR during Exercise Joint Venture 04. Despite not being specifically tasked in a MW advisory role for any of these exercises, I have already identified 2 key lessons worthy of sharing with the MW and Diving communities: firstly, MW is frequently at the forefront of the Maritime Component Commander's mind and, secondly, we still have a long way to go when it comes to educating our colleagues about the mine threat and how it can be countered.

Show Stopper.

Contrary to popular opinion, senior officers generally do not hold the "Damn the torpedoes, full steam ahead" view so often ascribed. In my limited experience, Senior Commanders are extremely aware of how much of a 'show-stopper' a mine can be if not treated with respect. This can be illustrated by my experiences during JMC 043 when a US Destroyer activated a Versatile Exercise Mine during a Mine Leadthrough Exercise. Within minutes of the report being received onboard the Carrier, I was called to give a personal debrief to both the Commander of the Strike Group and the Commander of the Destroyer Squadron as to why and how the mine had been activated, and what the Destroyer in question could do to avoid repeating an activation in future. This drove home to me that, notwithstanding any shortcomings the USN may have had in appreciating the mine threat in the past, they are now well aware that mines have sunk more warships since World War 2 than any other type of weapon, and give them the respect they deserve.

Mines can be found in the sea as well as on land.

While this is encouraging, the situation is not always so rosy. In my travels I have also encountered senior defence politicians who are surprised to hear that mines can be found in the sea as well as on land, and RN Warfare Officers who believe that the Sandown Class looks for mines on the sea-bed while the Hunt Class looks for buoyant mines. Although it would be easy to point the finger of blame at the politician or Warfare Officer, I believe that it is ultimately the fault of those of us in the MW and Diving specialisations who fail to explain to our superiors what it is that we actually do. When it comes to spreading the word about MW and Diving, it shouldn't be left to Squadron Commanders or Commanding Officers to 'talk up' MCM, we should all be doing it whenever we have the opportunity to make ourselves heard.

We may be competing with 'sexier' fast jet or missile programmes for a slot in the news, but remember - Mine Warfare matters!

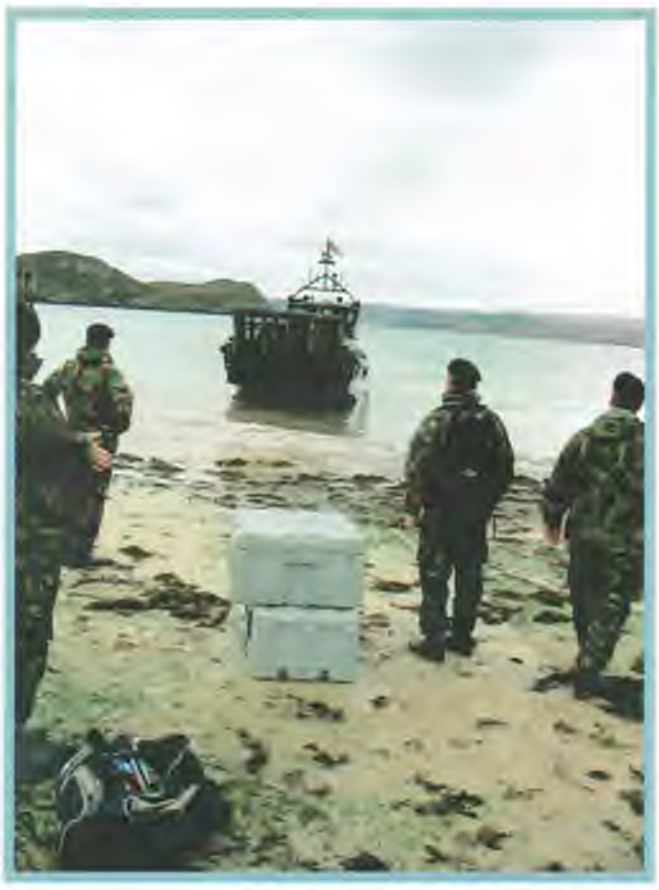
MCM1, OCF TA, MTSS(R) AND MINTAC DURING JMC 043 - DEPLOYABILITY PERSONIFIED

Overview. One year on from accreditation as MCM TA, MCM1 returned to Loch Ewe to conduct the Autumn JMC following their accreditation in 2003. Things were somewhat different to the previous year: no seagoing platform, new personnel, a new Command System and associated containerisation, and the fact that MCM1 had assumed duty as OCF Commander. The Course took place at the end of October into November and aside from MCM1 staff; FSU 02, FUUVU (the REMUS Team) and HM Ships BANGOR, GRIMSBY, BLYTH and BNS NARCIS were involved. The aim of this short article is to outline the highlights of the Course and show the step changes to connectivity and flexibility brought to MCM C2 by the arrival of the new kit. Notes on the foibles of operating ashore are also included.

Pre-Deployment Preparations. Mine Warfare Staff Battle Orders (MWBSOs) contains a comprehensive pre-deployment check-off list for JMC. We should train as we fight, so full thought to the ground Force Protection (FP) aspects of the Course was given. Obtaining appropriate clothing (Combat 95) proved to be a challenge, but this issue has been ironed out – kit requirement has been worked into MWBSOs and ratified by Fleet N7. Remaining on the subject of FP there is still work to do – none of the Staff are weapon trained and deploy ashore into an area of tension and a potentially hostile environment. It is assessed though that mounting cells, such as conducted for these heading for the Middle East, would cover this and cannot be drilled for peacetime exercises and courses. In a different vein, trying to establish correct Information Exchange (IE) between the Commander Danish TG (COMDATG), our CTG and immediate Boss, proved fruitless. The idea was to create UK Command Support System (CSS) connectivity to NATO Secret Wide Area Network (NSWAN) via e-mail, through a Bridge at Northwood. This was never achieved, despite many phone calls and e-mails. The lesson here is to engage earlier with CINCFLEET CIS (mea culpa!) for support. Submission of an Information Exchange Requirement (IER) is essential and gives N6/CIS a starting point. In the event comms with the CTG was by daily SITREP signal and was effective, but also the most challenging part of the Course.

Deploying into Theatre. Based on the geography in the Loch Ewe area (we were CYAN forces, in a Sovereign Base Area (SBA) surrounded by neutral Brownia and up against the evil Mustardia), it is not possible to co-locate MCMTA and FSU. Furthermore the topography presents a significant Comms challenge. Running the TA 'up the hill' at Loch Ewe raises the same old chestnuts for the TA staff. Where do we stay? Where do we put the TA and Comms modules? How do we manage FP within an operational theatre when no infrastructure exists for staff ashore? Will the Portaloos get blown away this year? In the end it was concluded that the team would best achieve the task by being spread throughout the area immediate to Loch Ewe Oil Fuel Depot (OFD) Main Gate. Communications connectivity from ashore has always been an issue: to that end it was decided to site the Comms container and associated generator as close to the top of the hill at OFD as possible. The Command module, containing MTSS(R), was located at the hard standing just inside the Main Gate, where use was made of the existing ISDN lines for IE. There are also 2 existing portakabins for use by the Command and Logistics teams. The staff at OFD were extremely welcoming and helpful – they could not do enough for us. The containers were also placed in accordance with our requirements by the very capable Forward Support Unit (FSU).

Command and Control. MCM1 operated MTSS(R), the new MW TA C2 system (with MINTAC software) for the first time on a JMC. The new kit is a resounding success, and presents digital data on a large Command display with route status for easy reference. Data handling has moved into the 21st century. MCM SITREP signals can be electronically stripped and contact / environmental data automatically fed into the server. All hardware is modern and looks professional. The 42" plasma screen (soon to be 2) is an effective briefing screen allowing an up- to-date tactical picture to be constantly displayed. Instead of spending the whole time filing and decoding signals, the Watchkeepers can involve themselves more in the Command decision making process. The RNR augmentees love it. So do the ASOO, SOO and the Squadron Commander, and here's why. During the JMC (by pre-arrangement), the MCM team simulated a requirement to re-deploy to a different, sea based, operating area. Within 10 minutes of receiving the order the MTSS(R) server was unplugged, in its waterproof box and in the back of the Land Rover. 20 minutes later a Squadron team comprising the Commander, SOO and ASOO embarked in an LCV(P) for transfer to HMS ALBION, to go and work for COMATG. Within 35 minutes of arriving on board, the system was running, with a full picture of the MCM battle presented to the Commodore. CSS connectivity was also achieved, with reach back for MCM signals e-mailed from the Loch Ewe Comms module



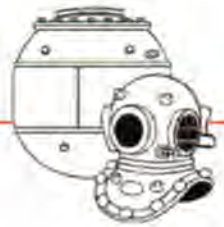
to ALBION to ensure none were missed. The system is great, and can be run in the field from the back of a Land Rover if necessary.

Conduct. Once set up, conduct appeared to be relatively smooth. Primary and secondary tasking existed at all times for Units in the TU, breaking task for logistic reasons as required. Midway through the Course, between serialised and free play phases, a mass Lead Through was conducted into Loch Ewe in balmy conditions. The 11 vessels that subsequently anchored in the Loch for the CTG conference made quite a sight. Lead Through, is it still valid as a serial? Tactically there are reasons for review of policy: All Ships carry GPS with the same SDNE as the MCMVs and therefore have the same degree of navigational accuracy. Are we unnecessarily putting high value minehunting units at risk, when they could remain on task? All vessels in the Theatre of Operations (TOO) would be up to date with Q-Route status and NAVWARNS through the AWNIS Cell. One counterpoint is that this is the only time larger vessels see MCMVs at work within a tactical scenario, there is no need for a 'showcase' however.

Ground Based Air Defence (GBAD). Co-located with the MCMTA was 16 Squadron RAF Rapier Battery. Early liaison with the RAF team (including a site visit) was conducted. With rapier heads sited all round Loch Ewe, the members of the GBAD Team came under TACON of MCM1 on the ground, although rapier, force air defence weapon, was in associated support, timesharing its operational line manager between Force Anti-Air Warfare Commander (FAAWC) and the land based air defence Commander. Located close to the Comms module – the RAF were able to communicate with the MCMTA by sound powered land line and real time raid reporting. Overall connectivity and liaison were very good, with OC 16 Sqn attending all Command briefs. In terms of FP, MCM1 Staff fell under the umbrella of the associated RAF Regiment Protection Group.

Minehunting Vessel Protection Unit (MMPU) - Formerly known as AAW Baby sitter. Always a challenging area. However this was well addressed by AAWC, HMS NOTTINGHAM, and other units in the area, such as HMS LIVERPOOL and USS WINSTON S CHURCHILL. Communications connectivity was strained and sometimes non-existent, but once the FF/DD were reminded of the paucity of circuits available to the MCMV in general, the MMPUs generally provided raid direction, countdown, and time on top on one of the MCMV guarded voice circuits.

ROE. This was interesting, if fairly simple in the scenario. Within Loch Ewe MCM Units were in their own territorial waters (TTW) and therefore able to explore and clear the Q-Routes with impunity. In neighbouring Brownia, however, despite being a weak ally, there was no guidance. In an unstable area therefore, would they have been happy with the MCM effort continuing down routes in their TTW involving diving, remote vehicle runs, and underwater explosions? The question was answered finally by COMDATG finally, but it is worth all considering this issue of position relative to TTW, whether on the Command team of an MCMV or ashore in the TA.



Drawbacks and Challenges. Two problem areas existed:

1. The difficulty in obtaining Combat 95 – this was solved as stated earlier.

2. CIS IE with the Danish CTG. This will be solved by early IER and engagement with FLEET CIS. MCM1 intend establishing full IE with NSWAN units on LOYAL MARINER (ex-NATO exercise BLUE GAME) in April 05, and thereafter during US BALTOPS 2005.

3. Non-availability of sea going platforms. With no LSL available, and early withdrawal of funding for use of these platforms in the future, the ability to sea base MCMTA co-located with FSU as compsite C2 and support is dwindling. We have to be fairly imaginative in the future.

Big Wins.

1. The biggest positive was proving MTSS(R) / MINTAC sustainability for shore based JMC, with scope for future operations ashore. Leading on from point 3 above, this could prove critical.

2. The deployment to HMS ALBION expanded upon the flexibility theme, showing the ability to use LPD, at least until another platform becomes available.

3. The resident skill within force to design and promulgate an anchorage, and order a 15 Ship Lead Through in 3 hours (VMT CO HMS BLYTH!)

4. Visibility increase – VIP visits by ACOS(CIS) and Captain, DNRes during the Course.

Summary. Flexibility is the name of the game when ashore in a Multi-Threat complex scenario such as JMC. The new equipment meets the challenges and, in the round, makes life considerably easier for the Command Team, whatever the environment or tempo. The future, in terms of what tools we are given to carry out MCM tasking, is never going to be certain. One thing that does raise confidence is that much care and forethought has gone into the Command and Control aspects, resulting in MTSS(R) / MINTAC. All those who were part of the project to bring the system into service should take pride in a job well done. After all, it's in colour, and must therefore be true.

RN DIVER PQC – FROM A BABY FROG'S VIEW

Royal Navy Diver training is world renowned for being arduous. Located at Horsea Island, the Defence Diving School works all year around to provide Commander in Chief FLEET with Divers capable of mine clearance, bomb disposal and a wealth of underwater engineering techniques.

So what does it take to become a clearance diver?

Even before starting basic training at HMS Raleigh, a potential diver must attend the Pre- Entry Aquaint(PEA) held at Horsea Island. The PEA is designed to give people a taste of the course and a chance to learn more about life in the CD branch. It's certainly an action packed couple of days. From the very start there is no walking allowed on the island, doubling is the only form of transport! The divers fitness test must be attempted which comprises of a 1.5mile run against the clock, sit-ups, chin-ups and dips. After this there are videos and lectures about the branch, but for the majority of the day an applicant can expect to be experiencing the divers' phenomenon – In Water Circuits! Dressed in a dry bag (a synthetic fabric dry-suit, one stage up from a bin liner, quite good at keeping water out and very good at keeping sweat in) the six meter dive board is climbed. Fins are then put on and with a jump the diver enters the water; preferably vertically, but commonly at varying degrees to the horizontal. The width of the lake is then swum and on reaching the other side, the fins are removed and it's a sprint to run back around to the boards. Typically the day ends with a 1km surface swim which if it happens to be a dark January evening, can be quite a chilling experience!

The Initial weeks

Returning home with aching limbs, there's plenty of time to reflect on whether that's the way to spend every day of a twenty week course. If the person should decide to enrol then there's much more to be discovered. The information comes in hard and fast. From Archimedes' principle to pneumothorax treatment, from search patterns to mixed gas theory, there's a lot to learn and very little time in which to learn it. Fitness and physical stamina features high on the

priority list and with two nights a week spent night-diving, the days are long and exhausting. However, with each passing day there comes a huge feeling of achievement. A week spent down at Portsmouth Harbour marks the transition from diving jackstays in the safe waters of Horsea Island to ships hull searches in the muddy waters of a working harbour. The bottom of the destroyer "HMS Bristol" is a dark and murky introduction to the world of underwater force protection. After instructors have placed dummy mines, the student divers will search the hull from aft to forward by feel alone. Whether night or day, it makes little difference as there's no visibility! On finding a device, the limpet mine disposal equipment is placed and then fired by the student, providing a satisfying and resounding boom!

Rebreather Diving

All diving so far has been conducted using air breathing sets. To get nearer the mine clearance goal it's time to bring out the silent bubbleless rebreather – Clearance Diving Breathing Apparatus or CDBA. One of the most advanced pieces of diving technology in the world, this is an electronically controlled heliox breathing system, and with that comes a whole new section of lectures and physics to befuddle the student. But one of the major differences is that the set can be dived for up to four hours, which of course means many an hour more to be endured at the bottom of Horsea Lake.

The Legendary Phase - Live In Week.

To be prepared for the rigours of a minesweeper's defence watch system, a diver must be capable of working on very little sleep in high stress situations. A week of living next to the lake and diving all hours of the day and night whilst enduring all manner of physical workouts is the Navy's way of testing the recruits to the limit. From start to finish it's a battle of minds. The students will never know when they will be allowed the next sleep, but they can be sure that they won't get more than four hours in any twenty-four hour period. In fact it's not uncommon for an "AWKWARD" to be given twenty minutes after they've been sent to bed, as this is exactly what might happen on a mine hunting operation. As the days blur and exhaustion is redefined, runs across the mud flats and circuits at all hours test the grit and determination of these potential divers. Only those prepared to demonstrate 100% effort and strength of mind will be successful, those lacking the necessary qualities will have undoubtedly decided to pursue an alternative career path by this point of the course! Completion of this phase is always an emotional and well-deserved moment for all those successful.

Search Training

Now the basics have been learned, the course moves onto other exciting subjects and

locations. Two weeks at Portland is spent carrying out back to back search techniques used in mine hunting diving preparing the divers for beach and area searches.

Underwater Engineering

A whole new set of diving equipment will be pulled out of the bag for underwater engineering, the surface supplied Kirby-Morgan equipment. Connected via an umbilical air hose to the surface and wearing a helmet this truly is Rolls Royce diving. Underwater tools are mastered covering many disciplines and techniques, be it videoing a damaged propeller or cutting metal with a one 1000° Celsius Broco rod. This stage is an interesting and important part of the course broadening your basic diving knowledge to encompass heavy engineering underwater.

Scotland – Deep Diving

To combine all the skills to date and descend literally to new depths, the course truck is stacked full to the brim, and training is relocated 600miles to Kyle of Lochalsh in North West Scotland. Here it's time to hit the bench mark of fifty metre diving. The student must show that even under the effects of nitrogen narcosis, he can still operate safely and responsibly. When you're on the surface there's no time to "loaf about" as it takes a whole team to support one diver at depth and every person must be able to carry out his responsibilities to the letter, no excuses as it will be you next down there!

Underwater Explosive Ordnance Disposal Training

The only hurdle left to the trainee is an intense couple of weeks at the Defence Explosive Ordinance Disposal School, near Chatham. Here he will learn everything necessary to mine and bomb disposal. Every type of ammunition used whether it be Air, Land or Sea has to be learnt and recognised as any of these weapons could be encountered in the world's oceans. It's a race to learn it before the final test dive in the on-site lake where the student will be expected to identify a suspicious object having conducted a reconnaissance in near zero visibility using only his hands to "see". Once it has been identified the munition will have to be disposed of using High Explosive or HE. The course covers this and you soon get used to handling "PE" (plastic explosive) and dets (detonators) under the direction of the training staff to destroy unwanted and dangerous explosive.

And Finally

The Navy diving course doesn't pretend to be anything other than physically and mentally demanding. Only the most motivated of people will make it through, however the benefits are extensive. This is without doubt one of the most satisfying and rewarding careers to choose in the RN – and there's even a little special service pay thrown in for good measure!

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SANDOWN AND INVERNESS BOW OUT

Rob Hoole

The Defence White Paper *'Delivering Security in a Changing World: Future Capabilities'* presented in Parliament on 21 July 2004 announced that the Sandown Class MCMVs SANDOWN, INVERNESS and BRIDPORT are to be paid off by April 2005 and the Hunt Class MCMVs BRECON, COTTESMORE and DULVERTON will be paid off by April 2007. These cuts will reduce RN MCM forces to 8 Hunts (out of 13 built) and 8 Sandowns (out of 12 built). However, the remaining Hunts will have been upgraded with wideband Sonar 2193 and the NAUTIS 3 Combat Management System.

Sandown Pays Off
Photo by Rob Hoole

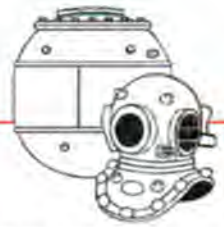
HMS SANDOWN entered Portsmouth for the last time on 7 Oct 04 and was decommissioned on 19 Oct in readiness for her disposal.

On a typically grey, cold and blustery November morning, HMS INVERNESS (CO Lt Cdr David Bence RN) wore her decommissioning pennant as she made her final entry into Portsmouth on 18 Nov 04 for handing over to the Disposal Reserve Ships Organisation (DRSO) on 17 Dec. She was granted the Freedom of the City of Inverness on 22 Oct during a ship's visit and decommissioned at Faslane on 15 Nov.

Inverness Pays Off
Photo by Rob Hoole

Members of HMS BROCKLESBY's ship's company, led by XO Lt Jason White and OPS Officer Sub Lt Ian Wood provided a nice touch by signalling INVERNESS by light from the Round Tower and giving her three cheers as she passed. BROCKLESBY was in refit having Sonar 2193 and NAUTIS 3 installed.

Members of Brocklesby's Ship's company
Photos by Rob Hoole



"MCM COMMAND AND SUPPORT - A VIEW FROM A SOO"

By Lieutenant Commander Martin Mackey (Ex SOO MCM2)

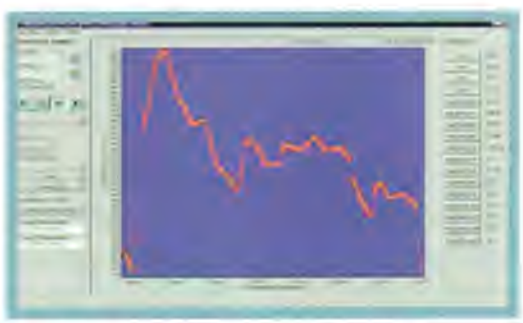
After returning from OP TELIC in July 2003, the staff of the 2nd MCM Squadron still had a busy 15 months of exercises ahead that would see them working as far a field as Belgium, America, Canada and Singapore. Having taken over as the UK's MCM On Call Force (OCF) Commander from MCM1 during OP TELIC, MCM2 (Commander Peter Lambourn and then, in April 2004, Commander Peter Williams) undertook the duty for an extended period, eventually handing over the reins again to MCM1 in August 2004.

So what were the challenges set before the staff? As well as providing Guidance, Leadership, Support and Direction to the 2nd MCM ships, and gaining FOST accreditation in order to train our ships, we had to focus on a number of major exercises that would keep us busy throughout the period as the OCF Commander that included:

Ex BELL BOTTOMS 03 – The computer based MCM Exercise held at Egermine, Ostend, Belgium.

ASWEX 04 – A large ASW exercise off the South West Approaches with HM Ships SHOREHAM and SANDOWN on what was previously known as OP GARDEN. I augmented the UK Maritime Battle Staff as the SO2(MW) embarked in HMS CORNWALL.

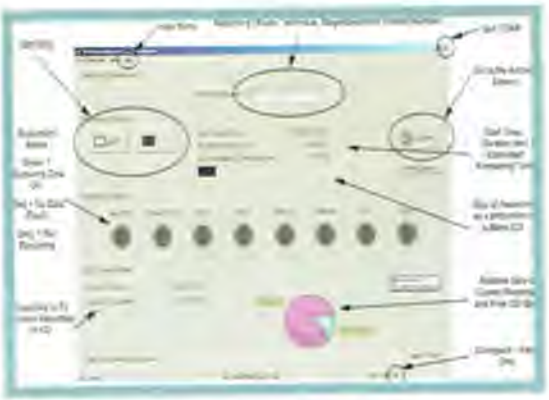
AURORA 04 - The UK's Naval Task Group deployment to the east coast of America to participate in Ex RAPID ALLIANCE, a CJTFEX (code named Op BLINDING STORM by the USA). We were embarked in RFA SIR BEDIVERE with MCM2 in charge of her and HM Ships WALNEY, PEMBROKE, MIDDLETON, SANDOWN, ROEBUCK and FDU2. During the exercise MCM2 acted as the Surface MCM



Commander adding US Ships BLACKHAWK, ROBIN and KINGFISHER to his command. Commander MCM1, his SOO and ASOO, joined the US MCM Staff of MCMRON1 embarked in USS PONCE with FDU2. The MCM deployment included visits to the Azores, Bermuda, Norfolk, Boston, Halifax and St. John's, Newfoundland.

Ex BERSAMA LIMA 04 -

A Five Power Defence Arrangement exercise hosted by the Royal Singapore Navy. MCM2, as the MCM CTU, deployed with some of his staff, along with RNR and RN augmentees, and personnel from the FPDA nations to make up the MW Battle Staff (MWBATSTAFF). Embarked initially in RFA DILIGENCE, we transferred to HMS ECHO during the exercise achieving the first use of that class in its MCM Command and Support role. MCM2 was CTU to RFA DILIGENCE (and for a time HMS ECHO), HMA Ships YARRA and HAWKESBURY, RSN Ships KALLANG and KATONG and RMN Ships JERAI and KINABALU, and five nation's diving teams that included FDU2.

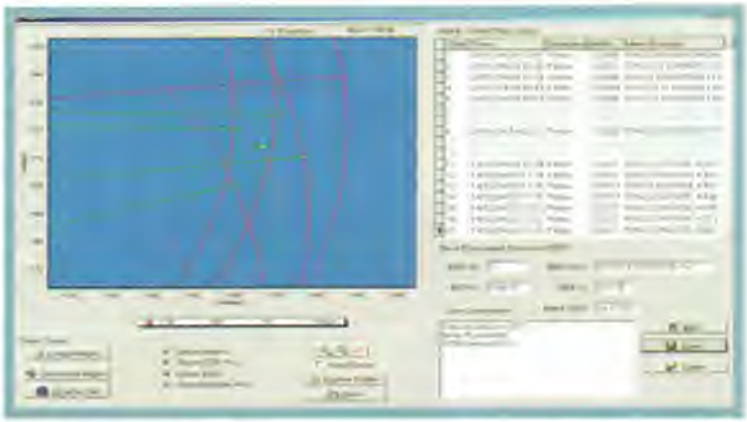


Whilst obviously a busy time, and each period out of the office provided its own challenges, it is not the intention of this article to give you a diary of events, but rather to highlight some of the key issues relating to the Command and Support of MCMVs. I will not be discussing the introduction of new MCM equipments which, on the whole, are being brought in to support the frontline MCMV. Also, I will not debate whether the MWBATSTAFF should operate from ashore - which we did successfully in Bahrain towards the end of our time on OP TELIC My points are focussed on the RN's current concept of effecting MCM Command, Control and Support from the sea.

The MCM Command and Support Platform.

Over the years a number of various types of ships have acted as the MCM Command and Support Platform (MCSP) hosting both an MCM staff and, at times, an FSU. Whilst each platform has brought with it many benefits, all have their limitations. Clearly, to achieve the best results, the platform to be used should be allocated based on the requirement and not simply whatever is available. However, having now operated from two LSLs (RFA SIR BEDIVERE and RFA SIR TRISTRAM), as well as RFA DILIGENCE and HMS ECHO, my platform of choice, from the RN's current 'Order of Battle', is the LSL, and specifically RFA SIR BEDIVERE, but with improvements.

The Mine Warfare Battle Staff.



