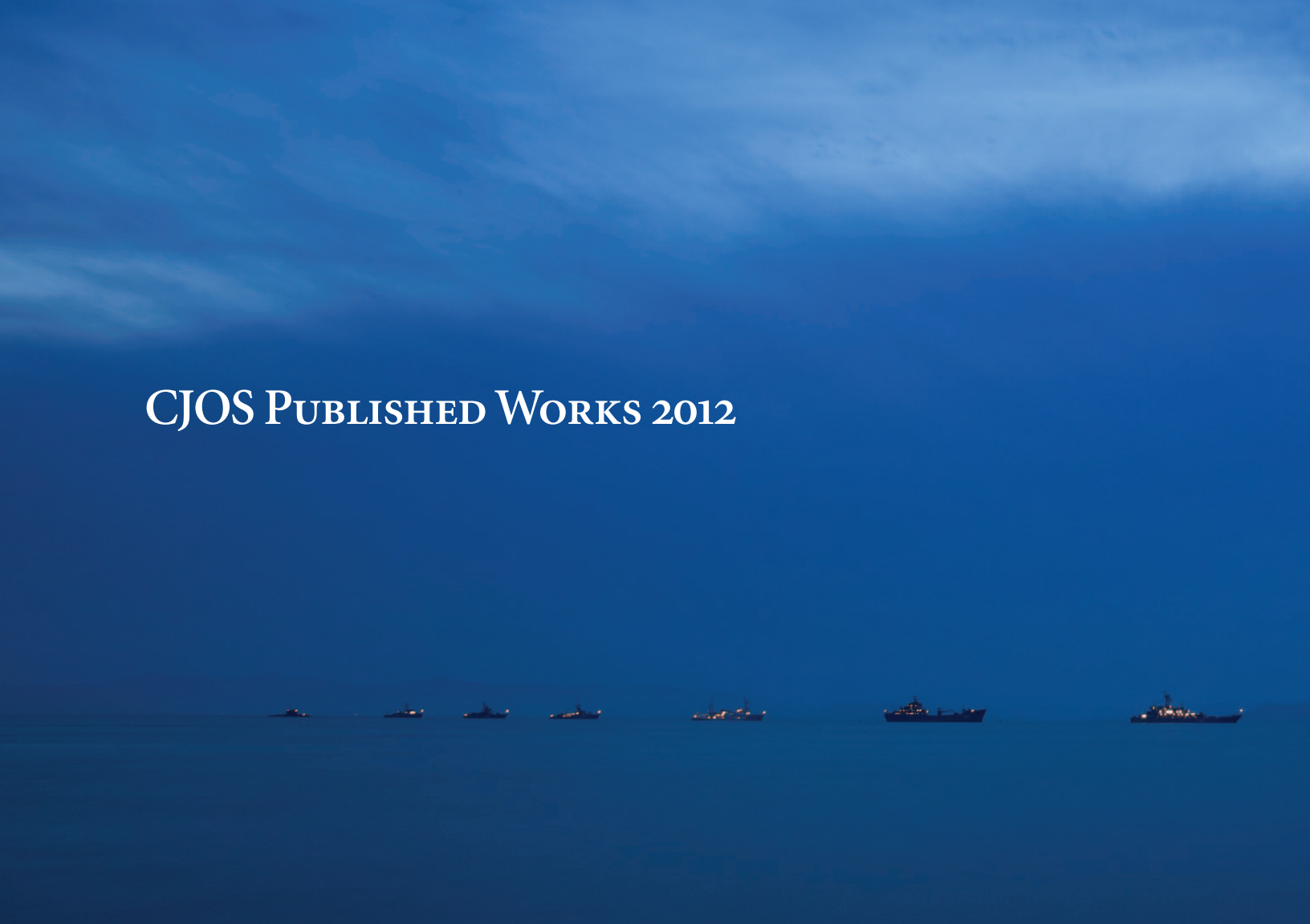
CUTTING THE BOW WAVE

COMBINED JOINT OPERATIONS FROM THE SEA CENTRE OF EXCELLENCE

2013



CJOS Published Works 2012

Supporting L.I.F.E. Apr 2013

A Humanitarian Assistance/Disaster Relief (HADR) initiative, the L.I.F.E. (Logistics, Information, Force protection, Expertise) concept provides a structured approach to improve coordination between military and humanitarian organizations during HADR operations. This concept provides the various humanitarian partners with a better understanding of the level of support they can expect from military units in the four key L.I.F.E. domains. It also provides commanders with a structured approach to HADR operations and the basic tools to plan and conduct their mission. CJOS COE has approached numerous international agencies and incorporated their comments into this updated version to reflect the importance of internationally recognized protocols and guidelines in natural and industrial disasters as well as complex emergencies.

A Framework for Enhanced International Maritime Security Cooperation and Awareness

CJOS COE produced this White Paper based on a series of Maritime Security Conferences, research and experience in maritime security concept development. The White Paper outlines and identifies the need for central governance and standards in order to coordinate efforts among various national/international organizations to establish an international framework for maritime security cooperation.

A Warfighting Concept for Littoral Sea Control Operations

This concept provides NATO maritime and joint commanders an operational level doctrine for joint maritime warfighting in the littorals against a hybrid threat pursuing an anti-access/area denial strategy, while operating at strategic distance from the European continent. The concept scope is broad and focused on the doctrinal aspects of littoral sea control operations, while providing an overview of the other elements of the Doctrine, Organization, Training, Material, Leadership, Personnel, Facilities, and Interoperability (DOTMLPFI) format.

Alternate Command & Control and Staff Organization for Amphibious Operations

A white paper by CJOS COE, requested by the Royal Netherlands Navy, develops a concept reflecting contemporary discussions within the amphibious community and proposes a leaner, smaller, and integrated C2 structure to better respond to the current operating environment. This concept provides an innovative C2 model which optimizes manpower while maintaining capabilities.

NATO Guidance for Developing Maritime Unmanned Systems (MUS) Capability

The guidance aims to inform the capability development of Maritime Unmanned Systems (MUS), broadening beyond that currently being exploited by UAV into Unmanned Underwater Vehicles (UUV) and Underwater Surface Vehicles (USV). It covers likely attributes and tasks for MUS, and discusses some of the challenges in developing these capabilities.

An Introduction to Joint Operations on and from the Sea

CJOS COE produced this "easy-to-read" handbook that highlights the significance and the possibilities of operating on and from the sea in support of joint and multinational operations. This expeditionary, sea-based capability provides joint force commanders the ability to initiate and conduct operations throughout the spectrum of force and is scalable from the deployment of a single ship to an entire fleet, depending on the size and type of the operation.

Autonomous Vessel Protections Detachments (AVPD)

This white paper provides information to gain a common understanding of the requirements of AVPDs in order to safeguard shipping through waters where piracy maybe encountered.

Allied Interoperability Handbook V2

The Allied Interoperability Handbook was firstly published in 2010 and was created to provide guidance and advice regarding the integration of Allied, or Coalition units into US Navy sponsored exercises. The objective was to reduce interoperability problems. In 2012 CJOS COE updated the Handbook to produce Version Two. The new version updated the Lessons Learned Data Base, the preparedness checklists, and added the Interoperability Metrics tool. The enhanced checklists and the IM Tool provide a self measure of interoperability to permit units to reduce the common challenges before beginning operations.

CUTTING THE BOW WAVE 2013

DIRECTOR'S MESSAGE

BUILDING MARITIME EXPERTISE

EXERCISE AND EXPERIMENTATION

COMMUNICATION AND CYBER SECURITY

Publisher Note

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Message from the Director

Vice Admiral Michelle J. Howard, USA-N
Director, Combined Joint Operations
From the Sea Centre of Excellence

The Combined Joint Operations from the Sea Centre of Excellence (CJOS COE), now in its seventh year of operation, continues to serve the needs of the maritime community by providing maritime operations expertise and maritime security advice on a global scale. It has been a busy year, with several works being published on topics ranging from Joint Sea Basing to Maritime Unmanned Systems to Littoral Sea Control. The highlight of 2012 was the Maritime Security Conference held in June. This event played host to over 250 attendees representing military, business and international organizations from around the globe.

Since assuming duties as Deputy Commander, United States Fleet Forces Command and Director of CJOS COE in August 2012, I have been reminded of the important work and perspectives that a talented and motivated group of international officers can bring to the maritime community. Building on the successes achieved by my predecessor, Vice Admiral David Buss, U.S. Fleet Forces Command continues to work closely with the CJOS COE team to improve interoperability with our NATO and international partners though joint exercises and integration opportunities.

Preparing our nations and their navies to address these challenges will require the combined and collective efforts of NATO members and our allies.

We are in the midst of a changing global maritime environment that includes emerging cyber and energy threats as well as traditional and developing maritime security issues. Against this background, global partners are operating under constrained defense budgets due to the ongoing stagnant economic climate. Preparing our nations and their navies to address these challenges will require the combined and collective efforts of NATO members and our allies. Going forward, I expect CJOS COE to continue to play a key leadership role within the maritime community and provide solution-oriented ideas that address our shared concerns. ■

Vice-Admiral David H. Buss *served as the Director of the CJOS COE from September 2011 until August 2012. Under his leadership, CJOS COE produced the* Humanitarian Assistance Guidance: Navy Supports L.I.F.E, *a handbook on Joint Sea Basing that later transitioned into a draft NATO concept and a White paper on global maritime security information sharing. His vision was instrumental in moving CJOS COE to the forefront of the maritime community. VADM Buss is now Commander, Naval Air Forces and Commander, Naval Air Force, U.S Pacific Fleet. We here at CJOS wish him well in his new appointment and thank him for his dedication and leadership.* Fair winds and following seas!

CJOS Mission

Working in conjunction with the Commander, U.S. Fleet Forces Command Staff, CJOS COE will provide a focus for the sponsoring nations and NATO in improving allied ability to conduct combined joint operations from the sea in order to ensure that current and emerging global security challenges can be successfully solved.

CJOS Vision

To become the pre-eminent source of innovative specialist advice and recognized expertise on all multinational aspects of combined joint operations from the sea in support of the sponsoring nations, NATO, and other allies.

Message from the Deputy Director

Commodore S. J. Chick CBE, GBR-N

Deputy Director,
Combined Joint Operations From the Sea
Centre of Excellence

As I sit and watch the effects of the current global economic downturn on nations, and in particular their military, it is very evident that we must mitigate some of the impact through innovation and collaboration. The following articles I trust will demonstrate that both are present. As the majority of equipment that we will have in 2025 is either in service today or under construction — our challenge is to use it more flexibly and more effectively — it is the classic ways ends and means equation with the political appetite for the ends unlikely to reduce. Not one to rest on laurels, we must do better and grasp every opportunity. As we look ahead, post Afghanistan I am convinced that we must identify options for our political masters that achieves the required end state in a cost effective, agile, collaborative and environmentally friendly way.

Whilst CJOS COE's main effort in recent years has, rightly, been Maritime Security, I believe it is now time to place more emphasis on the other three tasks identified in the Allied Maritime Strategy. The Joint Sea Base is well placed to meet much of the activity demanded by these tasks, but it needs us to challenge the norm, to recognize that the maritime area of interest does not stop at the high water mark; the debate should not be about ownership, but about adapting the sea base to accommodate joint assets, that together deliver joint effects. Maritime Security still features strongly in

The benefit gained by being embedded with the USN and collocated with NATO ACT is very evident, as is the warm relationships established with fellow Centres of Excellence and other organizations — several of whom have contributed to this publication.

U.S. Marines with the Maritime Raid Force, 11th Marine Expeditionary Unit (MEU) conduct a simulated casualty evacuation during a visit, board, search and seizure training exercise with Sailors assigned to the amphibious transport dock ship USS New Orleans (LPD 18) Oct. 1, 2011, in the Pacific Ocean. New Orleans and the 11th MEU conducted pre-deployment work-ups as part of the Makin Island Amphibious Ready Group. (U.S. Navy photo by Mass Communication Specialist 3rd Class Dominique Pineiro/Released)

our programme of work, although it has been decided to take an operational pause with the annual conference, as we gather our thoughts and allow momentum to gather on what has already been established. Scoping work is underway on the implications of cyber warfare to Maritime Security, which I suspect will have read across to other elements of our work.

As only a small team of 25, ably supported by a USN Reserve unit, collaboration is fundamental to the CJOS COE. A network of parties interested in the maritime brings a breadth of experience and intellect, and ensures our products are wholesome, understanding cultural, commercial and regional viewpoints. It is also essential to one of CJOS COE's enduring mandates of interoperability; in maritime operations, where the coalition is one of the willing, we need to ensure that our concepts and doctrine accommodate as many factors as possible, and that we train accordingly — it is not just about connectivity. The benefit gained by being embedded with the USN and collocated with NATO ACT is very evident, as is the warm relationships established with fellow Centres of Excellence and other organizations — several of whom have contributed to this publication. There is though, undoubtedly a need to reach out further, to develop more robust relationships with sponsoring nations and maritime commands, draw in academia and develop links outside of the traditional NATO region. For those readers of Cutting the Bow wave who wish to be more involved please do not hesitate to contact CJOS COE.

Who We Are and How We Accomplish Our Mission:

In May 2006, the Combined Joint Operations from the Sea, Centre of Excellence (CJOS COE) was established to provide a focal point for Joint Maritime Expeditionary Operations expertise for allied nations. Headquartered in Norfolk, Virginia, CJOS COE is comprised of representatives from 13 nations and is the only NATO accredited Centre of Excellence within the United States. We are one of 18 NATO accredited COEs worldwide, representing a collective wealth of international naval experience and expertise. CJOS COE draws on the knowledge and capabilities of U.S. Fleet Forces Command headquarters, as well as neighboring U.S. commands to promote common "best practices" within the Alliance, and to aid NATO's transformational goals with respect to maritime-based joint operations. We cooperate closely with Allied Command Transformation (ACT), other NATO maritime COEs, NATO Joint Force Commands, and various national commands. Our value is achieved by shortening NATO decision cycles between the COE staff and individual Sponsoring Nations' key experts by setting up focal points of contact within these nations. ■

How We Are Tasked:

Shortfalls in current maritime capabilities/procedures are identified by ACT and NATO, who then request CJOS COE's support as reflected in our Annual Programme of Work (POW), approved by the CJOS COE's Steering Committee. CJOS COE's POW 2012 contained a wide spectrum of proposals with strong focus on interoperability of global allies, maritime security initiatives, and working to deliver coherent operational Concept of Operations (CONOPS). Our aim is to become a pre-eminent source of innovative military advice on combined joint operations from the sea. We continue to raise our profile by collaborating with high profile, leading edge institutions, publishing high quality, well researched products, and validating them through experimentation and exercise. This is made possible through our close relationship with U.S. Fleet Forces Command which provides the appropriate validation opportunities, thus making maximum benefit of our unique position embedded in their command structure. We continue to work with non-military entities to leverage existing knowledge and expertise to share best practices on maritime issues to further enhance global maritime security.

A View From The Reserves

CAPT Gordon Broz, USA-N

Combined Joint Operations from the Sea Centre of Excellence
Reserve Component
Norfolk, Va, USA

Seamless Support – CJOS US Navy Reserve

Naval Reserve CJOS COE provides seamless, fully integrated direct support dedicated to the CJOS COE mission. Currently led by Captain Gordon Broz, the unit consists of 4 Enlisted and 16 Officer personnel. As a part of US Fleet Forces Command, Naval Reserve CJOS COE operates with US and NATO active duty counterparts as a model of integration, blurring the imaginary line between active and reserve sailors, working jointly side-by-side on Programmes of Work, conferences, and joint exercises.

The United States Navy Reserve, previously, was structured to augment active duty forces to defeat Cold War adversaries. Reserve units were designed to operate independently and were usually built around platforms and hardware connections. Reserve squadrons and ships were wholly manned with Navy Reservists. Cross connect with the active force occurred at the Echelon level with few opportunities for active-duty reserve integration. Conventional wisdom held that in time of increasing tension and hostility, US Navy Reserve hardware units would be activated. It was assumed that the interval between activation and a "shooting war" would permit adequate time for the mobilization process and acclimation to active duty for personnel and units. For decades this was the accepted role of the US Navy Reserve with World War II serving as a real world example.

The end of the Cold War, budget pressures, and asymmetrical threats required a change in the structure and use of Navy Reserve resources. Hardware units with their large budgets for training and maintenance, along with their support and command components, had to be transformed. US Reserve forces were evaluated and restructured on the basis of their ability to support and integrate with existing active-duty components. The only hardware units that remained in the order of battle were those that maintained a specific mission specialty not performed in the active force, such as small boat / littoral operations or helicopter special operations support. Active Reserve Integration (ARI) was the label for how the Navy Reserve would operate in the 21st century. Additionally, new technologies permitted flexible drilling and information sharing between unit members and were no longer hampered by geography or time.

Operation Iraqi Freedom (OIF) and Operation Enduring Freedom (OEF) presented new opportunities and challenges for the US Navy Reserve. Since 9/11, Navy Reserve personnel combined with other reserve service branches have represented over fifty percent of all deployed personnel in the combat theater of operations. Without ties to specific hardware units, it is not uncommon for individual reserve sailors to fill designated roles in either OIF or OEF. Former Naval Reserve CJOS COE Reserve Commanding Officer Captain Jamie Pierce (currently deployed as the Afghanistan Air Force Liaison Officer) is an example of this type of support. In the new structure, his civilian and past military experience was identified and he was subsequently mobilized to support a specific senior role for OEF. In a period of less than 7 weeks, he went from civilian / drilling reservist to deployed active duty in Afghanistan. This level of responsiveness was not possible before ARI. Thousands of Individual Augumentees (IAs) have provided substantive support for both OEF and OIF over the last decade.

The Navy Reserve CJOS COE Unit is a model for Active Reserve Integration (ARI). The unit offers a unique combination of military and civilian experience. For a unit that is designed to develop global maritime strategy, there are many benefits. Among the Naval Reserve CJOS COE unit members are attorneys, sales executives, contractors, entrepreneurs, and project managers representing Department of Defense, manufacturing, telecommunications, health care, and other sectors of the economy.

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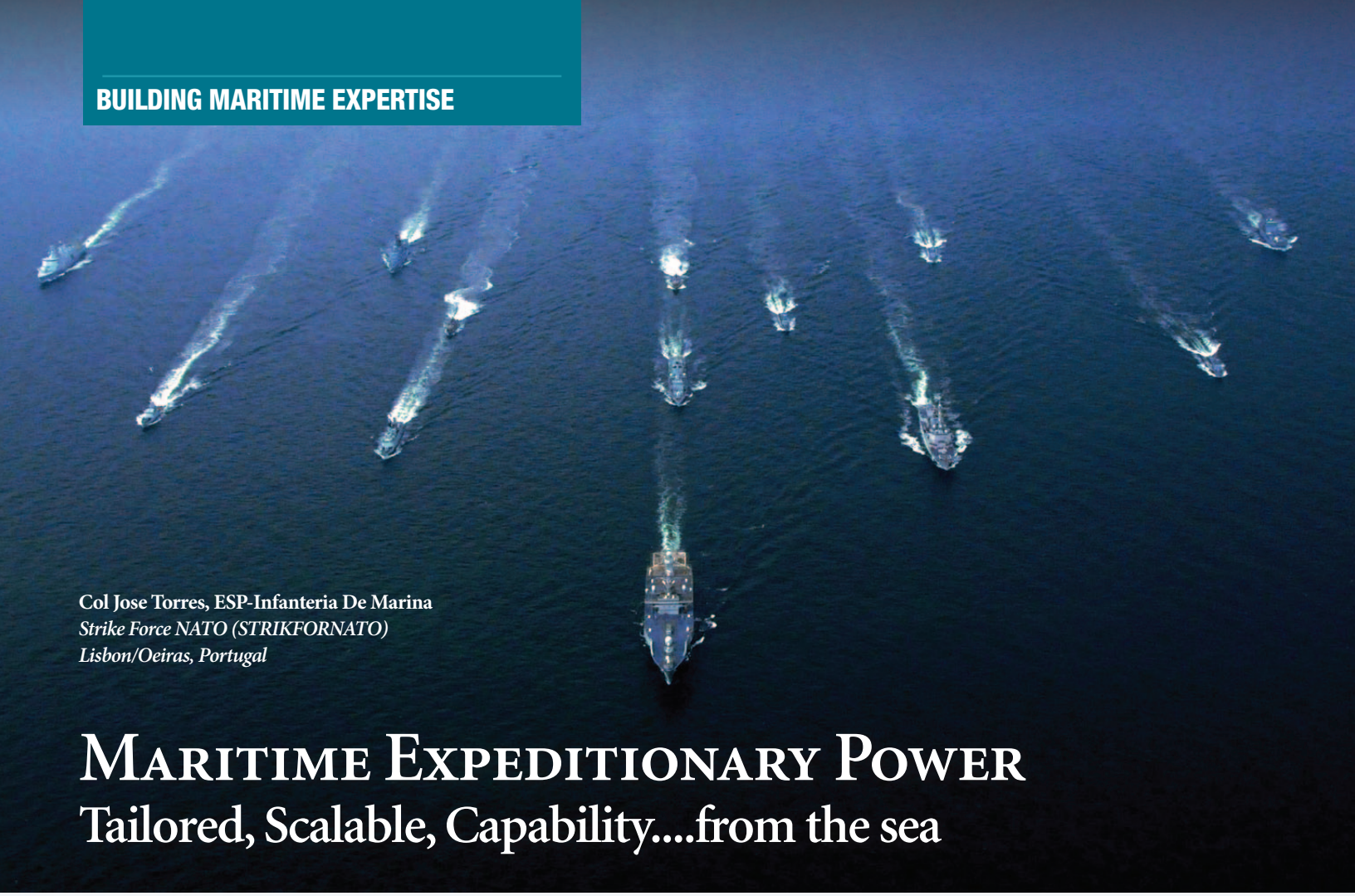
The fundamental structural change in the management and operation of the US Navy Reserve aligns effectively with the mission of CJOS COE. US Navy Reservists are dedicated to their commitment to military service while managing family and civilian work responsibilities. Often separated by geographic distance from their parent command, today's reserve member relies on technology to maintain a connection with the unit. Long term projects with definitive deadlines, clear expectations, which can be completed remotely, are well suited for the services that US Navy Reservists can render. Some members of the reserve CJOS COE Unit have also participated with their active-duty counterparts for longer periods of active duty when necessary. These Active Duty for Training (ADT) and Active Duty for Special Work (ADSW) intervals permit individual reservists to focus on an activity or project for CJOS COE for a specific extended time frame.

