Issue 6
December 2012
ISSN:2241-438X

NATO MARITIME INTERDICTION OPERATIONAL TRAINING CENTRE

nmiotc

Maritime Interdiction Operations journal

NMIOTC in Support to Regional Capacity Building

NMIOTC MIO JOURNAL
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The ***NMIOTC MIO Journal*** is a professional publication of NATO Maritime Interdiction Operational Training Center, aiming to serve as a forum for the presentation and stimulation of innovative thinking on NATO Maritime Interdiction related issues such as doctrine, concepts, force structure, employment and readiness.

The views and opinions expressed or implied in the ***NMIOTC MIO Journal*** are those of the authors and should not be construed as carrying the official sanction of NATO.

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COMMANDANT'S EDITORIAL

by Commodore Ioannis Pavlopoulos GRC N

NMIOTC's MISSION

To conduct the combined training necessary for NATO forces to better execute surface, sub-surface, aerial surveillance, and special operations activities in support of Maritime Interdiction Operations.

NMIOTC Commandant's Vision

Enhance Maritime Security through MIO Training and remain Alliance's credible MIO expert.

Economic recession, uncertainty, low optimism, illegal trafficking, maritime acts of terrorism, piracy, illegal flow of weapons and weapons of mass destruction and generally all forms of terrorism, are only some of the threats our contemporary society is facing. Daily there are more and more governmental and scientific / academic voices that ring the bell and express their concern that the cohesion of our society is not as healthy as it was in the past.

On the contrary, another great number of experts believe that we now more than ever have the mechanisms to control and effectively use our powers in order to efficiently spot illegal acts and restrict all those actions that tend to deorbit our society's focus from going towards a security framework. This approach has also become a tradition, specificaly, now having in mind that our well- formed international institutions and organizations have acquired and already implement the idea of confronting any illegal action for the sake of the common benefit. NATO, EU, UN and other well renowned organizations have made significant steps towards this direction and have altered dramatically the way that our society responds to any illegal and underground activity that takes place not only nationally or trans - continentally, but also on a global bases. A shining example of that is how international coalition forces are countering piracy and how modern network-based operations among different nations help centralized international command centers to take decisions that affect positively the way of executing our daily maritime business.

NATO Maritime Interdiction Operational Training Center (NMIOTC), from its own operational post and being an active subset of NATO, supports the above idea and effectively contributes to this direction focusing specifically on how training and transformational efforts can bring a halt to current maritime illegal acts. On a more specific basis NMIOTC is the only NATO accredited maritime training facility that provides practical and useful products setting up the acceptable NATO standards for participating in maritime operations combating all types of illegal activities that an individual or a naval unit can meet in the sea. Of course, it is not worthy to mention that all of our activities are being in close cooperation and by receiving guidelines from our Superior Commands, which in our case is Allied Command Transformation in Norfolk. Not to mention that NMIOTC has close cooperation links with all of NATO's critical maritime components and operational commands such as SHAPE, MCC Northwood and MCC Naples in order to receive up to date operational requirements and provide to the students a most effective and efficient type of training that they could finally implement in an operational environment. Generally, NMIOTC's training is based on standards of pre-deployment training for operations, executing mission rehearsal exercises that finally deliver to the trainees a firsthand approach to the way NATO operations are being executed before they actually participate in the operation itself. A perfect example of that is the final tactical exercises that take place in our training products, such as those conducted by the Dutch, UK and the US Navy, as well as other teams that are being trained in our center.

Another important area of our activities that has become a trend in the last two years is the increased participation of specialized teams benefit from our advanced training products. These trainings seems to overwhelm our framework, especially in the last year, where numerous highly specialized teams from different countries have participated asking for more demanding training products, such as "Opposed Boarding" or "Detainee" operations. This fact proves that NMIOTC's training standards attract even highly specialized personnel, and for us this is an honor as well as an

opportunity to strengthen our instructional training material and exchange valuable knowledge that could further enhance our initiatives and at the same time set NMIOTC as a primary training hub for pre-deployment preparation to maritime security related operations.

At this point and taking into account that NMIOTC counts only four years of functional operational capability, it is worth mentioning that our "customers" are mainly coming from NATO countries (82% representation in training are trainees from NATO members states). The total number of students is approximately 3.300; as for naval units 123 of them have berthed and received training in Souda bay Crete. A crucial characteristic to refer to is that this last year there has been an increase in the total training days that these trainees choose to participate in NMIOTC. During previous years the average was 3.3 days per unit or team or individual, this year, however, even though there is an apparent global economic crisis, this number has increased to 5.5 training days in NMIOTC. This apparently means that a student now remains and receives training 30% more time than in the previous academic years. Moreover greater quality has now become a main objective for NMIOTC.

On top of the above mentioned facts and taking into account that NMIOTC is an accredited NATO Education and Training Facility, our organization has voluntarily participated in the new ACT's initiative which requires that all NETFs and COEs be accredited in accordance with the procedure of the protocol of Bologna, following Universities Quality Assurance standards. NMIOTC being one of the very first institutions to take this opportunity / requirement, has already undergone the first steps of this quality assurance process and supports ACT's guidelines and products believing that at the end of this effort training and transformational processes inside the organization will advance to the next level, which will lead us inevitably to an operational academic environment, following University standards.

NMIOTC, sensing the future challenges and the evolution of actions that may need to be implemented especially in the maritime environment and listening the global heart beat of safety and awareness, is in the process and in full alignment with NATO and EU training guidelines, of stepping towards the future by providing training and transformational solutions to the Alliance and elsewhere needed. Some of the examples of how NMIOTC senses the tone of the future and its duties for contributing to Alliance's milestones are as follows:

- Border security,
- MIO – NEO (Non Combatant Evacuation Operations) linkages,
- Support to real operations at an advisory role,
- Creation of a NATO MIO related exercise in the Eastern Mediterranean area where NMIOTC will have a leading training and operational role,
- Increase of bilateral coordination among the Center and organizations / countries that lie outside the scope of NMIOTC's MOU,
- Creation of a Knowledge Management Database in order to increase research activities in NMIOTC,
- Creation of an academic board of directors for bringing universities into the challenging maritime security and interdiction environment, especially after the completion of the ACT Quality Assurance cycle,
- Increase cooperation and coordination with Global Maritime Lessons Learned Centers for acquiring access and analyze issues on a broader perspective,
- Cooperation with national and international merchant marine colleges and institutions for building up maritime security awareness behavior to merchant mariners,
- Further exploitation of the geographical features of Souda bay (sea, air, land).

Finally and as a capstone project NMIOTC is in the process of creating a Master of Science or Master of Arts type academic title in cooperation with national and international universities providing a holistic approach of maritime security operations to Command Level officers and civilians, taking into account that NMIOTC has the uniqueness of combining effectively tactical, operational and strategic knowledge that has been proven through the years of its functional capacity and can be delivered to students in a more formal form, such as by acquiring a Master's degree.

Concluding this editorial and as NMIOTC's Commandant I would like to express my sincere feeling that future will require far greater coordination and training efforts among partners, regard to building a serious security "dam" around the maritime environment, by training our personnel as effectively as possible, in order to tackle the phenomena of future maritime terrorism all the more efficiently. NMIOTC stands constantly ready to take new initiatives and actions in order to provide NATO and other relevant personnel with the most advanced and complete

knowledge regarding the maritime environment. Our institution with the immense support of the Greek Government, even through this serious economic crisis situation that Greece is going through, and with the immense contribution of the sponsoring nations (Bulgaria, Czech Republic, Italy, Romania and Turkey), as well US with their VBSS instructors, are running the Center following all the above virtues. In parallel, our above work is being supported by representatives from the Hellenic Air Force, Army Specialized Forces, Police SWAT Teams and Coast Guard Law Enforcement Officers in order to foster the idea of joint-multinational expertise and interoperability, and to increase knowledge exchange through all levels of interagency collaboration.

Finally, I would like to remind all of us that whoever knows history has a better and wiser grasp of today's reality. Maritime terrorism was always been an issue in the maritime arena. Training, however, has been the common proactive weapon to tackle this phenomenon. Therefore, NMIOTC provides this training that will enhance our readiness prior to deployment in the real area of operations and will act as the non lethal weapon to ensure that maritime terror will no longer be an issue in the near as well as distant future. Quoting Sir Winston Churchill's words, the pessimist approach "difficulty in every opportunity" and the optimist approach "opportunity in every difficulty", I would like to rephrase it and say that even in this bleak period of global crisis we should seize every opportunity to turn it into an advantage with efficient and responsible work on our part and remain optimistic.

Commodore Ioannis Pavlopoulos *was born in the city of Thessaloniki (northern Greece) on April 13th, 1961. He graduated the Hellenic Naval Academy and was commissioned as Ensign in June 1983.*

His specialties are Officer of Navy Special Forces' and Communication Officer. He attended the basic training course of the Underwater Demolition School, the static line and free-falling parachuting course of the Army, unconventional warfare in the U.S. and several NATO SoF courses in Germany.

He served on several types of warships (destroyers, guided missile patrol boats, landing crafts) as a Communication and Navigation Officer and as an XO onboard DDG KIMON.

He spent most of his sea carrier onboard amphibious ships. He was assigned as Commanding Officer on the HS RODOS (LST type) from 1995 to 1997 and as Operations Staff Officer in the Landing Fleet Command from 1999 to 2000. From August 2005 to September 2006 he assumed the duties of Commanding Officer on HS SAMOS.

From 1989 to 1994 he served in the Navy's Special Forces as an operational team leader and staff officer. He accomplished several missions (boarding officer during IRAQ crises in 1990 in the Red Sea, during UN sanctions imposed on Former Yugoslavia in the Adriatic Sea in the years 1992 and 1994, security team leader of ex-USSR President Michael Gorbachov and the Chiefs of the US Armed Forces in 1993).

From September 2006 till July 2008 he was assigned as Commandant of the Navy's Special Forces.

In 1993 he served for six months under the United Nations flag in northern IRAQ as a UN guard team leader.

From 1997 to 1999 he served in the Naval Academy as Director/Major of the Naval Cadets' battalion.

After his graduation from the Naval War College in 2000 he served as Head of the Current Operations Planning Department (J3) in the Hellenic Navy General Staff (2000 to 2002); Naval Attaché of the Embassy of Greece in Paris/France (2002-2005), Deputy Director in the Naval Staff Officers' Course School (2009-2010) and Director of the Athens Multinational Sealift Coordination Center (2010-2012).

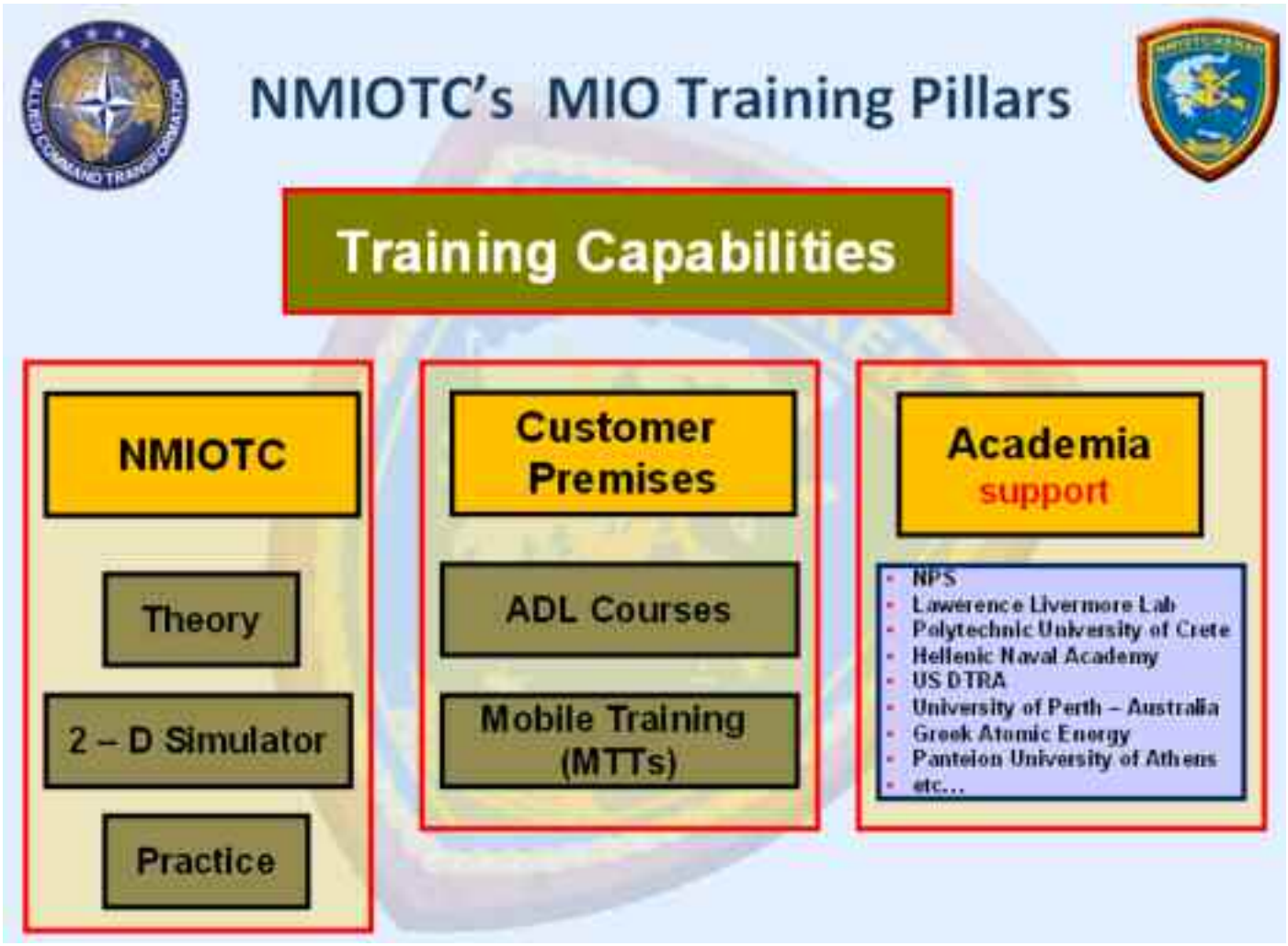
Being promoted at the rank of Commodore the 1st of August 2012, he has been assigned as Commandant of the NMIOTC on the 28th of August 2012.

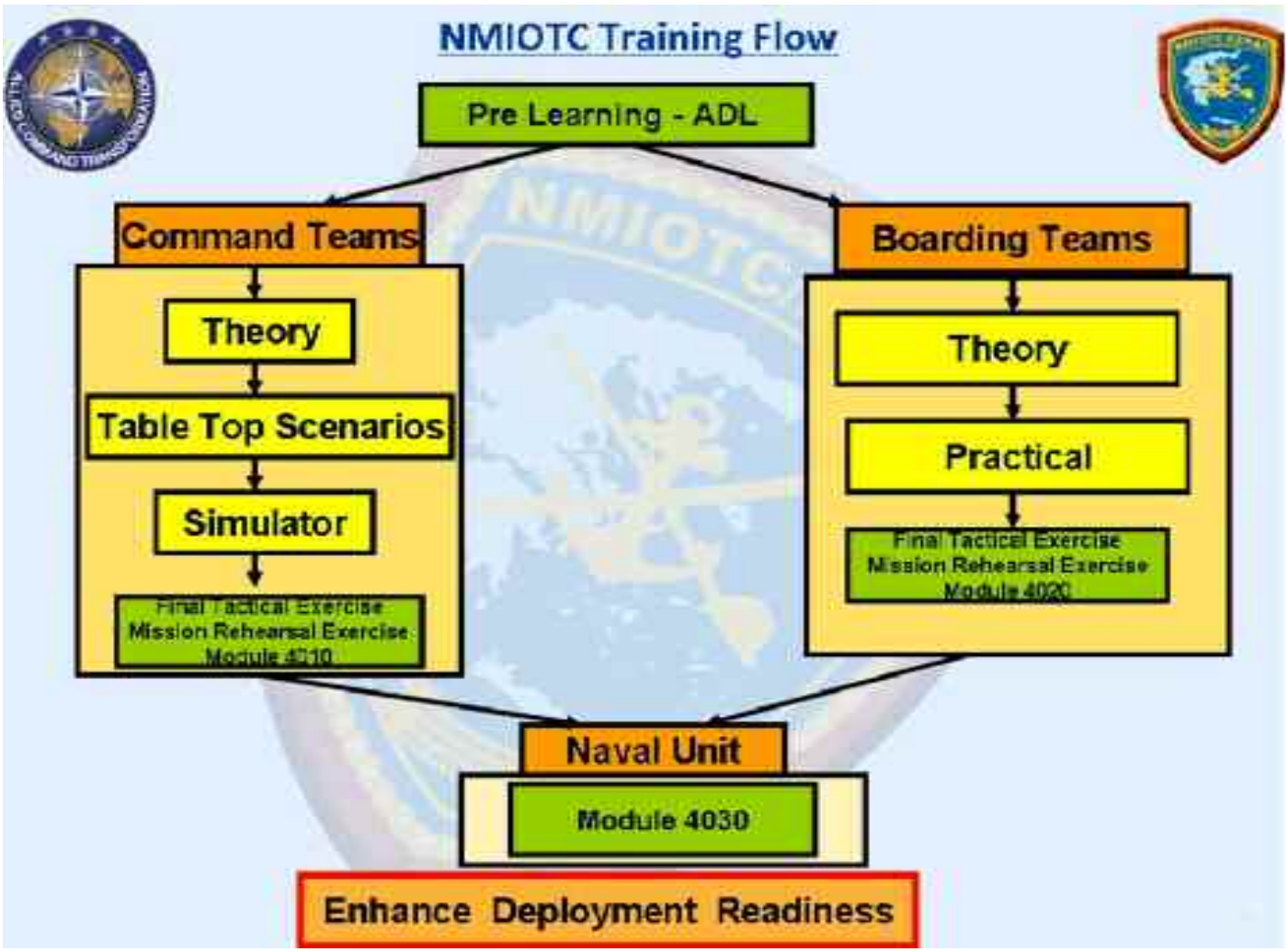
He bears the Gold Cross Phoenix battalion, the Peace Operations' medal (3 ops), the Military Merit, the Successful Command medals and the Gold Cross of Honor battalion.