The concept of the MWBATSTAFF has grown over a number of years and the organization is quite different from that of the past. High tempo operations, such as experienced during OP TELIC, confirmed that in order to support and sustain a long term MCM campaign, and provide the ships with a tailored service in a timely manner, we need an experienced, relevantly trained and well-equipped staff. The days of the SOO and ASOO doing all the planning are gone. So, today we rely on specialists to fill the various roles and when fully manned, the staff may number up to 22. Add to that the FSU, and the support team can reach up to 50 people. When embarked in the MCSP or ashore, this makes for a formidable but necessary organization; OP TELIC and AURORA 04, the two largest recent MCM deployments, proved the concept. The MWBATSTAFF standing orders form the cornerstone of the concept and have recently been issued as a BR that will be regularly reviewed and updated.
Now that we have the MWBATSTAFF in place, how can we improve the means by which it can effect command, control and support of a deployed of MCMVs in the future?

Communications.

Those of you who have operated in a deployed MCM group will acknowledge, no doubt with a wry smile, that communicating with the MCM Commander, even when you can see his ship, is often fragile, frustrating and sometimes non-existent. This problem stems from the fact that the staff normally operates from a makeshift Ops Room – either a converted office or messdeck - in an RFA, and rely heavily on the ship's own comms equipment which brings with it considerable limitations. When trying to keep up with modern 'Op Tempo', this can be difficult at the best of times, and almost impossible at the worst. However, the good news is that, when working with either HMS ECHO or ENTERPRISE, MCMVs can talk directly to the on-watch staff in the Ops Room by any number of comms links including radio, telephone (secure and non-secure), email and signal; suddenly, it all seems very easy. The lack of a dedicated MCM Ops Room in any of the RFA units remains a problem, but if the space could have a few minor changes that includes amongst other things, having a full range of dedicated comms, we would see an enormous improvement in our ability to communicate.

Building the Picture.

What about the bigger picture? The staff have the 'luxury' of having the Command Support System (CSS), but the MCMVs do not. Whilst it is not necessary for the MCMVs to have the whole picture, knowing where the threat is coming from is of utmost importance. A real or near real time system that provides a tailored picture as well as some form of CSS-Light capability in MCMVs is necessary to greatly improve their situational awareness. There must also be a mechanism contained within the CSS-Light system whereby ships can send MCM data both up the chain-of-command and also across the other units (between Hunts and Sandowns as well as other nation's

systems); transferring magnetic tapes by boat or plotting contacts from someone else's handover signals, are not conducive to 'Rapid MCM'.

Replenishment at Sea (RAS).

Operating in a benign environment where the sea is flat-calm is fine, but how often does that happen in the areas where we might expect to operate? One of my biggest challenges when planning the AURORA 04 deployment, was how to fuel the ships during the long Atlantic crossings. We have mastered the art of rafting and taking fuel, water and stores from almost any ship, but what happens when the conditions do not allow. Nations that have not gone down the route of rafting, or in fact RASing, expect their MCMVs to go off task, return to harbour to replenish and then return on task. In the Northern Arabian Gulf we would have lost ships for at least 48 hours in order for them to return to Bahrain to achieve this. Fortunately, on the whole, the weather in the Gulf was suitable to raft so did not cause too many problems. However, without the allocation of RFAs BRAMBLELEAF and OAKLEAF, the MCM AURORA 04 deployment would not have been achieved. If the MCSP could provide fuel and water either by an abeam or astern method, we would add considerably to our bag of tricks, improve our flexibility and be truly self-sufficient/sustaining.

Forward Support Unit (FSU).

Throughout my time as SOO the FSU proved to be one of our best assets. Without the on-site support that they provide we would not have achieved all that we did. Our US colleagues, as well as others, look on enviously at this capability and any platform that we operate from in the future must be able to support this team, their stores and equipment. At-sea support relies on us being able to transfer personnel and equipment to the ships. Fortunately the weather and sea state limitations are not quite as constraining for a boat transfer (of a RIB size) as they are for rafting. Whilst the LSLs are able to support a full FSU, other ships cannot, and that is a significantly limiting factor. Having the FSU embarked enables swift defect rectification thus ensuring that on-task time is maximised.

RNR

It goes without saying that the MWBATSTAFF would not work without the support and efforts of the RNR. Not simply a bunch of guys who pitch up for two weeks to get their annual bonus, they are a highly motivated, professional and dedicated group whose only desire is to do well in their support of both the MCM Commander and the ships; and that they do. Fully embedded within the MWBATSTAFF concept, they form the basis of the MCM expertise and are indispensable. However, they themselves acknowledge that there are areas in which they can improve. Particularly at the officer level, their future training is expected to focus more fully on: the Command Estimate, a broader appreciation of other spheres of warfare, a better understanding of non-MW signals and Rules of Engagement.

The Future?

The LSL is my platform of choice, and in particular RFA SIR BEDIVERE, but their time is running out. What does the future hold for the afloat MCM Commander? Our 'make do; can do' attitude has, on the whole, enabled us to get through, but if we want our MCMVs to achieve 'Rapid MCM' we need the means by which we can achieve 'Rapid MCM Command, Control and Support'. So what does the future hold? The Royal Navy's MCM community has a reputation it can be proud of and is seeing the introduction of some new and exciting equipment. But how will we support our MCMVs in any future operation once the LSLs have gone. Will the MCM Commander and his Battle Staff be embarked in a platform that fully supports all the requirements (either dedicated or fit to receive) or will we just make do?

SUBMARINE RESCUE WITHIN THE RN, PRESENT AND FUTURE

Lt Richard Osbaldestin

Northern Diving Group

The tragic loss of the Kursk in Aug 2000 demonstrated the risks involved in operating submarines and caused a number of nations to look closely at what procedures are in place to deal with similar incidents. The UK has invested in submarine rescue for many years but a significant increase in interest and funding has led to a period of change in this area. This article aims to explain the procedures in place at present and to highlight the direction that submarine rescue for the RN is heading over the next few years.

The Fleet Diving Squadron has a major commitment to support the United Kingdom Submarine Rescue Service (UKSRS). The lion's share of this commitment lies with the Northern Diving Group (NDG). This is primarily due to location, a close association with the submarine service and the future of the submarine rescue service within the RN, which will be explained later in this article. So what is UKSRS and what has it to do with the diving branch you may ask?

UKSRS is administered by the SUBIPT and is government owned and commercially operated by a division of James Fisher Rumic Ltd. The UKSRS base is in Renfrewshire about 10 mins from Glasgow airport, hence the logical geographic association with NDG. Rumic have a permanent team committed to the operation and maintenance of all the associated equipment. This is easily deployed from this location with good road networks from Glasgow, an air transportation option from Prestwick and a permanent out station at Fairlie Jetty. Fairlie is an old NATO jetty now privatised but capable of supporting sizeable vessels without having to transit up the Clyde to Greenock, Port Glasgow or other local berths.

LR5 Submarine Rescue Vehicle

The team are capable of deploying at short notice to a stricken submarine with the aim of commencing a rescue within 72 hours. The system and equipment require a mother ship (MOSHIP) to support the rescue. The SUBIPT maintains a database of suitable ships capable of supporting such an operation. This register includes large diving support vessels, cable layers and other vessels with sufficient deck space, accommodation for the rescue team and survivors and with the performance required to quickly transit to a site and operate in potentially inclement weather.

The focal point of such operations is the deployment of the LR5 rescue submersible. This is a 10-metre rescue vehicle that can operate to depths of 600m and mate with a stricken submarine whose internal pressure has increased to as much as 6 bar. Studies have shown that there will be no survivors if the internal pressure of the submarine has increased greater

than 6 bar. The LR5 has a 3-man crew; pilot and co-pilot who are permanent Rumic personnel in the forward control compartment and a rescue chamber operator in the rear of the submersible. The rescue chamber operators are locally trained clearance divers provided by NDG. The divers undertake a 4-week training package with Rumic, which consists of a 2-week dry phase at the Rumic base covering all the systems and drills. The training culminates with a 2 week exercise where the LR5 conducts live runs against a bottomed submarine or a purpose built target that enables the submersible to simulate docking with a submarine on the sea bed. As the RN no longer operates diesel electric boats (the only vessels that can bottom out) exercises are very much dependant upon participation with other nations namely Norway and Germany.

In the event of an emergency in far flung places the whole system can be air transported by civil or military transport for example a C-5 Galaxy or an Antonov heavy transport aircraft. The system can then be flown to a more suitable mobilisation port to embark the equipment and eleven strong rescue team. To facilitate the use of a variety of vessels the system includes a portable launch and recovery system that can be fitted into place on the stern of a ship not fitted with an "A" frame in approximately 12 hours.

LR5 deploying using Portable Launch and recovery System

Scorpion ROV with first reaction stores

Once the submarine is located a Scorpion ROV is used to do a preliminary survey of the hull to ensure that a docking can take place and this can also be used to transport pods of first reaction stores to the stricken vessel. These stores can be prioritised to *pod*ensure that necessary life support equipment canbe passed to the survivors prior to a potentially lengthy rescue mission. Commercial ROV pilots are sub contracted to augment the single pilot maintainer that Rumic retains, this ensures that current and experienced ROV pilots are available for such a critical task.

Once the rescue mission is underway the survivors are transported to the surface in batches of up to sixteen. Once on the surface the LR5 is recovered onto the MOSHIP and the survivors

need to be transferred to a decompression facility dependant on the profile that they may have been subject to. First reaction Type B RCCs from NDG and SDG are used for this and are operated by RN divers. Normally two Type B RCCs and support chacons would be deployed for this purpose. The survivors are transferred to these chambers by means of the Universal Deck Reception Chamber (UDRC) and a number of stripped down 7A One Man Compression Chambers (OMCC). The UDRC is now in receipt of a Lloyd's classification but has yet to be accepted into service with the RN.

Universal Deck Reception Chamber

There is a flexible coupling to mate with the LR5 then the survivors are processed by an attendant within the DRC and then a number of TUPs are conducted using the 7As to transfer the survivors to the Type Bs. The 7As have been modified and simplified with no therapeutic gas or bibs and can now transport two survivors at once, even so this can be a lengthy process and is extremely manpower intensive.

LR5 Rescue Chamber, a tight fit for 16!

The survivors may be in a variety of conditions depending on the profile they have experienced and the amount of time they have been waiting for a rescue. This may mean that a number of different tables have to be run for patients that may just be saturated from being exposed to pressure for such a long period and for those that have developed DCI.

The current system is showing its age and improvements can be made using modern technology. The Kursk incident demonstrated that the requirement for such a system is still very much alive and all nations operating submarines were forced to think about the effectiveness of the systems they had in place. It was shortly after this maritime disaster that the US announced the replacement of its current submarine rescue system. This presented

an opportunity for other nations to build a compatible system that could be operated using shared technology; after all, providing safe rescue systems is not an arms race. The cooperation demonstrated during the Kursk disaster illustrates a multi national support culture in this field.

This period of consideration gave creation to the future of submarine rescue within the RN. That future lies within the Nato Submarine Rescue Service (NSRS) due into service in 2007. NSRS is a multi national project to develop a European rescue system managed by the

Defence Procurement Agency on behalf of three participants – Norway, France and the UK.

NSRS will complement the planned replacement of the USN DSRVs AVALON and MYSTIC. Both systems will be capable of worldwide deployment, and work alongside other national systems that are confined to domestic littoral waters. As is the current arrangement with UKSRS, NSRS will be government owned and commercially operated with Rolls Royce being the prime contractor of a contract worth £47 million. This is a new field for Rolls Royce but the many sub contracts have been placed with existing and familiar names.

Containerised Type B RCC

Perry Slingsby, the manufacturer of LR5, will manufacture the LR5 replacement; Perry Slingsby will also provide a replacement for the aging Scorpion ROV currently in use. This ROV will be a modified variant of the PSSL Triton, which is a heavy duty ROV in widespread commercial use.

LR5 Replacement Rescue Vehicle

The rescue vehicle will be of a similar design to the LR5 with a crew of 3 made in the same way as LR5 requiring a clearance diver from NDG to act as the rescue chamber attendant. The vehicle will be capable of recovering 16 survivors and it will be able to mate with a stricken submarine up to a max of 60° angle.It will operate with improved batteries to provide a greater endurance and the information link back to the MOSHIP will utilise a high-speed fibre optic link. Of significant note is that the submersible will no longer require divers to assist with launch and recovery, as it will be fully automated.

As is the current situation the project will include a database of vessels, which have sufficient deck space to support a rescue operation. The deck layout required for NSRS will be significantly greater than is required at present. It will not be the intention to utilise vessels with an existing "A" frame. Instead the system will deploy

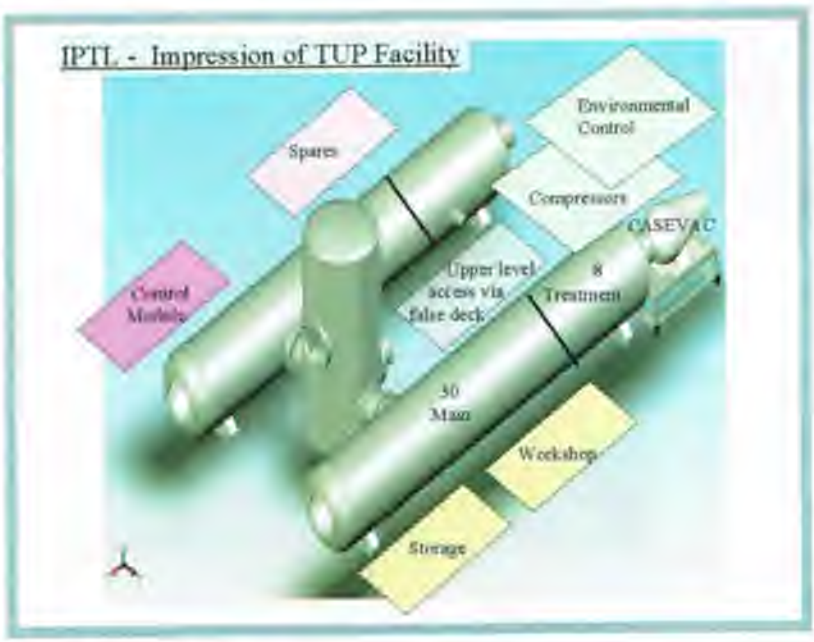
ROV replacement for current Scorpion

its own Principle Launch and Recovery System (PLARS) which can be swiftly fitted to suitable vessels. Part of the project will be to forward plan the fitting of the system on different vessels so an existing load plan has been Triton developed for each ship and the speed of mobilisation will be significantly reduced.

The most important aspect of NSRS to the diving branch will be the TUP system to provide decompression and therapeutic facilities. This system is being developed and manufactured by DIVEX in Aberdeen. It will be fully containerised consisting of two 40ft containers housing two compartment main chambers. A two-storey deck transfer chamber fitted with a flexible coupling to the rescue vehicle will link these.

NSRS Rescue Vehicle

The survivors will be transferred into the transfer chamber where they will be decontaminated, undergo medical triage and then transferred to a main chamber. Each main chamber is split in to two compartments to enable one to be used for a therapeutic treatment in the event of survivors showing symptoms of decompression illness (DCI). Due to the size of the facility and to conserve gas it will operate as an air saturation system with scrubbers, activated charcoal filters to sweeten the environment and an air make up system. There will be no requirement to flush through, as this would require a prohibitively large supply of gas. The project is expecting to operate existing tables but as it is joint venture each individual nation will be entitled to operate national tables. The Norwegian Navy is interested in trialling accelerated decompression table currently being developed by the US Navy that carry a 30% DCI hit rate, demonstrating the importance of being able to run concurrent treatments. An external transfer chamber can be linked to any of the chambers to enable medics to transfer in and out as required. These chambers will operate in a similar way to a 7A used in the UKSRS. The whole system will be controlled from a separate control room located on top of one of the chambers with an electronic control system.



DIVEX TUP Facility

Extensive redundancy is built into the system with the facility to manually drive the chambers from local control panels. The intention, however, is to house as much as possible in iso containers, thereby providing a modular system easily transportable but protected from the environment.

The whole system will be built into iso containers and will be compatible with the Atlas loading system and will be able to be transported on C-5 Galaxys or using commercial transportation options. The system will be based at HMNB Clyde, and for those familiar with the base the building adjacent to the Wardroom will be the proposed home of NSRS. Babcock Naval Services will be responsible for providing the base facilities and the transportation of the system to the port of mobilisation. Rolls Royce will provide a small team of permanent staff to maintain the system in Faslane with BNS staff used for the mobilisation. FDS is expected to provide rescue chamber attendants and the manpower to operate the TUP facility. Each nation will train a team capable of operating the system with the permanent staff. Initially the RN will man the system for 2007, its first year of service, covering the trials and acceptance but after this each nation will provide manpower for specific exercises.

The effectiveness of our current ability to deal with an incident such as the Kursk may be in question. This is being rectified with a huge investment and the introduction of NSRS. No doubt a joint European venture will present its own problems but the system introduced will bring submarine rescue within the RN into the 21st century and give a stricken submarine as much of a chance of survival as possible.

Fully computerised control room

LONG LOOK 2004

Diver 1 Keith Brown
RAN Dive School

Wow, where do I start? I have never filled a four month period with so many activities and experiences – if you ever have the opportunity to participate in Long look you'll understand. Before boarding the plane at RAF Brize Norton I didn't really know what quite to expect but now, a couple of days before I depart Australia, I can tell you that in every way this exchange has fulfilled every expectation and more.

Bush Living for the First Time.

During Long look 2004 I was employed by the Maritime Tactical Operations Section at the RAN Diving School, HMAS Penguin. This establishment was situated just north of Sydney in a small suburb called Mosman. During my time here I experienced an assortment of training activities from diving at the wharf to helping staff conduct a CDAT (Clearance Diving Acceptance Test). Highlights of my time at the school would have to include qualifying with a mixed gas re-breather at the Pitwater Diving Annex, one hour north of the diving school and accompanying a basic divers course to Triangular Island training area, Queensland. Here the course completed a ten day underwater demolition phase. Here I had to contend with bush living for the first time... Along with being included in a variety of interesting training serials I was able to experience bush showers and toilets, large spiders that seem to always spin a web in front of your tent (head torches on at night a must) and all sorts of insects trying to feed off you when moving around in the evenings.... Even a little bush tucker – was made to feel at home by being given a nice cup of tea but this time no tea leaves just green ants. Before landing on the uninhabited island via Landing Craft I asked one of the senior instructors whether he enjoyed staffing this element of the course – his response – "Yes, I enjoy it but only after it's over". It was an incredible experience, but one that I would prefer to do only once...

Sleeping under the Stars.

About half way into my time on the exchange I was granted some leave. I had talked to many people about places to visit which helped with ideas however didn't help with decision making as there seemed to be just too many. With Australia being along the same size as Europe it's possible to travel for four hours by plane and land somewhere with virtually totally different weather, scenery and culture. The next few weeks would turn into a very busy time....

Alice Springs - Ayres Rock, The Olga's, Kings Canyon and some sleeping under the stars

in the middle of the bush – watch out for wild Dingo's and camels.
New South Wales road trip - wildlife parks, Opal mining at a place called Lightning Ridge
Darwin - Litchfield National Park - getting accidentally completely lost in the bush for a few hours, but we won't go there....
Four day/ three night Coach tour through the Northern Territory and Queensland to Cairns - enjoyed my birthday in a very remote small town called Croyden and had happy birthday sung to me in seven different languages.
Cairns - diving on the Great Barrier Reef, Sky diving, becoming really nervous before a Bungy jump, white water rafting.
One week in Fiji where I was invited to stay with a Fijian Diver and his family after meeting when he was on course at the Dive School - Coconut climbing (Tui all the way to the top like a ferret up a drain pipe, me about a meter off the ground just trying to hold on), Shark diving and Fire Walkers from the Island of Beqa.

Make sure you apply for Long Look.
It is difficult to sum up my four month experience in Australia. Aside from the amazing time that I've had from working with the M.T.O section at the RAN Diving School and visiting the various places that I have whilst traveling on leave I firmly believe that the Long Look experience is made by the people you meet and the people who become friends. From international backpackers you bump into on tours, to both the staff and trainees you meet at work, to the good friends you make who want to drive you around, host Aussie BBQ's for you, take you out for evenings on the town and take you snowboarding for the weekend where the only thing you have worry about is bringing yourself.

As you already know, being in the Armed forces can and does broaden your horizons, professionally and socially. Make sure to apply for a position on a future Long Look.

PLANES, TRAINS, AUTOMOBILES - EVOLUTION AND DEVELOPMENT OF UNDERWATER FORCE PROTECTION SOPs

Planes , Trains and Automobiles..... What's next? May I suggest a coalition warship (USS COLE) or maybe a larger, high profile vessel such as the Queen Mary 2? The first 3 modes of transport have been involved in recent, devastating acts of terrorism with civilians the intended victims. Planes: 9/11. Trains: Madrid. Automobiles: Bali. The USS COLE in a way clouds the issue of UWFP. This was a surface attack using a suicide boat not an attack on a ship from beneath the waterline. Security Forces have scrambled to revise security procedures and establish SOPs to counter the threat. But are we able to counter the underwater threat for both military and civilian vessels?

The Underwater Threat.

The attack on USS COLE has seen all navies revise their requirements for security whilst alongside or close inshore. The Royal Navy has, of course, OP AWKWARD to counter the u/w threat. But do the tactics currently engrained in Ship' Divers across the Fleet and offered to Commanding Officers as a security blanket actually withstand scrutiny? Who is the command advisor on diving matters and the threat posed by limpet mines? The Ship's Diving Officer. How much training does the ShDO receive in the *current* limpet mine threat or indeed Improvised Explosive Devices? Any plastic case can be sealed using silicon or hot glue thus making an Underwater IED (UWIED). Can the ShDO provide information to the Command on the operating parameters and capabilities of a limpet mine or plastic drum/Pelican Case, divers have found on the Ship's Hull?

Why should a device be placed *on* the hull? Why not place a larger device at the base of the jetty or on the sea bed beneath the berth with a long delay timer, placed in advance of the ship's arrival? To a certain extent Commanding Officers can protect their Ships from this threat by requesting searches of jetties before their arrival, but what of civilian vessels? How far in advance was the Conservative Party Conference of October 1984 publicised? When and where will the QM 2 next berth?

Current Doctrine.

BR 8988 offers guidance in internal reactions; increased watertight integrity, evacuation, etc and then OP AWKWARD picks up the ball. As Op AWKWARD escalates, for example bubbles have been seen between the ship and the jetty, the ShDO asks for command approval to dive on the Ship's Hull. The implicit reason being limpet mines are believed to be placed on the Ship's Hull. Who knows the average arming delay on the 'top 12' limpet mines? What is the 'general' time delay for an IED? In fairness, these answers will depend upon the perpetrator and their established *modus operandi*. In IED procedures a 'primary soak' time is observed to protect the operator from approaching a viable device with the clock counting down in all but the most extreme circumstances. This soak may be revised by the operator, through a referral process, depending on his knowledge of the likely perpetrators, their capabilities and technological knowledge. Without this specialised knowledge, by what rationale can the command justify deploying his divers immediately, and to whom should the CO refer?

Obviously the CO does not have the organic means to conduct remote reconnaissance and disruption of devices placed on his hull. To counter this, OP ORACLE SOPs require the use of an ROV to conduct EOR. However, these means are only currently available in high threat theatres and, fortunately for the Diving Branch, we are still required to manually place a weapon to attempt disruption. In order to counter the threat in one of our home ports we must establish SOPs which do not rely on ROVs. Once again – is the diver's life worth less than a hole in a correctly evacuated, closed down warship? Clearly, the importance of the ship must be categorised. High Value / Mission Essential Units may justify the risk to a search group of divers.

Exercise FAST SWIM.

To date, SDU2 have conducted 5 Exercise FAST SWIMs (Ex FS), SDU1 have conducted 2. This considerable achievement warrants a mention for Lt Cdr Dave Welch (BOF) who started the ball rolling long before I 'picked up the ball'. CINCFLEET has directed that the termly Ex FS take the place of the classic CDBA DDWU which is now irrelevant with the set's revised depth limitations. Before the demise of PRISM a change was in progress to reflect this realignment of priorities.

The exercise tests the unit's short notice, reactive deployment capabilities to counter an underwater attack by terrorists on ships in any port. Thus far, SDU2 have only conducted the exercise using Portsmouth Naval Base and Southampton while SDU1 have conducted their exercise in Devonport. These exercises are not simply a live-in week of ship's hull and seabed searches. Previous exercises have started with an increased threat, moving on to false alarms or single device attacks and then multiple attacks on multiple vessels. During the last exercise a full IED exercise was conducted with HMS St ALBANS, involving the whole ship's company

reactions and subsequent arrival of an IED team and render safe of the device. On a typical task the duty supervisor (at least a CD1 but preferably additionally qualified as an IEDD No1 operator) must consider the importance of the ship to be searched, the current threat level, the likely threat

and feed this into the risk matrix. He must consider the 'bigger picture'. He must also deal with the C2 requirements and interaction with other agencies (QHM, MDP, Local and Marine Police, OODs and COs). Depending on the scenario and his threat assessment, he may request, through a referral process similar to IED SOPs, relaxations to mandatory actions, as he deems appropriate.

A draft SOP Matrix for UWFP has been proposed and is currently being 'staffed'. In the meantime, SDG continue to exercise and refine techniques based on the proposed UWFP SOP's. Once the SOP's and matrix are approved, even for exercise use, we will be able to more fully involve outside agencies and identify C2 issues as yet untested.

Crosspols between SDUs 1 & 2 take now place for each exercise. These have proved useful in 'spreading the word' about UWFP from more of an IED standpoint. It also helps to identify any differences in each team's procedures and should improve interoperability as a group. The FAST SWIM in October will continue our development. Southern Diving Group will exercise all together with SDG HQ performing a C2 role as yet untested. This exercise could prove extremely useful in preparing SDG for supporting Trafalgar 200 (International Fleet Review and Drumhead Ceremony) next year.

Constant evaluation and improvement.

Whilst investigating ways to improve UWFP procedures, SDU2 developed the new search scheme alpha (with some help from SofD of course – sorry Rich, Andy et al). Capitalising on the improved communications provided by DTWC, we are also changing the way in which it is used, improving probability of full clearance and the speed at which that clearance is achieved. During the last FAST SWIM, SDU2 divers were able to clear the main and auxiliary machinery spaces on HMS St Albans in 7 minutes, by searching across, instead of along, the hull. The supervisor no longer requires a surface swimmer to maintain comms with his divers, hence the new approach. Search of the free area aft took slightly longer using marked swimmers in pairs, but this could be achieved concurrently. This clearly requires a well worked up team. We currently require Sof D dispensation to exercise the athwartships search technique but hope that in time CDUs may be given permission to work-up and dive what is a very efficient search. Nevertheless, may thanks to the ShD team in HMS LIVERPOOL for their "pioneering" work with the new SSA! (Navy News, Aug 04).