Alignment throughout the Chain of Command is critical to successful employment of US Navy Reserve resources. The CJOS COE team excels at recognizing the capabilities of the Reserve team. By treating the Reserve Unit as an extension of the active duty component, the line between active and reserve is effectively blurred as intended in the shift to Active Reserve Integration (ARI). The Navy Reserve CJOS COE Unit will strive to enhance the quality of output from CJOS COE by supporting projects where their experience and availability are best utilized to accomplish the mission. ■

For more information about the US Naval Reserve, please visit www.navyreserve.com. For information specifically about the CJOS COE Naval Reserve component, visit www.cjoscoe.org/cjosnrco.html or CAPT Broz may be contacted at cjoscoe@navy.mil.



Col Jose Torres, ESP-Infanteria De Marina
Strike Force NATO (STRIKFORNATO)
Lisbon/Oeiras, Portugal

Maritime Expeditionary Power
Tailored, Scalable, Capability....from the sea

STRIKFORNATO, Naval Striking and Support Forces NATO (SFN) is NATO's premier Maritime Battlestaff and the Alliance's primary link for integrating US Maritime Forces into NATO operations.

Managed by a Memorandum of Understanding comprising of 11 Nations, SFN is a rapidly deployable, Maritime Headquarters that provides scalable command and control across the full spectrum of Alliance fundamental security tasks. It is also the natural link to bring US Navy & Marine assets into NATO chain of command.

Its logo is a shield with the Trident and the NATO Star. The blue section in the shield represents the sea as we deliver military effects from the sea on the land, the green part of the shield. The gauntlet represents our strength and the trident stands for the three forms of SFN's Power Projection ashore: Cruise Missiles, Amphibious Operations and Aircraft Carrier Operations.

Historical Overview

SFN was created in 1952 when Commander-in-Chief, Allied Forces Southern Europe (CINCSOUTH) ordered the establishment of a new command titled, Commander, Naval Striking and Support Forces Southern Europe (COMSTRIKFORSOUTH – original title of SFN). The Commander was also the Commander of the U.S. SIXTH FLEET, a dual assignment that continues to this day. The SRIKFORSOUTH (SFS) area of responsibility encompassed the entire Mediterranean theatre, from the Straits of Gibraltar to the Easter Mediterranean, including the Adriatic, Ionian, Aegean and Black Seas. A primary task of SFS naval units in all out war would be to participate in the SACEUR counter-offensive by launching deep conventional air attacks or close air support missions in conjunction with any amphibious operations, serving as a major advisor to AFSOUTH and SHAPE in the area of Nuclear Strike Planning in response to the Soviet naval build-up in the Mediterranean.

Within an evolving strategic context, STRIKFORNATO remains ready to deploy rapidly with optimized capabilities to plan, command, and control maritime operations across the full spectrum of Alliance missions and act as a joint commander for maritime / expeditionary operations for small joint operations.

In 1970s and 1980s, SFS assured the readiness of NATO's maritime power projection forces in the Southern Region, to include land

(Above) USS Mount Whitney (LCC/JCC 20) leads a formation of ships from 12 different countries through the Baltic Sea June 8, 2009, during the exercise Baltic Operations (BALTOPS) 2009. BALTOPS is an annual exercise hosted by the United States and is intended to improve interoperability with partner nations by conducting realistic training at sea. (DoD photo by Mass Communication Specialist 2nd Class Michael Rumbach, U.S. Navy/Released)

missions, by planning and conducting large-scale NATO amphibious exercises.

In the 1990s, SFS was directly responsible for developing and refining the Multinational Amphibious Task Force (MNATF) concept. These TF were high readiness, multi-purpose forces, which were task organized and supported by several nations. Also, SFS contributed to AFSOUTH operations in Kosovo by providing planning support and liaison officers.

In 1998 Staff personnel established the Kosovo Verification Coordination Centre in the former Yugoslavia Republic of Macedonia. During Operation ALLIED FORCE, the first high intensity air campaign conducted by NATO, COMSTRIKFORSOUTH assumed command of NATO Carrier Forces.

In 1999, following the reorganization of the NATO Command Structure, SFS moved from the Command Structure to the NATO Force Structure. CINCSOUTH refined SFS operational focus and named it the Regional Reaction Force, acting in response to moves within NATO towards the creation of High Readiness, Rapidly Deployable forces capable of operating beyond the immediate boundaries of NATO. From 1999 to 2004 SFS participated in NATO training, exercises and planning activities, but its status in NATO was still unclear.

Changing the focus: from STRIKFORSOUTH to STRIKFORNATO

On 01 July 2004, after the US, as lead nation, declared SFS a NATO force, the title was changed to STRIKFORNATO (SFN), and its responsibility was broadened to cover the entire NATO Area of Responsibility.

Consequently on 17 August 2004, SFN moved from Allied Joint Force Command Naples Operational Control to Supreme Allied Command Europe Operational Control. The member nations USA (lead nation), Germany, Greece, Italy, Netherlands, Spain, Turkey and UK accepted SFN as a NATO Expanded Task Force (ETF), and it was certified as a 3-star Maritime Component Command (at ETF level) after the execution of Exercise ALLIED ACTION-05. The SFN MOU was opened to other NATO nations and two members, France and Poland, elected to join SFN,

On 1 August 2006 - SACEUR, General James L. Jones, declared SFN at Full Operational Capability (FOC).

U.S. Navy members of the visit, board, search and seizure team from guided-missile destroyer USS Forrest Sherman (DDG 98) return to the ship June 11, 2009, after participating in a boarding training exercise during Baltic Operations 2009 in the Baltic Sea. (U.S. Navy photo/Released)

From January to July 2008 in the ISAF XI rotation, SHAPE directed SFN to act as a nucleus of the ISAF SHQ Staff.

From January to July 2009, and after successfully completing certification Exercise STEADFAST JUNCTURE 08 in November 2008, SFN served as the 2-star NATO Response Force MCC for NRF 12. In 2010, SFN served as the Higher Control for Exercises BALTIC HOST and EMERALD MOVE and as the JTF Commander for the US-hosted multilateral Exercise BALTOPS. In Feb 2011, SFN served at the 2-star Coalition Maritime Component Commander for the USS GEORGE H. W. BUSH Carrier Strike Group Joint Task Force Exercise.

At the onset of the Libya crisis, SFN provided planning support to JFC Naples as they developed draft OPLANS in preparation for the possibility of a NATO-led opera-

tion in Libya. SFN personnel, under national authorities, also augmented the JTF and the US-led JFMCC staff for Operation ODYSSEY DAWN. These responsibilities included positions as Deputy Commander JFMCC, Liaison Officers to France and the UK, and targeting and intelligence experts.

Throughout the NATO Libya operation, up to sixty percent of the SFN staff fulfilled key appointments in Combined Joint Task Force Operation UNIFIED PROTECTOR, until its successful termination by NATO Secretary General on 31 October 2011. SFN provided the bulk of the Current Operations Battle Watch Captains, maritime and air watch officers, formed and led the 1-star Ground Effects Cell (GEC) to provide the Commander and staff with ground situational awareness, staffed national intelligence cells, the Joint Synchronisation and Execution Cell and provided the Deputy Directors for Targeting, GEC, Support, and Operations as well as the POLAD and the Deputy Commander Operation UNIFIED PROTECTOR.

In November, the reconstituted SFN staff successfully executed Exercise STEADFAST JUNCTURE as the 2-star MCC, to become accredited for NRF duties in 2012 and successfully served as the JTF Commander for the US-hosted multilateral Exercise BALTOPS 12 between 31 May and 16 June 2012.

As a part of the NATO Command Structure Reform, SFN relocated its Headquarters from Naples, Italy to Lisbon, Portugal in summer 2012. Portugal joined SFN as its 11th member and Host Nation. SFN became fully operational in Lisbon as of 01 August 2012.

Vision & Mission

Within an evolving strategic context, STRIKFORNATO remains ready to deploy rapidly with optimized capabilities to plan, command, and control maritime operations across the full spectrum of Alliance missions and act as a joint commander for maritime/expeditionary operations for small joint operations.

SFN will develop, sustain and advance a mature relationship with US Navy and Marine Corps to ensure its ability to integrate US maritime forces into Alliance operations.

The SFN mission is to provide a rapidly deployable joint but predominantly maritime headquarters to plan, command, and control maritime operations across the full spectrum of Alliance Fundamental Security Tasks, including maritime Expanded Task Force operations and maritime-heavy small joint operations within the Euro-Atlantic region or at strategic reach.

SFN assists in the enhancement of Alliance and Partner nations' maritime capabilities and joint interoperability through training and cooperative action.

SFN will contribute effectively to the deterrence of aggression against Alliance members and if deterrence fails, contribute towards the setting of conditions for a favourable outcome of the crisis.

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Core Roles

To accomplish this mission, SFN will remain ready to serve as:

1. A deployable Joint Force Maritime Component Command at Expanded Task Force Level for Article V and non-Article V operations.
2. A deployable and scalable Joint Force Maritime Component Command at Sub-Expanded Task Force level.
3. A deployable Joint Task Force Command for Maritime / Expeditionary Joint Operations.

SFN will be ready also to carry out the Support Roles by providing:

1. **Training Support:** Supporting Allied Command Operations and Allied Command Transformation integration objectives for partner and other nations' staff and forces.
2. **Subject Matter Expert Support:** Supporting Supreme Allied Commander Europe and Supreme Allied Commander Transformation by educating, supporting, and providing expertise to NATO headquarters staffs and operations.

The impact of NATO transformation

In Riga 2006, NATO identified the need to conduct and support multinational joint expeditionary operations far from home territory with little or no host nation support and to sustain those operations for extended periods. This requires forces that are fully deployable, including the means by which they are deployed, sustainable and interoperable and the means to deploy them. It also requires a fully coordinated and, where appropriate, multinational approach to logistic support, avoiding dependence on local resources.

The New Strategic Concept, from Lisbon summit 2010 highlighted the need to sustain concurrent major joint operations and several smaller operations for collective defence and crisis response, including at strategic distance, identifying the requirement to further develop doctrine and military capabilities for expeditionary operations, including counter-insurgency, stabilization and reconstruction operations.

In the last Chicago Summit, May 2012, NATO agreed to ensure that the Alliance continues to have the capabilities needed to perform the essential core tasks to which they have committed in the Strategic Concept. To that end, NATO endorsed the Defence Package for the Chicago Summit, outlining a vision and a clear way forward towards the goal of NATO Forces 2020. A new structure will support this endeavour and as a part of the establishment of the new force structure, SFN changed its homeport from Naples to Lisbon.

In meeting these objectives and to achieve the NATO declared level of ambition, SFN can provide a fully deployable, high readiness Maritime Expeditionary Headquarters capable of commanding operations across the full spectrum of the Alliance security tasks, from a CJTF MCC role to a Joint Task Force Commander for a small joint operation in a maritime expeditionary environment.

This is what STRIKFORNATO stands for after 60 years of high value service rendered to NATO. ■

You may view the STRIKFORNATO web page at www.sfn.nato.int

CJOS COE's Support to US Joint forces Staff College's Exercise Purple Solace

Commander Helmut Zimmermann, DEU-N
\Section Head Strategy & Policy Analysis
Combined Joint Operations from the Sea Centre of Excellence
(CJOS COE)
Norfolk, VA, USA

Introduction

One component of CJOS COE's Programme of Work (POW) is a commitment to providing up to three international staff officers to participate in Exercise Purple Solace (PS), a three day training exercise at US Joint Forces Staff College (JFSC, Norfolk, VA), to support the joint and combined operational planning curriculum. Participation in all Purple Solace exercises conducted at JFSC is in keeping with the CJOS COE mission of becoming a source of innovative specialist advice and recognized expertise on the multinational aspects of Combined Joint Operations from the Sea.

Prior to the start of the Purple Solace exercise, students are acquainted with applying concepts relating to international humanitarian response mechanisms and to constraints in assessing US government response to a crisis.

US Joint Forces Staff College's Mission

Joint Forces Staff College, as a component of the US National Defense University (NDU), is a military institution for educating national security professionals involved in the planning and execution of joint operations. The JFSC programme educates staff officers (US and international) in the planning and execution of joint, multinational, and interagency operations and instills a commitment to joint, multinational, and interagency teamwork, attitudes, and perspectives.

The exercise format for Purple Solace is specifically designed to place emphasis on military planning interaction with other

U.S. Government agencies such as the State Department and USAID, as well as the national, international, and intergovernmental elements. The exercise emphasizes the interaction, coordination and consensus building required to execute a mission and is less focused on the actual planning product or deliverable.

The Purple Solace Exercise

Purple Solace is a three day, faculty guided planning exercise which reinforces the initial steps necessary to derive a mission statement and a Commander's intent (end state) and a limited Concept of Operations in response to a series of natural disasters. For the exercise, CJOS COE representatives join a notional USEASTCOM Headquarters with the mission to commence planning efforts in response to a rapidly developing humanitarian crisis in West Africa. The governments of Cameroon, Gabon and Equatorial Guinea have notionally appealed to the UN, US and other willing countries to assist in conducting search and rescue missions and to relieve human suffering. The augmenting staff officers, representing the coalition forces pledged by their respective countries, ensure their forces are properly included in the operational plans within the caveats identified by each country. Additionally, they provide counsel on forging a coalition in a multinational and intergovernmental environment.

One of CJOS COE's international staff officers participates in the panel discussion representing the "kick-off" for a Purple Solace exercise. The goal of the panel discussion is to understand the roles of key US Government interagency participants in the Foreign Humanitarian Assistance (FHA) process as well as the roles of key international partners, agencies, and non-governmental institutions in the FHA process. The CJOS COE task is to instill the experiences in a natural disaster relief operation from a non-US point of view and to deliver a short brief on one of its major Programme of Work items: "HADR (Humanitarian Assistance / Disaster Relief) – NAVY SUPPORTS L.I.F.E. (http://cjoscoe.org/majorwork.html).

Objectives and Achievements

Prior to the start of the Purple Solace exercise, students are acquainted with applying concepts relating to international humanitarian response mechanisms and to constraints in assessing US government response to a crisis. After the panel discussion, the audience breaks into groups where students learn how to categorize the contribution of U.S military and non-U.S. military capabilities during a crisis. Additionally, they are tasked with designing a comprehensive approach to a disaster in a foreign nation using Crisis Action Planning (CAP). As a result, they are able to explain the processes and complexities of an international response to a natural disaster. Participants also learn to synthesize key elements of strategic communications during a crisis. The seminar work culminates in assessing the depth of knowledge of a paired group by receiving a briefing on a mock deliverable. These seminar cross-briefings demonstrate the following:

- the selection of the most appropriate approach;
- the defense of the group's devised operational design/approach;
- an evaluation of the contributions of coalition members, categorization of participant contributions;
- an assessment of the deployment and employment timelines;
- an explanation of how U.S. and coalition military assets would be integrated;
- the defense of proposed command, control and coordination concepts; and
- explanation of: the roles and capabilities of international governmental organizations (IGOs) and non-governmental organizations (NGOs); the unique processes and complexities of international disaster response that arose during the exercise; and, the requirements for, and authorities involved in, a U.S. governmental response to a natural disaster.

CJOS COE Participation

Participation in this exercise provides the unique opportunity to interact with many US Armed Forces Staff Officers of all branches and from numerous commands to provide them an overview of a comprehensive approach to coalition-building and civil-military planning. The students realize that the military is only one actor among several key partnerships with civilian actors that have experience and skills in areas such as institution building, development, governance, judiciary and policing.

CJOS COE's participation in Purple Solace reinforces CJOS COE's continuing work on HA/DR. Student and staff attentions are channeled to injecting "international" experience on Policy-Military related issues when forging a coalition plan and thereby exchanging international views concerning experiences in HA/DR mission planning. This serves to promote the level of cooperation and make an international contribution to a US-led operation more valuable.

Joint Forces Staff College students become more aware of coalition capabilities and are exposed to interests beyond those of the US. Students seek a comprehensive, coalition and interagency perspective capitalizing on the increased legitimacy and capabilities available through multinational and interagency efforts and teamwork. CJOS COE's support to Purple Solace provides a high level opportunity to broaden CJOS COE staff's professional development related to planning an HA/DR operation.

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Enhancing Maritime Situational Awareness: Air And Space Power In Counter-Piracy Operations

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Introduction

The creation and preservation of Maritime Security (MS) is crucial for the Alliance. In addition to ensuring a secure and safe maritime environment, it upholds the principle of freedom of navigation and the protection of the Allies' and global maritime security interests.

An essential condition in achieving MS is Maritime Situational Awareness (MSA). MSA is the enabling capability which delivers the required Information Superiority in the maritime environment to achieve a common understanding of the maritime situation in order to increase effectiveness in the planning and conduct of operations. In simple words, the better one's MSA, the more effectively one can detect, evaluate and counter maritime and maritime-based threats.

Somali Piracy as a case study

The clearest example of the importance of this capability is provided by Counter-Piracy (CP) operations off the Horn of Africa (HoA). Somali piracy is a local problem with regional reach and global impact. It is commonly recognized that a comprehensive approach is required to obtain a real and decisive answer to defeat piracy. This multi-dimensional method, already in place, is intended to bring together coherent and effective military, foreign affairs, humanitarian aid and economic development policy strands. While initiatives by international organizations' continue ashore for increased governance and capacity building, a simultaneous and correlated military action at sea is needed.

Increased patrols and proactive efforts by warships (together with improved self-protection measures by mariners) have drastically reduced the number of piracy incidents, but have not stopped piracy. Warships offer much to the CP effort. Their inherent flexibility, endurance and reach, are key components of a true end-to-end CP capability. Their effect, however, is highly influenced by different factors. These include the vast area of CP operations and the intrinsic characteristics of the 'enemy'.

It is quite clear that the area in which pirates currently operate is simply too vast to be controlled. In 2011, Major General Buster Howes, Operational Commander of EUNAVFOR, stated: "If you wanted to have a one-hour response time in that huge stretch of ocean, you would need 83 helicopter-equipped destroyers or frigates." Due to the costs involved and the current state of the world economy, it is very unlikely that such force would be generated to fight piracy off the HoA.

For these circumstances, continuous or semi-continuous wide-area surveillance is necessary to locate potential pirate safe havens, since early detection of impending attacks increases the likelihood that avoidance, suppression or pre-emptive measures will succeed. A wide area surveillance system would require specific tools for detection, identification and tracking. Pirate skiffs are not easy to detect in the open sea and at long range (especially for surface sensors) since they are mainly small wooden craft with a low radar signature. Identification is also quite challenging. Pirate mother ships and skiffs are common sailing vessels in the CP area and due to lack of clear combatant indicators, it is not immediately possible to distinguish them from

legitimate fishing, or transport vessels. Finally, pirate craft remain at sea in remote regions for a long time; hence tracking of a suspect pirate vessel requires sensor coverage for extended periods.

Why Air & Space Power in CP operations?

Despite significant commitment to the CP mission, surface assets do not entirely match the requirements dictated by the operational environment. Even if one takes account of the many contributions from coalition task forces (NATO, European Union, Combined Maritime Force) and national task forces (e.g. China, Iran, India), the scale of the CP task remains daunting.

An alternate and effective way for the improvement of MSA is to implement Air and Space (A&S) Power in coordination with surface assets in CP operations.

The air environment is contiguous and overlays the land and maritime environments, and air, land and sea all are enveloped by space. A&S Power is therefore uniquely pervasive and offers the prospect of free access to any point on or above the Earth, with the opportunity to observe and decisively influence operations in other environments. In the CP scenario, the military use of air and space would provide a perspective over the whole CP region, ensuring the necessary wide-area surveillance capability. The intrinsic elevation, persistency and penetration characteristics of A&S Power would also greatly enhance the capability to detect, identify and track suspected pirates, even if operating in remote areas and outside the range of surface (shore-based or sea-based) sensors. Moreover, the ubiquity of air platforms could generate deterrence and discourage acts of piracy.

MSA is the enabling capability which delivers the required Information Superiority in the maritime environment to achieve a common understanding of the maritime situation in order to increase effectiveness in the planning and conduct of operations.