The States of Saudi Arabia and Kuwait have also decorated him for his participation in the operations for the liberation of Kuwait. He has also been decorated with the Peace Operations medal of the United Nations and the expert rifle-shooting award of the US ARMY.

On June 2006, he was decorated by the French Republic as "Chevalier dans l'Ordre National du Merite" for his appointment as Naval Attaché of Greece in France.

Commodore Ioannis Pavlopoulos HN speaks English and French. He is married, father of two children.


NMIOTC's MIO Training Pillars
Training Capabilities
NMIOTC
Theory
2 – D Simulator
Practice
Customer Premises
ADL Courses
Mobile Training (MTTs)
Academia support
NPS
Lawerence Livermore Lab
Polytechnic University of Crete
Hellenic Naval Academy
US DTRA
University of Perth – Australia
Greek Atomic Energy
Panteion University of Athens
etc...


NMIOTC Training Flow
Pre Learning - ADL
Command Teams
Theory
Table Top Scenarios
Simulator
Final Tactical Exercise
Mission Rehearsal Exercise
Module 4010
Boarding Teams
Theory
Practical
Final Tactical Exercise
Mission Rehearsal Exercise
Module 4020
Naval Unit
Module 4030
Enhance Deployment Readiness

NMIOTC's training is following ACT's training guidelines and principles. It is using the three key words that ACT has implemented in the training concepts...

Effective
Efficient and
Affordable

Training is **effective** by having modular structure, providing ad-hoc and on request - just in time training, executing specific training analysis for each target audience, conducting adjustable training levels on a case by case basis, conducting tailored and customized training iaw operational needs and finally by delivering a mission rehearsal training.

It is **efficient** as it follows NATO standards, it is being enriched with subject matter experts / specialized trainers/ experienced lecturers, by implementing day and night training scenarios and finally by having strong cooperations with other Institutions/Agencies and the Academia.

It is **affordable** primarily because it is at very low cost, students pay only for incremental costs like simunition and helicopter usage and finally because NMIOTC has the ability of deploying its Specialized MIO Mobile Training Teams (MTT) to customer's premises at very low cost.

NMIOTC Training Facilities

NMIOTC MIO Simulator

Simulation for MIO Scenarios Related to current NATO Operations

NMIOTC's instructors (in blue) teaching counter piracy techniques to a MIO boarding team. Training is being executed with NMIOTC's RHIBs in Souda Bay conducting realistic and mission reahearsal scenarios.

Real pirate whaler and skiff
are used for practical small vessel investigation training. NMIOTC extensively apply the model of **realistic mission rehearsal** before deployment.

Recently NMIOTC's training support team installed smoke, noise and background noise generators inside training ship "HS Aris" in order to make training more realistic and effective for the students creating a real war gaming zone environment.

Pictures from the monitors of the CCTV system on board NMIOTC's training ship "HS Aris", where students actions are being recorded and played back after training in post evaluation training briefs. These pictures show the material collected from 31 microcameras in hidden places inside the training ship.

VIP VISITS GALERY

Visit of the Commander Allied Command Operations (SACEUR) Admiral James Stavridis USN
5 September 2012

Visit of DASG
3 August 2012

Visit of the Minister of Defense of Greece and the Commander-in-Chief of the Hellenic Navy General Staff
14 August 2012

VIP VISITS

Visit of the Commander USCG Atlantic Area and USCG Defense Force East V.Admiral R.Parker
20 October 2012

Visit of the Desk Officer for Greece in the US Department of State
1 October 2012

Visit of the Dutch Ambassador in NATO Mr. F.Majoor
23 March 2012

Visit of the Commander SNMG 2
16 November 2012

Visit of CO of FS DUPUY DE LOME
27 November 2012

VIP VISITS

Visit of the Head of the Military Household of the King of Belgium and the CHOD
16 November 2012

Visit of the US Department of State Director for South-East Europe Mrs Maryrouth Coleman
4 December 2012

Visit of South-East Europe Brigade
15 June 2012

Visit of the Team Leader ot the First Dutch Autonomus Vessel Protection Detachment
21 August 2012

NMIOTC IN SUPPORT TO REGIONAL CAPACITY BUILDING (RCB) IN AFRICA

Year 2012 marked a new area in which NMIOTC is supporting the global efforts for better maritime security – Regional Capacity Building in Africa.

Recognizing that the piracy problem around Somalia cannot be solved without the help of the countries in the affected region, IMO launched a RCB initiative called Djibouti Code of Conduct (DCoC) to help building capabilities and interoperability between the participating countries. NMIOTC was afterwards chosen as one of the main training providers concerning Counter-Piracy and Law Enforcement Operations. Three events took place in NMIOTC premises:

- "Train the Trainers" course (in March 2012) during which a tailored training was provided to 15 Naval and Coast Guard personnel from 10 regional states, based on internationally recognized standards, IMO documentation and best practices;

- Two NMIOTC Supported "DCoC National

IMO DJIBOUTY CODE OF CONDUCT TRAINIING

Trainings" (in October and November 2012). During these events Naval and Law Enforcement personnel from Kenya, Tanzania, Maldives, Madagascar, Seychelles, Yemen were trained by trainers from their countries who received the "Train the Trainers" Course in March. The theoretical and practical modules were supervised and amplified by NMIOTC instructors and trainers.

Proven to be a good model, the NMIOTC Supported DCoC National training will continue during 2013. Four two week periods have been already booked by IMO for such activities.

NMIOTC is proud that the high quality training products offered through the last four years since its inauguration were recognized and extensively used not only by NATO countries, but worldwide. Having IMO in our "customers" list gives us confidence that the path NMIOTC follows is the right one.

FROM MILITARY INTERVENTION TO JUDICIAL PROSECUTION: BRIDGING THE GAP

by Prof Henri Fouché

International naval forces have been operating since 2008 in the area off the Horn of Africa, the Red Sea and the western Indian Ocean in response to United Nations resolutions calling for assistance in combating Somali piracy in this region. The combined efforts of the international naval forces patrolling and responding to the threat have been responsible for a reduction in the overall figures for Somali piracy with many attacks having been thwarted or disrupted. There have, however, been many challenges to prosecuting the pirates intercepted and arrested by the patrolling navies. Many of the pirates who were captured since 2008 were released without being prosecuted. This article will attempt to identify some of the challenges to successful prosecution and will suggest recommendations as to how these challenges can be surmounted. The article will specifically examine the challenges to navies in terms of legislation, arrest, evidence collection, information sharing and prosecution.

1. INTRODUCTION

In the decades prior to the 21st century most attacks against ships worldwide took place in the territorial waters of states[1]. The re-emergence in 2000 of classical sea piracy committed on the high seas in an area outside the jurisdiction of any state, is largely due to the pirates of Somalia, taking advantage of the absence of a central government, military and police force and functioning criminal justice system in their country to create safe harbours along their coastline from which to launch attacks against ships steaming off the coast of Somalia. The problem of Somali piracy became so serious in 2008 that the United Nations, under its mandate in chapter VII to address threats to international security, passed resolutions[2], calling on all states to co-operate in the investigation and prosecution of persons responsible for piracy and armed robbery off the coast of Somalia. In 2011 it was reported that Somali pirates had aggressively attacked ships in the northern, eastern and southern coast of Somalia. Attacks by Somali pirates had also spread and taken place as far off as Kenya, off Tanzania, off Seychelles, off Madagascar, off Mozambique/ Mozambique Channel and in the Indian Ocean and Arabian Sea/ off Oman and off the west coast of India and off western Maldives[3].International naval forces have been operating since 2008 in the area off the Horn of Africa, the Red Sea and the western Indian Ocean in response to the UN resolutions. The combined efforts of the international naval forces patrolling and responding to the threat have been responsible for a reduction in the overall figures for Somali piracy with many attacks having been thwarted or disrupted. The role of the navies is critical to the anti-

[1] Barry Dubner in M.Meija & P.K. Mukherjee. "Selected issues of law and ergonomics in maritime security."Journal of International Maritime Law, 10(4) August-September 2004. Pp301-325

[2] UNSC Resolutions 1816 an 1851 (2008)

[3] International Chamber of Commerce-International Maritime Bureau report on piracy and armed robbery against ships for the period 1 January-31 December 2011.

piracy operations in this area[3]. There have, however, been many challenges to prosecuting the pirates intercepted and arrested by the patrolling navies. Many of the pirates who were captured were released without being prosecuted. In a report issued by the Special Advisor to the Secretary- General of the United Nations on legal issues related to piracy off the coast of Somalia[4], it is stated that over half of the suspected pirates captured since 2008 were released without being prosecuted and as of May 2010, more than nine out of every ten captured pirates are not being prosecuted. The International Maritime Organisation's (IMO) guidelines for the investigation of piracy[5], rightly points out that the capture, prosecution and sentencing of pirates and perpetrators of armed robbery against ships is probably the most appropriate deterrent action against piracy available to governments. This article will attempt to identify some of the challenges to successful prosecution and will suggest recommendations as to how these challenges can be surmounted. The article will specifically examine the challenges to navies in terms of legislation, arrest, evidence collection, information sharing and prosecution.

2. CHALLENGES TO NAVIES

In May 2009 the Secretary General of Interpol, Ronald Noble, pointed out that a law enforcement approach to dealing with sea piracy could provide a critical link between military interventions which led to arrests and the prosecution. In this regard he highlighted the need for information collection and sharing between the military and law enforcement agencies and the need to create databases with information on the people who are known to be involved[6]. In January 2011, the Special Advisor to the Secretary –General of the United Nations, while noting that most captured pirates were still being released without being prosecuted, reiterated the need for the current military effort to be complemented by judicial action to ensure successful prosecution of perpetrators as a deterrent[4]. What does a law enforcement element entail and how could it provide the link between capture and eventual successful prosecution of the suspected perpetrators? The law enforcement element is firmly anchored in sound investigative police work, apprehending offenders and gathering admissible evidence to ensure successful prosecution in a court of law. The element which has hitherto largely been underexploited by navies is the investigative phase during which evidence to prove that a crime has been committed and to link the suspected perpetrators to the crime is collected for court purposes. This is perhaps not surprising as the investigative task is best conducted using conventional detective methods, assisted by expert personnel specifically trained for that purpose. These functions are traditionally carried out by detectives and forensic investigators attached to states police forces and not naval personnel. The Contact group on Piracy off the coast of Somalia,[7] (CGPCS) took cognisance of this challenge when on 29 March 2012 the group noted the difficulty in ensuring successful prosecutions following naval engagement. The group went on to make a call to all parties to maximise efforts to preserve evidence and facilitate successful prosecution of pirate activity wherever possible[8]. The special advisor on legal issues related to piracy off the coast of Somalia concludes that the difficulty of assembling evidence is the main reason why pirates escape punishmen[4].

Crime Scene Walkthrough

2.1 LEGISLATIVE CHALLENGES: INTERNATIONAL LAW AND CONVENTION

The IMO Code of Practice for the investigation of crimes of piracy and armed robbery against ships, takes cognisance that the fight against piracy is often impeded by the absence of effective legislation in some countries for investigating reported cases of piracy and armed robbery. One of the reasons forwarded by many states for not prosecuting pirates is the lack of legislation.

[4] Report of the Special Advisor to the Secretary-General on Legal Issues Related to Piracy off the coast of Somalia. Annex to UNSC S/2011/30 dated 25 January 2011 form the Secretary-General to the President of the Security Council of the United Nations. P21.

[5] IMO Code of Practice for the investigation of crimes of piracy and armed robbery against ships. IMO Resolution A.1025(26) adopted on 2 December 2009.

[6] http://www.interpol.int/News-and-media/News-media-releases/2009/PR052

[7] The contact group on piracy off the coast of Somalia, based on UNSC resolution 1851, held its first meeting in January 2009 and identified, amongst other, the task for itself to strengthen judicial frameworks for arrest, prosecution and detention of pirates. Congressional Research Service report "Piracy off the Horn of Africa" April 19, 2010. Available at www.crs.gov

[8] Eleventh Plenary session of the contact Group on Piracy off the Coast of Somalia. New York, 29 March 2012

Guilfoyle (2011,960) and Kraska (2011,104) concur that the provisions of international law in relation to piracy are sufficient and that the problem lies with states that have not yet enacted national law designed to implement the provisions provided for in international law.

United Nations Convention on the Law of the Sea (UNCLOS)

The United Nations Convention on the Law of the Sea, (UNCLOS: 1982) is the basis on which a littoral states jurisdiction, rights, privileges and obligations at sea are built. UNCLOS superseded the Geneva Convention of the High Seas, which came into force in 1962 to establish a regime for the high seas and which remains in force for those states that are not party to UNCLOS. Article 101 of UNCLOS defines piracy as any illegal acts of violence or detention or any act of depredation, committed for private ends by the crew or the passengers of a private ship or a private aircraft and directed on the high seas against another ship or aircraft or the persons therein. In an audit conducted in January 2009 the International Maritime Organisation (IMO) found that very few of its members fully incorporate the definition of piracy contained in article 101 of UNCLOS, in their national legislations, nor does their national legislations contain a jurisdictional framework based upon the concept of universal jurisdiction regulated by UNCLOS[9]. To overcome these shortcomings some states (UK, USA), concluded bilateral agreements with Kenya to prosecute pirates captured by their navies. Such agreements, however, although providing a way of addressing the shortcomings of international law in the opinion of Guyo they may go against the international law of the sea (Guyo,2009:1)

Convention for the Suppression of Unlawful Acts against the safety of maritime navigation (SUA)

The second international treaty which provides for appropriate action to be taken against persons committing unlawful acts against ships is the SUA convention. These acts include the seizure of ships by force; acts of violence against persons on board ships; and the placing of devices on board a ship which are likely to destroy or damage it. Article eight of the SUA convention defines the roles and responsibilities of the master of a ship, the flag state and the receiving state in delivering any person believed to have committed an offence under article three of the convention to the authorities of any other state party to the convention (Article three includes the hijacking of a ship). Article 12 places an obligation on state parties to assist one another in connection with criminal proceedings brought in respect of offences including, amongst other, the hijacking of a ship. The Convention further obliges contracting governments either to extradite or prosecute alleged offenders. UNSC Resolution 1950 urges states party to the SUA convention to fully implement their relevant obligations under the SUA convention and customary international law. The non mandatory obligation, again, is that states incorporate the offences created by the SUA convention, such as the hijacking of a ship in article three, in their national legislations.

2.2 LEGISLATIVE CHALLENGES:

UNITED NATIONS SECURITY COUNCIL RESOLUTIONS

Resolution 1950- adopted on 23 November 2010

Resolution 1950, acting under chapter VII of the Charter of the United nations in point four renews its call upon states to take part in the fight against piracy off the coast of Somalia by deploying naval vessels and "through seizures and disposition of boats, vessels, arms and other related equipment used in the commission of piracy and armed robbery at sea off the coast of Somalia." The ICC-IMB Piracy and Armed Robbery Against Ships Report for the period 01 January to 30 June 2011,[10] on page 32 states that "there is an urgent need for continued action against the pirate skiffs and mother ships at sea. In this respect, the ICC- IMB urges all countries which have naval vessels in the region to adopt and incorporate the terms of United Nations Security Council Resolution 1950, which calls for the seizure and disposal of vessels, weapons and equipment used, or suspected of being used for piracy, into the Rules of Engagement to their naval commanders"

If interpreted literally by naval commanders, this call would lead to the destruction of valuable evidence necessary for producing in court during the prosecution of the suspected pirates. In April 2011 a merchant vessel designated to be declared a major crime scene and to be forensically examined by an Interpol response team with a view to evidence collection for the identification and prosecution of the perpetrators, was boarded by a team from a naval vessel en route to the port where the investigation was to take place.[11] The naval boarding party destroyed valuable evidence such

[9] Fouche in Petrig 'Sea Piracy Law" MPICC 2010 p148

[10] ICC-IMB Piracy and armed robbery against ships report 1 Jan- 30 June 2011

[11] Fouche & Meyer. 2012. Investigating Sea Piracy: Crime Scene Challenges. WMU Journal of Maritime Affairs. 11: 33-50 DOI 10.1007/s13437-012-0020-7

as the equipment, (specially manufactured aluminium ladders, grappling irons and ropes) used to gain access to the vessel as well as equipment (magazines for weapons) used during the armed attack on the vessel. Also destroyed during the boarding were medicine vials and addresses and handwriting of the perpetrators to who the medicine had been dispensed ashore as well as possible fingerprints on these items for identification.