It is envisaged that Ex FAST SWIM will become a validation exercise from which to qualify suitably experienced operators to receive 'referrals' and offer further advice as appropriate. This role does not interfere with the roles of the CO, Duty Fleet Controller or local Police Forces. It provides a recognised *and qualified* Subject Matter Expert who can offer advice to the diving supervisor on the ground. At no time does the SME achieve primacy over the normal chain of command, but remains suitably close to the man on the ground and thereby can offer advice which is not diluted by layers of the 'command chain'.

Mission Creep?

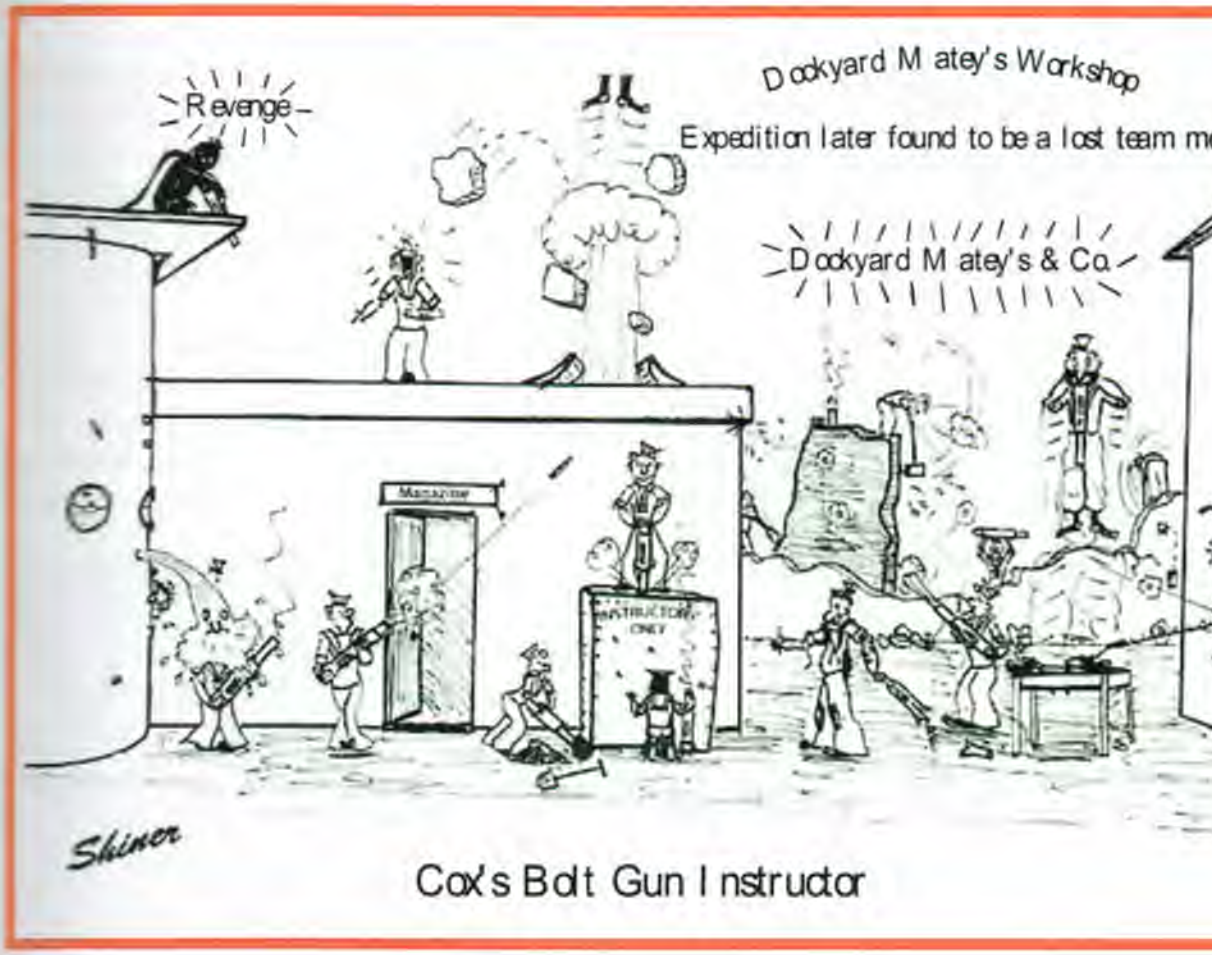
This 'new role' as a reactive UWFP asset is not an additional task on an already overstretched Unit. Training for UWFP does not detract from the provision of EOD cover under MACP (OP

MEDWAY) protocols, which remains our first priority. It is merely an extension of what an operator has to consider during a complicated CMD or IED task. It ties together our core skills into one coherent package and reinforces the CD Branch's proactivity and value to the RN in countering the asymmetric threat posed by today's sophisticated, technologically proficient, professional terrorist.

Employment of the Area Units in support of OP GARDEN RTSV completes the groundwork for effective response to a terrorist attack. In OP GARDEN and Ex FAST SWIM, I see a 'joined-up' doctrine. Beginning with data gathering and improving our knowledge of our ports and harbours, which will be of benefit to us when that fateful day arrives.

The chilling statement issued following the Brighton Bombing is as valid today for any terrorist organisation as it was then for the IRA, "Today we were unlucky, but remember we have only to be lucky once; you will have to be lucky always."

Lucky? – yes. Prepared – Definitely.



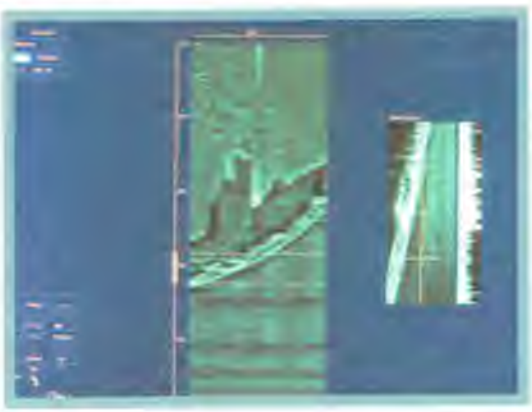
Cox's Bdt Gun Instructor

HMS HURWORTH – FIRST OF FIT SONAR 2193

Lt D J Griffen RN Ops

Having just completed the last MWO course to be trained on sonar 193 and CAAIS. With switch configurations memorised to start CAAIS, safe in the knowledge that 'NPN (inject)' would open the NAVPAC interface and that 'NN (inject)' would nominate the optimum track. Imagine my relief when I discovered that I would be joining the first Hunt to be fitted with a 'state of the art' minehunting system.

As I am sure many are aware, sonar 2193 is the first wide band, hull mounted sonar to be fitted to a warship. Unlike a conventional sonar, which emits a single selected frequency, 2193 emits a wide range of sonar frequencies, which the sonar's software then converts into a sonar picture. This combined with an off the shelf command system, Nautis 3, promised to provide a leap forward in minehunting technology.



The premise for the fit was that Thales Underwater Systems would design a wide band sonar to fit the existing directing gear, this combined with a fit in Fleet time was proposed to present a cost saving to the project, and a challenge to the Ship's Company! The fit started in mid January 04, with Babcock removing the old array and Ops Room fit and replacing it with the new equipment. However, as soft patches were lifted and the MWO's Nautis 3 console was given it's second shock test whilst being dropped from a trailer, the Ship's Company started to doubt that the fit would be completed in the 30 days confidently allotted by the contractors. But true to their word, cables were run, equipment fitted, soft patches replaced and the fit was completed on time. Now it just had to be turned on!

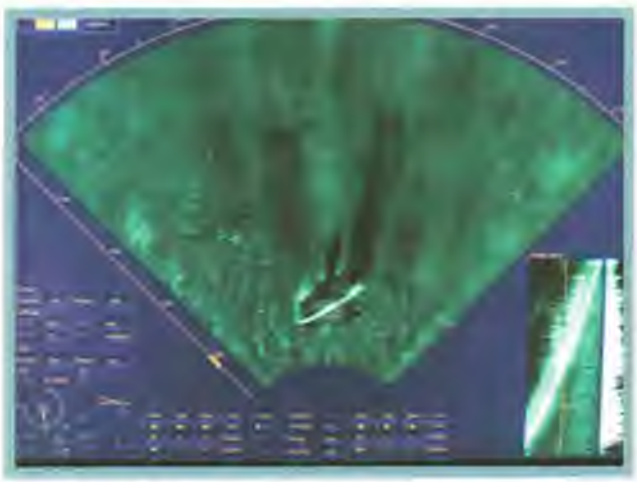
Whilst the Thales engineers conducted harbour trials and fitted the Initial Operating Capability (IOC) software, the Ship's Staff undertook Early Crew Training. Early Crew Training was divided between computer based training at MWTU COLLINGWOOD, which will eventually be replaced by a 2193 / Nautis 3 simulator and Thales' facility at Templecombe.

Nestling in the rolling hills of Somerset, Templecombe is an unlikely place to find a bunch of sonar experts. As the CO put it; 'Templecombe is 500 scientists hidden behind a hedge'. However it was here that the Ship's Staff were able to apply what they had learnt at COLLINGWOOD to the only working system.

After successful harbour trials, we proceeded to the sea phase. The sea trials were split into 4 distinct phases; Initial confidence check, Thales trials, Naval Weapon Sea Trials and deep-water confidence trials. The initial confidence check was to prove to Fleet that the sonar would work to a standard at least on a par with Sonar 193M. After a weekend at sea in Wey Bay preparing, Thales were to present the system to a delegation of Fleet, IPT and MCTA representatives including CMFP. This day, now known as 'Black Monday' to those onboard, was challenging to say the least. Following a real life demonstration of Man Overboard procedures by a member of the Thales staff during a boat transfer, it was found that the sonar would not flash up, this was eventually traced to a number of blown fuses caused by a Total Electrical Failure earlier that morning. After some rapid fault finding by a combined Thales and Ship's Staff team, the problem was rectified, the sonar flashed up and a relieved Ops Officer conducted a successful vehicle run for a packed Ops Room audience.

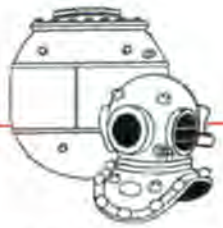
After this baptism of fire, the trials continued with static and dynamic phases, including vehicle runs and diving conning runs against a pre laid, mixed target field. The trials them moved to Falmouth for the deep-water phase. Whilst on passage to Falmouth, the Ship stopped at the wreck of the M2 Submarine off Chesil Beach and fully explored the imaging ability of the sonar, producing some very recognisable images of the wreck.

On completion of trials and acceptance into the fleet, the Ship's Staff were able to get to grips with the new system during a short Weapons Training Period prior to OST.



As would be expected, the MCM phase of OST was particularly challenging as the first of class with a new sonar. The system's fragility was a particular concern, with the sonar going off line at the most inopportune moments, this often lead to frustration of the Ops Room team as system shut downs and re-boots interrupted the flow of the minehunting operation. The system fragility almost made Final Inspection a repeat of 'Black Monday', with the sonar refusing to flash up as soon as the inspecting team embarked. After 4 hours of the WEO sweating over a sonar, and the SWO(MCD) quizzing the Ops Officer "Well come on then Ops, think, how are you going to find the mine now?", the sonar flashed up and the task was achieved.

Following OST, HURWORTH had an opportunity to pit S2193 against French, German and Spanish MCMVs during the Summer JMC 04. A rather disappointing WPA result during the JMC, was resolved during a further WPA in company with HMS CHIDDINGFOLD, the second 2193 fitted Hunt, against HMS ATHERSTONE, still fitted with 193M.



In conclusion, this has been a year of firsts for HURWORTH. First wide band sonar, first major Fleet time fit, first OST and JMC with a new sonar, and the first comfy leather seats ever to be fitted in an Ops Room. Certain elements of the new system have had an immediate and recognisable effect on minehunting operations. The Nautis 3 Command System has proven to be a reliable and user friendly system, allowing the MWO to gain a more tactical appreciation of the situation. The introduction of a constant Differential GPS feed in the form of Precise Fixing System (PFS) has further increased minehunting accuracy. The use of colour LCD displays has allowed the Ops Room to become 'White Light', and the potential for inclusion of digital chart overlays onto the Nautis 3 radar display further enhances the MWO's situational awareness. Sonar 2193's fragility has in part been disappointing. However, it's potential is recognised, and the ability of the software based operating system to be repeatedly upgrade should solve these reliability issues with the release of Full Operational Capability (FOC) software.

THE NEW THUNDERBIRD ONE
by CPO(D) Beeching

On December 2003 the Fleet Diving Squadron took delivery of first of nine Pinzgauer 6x6, light-duty logistic vehicles. Three of which lead very busy lives at SDU1 Plymouth, the new EOD vehicle or " The Royal Naval Bomb Disposal Vehicle (RNBDV).

Developed in 1971 primarily for the Army to deploy troops and equipment in various extreme environmental conditions, the Pinz offers a high degree of mobility and performance. The Ministry of Defence conducted a most extensive trial, which resulted in updating the design for the 21century. Namely the introduction of a Turbo –Diesel engine and increased payload capacity. This unique vehicle comes in four variations to accommodate different payloads. All three services currently use these vehicles in various roles from a Fire Engine to an Ambulance or a simple transporter.

From the desert to the arctic, the Pinzgauer can operate down to temperature as low as -46°C. With fuel tank consisting of 120 litres, these wagons can run up to a distance of 250 miles. The main factor of the RNBDV is its mobility with EOD teams being able to drive on rugged terrain. Half axles and portal hubs that pivot around the centre line of the differentials contribute to a smooth and determined vehicle. A modern five-cylinder 2.5L Volkswagen engine developed to meet strict Euro 3 emissions criteria. The pinzgauer can reach speeds of 80kms in 15 seconds and has an automatic ZF5 gearbox designed to offer a selection of gears to drive in any condition. There is also a transfer box, thus allowing the driver to select high or low range whilst on the move.

Royal Naval Bomb Disposal Teams wanted a vehicle that was designed for use in all EOD scenarios. It is equipped with designated compartments for specific equipment to meet the multiple tasking of the duty watch. All HSE standards have been recognised and implemented, this is demonstrated most clearly in the design for carrying the 40hp Mariner outboard engine. A telescopic transportation cradle pulls out to offer the engine at an acceptable height.

This is on the left hand side, which also houses the dry EOD equipment, firing cables, chemical agent monitors and hand held mine detector. The rear stowage compartment provides additional space for CDBA, Proto and ancillary paraphernalia. A clever roof rack assembly is provided for securing the inflatable boat. This is a far cry and much safer, from the struggle of manoeuvring a Gemini from a Land Rover's roof. Inside offers a spacious crew compartment with plenty of legroom and a food/ water heater. Further stowage is available at the front of the compartment as well as a separate location for stowage of detonator boxes. A sliding table is fitted to provide workspace as a mini ops room and operating ASH. On long journeys blackout blinds can be dropped to separate the crew compartment from the drivers cab (often done while utilising a laptop DVD player!). A MOD supplied key safe is also provided is fixed to the rear of the work surface.

To conclude, the area teams now have an EOD wagon, which encompasses all their CMD roles into one deployable vehicle. It's multiple terrain capability from roads to beaches and including treacherous mud flats gives each team a form of independence without the limitation of not carrying enough equipment or changing vehicles to suit conditions.

10,9,8,..... 3,2,1.... Pinzgauers are GO!

JMC 042
A PERSONAL VIEW FROM THE MCMTA
By Lieutenant Doc Cox Royal Navy

A VIEW FROM THE OTHER SIDE OF THE FENCE

Failte gu Gaidhealtachd na h-Alba

Introduction.

How many times have you been tempted to question the sanity of the MCMTA when you have been given new tasking that seems to defy all logic? I know that I have, on more than one occasion! So when the opportunity arose to augment MCM3 staff for JMC 042, I duly took up the challenge and packed my bags to see what it was like 'on the other side of the fence' as a MCMTA Watchkeeper.

After a day of briefings at Faslane with the CTU (Cdr Allan Wallace (Cdr MCM3)), it soon became apparent that for the next two weeks my learning curve was going to be steep (to put it mildly). The vast array of participating nationalities, the wide range of capabilities and a MW Battlestaff Accreditation were all going to make for an interesting time.

By late afternoon on 19 June 2004, it was with a sense of expectation that the MCMTA organisation set forth from Faslane for the 6-hour drive to Loch Ewe. The HQ and support modules were already enroute and we were all hoping that they would be there to 'plug and play' on our arrival.

Work up phase.

Whilst the 5 ships of the TU; HMS HURWORTH, FGS KULMBACH, FS ANDROMEDE, SNS TURIA and FS STYX

conducted their work up on the transit North to the AOA, we started the task of getting the MCMTA up and running. High above Loch Ewe, the MCMTA was situated on top of the NATO fuel storage depot. Not an ideal location to position yourself next to the key strategic asset, especially when it is highly flammable. However the camouflage nets over the modules and the presence of the RAF GBAD battery along the road did allay some of my fears.

During this period, the aim was to streamline the MCMTA processes in preparation for the arrival of the TU and the Accreditation Team. This included marking out (rather then digging, thankfully) slit trenches for evacuation during the many air raids. The SEO Lt Richie Metcalfe and SMEO WO1 Gordon Banks set about their task of organising the jetty management. They put together the 'perfect plan' which lasted about 12 hours before a couple of NATO compatriots from another Task Group had to have an unscheduled stay alongside. It was clear that a flexible approach was going to be required to controlling access to the jetty if the Command Aim was going to be achieved.

However, Mr Banks was going to have to get angry if units overstayed their welcome and hogged the jetty – imagine Victor Meldrew as a rather irate traffic warden! Nevertheless the system they put in place proved beyond doubt that they could facilitate the sustainability required by the units.

MCMTA.

As the Work Up Phase continued, so did the ramping up within the MCMTA. With the TU fast approaching tasking details were put into the air. We had immediately gone into a watchkeeping system from day one, under the overall charge of SOO Lt Cdr Ian Berry and DSOO Lt Cdr Lorne Robinson. The guidance and help provided by ASOO CPO Scouse McGrath proved invaluable. Being undermanned by 2 watchkeepers meant that we all mucked in, especially when the temperature started to rise (and I am not of course, referring to the Scottish summer).

In this new technological era, briefings went back to the Blue Peter tried and tested method of, little paper ships, mines and planes stuck to array of charts by blue tack. Oh to have MTSS(R)! The situational awareness was however, greatly enhanced by the 4 hourly download of the RMP on CSS from HMS Manchester.

As soon as the TU came on station our workload increased considerably, with mines being found from the start. FDU3 and the French Diving team from FS Styx worked together brilliantly in the shallow water operations around the refuelling jetty, immediately finding a plethora of mines. The use of REMUS to identify contacts of interest which could then be passed to the diving teams to spot dive appeared to be a winning combination. We rapidly produced a pile of dummy mines at the end of the jetty and for a brief period it appeared to be

like 'shooting fish in a barrel'. In fact one of the main challenges for the MCMTA was keeping up with all of the mine finds.

Operational Phase.

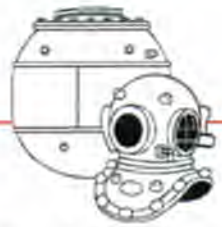
Despite the occasional Opdef, the TU continued to clear the Q routes. A short notice NEO by HNLMS ROTTERDAM inside the Loch resulted in the first significant bit of re-tasking. HURWORTH took on the major share of this new effort and the ship's diving team got to conduct over 20 hours of beach clearance ops. The FDU who would have normally done this task were otherwise engaged on MIE and it proved the flexibility of our MCMVs that they were able to conduct this task (even if the divers ended up completely knackered at the end of it!).

As the hostilities increased, force protection became the major concern since there was no dedicated 'baby sitter' available. The role of the Loch Ewe Guardship was instituted. To do this a unit was pulled of MCM Ops to sit a the entry to the Loch to provide a line of defence against the FIAC threat. The Guardship was encouraged to provide a robust defence where it could but most importantly provide a warning to the other units so that they could get into the right posture to defend themselves. The warning would also be passed to the GBAD who could use rapier in the surface (TV) mode although this did cause a certain amount of ROE angst amongst the higher pay grades.

With every thing running quite smoothly it was time for a sharp rise in tempo coinciding with the arrival of Fleet Accreditation team led by Captain Stanley RN. The team soon got to work and the fine tuning of the MCMTA started in earnest. Difficult questions were asked, internal communications were tightened, conference calls were plentiful, briefs were broadened, background colours on slides were toned down and the Command Estimate made its presence felt. To put a further squeeze on the TA, the Accreditation Team introduced some additional scenarios. Further re-tasking of ships took place to meet a rapidly changing tactical situation. Just as the mine reseeding was at its worst and the casualty list was increasing, units had to be diverted to find a line of pots lost by a local fisherman when his floats disappeared (!). The divers did find the pots and a few fresh prawns from a grateful fisherman ensured that everyone was happy. Operational matters reached a climax when the TA was mortared at 0400 hrs resulting in a controlled evacuation. The re-establishment of the MCMTA at an alternative location ensured that 'normal service' was quickly resumed. This coincided with the end of the Accreditation and the release of the TU back to Faslane and debriefing.

Conclusion.

Now that I have been 'on the other side of the fence' I can honestly say that I would much rather be in my steamer doing the business. It is clear to me that even when it feels like it, the TA do not change the tasking of the ships at short notice just for the 'hell of it'. There is usually a very good reason that normally involves not enough fully operational assets available in the right place at the right time. Some times the rationale for a decision will not be clear to the units and sometimes the TA will be making a decision based on scanty information (we all know the pitfalls of that from Rules Of The Road!). I now feel much better informed about what goes on in the MCMTA and would thoroughly recommend spending sometime with an MCMTA to those of you who want to have your eyes opened. You might even enjoy it and as Cdr MCM3 says, the secret is to be able to 'laugh as you are winning'.



THE DAY SOUTHERN DIVING UNIT 1 SANK THE SCYLLA

BY LS(D) P GALSWORTHY

On a very overcast morning on the 27 March at around 0600 CPO(D) "Paddy" McCabe and LD M Jones left Devonport Dockyard with a Canadian Explosives Team and dockyard skeleton crew aboard HMS Scylla on her last voyage (via a cold move) to her long deserved place of rest In Whitsand Bay.

Once in position the dockyard crews and tug crews skilfully moored the Scylla ready for sinking. Our Colonial cousins (the Canadians) helped by Paddy and LD Mark 'Jonah' Jones fitted all the charges and awaited the National Marine Aquarium's (NMA) go ahead which had a lot to do with when the press where in position.

In the mean time the team from SDU1 were carrying out the last dive preps before making our way to rendezvous with the Scylla. Our job, once the Scylla was sunk, was to confirm her clear of all explosives as well as lock down the access to the boiler room, which in the heart of the Scylla was deemed too dangerous for Joe public to explore. The Dive Support Vessel Datchet (skippered by our trusty boatman Mr Eddie Baxindale - old ex Chief stocker) made its way out with our 7m RIB and second DSV Miner 3, complete with camera operators on board in the shape of SDG Staff and families who offered their services for free (Bless um.).

We arrived as the final moorings where being put in place and spied Paddy and Jonah completing the preps on board. Once they were ready the ship was cleared of all personnel with Paddy the last man off.

There seemed to be a very long wait at this stage. Basically because on another boat was botanist Mr David Bellamy who

was there to promote the conservationist side of the sinking (i.e. artificial reef) and had with him a young boy who had won a competition to press the button to sink the Scylla. After a big communication problem and well after the boy pressed his button (pretend), Paddy pressed the real one.

The charges consisted of some thirty approximately 1m square CLC charges above and below the waterline which once blown would sink the ship fairly evenly.
Having helped place the charges I was impressed with the fact that all the CLC charges were set off by the det cord connected to the CLC by a "V" shaped tube, which was filled with PE. This meant that an absolute minimum number of detonators were used (clever!). To add to the effect several pyrotechnic charges where placed on the upper deck.

The Scylla's charges went. After a few seconds it was evident she was sinking. But how would she end up on the seabed? The Canadians who had sunk many warships were very confident that she would be upright (they were right).

We started the clearance as soon as the Datchet was in place. Paddy took charge of the first wave of Divers: Lt Cdr. Kim Godfrey, myself & D1 (Chuck) Norris. The ship had had three waterproof cameras placed to witness the sinking they had to be taken off. This was the CO's job while Chuck and I searched stbd aft.

The CO was to be the first to dive the Scylla and recovered the first 2 cameras for the NMA. I was the next to leave surface. We expected the vis to be poor but it was good and made for quite a sight. I had a quick look around and got into place until Chuck caught me up and we started the search. While swimming in and out of the ship through the holed sides I realised - with a snigger - that I was now one of the first divers to dive the new wreck the Scylla (good dit value).

The rest of the dive team (which consisted of LD M Jones, LD D Jones, D1 Mitchelmore, D1 Bridges, and D1 Cable) carried on with the search until the ship was confirmed free from explosives. Jonah dived to check the boiler room, which is in the heart of the ship and then closed and locked down the hatch.

On completion of the searches we travelled back, with an air of satisfaction knowing that we had helped create one of the biggest man made wrecks in the UK, a good job well done.

Lest we forget HMS SCYLLA should firstly be remembered for her support to the fleet from her launch in 1968 to 1994. (RIP.)

EXERCISE LONG LOOK 2004 – THE AUSTRALIAN PERSPECTIVE

BY WOMTSM 'BUCK' RODGERS AND LSCD 'JIMMY' BARNES RAN

By the time this article goes to print we will have packed our bags, said our farewells and winged our way back to Australia having spent a very memorable time working with Southern Diving Unit 2. So here then is a quick heads up on what we got up to during our stay.....

A wild English Rose we both yearned to see
So we gathered our gear, flew over the sea
Down through the clouds away from the sun
A strange voice informed us our summer's begun
No need for your jacket or jumper old son.

Out on the tarmac blue and in pain
We were bloody near tempted to get back on the plane
Then out of no-where like a bat out of hell
Our driver arrived; we were saved by the bell.

Off down the road past fields of green
We headed for Pompey to join a dive team
The boss made us welcome he showed us around
Then pointed towards a small pond he had found
'Been there a while lads' he said with a smile
'The French dug it for us, it's almost a mile'.

The boss he informed us in a sly sort of way
Your job will be simple during your stay
Just removing old bombs that pop up everyday
Not wanting to doubt what we'd just heard
Snakes and spiders would have been much more preferred

The fist job was easy, a dead simple task
An old river mine had popped up from the past
Setting the fuses and counting down time
We sure got a bang from that old river mine.

Feeling our need for some time in the sun
The boss sent us out to 'Gib' on a run
Diving and 'working' like mad men possessed
We returned to the unit needing a rest.

FASTSWIM had started, we answered the call
So down onto Burwood went one and all
Out in the Solent the weather was fine
We had little trouble locating the mines.

Back to the office with time on our side
We headed to Scotland for a wee ride
Over the mountains and down through the glens
The whisky was warm, we made truckloads of friends.