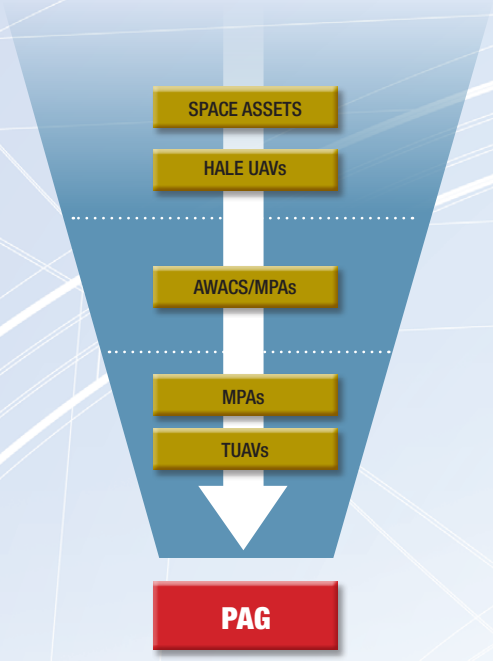

Figure: Multi-layered ISR CONOPS for A&S assets in CP operations

A&S Power could provide the necessary Intelligence, Surveillance, and Reconnaissance (ISR) capability to discriminate the 'abnormal behaviors' at sea. The synergistic use of A&S assets could substantially contribute to the building of the Recognized Maritime Picture (RMP), which would increase MSA, providing alerts for mariners as well as timely and tactically valuable information to Commanders at sea. This would ultimately increase the speed of response for merchant vessels (e.g. alter course and change speed, initiate protective/defensive measures, request assistance) and improve the employment of warships (e.g. escort of vulnerable vessels, shadowing pirate vessels, interception of Pirate Action Groups, disruption of attacks).

A&S ISR Concept of Operations in CP

To deliver actionable intelligence via A&S Power in CP, a multi-layered ISR Concept of Operations (CONOPS) should be adopted (see figure).

This CONOPS requires a 'sensor oriented approach'. Given the assumption that combining sensors reveals a more complete picture, it implies the synergistic and orchestrated employment of a composite 'system of systems', in which all components provide different or common capabilities and are necessarily complementary to each other for the accomplishment of the ISR mission and the enhancement of MSA. Moreover, this CONOPS provides the advantage of reducing the patrol burden on warships, allowing them to pre-position to areas of interest, which improves deterrence and increases the probability of successful intercept of Pirate Action Groups (PAGs).

This CONOPS places Space assets, High Altitude Long Endurance Unmanned Aerial Vehicles (HALE UAVs) and Airborne Warning and Control System (AWACS) high-to-medium orbit, Maritime Patrol Aircraft (MPAs) and Tactical Unmanned Aerial Vehicles (TUAV) in a medium-to-low orbit, with warships on patrol carrying organic helicopters either in flight or on alert. Assets are then able to mutually support one another in a series of cross-cueing, which typically flows from high to low.

Space-based and air-based Automatic Identification System (AIS) information can be collected to provide the basis of a real time, high resolution picture of cooperating maritime shipping. This basic picture can be further enhanced for military use by the employment of sensors embarked on both manned and unmanned air assets, providing raw contact data of non-cooperating vessels to command nodes, both ashore and at sea.

Comparing AIS information with data from other sensors (Synthetic Aperture Radar, maritime radar, optical, infrared, etc.) allows the detection of potential irregularities and discrimination of 'abnormal behaviors'. NATO AWACS and modern MPAs are key enablers in this role and can merge commercial AIS data with their own organic picture on board to give a complete 'contact' plot all vessels at sea in specifically designated regions. Digital LINK networks can disseminate the information, providing a common operating picture to CP units. HALE UAVs will offer a similar capability in addition to the advantages of a much extended endurance and high resolution imagery capability.

At this point, an additional layer is required to provide target identification and track correlation. The deployment of MPAs or TUAVs (eventually equipped with Full Motion Video) ensures the collection of further infor-

U.S. Navy Intelligence Specialist 1st Class Carlos E. Cruz monitors automatic identification systems aboard the aircraft carrier USS George H.W. Bush (CVN 77) while in the Arabian Sea Sept. 28, 2011. George H.W. Bush was deployed to the U.S. 5th Fleet area of responsibility on its first operational deployment conducting maritime security operations and support missions as part of operations Enduring Freedom and New Dawn. (U.S. Navy photo by Mass Communication Specialist Seaman K. Cecelia Engrums/Released)

mation with higher spatial and temporal resolution and possibly the identification of a piracy threat. In this way, the 'detect-identify-track cycle' is significantly reduced as relevant data is passed up the Command and Control chain. Commanders can then evaluate the threat and have the option to issue alerts to merchant vessels or initiate shadowing or interdiction with surface assets.

Helicopters are not included in the CONOPS because they are to be considered part of a warship weapon system. However, organic capabilities of rotary wing assets such as speed of response and unique sensors can provide high quality surveillance products, identification of pirates vessels detected by other means (air-based, sea-based or shore-based) and intelligence collection on pirate bases and ports. They also provide a crucial link in the information chain, from intelligence cueing (AWACS/HALE UAV/MPA), target identification and shadowing (MPA/TUAV), to 'end-game' activities.

Conclusion

The multi-layered ISR CONOPS envisioned for CP could be used as a template for the employment of A&S assets against other threats to MS, namely smuggling, drugs and weapons trade, human trafficking and sea-based IED (Improvised Explosive Device). However, the organizational and technical requirements deriving from the application of the described concept and the employment of A&S assets would be quite challenging. A substantial A&S Power contribution in the maritime environment for the enhancement of MSA would clearly require the presence of an Air Component Commander (ACC) supporting the Maritime Component Commander (MCC). Given that the military action mainly occurs at sea and the potentially extensive employment of air assets, stronger ACC-MCC liaison relationships should be established prior to the execution of this CONOPS.

Additionally, complex multinational and multidimensional scenarios (as in CP) would involve additional levels of liaison in order to guarantee coordination of forces belonging to different nations/coalitions. Integrated naval and air communication systems and a tailored network should also be implemented to foster information sharing by enabling 'synapsis' among forces for the construction of the necessary operational picture for Commanders of different Components in the NATO Force and for Commanders of different nations/coalitions.

These factors, together with unity of effort and the synergistic employment of assets, would at last elevate Air-Maritime operational and tactical relationships from the level of deconfliction/coordination to that of integration. It is not the case of structural integration of assets and manpower, rather the coherent combination of capabilities that ensure mission accomplishment. ■

The Joint Air Power Competence Centre web page is located at www.japcc.de/

Allied/Coalition-USN Interoperability

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Combined and Joint Operations from the Sea Centre of Excellence has issued the second edition of the *Allied Interoperability Handbook*. The scope of the Handbook includes interoperability problems that arise when allied/coalition and US Naval forces are participating in joint operations. These problems are mainly due to differences in culture, doctrine and planning.

The recent coalition experience during Libyan operations as well as Joint US- Coalition exercises have highlighted the difference between U.S. and coalition operating procedures. The U.S. Navy primarily employs national doctrine, publications, networks, and Tactics, Techniques and Procedures (TTPs). These elements are the product of an advanced technological and doctrinal supported infrastructure. NATO/coalition navies primarily employ NATO doctrine, publications, networks, and TTPs but exploit their national tools only when required.

When the US Navy operates with NATO and coalition navies, friction arises as a result of these interoperability challenges. Many of these challenges are linguistic and cultural but also include dissimilar terminology, training, and mindset. Coupled with information releasability challenges, it can become difficult to effectively integrate forces. Communication Information Systems (CIS) challenges such as non-compatible C4I networks require combined forces to use ad hoc networks outside of standard NATO and US systems for information sharing (e.g., CENTRIX vs. NSWAN). The current practice of dissemination of plans and orders via VTC, SIPRNET, and chat, which are often not backed up by messages to coalition forces, can lead to units missing important orders issued from commanders.

Training/Tactics/Procedure challenges are as divergent as the references and procedures themselves (U.S. vs. Allied vs. Multinational doctrine). This causes increased planning burden on multinational forces because OPORDs and OPTASKs cannot be shared with coalition forces. Releasability restrictions or inadequate means of transmission impedes the execution of coalition operations.

While coalition operations have been successful, the time taken to integrate forces can be lengthy. Greater emphasis on closing the gap among these challenges is needed to become a more effective participant in support of cooperative maritime security. For these reasons, CJOS COE promotes the use of the CJOS COE Allied Interoperability Handbook. It is offered as a source of reference for interoperability lessons learned and remedial actions.

CJOS COE recently has begun work on the 3rd Edition so that the Handbook will become more generic in nature. Broadening the scope and the utility of the Handbook may shorten the path that leads to interoperability and make the Handbook exploitable in different areas where US and coalition/allied forces operate. The upcoming 3rd Edition updates will make it more useful from a logistical side by incorporating logistic annexes for different operating areas like the east (North Atlantic) and west (North Pacific) coasts of the US and the Gulf of Mexico. ■

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2012 Maritime Security Conference Review

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Military and civilian leaders in the maritime community of interest from 29 countries met in Halifax, Nova Scotia this past June for the 5th annual Maritime Security Conference, jointly-hosted by the Combined Joint Operations from the Sea Centre of Excellence (CJOS COE) and the Centre of Excellence for Operations in Confined and Shallow Waters (COE CSW). As NATO-accredited Centres of Excellence (COE), the aim was to contribute to maritime security by identifying cooperative strategies for future maritime security engagement. Building on the success of previous conferences, the specific objectives were to (a) enhance national maritime security governance through comprehensive, whole-of-government approaches; (b) enhance inter-regional maritime security governance by developing the way ahead for international maritime security cooperation and awareness; (c) improve maritime security capabilities through effective, interoperable and affordable support infrastructure for maritime security efforts; and (d) identify future maritime security challenges and the way ahead to address them.

While planning for the 2012 conference, CJOS COE and COE CSW collaborated with Dalhousie University in Halifax on an academic critique of the four previous years of concept development, which refined the conclusions and set the scene for the 2012 conference in Halifax. A total of 33 distinguished speakers, all of them leaders in military, civilian government, and commercial industries, were chosen to critically address the topics from a broad spectrum of experience and insight.

Conference Objectives

The topics on page 21 were selected to form the basis of the conference, based on the conclusions of previous work by CJOS COE and COE CSW, as well as other independent sources. The idea that was taken into the conference was that maritime security is inherently a global issue, given the current economic interdependence of most nations. In consideration of the overwhelming percentage of the world's inter-state commerce that is transported by sea, and the fact that two thirds of the world's population lives within 400 kilometers of the coast, the events at sea directly and often dramatically impact the populations ashore. What is significant is that the ocean is at once freely open to anyone with a boat, and at the same time very difficult and challenging to remain on it for any length of time. Movement across oceans is relatively slow and requires large operational investment; yet maritime transport of commerce is several orders of magnitude cheaper than any ground or air method of transportation. It remains the world's transport method of choice for large volume movement across any significant distance. A nation's navy can maintain unchecked maritime supremacy across massive swaths of the sea, yet a few fiberglass boats carrying several men with rifles can divert hundreds of millions of dollars in commerce while raising the overall cost of business by fifty times that across the industry. In short, the maritime domain is simple and open, yet at the same time it is complex and challenging.

The research of CJOS COE, COE CSW, and others concluded that current investment into maritime security was creating a positive effect but left room for improvement. Collaboration in maritime security between nations was seen to have the greatest effect. And although collaboration is increasing with its demonstrated success, it is still not the international norm.

Efforts often spanned broad sectors of government, but responsibility was usually solely shouldered by a nation's navy or coast guard. Other conclusions were that adoption of new technology was critical in matching the growing challenges and that these challenges would continue to evolve as the threats reacted to previously secured maritime security successes.

With these issues and objectives established, the distinguished speakers engaged a thoroughly active audience of over 220 attendees from 29 countries and six continents. The real intellectual work came during the panel discussions, which followed the plenary presentations. Chaired and staffed by a distinguished group including admirals and scientists, Russian representatives to the UN and Turkish Fleet Commanders, think tank founders and military authors of maritime security doctrine, these smaller venues created a focus of academic rigor and an open crucible of contention, which made for an exciting and productive refinement of concepts and objectives. As Commodore Steve Chick, Deputy Director CJOS COE stated, "The insight and engagement provided by this unique arsenal of maritime

security expertise really formed a constructive friction that, in the end, sharpened the conference's proceedings, considerably."

Based on the presentations and the subsequent debates, the conclusions of the conference's panel chairmen were presented on the final day, in plenary. Within the scope of the conference's objectives, the conclusions are as follows:

National Maritime Security Governance

1. Without adequate national arrangements, the foundation does not exist for adequate regional/international arrangements;
2. Technology is not the main issue in maritime domain awareness. The national guidance and operational culture regarding the classification and sharing of information is a larger impediment. Investment focus should not be in equipment but in the human element – understanding, governance, training;
3. No two countries or regions are the same. Their culture and institutions are formative and influential. It is imperative to allow multiple approaches to maritime security solutions, i.e. top-down/federal mandate vs. grass-roots/coalition of the willing, etc;
4. Maritime domain awareness and surveillance capacity can be international, but the response capacity may need to be very clearly national.

Inter-regional Maritime Security Governance

1. Any framework or roadmap will have to accommodate a variety of national models. Levels of capabilities vary among states but the key is to create opportunities;
2. Maritime security must exist at two levels. The most successful international cooperation is founded on a high degree of national co-ordination;
3. An international body should have a role in facilitating the creation and adoption of standard operating procedures (SOPs) developed by engaged states;
4. Information sharing, capacity building and trust are key components of cooperative security arrangements, as are common communication strategies for developing and maintaining political will & popular support;
5. Non-NATO and Non-military stakeholders (e.g. NGO, IGO, non-allied governments) need to be engaged in developing maritime security solutions.

Improved Maritime Security Capabilities

1. Three important spheres of influence on maritime security are (a) maritime situational awareness, (b) maritime security operations (enforcement), and (c) political will / leadership
2. Comprehensive maritime situational awareness starts with national integrated efforts layered with a federation of national systems in a standardized paradigm, all of which is purposed towards information sharing between nations and regions;
3. Key issues and concerns are (a) willingness to share data between entities, (b) coordination of responsibilities inside and between governments and regions, (c) common architectures and requirements, (d) and most importantly, data policy, i.e. "need-to-know" vs. "need-to-share"
4. There is ample room for incorporating commercial interests collaboratively in the surveillance areas of maritime situational awareness.

Future Maritime Security Challenges

1. Future issues and concerns are (a) cyber vulnerability makes control of operation domains more difficult, (b) the rise of hybrid actors who excel at concealment in clutter, (c) Anti-access/area denial situations fuelled by sovereignty claims to control strategic SLOCs and (d) cultural differences in accepting risk and using force against adversaries will increasingly matter;
2. Maritime security and access to the domain can best be assured by maritime security regimes (MSR). MSRs should build on multi-stakeholder approaches involving all relevant state, international, non-state and corporate partners. There is no "one-size-fits-all" in designing MSRs/local ownership and stakeholder directed construct are keys for regime success; and
3. MSRs should provide scalable engagement capabilities for (a) law enforcement at sea, (b) deep-sea operations, and (c) inter-domain concepts of operations. These should focus on protecting critical maritime infrastructure as well as offshore and deep-sea installations and services

National Maritime Security Governance	Inter-Regional Maritime Security	Improved Maritime Security Capabilities	Future Maritime Security
• Nations are Basis for Maritime Security • Comprehensive Approach is Necessary	• Cooperation Required Among States • Mutually Beneficial • Develops Trust	• Information Sharing • Threat Analysis • Risk Assessment	• Varing Challenges as World Rapidly Changes • Identify Main Drivers • Broad Perspective

More than just concept papers and academic commentary, the conference's proceedings have reached a maturity and a momentum requiring segue to real-world actions. Best described as a culminating event, this five year series of conferences successfully wrought mature concepts and practical applications for comprehensive solutions to the maritime security challenges stressing the global maritime commons. From the impact to future planning, strategic guidance and operational execution, these concepts dovetail perfectly with NATO's Strategic Forces Initiative.

Over the next year, CJOS, in co-operation with other maritime stakeholders, will incorporate these proceedings into the development of the Implementation Concept for Maritime Security Operations.

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NMIOTC: THE CREDIBLE NATO MIO EXPERT

Commodore Adrianos Poulos, HEL-N, Commandant
NATO Maritime Interdiction Operational Training Centre (NMIOTC)
Souda Bay Naval Base, Chania, Greece

The mission of the NATO Maritime Interdiction Operations Training Centre is 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. The Commandant's vision is to enhance Maritime Security through Maritime Interdiction Operations (MIO) Training and remain the recognized expert in the field of MIO.

MIO relations to NATO's Strategic Concept

NMIOTC has stood in the NATO community for the last three and a half years delivering training and transformation concepts to help support the countering of illegal activity within the maritime domain. More specifically, NMIOTC has trained more than 3000 students in MIO on a practical and theoretical basis. We believe this is a significant contribution to provide experts globally capable of efficiently tackling the challenge of maritime security. Through cooperation and contributions from other international organizations and academia, NMIOTC is honored to be a proud member of the global maritime expert field and is maintaining a reputation as a Centre that can deliver basic concepts through advanced training and, most importantly, providing students trained to NATO standards. In order to pursue this goal, it is of the utmost importance to understand the strategic significance of MIO within the concept of the Alliance Maritime Strategy. MIO is not something old fashioned but combined with MSA, is a critical enabler to achieve the Alliance's Maritime Strategy. In any maritime operation, there is always a link to a MIO operation founded in MSA and an information exchange strategy.

NATO's Strategic Concept is the fundamental basis from which all maritime strategic tasks originate at the political level. One level below and still on the strategic level, Alliance Maritime Strategy has been agreed to by all NATO nations; it is the foundation from which the four core pillars are driving the whole concept of operational and tactical dimensions in the maritime environment. These core pillars are:

- Deterrence and Collective Defense
- Crisis Management
- Cooperative Security
- Maritime Security

MIO supports each of the above mentioned core values as follows:

- Deterrence and Collective Defense: MIO contributes actively to deterrence and collective defense in support of operations in the maritime, land and air environment, by supporting rapid and decisive force actions.
- Crisis Management: Crisis response actions often include embargo operations amongst others as defined in ATP 71 Maritime Interdiction Operations.
- Cooperative Security: In the theme of

(Above) Sergeant Richard Klein with the 26th Marine Expeditionary Unit's Maritime Interception Operations (MIO) assault force stresses the importance of keeping your elbows in while firing to a paratrooper from the 1st Paratrooper Battalion, Hellenic Army, in Malkme, Crete, Greece, Nov. 15, 2010. The MIO assault force went through a one-week course at the NATO Maritime Interception Operations Training Center in tactics to board a suspect vessel. (Official USMC Photo by Master Sgt. Christopher Matt/ Released)

contributing to partner capacity building by improving their capabilities to address security threats and to operate effectively, NMIOTC is actively contributing to training and exercises.

- Maritime Security: MIO is closely related to, and supports directly, all Maritime Security Operations.

Finally, we should stress the fact that counter piracy operations entail all core values of the Alliance Maritime Strategy from deterrence and NATO's current collective defense through to maritime security operations under the freedom of navigation MSO task.

NMIOTC's Activities

NMIOTC is a NATO Education and Training Facility with a mission to train command teams, boarding teams, naval units and individual personnel in Maritime Interdiction Operations. The NMIOTC vision is to remain the Alliance's credible MIO expert, enhancing the effectiveness of Alliance's Maritime Strategy in all possible ways. Currently, NMIOTC's area of expertise spans all activities that can occur during an interdiction mission, starting from safety of personnel to execution of the entire interdiction mission. In other words, NMIOTC provides training such that a boarding team is able to face any threat related to their own security and addresses any aspect connected to their ship and mission.

The training provided at NMIOTC consists of exercises and transformational activities as depicted in the flow chart below.

As it can be seen from the below flow chart, the training and exercises for boarding operations can be generally divided into two: compliant and opposed. During compliant MIO boarding operations, the boarding team will need to check papers and search compartments for suspicious or illegal cargo and report back to the MIO Commander, all the while taking safety of personnel into consideration. This requires a basic knowledge of the maritime terror threat such as WMD / CBRN/ CIED / Hybrid or any other possible threats, as well as layout, cargo and procedures onboard any type of merchant vessel.

In any maritime operation, there is always a link to a MIO operation founded in MSA and an information exchange strategy.

Before a boarding operation commences, no one can estimate if a compliant boarding operation will revert to an opposed boarding operation (force on force). Consider the following example: a ship that has been taken by pirates without the knowledge of external authorities. During the hail and query procedure, the master of the vessel replies to all queries, but under the pressure of the pirates as if all was well. The boarding team finally goes on board and discovers that the ship is under the control of pirates. This operation then becomes an opposed boarding operation. The same situation can happen during a small skiff / mother ship investigation, where the suspect crew on board the small skiff or the mothership is pretending that they are fishermen, but in reality there are strong indications that they may be pirates.

In supporting transformation, NMIOTC is conducting extensive experimentation, concept development; and modeling and simulation activities with Allied Command Transformation, Naval Postgraduate School, Lawrence Livermore National Laboratory, US European Command, Combined Joint Operations from the Sea Centre of Excellence, US Central Command and other organizations / academia. This will allow NMIOTC to validate the outcomes and enhance future boarding.