Collecting Forensic Evidence at Maritime Crime Scene

The special advisor to the secretary General of the United Nations on legal issues related to piracy off the coast of Somalia in his report to the secretary general in Jan 2011[4], points out that at the operational level the objective of naval operations is to discourage and thwart attacks and arrest the pirates with a view to possible prosecution. He also emphasises the need for collecting evidence such as the weapons and equipment used in the commission of piracy, in order to facilitate prosecution.

Naval commanders need to bear in mind that the difficulty of assembling evidence remains the main reason why pirates escape punishment. Evidence which can used in court proceedings to assist the court in reaching a verdict as to the innocence or guilt of a suspected perpetrator needs to be zealously assembled and protected in terms of the rules of evidence. Point 12 of resolution 1950 calls upon flag, port and coastal states to cooperate in determining jurisdiction, the investigation and prosecution of all persons responsible for acts of piracy and armed robbery off the coast of Somalia. This is to ensure that all pirates handed over to judicial authorities are subject to a judicial process. If the flag state, for example, fails to lay a charge against perpetrators who had been positively identified and against whom a prima facie case existed, this would be against the spirit of point 12 of resolution 1950. Failure to lay a charge would also exonerate perpetrators who are identified from being arrested in terms of a warrant and would exclude such perpetrators from being handed over to the relevant judicial authorities for prosecution. As this call is not mandatory no action can be taken against member states who do not comply. Points 13 and 21calls upon all states to criminalise piracy under their domestic law, consistent with applicable international law including international human rights law and requests states contributing through the Contact Group on Piracy off the coast of Somalia (CGPCS) , to the fight against piracy off the coast of Somalia, to within nine months (from 23/11/2010) report to the CGPCS on progress in this regard. This call is not mandatory and states are not under legal obligation to report whether they have established jurisdiction or not. On the 14th July 2011, (eight months later) and again on 29 March 2012, (a further nine months later)the CGPCS reported progress on legal issues without giving an indication or report on progress with regard to criminalising piracy in the national legislation of states which have not yet done so.

Resolution 1976 – Adopted on 11 April 2011

At the same time the resolution notes with concern that the domestic law of a number of states lacks provisions criminalising piracy and /or procedural provisions for effective criminal prosecution of suspected pirates. The resolution also expresses concern over the large number of persons suspected of piracy having to be released without facing justice and again urges all states, including states in the region to criminalise piracy under their domestic law and emphasises the further importance of also criminalising incitement, facilitation, conspiracy and attempts to commit such acts. The resolution recognises that individuals and entities who incite or intentionally facilitate an act of piracy are themselves engaging in piracy as defined under international law.

Resolution 2020- Adopted on 22 November 2011

Points out that the failure to prosecute persons responsible for acts of piracy and armed robbery at sea undermines the anti piracy effort and reiterates its decision to continue its consideration, as a matter of urgency, of the establishment of specialised anti- piracy courts in Somalia and other states in the region with substantial international participation and/or support.

REINFORCING UNSC RESOLUTIONS

UNSC resolution 1950 requests certain states, that is, those states contributing to the fight against piracy through the CGPCS, and other states in the region to report within nine months on their efforts to establish jurisdiction and co operation in the prosecution of

piracy. It is interesting to note that this is a request for specific action within a specific time frame and that it is directed at only a certain number of states. It remains, however, a non-mandatory request.

It is suggested that in considering future UNSC Resolutions which address the strengthening of legal interventions, particularly where international peace and security is at stake, as is determined by resolution 1950 to be the case in Somalia, that states be obliged to report to committees created in terms of the particular resolution on actions taken with regard to compliance to the requirement of the UNSCR and further that the committees have the mandate to ensure compliance. An example of such a committee is the counter terrorism committee which was established to oversee the implementation of UNSC Resolution 1373 in September 2011.States were asked to adopt legislation called for under Security Council Resolution 1373 as soon as possible. All States had to report by 27 December 2001 and were asked to give summary descriptions of measures they had adopted, executive machinery that was in place and actions taken to fill the gap between their own legislation and requirements of Security Council[12]. They were also asked when that would be done, and whether they would need assistance (Technikon Pretoria, 2001).In April 2011 an Interpol Response team, assisted by a regional task team, conducted a forensic evidence gathering operation off the coast of Africa, onboard a vessel at the first port of call, after being released by Somali pirates[13]. During the operation several suspects were identified by photo album and DNA evidence. To date the ship owners have not registered a criminal case against the suspects in the flag state. The implication of this is that Interpol cannot issue international notices for the arrest and extradition of the suspects as the country requesting the arrest and extradition for the purpose of criminal prosecution needs to have a valid arrest warrant in force for the suspect in the requesting country. Guilfoyle (2011:960) points out that one of the gaps in the International treaty of UNCLOS is that although UNCLOS confirms the duty of all states to suppress piracy it makes the actual prosecution of pirates discretionary. A possible step in the direction of addressing this shortcoming could be to at least make it mandatory for flag states whose vessels are hijacked by pirates to lay a charge in that state in order that judicial proceeding can be initiated.

Taking Statements and Maritime Crime Scene

2.3 ARREST

The Special Advisor to the secretary general of the UN on legal issues related to piracy off the coast of Somalia points out in his report in January 2011[4],that naval operations should be conducted in order to, apart from discouraging and thwarting attacks, arrest the pirates with a view to possible prosecution. Article 105 of UNCLOS authorises every state to seize a pirate ship, or a ship under the control of pirates due to piracy and to arrest persons and seize property on board such a ship on the high seas or in any other place which does not fall under the jurisdiction of any state. Resolution 1816 of the UNSC authorises states to arrest suspected pirates in Somalia's territorial waters, with the advance consent of the Transitional Federal Government of Somalia (TFG). There are, however, constitutional restraints which apply when detaining persons at sea as most states limit the deprivation of freedom of a person to a maximum of 48 hours from arrest to appearance before a judicial officer of the court for a decision by the court as to whether the detention can be extended or the detained person freed[4]. Article 5 of the European Convention on Human rights (ECHR) contains procedural safeguards that a person lawfully deprived of their freedom has the right to be informed of the reason for their arrest, is entitled to access to a lawyer and has the right to challenge the lawfulness of their arrest (Colvin and Cooper, 2009). It is not always practicably possible to comply with these provisions at sea as a naval vessel cannot suspend its operations every time a pirate is arrested and return to port. According to Fouché (2010:52) based on the Medvedyev case in which the court dismissed a claim that the applicants had not been brought promptly before judicial authorities on the basis that there had been no reasonable alternative to holding them for the 13 days required to transport them to the

[12] See http;://www.un.org/Docs/sc/committees/1373/ for documentation on the Counter-Terrorism Committee's mandate, briefings by the Committee, reports filed by members.

[13] Servamus- community based Safety and security magazine,vol 104 June 2011 p.8 ISSN 1015-2385

nearest port, Roger Middleton reached the conclusion that holding suspected pirates for the period of time it takes for a naval vessel to get to a country where they can be arrested and prosecuted would not be in breach of article 5 of the ECHR, but that arrest and later release without prosecution may cause problems.

2.4 EVIDENCE COLLECTION

On 29 March 2012 the CGPCS noted the difficulties at times in ensuring successful prosecutions following naval engagement and called on all parties to, amongst other, maximise efforts to preserve evidence to facilitate successful prosecution of pirates[8]. Burnstein (1999:132) points out that no matter who collects evidence that person needs to be mindful that more is involved than simply looking for and collecting it. When evidence is presented at a trial it is subject to challenge. If it has been compromised or made suspect by the way it was handled when it was collected or during its examination or while in safekeeping while awaiting trial, it may be suppressed by the court when presented (Burnstein, 1999:132).Possibly years later the person who collected the evidence may have to account for the way in which it was collected, how it was subsequently handled and whether there was any possibility of it being contaminated or tampered with while in safekeeping pending trial. In this regard Saferstein (2004: 34-46)

Collecting Evidence for Transportation to the Forensic Science Laboratory

provides the advice that the crime scene can be recorded by means of photography, sketches and notes. He emphasises that the collection and packaging of physical evidence is important so that the integrity of the evidence value is maintained. In order to prove the continuity of possession of a piece of evidence in court every person who handled or examined the evidence must be accounted for. In his report to the secretary-general[4], the special advisor on legal issues related to piracy off the coast of Somalia proposed that an international model case report on acts of piracy and armed robbery at sea be formulated to assist naval forces in acquainting themselves with the procedure for evidence collection, and for ensuring the validity thereof[14]. In this regard he emphasises the need to maintain the chain of custody which could be compromised through transfer to another ship or aircraft. The special advisor points out that in order to build a case for prosecution such a case needs to begin with a set of evidence, such as the presence of equipment on board, a global positioning system, weapons, a large quantity of fuel, the composition of the crew and aerial observation of behaviour. Fingerprints of the suspects are also indispensable for establishing whom one is dealing with and for information sharing. The evidence which is more difficult to collect and which is best left to experts is the recovery from the crime scene of forensic material to assist with the identification of offenders and for linking the offenders to the crime scene and the elements of the crime. Such potential evidence at a crime scene needs to be protected until appropriately qualified personnel arrive to examine them[5].Naval personnel should be made aware that it is during the initial response that the greatest risk of crime scene contamination is present and also that they should advise the master and crew of any ship involved to provide protection for any possible evidence. Focussed questioning at the crime scene may lead to the identification and arrest of the offenders together with a description of the ship and the direction in which the ship was last heading[5]. Cole (2011:108) Programme Coordinator at the United Nations Office on Drugs and Crime (UNODC) provides an accolade for navies by stating that "it is noteworthy that the quality of the evidence packages passed to regional countries by foreign navies has improved dramatically since the early handovers in 2008 and that the prosecutors and judges of regional states now routinely report to the UNODC that the cases prepared by foreign navies (The navies of France, Germany, Italy, Spain, Sweden, the UK and the USA), are amongst the very best they see in their courts."

2.5 INFORMATION SHARING: INFORMATION CLASSIFICATION

UNSC 1816 (2008) urges all states to co-operate with each other in terms of sharing information about acts of piracy and armed robbery in the territorial waters and on the high seas off the coast of Somalia. Gottlieb

[14] According to Alan Cole only Kenya and the Seychelles have to date issued handover guidance for foreign navies,specifying the manner in which evidence packages should be produced by navies intending to transfer suspects for trial in those countries.

(2010:3) points out that sharing of information remains a major challenge in combating sea piracy due to the tendency of naval forces designating information gathered during their policing role on criminal activity as classified. The application of standard navy classification procedures would preclude the sharing of low level, yet essential, operational information such as fingerprints and photographs with law enforcement agencies (Gottlieb, 2010:5). The exchange of such information is imperative for the arresting party, usually a naval vessel on patrol, to establish who they have apprehended, specifically whether that person is being sought for previous crimes committed on the high seas or elsewhere and whether a valid warrant for that persons arrest and extradition is in force. Should this be the case time and money could be saved by handing the person over for prosecution to the authorities which are seeking that person's arrest.

A memorandum of understanding on maritime security co-operation between South Africa, Mozambique and Tanzania, concluded on 16 February 2012 and which gives the forces of the participating states the right to patrol, search, arrest, seize and undertake hot pursuit operations on any maritime crime or piracy suspect[15], does not specifically address the question as to how information collected on piracy by the three navies will be shared with law enforcement[16]. If the standard navy classification procedures are followed the classification of the information collected by the navies while performing a policing function will not be accessible to law enforcement. In this instance the "over classification" of operational information essential to executing the law enforcement function will need to be guarded against. In this regard it must be borne in mind that the navies in this instance will be performing a law enforcement function rather than a military function, pirates not being part of an opposing military force. Were the information to be classified it would preclude useful exchange of information with the policing agencies of the three countries which could initiate/expedite prosecution as well as providing and receiving useful information for the navies patrolling the Indian Ocean north of the Mozambique channel. It may also result in perpetrators driven south by the international navies evading prosecution when apprehended due to lack of information regarding possible previous encounters with military forces. Another problem created by not making provision for information sharing with law enforcement is the question of prosecution. On 15 March 2012 the Chief Maritime Strategy Director of the South African Navy stated during a briefing to reporters in Simons Town, on the state of the South African Navy, that once pirates were arrested it could be difficult deciding who dealt with their criminal prosecution[17]. This statement highlights the need for early co-operation between navies and law enforcement, with the possible inclusion of representatives of the prosecuting authorities at the outset of negotiations for MOU's.

Biolgy Dog at Work at Major Crime Scene

STANDARD OPERATING PROCEDURES FOR COMMUNICATION

In examining the challenges encountered in April 2011 during an evidence collection operation conducted at sea onboard a VLCC by an Interpol response team[11], it was found that the lack of standing operating procedures resulted in a lack of or poor communication and misunderstanding between the owners, ships agents, law enforcement, Interpol and the first responders from one of the coalition navies. A team from a naval vessel boarded the VLCC shortly after its release and did not provide information on their activities on board the vessel to the Interpol response team designated to conduct the evidence collection operation. Details of this first encounter with the freshly released hijacked vessel would have been useful to the IRT team in terms of information/intelligence gleaned by the boarding party regarding the modus operandi used by the perpetrators, information as to the type of crimes committed, the number of perpetrators who were

[15] MASHAMAITE, K.P. 2012. "Minister Sisulu signs Memorandum of Understanding (MOU) on Maritime Security Cooperation with Tanzania and Mozambique" available at http://www.dod.mil-za/news/ news2012/february/mar-sec-coop-tan-moz.htm

[16] Article 4 (8) of the Memorandum of Understanding between the government of the Republic of Mozambique, the government of the Republic of South Africa and the government of the United Republic of Tanzania makes provision for a supplementary agreement/protocol to the MOU in which the modalities of sharing information will be contained.

[17] Jenna Etheridge. IOL News "Piracy threatens South Africa" March 15 2012.< online> available at http://www.iol.co.za/news/crime-courts/piracy-threatens-south-africa-1.1257480?showComments=true

involved and other useful information, such as in the incident in question, that the vessel had been used as a mother ship and that one of the pirates had died on board the ship.

FORMAL COMMUNICATION BETWEEN NAVIES, POLICE FORCES AND INTERPOL

Naval forces do not necessarily have a criminal databasis on personal information of suspects, fingerprints and DNA which are stored on police databasis and which are essential for comparison with data on apprehended pirates. The international police organisation, Interpol proposes three models by which information regarding law enforcement activities can be shared between navies and national police forces.

- The navy forwards the information gathered to its country or to its countries Interpol NCB which in turn can communicate the information to other NCB's and Interpol's general secretariat.

- The Navy communicates directly with Interpol through an extension of the communication system of the NCB of that country.

- The exchange of information can take place between Interpol and another international organisation with which Interpol has concluded an agreement (Gottlieb, 2011:14)

2.6 PROSECUTING THE PIRATES: OPTIONS FOR NAVIES

2.6.1. Embarked Officers.

Embarking law enforcement officers from states in the region in terms of article 7 of the Djibouti Code[18]. The aim of article 7 is to give effect to UNSC 1851 by embarking regional law enforcement officers on the host participants vessel to assist with the arrest of the piracy suspects and to conduct the investigation necessary for the prosecution in the state which provided the embarked officers

2.6.2. Prosecution in the country of the arresting warship.

This will be dependent on, amongst other considerations, whether the country of the arresting warship has fully incorporated the definition of piracy in article 101 of UNCLOS in their national legislation and the degree to which jurisdiction over piracy as an international crime which can be subject to arrest and prosecution anywhere in the world has been established. Kontorovich believes that countries may only be willing to bear the high cost of prosecution if their own ships and crews were subject to attack. He also believes that countries who claim that they do not have jurisdiction may be doing so to conceal their political unwillingness to prosecute[19].

2.6.3 Prosecution in the flag state

Flag states which have ships on their register for flags of convenience may not have the necessary resources or may be unwilling to prosecute.