Before we knew it the time had arrived
To pay our mess bills and say our good byes.
The knowledge we gained during our stay
We'll take home to OZ and use every day.

Once again ladies and gentlemen thanks for all the assistance you gave us and for making us feel so welcome during our stay.

Buck and Jimmy
Exercise Long Look 2004.

mainly working at the Low Water window when there were fewer merchant ship movements. The REMUS contacts were prioritised and pictures of those requiring ID were passed to both SDU and MCMV diving teams to Spot Dive. They found plenty of tyres and concrete posts but WW2 ordnance remained sadly illusive.

Command and Control of the operation was based at the London Cruise Liner Terminal at Tilbury. More commonly referred to as "Tilbury Landing Stage", the terminal building, its car park and jetty, provided the location for the MCMTA and FSU. Within the TA container was the new MTSS(R) command and control system deployed operationally for the first time. After an initially vertical learning curve for the Staff, MTSS(R) proved a powerful and user friendly tool. For the TA there was something surreal about working from a car park in the heart of the Port of London with no actual view of the Thames itself. This lack of reality was compounded by the fact that "Radio Caroline" and the paddle steamer "Waverley" were also using the Landing Stage. As well as providing a secure base for the MCMTA and available jetties for the MCMVs, Tilbury was also convenient for the offices of the Port of London Authority (PLA) in Gravesend. Starting with the initial site survey and continuing throughout the operation, a very close liaison was maintained with the PLA by regular telephone and face to face contact.

Following the precursor survey conducted by HMS GLEANER in July, the first element to arrive on task was FUUVU. Consisting of 1 officer and 2 Senior Rates with a RIB and 2 "REMUS" UUVs, their task was to conduct area surveys at a number of terminals and jetties east of the Dartford Crossing. Initially tasked at the slack water period around High Water, experience of merchant vessel movements led to a rapid adoption of Low Water as the optimal window. Each mission took one to two hours to complete not including transit times, followed by analysis back in the relative comfort of the Cruise Liner Terminal. High quality images of all significant contacts were then produced along with dimensions and possible identification. The many tyres became obvious after a while as did the anchors, but some contacts defied identification so their positions together with accurate dimensions were passed to the dive teams to Spot Dive. In the 12 days that FUUVU were "in theatre" they were able to complete operations on 7 separate jetty/

terminal complexes. Some runs had to be aborted due to shipping movements, but this was the exception. REMUS may still be an experimental system, but it is giving a glimpse into the future of Area Search and Route Survey in confined waters.

HMS BANGOR arrived at Tilbury on 21 Sep. Following an environmental assessment run up to the Dartford Crossing with a PLA Lower Reach Pilot embarked; she commenced her initial task from Gravesend Reach to the QE2 Bridge. As already stated the hard, smooth surface of the dredged channel made for swift progress. Strong tidal streams combined with significant merchant traffic meant that much of the operation was conducted as Mark and Plot, with diving and vehicle runs conducted in both the High and Low Water windows. The Port Authorities expressly forbade the use of drag ropes for environmental reasons so the limited number vehicle runs were conducted with mid-water weights. Other tasking further to seaward on the Q-Route was to follow and BANGOR's divers were to spot dive FUUVU contacts off both Canvey Island and Coryton Terminals.

The next unit to become available for tasking was SDU2. Available for 7 days, the plan was to conduct jetty searches in conjunction with the FUUVU. Route Survey Diving is not a common role for any of the Diving Units but it was an operational capability that Fleet wanted exercised. In the event, as with REMUS and RCMDV ops, the strong tidal streams severely restricted all diving operations to the very short windows available at slack water. The very poor underwater visibility prevented divers from being able to see their contents gauge so special dispensation was sought to extend dives to 20 minutes. The SDU did however, take advantage of the non-diving windows to develop and expand their jetty survey database

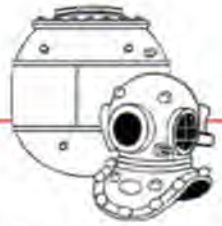
Towards the end of the first week, HMS BANGOR was joined by HMS GRIMSBY. After an initial briefing at Tilbury and a similar environmental assessment run to BANGOR, GRIMSBY's first task was out at the seaward end of the Q-Route. Initial good progress was halted by a sonar Opdef which required significant FSU support and the raising of the towed body alongside in Tilbury Dock. During this Opdef period, her divers were employed to supplement SDU2 in identifying the FUUVU contacts off Tilbury and at Northfleet Hope Container Terminal. Once back on task, GRIMSBY rapidly completed her segments of the route.

At the end of the second week, with SDU2 and FUUVU detached, BANGOR and GRIMSBY came alongside for a well deserved Stand Off. The whole length of the Q-Route to the East of the Dartford Crossing was declared Green as were the 7 jetties surveyed by FUUVU with COIs identified by the various dive teams.

The final week of the Operation was to see the MCMVs operating west of the Dartford Crossing, through the Thames Barrier and up to the West India Dock – that's the bit of the river you see on the titles for East Enders – near the Millennium Dome. BANGOR and GRIMSBY sailed on the Monday morning with Upper Reach Pilots embarked for a second environmental assessment passage, this time for the remainder of the route. The river is more constrained West of Dartford and significantly shallower, even in the dredged channel. Minehunting operations were restricted to daylight hours and both vessels were to return to Tilbury overnight. A further restriction was the regulation requiring that an Upper Reach Pilot be embarked for passage West of Cross Ness, about half way up the remaining segment of the route. In the event, BANGOR embarked an Upper Reach Pilot at High Water on the Monday afternoon and commenced to hunt back Eastward from West India Dock, whilst GRIMSBY, without the need for an embarked pilot, hunted West from Dartford.

The coverage of OP GARDEN-THAMES would not be complete without consideration of the visit programme. In many exercises, ships can be said to have fought through the scenario, opdefs or the weather: during OP GARDEN-THAMES they fought through the visits. With the increased interest in "Asymmetric MCM", the range of new kit on display and the convenient location for Whitehall and Portsmouth, Tilbury became a 'honey pot' for a wide number of interested agencies. In the 3 weeks of the operation there were no less than 12 distinct visits / VIP sea days ranging from MoD CT & UK Ops staff through FOSNNI to the Advanced Minewarfare Course. On one day BANGOR took no less than 17 visitors to sea and the MCMTA was on constant alert to provide walk throughs and briefs.

In conclusion, Operation Garden in the Thames was very successful. The task was completed with the required level of coverage being achieved, the new MTSS(R) was used in anger and the envelope for UUV operations was extended further with its utility as a force multiplier being clearly demonstrated. All of the participants gained experience of working in an extremely demanding physical and commercial environment, and a wide community got exposure to MCM operations. It was not Bersama Lima, we did not get a sun tan but we learned a tremendous amount and got the job done.



OFF ON YOUR HOLIDAYS AGAIN? - BLOODY DIVERS!

Lt Andy Stevens RN
Officer in Charge Fleet Diving Unit 2

Everyone has heard the dits, everyone likes to drip about how the Fleet Team are always swanning off around the world on their summer holidays, wasting 'subbies', loafing on a beach or in a hotel while the rest of the Navy is working so hard. Yes I've heard the dits and in truth, before coming here I am just as guilty as the next man of spinning them. Ignorance is, after all, bliss.

Boy's Club.

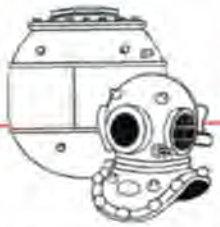
In the Diving Branch we are guilty of many vices but I feel one of our biggest has been our lack of self publicity. I don't mean bragging about past conquests, professional or otherwise (we can all do that). I mean keeping the wider audience aware of our real capabilities and limitations. Telling our contemporaries what we were really doing during the exercise or operation, briefing the Admiral on what we did and more importantly what we couldn't do because we were lacking in support, equipment or training. We (the Divers) all like the 'boys club' to which we belong and that esprit de corps is a commendable thing but we have kept a closed-door attitude to our little world for so long that the greater service has little idea of how we work and what we do. Nowhere is this greater felt than in the field of Very Shallow Water (VSW) MCM.

Agricultural Mine Clearance.

In the past VSW MCM was often regarded as a waste of time, an experiment of little operational value that will never by used. How often we fail to learn from history. Following on from the Lesson's Identified in Op TELIC, FDU2 's development of VSW MCM has taken a bold step forward. Whilst a full scale amphibious landing was never conducted in Iraq, several smaller insertions had to be abandoned due to the mine threat within the VSW and Surf Zone. The Royal Marines were unaware of FDU2's VSW capability and instead issued bolt croppers and sledge hammers to the crews of the RM Hover Craft to clear mines. Fortunately members of FDU2 were onboard the hovercraft at the time and were able to re-brief the crew on the implications of agricultural mine clearance. The rest of FDU2 were employed inland during the second phase of Op TELIC, conducting bomb disposal duties as part of the Joint Force EOD Group based in Basrah or working for the Iraq Survey Group, providing EOD support to the search for WMD in Bahgdad.

Shaping Operations.

The Royal Marines littoral warfare requirements highlighted the requirement for a Fleet Diving Unit to specialise in VSW MCM. They, like many of our dark blue colleagues, were unaware that FDU2 have been developing SOPs in this field for over a decade. The upshot was the decision to create the Beach Recce Group. Still in the developmental stage at present, this is an organisational structure, brought together for exercises and operations comprising of elements from, SBS, 539 Assault Sqn RM, 59 Ind Cdo Sqn R.E. RN Hydrographic Units, RM Amphibious Beach Units and FDU2. This group (working under COMATG's OPCON) was exercised for the first time during EX JOINT WINTER 04 in the north of Norway conducting Advanced Force reconnaissance and Pre-Landing Force beach



shaping operations prior to landing the UKNL Amphibious Force.

FDU2 operating from the HNoMS TYR, a small Norwegian ocean salvage and diving support vessel, conducted Over The Horizon insertions via RIB, RM Long Range Insertion Craft and Norwegian Combat Boats, in order to infiltrate VSW divers 1km from the shore. From here the divers completed clandestine reconnaissance and environmental assessments whilst precisely locating and recording the position of mines and obstructions. COMATG was then able to choose the ideal beaches and slips for his landings. In addition to the reconnaissance role, FDU2 also completed long range (4km) insertion swims in order to place simulated explosive charges on sites of tactical importance and placed large explosive charges and flares on beaches away from the landing sites to decoy and distract Red forces away from the actual landing areas and beaches.

Environmental conditions during an Arctic winter are challenging to say the least. During these operations the surface temperature never rose above zero and the added wind chill experienced during over the horizon RIB transits made for an uncomfortable experience for all.

Can-do Attitude.

Despite the success of JOINT WINTER and the greater appreciation that the amphibious community has of our input, we still suffer from the closed-door environment of the past. The Diving Branch has made the best use of a 'can do' attitude in a 'can't do' world. We have always got by with a combination of great talent, bloody hard work, professional pride and the good will of our divers. Diving and especially VSW MCM is dangerous and expensive. The only way to reduce the first is to increase the second. FDU2 are still trying to source numerous essential items of operational and safety equipment; comms, replacement boats, search and navigation tools etc. However, because we have always made do until now, it is increasingly difficult in these days of limited funds to finance such items. We need to be promoting ourselves to everyone who will listen. We need to show our lords and masters that although we realise the money is being sought by many parties, it is us in the MW and Diving world who are overdue for our fair share.

Exotic?

It is a fact that FDU2 and the other units within the Fleet Diving Group travel around the planet. The exercises and operations we take part in are conducted all over the world and while we are still being tasked to participate, there will always be volunteers to step up to the plate. We do not however, stay in hotels on 'subbies' all of the time. In the past two years I have lived under the stars in the Iraqi desert, in a snow hole on a Norwegian mountain, in machinery spaces on Norwegian, American and Singaporean warships and most recently in a hammock swung between two trees in a Malaysian jungle. Sounds exotic? And so it is, but it is not all a bed of roses. (Lots of sand, sea, sun with not much sangria). FDU2, like the rest of the Fleet Diving Squadron have all worked hard to achieve our success over the past two years and we continue to develop tactics and SOPs which are key to the success of MCM and amphibious operations. So next time somebody asks me if I'm off on my holidays again, I will smile and nod, then point out exactly what we do on our 'holidays'. I've had some fantastic experiences in the last two years, been all over the world and worked bloody hard. You choose your branch, you take your chance.

MINE DISPOSAL SYSTEM

WO (MW) Pete Whitehead UWS2a5

Historically during Mine Clearance Operations, disposal of mines and other ordnance has been conducted remotely using the Remote Controlled Mine Disposal System (RCMDS). This delivered a high explosive Mine Disposal Charge (MDC) positioned to achieve full order detonation by countermining or neutralisation to disable the mine and render it incapable of further operation. Due to the changes in the construction of modern mines and the introduction of insensitive explosives, countermining with a blast charge cannot now be guaranteed. This together with other issues regarding the RCMDS led the MoD to identify "a spend to save" initiative to procure a replacement Mine Disposal System (MDS). The MoD Contracts Bulletin was issued in 2002 and a Bidders Conference was organised for all interested parties at Abbeywood in May 03.

The prospective bidders were briefed as to the requirements for (MDS) the key points stated "A military off the shelf (MOT's) mine disposal system that will not degrade current operational effectiveness and only companies who can offer a fully developed (MOT's) System with an integral warhead solution need apply". The Invitation To Tender was issued in July with the tender assessment starting in Nov 03. Four companies tendered for the contract and the tender assessment process got underway. Having already been involved in a tender assessment I ordered in strong coffee and got rid of the TV in preparation for the long nights of total concentration required in order to assess hundreds of System Requirements (SR's) and cross referencing the supporting evidence. It is true to say I could not look at a BR for months afterwards without developing a cold sweat. The programme continued with warhead (jet) characterisation trials conducted at Pendine Sands. A MoD team was formed, lead by UWS4d Greg Pugh, the Equipment Project Manager (EPM), myself, WO2 Mark Sheldon were ably supported by a scientific team from QinetiQ. We were tasked to assess the relative performance of the (MDS) as part of the Integrated Test And Evaluation Trials (ITEAP) for stages 1-3 of the trials. The four tenders and their respective systems were ECA (K-STER), KONGSBERG (MINE SNIPER), ULTRA (SEAFOX) and BAe (ARCHERFISH) and were also known as contractors a-d (but not necessarily in that order)

ULTRA (SEAFOX) **KONGSBER (MINESNIPER) (ARCHERFISH)** **ECA (K-STER)** **BAE**

Stage 1 – Jet Characterisation Trials Pendine Sands:

The Jet Characterisation trials were conducted during June – July 04 at Pendine sands, they would assess the operational effectiveness of the MDS shaped charge warhead by modelling of the energy contained within the jet. In layman's terms the jet forms a slug which is fired into a metal block. Three tests were conducted:

a. Firing of the warhead in air only.
b. Firing of the warhead through a column of water.
c. Firing of the warhead through the forebody recording the erosion of the jet tip caused by passing through the forebody.

For all firings the warhead was fixed to a stand.

Stage 1 – Flow Tank Trials Hull:

Also during June –July the Flow Tank trials were conducted; each tender had a one week slot for this trial. The trials were conducted in the Sea Fisheries flume tank on the outskirts of Hull, the tank is a circulating water channel in which models of fishing gear and marine structures can be demonstrated and tested. The side of the tank has 11.0m of windows allowing a clear view of the working section which is 17.0m long, 5.0m wide and 2.5m deep. The maximum achievable speed of the circulation is 2.2 knots, modelling for a greater speed could be achieved by the QinetiQ team.

The aim of this trial was to see England win Euro 2004 and accurately measure the position and attitude of the vehicle relative to the mine at the time the system engaged the target. These measurements and image analysis of pictures taken were used to determine whether the system had achieved the engagement criteria, including timings, defined by the contractor in the tender response. The manoeuvrability of the vehicle about the mine in a flow was also assessed together with the operator loading during those manoeuvres. For the purposes of the trials three different representative mine targets (two ground and one buoyant) were installed individually in the tank. The results of the trials were used to assist the DLO in down selecting contractors to take forward to later stages of assessment. I should state at this point that the engagement criteria for each mine was defined by the contractor.

A series of vehicle runs were carried out at varying speeds these included vehicle camera sonar runs and sonar only. Other tests were conducted to test the individual components of each vehicle including a bollard pull to determine that the vehicles battery life could satisfy the

system requirement (SR's). Each contractor successfully completed the trials and most commented on the professionalism, thoroughness and innovation used by QinetiQ to determine the various assessment techniques which thoroughly tested each SR. We also heard many contractor comments especially in their native tongue which when translated could not be repeated. It is also worthy of note that England by now had surrendered to Portugal which cheered up the French and German contingent, who had also failed miserably, no end.

Stage 2 – Sea Phase Trials at Raasay Range BUTEC:

K-STER **SEAFOX**

The second trials phase was conducted in the Inner Raasay Range BUTEC in Sep – Oct 04 onboard HMS PENZANCE. It was decided early in the programme to conduct the trial onboard a platform which was going to receive the MDS equipment fit rather than use a ship taken up from trade. This seemed a logical step as we could determine any interfacing, launch and recovery problems from the outset. At this stage two of the contractors had been down selected and two remained, these were ECA (K-STER) and ULTRA (SEAFOX), BAe and Kongsberg had not met the Naval requirement. The ship developed an OPDEF on one engine which prevented her from sailing on time, many phone calls were made and received to try to get the problem fixed. Sight seeing became a chore as we had to remain in areas of sufficient mobile phone signal coverage that would be far easier to achieve on Mars. Greg Pugh the EPM was so paranoid about missing a call he decided to keep his phone on whilst we went horse riding (for one hour). It was emphasised very strongly that the ringing tone may well cause the horse to bolt and as these were Clydesdale Shire horses (the largest breed); I and WO2 Mark Sheldon made sure we trotted behind Greg. The inevitable happened, the CO of Penzance rang to say he was sailing. Fortunately for Greg we were trotting in the surf on the beach at the time otherwise he might still be missing in the surrounding woodland on Skye.

The ship arrived and the first contractor set about fitting and fine tuning his equipment in preparation for the trials. The sea trial assessment programme was designed to demonstrate performance of the equipment under real operational conditions. At the same time it provided a series of observable and measurable objectives which covered aspects of data communications and storage, system ergonomics, the preparation, launch and recovery of the

vehicle and the overall control of a disposal mission. A variety of targets in varying depths were laid for the trial and a set number of vehicle runs were conducted.

With all trials there are teething and technical problems which occur and these trials were no exception, without going into detail all problems encountered were rectified swiftly. This was largely down to the leadership of the Captain and eagerness of the crew, who throughout the trials showed both professionalism and keenness to learn both systems. The contractors were full of praise, one quote in particular stated he had worked on many warships of differing nationalities and had never worked on such a friendly or clean warship and congratulated the captain. HMS PENZANCE was clearly a good advert for the Royal Navy. With the sea trials completed it was now down to stage three trials.

Stage Three – Warhead proving trials (Pendine Sands second time around):

In November 04 both companies took part in the final set of trials lead by QinetiQ which involved RN Clearance Divers. These trials were to ascertain if the warhead could neutralise a mine if high order was not achieved. The trials were against a mixture of old and modern ordnance including both traditional and insensitive filling. Jigs were erected iaw the tenders stated engagement criteria and initial firings were conducted from worst case engagement scenario progressing as dictated by the initial results.

Final Assessment Selection:

With the three stages complete it was down to selecting the preferred bidder, with all the results and reports in, the

selection process began in earnest. The preferred bidder selected was ULTRA (SEAFOX). At time of going to print we are in early negotiations with ULTRA to ascertain if UWS will go forward and offer a contract.

Conclusion:

From a personal and professional point it has been an extremely enlightening experience to see at close hand the modern technology demonstrated within such thorough assessment criteria. If, or when a contract is placed, there will inevitably be problems whilst phasing in the new system and phasing out the old. On the bright side it will result in the removal of the RCMDS hoist transfer system (Hooray). There is still plenty of work to be done with legacy equipment which both the UWS and MCMV IPT's in conjunction with Fleet are working together to achieve the aim.

Ed: ULTRA has now been awarded the contract to supply SEAFOX OSMDS.

Additions to the Mine Warfare Glossary: TRAP; TARG; TOAR and RIPS

Integrated System Analysis and Performance Enhancement

By John E Cocking
MCMVIPT / VT Shipbuilding Combat Systems Project Manager

The Background:

The development of the Trials Recording and Analysis Package (TRAP) started in 1999 as a replacement for the original Sandown Class MHSA3 Trials Data Recording System (TDRS). The original requirement for TRAP was to supply a system that could interface with the Sandown Class and provide a means to assess if MHSA3 could achieve the required performance standard.

The Latest TRAP Hardware

Now some five years on TRAP has evolved into a comprehensive toolset capable of: conducting mine hunting performance assessment and evaluation in both Hunt and Sandown Class vessels; interfacing in real-time to the NATO FORACS IDATS computer system; providing Sandown Class Operational Analysis (OA) data for the Maritime Warfare Centre (MWC) and has been used as a most effective diagnostic aid to resolve a number of class and ship specific equipment issues and enhance overall mine hunting system performance.

The Sandown Class Glossary:

TRAP – Trials Recording and Analysis Package

TARG – TRAP Automatic Report Generator

TOAR – TRAP Operational Analysis Recorder

RIPS – Range Intersection Positioning System

TRAP – the generic term used for both the 'Trials Recording and Analysis Package' Hardware and Software.

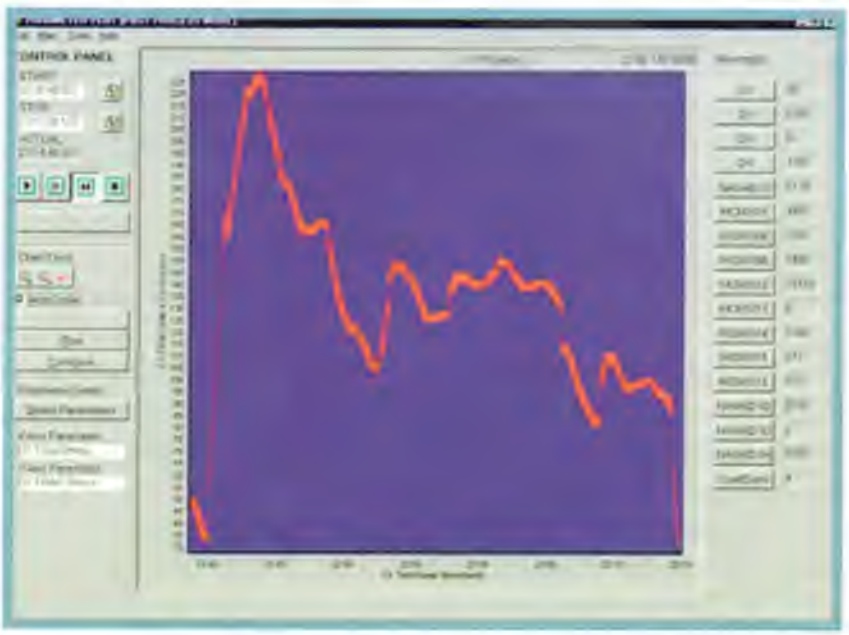
The Hardware:

TRAP – ruggedised laptop, junction box & interface cabling

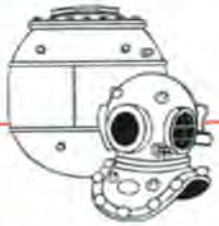
The system consists of a ruggedised laptop, interface box, junction box, a compact colour printer and a comprehensive ship interface cable set housed in two watertight carrying cases.

The Software:

Bespoke software running under Windows NT 4.0 to: simultaneously capture and accurately time-stamp data from MIL-STD 1553 bus and up to six serial devices; convert data into engineering units; perform real-time calculations; provide real-time data export; present data in graphical and tabulated formats for real-time analysis and store captured data for subsequent detailed analysis and evaluation.