Last but not least, all the above procedures are being improved through our efforts in concept development and the Lessons Learned procedures. We are cooperating with Allied Command Transformation, Joint Analysis and Lessons Learned Centre, Standing NATO

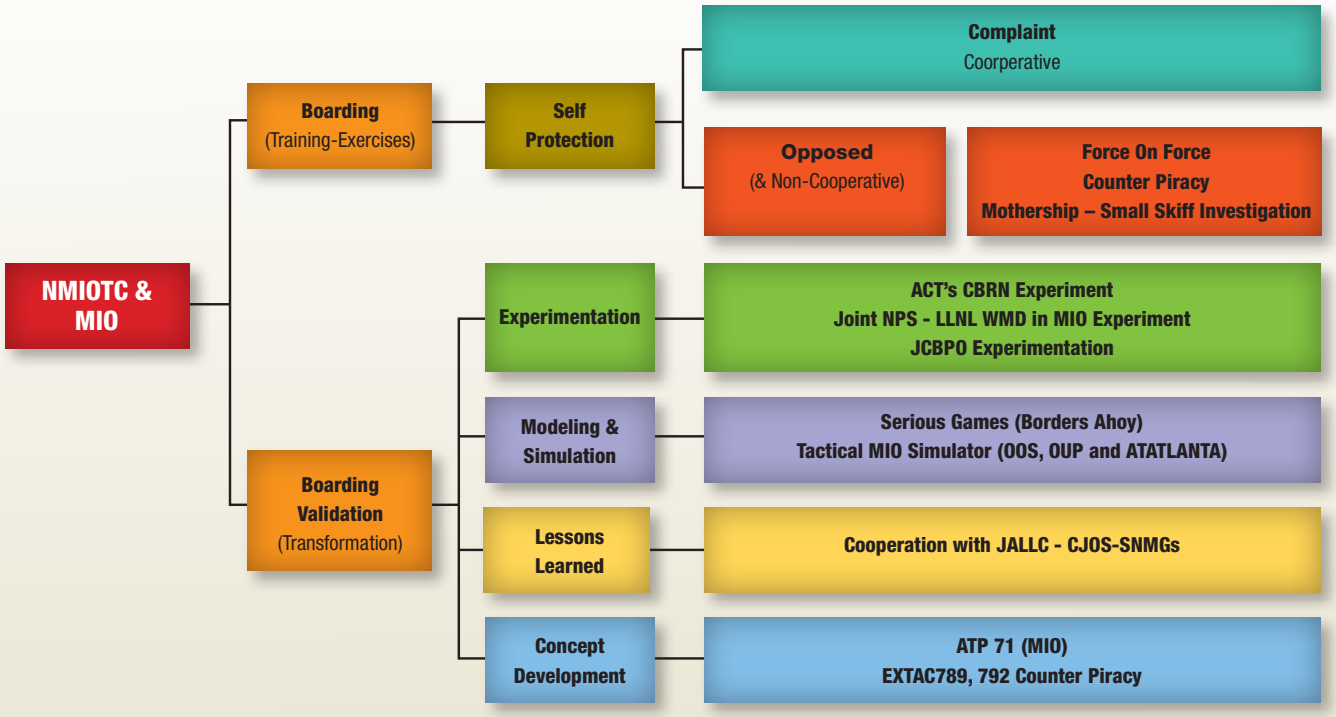

Figure 1 — NMIOTC's strategic perspective on how Maritime Interdiction Operations and Maritime Situational Awareness are critical enablers to implement the full range of tasks stemming from Alliance Maritime Strategy.

Maritime Group and other naval units, including personnel participating in real operations in order to share their valuable knowledge and better prepare for upcoming operations.

Epilogue

In conclusion, NMIOTC is proud to be a leader in the field of Maritime Interdiction Operations as a subject matter expert capable of delivering effective, efficient and affordable training in addition to transformative solutions aligned to NATO standards and policy. In the near future, and as the security threats continue to change in the maritime environment, NMIOTC will continue to prove its worthiness and capability to tackle the current issue of maritime security. Of course, all the abilities that we encompass can only be performed through strong cooperation with other international organizations and academia.

Our distinguished clients, including US Coast Guard and European Special Forces, give NMIOTC credibility in the field and the foundation upon which to strive for even better results. Following Socrates' words: "Happiness is stemming, not from money, but from productivity," we are committed to continuing our best efforts even in an era of severe global austerity. ■

For further information, visit the NMIOTC web site at www.nmiotc.gr/#home_en.htm or contact them at www.nmiotc.gr/#contact/contact_form_en.php

Commodore's Bio

Commodore Adrianos Poulos, GRC N graduated from the Hellenic Navy Naval Academy in July 1981 and was appointed as Navigation Officer and XO to various types of ships. He had the honour to Command, the Fast Patrol Boat HS KAVALOUDIS (P-25 – Missile Patrol Boat) and the "S – Kortenaer" type Frigate, HS AIGAION (F-460). Commodore's main appointments include, Operations Officer in the Frigates Command, Staff Officer to the Hellenic Navy General Staff / A1 directorate as well as Commandant to the Patrol Boats flotilla. His NATO experience includes a two year assignment to the NATO / PfP cell in Mons, Belgium and also a two year tour as DCOS for STRFORNATO in Naples. Since April 2011 Commodore Adrianos Poulos is the NMIOTC Commandant.

Besides his naval education, Commodore Adrianos Poulos has received a master's degree in Operations Research from Naval Postgraduate School in Monterey California and he holds a B.S. from the Economic University of Athens. Additionally, he has attended a number of educational programs in military colleges, such as the Hellenic Naval Staff and Command College, the Hellenic Naval War College and the Hellenic National Defense College.

Commodore's awards include the Cross of the Order of Honor, the Cross of the Order of Phoenix, the Medal of Military Merit B' Class, the Navy Force Formation Command Medal C' Class and the Staff Officer Service Commendation Medal B' Class.

He is married to Constantina Stratigou, who is an English Teacher in Primary Schools and he has three children, two daughters and one son.

Alligator Conference 2012 (AC12) – Lisbon, Portugal 3 to 5 October 2012

Major Andrew Cross, GBR-RM
Strike Force NATO (STKFORNATO)
Lisbon/Oeiras, Portugal

The annual Alligator Conference, sponsored by Naval Striking and Support Forces NATO HQ (STRIKFORNATO), took place near Oeiras, Portugal 3 through 5 Oct 12. Attending the event were 49 delegates representing 37 NATO Headquarters, Organisations and aligned Partner Nations. Key note speakers included Major General Ed Davies, Commandant General UK Royal Marines and Rear Admiral Ann Phillips, Commander US Expeditionary Strike Group Two.

The aim of the conference was to provide a credible platform for attending organisations to inform others on national capability developments and debate experiences from recent operational and exercise activity. AC12 focused on operational Lessons Identified and Learned from the primarily land centric operations in Iraq and Afghanistan in the last decade with a transferable benefit to the littoral domain and from the air and maritime domains during Op UNIFIED PROTECTOR. In addition, Alligator's intent was to then pass collective observations directly to the membership of the NATO Standardisation Authority Amphibious Operations Working Group (AOWG), Alliance Centres of Excellence (COE) and Nations as a catalyst to further develop amphibious doctrines and capabilities. The broader 'Vision' of Alligator is to provide outreach opportunities to those Nations with developing maritime and amphibious capabilities, or ambitions that may otherwise not have been a suitable forum in which to interact.

The broader 'Vision' of Alligator is to provide outreach opportunities to those Nations with developing maritime and amphibious capabilities, or ambitions that may otherwise not have been a suitable forum in which to interact.

Key topics discussed this year included: updates on the future of NATO Command Transformation processes; specifically Project MARCOM, the European Amphibious Initiative, advancements in the area of the Sea-basing concept, and opportunities to partake in future exercises such as BOLD ALLIGATOR and BALTOPS exercise series. Furthermore, it provided STRIKFORNATO with an opportunity to explain its ongoing work in respect to development of the Joint Headquarters and Maritime Expeditionary Command and Control concept on behalf of SHAPE.

Building upon the progress of AC12, STRIKFORNATO intended to broaden its primary littoral focus to the full spectrum of the future maritime enterprise and invited delegations to the STRIKFORNATO Maritime Conference 2013 (currently scheduled for 28-29 May. In support of this intent, the targeted audience will grow to include delegations from Air, Land and Civil communities; in order to discuss maritime issues affecting the future community of the interested. ■

More details will be published on the STRIKFORNATO webpage in due course: http://www.sfn.nato.int/operations/alligator.aspx

Point of contact within STRIKFORNATO: Major Andy Cross UK Royal Marines: a.cross@sfn.nato.int

Alternative C2 Structure For The Commander Amphibious Task Force And Commander Landing Force

LCOL Gary Yuzichuk, CAN-A
Combined Joint Operations from the Sea Centre of Excellence (CJOS COE)
Norfolk, VA, USA

Amphibious Operations involve and integrate a simultaneous action on the land, maritime and air environments and are conducted at a tactical level but with an important impact at the operational and strategic level. For this reason, amphibious operations are among the most complex of operations and are probably the area of joint warfare which requires a clear chain of command and a strong relationship between the Commander of the Amphibious Task Force (CATF) and the Commander of the Landing Force (CLF). Possibly one of the more crucial aspects that amphibious operations must overcome is the challenges related to the transition of forces from the sea to the land in a non-permissive environment.

In reaction to the realities of shrinking defense budgets across most of the NATO countries, amphibious forces have begun to adapt their doctrine to suit smaller scale operations, such as raids and minor incursions. This posture, while reflective of the current operating environment, decreases the ability for, and perceived need to conduct, large scale, opposed amphibious landings.

Based on this change in operations and the fact that current littoral operations are unlikely to require transfer of command, CJOS COE received a request from the Royal Netherlands Navy to develop an alternative Command and Control (C2) structure. The project aimed at supplementing the current allied doctrine for amphibious operations, ATP 8 (B), Vol I, caters for an effective comand and control relationship while carrying out less ambitious, smaller scale, amphibious operations.

Included in the CJOS COE Programme of Work (POW) 2012, the final product was published and distributed last January after a thorough revision by, amongst others, the Royal Netherlands Maritime Warfare Centre as well as the U.S. Navy Expeditionary Strike Group 2 (ESG-2).

The Alternate Command & Control Relationship and Staff Organisation for Amphibious Operations document emphasised that the proposed command and control structure fosters a greater integration of the amphibious elements of the Amphibious Task Force by regrouping functions and operating from a common command centre. Although the authorities are clearly delineated, the concept provides the sought after flexibility and mobility enabling the Commander of the Landing Force to exercise command from the most advantageous location. It also leverages the advancements of modern technology to conduct non-contiguous operations while reducing resources and manpower requirements. ■

LCOL Yuzichuk is a staff officer at CJOS COE in Norfolk, Va. For further information, he can be contacted at usff.cjos.coe@navy.mil. The Alternative CATF/CLF paper may be downloaded at www.cjoscoe.org

Prospective Operations in Confined and Shallow Waters

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Approximately seventy percent of the earth's surface is covered with water and almost eighty percent of the world's population lives within 500 km of the coastline. Additionally, ninety percent of international commerce is carried by sea. The confluence of the seas and their legal, economic, technological, organizational, and governmental spheres of influence occurs in confined and shallow waters (CSW). Depending on the international, national, regional and local orientation of stakeholders acting there, confined and shallow waters are priority areas of responsibility between the coast with its maritime infrastructure, the high seas and inland.

Generating a sufficient level of awareness for solution-influencing factors in CSW operations requires a well-structured and sufficiently detailed analysis. To conduct such analyses, well-founded maritime expertise in maritime safety and security in CSW is necessary.

Due to decades of experience as a "coastal navy", the German Navy identified these globally valid aspects and early in the 21st century, decided to establish a "Centre of Excellence for Operations in Confined and Shallow Waters" (COE CSW) in Kiel. The COE CSW, hosted by the German Navy and accredited by NATO in 2009, unites expertise from seven nations. A portfolio of projects (Programme of Work) is updated semi-annually through a vote of an International Steering Committee (SC). Revisions are made in accordance with NATO and participating nations' priorities. The primary objective of the COE CSW is to produce timely results and reduce duplicative efforts without lengthy processes. NATO's common ambition to develop existing capabilities to meet the requirements of 21st century's SMART DEFENCE strategy in an optimized and complementary approach resulted in COEs establishing themselves as relevant international knowledge networks. The capability of the COEs to act as a link between military and civilian agencies, corporations, universities, and research / trial facilities, make NATO's COEs unique.

Confined waters include narrow waters limited by geographical constraints and navigational restrictions (e.g. dense traffic in the approaches of choke points or along sea lines of communications). This definition allows for a broad interpretation. During the 2012 Maritime Security Conference in Halifax, the Deputy Commander MarCom Naples went so far as to include the Mediterranean Sea as confined waters. Shallow waters include a depth up to 200m. For discussion purposes, this reference point serves as a point of demarcation rather than including deeper areas of the sea.

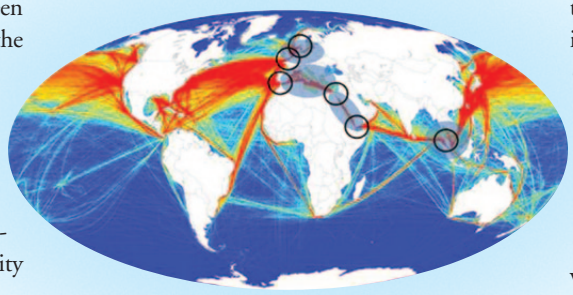

Figure 1 - This map depicts the main traffic lines and shipping density. The most frequented routes are shown in red.

Shipping routes and Chokepoints

Modern Container ships such as the EMMA MEARSK are able to carry up to 14,770 TEU, (twenty foot equivalent, a small standard container). With the average load of 12 tons per TEU it equals the freight load of 177,000 tons aboard one ship. The fuel consumption for the distance of approximately 8,700 nm from Singapore to Bremerhaven, Germany, is approximately 10 gallons per 1 ton load. Based on a price of heavy fuel oil at $180 /ton, the shipping cost of freight is $6.50 per ton. Compared to a theoretical transport by truck we would end up with $460/ton. Given geographic limitations, cost effectiveness, and quantity, sea transport is significantly more efficient than Intra-Continental shipping.

A ship underway on its route from Singapore to Bremerhaven will pass the blacked ringed choke points and blue marked confined areas on the map. They are critical points along sea lines of communication requiring protection to ensure safe flow of commodities. Their relative vicinity to the shore and shipping predictability enable threat factors to interfere with ships and form theaters of operations. Nation states might also use legal claims to deny sea borne transportation. The effect of those factors varies from hampering the flow of goods to loss of ships and personnel. The economic impact of these threats influence areas beyond operational areas.

Current Operations

Few maritime operations today resemble the tactics developed during the Cold War. The objective during the Cold War was defense of the territorial integrity by military forces or alliances. Today the focus is on the protection of economic sovereignty by law and resolution enforcement. These operations are primarily the responsibility of military organizations. However, non-military organizations like FRONTEX (Frontières extérieures for "external borders", legally: European Agency for the Management of Operational Cooperation at the External Borders of the Member States of the European Union) are an example of the cooperation by national non-military authorities. Current operations like Atalanta, Active Endeavour, Ocean Shield, UNIFIL, Frontex and others focus on CSW; however, blue water considerations continue to be disproportionally weighted.

Prospective operations will require new types of operational planning and execution and will be driven by several factors.

Drivers and Trends for Prospective Operations

Growing urbanization will increase the demand for sea borne trade as well as the need for exploitation of new off shore resources.

Harbors and ports will drastically grow in size to serve larger ships requiring additional force protection and protection of nearby industry and support sites.

As wind and other energy technologies exploit offshore capabilities, the demand for infrastructure protection will simultaneously increase. The information technology revolution will also place demands on CSW support. The use of the internet and social media is ubiquitous. Custom software solutions are of no longer the norm with the emphasis on open source software and platforms. Global communication networks provide a vital link for these systems. Protection of undersea communication lines will also be a serious consideration for CSW planners.

Prospective Objectives and Priorities

- Protect critical infrastructure, including sea borne (platforms, ships), territorial (power plants, harbor facilities), and natural resources,
- Ensure unfettered access to the maritime domain and the freedom of the seas in the defined area.

Area Access Safety Operations

Area Access Safety Operations are characterized by regionally limited operations in a defined area which have a specific objective in order to serve a specific purpose. Area Access Safety Operations are unlimited in duration and must be executed with limited assets. These operations are typically executed in CSW, so their complexity and number of possible theaters could exceed current capability.

Challenges

The first factor is the Assets to Area ratio (the challenge to operate with a limited amount of assets in a defined area). Bringing to bear the right force at the right time in the right place is an ongoing concern. Available entities must also be able to operate for an extended period of time in theater. Sustainability will remain a critical, resource-dependent determinant for the successful conduct of operations. Effectiveness will be determined by the availability of suitable sensor and communication equipment for the respective type of operation, while efficiency will be reflected by the maximized potential of the combination of human and material factors.

Center of Gravity

All stake holders must be aware of the meaning and need of the awareness of their area of responsibility. The ability to concentrate the effort on a particular location inside the operational area on short notice could be critical. This could range from sea presence by patrolling to interdiction or engagement on short notice. Unmanned systems can alleviate the pressure on resources. It is possible to make use of intra-force organic long range assets (e.g. rocket propelled carrier systems) or unmanned systems which can drop airborne assets equipped with sensors to identify contacts of interest to deter them as necessity dictates.

Sustainability

Sea endurance of assets in use has to be adapted to the threat. Anti-piracy operations on the Somali coast serve as an example. Somali pirates quickly altered their tactics once they recognized that merchant ships were altering their routes away from hostile coastal areas. Pirates broadened their operational radius by employing a mother ship as the basis for their center for gravity. Countering the threat could require the use of supply ships or mobile platforms /artificial islands offering supply, recovery, and maintenance capabilities.

Effectiveness

It is not reasonable to expect member nations to purchase new ship types to address the special needs of Area Access Safety Operations. Available assets will not significantly change from the current force structure designed for classic blue water warfare. The variety of threats and opponents' capabilities require the possibility for a scalable engagement and an increase of the identification and engagement capabilities optimized for the environment and task.

This could be done by ship borne and non surface solutions. Floating buoys equipped with sensors could be used like oceanographic probes as unmanned single intelligence devices. Autonomous underwater gliders could provide surveillance over wide areas.

Efficiency

Economic capability is the most limiting factor in today's operations. The capital intensive cost for assets and ongoing maintenance restricts plans regardless of ambition. Sustainment and rapid response are often financial trade-offs in terms of both material and personnel. Technology may serve as a force multiplier and reduce the need for human involvement.

Flexibility is also a parameter. By its nature, CSW requirements change rapidly and must be adapted to current conditions on short notice. Designing units to cover potential requirements with rapid deployment capability is cost prohibitive. Modularity and use of available use of theater assets is the key to flexibility.

COE CSW — Fields of Work

Access to Competence

Area Assess Safety Operations will be challenged by the number of theaters and the capability of assets. The implementation of Unmanned (Autonomous) Systems in operations is critical to maritime situational awareness. It includes static and territorial systems as well as fully integrated shipboard systems to process information and reduces workload. Improved the effectiveness of unmanned rapid carriers is an ongoing need. Off-shore platforms such as support and Command and Control sites will enhance sustainability and improve effectiveness.

Due to the character of confined and shallow waters, Area Assess Safety Operations require the willingness, reliability and a common interest of all contributors to give valid information and requires dependency on other players, who may follow other priorities without any preannouncement. Together with other entities in a so-called Community of Maritime Interest, the COE CSW is currently working on aspects of the aforementioned topics. COE CSW is committed to the development of strategic to tactical requirements for the improvement of experimental tactics and tactical documentation. Implementation of aspects of the Maritime Security Operations Concept resulting from the Maritime Security Conferences jointly planned by COE CSW and CJOS COE is a prime example.

The 2013 Program of Work estimate of COE CSW covers projects ranging from tactical to strategic level in this sphere which generally will meet – amongst other – NATO- and multinational initiatives such as the Multinational Capability Development Campaign (MCDC) 2013/2014. ■

View the COE CSW Programme of Work at www.coecsw.org

MARSEC COE

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Seventy percent of the world is covered by oceans. Since the dawn of mankind, we have used the oceans as a means to transport our products. And since mankind has used the oceans, he has also found ways to use the oceans illegally. The maritime dimensions of resources, energy, trade, transportation, environment and tourism make it a natural assumption that maritime security should occupy a very important position in the world agenda. As the global economy gets smaller, countries are gathering to find solutions to maritime security. At the Maritime Security COE, we have found that a whole-of-government approach is the best solution towards ensuring maritime security.

Since ninety percent of goods are transported via the seas, maritime security plays a critical role in today's interdependent and globalized economies. It is apparent over the last decade that the risks affecting maritime security can be categorized into four areas. These four risks are maritime terrorism; proliferation of WMD; organized crime and illegal immigration on the sea; and, piracy and armed robbery. In view of these issues, there is a need to clarify the mechanism/legal framework applicable to the efforts in countering such risks. Although there is the United Nations SCR's outlining the ways and means to cope with these problems, each nation first resorts to its own national laws and policies. In this respect, most nations have national crisis management structures that would be activated immediately in case of a maritime related terrorist attack. These structures typically include inter-agency representation, although levels of decision-making differ from country to country.

Maritime forces have been tasked to tackle some of the maritime security challenges along with their traditional roles, but maritime security tasks are getting more and more significant. Not only navies but also other maritime security stakeholders realize that they need to be better prepared for this new role.