2.6.4. Hand over to Somali authorities for prosecution.

Current thinking favours the "Somalialization" of solutions which foresees a strengthening of the rule of law by the establishment of a court system comprised of a specialised court in Somaliland and an extraterritorial Somali specialised court established temporarily outside Somalia[4]. On 14 July 2011 the CGPCS noted the need for mechanisms to enable navies to quickly hand over captured pirates to competent state authorities for prosecution, using in particular evidence collected on board naval vessels[8].

2.6.5. Memorandums of understanding (MOU's) with third states in the region

Memorandums of understanding with third states in the region to undertake the prosecution and incarceration of suspected and convicted pirates. Countries in the region which are being assisted by the UNODC with judicial, prosecutorial and police capacity building programmes to empower them to assist with prosecuting the captured Somali pirates are Tanzania, Mauritius, Maldives and Seychelles[20].

Prosecution of Pirates

2.6.6 International court.

To try cases of piracy in an international court would be costly and time consuming. Such trials would have to be based on international treaty, which would require a lot of political cooperation between states

[18] Djibouti code of conduct concerning the repression of piracy and armed robbery against ships in the Western Indian ocean and the Gulf of Aden http://www.imo.org/OurWork/Security/PIU/Pages/DCoC.aspx

[19] Eugene Kontorovich. Piracy and international law. Available online:, http://www.globallawforum.org/ViewPublication.aspx?ArticleId=96>

[20] UNODC and Piracy. Available online http://www.unodc.org/easternafrica/en/piracy/index.html

(Allesandri,2009:5)

3. FINDINGS

3.1 A major challenge to prosecution is that very few states which are members of the IMO have fully incorporated the definition of piracy in article 101 of UNCLOS in their national legislations, nor do their national legislations contain a jurisdictional framework based on universal jurisdiction regulated by UNCLOS.

3.2 The ICC-IMB request to countries operating navies in the region of Somalia to incorporate UNSC res 1950's call for the seizure and disposal of vessels, weapons and equipment used for piracy into their rules of engagement may lead to valuable evidence, which could have been used for court driven prosecutions, being destroyed.

3.3 The risk of contamination of evidence is greatest during the first response to an attack.

3.4. Lack of standard operating procedures for dealing with an event which includes interaction with the role players who have a stake in the proceedings may lead to misunderstandings and non adherence to crime scene management principles, leading in turn to the destruction of evidence.

4. RECOMMENDATIONS

4.1 It is recommended that in considering future UNSC Resolutions, particularly those which address the strengthening of legal interventions where international peace and security is at stake, that states be obliged to report (mandatory) to committees created in terms of the particular resolution on actions taken with regard to compliance to the requirement of the UNSCR and that the committees have the mandate to ensure compliance.

4.2 It is also recommended that it be made mandatory for ship owners to lay a criminal charge in the flag state against identified perpetrators of acts of piracy, hostage taking and kidnapping, to enable Interpol to issue red notices for arrest and extradition to the prosecuting state.

4.4 That the rules of engagement for navies operating off Somalia encompass specific provisions for the zealous protection of possible evidence which can be used in court for securing successful prosecution during court proceedings.

4.5. That the details of suspects arrested at sea be communicated to International Law Enforcement (Interpol) via the agreed upon channels, together with a précis of the circumstances of capture in order to possibly positively identify the suspects and or connect them with other crimes. The information obtained from a search of Interpol's database may affect the decision whether to prosecute or not. Also for Interpol to assist with possible suggestions as to where the suspects might be taken for prosecution.

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WHAT IS THE NATO MARITIME C-IED INITIATIVE?

By CDR Raymond Albarado, NATO ACT C-IED IPT

Improvised Explosive Devices (IEDs) continue to be the primary casualty-producing weapon and tactic against NATO forces; this threat will not end after NATO refocuses its mission in Afghanistan in 2014. Without increasing efforts to Attack the Networks (AtN) that facilitate the employment of IEDs and the institutionalization of C-IED capabilities developed during ISAF, NATO will not be prepared for post ISAF operations, will continue to take unacceptable casualties and be challenged in future operations.

The oceans connect nations globally through an interdependent network of economic, financial, social and political relationships and provide a means of transportation for 90% of the world's commerce. The evolving international situation of the 21st century combined with the increasing complexity of global commerce, the rapid spread of advanced weapons including IEDs and the potential threat from both state and non-state actors may challenge mission areas the Alliance has historically dominated. Therefore the Alliance must institutionalize C-IED capabilities and adopt a comprehensive approach requiring new levels of interdependence between states, international organizations and non-governmental organizations to maintain freedom of navigation, sea-based trade routes, critical infrastructure, energy flows, protection of maritime resources and environmental safety.

THE GLOBAL IED THREAT

One of the significant threats facing NATO in the foreseeable future is the non-conventional/irregular, non-state, regional, and trans-national threat networks. This includes insurgents, terrorists, criminals, weapons traffickers, pirates, etc. These networks have all recognized the benefits of using the IED as a tactical, operational and strategic weapon of choice against the Alliance, nations, and partners. In addition to killing or wounding more than 15,000 NATO forces in Afghanistan since 2001, from January 2011 to October 2012 there have been 12,461 IED events globally (outside of Iraq and Afghanistan), averaging 556 events a month, resulting in 27,169 casualties in 121 countries conducted by 51 regional and transnational threat networks[1]. There were also over 20 recorded IED-related incidents in the maritime environment recorded between November 2010 and Jan 2012[2]. Consequently, the IEDs success as a weapon system provides threat networks with a disproportionately effective capability against the Alliance and our partner nations.

NATO has been directly dealing with insurgent and terrorist threat networks, especially ones that facilitate IED use within the ISAF Joint Operating Area (JOA) since 2003. NATO's success in interdicting these networks has had limited results[3].

To date, NATO has dedicated the majority of its C-IED efforts to Defeat the Device (DtD) and Prepare the Force (PtF) requirements. This defensive approach has achieved modest success. The more proactive and offensive Attack the Networks (AtN)[4] approach is necessary to impact the continued use and emplacement of IEDs. Success in AtN operations to interdict and defeat threat networks facilitating the use of IEDs requires synchronized joint, interagency, multinational

1 Institute for Defence Analysis (IDA) Worldwide Improvised Explosive Database, 1 Jun 12.

2 AllenVanguard Counter Threat Solutions TRITON Database.

3 US JIEDDO ISAF 3rd Quarter 2012 Statistics Report dated May 2012.

4 It is important to understand that valuable lessons learned from the land domain in ISAF have been written in blood. The current C-IED doctrine, AJP 3.15(B), is an excellent document that explains the current C-IED approach and strategy for the alliance and any other organization that desires to reduce the effect of IEDs. Though written with a focus on the land domain, its approach can serve as a template or framework for all domains.

as well as political efforts to understand, anticipate, warn on, and interdict threat networks enabling adversary activities both within the JOA and in the NATO Area of Interest (AI). Accordingly, NATO has made AtN its main effort but the final step needed is the institutionalization of C-IED Capabilities to transform the Alliance in order to succeed in future conflict environments.

The oceans are vast but have well recognized choke points, infrastructure and areas of high naval and commercial traffic. The ability to maintain open seaways against threat networks that would seek to close them or otherwise exploit them, for their own gain, either politically, strategically or financially, will be paramount to the security and good order of the seaways. Thus maritime operations, although having not received the same level of attention as the land counterpart, have an important and integral part to play in countering these transnational threat networks—inter alia facilitating the use of IEDs. While much of the existing C-IED doctrine is entirely relevant to the maritime component, there are unique challenges and operational differences that need to be considered. The NATO initiative for C-IED in the Maritime Environment (ME) seeks to highlight and subsequently resolve these issues and so steer the Alliance toward an enhanced maritime operational capability and effectiveness in countering threat networks in the ME.

24 Jan 2011, Reconnaissance of the Suez Canal undertaken by Al Qaida prompting discussion on the best way to attack US warships traversing the waterway. Discussions revealed examples of improvised Limpet devices for use by suicide swimmers and timed devices utilizing chemical time pencils.[2]

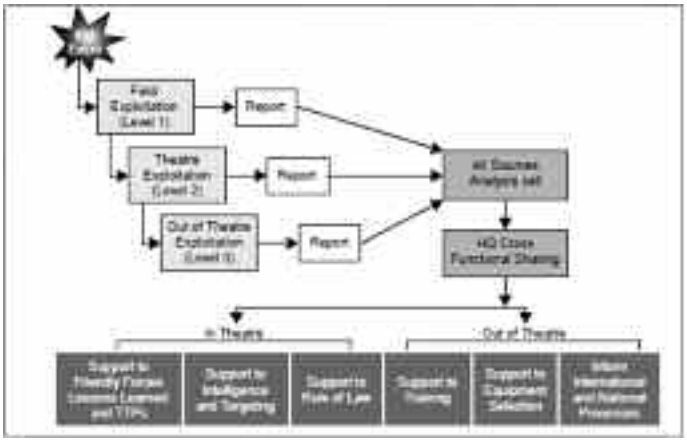
Threat networks in the ME have exploited the modern maritime industry for decades. Whether attacking a vulnerable naval vessel in a confined waterway, targeting critical oilrigs or in hijacking a commercial trader for ransom or other motives, they have exploited a vulnerability that uses sea lanes to move personnel and resources regionally and across continents. The blatant paradox is that the same sea-lanes that provide our economic lifeblood supply our adversaries as well.

The adversary IED system diagram shown below is representative of any threat system, criminal or terrorist, where the key planning elements and action steps leading up to execution of an activity can be identified for intervention action. It is these steps—i.e., networks—that need to be targeted to prevent an attack from occurring. One of the enduring capabilities that enables these intervening actions is through intelligence driven, evidence based, operations.

INTELLIGENCE AND EXPLOITATION

Intelligence gathering, including information obtained from the exploitation of recovered materiel and biometric data are vital components of an effective AtN and counter-threat networks approach. This intelligence and information can be added to wider all-source intelligence so that the best possible understanding of adversary capabilities and intentions, perpetrator relationships and threats can be achieved. The production and dissemination of fused intelligence assessments informs operational planning and targeting processes which can be both kinetic and non-kinetic in nature. Biometric data, if collected and processed correctly, can also—with other evidence—support prosecution of terrorists, criminals, pirates and other adversaries.

The NATO C-IED exploitation model (shown below) provides a process to exploit recovered (IED)



material and personnel. Although focussed on C-IED requirements, the mechanisms and processes offer a sound framework for expansion to meet wider counter threat network requirements including within the maritime domain. Established NATO exploitation activities occur in three successive and progressive stages: in the field (Level 1), at theatre-level (Level 2) and out of theatre (Level 3), although there may be situations when not all three of the stages are employed. The application and employment of these levels, as well as scales of deployment, are decisions for the force commander to determine, influenced by higher-level policy and host nation legal requirements.

MARITIME INTERDICTION OPERATIONS (MIO) AS AN ENABLER

Maritime forces perform a range of maritime security operations, including counter-proliferation, counter-terrorism, counter-piracy and more routine maritime interdiction operations in oceans, seas, bays, estuaries, waterways, coastal regions and ports. MIO is the ideal capability to employ in countering threats and mitigate the risks of illegal or threatening activities at sea, as well aiding the free passage of shipping. MIO can be seen as vital in isolating adversaries from external support via the waterways, and can reduce the effectiveness of threat networks such as piracy and criminality, both of which are funding sources for terrorist activity. Naval support may involve the provision of deterrence and presence patrols that enforce sanctions or blockades and can assist with AtN activity by disrupting adversary supply lines and identifying the individuals responsible as well as collecting information from boarding's that could be exploited and used to feed into the intelligence cycle.

THE MARITIME ENVIRONMENT (ME) BRINGS ADDITIONAL CHALLENGES

At sea, MIO is the vehicle for direct intervention into the adversaries system and initiation of the subsequent processes to exploit the evidence and intelligence gathered. Although no parallel exists or guidance yet provided in NATO maritime doctrine, exploitation activities are as applicable to maritime operations as on land and are in any case commonly carried out at the national level by maritime agencies other than navies.

A maritime exploitation model would almost certainly reflect a tactical or field capability (level 1), embedded within boarding personnel, and then the capacity to exploit findings which may be addressed through the expedient utilisation of an existing capability. However, due to the obvious restrictions of maritime operations, it is more likely to be a strategic hub with the capacity for technical exploitation at both L2/3 with permission to liaise with other military and non-military organisations.

SOME CAPABILITY GAPS AND THE NECESSARY ENDURING CAPABILITIES

The apparent shortfall in NATO Counter Piracy (CP) capability, specifically in evidence collection to support the prosecution of suspected pirates, is highlighted in a recently published (July 2011) Joint Analysis and Lessons Learned Centre (JALLC) study. This work covered external information sharing in support of CP operations and one of the key findings was that:

"…NATO does not currently provide comprehensive training in law enforcement activities to its maritime forces and such training is needed, especially on the collection and preservation of evidence needed by foreign or international courts for the prosecution of suspected pirates"

There is also increasing acknowledgement of the need for units and ships to undertake tactical-level exploitation activities. In the maritime domain, this goes beyond securing the scene of incidents, as on land, in order to preserve material of forensic and technical value for specialist exploitation by Weapons Intelligence Teams.[5] In the maritime environment, naval forces are unlikely to be able to call on assistance from dedicated teams and skills must be embedded in boarding teams but beginning at the basic awareness level throughout the force.

Given the likely isolation of target vessels, boarding parties must be able to conduct tactical questioning of persons found onboard, perform search to gather intelligence and correctly (and lawfully) recover material and biometric data for higher level exploitation. They must also be capable of planning and effectively executing such search, intelligence gathering and exploitation tasks, consistent with the safety factors imposed by the environment. Military requirements,

5 Weapons Intelligence Teams (WIT) often deploy to assist Explosive Ordnance Disposal (EOD) teams in the investigation of IED events. See AJP 3.15(B) or STANAG 2298, NATO WIT Capability Standards for further information

especially the need for rapid outputs, may mean that conditions and processes employed at sea are not identical to traditional crime scene investigation methods. Although some degree of compromise may be necessary, continuity of evidence procedures must be observed if cases are likely to result in legal action and prosecution through the courts.

Recovery and examination techniques must be non-intrusive and non-invasive in order to preserve the maximum amount of forensic and technical evidence for higher-level exploitation, unless immediate safety requirements dictate otherwise. In order to ensure that boarding parties and maritime security personnel are fully capable, they should be equipped and trained in the use of manual (fingerprinting and DNA collection) and automated systems (e.g. SEEK II, HIIDE etc) in order to enrol personnel onboard vessels, consistent with extant data protection policies. Teams can also be expected to produce reports and assessments to support wider J2 analysis and operational planning. Reports can provide rapid intelligence assessments of emerging trends and changing adversary TTPs.

For planned maritime operations, a strict level 1 to level 2 to level 3 hierarchy and approach may not be appropriate depending on scale, rate of effort and duration. It is assessed that for typical naval component command / task force deployments, search & exploitation-trained boarding parties would form part of the force structure from the outset. The intelligence, material and biometric data would need to be passed to J2 staff, ideally in an all-source intelligence fusion centre with exploitation staff representation for assessment and linkage of cases. Recovered hardware and evidence could be transported directly from theatre via secure transportation to appropriate reach-back facilities in the home base for detailed examination and evidential processing. In this instance level 2 facilities are not required, but the intelligence fusion centre would act as a hub for control and information management. A hub approach ensures timely assessment and intelligence provision for the force, as well as chain of custody assurance through compliance with accepted protocols.

In the maritime domain, search is a key component of MIO. The maritime environment offers specific challenges for the conduct of search in comparison to land-based search execution where teams can be expected to be working onboard vessels at sea in remote locations, in confined spaces and with limited support available. Nationally, search at sea may well be an embedded capability within boarding teams, but the application is not consistent and consists largely of rummage search techniques inappropriate for threat led search activity, where items found are to be treated as evidence likely to be used in a criminal prosecution. Current search doctrine[6], while providing a platform for maritime search operations, is not entirely sympathetic to the requirements of seaborne search or the skills required but can relevant considerations in support of efforts to counter the IED threat.

THE ACT MARITIME INITIATIVE

Terrorism, criminality and piracy are threats to the freedom and safety of maritime navigation, undermining economic security, and contributing to the destabilisation of governance and the global security situation. The compromise of one strategic waterway or chokepoint, even for limited duration, can have a strategic economic effect nationally and globally; such is the reliance of nations on sea trade routes and communications.

Through the NATO C-IED Action Plan, the NATO ACT C-IED Integrated Product Team (IPT) has been tasked to assess the ability of the alliance to counter IEDs in the ME. To date, the IPT has conducted a Maritime C-IED Community of Interest (CoI) workshop, co-hosted with the COE CSW in October 2012. The aim of this initiative is to establish a CoI to discuss the issues and challenges, to share information and best practices, and to come to a general consensus on potential ways forward for NATO in order to influence and improve and develop National and NATO capabilities to counter IEDs in the maritime environment. The first meeting revealed that some of the biggest challenges are not necessarily equipment and material resourcing but understanding and buy-in at all levels. The next conference is scheduled for 12-14 March 2013 in Kiel, Germany.