Example Parameter Plot – provides comparison of message parameters



Message: MCN1012

TimeStamp	Ships Heading	Ships Log Speed	Wind Speed	Wind Direction	Time of Validity	Validity 101?
04/03/00 23:40:36	189.904174789205	0.20703125	18.125	21.25854492381	96897490	249
04/03/00 23:40:36	189.953613285772	0.20703125	18.1484375	0.977783203214	96897531	249
04/03/00 23:40:36	189.992065414213	0.20703125	18.5	11.107177735386	96897569	249
04/03/00 23:40:36	190.030517562654	0.20703125	18.953125	22.862548830206	96897910	249
04/03/00 23:40:36	190.046993054843	0.1953125	19.35546875	0.076904296882	96898049	249
04/03/00 23:40:36	190.057383382969	0.20703125	19.00390625	12.623291016774	96898187	249
04/03/00 23:40:36	190.068969711095	0.20703125	18.44921875	44.637451175938	96898328	249
04/03/00 23:40:36	190.079956039221	0.20703125	18.65234375	40.816455081822	96898465	249
04/03/00 23:40:37	190.090342367347	0.20703125	18.32421875	4.910888672322	96898619	249
04/03/00 23:40:37	190.101928695473	0.20703125	18.30078125	359.035205507811	96898744	249
04/03/00 23:40:37	190.118403187602	0.20703125	18.0515625	21.961669923874	96898884	249
04/03/00 23:40:37	190.15136717204	0.20703125	18.30078125	21.785668671858	96899034	249
04/03/00 23:40:37	190.178832992355	0.20703125	18.625	23.036330080222	96899164	249

Pause Close

Example Message Numerical Grid - showing detailed message contents

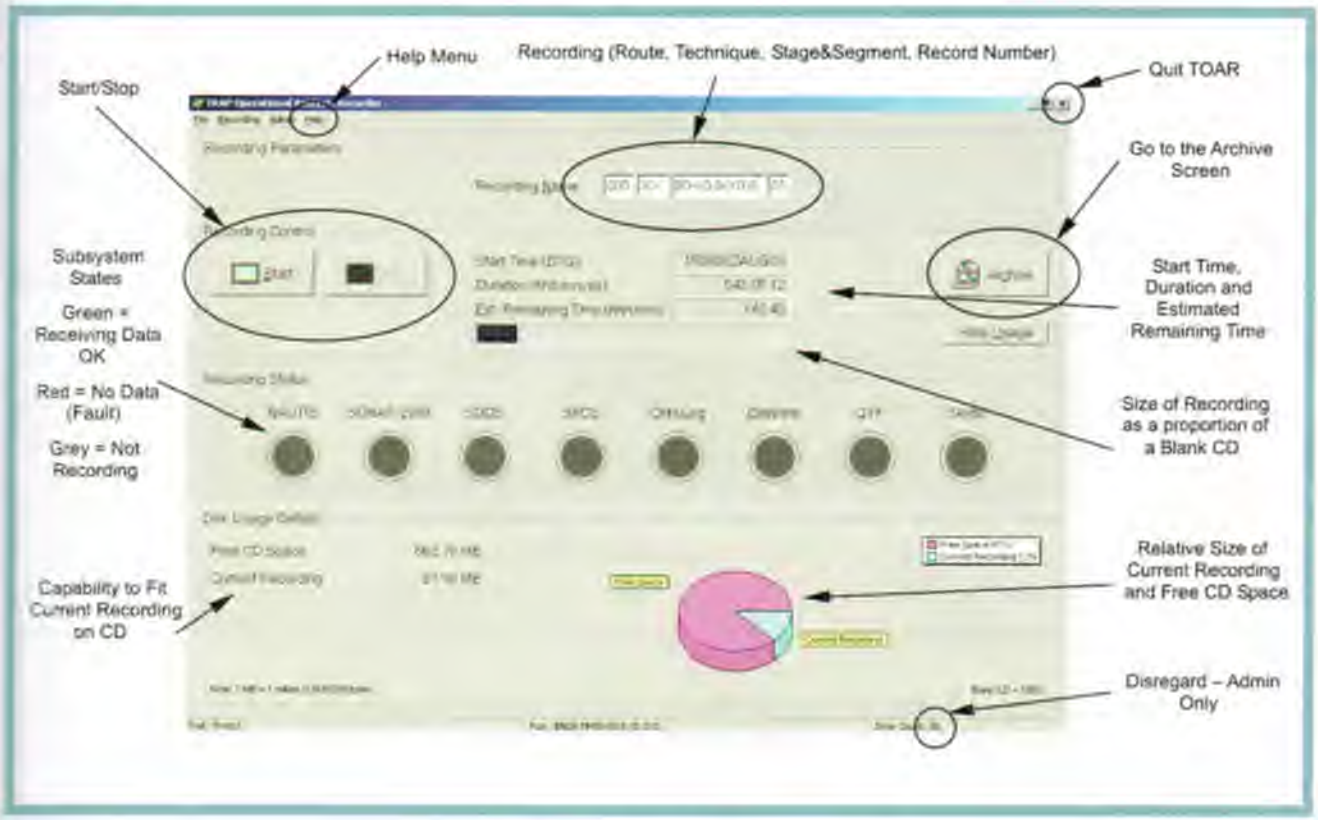
The Story So Far:

TRAP was developed by Mass Consultants in conjunction with VT Shipbuilding for the MCMVIPT. The original tasking was for the provision of two systems that were intended to be used exclusively for MHSA3 Fleet Weapon Acceptance Trials. Having completed the first trials of MHSA3 at BUTEC in 2000 the true potential of TRAP became apparent. TRAP could not only provide near real-time performance assessment but was also capable of being used as a diagnostic aid. Data recorded by TRAP was used in support of detailed technical studies to resolve a number of class equipment issues, which resulted in improvements in mine hunting system performance. Following this initial success two further systems were procured, this meant that systems could now be made available to MCTA, MWC and Fleet. In support of this a series of training courses were arranged for representatives of these organisations to cover the physical installation aspects, equipment operation and the analysis of recorded data. A number of enhancements to the initial TRAP functionality then followed. Firstly, following a decision to undertake MHSA3 trials at NATO FORACS Stavanger, TRAP was modified to interface in real-time with IDATS, the NATO FORACS computer system. This enhancement meant that full advantage could be taken of the independent FORACS accurate dynamic ship positioning and heading reference data. Further, TRAP could also simultaneously provide ship reference data to IDATS in place of the limited manually recorded data that had previously been used.

The next significant enhancement was **TARG**. It had become clear that a structured way of presenting data from independent trials was required and that it should be possible to present this data quickly and efficiently. The advent of TARG made it possible to select recorded TRAP data and automatically export it into a structured analysis framework that was directly linked to Microsoft Word enabling the production of consistently high quality reports.

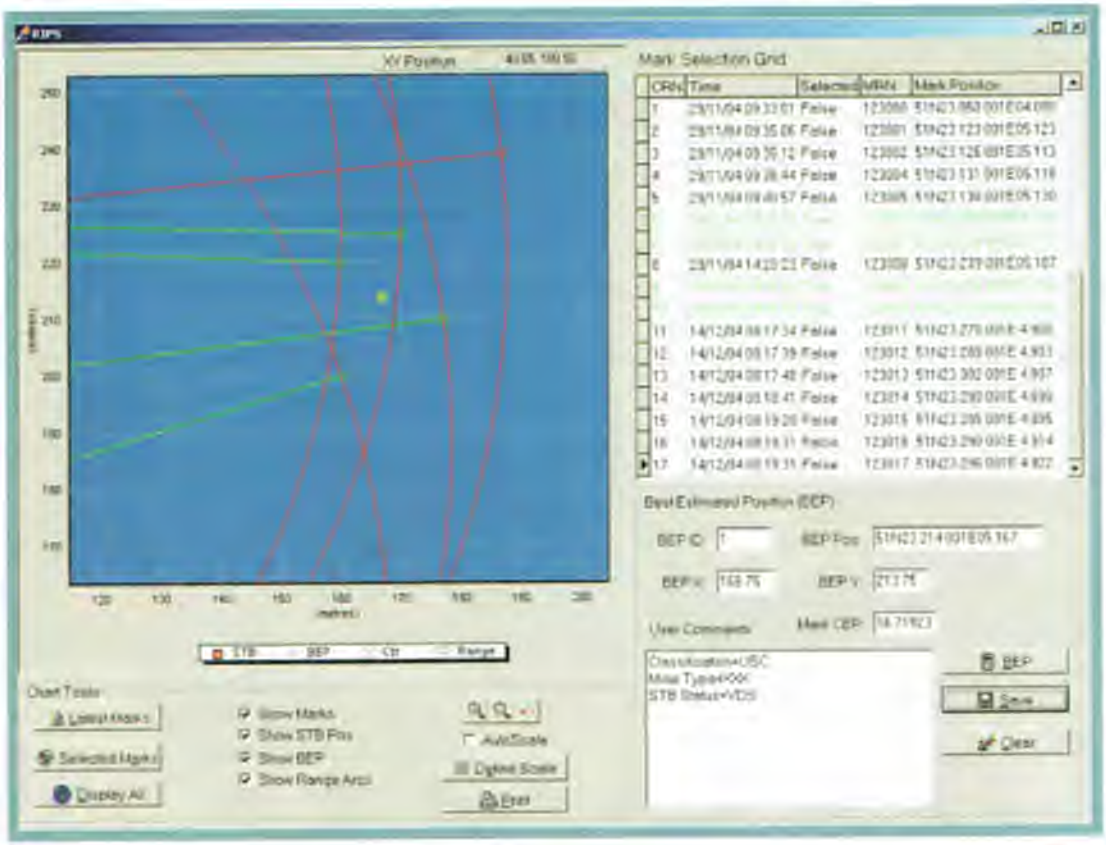
This was followed by a requirement from MWC for a system to record Sandown Class OA data,

another TRAP application known as **TOAR** was developed and a further four TRAP systems procured to meet this requirement. TOAR was the first TRAP application to be specifically designed to be operated by ships staff. The design brief was for a system that was to be as simple to use as possible, require little or no operator training and have minimal impact on the existing workload of the MWO/MHD. The solution was an application with a two screen graphical user interface (GUI). One screen to control data recording and present the operator with a series of Red/Green lamps to indicate equipment status, and a second screen to control data archive to CD.



The Initial TOAR Screen

Currently TRAP systems are temporarily installed either for specific trials or as requested by MWC for OA data gathering. It is however intended to permanently install TRAP system hardware in all Sandown Class vessels in the near future. Whilst TRAP will continue to be used for specific engineering trials and the provision of OA data the key driver behind the transfer to a permanent installation is to host **RIPS**. RIPS is a TOAR sub-application that is currently under development. It is being introduced to improve current geodetic mine location accuracy of the Sandown Class. RIPS will take intersecting range data from a number of sonar cuts to calculate contact position exclusive of sonar bearing. The methodology behind RIPS has already been proven to be extremely accurate and is currently used within TARG to establish reference contact positions. Training needs analysis and the support philosophy for RIPS are currently under consideration. It is anticipated that RIPS acceptance trials and ship installation will take place mid 2005.



Prototype RIPS GUI

The Hunt Class Glossary

HTRAP (Sonar 193m / CAAIS) – Initial Hunt Class TRAP

HTRAP (Sonar 2193 / Nautis3) – Revised Hunt Class TRAP

TARG – TRAP Automatic Report Generator

The initial HTRAP requirement was for a system that had the same underlying functionality as the Sandown Class TRAP but could interface with MHSA2. The resulting solution utilised the existing Sandown Class TRAP laptops along with a myriad of bespoke interface cables. In parallel with the initial HTRAP development VT Shipbuilding were tasked with conducting a study of MHSA2 overall system accuracy. The reason behind both the initial HTRAP development and the accuracy study was to benchmark MHSA2 performance in advance of the Hunt Class Sonar 2193 and Nautis3 upgrade. Overall system accuracy trials of HMS LEDBURY were then undertaken at NATO FORACS Stavanger, where HTRAP proved to be a most capable tool and the specific findings of the study were confirmed.

Having achieved the objective of bench marking MHSA2 overall system performance the next task was to develop a new HTRAP system to interface with the upgraded Hunt Class mine hunting equipment.

www.mcdoa.org.uk

The new HTRAP system hardware now had to be capable of accepting inputs from two independent Ethernet connections; coarse/fine synchro data from the Hunt's two gyro compasses along with a variety of serial devices including GPS based navigation aids and Sonar 2059. This necessitated the procurement of two new Kontron Power Lite laptops, the earlier Sandown Toughnotes no longer being suitable, along with the obvious requirement for new bespoke interface cabling.

The new software was to have the same functionality as the most recent version installed on the Sandown Class TRAP systems and was to include a real time and post process interface to IDATS, TARG and an improved trial configuration GUI. With the software development, hardware procurement and system testing complete the new HTRAP equipment was installed in HMS CHIDDINGFOLD for overall system accuracy studies at NATO FORACS Stavanger. Following the trials, the results from HMS LEDBURY were directly compared with those from HMS CHIDDINGFOLD (MHSA2 v MHSA4 at MOC) and the results were extremely encouraging.

The future for TRAP:

What was initially perceived to be a one off requirement for what was essentially an item of portable test equipment back in 1999 has now resulted in a system that is widely acknowledged as a world leading mine hunting performance analysis tool.

TRAP continues to evolve. In addition to the prime functions detailed above TRAP is also used to provide correction data to the Meridian Surveyor reference gyro compass, used during all detailed performance analysis trials, and has most recently been enhanced to supply ship positioning data to the CMS Log for calibration in Sandown Class vessels.

The way ahead, once the current RIPS development programme has been completed, the next milestone will be the enhancement of TRAP in line with the Nautis3 upgrade to the Sandown Class.

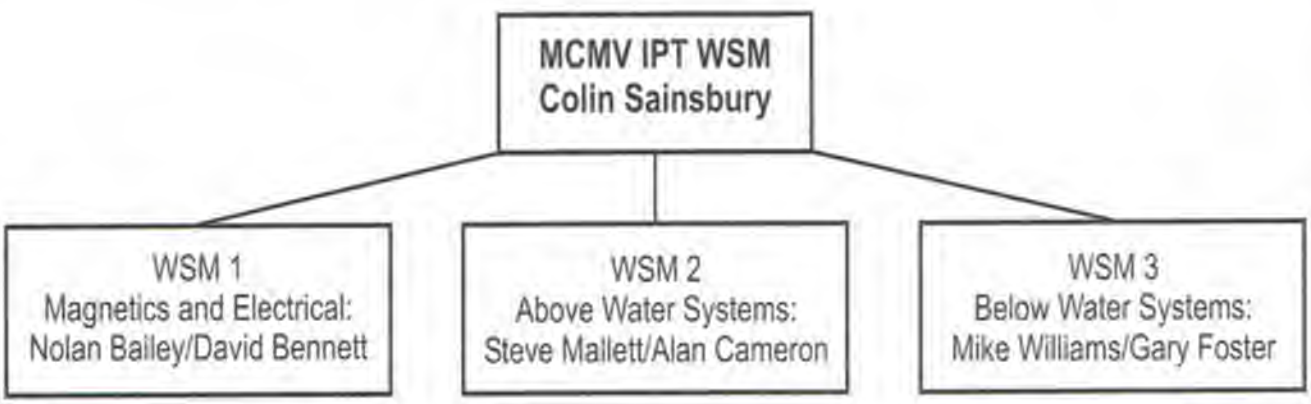
MCMV WEAPON SYSTEM UPGRADES

By Colin Sainsbury, MCMV IPT Weapon System Manager.

Introduction.

I am the Weapon System Manager within the Mine Countermeasures Vessels IPT, and this article is based around my presentation at the MCMV Seminar, in the spring of 2004. As always, projects within the MCMV world move on at a considerable pace, and I'm pleased to be able to significantly update last springs position. Some programs have started their role out, and some are nearing completion.

To set the scene, our Section comprises of three groups, looking after three distinct areas:



Between us, we look after all the Weapon System Platform issues raised by these upgrades, so I'll go through them in no particular order:

Hunt Class Comms.

The 643/CJP & ATU are finally being replaced (did I hear a cheer?) with modern, more capable systems. The downside is that due to the MOD's procurement techniques, we've replaced one system used in two places with two different systems – 1CLF in the MCO and 4KMA on the bridge.

Outfit 2QCD replaces one 1207, and Bederal replaces Aroflex.

The other big change is the MCO modernization program that we've rolled out – the pictures below tell the story:

Fig 1: Hunt MCO Before Modernisation

Fig 2: Hunt MCO After Modernisation

Sandown Class Comms.

Outfit 4KMA (same as the Hunts) comes in as a new piece of kit, and Outfit 2QCD replaces one 1207. Again, Bederal replaces Aroflex.

Mine Disposal System.

MDS will replace RCMDS 1 & 2, and will be fitted to both Classes. Tenders have been evaluated, and Ultra have been selected as the "preferred bidder", with its Seafox system. This starts a detailed negotiation process, leading to (hopefully) the first ship fits in late 2005/early 2006. Key benefits are the much smaller and lighter vehicles, leading to easier deployment and recovery, much quicker target acquisition/disposal times, and much improved ship safety by virtue of the warhead using an Insensitive Shaped Charge.

Fig 3: Seafox Combat Round (Overall length about 1.3m, weight about 42Kg)

Precise Fixing.

Another modern system, replacing Skyfix which was always "hired in". It has a Dual receiver - OEM4/SPLGR, and we've proven the Dynamic Accuracy to be better than +/-5m.

SIFF.

Successor IFF Replaces RT1013 with RT1019, and uses the existing AMA antenna. It provides Modes 1, 2, 3/A and C, plus new secure Mode 4, together with an easy upgrade path to Mode 5.

2093 MODEX.

This Modification Exercise gives the Single Roles a total upgrade to the Aux cabinet, an upgrade to consoles by the installation of new flat screens in place of the old CRT's, together with AFC and control panel changes. Towed Body Mods complete the package.

Fig 4: The Flat Screens installed on HMS CROMER, as a trial.

2193/Nautis 3.

The Hunt Class weapon system mid life update, replacing Sonar 193 with 2193, and the old Command System (CAAIS) with Nautis 3. All ships will be fitted by the end of February 2005, with a program in place for the final upgrade to Full Operational Capability by the end of 2005.

Nautis 3.

Single Roles will benefit from the upgrade of Nautis M to Nautis 3, aligning both Classes with almost identical Command Systems. This program is currently on contract with AMS, with first ship fits due to start at the end of this year.

Running in parallel with (and included in) the SRMH upgrade, is a further upgrade to the Hunt system, adding Additional Military Layers, which brings electronic charts and other functionality to the MM fleet.

WECDIS.

Warship Electronic Chart Display Information System is currently being rolled out to the larger Platforms. Options are being considered for MM's, which require a smaller, lighter version. Earliest likely fits are due 06/07.

Navigation Command Aid

A stand-alone laptop based GPS and electronic chart system, moved around as MTE by Fleet, as required.

MBDS.

Proof of Principle Trials for the Maritime Biological Detection System were held in June 04, but the results were not quite as expected. The assessment phase has therefore been extended by about 15 months, suggesting an In Service Date of about the end of 2007.

Minigun.

A CIWS, comprising of a six barrel gattling type gun, pedestal mounted, firing 7.62mm ammunition at a rate of approximately 4,300 rounds per minute. Three weapons are expected to be mounted to give almost 360° coverage, on both Classes, and replaces the GPMG. Also comes with a Night Vision Aid. Should be supplied to us as part of Maritime Force Protection, and was due to start rolling out at the end of 04. Current delivery/fitting plan very unclear, at present.

Hunt MCAS.

The Hunt Machinery Control and Surveillance system is obsolete, and desperately needs replacing. The EPM (MLS IPT) are currently working up the Business Case for a replacement, with first fits planned for 06/07. One of the many advantages of a modern system will be its potential for easy expansion.

Hoverplan.

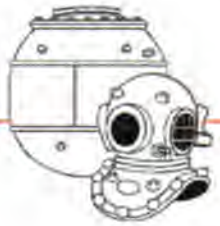
Another system that is currently obsolete, with no spares available. However, procurement is in hand, replacement date currently unknown.

TRAP/TOAR/RIPS/HENS.

See the complimentary article by John Cocking, for details of this powerful Weapon System analysis tool, and its derivatives.

WAIS.

A fleetwide Warship Automatic Identification System (WAIS) that enables RN Ships to become compliant with this IMO initiative. ISD currently unknown.



HVME.

Currently suffering from severe obsolescence and a lack of spares, which is largely being managed by Storob action. Replacement system due to go to competition summer 05, with ISD due summer 06.

SATCOM.

Proof of principal trials currently being undertaken. Project is expected to deliver a "mini" SCOT system, ISD currently unknown.

And finally:

TOMS – TV over Military Satellite which uses spare Skynet capacity to broadcast BFPS1 & 2, Skynews and Sky Sports, to ships which will be fitted with a stabilized antenna.

Conclusion.

I've tried to give a very brief overview of some of the Weapon System upgrades that are either ongoing or planned, but I might have missed something out – don't shoot the messenger! As always, plans are subject to change, and must be heavily caveated.

As Users/Operators/Maintainers you probably have strong views on all our other kit, so use the S2022 process to feed comments back into the system.

I hope you will find encouragement in these plans, and see that the world of Mine Counter Measures is moving forward, albeit not as fast as some would like!

COMMAND SUPPORT SYSTEMS IN MINE WARFARE VESSELS

by WO1(CSM) J. Berry, FLEET CIS-CCISWO, 92832 5666

CSS has been introduced to all Major Warships, DD/FF and is currently being rolled out to the SSN community; currently CSS is not available in Mine Warfare platforms but there have been recent advances in how CSS can be provided to smaller communities which this article attempts to explain.

The Command Support System (CSS) provides the command with a Secret High system that has a wide range of capabilities that covers areas such as Communications, Situational Awareness, Mission Planning, Battlespace Management and Environmental Support. Increasingly CSS is being talked about as "mission critical", with the general feeling that in today's modern ways of working operations cannot be conducted properly without this system. A study is being undertaken as part of the NAUTICUS Midterm update by MWV IPT and QinetiQ to work up a logical and coherent solution so that the MW community can share the immense amount of data collected by them, using a wide range of systems, without recourse to the boats crew as the distribution method. CSS, being common and widespread, is one system being looked at to provide this capability.

Unfortunately CSS is big and bulky, the kit sits in a 19 inch 39U rack (for the uninitiated 1U is 1.25 inches high) and is typically made up of 3 servers (SUN, HP (both UNIX) and NT), terminal server, Combat System interfaces, UPS, DAT drives, router, hubs, and a monitor. Clients distributed throughout the ship connect to the servers via a LAN infrastructure, (Fig 1). When you take into consideration the requirement for shock clearances you can see the required space envelope is considerable.

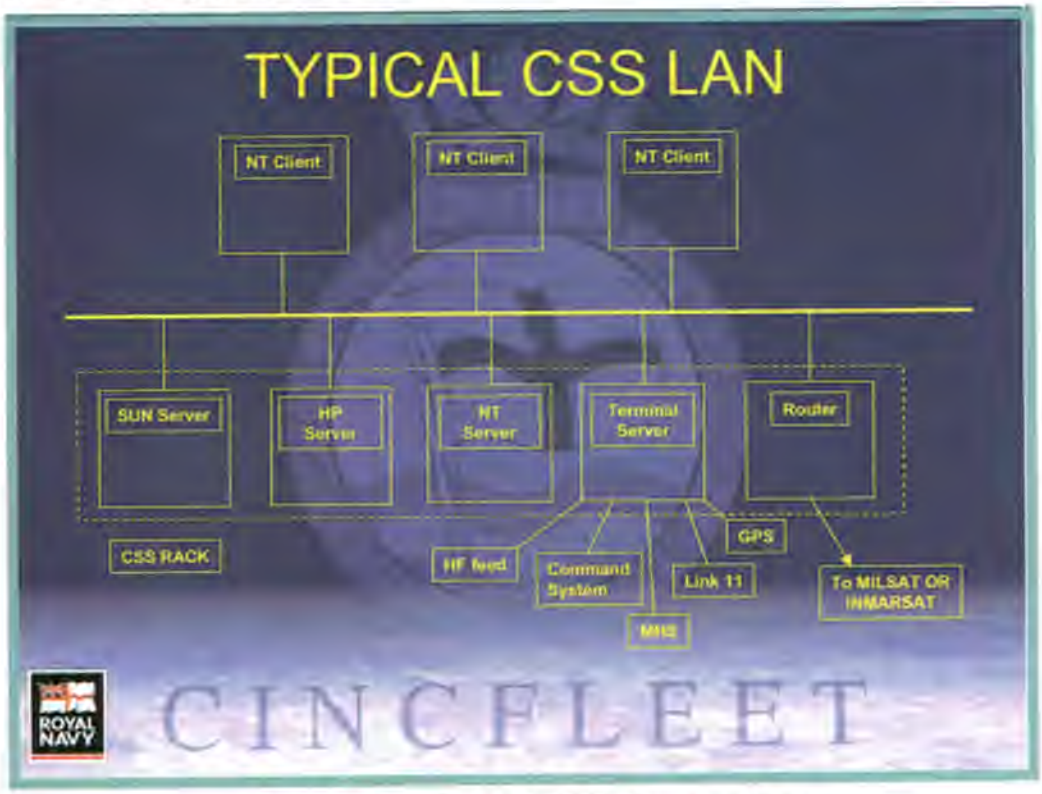


Fig1. Typical CSS LAN infrastructure

The CSS Wide Area Network (WAN) is arranged in a hub and spoke arrangement with all CSS servers connected to NWD. From there connectivity into other CIS networks such as JOCS, NSWAN, CHOTS etc, is achieved by links to the JOCS Communications Processor (JCP). (Fig 2).

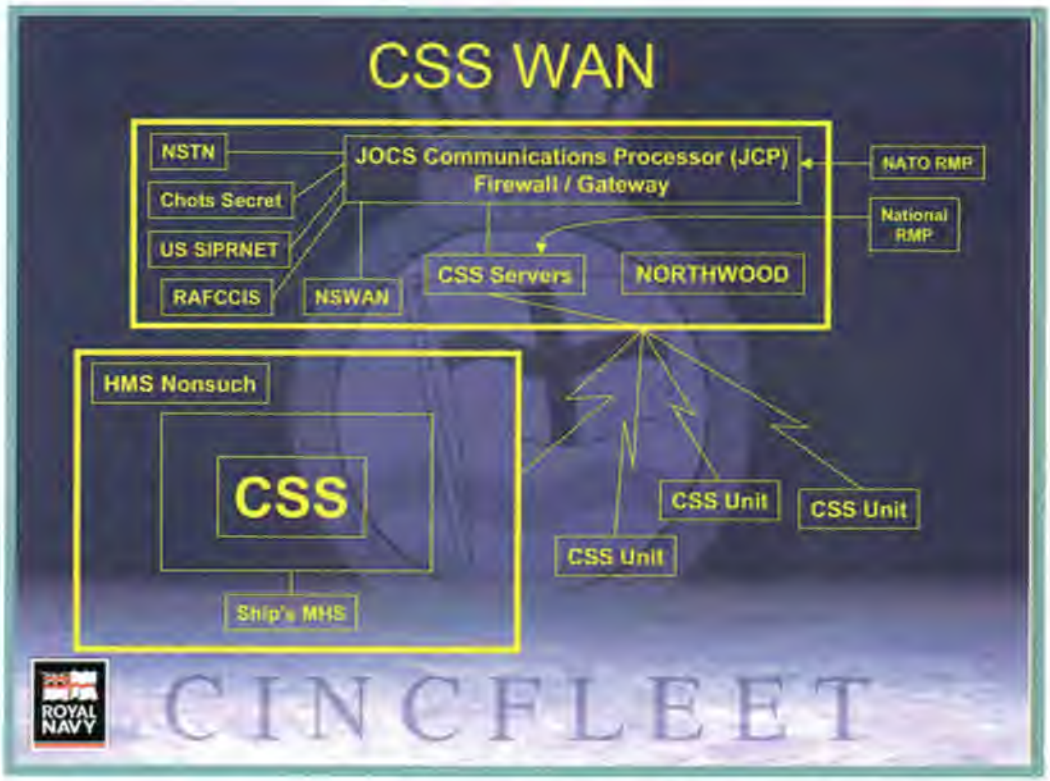


Fig 2. CSS WAN architecture.

The three servers all have different jobs, the two UNIX servers run ICS and Nauticus (applications that run the National and NATO RMP respectively), formal messaging using the Compucat CMX application, IRIS, web services, x.400 addressing, Horace and Oracle Databases, network addressing protocols and host the home directories. The NT server runs MS Exchange, C2PC (another RMP application), SQL database and all Windows based CSS applications. In all there are over 200 applications running over the 3 servers.

Until space is identified and an installation guidance package worked up, the MWV community will be disadvantaged as we begin our first steps towards networked capabilities.

In the meantime work has been ongoing to identify a suitable way to allow disadvantaged users access to the world of CSS without the need for masses of kit. The answer is CSS REMOTE. Essentially this is a CSS laptop that can be used to dial into a distant server to accesses a user account on that server. The equipment outfit comprises a laptop, a router and a BRENT 2 secure telephone, with the laptop and the router housed in a sturdy suitcase, unfortunately the BRENT has no home at the moment.