However, maritime forces have been tasked to tackle some of the maritime security challenges along with their traditional roles, but maritime security tasks are getting more and more significant. Not only navies but also other maritime security stakeholders[1] realize that they need to be better prepared for this new role.

One of the challenges within maritime security coordination and cooperation is that culture varies by country as well as between different national agencies. Also, there is a vast difference in the capabilities of the different nations/ regions of the word. Maritime security requires both multinational-inter-agency cooperation and the necessary legal framework. A solution is not possible using only military forces. However, it is achievable through civilian involvement, awareness and engagement. The Shared Awareness and Deconfliction (SHADE) meetings in Manama/ Bahrain are the best example for multinational-interagency cooperation on maritime security. Within this spirit, maritime security challenges to be addressed require a sustainable, multinational, cross–functional-interagency approach. Multinational Maritime Security Centre of Excellence (MARSEC COE) is ready to help provide this environment.

MARSEC COE

MARSEC COE officially opened on 12 November 2012 with a ribbon-cutting ceremony at the Southern Task Group Command Headquarters in Marmaris, Turkey. The presiding officer was Vice Admiral Atilla KEZEK, Commander of Turkish Naval Southern Sea Area Command. The opening of MARSEC COE commenced with a two-week Maritime Security and Counter Piracy course organized by the new Centre of Excellence and Turkish Partnership for Peace Training Center. Thirty two participants from 18 countries participated in this first event (Albania, Algeria, Azerbaijan, Bahrain, Bangladesh, Estonia, Ireland, Lebanon, Oman, Pakistan, Poland, Qatar, Saudi Arabia, Spain, Sweden, Tunisa, Turkey, United Arab Emirates). Concurrently, a Maritime Security Workshop was held from 14th to 16th of November 2012. Fifteen international academics gave presentations on maritime security to the participants. Following the workshop, MARSEC COE hosted the NCAGS Units participating "Exercise Dynamic Master" from 20-29 November 2012. This is an NCAGS Counter-Piracy Exercise (CPX) designed to exercise Naval Cooperation and Guidance for Shipping (NCAGS) and Allied Worldwide Navigational Information System (AWNIS) personnel in accordance with procedures in a multinational environment.

MARSEC COE objectives are to:

- Establish a maritime security community of interest via extensive networking;
- Assist in concept and doctrine development for various aspects of maritime security;
- Distribute in-depth expert knowledge through training, exercises, conferences, seminars and papers;
- Educate leaders/specialists and help overcome "sea blindness" of maritime security related issues;
- Contribute to maritime security capacity building;
- Promote interoperability, standardization and best practices in the context of maritime security;
- Analyze maritime security activities to identify lessons and to identify best practices; and,
- Test and validate concept through experimentation.

Our mission is to support UN, NATO, Partner Countries and maritime security stakeholders by providing subject matter expertise in a comprehensive approach for all levels and aspects of maritime security.

Our vision is to become a centre producing proactive strategies related to maritime security as an internationally efficient and effective academic institution.

MARSEC COE has a busy 2013 planned, offering many courses and workshops. Please contact us to inquire about participation in any of these events. ■

For further information visit our web site: www.dgmm.tsk.tr

Contact marseccoe.admin@dzkk.tsk.tr for further information about the MARSEC COE.

1. Government (Navy, Coast Guard, Custom, Harbour Authorities and related Government agencies), Private Sector (Private Maritime Security Companies-PMSC, Privately Contracted Armed Security Personnel-PCASP, Recognized Security Organizations-RSO) and Maritime Industry (shipping lines, R&D etc.) and Academics.

MARSEC COE 2013 Training/Courses/Workshops

Vessel Protection Detachment Training	1-12 April 2013
Counter-Improvised Explosive Device Course	17-21 June 2013
International Ship & Port Security (ISPS) Course	8-12 July 2013
Maritime Security Operations Staff Officer Course	9-20 September 2013
Maritime Security Workshop- stanbul	7-9 October 2013
Maritime Security & Counter Piracy Course	18-29 November 2013

High Level Decision Support in Maritime Interdiction Operations

Complex Experiments, Intelligent Reachback & Computational Supply Networks

Heinrich Buch, *Senior Advisor COMTESSA, Universität der Bundeswehr, München, Germany*
Prof. Dr. Alex Bordetsky, *Professor, CENETIX, Naval Postgraduate School, Monterey, CA, USA*
Goran Mihelcic, *Fakultät für Informatik, Universität der Bundeswehr, München, Germany*
Prof. Dr. Stefan Pickl, *Fakultät fur Informatik, Universität der Bundeswehr, München, Germany*
Venera Pjetraj, *COMTESSA, Universität der Bundeswehr, München, Germany*

Complexity is a natural component of the globalization process: Traffic systems, critical infrastructure protection, network topologies, energy resource management and so forth are all characterized by complex behavior and economic interdependencies. Operations Research (OR) is one of the key instruments to model, simulate and analyze such systems and questions concerning safety and security. Gaining optimal solutions, suitable heuristics, and efficient procedures for these applications are some of the main solutions which were developed at COMTESSA, University of the Bundeswehr Munich (COMTESSA is part of the Centre for Network Experimentation and Innovation (CENETIX) which is directed by Prof. Dr. Alexander Bordetsky from Naval Postgraduate School (NPS) in Monterey). COMTESSA focuses on awareness, analysis, control, and optimization of complex systems. Research is also conducted on IT-supported process optimization as well as service-orientated, reach-back convention.

Maritime Interdiction Operations (MIO) and CENETIX

"The question is, if it is hard to detect this special maritime traffic, how can we improve our awareness of what is going on? How do we know if a suspicious vessel is in the area? And when there is one, what does the boarding team do?"

— Dr. Alex Bordetsky

These are central questions focusing on the work of the MIO experiment series as well as the participation of COMTESSA within the Centre of Excellence for Operations in Confined and Shallow Waters (COE CSW). Furthermore, CENETIX and COMTESSA intend to increase the cooperation with the CMRE at La Spezia. CENETIX is engaged in Sensor Allocation and Complex Harbor Protection. Dr. Alex Bordetsky leads a team of NPS researchers working with their counterparts in the US Joint Special Operations Command, the US Navy, Homeland Security, and Department of Energy to determine the fundamentals of

identification and tracking in the maritime domain. The international community, led by NATO, Sweden, Germany (COMTESSA), Denmark, Greece and Singapore, are also participating in MIO experiments designed to efficiently manage maritime traffic. Maritime interdiction operations research and experiments conducted since 2002 are showing promise in the development of intelligent tools to better identify, tag, track and monitor complex (reach back) processes. Annual NPS-led exercises and experiments are therefore providing a test bed for new detection and communications technologies and search tactics, as well as interagency and international communications to support specialized maritime interdiction operations.

A ScanEagle unmanned aerial vehicle launches from the flight deck of the dock landing ship USS Comstock (LSD 45) in the Persian Gulf May 17, 2011. Comstock is supporting maritime security operations and theater security cooperation efforts in the U.S. 5th Fleet area of responsibility. (U.S. Navy photo by Mass Communication Specialist 2nd Class Joseph M. Buliavac/Released)

Complex Computational Supply Networks

"*Complex experiment series and high-level decision support are the heart of CENETIX and COMTESSA.*" Dr. Stefan Pickl

The heart of the effort is a network that enables partners to collaborate and share data that they can relay, in real time, directly to first responders and patrol crews in a position to interdict. International law and enhanced monitoring capabilities have made it easier to track larger vessels and, in many cases, identify any critical materials in their cargo. COMTESSA is engaged in the area of understanding complex supply networks, especially in the area of cargo transportation and surveillance.

IRIS-Integrated Reachback Information System

"Improving maritime awareness requires an elaborate system of sensors, unmanned systems, screening portals, modeling and simulation and unconventional networking capabilities being advanced through the MIO program. COMTESSA is developing a special information system known as IRIS (Integrated Reach-Back Information System)."

Such a holistic decision support procedure supports the flexible coordination between multiple disciplines and responsibilities (within the creation of OR cells and CD&E processes) to create an optimal operational picture. Therefore OR/M&S is central to the area of IT-supported process optimization as well as issues regarding decision and game theory/ strategic planning, particularly with a view to the background of international military experiments and service-orientated "reach-back"-concepts. IRIS focuses on the development of a technical platform that seeks to support the effective and efficient application and integration of soft and hard OR techniques within a distributed decision environment like the MIO experiment series.

SUPPLY CHAIN CONTROL TOWER - Self-forming adaptive networks and services

In order to analyze such complex adaptive systems on a platform; agent-based modeling and simulation is necessary. Agent-based modeling and simulation are an approach for modeling real world complex systems of an adaptive nature, such as an adaptive supply chain network. They enable design of each actor's supply chain network individually, based on their own decision rules. Moreover, it allows the simulation of the aggregate behavior of these heterogeneous organizations. In this way emergent, non-linear behavior can be captured. To adapt as flexibly as possible to unexpected changes, information along a supply chain network has to be visible. Achieving visibility in a supply chain network continues to remain a problem. To overcome this difficulty, *a supply chain control tower which could be embedded in the global reach-back concept of the future via a special service-orientated approach*. The whole initiative, once completed, will enable analysts to put together a more complete and integrated operational picture. An integrated MIO network is vital for providing instant expert service orientated reach-back. Our aim is the creation of a robust SOA in an agile complex environment like Maritime Interdiction Operations. ■

LITERATURE: Program Promotes Improved Small-Craft Surveillance, By Donna Miles American Forces Press Service, MONTEREY, Calif., Sept. 21, 2011

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Prof. Dr. Pickl may be contacted through the Universität der Bundeswehr web page at www.unibw.de/startseite/index_en.html

Common Design Standards, Interoperability and Data Fusion

Karna Bryan,
NATO Science and Technology Organization (STO) Centre for Maritime Research and Experimentation (CMRE)
La Spezia, Italy

Securing the maritime environment relies on many factors such as interagency coordination, international cooperation, and organized response. The ability to identify threats far away from where they may strike helps to reduce vulnerability by reducing the necessity to respond to threats on short timescales. Situational awareness on its own cannot guarantee a secure maritime environment, but it is a key enabler to building the knowledge required to recognize threats and respond to them efficiently. As the quantity of data increases from scarce to abundant, operators are no longer able to manage and fully utilize all available information in order to make the connections required to sufficiently identify threats in advance. The employment of innovative tools and automated techniques are a vital component of information superiority.

A complex global supply chain and complicated maritime governance are two other contributing factors to situational awareness. The amount of commercial and recreational maritime traffic is massive and this traffic often operates on a global scale, with no one entity having all critical pieces of information. Additionally, no single nation has a mandate to govern the Global Maritime Commons, yet all nations have a common interest in protecting the environment and securing the right of free passage. Collaboration is essential for the common interest, and it follows that some level of shared situational awareness is essential for effective collaboration. While data sharing is fundamental to increased situational awareness and is frequently discussed, an area yet to receive significant attention is how data which is shared will be effectively utilized. This must be done collaboratively, without each agency or nation operating in isolation.

Data fusion is the process of combining data from multiple sensors and other forms of knowledge to create the most complete and accurate understanding of objects in the environment as possible. With increasing sensor coverage, new platforms, and better information sharing, the technical requirement to quickly synthesize this information into a use-

ful and precise picture is a clearly identifiable challenge. The ability to correlate between high-level, context-based knowledge and low-level information about location in space and time is also a prerequisite to building a picture of intent.

From a technical point of view, data fusion has multiple definitions and a wide variety of algorithms can be employed. Data fusion can be as simple as overlaying information and re-aligning data to match time stamps. For location data, target tracking algorithms are often used to optimally correlate multiple data sources over space and time. These range from simple rule-based measures defining "close" to sophisticated mathematical formulations which account for motion models and interactions between multiple targets. It is widely agreed that there is no "holy grail", or single algorithm which is best for all situations; however the best model for a particular situation will depend on the sensor mix, target characteristics, and other factors.

Interoperability between data fusion engines would enable nations to not only share data but also the tools to manipulate data. The effort to define a framework for this interoperability is non-trivial and undertaking such an initiative is less interesting for a single nation, agency, or industry partner. Existing data fusion engines are generally used as a black box where data is fed in and supplied back, with no knowledge of what happens inside the box. Often, significant investment has gone into the development of these algorithms, and the challenges of "algorithm sharing" may be even more difficult than data sharing.

Data fusion is the process of combining data from multiple sensors and other forms of knowledge to create the most complete and accurate understanding of objects in the environment as possible.

With the aim of enabling interoperability between tools which can reason on maritime data, the NATO Science and Technology Organization (STO) Centre for Maritime Research and Experimentation (CMRE) is working on an interoperability platform which allows various national programs and industry partners to share a common framework for processing data. The framework is called the "Collaborative Multi-Sensor/Source Fusion and Tracking" (CoMSSoFT) tool, and the primary objective is to develop a standardization within data fusion engines which enable partners entities to better utilize data collaboratively. Key to this collaboration is the use of an open framework as an expandable base where additions and modifications to the collective knowledge and know-how can be made by participating organizations when appropriate. Even without explicit contributions from partners, the CoMSSoFT framework could be used simply as a means of standardization in data fusion engines. A secondary objective is to create a highly modular environment to facilitate more efficient development and the ability to quickly tune and adapt algorithms to new data sources and environments.

The current trend is to replace monolithic implementations of software and command and control systems with open architecture, service-oriented implementations. These more modern systems are an important enabler in effectively using all available data. The next step beyond the sharing of data will be the sharing of algorithms, or "services" in a software engineering paradigm. The benefits of such service-oriented architectures are notable, allowing for rapid integration of new data sources and the rapid prototyping of new services. As these systems are becoming more effective at managing the sharing of data, the next step will be the insertion of modular components which provide content and added value services to the data. To achieve collective Maritime Situational Awareness (MSA), data on its own is of little value, unless its meaning can be collectively understood. Enabling and enforcing interoperability in the design of these components will allow greater contributions by a larger spectrum of industry partners which can allow nations, organizations, and agencies to better exploit the information available to them. ■

The NATO Science and Technology Organization (STO) Centre for Maritime Research and Experimentation (CMRE) web page is www.cmre.nato.int

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Littoral Sea Control Concepts

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Ultimately, the goal for NATO should be to use the collective expertise of the various centres of excellence to establish a sound doctrine for joint operations in the littoral environment and to issue the doctrine in a formal NATO publication.

CJOS COE has recently completed work on the final draft of an *"A Warfighting Concept for Littoral Sea Control"*. This concept was developed with help from representatives from the Centre of Excellence for Operations in Confined and Shallow Waters (CSW COE), UK Maritime Warfare Centre (UK MWC), the Netherlands Navy Maritime Warfare Centre (NLD MWC), NATO Naval Mine Warfare Centre of Excellence (NMW COE), and the US Naval Warfare Development Command (NWDC). The concept will provide NATO maritime and joint commanders an operational level doctrine for joint maritime warfighting in the littorals against a hybrid threat pursuing an anti-access/area denial strategy, while operating at strategic distance from the European continent. The concept scope is broad and focused on the doctrinal aspects of littoral sea control operations, while providing an overview of the other elements of the Doctrine, Organization, Training, Material, Leadership, Personnel, Facilities, and Interoperability (DOTMLPFI) format.

In the course of the concept's development, several doctrinal pillars for littoral sea control operations emerged, which were based on historical analysis and wargaming. These pillars are interrelated. First, a commander must understand the littoral battlespace in which he fights. This understanding includes not only the enemy's order of battle and anticipated strategy, but also the geographical features and the human terrain that may impose limitations on his actions. Understanding the battlespace requires both academic expertise about the region in question and operating experience. It also requires persistent intelligence, surveillance, and reconnaissance (ISR), both before, during, and after any conflict.

Persistent ISR requires access to the battlespace. Access is assured through the attainment of a measure of air superiority and sea control, which also enables maritime manoeuver. This access in turn, allows for the application of local airborne and seaborne ISR platforms, permits strike operations ashore and afloat, and enables effective employment of information operations; vital to success in a littoral environment.

Force protection, always a critical requirement, is particularly important in the littoral environment, given the overlap of various conventional and asymmetric threats found within the confines of coastal waters. These threats can range from high-tech capabilities such as cyber attacks, and ballistic or defense cruise missiles to low-tech fast inshore attack craft (FIAC) and naval mines. Utilizing sea-based command and control can mitigate the threat to shore based headquarters and facilitate operations in a GPS or satellite denied environment.

The next step in further developing the concept described above is to seek opportunities to validate the doctrine. These opportunities may exist within future planned exercises or formal wargame simulations that stress the complexities of operating in the littoral environment against a hybrid maritime threat. Lessons learned from these exercises can be further integrated into the doctrine established thus far.

Future NATO operations will likely be conducted from within the maritime environment. These operations may not be confined to the waters around the European land mass as NATO security concerns expand across the globe. Ultimately, the goal for NATO should be to use the collective expertise of the various centres of excellence to establish a sound doctrine for joint operations in the littoral environment and to issue the doctrine in a formal NATO publication. This approach will provide NATO a baseline from which to conduct training for future operations, which may include crisis management operations in littoral waters at strategic distance. ■

CDR Coffman is a Staff Officer at NWDC in Norfolk, Va. The CJOS COE Warfighting Concept for Littoral Sea Control Concepts can be found at www.cjoscoe.org/published_docs.html. Comments are welcome and should be sent to usff.cjos.coe@navy.mil

BOLD ALLIGATOR: *2012 Review*

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In the spring of 2012, along the coast of Virginia and North Carolina, military forces from Australia, Canada, France, Germany, Italy, the Netherlands, New Zealand, Spain, Turkey, United Kingdom, and the United States conducted BOLD ALLIGATOR 2012 (BA12). As part of an annual series of exercises, BOLD ALLIGATOR was a large-scale, multi-national, amphibious exercise designed to maintain and further the allied littoral expertise.

The US and France made the largest force contribution. The U.S. employed the USS WASP, USS KEARSARGE, and USS SAN ANTONIO to embark the Expeditionary Strike Group and Marine Expeditionary Brigade. USS ENTERPRISE and her escort combatants supported the exercise, as well as units from the 1st Riverine Group, US Coast Guard and five auxiliary ships from Military Sealift Command. France provided the amphibious assault ship FS MISTRAL with embarked Commander Amphibious Task Force staff, amphibious landing battalion and embarked helicopter air wing. Additionally, a Dutch boat detachment, a Canadian Army Company and a Royal Marines Company each took an active part in the training. U.S. Marines have recently fought side-by-side with these allies in Iraq and Afghanistan; this exercise provided another opportunity for these coalition forces to refine and strengthen their combat skills, this time from a sea-based environment. As expected, this generated some important lessons learned, discussed in the latter part of this article.

The Combined Joint Operations from the Sea Centre of Excellence (CJOS COE) played an important role in BA12 by capturing "Lessons Learned" from a "Coalition Interoperability" perspective. Additionally, CJOS COE played a key role in facilitating the communication and integration of coalition forces via liaison officers. Lastly, BA12 was an excellent opportunity to collect data to support our Programme of Work items including: Amphibious Force Operations, Littoral Warfare, Joint Sea-Based Operations, Interoperability, Humanitarian Aid\Disaster Relief and Information Exchange. To accomplish this, CJOS COE staff officers were deployed with the Commander Amphibious Task Force\Commander Landing Force staffs on board USS WASP, embedded with the Riverine Group and underway on board FS MISTRAL.

From the U.S. perspective, Exercise BA12 was the largest Navy and Marine Corps amphibious exercise conducted in the last ten years. Due to sustained combat operations in Iraq and Afghanistan, the Marines have been more focused on land operations. The previous live exercise executed at the Expeditionary Strike Group and Marine Expeditionary Brigade level was conducted in 2001 on the US East Coast. The BOLD ALLIGATOR series is aimed at revitalizing and reinforcing the Navy and Marine Corps traditional roles as "fighters from the sea".

The BOLD ALLIGATOR series actually started in late 2007 following publication of "A Cooperative Strategy for 21st Century Seapower", with a unified U.S. Navy, U.S. Marine Corps, and U.S. Coast Guard strategy. In order to implement this strategy, Sailors and Marines identified the specific requirements and training objectives through workshops, symposiums and academic training sessions.

This exercise, unrelated to any current geo-political situation, involved fictional countries and opposing forces to provide realistic scenarios that an amphibious task force may be expected to successfully encounter. The training was based on a continuum of scenarios that develop critical experience and skills that the Navy\Marine Corps team is likely to leverage in the near and distant future.

Communication in a multinational exercise amongst all partners is a requirement in order to be effective. Early in the planning process of BOLD ALLIGATOR 2012, Cenrix was identified as the favored system to allow information sharing/communications between all partnering nations; however, it was not used from "cradle to grave" for planning and execution causing discontinuity in sea, air, and land coordination. Secondly, not all key planning documents such as OPTASKs for ASW, ASUW, and AAW were released to coalition partners due to classification problems.

Interoperability was noted as a hindrance in both reports as well. Lack of early coordination and follow through hampered US and coalition forces by causing confusion and communication problems. Lack of LNOs aboard FS Mistral, use of 2 different time zones, pre-exercise knowledge base of amphibious operations on staffs within various operations' centers were identified as causatives for difficulties in operability.

Both reports recommended similar follon on actions. There should be early engagement by all partners in order to reveal differences and deficiencies as a key component to success. Facilitation interoperability and information sharing issues required all involved to address the identified issues early enough in order to develop a solution. This includes: acknowledging and configuring a common operation system; addressing Foreign Disclosure issues prior to exercise commencement; all partners should participate in pre-exercise education for a knowledge baseline; exercise standards for time zones and terminology; and lastly, provide engagement and liaise to smooth the difficult areas.