NOTE: The NATO C-IED Campaign Plan continues to be staffed for ratification and any maritime strategy will be aligned with that plan. The aim is to pull together all aspects of the much more developed concepts and strategies for similar land based operations and to revise them with a joint operational aspect.

Further Information

Further information on C-IED in the ME Initiative and upcoming conferences is available from NATO ACT C-IED IPT at www.c-ied.org.

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6 ATP-73 Vol 1 Military Search and ATP-73 Vol 2 Military Search (Techniques & Procedures).

COURSES, EXERCISES AND TRAININGS

WMD in MIO Course
11-15 June 2012

Pilot Maritime C-IED Course
2-13 July 2012

Training HMS DIAMOND
26-28 June 2012

COURSES, EXERCISES AND TRAININGS

Eurasia Pratnership Capstone 2012
10-14 December 2012

Training of the French Ship ACONIT
1-3 February 2012

Training of German Specialized Boarding Company
10-20 September 2012

Training of HMS SOUTHERLAND
23-25 July 2012

"MIO IN AN ERA OF CONVERGING – DIVERGING MARITIME SECURITY OPERATIONS"

By Erik Sandahl, NATO HQ/Operations Division

"Since 90% of the world's trade must travel by sea, and 95% of all military logistics must go by sea, the Navy is utterly essential to the freedom and security of all nations. This was not changed by 9/11." (Dr. John Lehman, former USN Secretary).

In all Western countries, the Cold War's conclusion led to a reduction in armed forces, including fleet size (the U.S. Navy now has the smallest sized fleet since the 1930's). Since the end of the Cold War, defence spending by the European NATO allies has fallen by almost 20%. Over the same period, their combined GDP grew by around 55%. Within NATO, if one compares Europe's spending with that of the United States, the contrast is also large. By the end of the Cold war, in 1991, defence expenditures in European countries represented almost 34% of NATO's total, with the USA and Canada covering the remaining 66%. Since then, the share of NATO's security burden shouldered by European countries has fallen to 21%.

Obviously, the current global financial and economic crisis is likely to increase the existing gap. Thus affecting significantly the global distribution of military power within the Alliance and in the world. According to the Stockholm International Peace Research Institute, between 2000 and 2009, India's defence spending grew by 59%, and China's tripled. This led to a double leap forward: a transformation of these countries' armed forces and their acquisition of new weapons systems.

Operations in the Balkans, Iraq and Afghanistan worsened the decline of navies in allied countries by shifting attention away from emerging powers' maritime challenges or Iran's rise as a regional maritime – and potentially nuclear - power. The prospect that the Arab Spring will again return the Mediterranean to its historic position as an intersection of conflicting interest cannot be ignored. Piracy could affect other regions than the Horn of Africa. Terrorists could shift their activities to critical sea lines of communications and vulnerable energy infrastructure ashore or off-shore.

However, Operation Unified Protector last year, which involved an important maritime component, with the arms embargo on Libya, sends a more positive signal. This operation showed that European countries, even though they spend less on their militaries than the US, can still play a central role in a complex military operation, with the support of US and NATO's unique capabilities, and partners' contributions.

After the US, Europe still holds the world's most advanced military capabilities. The question, however, is whether Europe will be able to maintain this edge in 5 or 10 years.

In this context, I will try to explain what NATO is currently doing at the politico-strategic and at the operational level in the maritime domain and what could be envisaged in the future in the context of the Smart Defence concept. A lot is being done. A lot more remains to be done.

I. WHAT IS NATO DOING?

Developing new Concepts and Policy.

The NAC approved two important documents in 2011 that frame the debate on future NATO maritime activities and operations.

The Alliance Maritime Strategy "sets out the ways that maritime power could help resolve critical challenges facing the Alliance now and in the future, and the roles - enduring and new – that NATO forces may have to carry out in the maritime environment in order to contribute to the Alliance's defence and security and to promote its values. These roles capitalise upon the ability of maritime forces to provide a spectrum of strategic options to the Alliance, and include appropriate contributions to Deterrence and Collective Defence; Crisis Management; Cooperative Security: outreach through Partnerships, dialogue and cooperation; and Maritime Security."

The MC Concept on MSO describes the tasks which NATO should be able to undertake (e.g. support MSA; uphold freedom of navigation; fight against proliferation of WMD; protect critical infrastructure; support maritime counter-terrorism; contribute to maritime security capacity building). It also touches on current military capability and focuses on likely requirements to

undertake MSO effectively in the future. The NMAs have been tasked to provide an Implementation Concept for MSO, which is expected to be ready by October next year.

Both conceptual documents are fully in line with the new Strategic Concept approved at the Lisbon Summit in November 2010, forward-looking and ambitious, but also pragmatic and resource-conscious. Their implementation will be conducted in line with Smart Defence, which is a the heart of NATO's new approach, as stressed at the Chicago Summit by NATO Heads of State and Government in their declaration on defence capabilities: Toward NATO Forces 2020.

Alongside this conceptual approach, a far-reaching decision was taken in 2011 to transfer the command of all maritime operations to MC Northwood in 2013. The new single Allied Maritime Command will be the hub, at operational level, for all NATO maritime operations. With its integrated structure, it will be able to advise, plan, conduct and support joint operations to influence security from the sea. Collocated with the EU maritime component command, it will maintain, at staff level, a close link with the EU and build upon the practical experience accumulated so far in operations Ocean Shield and Atalanta. It will also establish and maintain relations with non-NATO operational partners and facilitate their engagement in NATO-led operations and activities, in peace or times of crisis.

Reviewing current maritime operations and looking at the future.

Operation ACTIVE ENDEAVOUR, launched in October 2001 to counter the threat of terrorism in the Mediterranean Sea in the wake of the attacks of the 11 September 2001 has evolved considerably overtime. It is currently transitioning from a platform-based to a network-based operation. The new concept consists currently into a combination of assets on call and regular surge and deterrence operations. The transition of OAE, to be successful, requires the development of a robust information sharing network, to provide accurate and permanently updated maritime situational awareness. OAE already provides good value for money, in particular with regard to interoperability, enhanced maritime awareness, engagement of operational partners and information sharing. The establishment of an effective sensor and non-sensor network will require some 4 to 5 years if the required measures, resources and equipment are provided by Allies. NATO nations are currently considering strategic options for the future of OAE.

Operation Ocean Shield, launched in 2009 as a contribution to the international community's efforts to counter piracy off the Horn of Africa, works in close coordination with other key actors, including Task Forces (ATALANTA, CTF 151) and independent deployers (China, Russia, India, Japan and others, like South Korea and the United States). They have contributed to a significant decrease of pirate attacks in 2011. The focus in on escort and protection of merchant vessels in the IRTC in the Gulf of Aden.

In approving the Strategic Assessment for Operation Ocean Shield last March, the NAC agreed to enhance NATO action at sea under the current mandate and OPLAN, with revised ROEs. NATO nations also agreed to extend this operation until December 2014. They are currently discussing the Periodic Mission Review of this operation and will consider different options, taking into account recent developments affecting piracy in Somalia and in the region.

Both operations suffer significant critical shortfalls to be fully effective. A critical capability will be ISR. Providing commanders with an accurate, comprehensive, permanently updated Recognised Maritime Picture thus enhancing the Maritime Situational Awareness (MSA) requires a range of surveillance assets and the development of an effective information sharing network. In this regard, it is of utmost importance to enhance the engagement of partners and the coordination with relevant international and regional agencies.

II. CAN WE DO MORE IN A GENERAL CONTEXT OF SCARCITY AND REDUCED RESOURCES ?

On the paper (AMS, MC Concept for MSO, OPLANs, Summits and Ministerial Meetings' communiqués), NATO's ambitions are high. Our capabilities remain significant as demonstrated last year in OUP. But those made available by nations for our current maritime operations remain limited.

Whatever NATO nations envisage for the future in the maritime domain, it is clear, and I will quote the MC Concept for MSO (MC 0588) approved by the Military Committee and the Council, that some key conditions must be met:

- "Every effort should be made to leverage existing and already planned capabilities to enhance MSO effectiveness. Concurrently, actors within the Maritime Environment (ME) should endeavour to avoid duplications of existing capabilities. Careful consideration to the funding of operations costs generated by the task to provide rapid response will also

be required.

- Whilst primarily relying on existing assets and resources, Allies will be guided by the NATO Defence Planning Process (NDPP) in the development of capable, flexible, rapidly deployable, interoperable and sustainable maritime capabilities.

- Establishing formal NATO relationships with emerging regional maritime organisations, where capacity already exists, may also offer an attractive way of mitigating some of these requirements.

- Inexpensive information sharing mechanisms for working in coalition with willing partner nations, in support of Maritime Security, should also be considered as a force multiplier. "

It is clear that the way forward lies in not spending more but in spending better – by pursuing multinational approaches, making the transatlantic package of capabilities more strategically oriented, and working with emerging maritime powers to manage the effects of the globalisation of security.

NATO and especially European NATO nations, as recommended in the new Strategic Concept adopted in Lisbon in November 2010, should pursue a "smart defence" approach, i.e. building security for less money by working together and being more flexible. This requires identifying those areas in which NATO allies need to keep investing. Priorities should be set on the basis of threats, cost-effectiveness and performance – not budgetary or prestige considerations alone. Keeping a deployable army, a powerful navy, and a strong air force costs money and not all European countries can afford to have a bit of everything. European nations should work in small clusters to combine their resources and build capabilities that can benefit the Alliance as a whole.

European countries can help bridge the gap with the US by increasing their contribution to two ingredients: deployable and sustainable maritime capabilities. This requires an open and truly strategic dialogue between the US and European allies to discuss issues of common concern. In this regard, particular efforts should be made to ensure that the two major Euro-Atlantic security providers, NATO and the EU, cooperate more closely.

Finally, NATO should work more closely with key emerging powers (China, India). Fostering a mutually assured dialogue with these countries would help defuse crises, overcome disagreements and clear-up misperceptions. Working together, for instance in the context of counter-piracy, as it is currently the case off the Horn of Africa, in counter-terrorism or counter-proliferation of WMDs, could eventually lead to a common understanding of how to build twenty-first-century global security , which entails a sense of shared responsibility.

I will conclude by quoting Anders Fogh Rasmussen, the NATO Secretary General,

"The economic challenges that European nations face are immense, but that should not prevent them from seeing the wider strategic picture. Uncoordinated defence cuts could jeopardise the continent's future security. Libya can act as a wake-up call, but this mission needs to be followed by deeds. Making European defence more coherent, strengthening transatlantic ties, and enhancing NATO's connections with other global actors is the way to prevent the economic crisis from becoming a security crisis."

Views expressed are personal and do not reflect the positions of NATO

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IS MARITIME SECURITY A WICKED PROBLEM?

by Dr. Alec Coutroubis and George Kiourktsoglou , PhD candidate

In this article we wish to briefly examine maritime security (MARSEC) not in a conventional way used by industry experts, but through the lens of a social policy planner. The latter leverages the very unique concept of 'wicked problem(s)' to work out solutions under the most extreme of circumstances, more specifically, when the key-stakeholders do not have the same understanding of the problem.

THE MARITIME SECURITY PROBLEM

Maritime security is a very broad field of study and often brings together under the same roof interests from extremely diverse backgrounds. In the case of Somali piracy for instance, supra-national (United Nations, International Maritime Organization, International Maritime Bureau), national (Governments, Navies, Intelligence Outfits) and private interests (shipowners, charterers, private maritime security companies, marine insurers) from around the world have successfully coordinated their efforts with Non-Governmental Organizations both to avert human suffering of Somalis and seafarers, and to work on a sustainable, long-term solution.

For such a remarkable alignment of the international community behind a common cause, it strikes as particularly impressive given that the stakeholders have (to put it diplomatically) very diverging views of the challenge. If you ask a marine insurer, a naval officer, a politician, a UN officer, a private maritime security professional, even a Somali, 'what is the problem with piracy and its practitioners?' they will all give you widely diverging definitions of the problem (if any at all…)!

Start with shipowners for instance. They most probably will underline the misery of the seafarers in captivity, insurance premiums, and then the loss of income (if not property). Politicians will focus on the human drama, regulatory issues (on the use of armed guards onboard merchant vessels) and potentially on the economic sustainability of naval fleets off Somalia. United Nations officers will express their feelings for the suffering both of Somali people and captive seafarers, and will further elaborate on issues of regional (prosecutorial) capacity building and national legislation. Marine insurers will express their absolute horror face to the risk of losing millions in insurance cover-payments to shipowners. Last but not least, many Somalis in Puntland will express (worst case scenario) sympathy for the Somali 'coast guard' protecting their ocean natural resources. With such a plethora of different perspectives on the problem, one is seriously tempted to call it a 'wicked problem'.

Distinguishing properties of 'wicked problems'

'Wicked problems' share at least ten different distinguishing properties which are responsible for their unique nature. For all it matters though, the hallmark of these problems which have traditionally pestered policy makers and social planners, has remained all along the same: they can be 'solved' neither as 'simple' nor as 'complex' ones. Traditional analytical thinking (even iterative methods) used in engineering and sciences cannot yield 'solution(s)' to a 'wicked problem'. At best, the planner can hope for 'improvements' or (as some social scientists put it) a re-solution. A 'clear-cut/endgame solution' is beyond reach by default.

Rittel and Webber (1973, p. 161) explicitly lay out the ten distinguishing properties of 'wicked problems':

1. There is no definitive formulation of the a solution to a 'wicked problem'; For any given tame problem, an exhaustive formulation can be stated containing all the information the problem-solver needs for understanding and solving the problem, provided he knows his 'art', of course. This is not possible with wicked-problems.

2. 'Wicked problems' have no stopping rule; when solving a chess problem or a mathematical equation, the problem-solver knows when he has done his job. There are no criteria that tell when a solution has been found.

3. 'Solutions' to 'wicked problems' are not true-or-false, but good-or-bad; you cannot ever 'solve' a 'wicked problem' in the traditional analytical sense. You can only improve the situation that produces the problematic.

4. There is no immediate and no ultimate test of a 'solution' to a 'wicked problem'; […], any 'solution', after being implemented, will generate waves of consequences over an extended, virtually an unbounded, period of time.

5. Every 'solution' to a 'wicked problem' is a 'one-shot operation'; because there is no opportunity to learn by trial-and-error, every attempt counts significantly; with a 'wicked problem', however, every implemented

solution is consequential. It leaves 'traces' that cannot be undone.

6. 'Wicked problems 'do not have an enumerable (or an exhaustively describable) set of potential 'solutions', nor is there a well-described set of permissible operations that may be incorporated into the plan; There are no criteria which enable one to prove that all solutions to a 'wicked problem' have been identified and considered.

7. Every 'wicked problem' is essentially unique; […] despite long lists of similarities between a current problem and a previous one, there always might be an additional distinguishing property that is of overriding importance.

8. Every 'wicked problem' can be considered to be a symptom of another problem; Problems can be described as discrepancies between the state of affairs as it is and the state as it ought to be. The process of resolving the problem starts with the search for causal explanation of the discrepancy. Removal of that cause poses another problem of which the original problem is a 'symptom'.

9. The existence of a discrepancy representing a 'wicked problem' can be explained in numerous ways. The choice of explanation determines the nature of the problem's resolution; 'Crime in the streets' can be explained by not enough police, by too many criminals, by inadequate laws, too many police, cultural deprivation, deficient opportunity, too many guns, phrenologic aberrations, etc., Each of these offers direction for attacking crime in the streets. Which one is right?

10. The planner has no right to be wrong; […] the scientific community does not blame its members for postulating hypotheses that are later refuted—so long as the author abides by the rules of the game, of course. In the world of planning and 'wicked problems' no such immunity is tolerated. Here the aim is not to find the truth, but to improve some characteristics of the world where people live.

Coping Strategies: How do we 'solve' 'wicked problems'?