The Remote user connects to a "home" server, currently Northwood, (although future expansion

will include the servers at UKMARFOR - Whale Island and 3 CDO BDE - Stonehouse) a 64k ISDN line is required for this. Luckily, in the MWV this can be supplied by the use of INMARSAT and of course an ISDN shore connection can be utilised when alongside, (Fig 3)

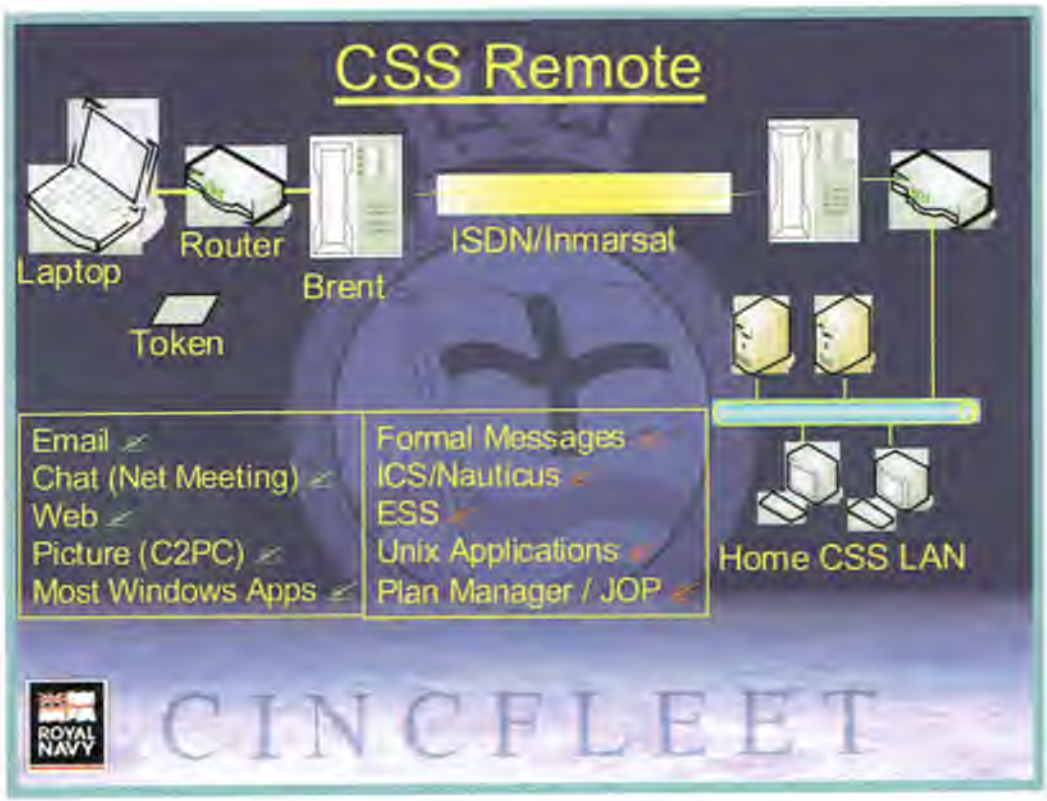


Fig 3. CSS Remote connectivity

The laptop is protected by "guarddisk", a software and token protection system that will not allow the system to be used unless the token and password are used on boot up. When the laptop is shut down the equipments protective marking becomes Restricted, unfortunately the laptop cannot be used for any other applications if the laptop is booted without the token. The CSS REMOTE can be used "off-line" so that users can prepare email etc before connecting to the home server.

Applications that are accessible to the CSS REMOTE user when connectivity is available are:

Email, up to SECRET and beyond the CSS domain, ie, NATO, JOCS, RAFCIS etc, although email can be prepared off line.
Net Meeting, includes Chat, Whiteboarding and desktop sharing.
Web, ability to "surf" the CSS web and into NATO
Picture (C2PC), displays the picture as managed by the home server.
Most Windows Apps.

Early indications are that these applications work relatively speedily over a 64k bearer.

CSS REMOTE is not capable of the following:
Formal Messages – system cannot be attached to the ships MHS
ICS/Nauticus – No picture management
ESS – No sonar, radar, radio propagation modelling and prediction or environmental forecasting.
Unix Applications
Plan Manager / JOP

Unfortunately due to the network speeds these applications cannot be run as they are hosted on the UNIX servers as described above.

CSS REMOTE was initially designed to provide Battlestaff Officers a method of staying in touch with home when deployed on Recce or planning missions, but such is the utility of the system disadvantaged users, such as the Mine Warfare community, could easily take advantage of a small, rapidly inserted, capability that will make use of bearers that are already in place, this will also include the Maritime Tactical Network that was trialled during Aurora 04 (although this is yet to be proved and would require a different cryptographic solution). FLEET have taken on five laptop/routers pairs for trial purposes and are currently installing the necessary connectivity into Whale Island and Stonehouse to allow the trial to go ahead. If all goes well a FLEET will procure fifteen sets. CSS REMOTE is currently deployed on RFA Diligence.

The frustrations of the MCM community not being fully NEC enabled are well understood and have been noted in many Lessons. Fleet is actively engaged in resolving this issue and as progress is made will ensure that you are kept informed.

THE DIVING STANDARDS TEAM (NAVY)

The Diving Standards Team (Royal Navy) work directly for the Superintendent of Diving who is now responsible for the safe conduct of all MoD and military diving. The team consists of:

DSO(N)	Lt Cdr Mike Leaney MBE
DSI(MIX)	WO1(D) Buck Taylor
DSI(ENG)	WO1(MEA) Geoff Lindsey
DSI(AIR)	CPO(D) Andy Carss QGM

This last year has seen much work to implement the Military Diving Safety Management System. In particular, the feedback from a growing number of DIR's is providing a valuable and expanding data pool from which trends can be recognised and, in time, will allow progress to be objectively evaluated using statistically derived Performance Indicators.

During 2004 the Diving Standards Team (Navy) (DST(N)) has carried out 17 Diving standards checks covering 12 Ships diving teams and 5 Diving Units. The vast majority of the teams we see are very enthusiastic and highly motivated. Most of the problems seen are a direct result of manpower shortages (unqualified people) and the resultant lack of practice and skill fade. The standards of diving administration, equipment maintenance and diving practice observed by the team varied greatly:

Good	3
Very Satisfactory	4
Satisfactory	3
Just Satisfactory	1
Below Standard	2
Unsatisfactory	4

Some of the common weaknesses are;

1. Maintainers not being aware of DESN's and hence the specified routines not being completed.
2. Incorrectly completed pre and post dive routines.
3. S288's incorrectly filled in.
4. Military Diving Safety Management System (MDSMS) not fully implemented.
5. BR's at incorrect amendment state.
6. Incorrect accessories held, i.e. Locally produced lazy shots.
7. Supervisors not being fully aware of, or planning for, decompression stops in the event of time/depth overrun.

The Team have a busy year planned for 2005 with over 48 Ships and units requiring DSC's by the end of the year.

CDBA – PRESENT AND FUTURE

Present.

CDBA completed an extensive Get Well modification program between Jul 04 and Jan 05 to safely re-introduce the equipment back into service. The original fault focussed on the Diluent, Bailout and XBS Regulator systems which had an inherent design fault which could permit high pressure gas to flow downstream, risking both equipment damage and injury to the diver. DLO BATH (UWS4) tasked the CDBA Design Authority to provide a completely new regulator system, which would meet the required reliability and durability, under the full range of temperatures and pressures. The Design Authority spent several weeks conducting cyclic testing of re-designed regulators with the manufacturer. The new variants were tested over 15000 cycles at temperature ranges from –20°C to +70°C. During this process it was also agreed with the CDBA Safety Committee that the Working Pressure (WP) of the Diluent and Bailout systems would be dropped from 345 bar to 300 bar in order to improve reliability. The subsequent reduction in Bailout capacity/endurance was independently verified by MoD scientists at QinetiQ(Alverstoke) as appropriate for CDBA diving. An attempt was made to restart CDBA diving, post 60m verification dives by FDU3, in Jan 04. However, despite all previous testing a further regulator fault occurred at DDS within 3 weeks!

The Design Authority returned to the regulator manufacturer and reconstructed a totally realistic test rig to establish the root cause of the fault. Comparisons were made to the commercial versions of similar regulators produced by the manufacturer. The CDBA regulator build was aligned as closely as possible to these designs, adjusting where necessary for magnetic hygiene. The Design Authority also discovered that the valves fitted to both the Bailout and XBS cylinders were capable of admitting full gas pressure to their respective regulators within $^{1}/_{16}$ of a turn. This could result in 'shock loading' of the regulator valve stems and in turn cause regulator damage and thereby poor gas control downstream. The Bailout cylinder valve was replaced with a progressively opening design, however the XBS valve re-design could not be resolved by summer 2004. Superintendent of Diving (SofD) instructed DLO Bath(UWS4) that further delays for re-design work was not acceptable due to the resultant reduction in MCM Diving capability. The XBS system was permanently withdrawn from CDBA, which has in turn reduced CDBA diving to 42m 'no stop' only.

During the long period that CDBA was out of service, SofD and UWS4 staff took the opportunity to review and revise the CDBA Safety Case, making further safety improvements to the system. These included:

- A reduced-pressure Power Inflate system for the BCD, similar to other in-service diving equipment
- Divers Through Water Comms (DTWC) for training dives.
- Enhanced Bypass Valve fittings to improve durability/reliability.
- A full revision of PMS and BR2807(1)(R), including CD-ROM version.
- Replacement of all Primary Batteries with a higher reliability version.
- Removal of the redundant XBS Quick Disconnect hose, reducing diver snag hazard.

An enormous collective effort by many parties has ensured that the whole Get Well program has been successful. Particular thanks are due to Mr Geoff Gallimore (DDS – Flagship), whose tireless efforts in amending CDBA PMS, BR2807(1)(R) and providing endless unseen support to the Get Well team has been key in it's success. Mr Gallimore is now instructing CDBA Maintenance Courses at DDS for both Career Courses and Fleet personnel. All CDBA Units/ Ships are advised that it will shortly become mandatory for all maintenance on CDBA to be conducted by qualified maintainers, with the exception of "Before and After Use" routines.

CDBA Power Inflation Assembly (PIA)

CDBA BCD Reduced Pressure Inflation Regulator & Cylinder Assembly

Several MCDO's/CD's have queried how they become 'qualified' in CDBA diving again. The straight answer is that they are already qualified but obviously require re-familiarisation with the equipment. The Get Well program has now ended but 'estranged divers' may still contact ships/units to conduct basic acquaint dives in CDBA, on an opportunity basis. Supervisors hosting such dives are to thoroughly brief and exercise all CDBA drills, prior to permitting swims or progression to depth. During Before Use and After Use Routines re-acquainting divers are to be closely supervised when working on the dive sets.

Future.

CDBA is forecast to remain in-service until mid-2007, at least. Procurement of the successor to CDBA is now underway, the new equipment has been designated Clearance Divers Life Support Equipment (CDLSE) and is programmed to enter service in mid 2006.

The main reasons for replacing CDBA, are as follows:

- To enhance Bailout capacity to meet the required MCM diving capability (81m)
- To improve the swimming performance of the set for searches
- To reduce the mass of the set

It is also acknowledged that the current equipment has suffered from historical reliability issues, which have caused the set to be removed from service on occasion.

The process to replace CDBA commenced in Feb 2004 when DLO BATH (UWS4) placed an Invitation To Tender (ITT) in the MoD Bulletin. This publication is distributed to all potential contractors and is also available in the public domain. A total of 9 companies registered an interest in supplying the new dive set. There are no pictures available at present of any of the bidder's dive sets. Some of these companies are current suppliers of MoD dive sets, others are submitting for the first time. All the bidders have had the opportunity to query the detail of the CDLSE Systems Requirement Document (SRD) with both MoD and Service diving representatives. The SRD covers all aspects of the future set including:

- Task description
- Operating depth/duration and conformity with Table 90 Series Decompression Tables
- Full Bailout capability from depths up to 81m to surface at high respiratory rates (50lpm)
- Exceptional breathing performance in **all** attitudes
- A maximum mass of 40kg, including weights
- A dive data recording system

The SRD also includes concise details on high reliability as well as Contractor obligation to maintain capability within various ship/unit readiness criteria.

Selection panels will commence a review of all bidders documentation throughout Feb-Mar 2005. At this stage all contractors will be scored on compliance with the SRD as well as a 'confidence factor' that they are actually capable of meeting their declared performance/ capability.

In April 2005 all bidders who are selected from the initial marking process will be invited to produce their equipment for demonstration/review by the selection panels at Horsea Island. Each contractor will have 1-2 days to explain the function of their equipment, which will in turn be dived by a selection of RN divers drawn from operational teams, SofD staff and UWS4, under a dispensation issued by SofD. The demonstration will include deployment from the MIB 525 and any proposed supplementary decompression gas systems being offered. THIS IS NOT THE TRIAL. Following the equipment demonstrations the selection panels will reconvene, review and adjust their previous scores as necessary. The final contract award is due May 2005.

Trials of the proposed CDLSE will commence with unmanned testing in November 2005, culminating in manned diving to 81m in March 2006. The RN Diving Trials Team has not been identified at present but will probably consist of a core unit from the Fleet Diving Squadron, supported by other suitably experienced members drawn from the CD Branch. COFDS has undertaken to populate the Trials Team.

CDLSE will be delivered in batches from May 2006 though to January 2007. DDS and operational priority Ships/Units will receive the first issues. The required Conversion Training to CDLSE has not been fully formulated to date but it is likely that it will incorporate a greater element of equipment maintenance than the previous CDBA Conversion package.

Clearance Divers are already familiar with the technology associated with fixed PO2 mixed gas rebreathers. The introduction of CDLSE will re-establish MCM/EOD diving to 81m and enhance both ergonomics and operational capability whilst improving diver safety also.

Air Diving.

The last 12 months have been hectic and have seen the trial and introduction into service of SABA Mod 1 and the new SSDE known as Open Space Diving System (OSDS) dovetailed into an already busy schedule. Each set was trialled using a mixed Navy and Army team and approximately 400 dives were conducted.

SABA Mod 1.

SABA Mod 1 has changed siggnificantly from SABA DTWC, sharing only the facemask and DTWC. The new set has a BCA with coloured handles and flashes to improve safety and a 12 ltr main cylinder backed up with a 3ltr bailout, both charged to 232 bar. Both cylinders have Apeks regulators and are connected to the mask via a switch block (quarter turn valve) mounted on the front of the BCA. There is also a pouch for the DU. The cylinders are mounted the right way up and each is fitted with a gauge. On the front of the mask is an LED which flashes when the main cylinder pressure drops to 55bar, indicating the end of the dive. DDS is already training the new set and all units with CDs should have Mod 1 by May 05 with all units converted by Sep 05. Later in the year a transit case will be available. Work to modify the DTWC and replace the facemask is ongoing and should bear fruit in 2006.

SABA Mod 1

SSDE OSDS.

The term SSDE now covers ESDS and OSDS. The new set utilises the existing, although modified ESDS panel.

OSDS Panel

A light weight, spun umbilical supplies the diver who is equipped with a recovery harness, BCA and an 18b band mask. The new 17k helmet has further noise testing to be concluded prior to it introduction.

OSDS during Equipment Trials.

The suit inflation has been replaced by a direct feed from the side block; this also supplies the BCA. The diver also has a hat mounted digital video camera and light. The PC based ruggedised digital video system can record for 20 hours onto an internal hard drive which can then be stored on DVD. The system also enables the supervisor to write reports and use GPS, digital charts etc whilst diving. The whole system comes in transit cases and includes separate user and maintainer tool kits.

OSDS Configured for Loadout

This period has also seen the trial and introduction of new hoods, fins, distress lights, belts, boots and Search Scheme Alpha necklace. Diving suits, and their issue has also been addressed. Contracts are now being placed that will enable new 'tailored to fit' suits to be supplied to all military divers along with wet suits, skin suits and under suits. These will be issued as required to individuals.

Significant effort has also been put into BR 2806 with 3 changes being published in 18 months and work currently being done on change 7, which will see the BR split into 6 volumes. BR 2806 SUP will be updated once change 7 has been published. Suggestions for changes are always welcome and asked for each year; however the response is disappointing with only 3 from units in the last year.

BR 2806(Record) is also being rewritten to make it easier to use and maintain and a new Permit/Safe to Dive Certificate has been published

THE DEFENCE DIVING SCHOOL – A SCHOOL OF CHANGE

For those divers amongst us, courses at the DDS have usually invoked dread beforehand, hard work but enjoyment during and, in most cases, fond memories afterwards. The branch has always prided itself on the quality of the training and the robustness of the courses. As a consequence, each one of us knows that we have earned our place within the most challenging and professional branch in the Royal Navy. It goes without saying that our sense of elitism is borne from the knowledge that we are the chosen few and that if you need a job done well – ask a Clearance Diver. So, enough of the backslapping the question is, does DDS still deliver the training to the same high standards, how is this training going and how are we dealing with new rules and new equipment.

It is common knowledge that following the diving fatalities in 2002 the school has been forced to change radically in the way it delivered training. Most of this change has been driven by the need to meet criteria mandated by the Health and Safety Executive (HSE). Throughout 2003 the school underwent a microscopic review of training procedures with the aim to provide clearer and more defined aims to the training that is carried out and formalise those areas that lacked the relevant documentation.

The Maritime Warfare School Connection.

The most noticeable change to the school is its command and control, with the DDS now firmly imbedded within the Maritime Warfare School (MWS). This has given the school a direct line to Commodore MWS. The change in profile has resulted in much better representation of DDS issues, while still remaining an independent defence asset but with all the benefits of collocation with our operational colleagues in the Fleet Diving Headquarters building.

Internal Changes.

The result of the various reviews emphasised the good standard of instruction carried out at the school but also highlighted the variety and standard of training documentation. The deficiencies in this area was countered by an increase in size within the Diving Training Support (DTS) Cell and the implementation of the Joint Instructor Element (JIE), headed by a WO(D), who is the school's Chief Instructor. These two support cells are there to not only ensure the ISPEC's are current and useable but also ensure all instructors have undergone a formal induction in all-diving equipment and instructional techniques both in the classroom and

underwater! In short all training delivered by the school should conform to a common standard and follow set guidelines so that all courses are taught to an equal level.

Health and Safety - The School's gone fluffy?

There are many throughout the branch that have commented that we are now too conscious of Health and Safety, allowing it to soften the arduous nature of diving training. That will always remain a matter of individual opinion, but Health and Safety is mandated by law and it is some

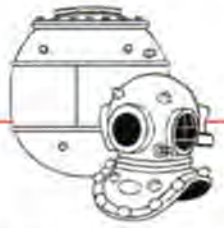
thing we all already do - "Risk Assess", only we now conduct this in a formal, open and recordable manner. Regarding the arduous nature of diving training, the current courses still complete the same hurdles as have been set for the past decades just with more fallbacks to safe guard the individual and the instructor. Students are reported on and formally de-briefed at every phase of their course so that progress can be monitored and any shortfalls are identified early on prior to commencing the next stage of their training.

Audits and Inspections.

By the middle of 2004, all the new procedures had been fully implemented and DDS had to prove to both the HSE and the Naval Recruitment and Training Agency (NRTA) that it had turned the corner. Both these organisations conducted a detailed audit and both judged that DDS now fully complied, and in some aspects was now an example of best practice, within the MOD

Outlook – Future Defence Diving Training.

It would be nice to say that after two very hard years achieving these changes that the DDS could relax into a period of steady progression and set programmes. However life is never that kind! The reintroduction of CDBA in its modified form, an increase in the number of Leading Divers promoted, the conversion programme to SABA MOD 1 and the introduction of the new SSDE 2003 are some of many factors that now need addressing. All this has necessitated a constant modification of the programme with many new courses introduced.



On top of those changes already made, the MWS commissioned a study into the "Future of Defence Diving Training". The main thrust of this reviewed deployed training, internal organisation and the future of Air SCUBA training. The main results of the study are summarised below:

a. *Diving Sites.* The future of the Horsea Island Site is assured. After consideration of locations around the UK the following areas were chosen to minimise the footprint of training assets around the UK.
- Portland for RN shallow search and Army fast water training.
- Kyles of Loch Alsh for deep water training.

To most who have passed through DDS this may not sound "revolutionary" but the study proved that these sites are the most cost effective for diving training and therefore warrant further investment from NRTA and MWS. The current push is to formalise contracted agreements and make the best use of all the available MOD amenities in those areas with the aim to improve the overall training package and enhance students and instructors quality of life while deployed.

b. *HSE SCUBA Course.* It is MOD policy that whenever possible military courses should provide civilian accreditation and qualifications to enable personnel to gain nationally recognised certification. The Ships Diver Course was identified as an area where this principle could be applied and as such is undergoing re-design to incorporate the HSE SCUBA Course. If all goes to plan this means that students will qualify not only as RN Ships Divers but also have the opportunity to qualify for the HSE SCUBA ticket. The course, potentially starting from October 2005, will have all the facets of the previous ShDC as well as RCC operator training and a deployed period to concentrate on open water diving skills.

Conclusion.

The School has taken a number of hits in it's immediate history, however it has come back fighting and is now ready to take Defence Diving Training into the future. It has embraced modern teaching ideals and training methods and gained a close working relationship with the HSE, encouraging a free flow of knowledge and experience. The school is now looking to stabilise and build on a firm foundation while continuing to train the world's best military divers.

Ships Diver Selection Test –More than just a dip.

In times gone by it was accepted that the Ships Diver (ShD) Selection Test (ST) would rarely fill the day and usually complete for a late lunch. This gave little latitude to coach potential ShD's with the necessary knowledge and skills to adequately prepare them for the demands of the ShD's course. It was accepted that this test needed to be reviewed and revised with the aim of offering more training and allowing instructors

more time to assess the students. The new ShD's ST are run over a two day period and an overview of the course is summarised below:

a. *Day One.* The morning of Day one consists of a welcome address, documentation check and medical screening followed by the RNFT (to a "good" standard). During the afternoon, theory lessons in basic diving physics, physiology and regulations are conducted followed by a staff demonstration in the use of the Swimmers Air Breathing Apparatus with Divers Through Water Communications (SABA)DTWC.

b. *Day Two.* This day concentrates on the candidate practical skills and aptitude to pass the Sh D course. On completion of the dive brief and the surface preparation of the diving equipment, candidates will conduct two dives during the day to a maximum of 9 meters. The initial dive is conducted in clear water (Pasley Tank) with an in-water trainer/supervisor. Candidates are required to complete to a satisfactory standard a number of in-water skills under the direction of the in-water trainer. On successful completion of the drills the candidates move to the open water phase of the course to conduct a dive in low visibility. Candidates who successfully complete the ST will be issued with a pass certificate, which is valid for two years.

The full ST programme and joining instructions are contained in DCI JS 78 2004.

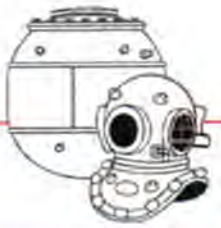
This revised ST ensures that the selection of candidates occurs prior to, rather than during the course. Thus, once the course commences instructors are able to concentrate on teaching rather than weeding out those not suitable. Students also benefit, arriving at DDS better prepared and more likely to pass the course.

Candidates must arrive with all the correct pre course medical documentation. Those arriving without it cannot conduct the test.

SABA Mod 1 – The Wrong way up and Pink?

SABA Mod 1 has modernised Military SCUBA diving. It now conforms to HSE legislation and has incorporated recommendations from SABA Mod 0 incidents. Below is a brief technical description for all the diving equipment spotters -

- 12 Litre Steel Cylinder with Apex Regulator – charged to max 232Bar
- 3 Litre Bailout attached to the Main Cylinder
- Additional 3 Litre Rescue Cylinder for the Standby Diver



- ¼ turn switch block enables diver to select main or bailout cylinder
- Cylinder Pressure Sensor (CPS) Activates from 55Bar – 15Bar
- 0.4 Litre Emergency Inflation Cylinder for the BCA
- 4 Function AP200
- Diver Through Water Communications - 1000M range.

The most significant enhancements are listed below:

- Single Main Cylinder -
  No Equalising, No requirement to touch the diving set throughout the dive.
- The main cylinder low pressure indication (Cylinder Pressure Sensor -attached to the facemask) – limiting the risk of running out of air without warning to the diver.
- A bailout facility in case of loss of the main supply – ensures the diver has enough air to return to the surface in emergency.
- A rescue cylinder that allows the Standby Diver to re-supply the casualty diver with air.
- An emergency inflation cylinder with the facility to power-inflate, pull to dump, purge and orally inflate the jacket.
- Some questionably "day glow pink" high visibility reflective strips fitted to the shoulders of the BCA to aid visibility of the diver when on the surface!

As SABA Mod 1 is introduced into service across 2005, DDS will start training initial career diver training courses from April 2005. For those personnel that require conversion courses these are available through the DDS Course Bookings Office. Current plan is for Fleet to prioritise places on conversion course to meet the equipment delivery programme. Details of how this will be done are to be confirmed in due course. The following conversion courses are available –

- Career Divers - 3 days.
- Ship's Divers will complete an enhanced course of 5 days, which includes training in the Modified Search Scheme Alpha.

So You want to become a Clearance Diver ?

Baby Divers Training.

Young Strawberries and the PEDA.

Traditional routes into the diving branch have, during the last 2 years been amended and updated to take into account NRTA requirements and incentives to reduce wastage in training. To effect this the Direct Entry (DE) route has seen the introduction of the Pre Entry Diving Acquaint (PEDA). This is a 2 day visit to DDS which does as the name suggests, give

the potential diving entrant a full and frank (warts and all) overview of the Diving Branch. Students (who live in at DDS for 2 nights) are given briefs on the Diving Branch and the D1 PQC, they will undertake a full Diving Physical Fitness Test followed by circuits and other in water exercises culminating in a night lock gate swim. Whilst this is an acquaint and therefore there is no pass or fail, students are graded, with those obtaining a "Below Sat" grade invited to return 6 months later. The acquaint is now a mandatory pre-joining requirement. Its success has been measured in screening out those who are joining with an unrealistic idea of Naval Diving and those who are just not "physically robust" enough to undertake diving training.

Sideways Entry - The Old an Bold - Blue and Green!