Overall, BA12 was an excellent opportunity to strengthen the proficiency of the Navy\Marine Corps team's amphibious capabilities and enhance partnership with coalition maritime forces. Realistic exercises, such as the BOLD ALLIGATOR series, are essential to maintain US and coalition military forces in persistent combat readiness, able to act worldwide at sea and ashore. The important lessons identified from BOLD ALLIGATOR 2012 were interoperability and information sharing. By addressing these matters early in the exercise planning process, it will better allow command and control communications and operations throughout a combined task force. For the future, and in an effort to minimize resources and operating funds, CJOS COE is now focused on BOLD ALLIGATOR 2013 as a synthetic exercise in April/early May 2013. ■

CDR Fonseca is a Staff Officer at CJOS COE in Norfolk, Va. He may be contacted at usff.cjos.coe@navy.mil. *BOLD ALLIGATOR 13 continues to build on BA12 and the previous exercises. BOLD ALLIGATOR 13 is scheduled 22 Apr-02 May 2013.*

Collaboration is a virtue at NATO Centre for Maritime Research and Experimentation

"Our role is to be a catalyst for scientific work among the nations."

Edward Lundquist
Centre for Maritime Research and Experimentation (CMRE)
La Spezia, Italy

NATO's premier undersea research center is broadening its horizons. Although now 50 years old with a legacy for discovery and innovation in support of warfighters; the Centre for Maritime Research and Experimentation in La Spezia, Italy, takes a vibrant and enthusiastic approach to finding and trying new concepts and technologies.

In July 2012, the NATO Undersea Research Laboratory became CMRE. "We welcome this opportunity to apply our knowledge and capabilities to the entire maritime domain," says Director Dr. Dirk Tielbuerger. "This will better reflect our contributions to meet the needs of the 28-nation alliance, and to take full advantage of science and technology and expertise. Our Science & Technology (S&T) focus is to develop and then demonstrate how new concepts and equipment perform in the operational maritime environment."

The Centre invites visiting scholars and interns from a broad spectrum of academia, government agencies, and industry to join in the research and bring fresh insights and ideas.

CMRE is a world-class laboratory with a highly qualified international staff of scientists, along with technicians and engineering support to fabricate and conduct experiments. The Centre invites visiting scholars and interns from a broad spectrum of academia, government agencies, and industry to join in the research and bring fresh insights and ideas. Just as important, the Centre has been, and continues to be, a fulcrum for leveraging the work of partners around the world to take advantage of exciting discoveries, inventions and knowledge.

To investigate underwater acoustics, the Centre has the world's quietest research vessel, the R/V *Alliance*, designed for underwater acoustic research for the benefit of NATO and member nations. "We invite researchers to see how we can collaborate on oceanographic and maritime research that is best conducted aboard a highly capable and quiet, dedicated research platform," according to Tielbuerger.

CMRE also operates the smaller 94-foot coastal research vessel *Leonardo*. Like *Alliance*, CRV *Leonardo* is built for quiet operation to enable acoustic research.

Known for its work in anti-submarine warfare, today the Centre is creating new approaches to maritime security and harbor protection for NATO's Emerging Security Challenges Division Defense Against Terrorism program.

Powerful modeling and simulation tools allow scenarios to be examined that could not be accomplished in the real-world. Gaming technology is used to improve advanced interoperability and watch stander capabilities in maritime security situations. "We're studying how to protect military forces, seaborne shipments, and critical civilian infrastructure in ports and harbors during times of high threat alert," says CMRE scientist Ron Kessel.

One widely used tool today is the internationally adopted Automatic Identification System (AIS), which requires every vessel larger than 300 tons to transmit identification and sailing information. CMRE has been investigating ways effectively use this data for maritime domain awareness. "Situational awareness is sort of an all-encompassing sort of task to know more about the maritime environment than we know right now," says Dr. Karna Bryan, a CMRE research scientist. "A lot of our global awareness is based on AIS." Bryan, a mathematician, is an operations analyst developing tactical decision aids for various warfare func-

tions. Better understanding AIS data can point out potential problems, through identification of traffic pattern anomolies.

"Maritime anomaly detection requires an efficient representation and consistent knowledge of vessel behavior. Automatic Identification System (AIS) data provides ship's state, vector, and identity information to automatically derive knowledge of maritime traffic in an unsupervised way," states Bryan "With AIS, more and more data becomes available, and people are not able to process it all. In fact, right now, I think there is more data than people can use. We've gone from not enough dots on the screen to too many dots on the screen. We're developing ComSoft, which is Collaborative Multi-Sensor Source Fusion and Tracking Tool, which is a computationally intensive solution to automatically learn maritime motion patterns using unsupervised algorithms to analyze the AIS data flow so it is suitable for historic or real time analysis." In looking for anomalies, it becomes less of an issue of what a particular vessel is doing, but rather whether there are vessels that are not doing what they should be expected to do. "Surveillance remains a challenge because certain vessels that you're interested in are not necessarily easy to track," says Bryan.

The Centre is also experimenting with autonomous unmanned systems to conduct undersea surveillance and intervention to sense, comprehend, predict, communicate, plan, make decisions and take appropriate actions to achieve mission goals. According to CMRE research scientist Dr. John Potter, "Naval operations have been traditionally performed by a relative small number of large, expensive platforms dealing with well-defined threats to which those platforms could be designed to address." "That's changing," he says. "The threats are now much more diverse, changing rapidly, and so we require a more adaptable, flexible response. That's changed the focus from the platform—which have life cycles of several tens of years— to capabilities. New platforms are built to support multiple missions with a variety of capabilities. You basically plug in the ones that you need for this mission."

That has motivated Potter and his associates to look at unmanned underwater vehicles. "They're smaller and cheaper than ships. In the past you explored the undersea environment by towing a long sensor aperture from a big ship, we now have new intelligent-adaptive ways of gathering and responding to environmental information. As the unmanned vehicles mature and becoming autonomous, the new challenge has shifted toward their intelligent behavior."

"It is our role to be a catalyst for work among the nations; a place where the nations can send scientists and collaborate at sea to achieve the mission of NATO," says Chief Scientist Ed Gough. "Even when nations have an S&T capability themselves, they can gain a great deal from collaboration."

Since the end of the Cold War, NATO has been proactive in reaching out to other nations in an attempt to promote its mission of peace, cooperation and interoperability. CRME embodies the ability to work together to form coalitions to establish an environment of security.

"At CMRE, we are proud of our past," says Tielbuerger. "But we are focused on the future."

Contact the Centre for Maritime Research and Experimentation about research partnerships, visiting researcher opportunities and internships:

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Multi-National Experiment – 7 Maritime Domain

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Introduction

Throughout 2011 and 2012, a group of 17 NATO and partner nations collaborated in a comprehensive concept development and experimentation (CD&E) effort to address "Access to the Global Commons". Since 2001, the United States has spearheaded these multinational efforts in a series of limited objective experiments. The aim of these experiments is to apply academic and analytical rigor to concepts and operations that involve military forces. This latest campaign (MNE-7) sought to improve coalition capabilities to ensure access to and freedom of action within the Global Commons domains (Maritime, Space and Cyberspace).

The specific problem statement was:

"Nations and organizations require concepts and capabilities for anticipating, deterring, preventing, protecting against and responding to a disruption or a denial of access to the global commons domains (maritime, space and cyber) and for ensuring freedom of action within them, while taking into account their interrelationships."

The framework for the campaign consisted of four outcomes, each dedicated to the three aforementioned domains with the fourth dedicated to the linkage between them, or the "inter-domain".

- Outcome 1, Maritime Domain, co-led by United States and Germany
- Outcome 2, Space Domain, co-led by Canada and NATO ACT
- Outcome 3, Cyber Domain, led by United Kingdom
- Outcome 4, Inter-Domain Understanding, led by France

The Combined Joint Operations from the Sea Centre of Excellence (CJOS COE) lent its expertise and efforts to the concept experimentation within Outcome 1 - Maritime Domain. Co-led by the U.S. and Germany; CJOS COE, the 17 nations; and the COE for Operations in Confined and Shallow Waters (COE CSW) worked to design an improved ability to build and enhance "maritime security regimes" (MSR). An MSR is a group of states acting together under a framework aimed towards improving collectively, security in the maritime domain. CJOS COE had previously written a white paper titled "A Framework for Enhanced International Maritime Security Cooperation and Awareness", which informed the initial foundation for the maritime domain concept. The subsequent campaign consisted of five workshops and two limited objective experiments. The concept writers and professional analysts developed case studies and queried subject matter experts from the military and civilian ranks. Their work culminated in an innovative concept titled "Maritime Security Regime Concept" and an implementation plan titled "Enterprise Proposal and MSR Manual." This concept and its accompanying manual consolidated the lessons from current maritime security regimes with the goal of fostering and facilitating mutual support among them. The latter is where the Maritime Domain objective of MNE-7 achieved the greatest impact.

This active collaboration carries significant potential in securing the resource that makes the world economy possible, i.e. the global maritime commons.

The Big Idea

In the early phases of the case studies, concurrent with initial conceptual work, the problem of situational awareness horizons started to emerge. The challenges faced by a MSR inevitably originate or reach beyond the MSR's geographic and operational limits. A global approach to regional problems is then necessary to overcome this inherent disadvantage. With this insight, MNE-7 evolved the concept into a maritime security Enterprise, centered on the idea of a global network of maritime security regimes.

The concept of this Enterprise is not merely the sharing of maritime situational awareness, but neither is it a supra-national entity governing authority over the oceans. The Enterprise is an active, voluntary, collaboration of nations and the MSRs that they form. This active collaboration carries significant potential in securing the resource that makes the world economy possible, i.e. the global maritime commons. Two principles inherent to its success are (a) the building of confidence and trust among participants and (b) the establishment of mutual stakeholder benefit. Concomitant with these principles are complementary functions of Enterprise support to MSRs. They are: (1) the net-enabled collaboration of the MSRs, (2) a repository of proven best practices and MSR procedures, (3) the enhancement of the "assessment" aspect of situational awareness and (4) an advocacy function that collaborates, mentors and builds capacity within the Enterprise.

Increased Situational Awareness

At first glance, networking the MSRs for increased situational awareness and operational cueing provides an obvious potential for more effective response efforts. A clear example of this networking at the regional level was the Italian Navy's work to found a network of federated surveillance systems, which has now become the Trans-Regional Maritime Network (T-RMN). The T-RMN began as an idea with

roots in NATO, EU and national initiatives to network maritime situational awareness. It has subsequently expanded to network the maritime operations centers of the wider Mediterranean community. This includes five North African navies of the Maghreb plus the integration of Brazil and Singapore through their own national systems (SISTRAM and OASIS). With this increased situational awareness facilitated by open collaboration, maritime assets are coordinated in identified areas and warning indications are dramatically improved. As one might predict, the T-RMN partners have compounded their operational effects simply by sharing data and analysis. This improvement also shows potential for further operational expansion as their network matures and grows in scope and effectiveness.

Mentorship

While the tactical and operational improvement with this expanded situational awareness is self-evident, the Enterprise can provide much more to allied MSRs in mutual benefit and strategic advantage. A strategic advantage of the Enterprise is the ability to link MSRs facing an emerging problem in their region with other MSRs who have an established expertise in addressing that challenge. This mentor function reduces the required time to learn and adapt to issues, possibly eliminating the mistakes of a solitary effort. This transforms the MSRs into more agile and responsive engines of change, i.e. it mitigates the need to reinvent solutions to previously solved problems. We see this with the multi-national effort of mentorship that the U.S. and its partners from Europe, Canada, Australia, and South America have provided to the emerging nations of Africa, through the African Partnership Station (APS). One highlight of APS's success is its impact on the nascent Maritime Organization of West and Central Africa (MOWCA) working to form an MSR on the continent's west coast. APS brings navies with developed maritime safety and security into a recurring contact with African participants. As these developing navies mature in capacity and capability, they in turn, take on more of the planning and training roles of the engagements. This persistent and tailored interaction creates an enduring fast-track to a much higher level of success and return on the African investment. For one of several specific examples, the continent of Africa has historically lost one billion dollars annually to unlicensed and unregulated illegal fishing. The regional GDP per capita is under $2,400 making this a viscerally acute loss. Throughout the previous decades, bi-lateral engagement in maritime capacity building throughout Africa (Russia, U.S., et al) involved providing operational assets (i.e. boats) and some basic training. This resulted in little to no increase in any maritime security capacity of any form for any length of time. In contrast, the APS mentorship has facilitated the rapid improvement of African states' capability and capacity in fisheries protection. This sustained success has created an immediate benefit at both the government level and within the coastal population. Concurrently, there is a growing, mutual confidence among the participating navies.

MSR Formation

In this same vein, the Enterprise becomes a key enabler to the formation of new MSRs and the sustained improvement of existing regimes. For example, the International Maritime Organization (IMO) and the Regional Co-operation Agreement on Combating Piracy and Robbery Against Ships in Asia (ReCAAP) were instrumental in supporting the emerging MSR in the Gulf of Aden and western Indian Ocean, that results from the Djibouti Code of Conduct (Djibouti Code). The IMO hosted the initial conference for the Djibouti code, where the draft MOU was developed. IMO then linked the Djibouti Code representatives with ReCAAP, who provided a proven MSR construct that meets both operational and political requirements. ReCAAP and IMO continued their involvement with a joint training program for the Djibouti Code's Information Sharing Centres and a set of agreements that pave the way for complete operational link-up in ReCAAP's and the Djibouti Code's anti-piracy efforts. In this instance, the roadmap to concrete results already existed, with ready partners to facilitate an efficient operational transition. This is not to state that the formation of an MSR is now a simple matter requiring little effort. Yet, the involvement of another MSR dramatically improves the efficiency and effectiveness of the formation process. When compared to what would otherwise be the necessity to form a MSR independently from scratch, the transformational impact of this Enterprise is difficult to refute.

Sovereignty Concerns Addressed

As MNE-7 developed and codified the Enterprise concept, it was initially not without detractors. Throughout the concept development, the various subject matter experts and some concept writers raised concerns with creating a global maritime governing body or contributing to the loss of national sovereignty at sea. These concerns are understandable and, perhaps even valid. However, the surrender of any governing authority is expressly counter to the prescription of the Enterprise's concept. To be of any value, the MSR Enterprise must be the collaborative network of regional MSRs. Any authority that the MSRs have is a product of the sovereign authorities that support them. In short, the Enterprise serves the MSRs who make up its voluntary network of contributors, who in turn serve the nations that fund and support their own regional actions. The power of the Enterprise is not in the usurping of sovereignty, but in supporting it.

Conclusion

Herein lies the strength of the MSR Enterprise. The momentum of confidence and trust created from successful and voluntary collaboration establishes mutual benefit and an increased operational agility in a complex environment. Sustaining the engagement in this Enterprise offers an even greater potential than the immediate gains. It reinforces the mutual benefit and institutionalizes the norm of a secure maritime domain. The result is a steady, global improvement in stable and continued access to the maritime commons and freedom of legal action within it. This maritime security is ultimately a critical foundation for the world's economy. It is this dual approach of a global Enterprise, combined with individual improvement efforts, that promises to ensure future security in the maritime global commons. Within the maritime realm, MNE-7's concept and accompanying manual offer an adaptable and effective construct for sustained global maritime security. ■

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"Mental Models and their Influence on the Concept Development Process"

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Introduction

One day while reviewing the *Allied Command Transformation's Concept, Development and Experimentation (CD&E) Handbook*[1], I came across the statement that the output of the CD&E process is a concept. Reading further, one discovers that a concept is "a notion or statement of an idea, expressing how something might be done or accomplished, that may lead to an accepted procedure". This definition of a concept is refined within the handbook to state a concept is a "solution-oriented transformational idea that addresses a capability". The crux of both of these definitions is a concept is an idea. So, how are ideas formed? No, I am not a neuroscientist with the intention of explaining the inner workings of the brain. I am; however, a Staff Officer positioned within a diverse international organization tasked with concept development. The purpose of this article is to explain how ideas are formed as mental models, the dangers and pitfalls of mental models, and their influence on the concept development process.

What is a Mental Model?

The definition of "Mental Model" depends on the discipline and context in which one finds these words. The contemporary originator of the mental model concept was Kenneth Craik, a psychologist, who in 1943 stated that mental models are "small scale models of reality[2]" or more simply stated "individual mental representations of the external world influenced by cognitive factors[3]". The ability to form mental models is considered a basic characteristic of the human cognitive system[4].

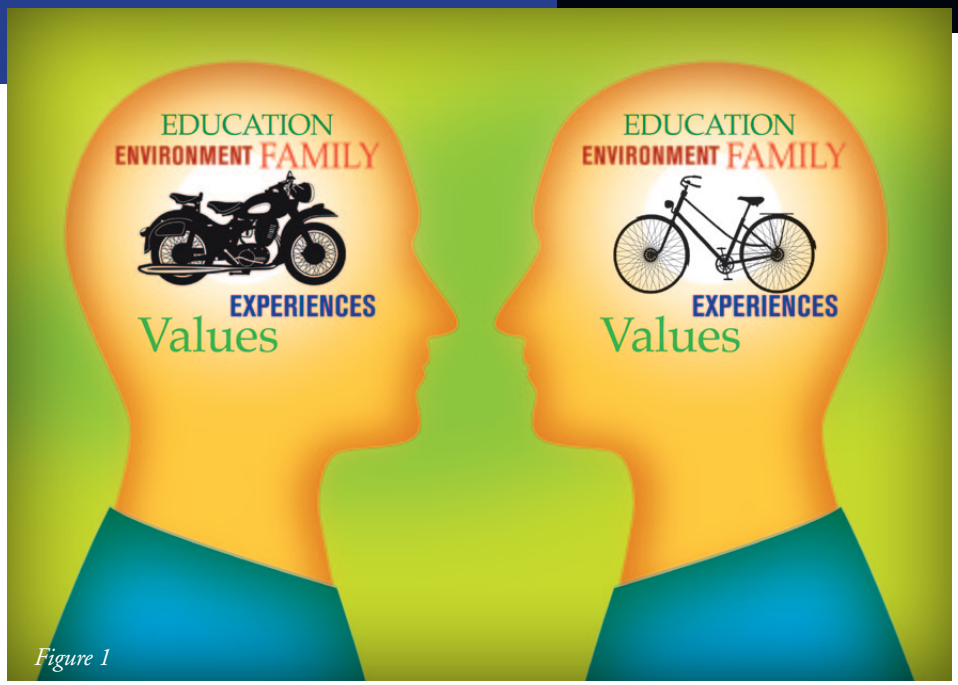

Figure 1

For example, if I were to say "I rode my bike to work this morning". My Dutch colleague, knowing I enjoy exercise, might presume, since it is a sunny day and in his nation there are more bicycles than people, that I pedaled my way to work. On the other hand, my Italian Supervisor, a motorcycle enthusiast, knows that my family owns a motorcycle and a motorcycle is extremely helpful to utilize the High Occupancy Vehicle lanes, lanes that enable one to possibly avoid the dense Hampton Roads traffic. Considering the above, he might think of a motorcycle instead. Whether a bicycle or a motorcycle is imagined, each individual built their own mental model.

There are various applications that facilitate bringing mental models into the open and supporting collaboration.

Figure 1 is a simple illustration of the mental model constructed by each individual's interpretation of the word "bike" where cognitive factors influenced their model. The cognitive factors listed in figure 1 are just a few. They are by no means exhaustive nor does the figure imply that both individuals used the same cognitive factors to reach the end result and they didn't necessarily use the factors I have represented.

Building on the definition presented of a mental model, the following are a few key characteristics of mental models[5]:

- Mental models include what a person thinks is true, not necessarily what is actually true.
- Mental models are similar in structure to the thing or concept they represent.
- Mental models are simpler than the thing or concept they represent.

These characteristics are important when evaluating the dangers and pitfalls of mental

models as well as assessing their influence on the concept development process.

Dangers and Pitfalls of Mental Models

Recognizing some of the dangers and pitfalls or limitations of mental models enables organizations to establish mechanisms to reduce the limitations that mental models can sometimes inject. The following are a couple of mental model limitations[6]:

1) Just like the first mental model characteristic listed above states, mental models are not always reality. This can be dangerous when ignored because unrealistic models can lead to false conclusions.
2) Similar to the above, mental models are not always articulated; therefore, assumptions remain unchallenged. Mental models are only as accurate as the information upon which they are based.
3) Mental models can be mental traps. Mental models are built to assist in the development of ideas; however, failure to continue learning or process new experiences can sometimes create mental models that become barriers to new ideas. The cognitive factors become frozen producing stale models which must be discarded. As Heidi Klum would say on Project Runway "One day you are in and the next day you are out!"

Influence on the Concept Development Process

As previously mentioned in the definition of mental models, the formation of a mental model is a basic characteristic of the human cognitive system. Therefore, mental models are essential to the concept development process. The CD&E Handbook states that in concept development, one must "approach the task with an open mind prepared to alter course in light of knowledge gained". Personnel engaged in concept development must continually learn and stay abreast of new information in order to constantly reevaluate their mental model. The best new ideas are said to develop by gradually adding bits of complexity to older ideas.