The alternative method(s) of solving problems of any kind are depicted in Figure 1 (Roberts 2009, Ch. 20, p. 356). Pundits call these methods 'coping strategies'. In the case of 'wicked problems' there are two questions to be asked for the planner to corroborate the nature of the problem:

1. Is there broad based agreement over both the definition of the problem and its solution?

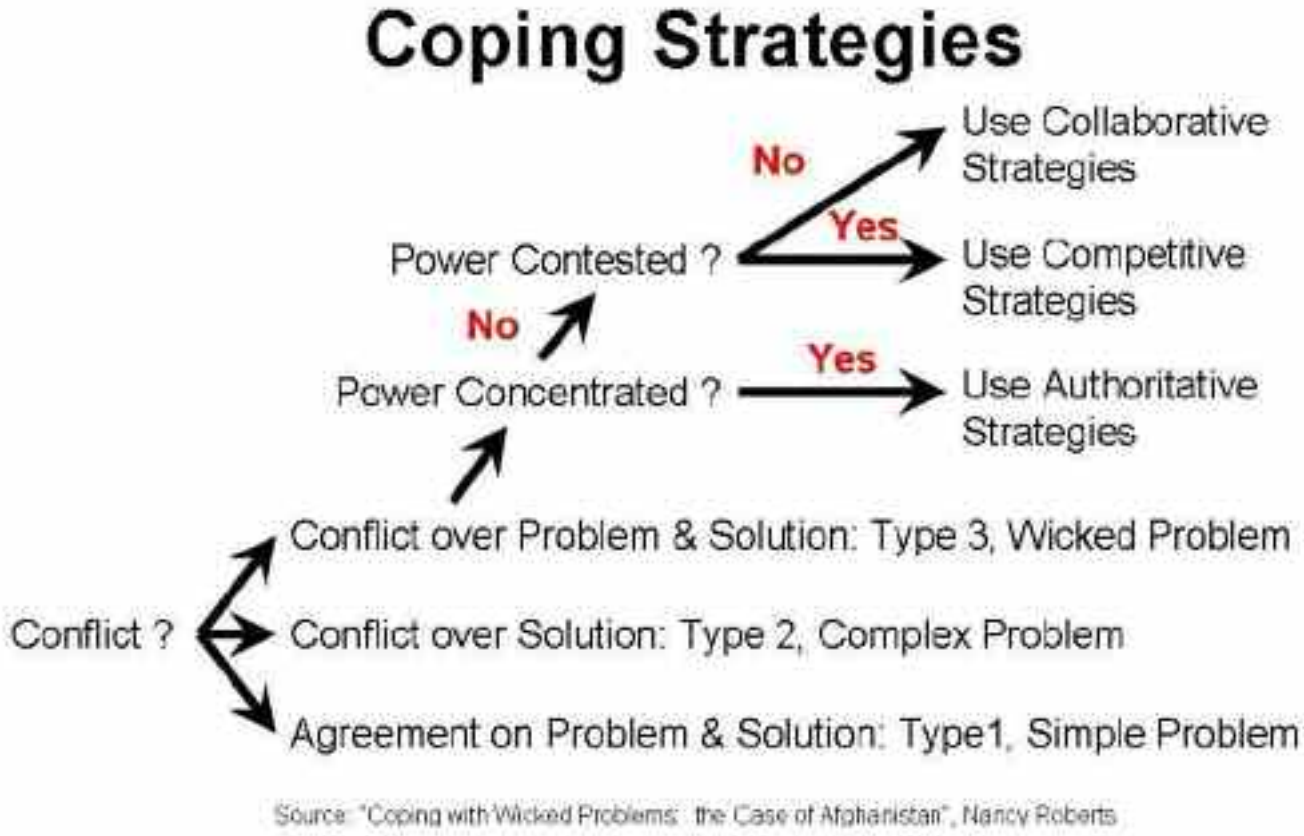

Figure 1. Coping Strategies

2. Is power to define the problem and at the same time its solution concentrated or contested?

The rationale described in Figure 1 gradually moves from the definition of the type of the problem (simple, complex, 'wicked'), to the acid test of whether the power to define (the problem) and solve (it) is 'contested' or 'concentrated'. In the former case, there is the choice of either a 'competitive' (War for instance) or a 'collaborative' copying strategy. In the latter case, a typical example of a standard bearer of 'concentrated power' who leverages 'authoritative strategies' is the U.S. Supreme Court.

Using a collaborative strategy to 'solve' a 'wicked problem'

The advantages of collaborative strategies used to solve 'wicked problems' are obvious and for good reasons:

1. They promote cost sharing practices;

2. They create strength in numbers;

3. They eliminate redundancies.

Thus

4. They enhance efficiency.

By the flip side of the same token though:

I. Collaborative strategies increase the so called 'transaction costs';

II. They potentially create 'challenging synergies';

III. They may also render the whole process of problem solving more time consuming.

Nancy Roberts (2009, Ch. 20, p. 361-372) describes the basic steps of a collaborative strategy in search a 'solution' to a 'wicked problem':

A. The bedrock of the whole process is the creation of a 'spirit of collaboration' translated as 'working together';

B. Of comparable importance is the development, validation and eventually implementation of a 'strategic framework' of principles and policies;

C. Collaboration is by default a challenging if not demanding effort and as such all the stakeholders in the problem solving process should strive for some 'common ground' instead of resigning to 'silo mentality';

D. The most intriguing part of the search for a plausible 'solution' is the 'failure into collaboration' eloquently summed up in 'people have to learn what does not work before they are willing to absorb what they perceive to be the extra 'costs' associated with collaboration. This learning is especially important for people who come from different cultures' (Nancy Roberts);

E. Get the whole system 'in the room' and create a 'community of interest'. Aligning diverging definitions of a 'wicked problem', let alone the disparate interests of the stakeholders is a Herculean task, and for this the process must be utterly inclusive;

F. Last but not least, it is of the utmost importance for the stakeholders to have unwavering trust in the 'solving' process. Only then, within a context of strong commitment, does the whole endeavor have its best chances to come to fruition.

IS MARITIME SECURITY A WICKED PROBLEM?

To determine the true nature of the maritime security problem is to investigate whether Somali piracy, for instance, features the distinguishing properties of a 'wicked problem'. The challenge posed by Somali piracy has obviously neither a single, universally accepted definition nor a readily understandable stopping rule. A solution can only be a 'one shot operation', good-or-bad not right-or-wrong, with long term (positive or negative) consequences. By the same token, Somali piracy is uniquely benchmarked against the Nigerian one and a symptom of a host of other problems including utter poverty, corruption, and collapse of the state.

As international pressure has been applied to the Somali piracy problem, the problem has continued to change. At its inception, Somali piracy was a fairly unsophisticated, local problem. The widespread implementation of industry Best Managements Practices (BMP-4), the presence of significant international Naval vessels, the use of convoys and a guarded shipping channel through the war risk zone, the initiation of offensive military operations to combat Somali piracy, the use of armed guard forces aboard transiting commercial vessels, and the continued payments of ever larger vessel ransoms, have combined to change the nature of the problem, but not to eliminate it. Piracy has become a well organized criminal enterprise. The pirates now utilize more sophisticated tactics both when seizing vessels, and when negotiating their release. The ransom values have significantly increased while the average duration of negotiations has also increased. The piracy risk area has expanded to include the sea space extending all the way to the Indian coast, and the overall number of events has drastically fallen, but the overall rate of hijackings versus attempts

of

	2012	2011	2010	2009
Vessels Hijacked	7	27	51	52
Vessels Boarded	0	17	16	0
Vessels Fired Upon/ Boarding Attempts	24	122	119	129
Vessels Hijacked/ Piracy Events	0.23	0.16	0.27	0.29

Figure 2. SOMALIA: Piracy Analysis and Warning Weekly (PAWW) Report (Horn of Africa) for 29/Nov. to 05/Dec., 2012

has not been significantly altered. Additionally, many of the conditions in Somalia that make piracy an attractive venture (including poverty, low life expectancies, arms and vessel availability, ineffective law enforcement, a high maritime traffic area, and high returns) still persist. The problem is far from solved (see Figure 2). Given a relaxation in the international pressure applied in response to the declining empirical number of annual events, the problem will undoubtedly morph again to fill the void.

Establishing the character of maritime security as a 'wicked problem' creates some very interesting insights into a potentially robust 'solution' and its corresponding context. As was previously mentioned, a strategy of collaboration among the disparate stakeholders is of utmost importance and as such, it begs for full inclusivity. For all it matters though, (and in the case of Somali piracy it does matter a lot) inclusivity does not entail a 'cake cutting exercise' among the stakeholders but rather an alignment of all these interest groups (mainly the Somali people) behind the ultimate cause of eradicating the scourge! Piracy is neither a new challenge, nor one that has ever been solved. Piracy has simply moved from one area of the world's shipping lanes to another based on the solutions applied at any given time. We are unlikely to fully eradicate piracy, but we can limit it by understanding the true nature of the problem and the nature of potential solutions that may be applied in a given area at a given time.

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VISITS, CONFERENCES AND WORKSHOPS

Office Call of the Commanding Officer of USS HUE CITY
13 July 2012

Office Call of the Commanding Officer of German Naval Specialized Boarding Batallion
12 November 2012

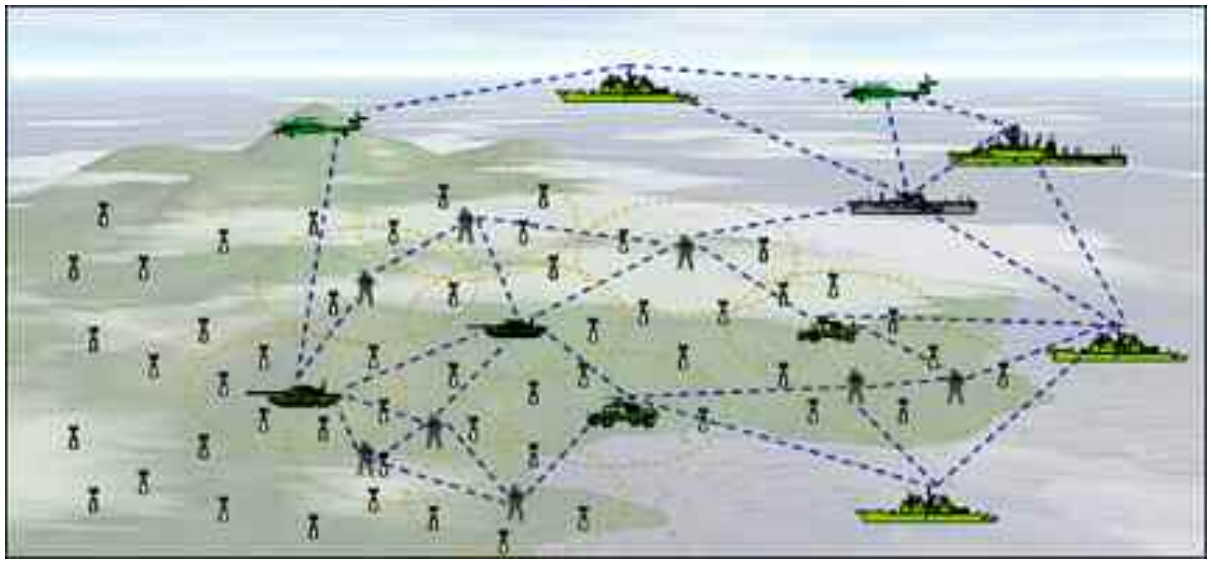
Office call of the Commanding Officer of BGS VERNI
8 October 2012

ACT Quality Assurance Team Visit
12 November 2012

Joint Naval Postgraduate Course (NPS) and Lorance Livermore National Laboratory (LLNL) WMD Experiment
11-15 June 2012

AD-HOC SENSOR NETWORKS FOR MARITIME INTERDICTION OPERATIONS AND REGIONAL SECURITY

by LT Theofanis Kontogiannis, Msc



Unambiguous, robust communications are vital to the success of naval operations such as area surveillance, control, and interdiction. Communications and sensor networks allow the flow of data and critical information that is necessary for the conduct of an operation from both tactical and strategic perspectives. Sensor network communications are affected by several factors, such as the physical environment, network-systems quality, asset positioning, and the electromagnetic environment. Conventional wireless networks have stationary networking infrastructure such as base stations (e.g., buildings and antennas) serving as gathering nodes for traffic emanating from mobile devices. These nodes interact with the base stations in a client/server fashion. When considering naval operations, the situation becomes more complicated: the platforms are hardly stationary, as the networking infrastructure operates from a variety of platforms in motion on the sea, above the sea, and from space, in the case of satellite support [2]. Such systems are known as sensor networks or ad-hoc networks.

Sensor networks consist of nodes made up of small sensors that are able to monitor, process, and analyze phenomena over geographical regions of varying sizes and for significant periods. Recent progress in sensor-network technology has led to the invention of small, low-cost sensors that are able to collect and transmit, or relay, sensor data about physical values (e.g., temperature, humidity, and sea state), or dynamic attributes of objects (e.g., speed and direction of movement), and the existence or absence of substances (e.g., radioactive materials and explosives). These capabilities are useful applications in a number of other maritime operations (e.g., habitat and environment monitoring, healthcare, and military surveillance) [2]. As mentioned by Hans-Joachim Hof [3], the application of a sensor network customarily determines not only the sensor nodes' design, but also the design of the particular network comprising those nodes.

Surveillance is the primary aim of sensor networks used by the military. The purpose of surveillance missions is to collect or verify as much data as possible concerning the enemy's capabilities, positions, and intentions in order to have a detailed tactical overview, along with data about the area of operations. Since manned surveillance missions in forward-deployed areas often involve high risk for friendly forces, the assets assigned to the missions require a high degree of stealth and protection. With advances in sensor networks, many surveillance missions can be achieved with less risk; consequently, the deployment of unmanned surveillance missions, by exploiting wireless sensor networks, is crucial for military and other security-related missions. Nowadays, threats vary from bands and organized groups to unmanned vehicles able to operate above, on, and even below the sea surface. Combining the aforementioned situation with the potential of asymmetric threats such as radiological, biological, or chemical agents makes for a difficult security challenge.

A network designed for military and general regional security purposes has to provide reliable communications among the participating nodes and

facilitate the flow of information—voice, video or data—during the operation. Moreover, network adaptability is critical to allow adjustments based on current circumstances and future operations demands that may affect the network (e.g., node positioning and increases in the amount of data transmission requirements). In Maritime Interdiction Operations (MIO), most sensors are employed on assets moving and operating on the sea surface, or in the air, in the case of unmanned, aerial vehicles (UAVs). Those dynamic conditions hinder reliable connection (i.e., cause range changes among nodes, or interference of physical obstacles between two network nodes) or even interrupt reliable connection among the sensor nodes of the MIO network and require the adoption of methods to facilitate and maintain area coverage. A military wireless-network design is highly affected by signal-propagation phenomena. Many architectures are tested and utilized to ensure that alternative routing and handling of data address potential problems and drawbacks beyond the standards acceptable in civilian ad-hoc networks. Currently, terrestrial node cannot reach far into open seas; therefore, an aerial platform (e.g., a UAV) or other relay platform (e.g., smart buoys) [4] are a low-cost solution when there is no coverage by a land-based network, or low-earth orbit (LEO) satellite coverage is inadequate or unavailable.

The network for a MIO must consist of various kinds of sensor nodes. Some nodes must be equipped with radar devices for ensuring the surveillance and monitoring of an area within their effective range; other nodes need a camera to transmit real-time pictures/video; others may have electro-optical (EO) and infrared (IR) equipment for better surveillance and target classification at night. Equipment used for detection of Chemical, Biological, Radiological, Nuclear, and Explosive (CBRNE) material is necessary for MIO and regional security operations. For example, the boarding team during the sweep phase of a MIO may transmit real-time video from the suspect ship from helmet cameras while simultaneously transmitting information from CBRN sensors. In the case of maritime security in an expanded area, the presence of nodes whose role is just to relay the data to the end node (multi-hop) is essential. The number and the type of nodes of the network are highly related to the area of interest and potential threat.

A critical factor in operation execution is the effective range for direct communication between two nodes of the network and the overall effective transmission range with the multi-hop effect exploitation. During MIO and regional security operations, a primary goal is the interdiction of dangerous material before they reach a vital area (e.g., port or population center). Moreover, during MIO execution, the command post in tactical command may need to keep a safe distance from the seized vessel to avoid damage in case of explosion or bio-hazardous emissions from the cargo. The effective communications range of each node (i.e., the per hop transmission range) that a node covers relies on several factors, such as frequency, transmission power, antenna gain, signal-to-noise ratio (SNR), height of antenna, and atmospheric conditions. The effective communication range significantly affects the number of nodes required to ensure the uninterrupted flow of data and, consequently, the total cost of the network construction and management burden. Current ad-hoc networks make use of IEEE 802.11 (Wi-Fi) or 802.16 (WiMAX) standard mode of operation. Since IEEE 802.11 typically supports relatively short range (few nautical miles) Wi-Fi networks, a potential employment of WiMAX or IEEE 802.16 standard in the networks can dramatically increase the communications range among nodes, and consequently the network coverage, since the transmitted signal can reach at distances beyond Line of Sight (LOS) to around 50 km (27 nautical miles) with high data rates up to 100 Mbps [5].

A significant requirement for ad-hoc sensor networks supporting MIO and regional security operations is the security of information distributed through the network. Since there is no physical connection between nodes, and data is distributed over the air using electromagnetic waves, there is the potential that the transmitted information may be intercepted by anyone within a node's transmission range. Security of the ad-hoc sensor network can be enhanced with the use of a virtual private network (VPN) and intrusion-detection systems (IDS). A VPN tunnel encrypts the transmitted data additionally to the WEP encryption. VPN can be used as well for the encryption of WiMAX (IEEE 802.16) standard communications. [6], [7].