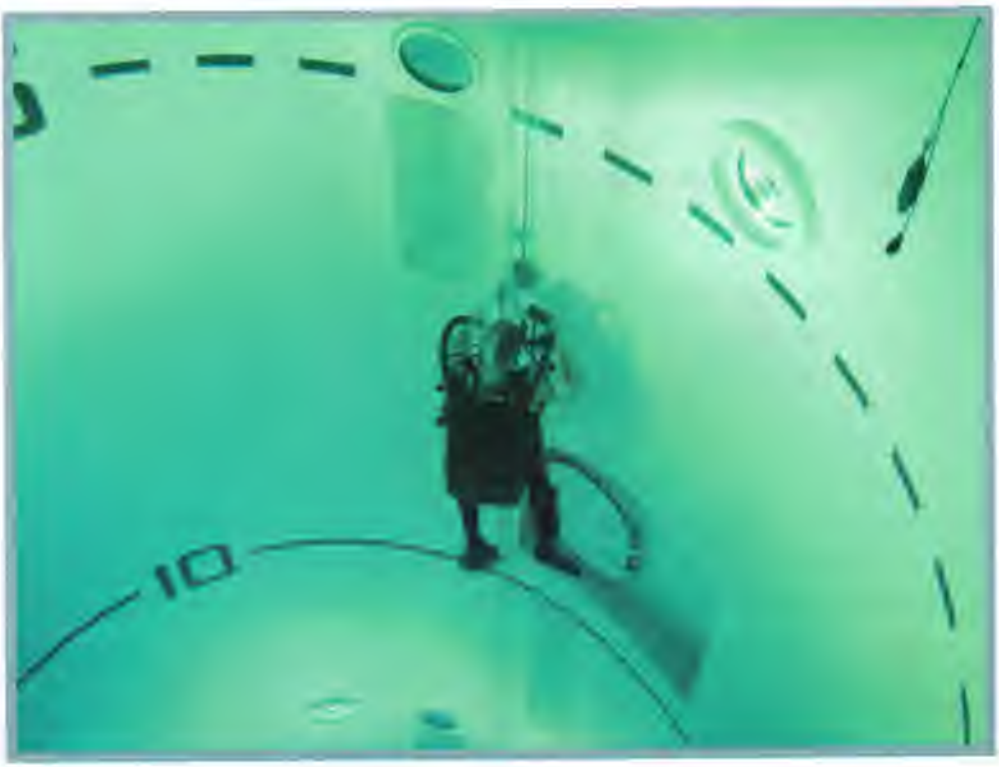
The Sideways Entry (SWE) route has recently seen a dramatic drop in the number of personnel waiting to transfer. This is possibly in part due to the impact of a reduction in Ships Diver training during 2003-4, an area that traditionally is a rich source of potential diver recruits. From having approximately 12 waiting at any one time to start course, we are now in the invidious position of struggling to fill the two places allocated per course and having no SWE available at short notice to fill places should not enough DE pass the Clearance Diver aptitude.

If you were not aware, it's not just sailors who can apply for a SWE transfer, Royal Marines can also apply through drafty for manning clearance - historically those marine ranks that have made the jump performed well on course and have a bright future ahead of them.

Training Pipeline - Want to be a Diver?

In 2002 we had nearly 100 potential DE Divers waiting to join the diving branch, some waiting nearly 2-3 years for an entry date. The PEDA did a good job in initial weeding and the branch was also closed for 12 months to allow us to reduce the "bulge" in the DE route. The pipeline is now open again and the rush is on to fill the DE Diver places available every year. Presently the realistic entry to Raleigh is 6-12 months after successful completion of the PEDA.

On the SWE front again, as we bring Ships Divers courses back on line it is hoped the number completing course and applying for manning clearance will increase. There has never been a better time to apply to join the branch, the expected waiting time from obtaining Manning Clearance to joining D1 PQC is realistically within 12 months. Any queries on SWE into the Diving Branch should be answered by consulting BR 1066 Ch 16, where the criteria is laid down. If you have any questions please contact WO(D) Devit (DO3) at DDS who is available on 93 832 4037 or via email on MWS-DDS-DO3.



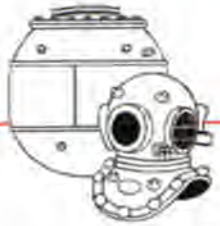
The Long Course – Mine Clearance Diving Officer.

All Officers with a wish to join the ranks of the Diving fraternity must fulfil the following criteria:

a. Warfare Officer who has completed his BWQ.
b. Completed Ships Diver Course with recommendation for MCDO Course.
c. Recommended by your CO.
d. Apply though your Career Manager (Appointer).

The MCDO course is often revered for the physical elements that are most apparent to the unqualified observer. It is true the course is arduous in nature and physically demanding – but what is often missed is the preparation for the supervisory role. This requires a full understanding of the Military Diving Manual and a good spacial awareness. Officers are advised to prepare themselves by following the advice below:

a. Complete the ShD Supervisor Course.
b. Refresh your General Diving Knowledge to a minimum of ShD Supervisor DSC.



c. Ensure you have a generous amount of open water diving experience - ideally as a Supervisor.

d. Get fit - but do not injure yourself prior to the start of the course.

If you have any further questions on becoming an MCDO or wish advice on pre-course preparation then call Lt John Bainbridge (LTO) 93832 4049 or via email on MWS-DDS-LTO.

Clearance Diver Professional Qualifying Courses - Are you ready for it?

If you have a promotion course coming up then make sure that you read this!

LS(D)' s PQC.

a. *Briefing Technique*. All students should endeavour to attend LRCC before the PQC. This aids the individual by giving confidence especially when taking charge and speaking in public. However, LRCC does not include giving Dive Briefs! Line Managers should endeavour to give senior D1's the opportunity to practice a dive brief, and in particular to get an understanding of what issues need briefing. Any opportunity that can be used to let potential students give a dive brief, monitored by the dive supervisor, will be of benefit. The precise format of the brief is not particularly important but the wider lessons learnt will be significant.

b. *Inflatable Boat Driving*. The standard of boat driving of the majority of students arriving on this course is very poor. Parent units must provide potential students every opportunity to practice and hone their boat driving skills if they are to have a chance to succeed on course.

c. *General Diving Knowledge*. The course assumes that students join with a level of diving knowledge at least as good as that expected of a Diver passing out of the D1 PQC - any students who join at a lower level struggle from day one. The Joining Instructions sent to each student provides a list of suggested pre course reading from BR2806 and associated publications.

The Leading Diver is rightly the mainstay of the Diver Branch and it is incumbent on us all to ensure that the people that attend the LS(D) PQC are given every opportunity to reach the high standards required. If given the support detailed above their chances of success are significantly increased.

If you have any further questions on LD pre-course preparation then call WO(D) Bray (DO2) 93832 4172 or email on MWS-DDS-DO2.

PO(D)'s PQC.

Generally the standard of LS(D)'s arriving for the PO(D) PQC is very satisfactory. Potential students should bear the following advice in mind when preparing for course.

a. *Air Supervision.* The course does not allow time to refresh students in Air Supervision of SCUBA tasks. All students are expected to pass a Ships Diver and Supervisor DSC in the first week of course. This should be no surprise and LS(D)'s are expected to be the best Ships Diver Supervisors in the Fleet! Make sure you are familiar with your diving brief and all safety factors.

b. *Diving Brief.* This should be well practiced and second nature. The content should be *meaningful* and cover all safety factors pertinent to the divers conducting the task and the task itself.

a. *Diving Theory.* Presently students arrive having tied themselves in knots when revising Diving Theory. It is more advisable to revise practical diving supervision rather than get into the weeds of theory, which will be covered from a basic level on the course.

If you have any further questions on PO(D) pre-course preparation then call: Lt Micky Beale (DO1) 93832 4035 or email on - MWS-DDS-DO1.

FOREWORD FROM OiC MWTU

Lt Cdr Tim Russell RN

A lot has happened since the last update from the school, not least the fact that we have moved home once again. It has therefore been our intention to update all our parishioners on where we are at physically and professionally. We live in interesting times and the school has been at the van of the introduction of all the new equipment's that have been procured, a task I assure you, which has focused a great many people on how to best use the equipment and develop new operating procedures. I have enjoyed meeting all the ships teams as they have come to the unit for 2193 Early Crew Training and I would extend an invitation to all of you to pop in and say hello as you are passing. My parting shot is that Tony Mulrain is now the Branch Champion for the introduction of the Navy Boards Personnel Change Programme, so you will be hearing more from him in the near future; oh and he has been fitted for his suit of armour which should be with us shortly. Do enjoy the article and if you have any feedback positive or otherwise please give us a call.

THE MINEWARFARE TRAINING UNIT (MWTU) at MWS HMS COLLINGWOOD

How to find us.

As many of you are aware the MWTU has made the transitional move from MWS Southwick Park (SP), formally HMS Dryad, to HMS Collingwood. Although there was many fears and those who were for and against the move, it has been fairly painless. Due to much hard work by **all** and good liaison between the MW Operators and the MW Technicians (already based at HMS Collingwood), it has been possible to carry on with business as usual. The MWTU is situated in Marlborough Building, which is the large brick structure that runs alongside the parade ground. The unit can be reached by entering the double doors closest to the far end of the parade ground and follow the signs upstairs to F85.

MWO's Training - Lt Cdr Tim Russell, CPO (MW) Bob Mitchell, CPO (MW) Allan Mills.

The course has recently emerged from a full review of course documentation and content. It has also increased in length, from 15 weeks to 16 weeks, due to 3 extra days that have been added to the crypto custodian course and the addition of a 2-day introduction to CSS package. The students now utilise the new Fleetwork trainer to consolidate their tactical minesweeping knowledge and then transfer across to the Bridge Trainer for a very realistic Armed Team Sweep. General Warfare training will now culminate in a Tactical Floor exercise run by the Command Advance Warfare Training Unit. Due to the introduction of 2193 and NAUTIS 3, the Hunt Stream has been re-written to incorporate the new drills and procedures associated with MHSA Mk4. With the next 2 MCDO courses running close to capacity, the output should continue to be around 15-20 MWO/MCDO students per year.

PO (MW) Training - Lt Mat Dodds, CPO (MW) Craig Campbell, CPO (MW) 'Joe' Munro.

The continuing lack of PO (MW) candidates and the knock on effect for those qualified, serving at sea and looking for a relief continues to be a concern. Only 2 students have successfully passed the PO's course in the last year, due to the lack of candidates and the stoppage of training for the Hunt Sonar 2193/Nautis 3 update.

However, this has meant that instructors have been freed up allowing them to learn the new Nautis 3 and Sonar 2193, amend the course documentation, teach the ship's Early Crew Training and prepare for the 'ready for training date' of 07 Feb 05 when the new Hunt COT comes online.

At present there are 3 PO's on course, its early days so far but they all seem to be doing very well. Its not all work though as they are luckily travelling up to Aldershot this afternoon to compete in a cross-country run. Exercise is not a dirty word in the MW section!

LOM/LH (MW) Training – Lt 'Dolly' Parton, PO (MW) 'Bagsy' Baker.

2004 has seen three courses completed, with a total of 22 students successfully completing course. Each course undergoes common and stream training. This has been difficult with 2193 training but PO Baker has battled through.

The courses continue to run at maximum capacity (8+1), for each of LOM 26, 27, 28 courses UPT has been a feature and a variety of training serials were organised including charity work (great PR for course, Collingwood and the Royal Navy), visits to DEODS and Gosport expeds. This will no longer occur as training now coincides with LRCC.

Early integration between the LOM (MW) and the OM (MW) 2 courses with coffee and sport events are being encouraged, this will continue as I believe it bears fruit on MCMG sea week with the classes knowing each other by sight and occasionally name.

OM2/AB (MW) Training – WO (MW) Tony Mulrain, PO 'Nobby' Clark, PO Jamie Dawson.

As many of you know the Mechanic element of the OM (MW) course was removed back in Jan 04. The MWTU was the first of the Warfare disciplines to do so and the others are intending to follow shortly. It has allowed the students to concentrate on MW, which they appear to relish. Due to the transition from Sonar 193M to 2193, it has not been possible to Stream Train for Hunts. This has also meant the reduction in class size from 12 to 10. It is realised that the community is infested with 2093 OMs, but there was no other way to manage the situation. However the Unit is now back on line with Hunt Stream and the present course (66) will all be 2193 trained. It will soon be possible for personnel to complete the 2193 PJT, so contact your Squad Co-ordinator if required. The Warfare Branch is currently going through modification to comply with the Personnel Change Programme (PCP), which is to be in place by Jan 06. The MW fraternity is very much involved and confidence is high that the changes for the branch will be for the better. This may include better Seamanship training, leading to enhanced civilian qualification.

Sandown COT (2093 Simulator) – CPO (MW) 'George' Atkinson

The move of the Mine Warfare Training Unit (MWTU) from HMS Dryad to HMS Collingwood provided an interesting period for the 1107 Sandown Trainer, staff and maintainers. The main transition of the unit took place within the Easter leave period by removal contractors, however the 1107 COT was not transported to HMS Collingwood until the beginning of May. The COT was transferred from the Dryad site on a lorry, in two parts over a period of two days. The move of the first section of the COT did not go as smoothly as first planned due to an over zealous crane driver. The result being a slightly bent lamp post with streaks of blue paint and only minor damage to the trainer. Lessons were learnt and the transfer of the second section went a much smoother.

The site that was allocated at HMS Collingwood was ready to receive the COT, however the newly prepared foundations were not big enough to accommodate the COT, so temporary alterations had to be made. When the COT was in position on its pillars, the repair work and acceptance trails commenced. Defect rectification and acceptance from AMS (maintainers) were completed before training commenced mid June. Since the acceptance, the COT has been used by all MW courses.
The new addition to the COT, hopefully in the next year will include the new NAUTIS 3 system and the one-shot mine disposal system along with a new Sandown CBT.

Hunt COT (2193 Simulator) – PO (MW) 'Taff' Owen

2004 has seen enormous changes within the Training Unit for the Hunt Class ships. The major upgrade from CAAIS / 193Mod 2 Sonar to NAUTIS 3 / 2193 Sonar is almost complete. Early Crew Training (ECT) for ships and the first career courses has already benefited and all indications are that it will be a prolific training aid for the future. The following is a short narrative of training conducted:

02 Feb 04 - HMS HURWORTH. The first ship to use the trainer.

17th Feb 04 – Major interested parties i.e. FLEET (Lt Cdr Darroch Woodward, Phil Preston), FOST (Lt Jim Blacklock), MCM ASOO's (Taff Hembrow, Andy Strickland, Tony Starbuck, Nat Coles) and FSAG (Mr Dixie Dean). As can be imagined the air was rife with old sea dits, but it did not get in the way of some very informative training.

08 -11 Mar 04 / 22 -25 Mar HMS CHIDDINGFOLD

21 – 24 June 04 / 28 Jun 04 – 01 Jul 04 HMS BROCKLESBY

12 – 15 Jul 04 / 19 – 22 Jul 04 HMS CATTISTOCK

06 – 09 Sep 04 / 27 – 30 Sep 04 HMS LEDBURY

18 – 21 Oct 04 / 25 – 28 Oct 04 HMS QUORN

29 Nov 04 – 02 Dec 04 / 06 – 10 Dec HMS ATHERSTONE

The last hunt to be trained will be HMS MIDDLETON, in January 2005.

The 2193 Sonar in the trainer is still in Initial Operating Capability (IOC), however all of the ships are at the minimum of Mid-term Operating Capability (MOC). This is not an ideal situation, but the MWTU has been able to deliver the best training possible given the lack of up-to-date software.

Establishment Acceptance trial (EAT) part 4 is taking place on 24 Jan 05 and if successful the trainer will then be at (MOC).

MW Staff – CPO (MW) 'Taff' Reader

This year has seen yet another fast turnaround of staff, and despite good relations with drafting, we still have difficulty in filling some of our billets. We also suffer the turmoil caused while guys are away doing PJT's for their next draft etc. So if any of you out there are wondering what to do with your next bout of shore time why not come and join us. Most of you will have seen how we do our business when you have been up for ECT or CTT. It's a relaxed and friendly atmosphere, and despite many initial reservations by some, I think all the staff will agree that being an instructor can be very rewarding, and the time in the Unit enjoyable. If in doubt pay us a visit. You're always welcome.

Below is a list of current staff in the Unit:

OiC MWTU - Lt Cdr Tom Russel.l

Officers Training

MWI	Lt Cdr Tim Russell
MWOIH	CPO Allan Mills
MWOIS	CPO Bob Mitchell
MWCSI	CPO Jan Takel

PO's Training

MW2	Lt Matt Dodds
POIH	CPO Campbell
POIS	CPO Joe Munro

LOM's Training

MW3	Lt Dolly Parton
LOMIH	PO Bagsy Baker
LOMIS	Gapped

OM's Training

RTOMW	WO Tony Mulrain
OMIH	PO Jamie Dawson
OMIS	PO Nobby Clark

Sandown Trainer Staff

STC	CPO George Atkinson
STD	Gapped
STO	Mr Steve Cross

Hunt Trainer Staff

HTC	Gapped
HTD	PO Taff Owen
HTO	Gapped

Admin and Support.

MW Manager	CPO Taff Reader
MWTFC	PO Sterling Moss
MW Admin 1	Miss A Warren
MW Admin 2	Mrs M Nettleton

New Joiners to welcome to the MWTU, in early 05 include:
Al Innes, Ricky Nelson, Ollie Olsen, John Hibbert, and Basher Briggs. To name but a few. Oh and you if you contact Drafty Now!

MWTU Staff

Minewarfare Re-union 2004.

2004 saw the Seventh Minewarfare Re-Union. With a splendid meal and social at the WO and S/R's mess in HMS Collingwood. Although not as well supported by serving members as we would have liked, mainly due to ship commitments, it was good to see an increase in the Ex serving members, and was a successful night enjoyed by all. It was good to see that Pony (DJ) Moores had lost none of his skills since leaving the navy some years ago, by dropping to both Knees without spilling a drop!!. The Collingwood venue was initially chosen to give everyone the opportunity to see our new home (Love it or hate it, we are here now). From feedback received this seems to have been a good choice, especially the sit down meal. However some thought the main room was slightly large. So picking up on these points, We have decided to hold the 2005 Re-Union in the Mess again, with a similar format, however being on site this time, we have got in early and booked the smaller function room. And agreed a date of **10 September 2005**. So that you are available put it in your diary **now!**

On a lighter note, Tue 29 Nov 04 saw a remarkable event. The air around HMS Collingwood's parade ground was rife with liniment and groans as 5 CPO (MW) completed the Rockport walk. They were Taff Reader, Bob Mitchell, Allan Mills, Whiskey Walker and Jasper Stride.

Question: *What is the combined years service between the fossils above?*

Answer
150 years 1 month.

ADVANCED MINE WARFARE TRAINING

Advanced Mine Warfare Training remains available through your Career Manager.

Primarily arranged for post 1st tour PWOs who have been nominated as Squadron Operations Officers of MCM Squadrons, the course also caters for Officers appointed to Battlestaffs, JMOTS and International students.

The 7 week course trains the officer in higher level tactical Mine Warfare and integration with other Warfare spheres.

The recently trained students include the command team of the Australian Task Group, the PSO to MCMFORSOUTH and the MCM advisor to COMATG. South African Students will complete a 4 Week International Mine Warfare Staff Officers Course (IMWSOC) during April and May.

The Minewarefare Tactical Support System Replacement MTSS(R) has been received in the unit and training will start in the Summer Term. This will align with the FOST MPV accreditation of Squadron Commanders during JMCs.

Left to right: Cdr Geoff Uren RAN, CPO (MW) 'Jan' Takel, Lt Cdr Alex Bush RN, Lt Cdr Neil Holden RN.

Left to right: Lt Sarah Whitlum RN, Lt Cdr Chris Mitchell RN, Lt Cdr Alex Bush RN, Lt Cdr Mick Parker RAN.

The International Mine Warfare Staff Officers Course is available, via NRTA, to all countries who wish to train Officers in Advance Mine Warfare. The 4 week course, at an unclassified level, will teach Minefield planning, advanced MCM operations and Command and Control of MCM Forces.

Top left to right: Lt Andre Geel SAN, Lt Musawenkosi Nkomonde SAN,
Bottom left to right: Lt Frederick Thiart SAN, Lt Cdr Alex Bush RN, CPO(MW) Allan Mills, Lt Johannes Kruger SAN

AMW Star Pupils

SWO MCD has moved to Room 137 Malborough Building,
HMS COLLINGWOOD
Mil: 93825 3445
BT: +44 (O) 1329 333445
Fax: 3443
MWS-WOT-SWOMCD
mws-wot-swomcd@nrta.mod.uk

THE MARITIME WARFARE CENTRE
NOTES FROM THE HILL

Standing on top of Portsdown Hill surveying Horsea Lake, (the bit you can still see behind the growing mountain of Portsmouth's detritus), 2 Basin, the SETT and the Solent beyond, it is difficult to divorce yourself from the MCM and Diving communities, yet the sad reality is, that for many of MAD's readers, the Maritime Warfare Centre will remain; 'that bit of DRYAD which was full of Commanders who never wore caps!'

Please indulge me with five minutes of your time so that I can correct this misconception. For starters, MWC was never part of DRYAD. The Director MWC works for COS(W) and through him to the Deputy Commander Fleet, MWC is therefore a ***Fleet Asset***. The 130 or so personnel who work in the MWC are approximately half Service and half Civilian. The Civilian half comprises a mixture of Civil Servants, DSTL and Industry personnel, in addition some work is contracted to off-site Industry and Academic Institutions. By any measure an eclectic mix of experience, knowledge and intellectual power, all focused on enabling you, the front line, to fight smarter.

The MWC is divided between 2 sites; Southwick, where the 'Commanders without caps,' develop Concepts and Doctrine and Educate numerous Courses and Portsdown, where the emphasis is on Tactical Development (TD) and Operational Analysis (OA). MW, EOD and Diving are the provenance of 2 desk officers, myself, Lt Cdr Kevin Giles (OA) (mw.oa@mwc.rn.mod.uk) and Lt Cdr Angus Benton (TD) (mw.td@mwc.rn.mod.uk), with the scientific support of Jeremy Disley (mws.oa@mwc.rn.mod.uk), a Civil Servant who is very good at hard sums!

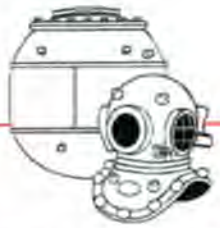
Trials.

Of the £3 M this year's MWC trials budget MW EOD and Diving received ~£200k and of a little more than £1 M next year's, we anticipate to spend this and anticipates nothing in 05/06!! This year Angus spent his money in 3 areas:

- Quantifying the risks associated with the Diving Conning Run and MIE (do these procedures put the Diver and surface team in unnecessary danger?) – Complete, thanks to CHID and FDS.
- The use of Land Service Munitions for in-water EOD (the Army has a variety of bespoke explosive tools for EOD / IEDD, can they be used in water?).
- Developing a CIS tasking tool (MTSS(R) lacks such a tool) – Thanks to MWTU and ASOOs 1 and 2 for their input.

To accomplish these trials requires specialist non-MOD support and hence costs money. With nothing to spend next year, we will be limited to those activities which can be accomplished in-house, which means a big push to get 2193 working to its optimum and continuing to evaluate the effectiveness of REMUS. And, just so the Divers don't feel left out, we are going to try and quantify Diver Search (in?)Effectiveness.

2193 Operational Evaluation (OPEVAL) will begin May 05 in HMS ATHERSTONE, the first Full Operational Capability (FOC) ship with a slot in her programme. These trails will examine the performance of the sonar in a number of mine fields in the Clyde areas and should produce



the most realistic effectiveness measure - to date - for the new system; the first stab at establishing the Detection Width and Detection/Classification Probability. Expect Evaluation of 2193 and later, MHSA4, to continue for the foreseeable future (3-5 years).

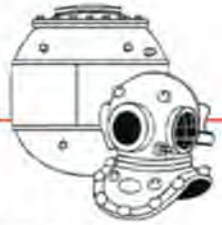
REMUS continues to gain exposure and demonstrate utility within our community and establishing the limitations as much as the capabilities, of small Autonomous Underwater Vehicles (AUVs) will be a major TD and OA task for the next 2 or 3 years. What is already clear is that such AUVs are complementary to existing MCM Systems, but are not yet capable of replacing them.

Divers are currently the only RN asset capable of ships bottom search, and still represent the backbone of the Advance Force VSW MCM effort. Their effectiveness in both of these tasks, although anecdotally high, remains unquantified, but it is hoped to put some figures to it next year.

OA.

The OA of Trials and Exercises enables the degree of success or failure to be established along with (hopefully) highlighting the causes of success of failure. OA relies on records, but as many will be aware, the NAUTIS(M) recording package is incomplete and it has been necessary to fit separate TRAP OA Recorders (TOAR) to facilitate analysis. All the Sandowns will soon receive a permanent TOAR fit so MWOs please start your recorders!! In a similar vein an MS Word-based narrative tool will soon be delivered to all MCMVs, feedback from the four current users has been positive, but further thoughts are always welcome.

Thanks for your time



THE MINEWARFARE & CLEARANCE DIVING OFFICERS' ASSOCIATION

by Rob Hoole

The Royal Naval Minewarfare & Clearance Diving Officers' Association (MCDOA) is open to all serving and retired RN qualified MCDOs and MWOs and officers from other navies who have completed courses in the UK. The Association was founded in 1991 and now has over 280 members worldwide including 98 serving MCDOs and MWOs (66% of those eligible). The annual subscription of £10 is paid by Standing Order.

Aim of the MCDOA.

The aim of the MCDOA is to perpetuate the "Esprit de Corps" of Royal Naval Minewarfare and Clearance Diving Officers by the regular exchange of information and meetings on both a social and formal basis to their mutual benefit. A Newsletter called 'Five Bells' is published to keep members up to date with MCD news and a website and fast-reaction e-mail link serve the same purpose for more urgent items.

Activities.

Annual MCDOA activities include:

- A Northern Dinner held at Faslane in the New Year.
- A Ladies Night held at Portsmouth in the Spring.
- Operational update presentations followed by the AGM at Horsea Island in November.
- The Annual Dinner at Whale Island on the same day as the AGM. This provides an opportunity to dine out members leaving the RN and acts as a reunion focus for LMCDO Courses celebrating their 25th anniversaries.

Website.

The Association has its own website at www.mcdoa.org.uk which contains news and pictures of MW & CD activity, MCD related dits, the history of Diving and Minewarfare, the development of the MW and CD Branches including the part played by *HMS Vernon* and a photo gallery. A members only section contains members' personal updates, funnies, photo galleries containing pictures of past courses and social activities, a discussion forum, past issues of Five Bells, minutes of AGM and Committee meetings and much more.

Association Officers.

The President of the Association is Captain Colin Welborn RN.

The Committee for 2004/2005 comprises:

Chairman:	Cdr Simon Nicholson RN (tbrb Cdr Chris Ameye 5/05)
Vice Chairman:	Lt Cdr Rob Hoole MBA RN
Secretary:	Lt Cdr Tony Griffiths RN
Treasurer:	Lt Cdr Graham 'Tug' Wilson MBE RN
Committee 1:	Cdr David Edwards RN
Committee 2:	Cdr Frank Ward RN
Committee 3:	Lt Cdr Martyn Holloway RN

MCDOA Committee (Cdr Ward absent on duty)

Applying for Membership.