Another example of the influence of mental models in the concept development process is during the detailed phase of the concept development process. Throughout this phase, the production of a series of drafts, soliciting comments, and brainstorming are all highly recommended by the CD&E Handbook. One reason these actions are beneficial to the process is that concept development is a collaborative effort providing a measure of insurance guarding against the mental model pitfalls previously cited. There are various applications that facilitate bringing mental models into the open and supporting collaboration. A contemporary term for one form of this is "Mindmapping". A more formal definition is "A mind map uses visual thinking to create an organized display of the plan, problem, or project—a diagram that mirrors the way our brain naturally processes information[7]". Mindmapping tools range from basic office tools that most Staff Officers currently have access to on their desktop to an assortment of freeware and commercial software available online. Some example applications include FreeMind, Mindjet, Gliffy, Mind42, and TheBrain.

Finally, building on guarding against mental model pitfalls and using collaborative applications, usually in concept development two ideas are better than one. I cannot attempt to explain this any better than, Mr. Steven Johnson, author of "Where Good Ideas Come From: The Natural History of Innovation", who argues that "although we tend to think that good ideas emerge from our own mental prowess; our environment provides an equally crucial influence. If we isolate ourselves from the intellectual influence of others then good ideas will rarely develop[8]". Communicating our mental models to others allows our ideas to evolve as well as endure a form of testing through the validation of our assumptions.

Conclusion

Personnel involved in the concept development process must recognize the need to continually change their mental models and perceptions of reality, in order to effectively come up with new ideas or concepts. It is these new concepts that ultimately contribute to NATO's transformational goals. Errors in mental models are inevitable but if personnel and organizations acknowledge the importance of these models or even the existence of mental models, they can position themselves to reduce the limitations of mental models by establishing processes that harness each individual's creativity, leading to new ideas and concepts. I leave you with one final quote from Mr. Johnson, the author previously quoted, who likens ideas to neurons in the brain, "A single neuron firing alone produces nothing. It is when thousands of neurons fire in sync that an idea is born". ■

"A mental model changes with time and even during the flow of a single conversation. The human mind assembles a few realtionships to fit the context of a discussion. As the subject shifts so does the model. Each participant in a conversation employs a different mental model to interpret the subject. Fundamental assumptions differ but are never brought into the open."

— Jay Forrester, inventor of magnetic-core memory storage.

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The Sad State of Maritime Blindness

Mr. Tim Dunne
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The consuming public, and by extension their governments, are generally oblivious to the degree to which they depend on the oceans as a major transportation superhighway, a source of food and energy and strategic resource. Consumers and manufacturers are unconcerned that 90 per cent of the world's trade is conducted by the international shipping industry. The oceanic transportation industry has transformed the industrialized world into a "just-in-time" manufacturing zone, in which "our warehouses now float," as Canada's Rear-Admiral David Gardam, commander of the Royal Canadian Navy's Atlantic Fleet, observed.

The public's blasé expectation that what we want will be available when we want it without being mindful of how it arrives at the table, store shelf or the assembly shop floor has been loosely called maritime blindness. It also describes the lack of awareness about strategic and security issues associated with international use of the ocean commons.

About one million mariners are employed in 50,000 merchant ships registered in more than 150 nations. New Zealand's Vero Marine Insurance estimates that between five and six million sea containers are in transit at any given time.

Freedom of the seas is guaranteed by the United Nations Convention on the Law of the Sea (UNCLOS) of 1982, which comprises, *inter alia*, freedom of navigation, overflight, fishing and freedom of scientific research.

This constitutes *de facto* authorization for nations to exercise these freedoms, to use the ocean commons for commerce, trade, fishing, transportation and recreation. But navies, coast guards and law enforcement agencies that enforce these provisions, do so invisibly. Only occasionally and with the cooperation of the media can the public learn of our reliance on the world's oceans. The Interagency Round Table of International Shipping Associations cautions that with any significant disruption to maritime commerce, "Half the world would starve and the other half would freeze."

What are the issues that consumers, manufacturers and governments are missing?

Canadian public policy analyst Tim Lynch enumerates a series of *hot buttons* that emanate from our growing reliance on maritime trade and commerce:

Human smuggling and trafficking

With illegal profits from US $7 to 12 billion per year from human smuggling and trafficking and $32 billion from the sexual servitude of women and children, there are many unscrupulous predators who take advantage of the disadvantaged for personal profit. According to the United Nations Office on Drugs and Crime (UNODC), while maritime smuggling of migrants is a small proportion of the total number of migrants smuggled worldwide, it accounts for the highest number of deaths among smuggled migrants.

UNODC notes that an estimated 1,000 lose their lives each year. The International Catholic Migration Commission puts the number higher, reporting that 2,000 people lost their lives in the first months of 2011, including 61 people who died of dehydration and starvation on board a boat in the Mediterranean Sea.

Energy security

Maritime oil drilling operations and bulk carriers that carry petrochemical resources to user nations need to be protected to ensure that they arrive and not suffer any mishap along the way. Another aspect of energy security is Nigeria's experience, losing $7 billion to oil theft from maritime drilling platforms. And recently there was another threat emanating from Iran, saying if it had to, it could block the flow of oil through the Strait of Hormuz — a

waterway that borders that country and connects to the Persian Gulf and channels almost 20 percent of the world's oil.

In January 2012, Britain's Royal Institute of International Affairs issued a briefing paper, Maritime Choke Points and the Global Energy System, in which it warned that "the global energy system is vulnerable to disruption at key maritime choke points such as the Straits of Malacca, Bab Al-Mandab, the Suez Canal, the Turkish Straits and the Strait of Hormuz." The international community, it warned, must establish and maintain legal and political measures to ensure the security of these choke points and that this "ultimately rests . . . on the willingness and capacity of interested members of the international community to enforce it if necessary."

Port security

Eighty per cent of global trade passes through the world's 4,000 ports, making them the potential targets for illegal activity and terrorism.

Royal Navy Commodore Steve Chick explained to this writer, "When you see the significant volume of trade, you see some of these container vessels, gas carriers and car carriers that are plying their way backwards and forwards between our countries, it is very easy to conceal something. That's why we need robust port security facilities and cargo loaded in a more secure manner." Cmdre Chick's remarks were made prior to NATO's Combined Joint Operations from the Sea Centre of Excellence (CJOS COE) and the Centre of Excellence for Operations in Confined and Shallow Waters (COE CSW) Maritime Security Conference held in Halifax, Nova Scotia last June.

The highly respected magazine, The Economist, warned in 2002 that any container aboard any carrier ship could deliver "an instrument of death."

Territorial claims

Despite the general belief that all land has been allocated to the various nations since the Treaty of Westphalia, there are hundreds of regions under dispute. Portions of the Arctic are being subjected to claims by the United States, Russia, Norway, Denmark and Canada; and, we are facing the possibility of conflict over the claims to the small island archipelago which Japan calls Senkaku and China calls Diaoyu.

Included in the many other territorial claims with a maritime association that could spark conflict are: Mauritius and Seychelles claim to the Chagos Islands; Spain and Morocco both claim Perejil Island, which led to an armed incident between the two countries in 2002; and Somalia and Yemen claim the Socotran Archipelago.

Maritime terrorism

Terrorism has a maritime component with a legacy that goes back to October 7, 1985, when four Palestinian Liberation Front members hijacked the cruise ship *Achille Lauro* off the Egyptian coast. Singling out 69-year old retired American businessman Leon Klinghoffer, they shot him and threw his body overboard.

An article in the respected journal, The Economist (11 October 2002) disclosed that an Egyptian, suspected of being an al-Qaeda terrorist, was discovered hiding in a sea container in the Italian port of Gioia Tauro. Had he not been discovered, his voyage would have taken him to Halifax, NS.

Two terrorists believed to be responsible for the bombing of the USS Cole masterminded the 7 October 2002 bombing of the French supertanker *Limburg*. The bombing came the day before the first anniversary of the U.S.-led war against the Taliban and the al-Qaeda terror network in Afghanistan.

The 27 February 2004 bombing of SuperFerry 14 off the Philippine coast destroyed the ship and killed 116 people, including 15 children. Two years later, Philippine authorities arrested three suspected Moro Islamic Liberation Front (MILF) members attempting to carry improvised bombs aboard SuperFerry 3, docked in Parang town in Maguindanao.

And added to this list are:

Drug smuggling

A United Nations report estimated the global illegal drug trade at US$321.6 billion in 2003, against a global GDP of US$36 trillion. Since the 1980s, maritime traffickers of cocaine, who transport over 80 percent of the cocaine for the United States market, have been remarkably and successfully innovative at evading detection. The private aircraft of the 1980s were replaced by "go-fast" boats in late 1990s that could carry approximately 2,000 kilograms of cocaine. High speed fiberglass boats traveling up to 130 kilometres per hour were faster than the vessels of enforcement authorities. At about $25,000, the boats were cheaper and more easily disposed than airplanes.

The public's blasé expectation that what we want will be available when we want it without being mindful of how it arrives at the table, store shelf or the assembly shop floor has been loosely called maritime blindness.

A boarding team from the Royal Thai Navy's HTMS Similan investigates a skiff suspected of being involved in an attempted pirate attack on Liberian-flagged merchant vessel MV Hellespont Protector in the Gulf of Aden Oct. 28, 2010. Hellespont Protector evaded the skiff. (Combined Maritime Forces photo/Released)

Illegal migration

The arrival in Vancouver of 76 Sri Lankan Tamil men aboard *The Ocean Lady* in October 2009 underscored the extent to which impoverished people will go to improve their lives, and the extent to which unscrupulous people will exploit them for profit. There are estimates of between five million and fifteen million illegal residents in the United States; illegal migrants have landed on both of Canada's coasts, and the potential to land illegal migrants in Canada's warming north is increasing.

There are at least 50,000 illegal workers estimated to be in Australia, but a 2010 Australian Government report suggested it could be as many as 100,000. Thousands of illegal African migrants make the trek across the Mediterranean Ocean to Italy. However, the target of choice for illegal migration is the United States, viewed worldwide as the most desirable destination for people seeking to improve their circumstances.

Catherine Dauvergne of the University of British Columbia's Faculty of Law sets the worldwide number of 'illegals' at a minimum of 20 million. As the financial and employment situations continue to worsen for many of migrants' target nations, the receptions they receive can be expected to be increasingly hostile and laws regarding illegal residents more hardened.

Maritime piracy

Events off the Somali coast have raised the profile of piracy and attracted the world's attention. But the problem isn't exclusively Somali. There have been reports of piracy in the Caribbean as well. Dr. Manoj Gupta, a retired Indian Navy submarine commander with 22 years of naval service and currently a member of the Australian Defence Science and Technology Organisation, recognizes piracy as a major concern. He warns that Somalia-based piracy has grown from its birthplace in the littoral waters off Haradeere to the waters of the United Arab Republic to the north, northern Mozambique to the south and eastward to India's Gujarat peninsula.

In 2011, while there were 160 incidents of piracy off the Somali coast, there were 13 in the South China Sea, 33 in Benin, 37 in the Gulf of Aden, 46 in Indonesia 16 in Malaysia and 39 in the Red Sea, totalling eleven more than were in Somali waters.

New Trade Customers

In a speech at the East-West Center, Washington, D.C., Michael Wesley, former Executive Director of Australia's Lowy Institute for International Policy, explained that while the east Asia's trade with North America grew by 3¼ times between 1998 and 2008, its trade with south east, south and West Asia grew by 6¼ times over the same. This pan-Asian trend is accelerating: while Indo-Pacific trade grew by 240% in the 1990s, it grew by 280% in the decades that followed.

The growth of industry in India and China is creating increased competition and accelerating price wars for resources, witnessed by the sharp increases at the gas pump.

The new industrial and manufacturing models have created new oceanic trade corridors making the Indian Ocean, with its 33 nations and its maritime choke points — straits of Malacca, Sunda and Lombok — increasingly critical gateways for energy, manufactured goods and produce between the Indian Ocean and the South China Sea.

The Strait of Hormuz is another narrow entranceway, with the United Arab Republic's peninsula jutting between the Iranian headlands. This makes the strait particularly vulnerable to political polemics between Iran and customers for the oil leaving the Persian Gulf.

Post-modern hyper-globalization has elevated the Indian Ocean from being merely a series of shipping arteries to an important centre for the flow of materials and the development of investment relationships among the Pacific Rim nations as well as the north Atlantic Rim.

Communicating maritime blindness

In effect, consumer and corporate sectors are as oblivious to the maritime sector as they are to the automotive sector and the agricultural sectors, until they are made aware of the importance of those commodities by principals within those communities, or by the absence of the very commodities they want and need.

By virtue of their blue-water operational jurisdictions, navies have always been away from the public eye and distant from the public consciousness, earning the moniker "Silent Service". The Center for International Maritime Security (CIMSEC), a non-profit, non-partisan think tank, describes U.S. efforts to address this "blindspot" in the public knowledge of the importance of the global ocean commons, by conducting a series of Fleet Weeks across the country to educate Americans, by "bringing exposure to the sea services even in those corners of the country far from a sea."

The 16th century Dutch Renaissance humanist, Desiderius Erasmus opined, "Concealed talent brings no reputation." The world's "Silent Services" need to develop and implement programs to educate their citizens about the importance of the seas as marine superhighways, and the roles and missions of their navies and coast guards in protecting the interests of their nations on the ocean commons and in littoral waters. ■

In 2011, while there were 160 incidents of piracy off the Somali coast, there were 13 in the South China Sea, 33 in Benin, 37 in the Gulf of Aden, 46 in Indonesia 16 in Malaysia and 39 in the Red Sea, totalling eleven more than were in Somali waters.

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Maritime Security Conference (MSC) Series Report

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Combined Joint Operations from the Sea Centre of Excellence (CJOS COE) has organized an annual Maritime Security Conferences since 2008 with the objective of improving international maritime security co-operation and awareness. Since MSC 2011, the Centre of Excellence for Operations in Confined and Shallow Waters (COE CSW) has joined with CJOS COE as a co-organizer. In uniting our forces to organize the last two conferences, it has set an example for other organizations in the endeavor to address global maritime challenges in a cooperative manner.

The world's prosperity in today's interconnected economic system is dependent on safe sea lines of communications and maritime security (MS) is providing the means to that end. Today's maritime environment is experiencing a wide range of national, regional and global challenges which require both a collective approach and collective effort to address. Maritime security is a requirement for the smooth functioning of the global economy and this factor should provide the impetus to bring international players together in cooperation, irrespective of geographic locations and political positions.

Global partnership and cooperation have always been the backbone of the Maritime Security Conference. Over the years, maritime security has been discussed and explored from a variety of perspectives. The focus was on information sharing in 2008, improving collective capabilities in 2009, building a comprehensive approach in 2010, creating a strategic framework in 2011, and identifying and developing cooperative strategies to address future challenges in 2012.

The overarching goal for the Maritime Security Conferences was to enhance global maritime security by focusing on how to implement cooperative and capable security measures around the world. A frame work for international maritime security cooperation, as was discussed extensively during the MSCs, would help achieve this end by setting policies and standards that promote an integrated approach to information sharing and international cooperation.

Maritime security issues and responsibilities are distributed among different agencies within the governments, a collaborative and coordinated effort among various agencies and authorities is essential in order to quickly respond to maritime threats and mitigate

risks. Therefore, a wide representation was the goal for participation at the conferences. Participants ranged from strategic level political/military leaders to the operational mid-level decision making/decision support personnel of global maritime stakeholders, including not only NATO or military representatives but also civilians, government representatives, international organizations, academia and commercial partners with a very good geographic representation of the world.

Choice of conference venue was also an enabler to achieve the Maritime Security Conference objectives. The conferences were not held in one location but rather the location was changed from year to year. Selecting different locations in Europe and North America undoubtedly enhanced the exposure to a wider professional and academic audience.

A number of deliverables were produced after MSC series. These products include: a CJOS COE White Paper, the MSC 2011 Proceedings, the MSC 2012 Proceedings and the MSC Series Analysis.

The CJOS COE White Paper "A Framework for Enhanced International Maritime Security Cooperation and Awareness" identified the need for central governance and standards in order to coordinate regional efforts among various existing international organizations. This coordination of effort would help to establish an international framework for maritime security cooperation. The CJOS White Paper has been central to the MSC series and was analyzed and discussed between MSC 2011 and 2012 by the Centre for Foreign Policy Studies (CFPS) at Dalhousie University at a dedicated workshop.

MSC Discussions and Key Issues

Given the alarming proliferation and adaptability of criminal and piracy activities, the importance of keeping the Sea Lines of Communication open and safe is becoming more and more important for the nations that are connected with the vital requirements of global economy. Disruptions in any part of the global system will ultimately affect all nations. Therefore, establishing better maritime security cooperation now is a critical step to preserving maritime security and stability in the future.

The MSC series began with the aim to create awareness about maritime security. Over the years, this goal has been achieved, and we can now talk about a common understanding of maritime security and its fundamentals. This is a very important achievement – we cannot meet challenges and solve problems in the absence of common understanding of all aspects of maritime security. MSC discussion topics revolved around three mutually dependent main pillars. The three pillars are: maritime security cooperation, maritime situational awareness/information sharing and maritime security governance. The first pillar is the most inclusive, and the other two pillars could be included in this category, although it is helpful at some stages to discuss each separately. Other aspects of maritime security discussed over the years are Maritime Security Operations, future threat environment, technical capabilities, ISR, climate change, management of natural resources, protection of marine environment and cyber security.

Achieving maritime security globally is an enormous task and no one state has this capability in itself. The only alternative is to build a global network of maritime security cooperation, whereby all states have a role and responsibility in securing the maritime domain against the broad challenges that exist today, from the national up to the international level. These synchronized efforts among the different entities and nations are the key to the success of maritime security.

Inter-agency cooperation is one of the fundamental elements of MS. The civilian and military counterparts that have separate maritime security responsibilities allocated by law should work very closely and in harmony with one another. Information must flow seamlessly among civilian, constabulary and military security networks.

Political will is the driving force to increase cooperation at all levels, within and across jurisdictions. Without support from the political leadership, cooperation will be limited to a low level, and activities that do occur will fail to bring all the stakeholders together and will not orchestrate maritime security efforts. Political leadership is even more critical to achieve international (bilateral, multilateral, regional, inter-regional) engagement.

International maritime security cooperation should unite regional initiatives. We must recognize that regional and inter-regional cooperation occurs when there are common interests. If maritime actors have common interests that are served by cooperation, then there will be a significant motivation to work together. The maritime security challenges on an organizational or national level can be extrapolated to regional/international maritime security where they are joined by additional concerns such as language and cultural differences; national tensions and conflicts; suspicion; lack of common doctrine; leadership; interoperability challenges; and, varied technology levels.

Collaboration, coordination and cooperation on a regional level offer unique opportunities and challenges. There are even more challenges to implement and maintain one overarching international body to deal with maritime security. If there is one overarching body, it is likely to be not only distant geographically but also unaware of the dynamics particular to each region. These challenges will complicate the process of coordination and make the organization either insensitive to, or unaware of, local concerns, potentially creating resentment that it is not addressing problems as well as regional actors who understand the area might. Decision-making processes will work more efficiently among countries that have common challenges, concerns, connected by the realities of their geography – i.e. common interests.

The basic form of cooperation is information sharing. A problem with information sharing is that information is often closely guarded by the agencies that collect it. States tend to over-classify and over-protect information; information should be classified to the minimum level required so that more of it can be shared. Institutional and cultural change will be necessary to bring about greater cooperation among all maritime security entities and build the core of maritime security cooperation. Information sharing will be more likely, widespread and efficient if there is a certain level of trust and transparency among the stakeholders. These are critical challenges because broad information sharing may make some countries/agencies uncomfortable. It may be viewed as reducing their sovereign rights and/or jeopardizing their security.

The limits and definition of the role of navies to provide maritime security are still not clear and vary from state to state, but the

capabilities that navies offer, especially for blue water security operations, remain irreplaceable. Some people would argue that maritime security is not one of the traditional warfare roles for which navies are trained and equipped. On the other hand; however, maritime security tasks have been carried out by navies for centuries, and around the world the maritime security operational practices of navies are highly similar – although not standardized.

Commercial companies have different concerns, with a focus on profit. To them, maritime security is not their biggest concern. On the contrary, increased maritime security applications such as International Ship and Port Security are considered a threat to business and profitability. How can commercial interests, ownership and crewing of vessels be balanced with effective maritime security response and law enforcement?

MSC Findings

No country can tackle the maritime security challenges alone. Therefore, a more effective network of global MS cooperation needs to be instituted, synchronized and operationalized.

We must remember that military power alone will not be able to address maritime security challenges. Multi-stakeholder involvement – including political actors, governmental departments, legal institutions, law enforcement agencies, academics, international organizations and non-governmental organizations – are crucial for success.

Maritime security engagement should be guided by a long-term participative strategy that will help to activate political and public attention. The overall strategy needs to consider organizational, national and regional differences to reduce cultural barriers.

There are numerous successful regional bodies conducting maritime security initiatives. They all display at least the possibility to be a model for a global maritime security network and cooperation. Separate solutions have to be brought in line with a common goal. The responsibility starts at the national level with a vision to interact with regional and international MS actors. A bottom-up approach starting at the national level, followed by the linkage to sub-regional security arrangements offers the greatest promise to achieving an international level of cooperation.

There is already sufficient structure for cooperation; it is time for action. The best way is to start with simple, basic information exchange as the first step. Based on the success of this experience, it will evolve to broader cooperation. Taking small steps will help to develop trust. In some cases, it may be very difficult to build trust among certain partners but, even so, cooperation on small matters will establish the practice of working together. There remains much to be done to achieve the desired level of international cooperation for maritime security operations, but small steps are a start.