For ensuring continuous and reliable functionality during an operation, a network operation center (NOC) should be established, not necessarily in the area of operations. The NOC assists in managing and monitoring the network. A primary function is monitoring all the participating nodes to ensure that they are connected to the network and working properly. If monitoring uncovers problems in the network, then the NOC assists in providing solutions whenever necessary. Another role of the NOC is to provide accessibility to new users/nodes on the network, an attribute necessary for MIO networks that alter the number of participating nodes. The NOC can make use of several applications

for network management such as fault management/service restoration, trouble-ticket administration, configuration management, security management, performance management and accounting management [8].

MIO and naval operations related to regional security generally take place at sea, either close to coastal areas or far away from shore on the open sea. It is obvious that the majority of assets used for the conduct of an operation will be deployed at sea or in the air. However, the use of shore-based stations cannot be excluded, especially when the operation evolves near a coast. The assets that may carry nodes of a MIO ad-hoc sensor network are the boarding team (in the equipment carried by the team), surface vessels (ships or boats), aerial vehicles such as UAVs, unmanned surface vehicles (USVs), buoys, swimmer or diver equipment, and shore-based nodes, whether mobile (e.g., trucks equipped with sensors and antennas or personnel with equipment) or stationary (e.g., a headquarters, an antenna, or a sensor for relaying data to other nodes).

During a MIO, a team may board a suspicious vessel. Apart from inspecting the ship's documentation (i.e., manifest) and crew (e.g., checking the crew and passenger list against watch lists), the team may search for the presence of illegal and dangerous material in the cargo such as CBRNs or Improvised Explosive Devices (IEDs). The data from sophisticated sensors can be transmitted from the boarded ship to another station for evaluation. For the detection of this material, the team has to carry appropriate sensors as they search the ship. Furthermore, the boarding team can have video and voice equipment to transmit real-time pictures from the ship to other nodes of the network to assist scientist in properly and efficiently identifying the source material. The exchange of information can be enhanced through text chatting between the boarding team and other participants in the network such as CBRN subject matter experts. All data gathered—picture, video, and sensor data—from the CBRNE detection sensor can be transmitted from the suspect ship through the network with the communications equipment carried by the boarding team.

During MIO and regional security operations, the deployment of swimmers or divers in the area of interest may be required to investigate the hull of a seized ship or conduct a security check on an object floating in the area of interest for assessment as a potential threat. Swimmers should be able to transmit real-time pictures through the network via video and voice devices. They may also be able to detect with portable sensors whether a suspicious object contains CBRNE material and transmit that data for further evaluation by a subject matter expert brought into the network. Obviously the equipment carried by a swimmer must be waterproof.

Apparently, ships and boats can form almost any type of node in a MIO network. With the communication and detection equipment that they may have available onboard, they are able to operate as a communications relay node, and as a sensor node that distributes data such as video or radar, IR, or EO pictures of the area where the ship is deployed, and/or data concerning meteorological and atmospheric conditions. They can also operate as the end node of a network that gathers, processes, and evaluates all data collected by the other nodes of the network. A ship acting as an end node can be the flagship of a group or division of ships that execute MIO or other naval operations. An important advantage of ships acting as nodes is the fact that they do not have the energy constraints that other assets/nodes, such as buoys and UAVs, face. With the variety of detection and communication means onboard, they can collect and transmit data in several ways to the desired destination, even to nodes that are not necessarily part of the network. Also, ships have the ability to repair potential equipment failures because of trained and specialized crew members; making them highly important to network performance. Ships may also carry and deploy, according to operational requirements, additional nodes, such as the boarding team (even though the team itself cannot be considered a node), swimmers, buoys, UAVs and USVs.

To avoid the employment of a significant number of ships and UAVs as nodes, the use of buoys as communications-relay nodes or sensor nodes can be an acceptable and cost-effective solution. Since buoys are

regularly used as sensors for environmental monitoring purposes, they are also able to work as sensors for naval operations. Apart from radar and environmental sensors, cameras and EO/IR devices can be installed, and with the use the communications equipment, the data collected by sensors on buoys can be distributed throughout a wireless network. The combined use of sensor buoys, ships, and air assets can reliably and effectively cover a wide area. A buoy with a camera can transmit real- or near real-time pictures of the area

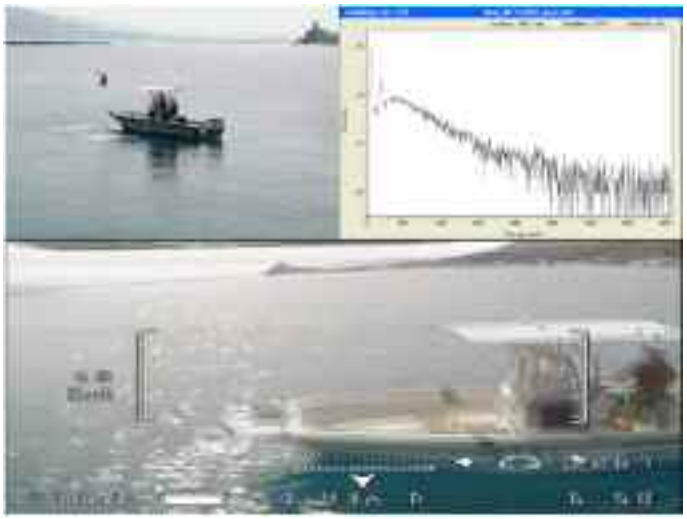
Networked Divers During Experiment

around it. That data may facilitate decision making by a headquarters responsible for the area of interest. For example, a target detected by radar (perhaps installed on a buoy) is difficult to classify if there is no other information or intelligence about it. The camera allows the participants in the network to see the detected target and provide more data towards identify it. Hence, by taking advantage of sensor buoys as nodes in a MIO or regional security network, the continuous monitoring of a wide area can be achieved. Apart from monitoring a particular area, the buoys may have only a communications relay role during an operation. In a MIO network, the buoys can be placed permanently in position for the specific the operation (e.g., as a communications relay node during the boarding phase), or can float and move towards an area (at very low speeds of around two knots). However, a moving buoy is considered an USV or unmanned maritime vessel (UMV). One disadvantage of buoys as nodes in a MIO network is the exposure of the sensors and communications equipment to rough conditions, especially when a buoy is placed permanently at sea. The equipment has to face temperature alterations, humidity, salinity, and winds. Obviously, maintenance of a buoy is necessary, but the further away it is from the coast, the more difficult it is to maintain and repair it.

Besides buoys, USVs such as small remote-control or autonomous navigation boats can be employed as nodes of an ad-hoc MIO network. These small craft can be equipped with a wide array of sensors for the investigation of items floating at sea that swimmers or staffed units may be hesitant to approach. When such an item is detected during an operation, the small USV can be deployed by another unit (e.g., a warship conducting a patrol) to examine it at close range and transmit data to other nodes that can remain aloof from the potentially dangerous object. The small dimensions of many current USVs allow for their storage and deployment from a wide array of vessel such as destroyers and patrol boats.

UAVs are "mini" airplanes and helicopters, and they are becoming prevalent in ongoing operations. As mentioned before, some sensor nodes can move in airspace, and conduct either surveillance or communications relay according to the needs and the topology of the network. Since staffed, large aircraft may be too expensive or vulnerable, UAVs offer a good option to participate in ad-hoc sensor networks. UAVs can be equipped with several types of sensors, apart from their communication systems. A UAV is able to execute surveillance operations with radar or cameras, a task that is greatly enhanced by the altitude and speed that this type of asset can achieve. Besides the area-surveillance role, UAVs can relay information on a suspicious vessel within its assigned area by flying above it, discovering what kind of cargo this vessel carries, and assessing whether or not there are people on its deck, etc. The collected data can be transmitted to the other nodes of the network with the featured communications equipment. As in the case of the previously discussed assets, a UAV is able to perform the role of a communications-relay node—they are in fact the best asset for this role due to their antenna height. This antenna height, especially for fixed wing UAVs that can fly at high altitudes, enables them to establish communications with other nodes of the network in greater ranges than surface assets can.

Mini-Helicopter for Radioactive Material Detection at NMIOTC Experiments



UAV standoff detection results during NMIOTC experiments

During the experiments that took place (with the collaboration of NMIOTC, Naval Postgraduate School (NPS) and several expert centers) in the NMIOTC within the last three years, a mini-helicopter was equipped with a nuclear-material detector, a surveillance camera, and a networking node. The UAV's role was the detection of radiological materials from above as suspect vessel on the move. The network equipment allowed the UAV to transmit detection data and video from a vessel in real time to the other nodes of the network. The employment of the mini-helicopter extended the range of the detection network during a pursuit of a suspicious vessel by friendly patrol forces [9]. This demonstrated that mini-helicopters are a responsive and capable asset to investigate the existence of dangerous materials or Weapons of Mass Destruction (WMD) onboard a vessel or floating object. With the use of a UAV helicopter as the node of a MIO network, the safety of personnel and units can be improved. Furthermore, UAV helicopters may form a communications-relay node, extending the range of the network and ameliorating its operational limitations.

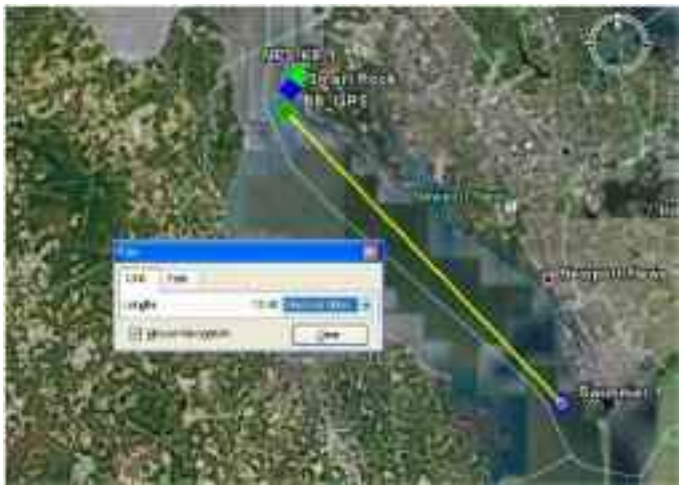
Apart from mobile assets in the sea or air, land-based stations can constitute nodes of a MIO or regional security network. These stations can be either stationary, such as buildings and sensors infrastructure (e.g., radars, communications antennas), or mobile assets, such as trucks equipped with surveillance and communications systems, or even people wearing sensors. They can be equipped with surveillance systems such as radar, EO/IR devices and cameras, meteorological sensors, and communications equipment in order to relay to other nodes the data collected by them and from other sensor nodes of the network.

Since 2004, a series of experiments related to ad-hoc sensor networks in support of MIO and security operations are being conducted under the aegis of NPS in cooperation with USA and non-USA organizations such as Defense Threat Reduction Agency (DTRA), Lawrence Livermore National Laboratory (LLNL), the United States Coast Guard, first responders in San Francisco Bay, New York, and New Jersey under the Department of Homeland Security, and USA federal and international academic and military agencies (e.g., NMIOTC and Swedish Defense Research Agency (FOI)) under the leadership of NPS's Professor Dr. Alex Bordetsky. During these experiments, useful conclusions about the benefits and potential drawbacks of this kind of networks are extrapolated, resulting in a better understanding of the concepts behind them, and how to operate these networks to satisfy operational requirements. The main scopes of these experiments are: (1) network performance, (2) advanced sensors and collaborative technology assessment, (3) the detectability of CBRNE material, and (4) the establishment and preservation of ship-to-ship and ship-to-shore communications via tactical wireless network connectivity. The results yield high quality cooperation between command-and-control (C2) organizations and expert centers on a worldwide scale for the rapid detection, identification, and proper response of CBRNE threats in various geographical areas [10]. For the execution of these experiments, systems such as sensors, vessels, UAVs (mini – helicopter), and USVs have been extensively used alongside actual security operators (boarding teams, networked swimmers and reach-back centers). These experiments have already taken place in San Francisco Bay, port authority areas of New York and New Jersey, riverine areas in Virginia, at the NMIOTC in Greece, and various locales in Germany, Poland and Sweden.

During the execution of the above mentioned experiments a reliable direct communication distance of seven nautical miles has been achieved between mobile small surface vessels, utilizing the 802.11 standard. That distance was expandable to fourteen nautical miles with the use of a relay node exploiting the multi-hop effect. Moreover, these experiments made clear that the higher the antenna gain of the two nodes, the larger the throughput and data rate achieved. Consequently, one significant factor on which the coverage of an ad-hoc sensor network relies is the equipment used. With the appropriate equipment and availability of participating nodes, the network coverage can be increased significantly beyond fourteen nautical miles. Conceptually, with the inclusion of WiMAX capacities, network connectivity beyond LOS at a distance of approximately twenty-seven nautical miles is possible. With relay nodes, the area covered by the network can be augmented encompass many mobile sensor nodes

operating an area with a radius of fifty nautical miles. Moreover, using UAV systems, the network can likely achieve data-link communications at distances of 100 nautical miles. However, connectivity range, and consequently coverage area, is highly affected by the amount and type of disseminated data (e.g., voice, video, etc.) and still has to be examined thoroughly, especially in the case of MIO networks where the assets/nodes are moving on the sea surface and in the air.

Another significant outcome of these experiments, regarding the use of ad-hoc networking in MIO, is the achievement of information exchange between assets/nodes operating on-scene and remote experts located elsewhere in the world and far away from the MIO. The assets/nodes were the boarding teams, the networked swimmers, UAVs etc., that were carrying sensors and disseminating the collected data through the network and consequently to the remote experts who



Network connectivity at 12.4 nm during an experiment in riverine area of Virginia

were evaluating the situation in near real-time.

Concerning the Quality of Service (QoS) that ad-hoc sensor networks provide to MIO and regional security operations, it is shown in the outcomes of those experiments that data in the form of video, voice, text chat or sensor spectra can be disseminated through the network to provide other nodes with real-time information from the operational theater. The bandwidth capabilities in the experiments allowed duplex communication among nodes, depending on the nodes' individual equipment. The latency and the packet loss observed during experiments were not eliminated; however, most of the time, they did not prevent continuous network connectivity and reliable receipt of vital information at key nodes (e.g., reach-back centers). Depending on the equipment used and the nature (e.g., number of bytes) of the data to be disseminated, ad-hoc sensor networks appear capable of effectively supporting MIO communications requirements, and offer flexibility to support moving assets/nodes, scalability, and fault tolerance. Moreover, with the appropriate array of nodes, connectivity can be maintained even in the case of node failures, resulting in network survivability during execution. Furthermore, another factor that increases the survivability of the network, and consequently the flow of information, is its own versatility: the availability of ways that participating nodes can transmit data. The survivability of the MIO ad-hoc sensor network is also enhanced with VPN utilization, as has been tested in these experiments, preventing non-authorized network use and monitoring, and potential cyber-attacks that could lead to DoS.

Even though ad-hoc sensor networks can support MIO and regional security operations, there are still limitations to their use. The most significant is the energy constraints of some assets/nodes. For example, the boarding team or networked swimmers have limited power available during their missions. The equipment they carry is usually battery powered, so there is the potential, of running out of energy and not being able to share their information through the network. The same constraint may apply to UAVs such as the mini-helicopter employed in the experiments in NMIOTC. Energy consumption rates also depend on the applications used and the amount of data to transmit. Another limitation on ad-hoc sensor networks is the connectivity range. Although a direct connectivity range of seven nautical miles was achieved during these experiments and is considered more than sufficient for MIO, there remains a need for a greater connectivity range that allows a less dense array of nodes to cover data flow for a large area. Extended connectivity ranges also enhance network survivability in case of node failure. Of course, tradeoff analysis will need to be conducted to balance cost of increased connectivity coverage against more lesser-capable relay nodes. Also,

Transmitted video and videoconference between swimmers and experts during NMIOTC experiments

the limited standoff distance (few meters) from which a sensor can detect CBRNE material can be considered a potential constraint, even though it does not have to do with the network's overall performance, rather just the sensitivity of the detector itself. The throughput of the ad-hoc sensor network can also be a potential limitation. Though the throughput achieved during these experiments was highly satisfying, allowing video, voice, and sensor data to be transmitted in high fidelity field experiments, the amount and variety of data can be excessively high and may not be supported by the bandwidth of the network, since throughput is reduced during multi-hop transmission. More experimentation must be conducted to understand and overcome these limits.

Apart from MIO and regional security operations, ad-hoc sensor networks are able to support naval area surveillance operations. For this application, radar, video, and EO/IR systems are required. During the above mentioned experiments, none of these systems—except for cameras—were employed. The use of smart buoys and UAVs, except for the mini-helicopter employed in the NMIOTC, was not examined, though the presence of a vessel may be considered a surrogate for a buoy. Assets with the appropriate sensors and communications means can be placed in such an array to ensure the surveillance and monitoring of a wide area from the sea surface. For example, a potential area that these assets/nodes could be deployed in is waters off of the Horn of Africa where the detection and interdiction of pirate vessels that threaten safe and free commercial navigation is a high profile mission. Another area where a network consisting of UAVs, buoys, vessels with radar, cameras, WMD sensors, and EO/IR devices, in combination with satellite surveillance, could be deployed is the Mediterranean Sea to help prevent illegal immigration from Africa and Asia to Europe.