The website contains full application details. Alternatively, membership application forms can be obtained from Lt Cdr Graham 'Tug' Wilson, the Association's Honorary Treasurer & Membership Secretary:

Lt Cdr Graham Wilson MBE RN
MCDOA Treasurer/Membership Secretary
OIC XTU CTG
Royal Arthur Building
HMS COLLINGWOOD
Newgate Lane
Fareham
Hants
PO14 1AS

Tel: 01329 237493
E-mail: wilsonindeep@tiscali.co.uk

FISHERY PROTECTION DUTIES HMS LENNOX 1958

Ron Howell has been involved in archaeological and exploration diving over the last 30 years since leaving the RN. Over a few beers, Ron recounted some dits to me about Mine Sweepers in fishery protection duties in the late 50's and kindly agreed to write an article for the Mad Mag. What is fascinating is how much has changed but actually how many things have not.

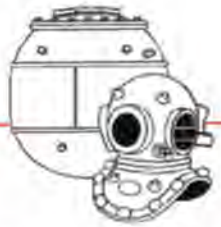
What follows are some pearls of wisdom and a historical account of life in the Navy in the late 50's in a job that some of us will have had first hand experience.

This is an account of a short period of my life. It is very important because of three things it taught me at the age of 19. The first was coming to terms with the situation I was in, and resolving it, secondly facing up to hardship and dangers with others, and thirdly, the satisfaction of pulling through it together. The problem is that you don't think about it at the time; it is only upon reflection in later life that you realise just who you are and what made you that way. My thirty-year diving career has pulled in all three of them, and for that I thank my time in the Navy.

A biting easterly wind was blowing across the River Medway as I watched the distant vessel coming towards us getting larger as it dodged around the sandbanks.

I stood alone, surrounded by my kit bag, tool box, hammock and case, another group stood close by stamping their feet attempting to keep their circulation going. Dockyard Matey's were sheltering from the wind as we all awaited the arrival of the Algerine Minesweeper, HMS Lennox, from fishery protection duties in the Arctic.

Two months previously I was summoned to the ships office of the Battle Class Destroyer HMS Corunna, my home for the last two years, to be given my draft chit. "What is the



in a pot and boiled. I soon learnt to make pastry (clacker) and doughboys (dumplings) a skill I practice to this day, thanks to the days on the Lennox.

Loss of Fingers.

We were engaged on a very real job, and for the next three months there would be very little time for anything but work, and trying to stay alive in the stormy Arctic winter. Among the variety of tasks we carried out in support of the multi national fishing fleets was providing a floating doctors surgery. We carried a naval doctor on board and he was kept busy treating a number of injuries and illness's from the crew of the fishing boats. The most common of injuries were the loss of fingers due to nets and frost bite, in bad weather we would fire a line across the bows of the fishing boat, and they would then pull our covered life raft containing the doctor over to them. Quite often the casualty would return for treatment in our very small sick bay, then landed when we returned to Tromso. We got to know and respect these deep water trawler men from Grimsby, Hull, Fleetwood and other nations, they all had one thing in common, they invented the word 'hardmen', for they fished in all weathers and temperature, once they found the cod and herring they fished until the holds were full.

We also had to act as 'policemen', looking out for illegal fishing, catch sizes, and net sizes, however quite often when we gave chase some of the newer fishing boats outran us, perhaps that was one of the reasons the Algerine's were eventually replaced in 1959 by the all welded new type 14 Frigates.

Our north Norwegian base was the port Tromso, a town with a permanent blanket of deep snow nine months of the year, when we were there all we saw was a couple of hours of twilight. Upon our arrival at Tromso we relieved, HMS Bramble, as she passed us to return to UK, she was pelted with flour bombs and spuds, to which she replied with interest. She slowly faded into the gloom, her life with the Royal Navy nearly at an end; she paid off on return to Chatham.

Dancing in Clean No. 8's.

Tromso was not the most exciting run ashore, I remember going to the local hop dressed from head to foot in Arctic Gear, dancing in clean No 8's. And then there was the nearest British Trawler, if you were a hard drinking man, a session in their messdeck was guaranteed to put you off drink for weeks.

We also put in at Vadso, Honningsvaag, and Kirkenes which was close to the Russian border, where, in what light there was, we put to good use the eight pairs of ski's we had on board. There is no funnier sight than a mateloe trying to ski in front of people who were born with skies on their feet.

Chipping Away the Ice.

During our time in the Arctic it was bitterly cold, on one calm morning the sea was steaming when the sea was warmer than the outside air. It was during this calm period that we stopped a Hull trawler to swap a few bottles of whiskey for a whaler full of cod. It was so cold that the fish lay frozen by the bread lockers on the upper deck until they were requires by the galley. I often wondered how they managed to fight a war in those frozen waters, we were constantly battered by heavy seas, and when we were not chipping away the ice on the upper

deck we were imprisoned below, only allowed up top to change watches on the bridge. Below we seemed to have a constant river of condensation running down the sides of the bulkheads, and the deck head resembled a huge slow dripping showerhead of cold water.

After four weeks of near constant sea time we hit a gale to end all gales, I believe it was storm force 1 11, anyone who has experienced that sort of weather in the open ocean will know that the seas are enormous, very quite in the troughs, with the tops of the waves, a white foaming, screaming madness. The Lennox was driven miles of course helpless to assist in the loss of several trawlers. A huge crashing sea hit us after several days which split the focastle by the breakwater, resulting in the forward mess decks being evacuated and the watertight doors permanently shut. It was several days of hell and it finished the Lennox, we turned south and headed for Amsterdam for repairs, perhaps it was the only port that could take us, and anyway we enjoyed ourselves for a week, a well earned rest.

At the end of February 1958 we entered Chatham for the last time; the Lennox paid off, decommissioned and was moored on the trot. I joined HMS Neptune the reserve fleet at Chatham, and maintained the Lennox for several months, daily going down the river on the trot boat and spending the working day on her.

Special Friendship.

I left the reserve fleet and the Lennox in August 1958 to join HMS Barnard a salvage vessel on the Clyde. I was the last one to wear the cap tally HMS Lennox, which I still have in my possession. The hard ship that put the fear of god into me upon joining turned out in the end to be a happy ship, we had all survived the worst storm in the Arctic regions for many years, which resulted in a special friendship with those that had given me a hard time upon joining.

Lennox stayed on the trot on the River Medway until 1961 when she made her last journey to Gateshead to be scrapped.

As for myself I still had in front of me a salvage vessel, a fast minelayer and a Daring Class Destroyer, and once outside as a civvy, building HMS Euraylas at Scotts Shipyard in Greenock.

Last of the Hard Hat Divers.

I also had in front of me a long diving career that started on the salvage vessel HMS Barnard, One of my jobs on her was as a tender to the last of the Navy's last hard hat divers, it still amazes me that diving technology has advanced in leaps and bounds since then. In 1988 our diving team was searching the River Clyde near Ayr for an Armada wreck, and I remember looking across to the Isle of Arran and thinking that 30 years ago I was screwing Diver Ginger Whitlocks face plate down, before he decended to the bottom to survey a mooring chain the other side of the island, the last of the hard hat divers on the last of the coal burners, how times have changed.

I am still diving, helping to rewrite the history books with our team's discoveries, the latest one the most important yet, but that is another story.

R.W.Howell, Strete, Nr.Dartmouth January 2005

SPACE SHUTTLE RECOVERY IN EASTERN TEXAS TO SATURATION DIVING IN FLORIDA KEYS

LT CDR David INCE on Exchange in the USA

It has been a while since I wrote an article for the MAD Mag, but nearing the end of my three year tour to the United States I thought I would share some of the highlights. The exchange MCDO appointment here at the Navy Yard in Washington D.C. is basically all about gross acts of underwater engineering. For most of my tenure I have been acting as a Project Manager, Technical Supervisor and Quality Assuror for underwater repairs to US warship and submarine propulsion systems. This has involved CPP hub and blade repairs, mono block propeller removal, Voith Schneider repairs and Auxiliary Propulsion Motor repairs. The latter are small motors lowered from the bow section of the single screw FFG7 class in lieu of bow thrusters. With a Fleet spread across the globe, and a maintenance philosophy that sees dry-docking as a very last resort, there is certainly no lack of travel. As well as all the US home ports East and West coasts, Japan, Guam, Hawaii and Bahrain are regular travel destinations, and just in case I was missing anything the USN were even kind enough to deploy me to the West Coast of Scotland for one task. As I work embedded within the USN's Salvage Diving Organization, more traditional diving activities are also on the agenda and it is these I will dwell on a bit more. If you want to know more about the UW Engineering side, check out the RN Review of Naval Engineering, I wrote on the subject there!

In February 2003 I was one of many divers deployed to the swamps, lakes and rivers of Eastern Texas to search for debris from the ill fated space shuttle Columbia, in particular the three voice and data recorders. A lot of high tech equipment was brought in, from UAVs to short range very high definition sonar systems, and we began scouring the local waterways. Our main area of interest was fog enshrouded Toledo Bend reservoir on the border of Eastern Texas and Louisiana, real 'Deliverance' country. The valley was damned up in the 1960's with a predicted flood back time of years. Unfortunately for the local inhabitants it only took a few months, and before any de-forestation or re-location of buildings could occur, the whole area was drowned. Predictably the diving conditions were very difficult and

Toledo Bend Reservoir

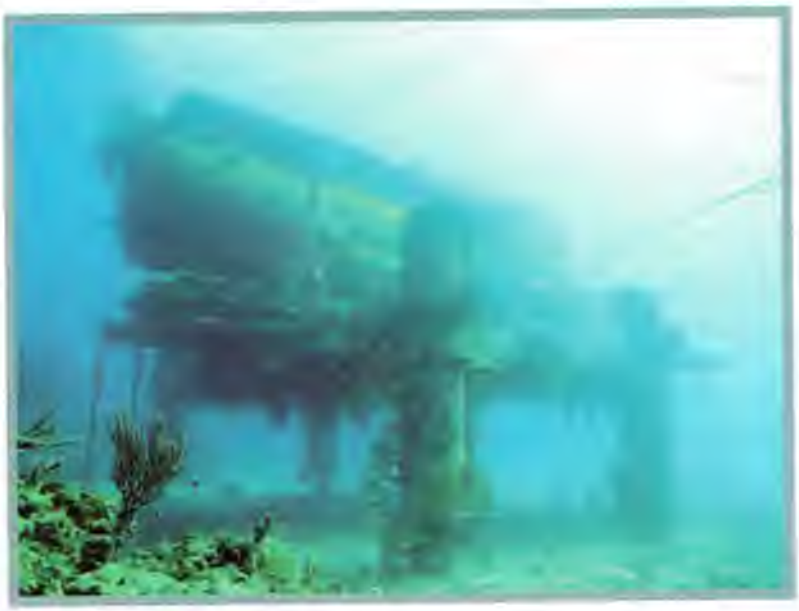
sometimes hazardous. Fortunately we had through water communications and some excellent short-range sonar equipment bought for us by the Federal Emergency Management Agency (FEMA) specifically for the task. This enabled the surface support team to see exactly where you were in a 30 – 40 m radius, and con you onto the targets of interest, previously marked for classification by a separate team conducting HD side scan sweeps. Things were further complicated when the old rotten trees collapsed around you as you sifted through the silt at their roots. A number of divers (including myself) had to cut themselves free. On one such occasion I arrived on the surface in a burst of bubbles, branches, blue language and wielding my short sword, to the bemused face of Sean O'Keefe, the NASA Top Dog. He had come out to express the gratitude of NASA and the American Nation for our endeavors.

Strangely the local Hill Billies didn't seem so enamored of our presence, and were convinced the whole disaster was a government conspiracy as the 'Feds' descended on the area and started (albeit unwittingly) to uncover the countryside's darker secrets. This ranged from moonshine stills to marijuana plantations, but more sinisterly strong rumour had it that 13 bodies were located during the search **after** the 7 astronauts had been recovered! Some were chained to trees, one (confirmed) was found on side-scan tied to a concrete sinker at the bottom of Toledo Bend reservoir. Can you hear the banjos now?

As well as diving the larger bodies of water, we also had to search a lot of smaller lakes and ponds on and around the 'flight path'. I joined a small team of 'puddle jumpers' and we toured the area following up on the eyewitness accounts of debris land/water impacts. This had its amusing moments, on one occasion we were called out to a farm where the owner had declared that his horse had been hit by a piece of (cue Eastern Texas drawl) "shutal daybree" as the nag drank from the pond. Sure enough there was a big old dead horse floating in the water, a closer look revealed a neat bullet hole in its head, we made our excuses and promptly left! Another time had us called out to a property at the side of a lake; the witness claimed a bit of shuttle debris had hit his pier and burnt a hole through it. We saw a freshly burnt 18-inch round hole in his pier and dived beneath it to find a legless semi circular BBQ grill. Yep, there were all sorts. "Wot's a goddam Brit doin' here looking fur shutal daybree anyways??!" After six weeks, despite our sterling efforts the land search teams eventually located the three data recorders.

Shuttle Debris

Another aspect of the post here is various longer-term project work, and one of the most interesting I have been working on is the development of an underwater laser scanner for 3D ship hull profiling. The concept here was/is to have a capability to get accurate hull form information for the construction of cofferdams should a vessel need in water repair. Ship's drawing are not always as accurate as we would desire, and an 'as built' 3D picture is a perfect solution. The scanner is a commercial off the shelf item that has been placed in a tough aluminium box. The early trials saw it being tested in diving tanks, but obviously it needed to be tested in a more challenging environment and at greater depth, preferably in clear water. The perfect opportunity arose when the National Oceanographic and Atmospheric Administration (NOAA), approached us and asked if we could develop some underwater repair solutions for their Aquarius underwater laboratory down in Key Largo, a perfect test platform for our system.



Aquarius

The Aquarius Underwater Laboratory, the only one in the world, lies in 20m of water reef, 7 miles east of Key Largo, Florida. The habitat is about 15m long by 4m in diameter, and sits on a 116-ton support structure. For those interested more information can be found at the website 'http://www.uncw.edu/aquarius/'. As you would expect the underwater visibility was fantastic. Although not especially deep, to conduct the scans would take some time and for practical purposes the divers would have to work out of the habitat and hence become saturated. Therefore, I was dispatched to the US Navy Dive School in Panama City to conduct the requisite saturation diving training. Four weeks later I found myself gazing in awe at the marine aquarium flowing past one of the habitat's large viewing ports. The world was now back in balance, having experienced some of the worst diving of my career in Eastern Texas, I was now to experience the best. The variety of marine life was stunning, from bull sharks to manta rays and everything in between. Being the human fish in an

Laser Scan

aquarium was quite the experience. The first night in the hab I woke up in the 'middle' to see a 5 foot barracuda staring through the 30-inch view port at the foot of my bunk, all very surreal. It was hard to concentrate on the job at hand. In fact the job at hand was not helped at all by the shear numbers of fish present. The laboratory has virtually become part of the reef system over the years, with yellow tails and snappers swarming over its surface like a living exoskeleton. The only thing that concerned them was the occasional predation from the shoal of barracuda that cruised the outer perimeter. In fact, if one of the barracudas could have been trained as a sheep dog we would have had a lot more success getting timely scan data from the hull. Unfortunately the vain attempts to shoo them off only resulted in more curious fish joining the throng. Fortunately the beauty of 3D profiling is that when processed you can 'virtually' move around the scanned model on a computer and edit out the unwanted data. It would take me some considerable time later to clean up the scan, but the upshot was the system acquitted itself very well. As an aside, one of the stranger life forms to visit us whilst on the task was none other than Lt Cdr Mike Leaney, taking a sabbatical from diving inspections to view the USN's diving set up at Aquarius and Panama City. He was one of the 'fish' I had to remove from the scan data, captured swimming through the laser beam on his sight seeing tour, cheers Mike!

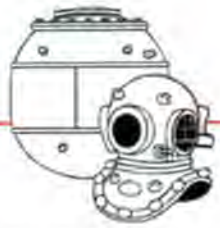
As there is no diving bell in the Aquarius saturation system, the only way to get to the habitat is to scuba dive down to it, taking all the gear you will need with you in sealed containers. This makes for an interesting decompression method that I will come back to. There were 6 of us in saturation, including a NOAA diving technician/supervisor, and all the creature comforts were provided. This included computer, Internet connection, telephone, TV, hot and cold running water and all the food we could eat. The sanitary arrangements were unique, as although there is a toilet in the habitat, we were only allowed to use it during the decompression phase (and then you'd better stand from under if you deposit anything but liquid in there!). During our stay we would have to duck out of the wet porch wearing a mask and trunks and swim to the 'gazebo' (a metal and Perspex bubble adjacent to the main structure) to do our 'solid business' and let the snappers do the rest, our resident toilet paper with teeth. This process was further complicated by the fact that there were live web cams all over the laboratory inside and out, to allow mission control shore-side to monitor the diving operations. One was pointed straight at the gazebo so we were briefed to stick our backsides out the gazebo away from the camera when doing our business. The fact that the world could see the trunks around your ankles was beside the point!

Gazebo

The storage depth of Aquarius is only 15m (I can hear the snorts of derision from the old sat divers), but it was great to be able to conduct excursions to 30m for hours at a time, something we did 'just because we could' when off the laser scanning task, basically coming and going as we pleased. However, it wasn't to last and we began decompression after only four days. As it is totally impractical to bring the 200-ton structure to the surface, this was achieved by locking down the habitat and slowly bringing it to the atmospheric pressure over a period of 17 hours. We did a 45-minute stint on O2 as we left bottom, but the remaining decompression was on chamber air. On reaching 1 bar the whole hab was then swiftly pressed back down to 15m where we donned fins, mask and exited the wet porch clutching a small pony bottle under one arm. Safety divers met us outside and guided us to the surface support vessel. After a 24 hour stand down I was back out as a support diver for the next team, recovering the laser equipment, getting some great underwater photographs and further ensuring that minutes would not be a problem for the 'quarter'!

Aquanaut

Although Aquarius was the icing on the cake, the whole tour has been a fantastic experience. Lots of diving in exotic locations around the world, and working with some very professional people. Not least has been the chance to work closely with the USN's Salvage Divers and learn a great deal about underwater engineering. Good memories to get me through my next job at FLEET HQ and the SABA Mod1 conversion in Horsea Lake!



THE NITEWORKS PROJECT - A CUSTOMER / INDUSTRY APPROACH TO FUTURE MCM CAPABILITY.

Introduction.

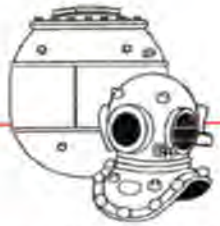
Called for in their consultancy role but unpaid, you will be glad to hear, MCM1 Staff comprising Cdr Jason Scott, Lt Cdr Rob Giles (SOO) and CPO (MW) Taff Hembrow journeyed to Farnborough to take part in a 3 day experiment at NITEWORKS' laboratories and eat lots of sandwiches. This project, established with £2.5m of existing money will, over the next 6 months establish how we in the MCM community are likely to be providing the MCM component of the JRRF effect in 2010 and beyond. NITEWORKS will produce a report by September this year that will allow Equipment Programme money for new developments to be justified more effectively. The organisation has already been used to good effect by the Army and the RAF and is sponsored by COS(W), personally. It is worth noting that MCM is the first naval warfare discipline to work at NITEWORKS. The computer based experiment will bring together partners from industry (Qinetiq/BAE/Drumgrange/EDS and others) and the Navy (MWC/FLEET/DEC/IPT/OCF CDR/COMATG) to give the resultant written report more impetus.

Main Participants.

BAe Systems' facility replicated the MW element of an Amphibious Operation. Walking into the space there were some very familiar pieces of equipment present: CSS, MTSS(R) / MINTAC, Nautis 3 along with the BAe sponsored Server based messaging and data handling system. MCM1 Staff provided the manpower to run a successful Tasking Authority (Cdr and CPO MW), and SOO stepped in as CO of one of the on task Hunt Class. Of particular note was the presence of COMATG SO2 N3 to provide the view of the Commander Amphibious Task Force (CATF). Stood behind the equipment was the industry manufacturer / sponsor of the same: EDS for CSS, AMS for Nautis, Drumgrange for MTSS(R). QinetiQ were also present with their technological expertise. We were also assisted ably by MWC Staff in Exercise Control.

Execution.

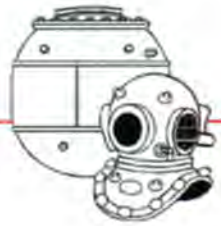
The main thrust of the exercise is to simulate a series of MCM operations, with varying levels of MCM technological advance (bringing the future forward to now). Each operation was described as a 'Treatment' and took approximately 3 hours to run. The object was to see what force multipliers such as Long Range Autonomous Underwater Vehicles (LR AUV), and real time high data rate facilities provided to the force, in terms of MCM tempo. The scenario was an Amphibious Operation to land marine in Luce Bay (inside the Stranraer Peninsula). Incidentally this tasking is a dormant scenario for JMCs. Treatment 1 involved conventional MCM tasking using 2 Hunt Class, 2 Sandown class, a Fleet diving Unit and 4 REMUS vehicles for VSW Survey. The mission required covertness, so 2 night time slots of 8 hours were allocated prior to the latest time to put troops ashore. Q-Routes were constructed and entered into MINTAC, tasking was allocated and the Treatment run. In all the operation was completed just inside the allocated time. The next treatment involved use of LR AUVs. Previously obtained survey information was available to the MCMTA for the planning stages. The team



were able to plan the Q-Routes, the Amphibious Operating Area (AOA) and the Boat Lanes away from the areas where contacts of interest were discovered by the LR AUV. These vehicles truly shaped the MCM (and therefore Amphibious) battlespace, and was a complete eye opener for our RM counterpart. As a result of this survey confidence in the MCMVs was heightened and the operation completed in half the time. The final treatment involved the use of 2 LR AUVs at exercise start time, but with no historical survey data. The future concept of these vehicles is that they are able to transit low data rate contact details direct to the TA at any time (through underwater data link). This would take the place of high data rate transfer when the vehicles are within 5km of a strategically laid gateway buoy. In the event the operation was equally successful, although shaping was not quite as easy with no recent survey information. Other force multipliers included use of secure e-mail, high data rate capability and Chat / Whiteboard from MCMV to MCMTA. With less reliance on HF voice Comms as a Command circuit things ran a lot more smoothly. Funny old thing.

Summary.

What is most pleasing is that the initiative has been taken by all parties to drive composite identification of essential capability and nice to have capability balanced against cost. Two major wins were identified from the MCM Commanders point of view from the NITEWORKS week: use of LR AUVs (from the sweepdeck of a Hunt??) and Network Enabled platforms able to transmit high data rate and real time data back to the TA. It is assessed this may be part of the new generations of Command System - stepping towards co-located Command- and Command support Systems on a fleetwide common terminal. We live in hope. Returning to LR AUVs, they have to become part of our MCM ORBAT. They are covert, shape the battle space and remove the man from the minefield.



Project:	Mine Sweeping Safety Case Report			**Hazard No.**	19.
System:	Hunt Class MCMV	**Equip:**	CIS, WSMk8	**Issue No.**	2.

Identified Hazard:
Dangerous Wildlife

Cause:
Sa1.30 Personnel come into contact with harmful wildlife brought up on sweep wires in tropical climates.

Consequence:
Snake bite or jellyfish sting

Safeguards:
None

Initial Accident Severity:	Critical	**Initial Accident Probability:**	Remote
Initial Accident Risk Class:	**C**	**Target Accident Risk Class:**	**D**

Comments:
- When sweeping in the gulf, sweep wires were often hauled in with snakes or jellyfish attached.
- A process called electro-netting exists, which uses an electric potential to attract fish. The same phenomenon may be attracting the snakes to the CIS system.

Assessment Method:
1. Risk Assessment held by the Project Safety Review Committee (PSRC) at Abbey Wood 24th June 2002.
2. Risk Assessment held by the Project Safety Review Committee (PSRC) at BAE SYSTEMS, Waterlooville 25th October 2002.

Assessment Results:
The PSRC discussed several risk reduction measures:
- A warning could be posted in the BR along with a snake recognition page.
- Special snake guards consisting of a wire brush could be fitted to the fairleads to brush off the snakes/jellyfish that are hauled up by the sweepwires.
- Each MCMV could be furnished with a ships mongoose to neutralise any snakes that may stray onto the sweepdeck.

Assessed By: PSRC **Date:** 24/06/02 and 25/10/02

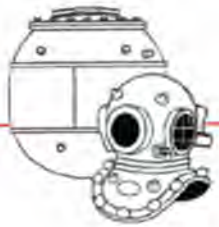
Action Required:
Rec19.1 – It is recommended that the relevant BRs be amended with warnings to address the issue of dangerous wildlife.

Action Taken:
None

ALARP Assessment:
The Project Safety Review Committee considered the potential for risk reduction and identified the following option:
Rec19.1 – Warnings within the relevant BR will make crew aware of the risks posed by dangerous wildlife, and may help to reduce the probability of an accident occurring.
Recommendation Rec19.1 must be addressed for an ALARP assessment to be made.

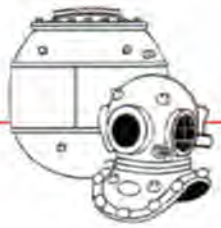
Achieved Accident Severity:		**Achieved Accident Probability:**	
Achieved Accident Risk Class:		**Target Accident Risk Class:**	
Assessed By:			
Further Action Y/N	Y	**Date:**	

Risk Class: A - Intolerable B - Undesirable
C - Tolerable with safety review D - Tolerable with normal review



One of the few disappointing aspects of Command is the evitable long list of defects that are brought to the Commanding Officers attention as a result of the daily ritual of SOCs. Whilst any affecting the ship's immediate programme need urgent investigation, others can be tackled in slightly slower time. A subsequent check by the Command is a useful vehicle for maintaining interest, monitoring progress and to confirm that mutinous thoughts are never far below the surface in the average technical department. The following entries extracted from various defect logs highlight the point and the battle (?) that raged between the users and the maintainers, all now of course consigned to history with the coming of the OMs!:

Defect Reported	Rectification
Port boat rope almost needs replacing.	Almost replaced port boat rope
Something loose in CIS Control Cabinet	Something tightened in CIS Control Cabinet
Dead bugs on bridge windows	Live bugs on order
Evidence of leak on starboard Main engine	Evidence removed
Ops Room 1206 volume unbelievably loud	Ops Room 1206 volume reset to more believable level
IFF inoperative	IFF always inoperative in OFF mode
Friction locks cause throttles to stick	That's what they're there for
Suspected crack in MWO CAAIS display	Suspect you're right
Port dive boat engine missing	After brief search, port dive boat engine found on port dive boat
Bridge 1006 radar display hums	Display re-programmed with suitable lyrics
Ops Room mouse lost behind chart table	Cat installed
Noise coming from under QM's instrument panel sounds like a midget pounding something with a hammer	Hammer removed from midget



Defect Reported	Rectification
2059 tracking poor and inefficient	Tracking generally improved when transducer is lowered

and just to prove this problem is not limited to MCM equipment, the following was extracted from a FAA squadron aviation publication:

Defect Reported	Rectification
Check Test flight OK but auto land very rough	Auto land not installed on this a/c !!!