Maritime security initiatives need to create efficient inter-agency cooperation as maritime security requires multi-stakeholder engagement including all relevant state, international, non-state and corporate partners. They have to work in concert with each other.

It may be unrealistic to expect one international authority to act as an executor of the common goal of secured maritime security on all oceans. However, such a global body is required as a facilitator for developing guidelines and a collaborative environment for all parties involved. The question – "Who should coordinate and lead international maritime security cooperation: Is it an existing organization like UN/IMO, or a new body formed by a group of likeminded states, or a confederation of all the regional initiatives?" - will certainly be a central focus of our upcoming work.

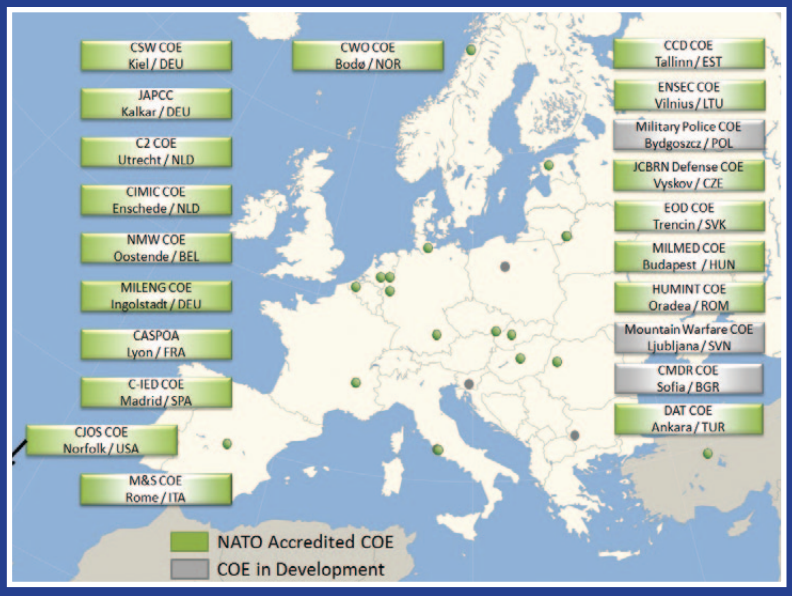
MSC Way Ahead

The Maritime Security Conference series created significant maritime security awareness and identified the need to work together for improved maritime security. The solution to maritime security challenges requires global participation, and our conferences have always aimed at achieving this goal. The Maritime Security Conference series has inspired and led to new initiatives for international maritime security cooperation. ■

CDR Mahmut Karagoz is a staff officer at CJOS COE in Norfolk, Va. For further information on this subject, he may be contacted at usff.cjos.coe@navy.mil. The full MSC report is available at http://www.maritimesecurityconference.org/

MSC Themes

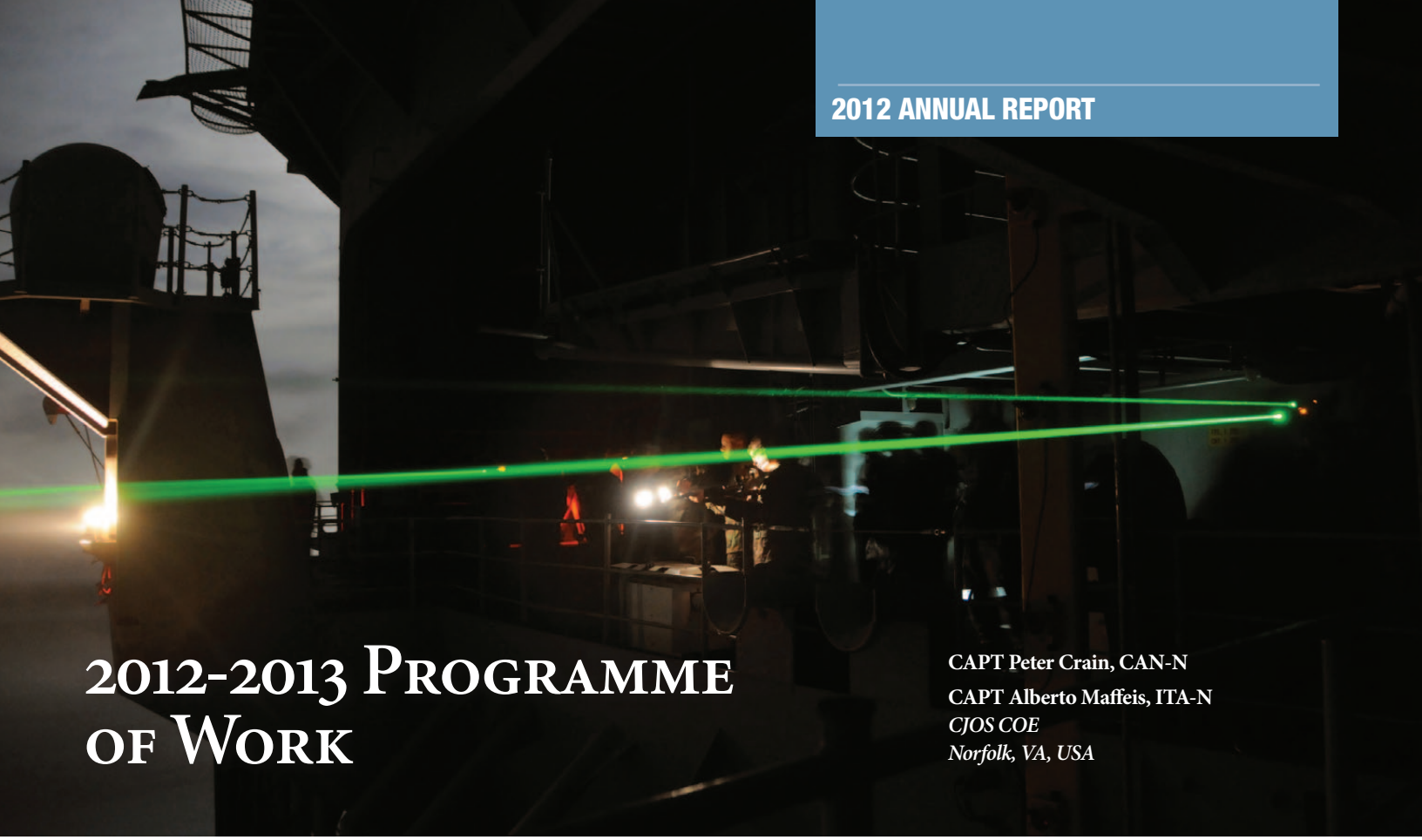
- **MSC 2008: "Structuring a Global Maritime Information Sharing Environment."**
- **MSC 2009: "Delivering Maritime Security in Global Partnership: Improving Collective Capabilities."**
- **MSC 2010: "Delivering Maritime Security in Global Partnership: A Comprehensive Approach for Mutual Benefit."**
- **MSC 2011: "Delivering Maritime Security and Safety in Global Partnership: Creating a Strategic Framework for Maritime Security Cooperation."**
- **MSC 2012: "Delivering Maritime Security in Global Partnership: Identify Cooperative Strategies For Future Maritime Security Engagement."**



CENTRES OF EXCELLENCE FACT SHEET

- A COE is a nationally or multi-nationally sponsored entity, which offers recognised expertise and experience to the benefit of the Alliance, especially in support of transformation.
- A COE is not part of the NATO command structure, but forms part of the wider framework supporting NATO Command Authority.
- COEs support transformation through Education and Training; Analysis of Operations and Lessons Learned; Concept Development and Experimentation; and, Doctrine Development and Standards.
- There are 18 NATO accredited COEs:
  - Joint Air Power Competence Centre (JAPCC / DEU) — www.japcc.de
  - Defence Against Terrorism (DAT / TUR) — www.coedat.nato.int
  - Naval Mine Warfare (NMW / BEL) — www.eguermin.org/coe/coe.asp
  - Combined Joint Operations from the Sea (CJOS / USA) — www.cjoscoe.org
  - Civil Military Cooperation (CIMIC / NLD) — www.cimic-coe.org
  - Cold Weather Operations (CWO / NOR) — http://mil.no/education-training/coe-cwo/Pages/coe-cwo.aspx
  - Joint Chemical, Biological, Radiological & Nuclear Defence COE (JCBRN / CZE) — http://jcbrncoe.cz/joomla
  - Air Operations Analysis and Simulation Centre (CASPOA / FRA) — www.caspoa.org/
  - Command & Control COE (C2 / NLD) — http://c2coe.org/
  - Cooperative Cyber Defense COE (CCD / EST) — www.ccdcoe.org/
  - Operations in Confined and Shallow Waters COE (CSW / DEU) — www.coecsw.org/
  - Military Engineering COE (MILENG / DEU) — http://milengcoe.org/Pages/default.aspx
  - Military Medicine (MILMED / HUN) — www.coemed.hu/coemed/index.php
  - Human Intelligence COE (HUMINT / ROU) — www.natohcoe.org/en/home/
  - Counter – Improvised Explosive Devices COE (C-IED / ESP) — www.coec-ied.es/
  - Explosive Ordnance Disposal COE (EOD / SVK) — https://www.eodcoe.org
  - Modeling and Simulation COE (M&S / ITA) — TO BE PROMULGATED
  - Energy Security COE (ENCOE / LIT) — http://enseccoe.org/

  (All web sites are unclassified)
- The NATO point of contact for COEs is ACT's Transformation Network Branch - https://transnet.act.nato.int/WISE/TNB



2012-2013 Programme of Work

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CJOS activities are guided by a programme of work approved by the sponsoring nations based upon the requests received by NATO, the CJOS member countries, and other entities. CJOS, as an organization outside the NATO Command Structure, is open to requests for support by any organization and, requests received will be considered for inclusion in the programme of work based upon their alignment to CJOS interests and those of the sponsoring nations and NATO. The 2012-13 CJOS Programme of Work is summarized below.

Programme of Work

Throughout 2012, CJOS COE continued to build upon its knowledge of joint maritime operations and demonstrate this knowledge through active participation in exercises and the publication of several concepts. The year began with several of CJOS COE staff participating in the BOLD ALLIGATOR exercise series. CJOS COE staff provided a keen focus on Interoperability and Lessons Identified. The year progressed with CJOS COE publishing several documents, some of which are detailed in this edition of "Cutting the Bow Wave". In June 2012, CJOS co-hosted its annual Maritime Security Conference (MSC) in Halifax, Canada with the Centre of Excellence for Operations in Confined and Shallow Waters. This conference, the fifth in a series of conferences, highlighted building greater collaboration and cooperation amongst international and regional maritime security organizations. The MSC series fostered considerable awareness of Maritime Security (MS) issues and led the way to new initiatives for international maritime security cooperation. To capitalize on the success of the MSC series, the decision was taken to forego a conference in 2013 in favor of a series of workshops dedicated to advancing the NATO Maritime Security agenda. CJOS COE and COE CSW will examine the status of ongoing MS projects with an announcement expected in early summer 2013 as to the location and focus for MSC 2014. Continuing into 2013, CJOS COE plans to support Allied Command Transformation in the development and refinement of several overarching Maritime Strategy and Security concepts and a NATO Joint Sea Based Operations concept, further maintaining CJOS COE's reputation as the "go to" centre for international maritime expertise. In addition, new for 2013, is CJOS COE's participation in the NATO Reaction Force 2014 certification process, the review of the NATO Maritime Evaluation Checklist, and the development of a Riverine Operations concept. We are sure these projects will continue to meet the

Royal Netherlands marines and sailors attached to the U.S. Navy Riverine Squadron (RIVRON) 1 prepare to begin a hot extraction drill Feb. 7, 2012, at Camp Lejeune, N.C., during Bold Alligator 2012. Bold Alligator is a joint and multinational amphibious assault exercise involving several foreign militaries and the U.S. Navy and Marine Corps, designed to execute brigade-sized amphibious assaults against low-to-medium land and maritime threats to improve amphibious core competencies. (U.S. Navy photo by Mass Communication Specialist 1st Class Lynn Friant/Released)

expectations of our sponsoring nations as well contribute to NATO's transformation goals.

Maritime Strategy

During 2013, CJOS COE will be engaged in three major projects related to NATO Maritime Strategy. First, the command will be reviewing the Conceptual Framework for Allied Operations (CFAO) to provide recommendations that link ongoing and emerging Maritime Domain concepts with the Allied Maritime Strategy and NATO Strategic Concept. Supporting the Allied Command Transformation (ACT) in developing the Connected Forces Initiative (CFI) from the Maritime perspective with the overall objective to maintain the Alliance's relevance post-ISAF is another important piece of work this year. Lastly, CJOS is taking part in the NATO Strategic Foresight Initiative (SFI) focused on the future security environment to set the strategic context by both establishing a shared perspective of the long-term future and then developing a concept for how NATO could operate in the future.

Maritime Security

CJOS COE is supporting Allied Command Operations and Allied Command Transformation in the development of "Implementation Concept for Maritime Security Operations-ICMSO"; that will enable NATO to implement the NATO MSO concept. CJOS COE will lend its expertise to the implementation of MSA in MSO and a refresh of the NATO MSA concept.

Maritime Cyber Review/Maritime Information Dominance

There are increased operational complexities and multiple maritime stakeholders involved within the Maritime domain, which makes the existing environments particularly vulnerable to cyber attacks, which could result in severe maritime service disruptions.

We are conducting a literature review of the current state of Maritime Cyber strategies, policies, and concepts to determine if Maritime Cyber related issues are being adequately addressed. The research concentrates on identifying cyber arena gaps that need to be addressed with new and future concepts, as a common prospective, but also from the civilian and industry side.

Throughout the calendar year, CJOS COE will continue to investigate Maritime Cyber, especially on the area of Cyber Security impacts on Maritime Security (MSA and MSO) and also the interrelationships among Cyber Security, Maritime Security, and Energy Security.

Operations on and from the Sea

CJOS COE was requested by the French Maritime Force Headquarters (FRMARFOR HQ) to develop a concept for Riverine operations, to include brown and green water as well as special boat operations by revising current international doctrine and examining best practices. After collating a substantial quantity of doctrinal and tactical publications, the Expeditionary Operations section is conducting an analysis of the relevant documentation and developing the concept's framework. The concept is expected to be delivered by 31 December 2013.

The development of the NATO Joint Sea Basing Operations (NJSBO) concept was initiated by CJOS COE and resulted in a formal task in April 2012 from NATO International Military Staff to ACT to develop a NATO Joint Seabasing concept. The concept is now in its final stage of being approved by NATO Nations. CJOS COE will continue to support any resulting follow-on work of this concept. One of the first outcomes of the concept is ACT's proposal to include elements of the NJSBO concept in the upcoming Multinational Capability Development Campaign (MCDC) 2013-2014.

Analysis and Lessons Learned

Modeling and Simulation (M&S) is an invaluable tool to enabling NATO's transformation goals such as those articulated in Smart Defence and the Connected Forces Initiative. The benefits of M&S apply to numerous areas such as concept development, training, defence planning, and support to operations. Recognizing the need to further implement NATO's M&S vision, ACT worked with Nations and other NATO agencies to develop a customer and supplier business model to better allow NATO to exploit the potential benefits of M&S. In order to better understand the needs of potential M&S customers, ACT requested the support of the Centres of Excellence in developing the customer side of the business model. CJOS COE, as a potential customer of M&S, understands that modeling and simulation is important to adding analytic rigor to the concept development process and accepted this task for 2013. The kick-off meeting for this project is a NATO M&S Customer Forum to be held in May in Rome, Italy. This meeting will be held in conjunction with ITEC, an annual forum for representatives from the military, industry and academia to connect and share knowledge with the international training, education and simulation sectors.

CJOS COE supports the formal lessons learned process primarily through active participation in the BOLD ALLIGATOR amphibious exercise series, as well as other exercises on a smaller scale. This directly feeds our work on interoperability, especially with regard to European NATO countries joining and operating in U.S.-led exercises and operations. This also touches several other CJOS programme of work issues, such as NATO Joint Sea Based Operations, Multinational Capability Development Campaign, and, inter alia, Amphibious Operations Working Group.

Interoperability

The CJOS COE has been working on improving Interoperability among Coalition Navies and US Navy since 2010 through two

CJOS COE supports the formal lessons learned process primarily through active participation in the BOLD ALLIGATOR amphibious exercise series, as well as other exercises on a smaller scale.

main paths. The first path is through the use of the Allied Interoperability Handbook developed in 2010 by CJOS COE to reveal possible interoperability challenges and concerns among Coalition Navies and the U.S Navy.

The analysis of the amount of gathered data has shown 5 major areas of further attention in order to increase the levels of Interoperability:

- **Command and Control (C2):** Military cultural differences have an adverse impact on interoperability across the C2 spectrum. Documents conveying specific directives and details pertinent to operations must be distributed well in advance to allow time for in depth review and understanding of the content.
- **Communications:** Effort should be invested to ensure communications plans are a result of early collaboration, detailed planning, and early dissemination. Special attention to the availability of voice and internet networks on both sides is needed to ensure a good level of flow of information.
- **Common terminology, references, and procedures:** NATO publications should be used as much as possible to provide common references.
- **Dissemination of Orders/ Information Sharing:** The distribution and handling of formal orders require coalition agreement on method of delivery. The mindset of "inadvertent release of information" should change to "failure to share required information".
- **Execution:** Watch Officer training on coalition operations, and access to publications could be improved. Execution of different tasks or function or exercises could also improve with the use of common TTPS.

The second path to improved interoperability is through the cooperation with the US Navy aiming at developing releasable US Navy documents conveying specific directives and details pertinent to operations (OPTASKs). These documents will increase integration of Coalition ships into US Navy forces by decreasing significantly the releasability problems. To date, there is a releasable working draft of OPTASK Antisubmarine Warfare & OPTASK Communications. The next scheduled US OPTASK to be reviewed & developed is OPTASK Mine Warfare while the rest of OPTASKS will follow.

Working Groups

Within the framework of the NATO Standardization Agency (NSA), CJOS COE, since 2007, holds the Chair of the Maritime Operations Working Group (MAROPSWG) which, in turn, is established by the Military Committee Maritime Standardization Board (MCMSB) to develop standardization and to improve interoperability with the final goal of making NATO maritime forces more effective. The 2013 meeting of the MAROPSWG was held in Copenhagen, Denmark from 23-31 January 2013 and over 110 delegates from NATO, Partner and Contact Nations, as well as NATO Commands and COEs, participated in this year's very successful meeting. Next MAROPSWG will take place in Taranto, Italy tentatively from 22-30 January 2014.

The Maritime Multi-National Information Systems Interoperability (M2I2) Board is an operationally focused working group consisting of representatives from coalition nations to enable the provision of critical Command and Control systems for operations and exercises. The M2I2 has been established to develop and supervise the implementation of mutually agreed operational and technical solutions for the efficient and secure operation of all CENTRIXS enclaves, Communities of Interest (COI), and other networks that are deemed a priority. CJOS holds the position of Permanent Secretary of Operations and Training working Group, one of three Sub working groups in the M2I2 Board.

Since 2004, CJOS COE, as an emerging authority in the field of Operations from the Sea, has participated in the Amphibious Operations Working Group (AMPHIBOPSWG). This annual meeting is hosted by NATO's Standardization Agency and addresses NATO standardization issues from an amphibious view point. The focus is standardizing Amphibious Doctrine; Techniques and Training Methods; Equipment for use in Amphibious Operations; Communications; Operational Intelligence; and, Command and Control relationships to enhance NATO Forces effectiveness and interoperability. The AMPHIBOPSWG is attended by NATO nations, Strategic and Operational Commands, Partner Nations, Centers of Excellence, and civil Standardization Developing Organizations.

Certification and Evaluation

CJOS lends its expertise to the NATO Force Structure by assisting, upon request, in the evaluation and certification of various force entities. In 2012-13, CJOS will provide support to the Maritime Evaluation Group and the Certification of JFC Brunssum.

CJOS will support Allied Command Operations in the NATO Response Force 2014 (NRF14) Evaluation & Certification process. CJOS staff officers will bring maritime expertise and additional capacity to assist in evaluating JFC Brunssum during Exercise STEADFAST JAZZ 13 (SFJ 13),scheduled to take place November 1-9, 2013 in Latvia. The activities leading to Exercise SFJ 13 include several preparation seminars and exercise planning activities in Brunssum. This work is consistent with the CJOS mandate to support NATO forces' Education & Training as responsibility shifts from Allied Command for Operations to Allied Command for Transformation.

The Maritime Evaluation (MAREVAL) group is in the process of updating Allied Command for Operations Forces Standards (AFS) Volume 4 - Maritime Standards and Volume 8 – Evaluation Manual. Over the calendar year, CJOS, working as part of the MAREVAL team, will participate in the revision of the maritime standards to reflect new and updated references. The team will also develop new evaluation checklists to include quality control checks as part of the Evaluation Manual review. This work is scheduled for completion and publication of the new standards by the end of 2013.

Conclusion

CJOS COE has a very active 2013 planned with a Programme of Work that spans the four pillars of transformation: Education and Training; Analysis and Lessons-learned; Concept Development and Experimentation; and, Doctrine Development and Standards.

To view CJOS COE's Programme of Work; seek additional information; or to request CJOS COE support, please contact us at usff.cjos.coe@navy.mil

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Transforming Allied Maritime Potential Into Reality