Except for surveillance purposes, ad-hoc sensor networks like those for MIOs can enhance the force protection, not only of a naval base, but of a commercial port, by detecting suspicious cargo on vessels or floating objects that may pose an imminent threat.

Connectivity-range augmentation, direct and indirect, is one of the factors defining the coverage area of the network; the other is the coverage of each individual sensor. Together with bandwidth increase, this issue will be the object of much research. With technological evolution, these problems are likely to be resolved soon, but the tradeoff analyses will remain: as technology evolves, so does the cost of these systems. The employment of radar and surveillance systems in ad-hoc sensor networks has to be examined thoroughly to provide, in addition to the video and data dissemination, real-time radar picture through the network to other nodes such as Tactical Operation Centers (TOCs), intelligence centers, and ships operating far away. Creating that kind of wide-area, integrated, mostly unattended sensor-provided SA picture to support decision makers' information needs should be a networking goal to provide better fidelity surveillance than can only be achieved by costly satellite surveillance or the commitment of a large number of manned military or security force assets. This is a rich area for future research.

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COURSES, EXERCISES AND TRAININGS

Training of US Coast Guard Team
22 October - 2 November 2012

Training of US Coast Guard Team
22 October - 2 November 2012

Training of HMS MONMOUTH
29 October - 2 November 2012

Training of German Specialized Boarding Team
5-15 November 2012

COURSES, EXERCISES AND TRAININGS

Training of HMS NORTHUMBERLAND
12-15 November 2012

Training of BNS LOUSE-MARIE
15-16 November 2012

Training of BGS VERNI
8-11 October 2012

NATO AND IMO WORK TOGETHER TO BUILD REGIONAL CAPACITY TO COUNTER-PIRACY: JOINT NATIONAL TRAINING FOR BOARDING TEAMS FROM DJIBOUTI CODE OF CONDUCT REGION

by Mr Osamu Marumoto, IMO Project Officer (Operations)

Following the intensive "train-the-trainer" course for the maritime law enforcement teams from the western Indian Ocean region in March 2012 in NATO's Maritime Interdiction Operational Training Centre (NMIOTC), the trained trainers are now the leaders of the national teams from those States that attended. These were invited back to the NMIOTC with their national team members to conduct the joint national training for boarding teams in October and November 2012. Teams from key countries: Kenya, Madagascar, Maldives, Seychelles, United Republic of Tanzania and Yemen got together and demonstrated what they have achieved in their national endeavours to counter piracy.

The series of joint training activities are facilitated and coordinated in partnership by the NMIOTC and the International Maritime Organization (IMO) and this partnership will continue in 2013, inviting more teams from States in the western Indian Ocean region.

Modus operandi: NMIOTC provides a broad, holistic and comprehensive training package to introduce trainees to all aspects of piracy & armed robbery. Training was based on internationally recognized standards, IMO documentation and best practices. IMO finds the trainees based on a counter-piracy training plan, and facilitates their attendance. Both parties work together of syllabus. All benefited from the experience and at the end of the courses, trainees demonstrated significant improvement, establishing a wide and common understanding of piracy & armed robbery and the actions needed to be taken in operations.

The latest round of training, which was developed and funded as part of the IMO's regional counter-piracy programme, the Djibouti Code of Conduct, which was led by the country team leaders under the watchful eye of the NMIOTC Staff, was the second phase of a programme aimed at creating small, skilled law-enforcement teams within the maritime law enforcement forces of the region.

As well as developing professional skills it allows teams from different backgrounds within the same region to cooperate to face together the problem of piracy and share best practices and experiences. Mr Marumoto, IMO Project Officer responsible for this training said: "This is exactly the sort of regional cooperation in the field of maritime interdiction that the Djibouti Code of Conduct is all about. Regional cooperation in the fight against piracy requires interoperability and the interoperability of teams serving at sea from different organizations can only be enhanced by this type of joint training and exercises".

This pattern will be repeated for those regional countries seeking to develop their maritime law-enforcement capability. Joint national training is also scheduled to be delivered at NMIOTC in January 2013 for more teams from Kenya, Mauritius, Oman, and South Africa, and other countries later in the year.

THE FRIGATE ROS REGELE FERDINAND IN SOUDA BAY, CRETE

by LtCdr Mihai Egorov ROU (N)

After nearly three days of sailing, ROS Regele Ferdinand frigate moored in the port of Souda on Friday, September 15th. The port is like a second home for the ship, if you consider that from 2005, within the first Romanian participation in Operation Active Endeavour, and in the following years, the ship was always entering the port of Souda while deployed overseas. Crete greeted the crew with a bright sun, the same splendid landscape and wonderful possibilities for both recovery and building up action capability.

The most important activity in Souda harbor was organized at NMIOTC (NATO Maritime Interdiction Operational Training Center). The counter-piracy course was attended by the ship's command team, boarding and SOF teams.

The official opening of the course took place on Monday, 15th of September, at NMIOTC, in the presence of Commodore Ioannis G. Pavlopoulos HN, the commandant of the center. The ship was introduced to NMIOTC institution and facilities, offered the training schedule for the event involving Romanian sailors. Also, the ship has presented the operating capabilities and missions of ROS Regele Ferdinand frigate in the recent years.

After the official lecture, the command team, boarding and SOF teams started the training. Piracy, as it became a widespread phenomenon in recent years, has been theoretically analyzed, identified and clarified once more for the command team. Gulf of Aden/Horn of Africa area of operation was analyzed and the means and current modus operandi of the pirates was presented. A number of case studies were analyzed.

At the same time boarding and SOF groups started training in the use of weapons in different conditions, tactical action procedures when working on a pirated ship, insertion methods, etc.

Monday was also a good opportunity for the commanding officer of ROS Regele Ferdinand - Captain Mihai Panait - to have an informal meeting with Commodore Ioannis G. Pavlopoulos. The Commodore, who had a good knowledge of Romanian Navy, expressed his satisfaction for the third participation of Ferdinand in NMIOTC courses. He described the training capabilities of the center – with trained personnel, equipped to NATO standards and experienced in training NATO and Non-NATO crews prior their deployments.

Captain Panait thanked for facilities offered and stated that the premises were best suited to make the event beneficial for crew's frigate in the preparation and execution of missions in Operation ATALANTA.

A return visit was scheduled and conducted on the next day, when Commodore Ioannis G. Pavlopoulos H.N. together with NMIOTC Deputy Commander, the Chief of Staff and a number of officers from Souda Logistics Base paid a visit aboard frigate.

The first deployment of the ship's helicopter (PUMA 330 SOCAT NAVAL) into an overseas mission and the facilities it offers to the ship was one point onto the discussion agenda. The visit also brought together two officers - LCDR Decebal Ciobanita and LCDR Adrian Gobjila, past and present Romanian staff members in NMIOTC.

After three days of training at Souda NMIOTC, ROS Regele Ferdinand had two days of Final Training Exercises. The scenario was a dynamic one, close to a real piracy event in HOA. Instructors have observed the response of the crew in the event of a "citadel scenario", the action of Boarding and SOF teams capturing pirates' skiffs and the force-on-force engagements onboard a pirated ship (played by MV ARIS). Following a thorough evaluation, carefully supervised by NMIOTC, the crew proved to be overall prepared for such interventions. Recommendations were made to work on "finesse" details that will allow all the "gears" within the mechanism called "ROS Regele Ferdinand frigate" to operate at a maximum level during the deployment in Operation ATALANTA.

Friday, after the last analysis, a graduation ceremony conducted onboard awarded certificates to the teams, considering the effort they have made the throughout the week. It was the final rehearsing prior the first Romanian deployment in the Operation ATALANTA.

ROS Regele Ferdinand frigate has left sunny Greece and headed for action in HOA/GOA area under the European Union command.

***Lieutenant Commander Mihai Egorov**, Chief Editor of Navy Media Group was assigned as Public Affairs Officer on board ROS Regele Ferdinand during her deployment in the EU Counter-Piracy Operation "ATALANTA"*

COURSES, EXERCISES AND TRAININGS

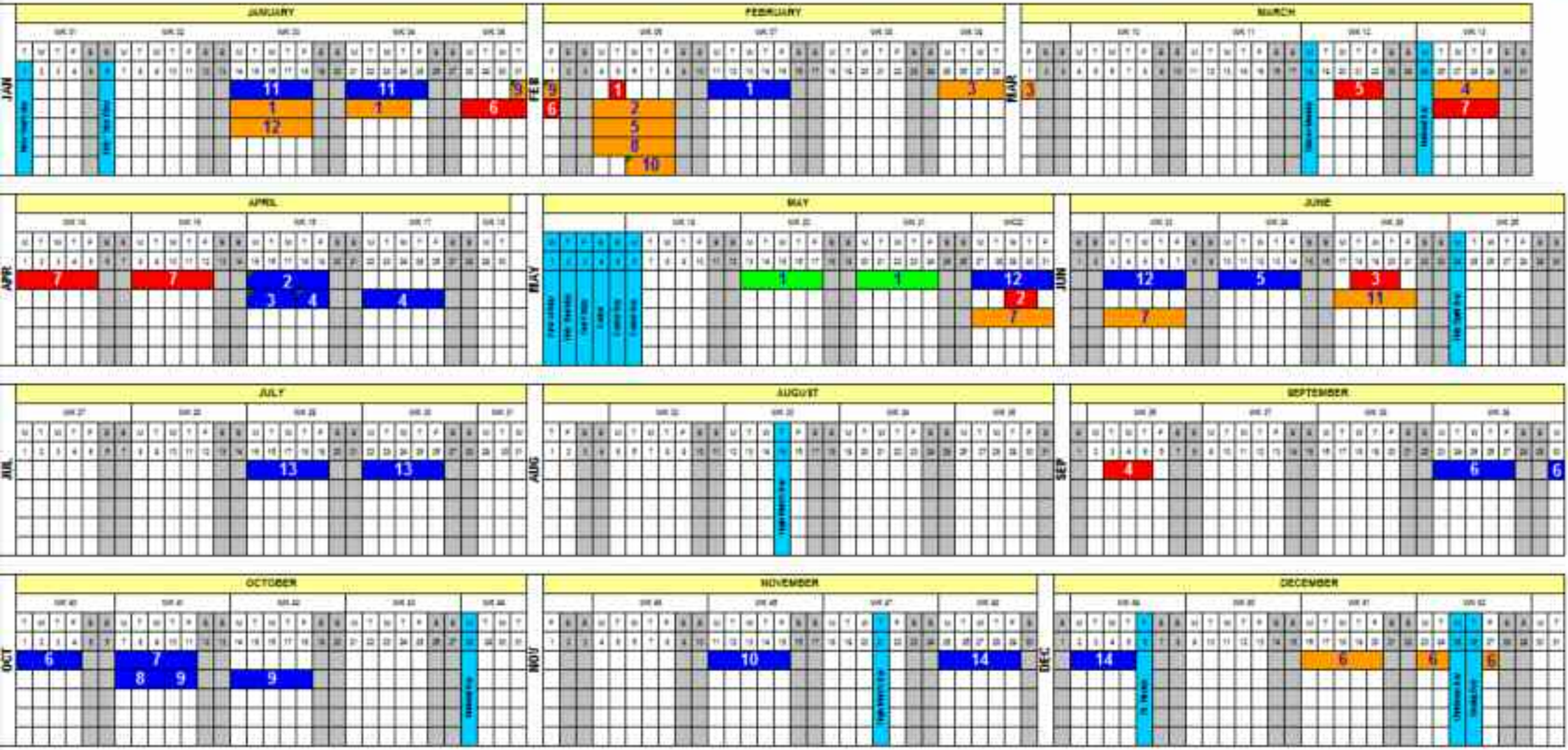
Training of Swedish Marine Boarding Team
20 August - 7 September 2012

Shaking hands with
SACEUR Admiral James Stavridis USN

Maritime Operational Terminology Course
24 September - 5 October 2012

NMIOTC MIO Resident Cources
12-19 October 2012

NMIOTC Program of Work 2013



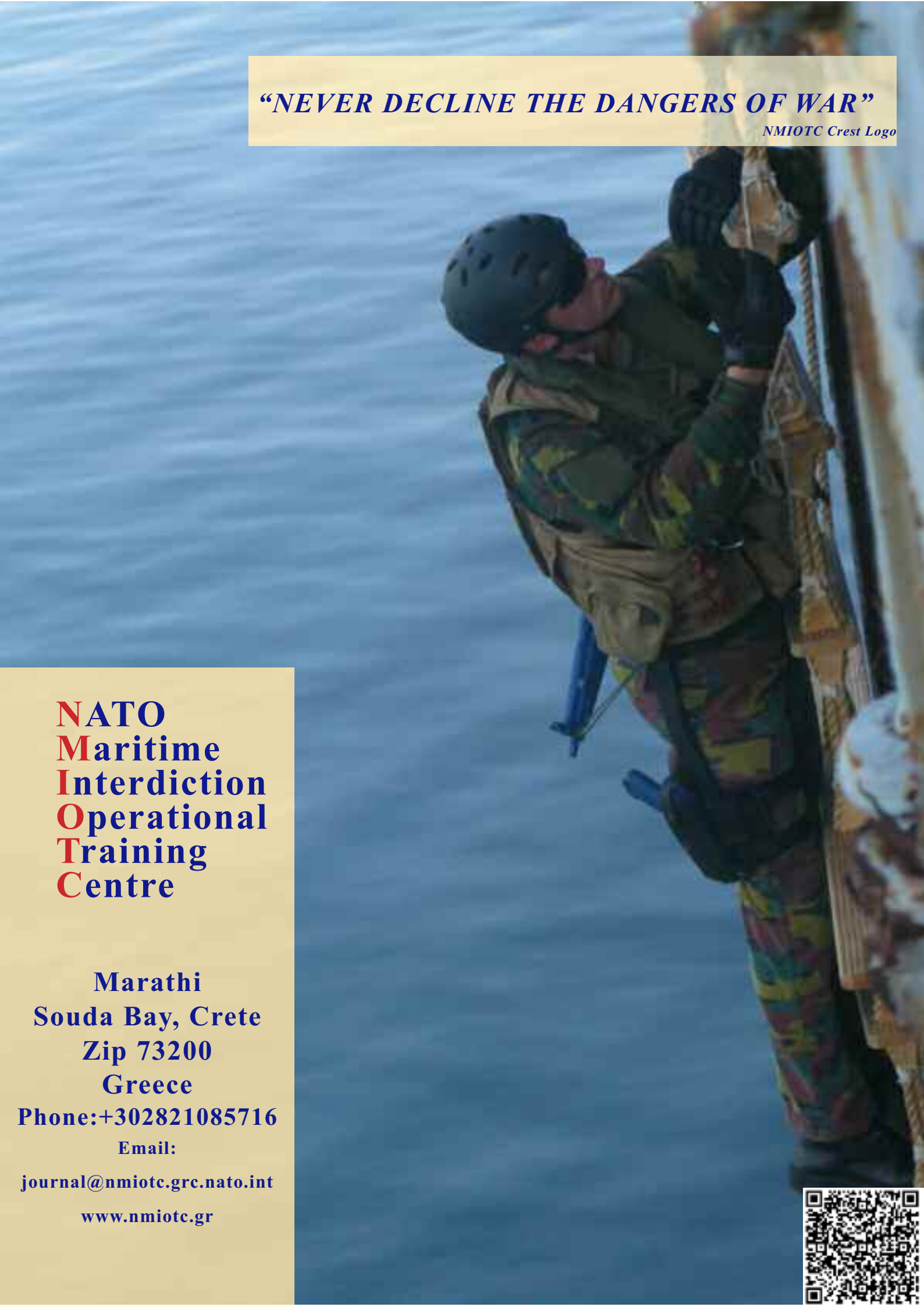
1	Resident Course 7000
2	Resident Course 1000
3	Resident Course 2000
4	Resident Course 3000
5	Resident Course 6000
6	Resident Course 5000
7	Resident Course 1000

8	Resident Course 2000
9	Resident Course 3000
10	Resident Course 7000
11	IMO DCoC Training
12	IMO DCoC Training
13	IMO DCoC Training
14	IMO DCoC Training

Already reserved for national trainings

1	NMIOTC Advisory Board (NAB)
2	NMIOTC Coordination Board (NCB)
3	NMIOTC Annual Conference
4	ATP-71 Workshop
5	FPC "Phoenix Express"
6	C3PO-NMIOTC Coordination MTG
7	C3PO-NMIOTC Experiment

1	Exercise "Phoenix Express" (NMIOTC Training)



"NEVER DECLINE THE DANGERS OF WAR"

NMIOTC Crest Logo

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