

# Combined Joint Operations from the Sea Centre of Excellence



## 2020 VIRTUAL MARITIME SECURITY REGIMES ROUNDTABLE REPORT OF PROCEEDINGS



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*Transforming Allied Maritime Potential into Reality*

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## **INTRODUCTION**

### **BACKGROUND**

As a part of its annual Programme of Work (PoW), the Combined Joint Operations from the Sea Centre of Excellence (CJOS COE) is actively involved in identifying gaps, seams and shortfalls in Maritime Security including enduring work on improving Maritime Situational Awareness (MSA). Through its extensive network of key maritime stakeholders (nations, NATO, law enforcement agencies, international organizations, non-governmental organizations, etc.), CJOS COE works to share best practices, to identify information exchange requirements and to improve protocols for the purpose of improving MSA.

Key to success is improved cooperation between stakeholders, particularly amongst Maritime Security Regimes (MSR), a term used to describe a group of states and/or organisations who act together within an agreed framework of rules and procedures to ensure security within their regional maritime domain. Since 2008, CJOS has contributed to this effort by holding the Maritime Security Conferences, later renamed 'Roundtables' (RT).

The inaugural MSR RT meeting was held in Madrid, Spain in June 2015 with a follow-on conference hosted by the CJOS COE at the historic Slover Library, Norfolk, Virginia, USA, in 2016. The event was resumed again in Norfolk in April 2018 and from then on CJOS COE has been hosting it on an annual basis. Due to the global pandemic, the latest iteration was hosted virtually with over 400 registered attendees in April/May 2020.

### **NARRATIVE**

The aim of 2020 MSR RT was to foster the cross-fertilization of ideas and work towards the design and implementation of future solutions tailored to Situational Awareness problem sets. With the theme "Future Trends in Maritime Situational Awareness", the 2020 MSR RT explored critical issues through engagement with subject matter experts drawn from the military, academia and industry.

The 2020 MSR RT aimed to identify the most important trends that will shape maritime security regionally and on global scale in the mid-to-long term. It is not a prediction of the future evolution in the maritime environment but an opportunity to identify and examine contemporary critical underlying factors that will shape and influence maritime stakeholders.

### **OBJECTIVES**

The following were the principal objectives for the 2020 MSR RT:

- Understand the main hot-spots of the world in terms of Maritime Security, the issues found there and the challenges they pose, to agree coherently on the best ways to tackle those issues that affect global commerce and prosperity at a global scale;
- Provide a Multi-Domain perspective of MSA as it affects a wide variety of interests and organisations;
- Present and discuss technical and operational challenges, advanced technologies and knowledge gaps, in order to facilitate future collaboration and research activities; and
- Introduce the recently formed Maritime Security Regimes Working Groups to all stakeholders.

## **STRUCTURE / METHODOLOGY**

The forum was conducted via a commercial webinar hosting application, using an “in situ/simu live” format, at the unclassified level. The audience was drawn by invitation and networking from an international community of maritime security practitioners. This included a strong cross-section of government, non-government, military, academic and industry stakeholders in a collaborative setting to discuss the challenges to building, maintaining, and sharing maritime security information, and to propose solutions that contribute to an enhanced global network for MSA – the foundation of effective maritime security.

The theme of the 2020 MSR RT was ‘Future Trends in Maritime Situational Awareness’. The 2020 MSR RT was structured around six panels with a number of panelist speakers, each providing their perspective on the themes based on individual backgrounds and experiences. Each panel’s theme and supporting presentations were designed to trigger questions and stimulate discussion. Each panel was asked to examine one of the different sub-themes:

- Contemporary Challenges;
- Information Systems;
- Mediterranean / North Africa Updates;
- MSA and the Domains;
- Operations at Sea; and
- Introduction to our Working Groups.

With these themes, the aim of the 2019 MSR RT was to achieve a better understanding of the current global MSA environment, examine what is/is not working, and determine the best practices that can be employed amongst the maritime stakeholders to globalize MSA.

The final output from the MSRRT is this Report of Proceedings. This report provides a number of findings, recommendations and conclusions, drawn from the discussions and subsequent CJOs COE’s team analysis. To get the most out of the report, read it in conjunction with the individual presentations, which are posted on our website ([www.cjoscoe.org](http://www.cjoscoe.org)).

## **CONFERENCE INTRODUCTION**

The conference started with a brief scene-setter from Cdre Tom Guy, the Acting Director of CJOs COE, and the Commander of the Allied Maritime Command, Vice Admiral Keith Blount CB OBE providing an introductory address. Cdre Guy welcomed the audience, observing that the current COVID-19 crisis had turned the conference into a new format that had not previously been envisaged. However, the 2020 MSR RT should be considered as a continuation of the previous conferences, with the added value of over 400 attendees that registered from around the world, an achievement that probably can only be reached through a virtual webinar like this. With the backdrop of a global pandemic, the security of maritime borders, MSA and the control of legal and illicit movements of goods and people are all absolutely vital and this forum was very well placed to help.

VADM Blount’s introduction stated that there is no doubt that the challenge of COVID-19 is profound and is resetting the way by which we do our business, not only now but also in the future as we emerge from this crisis, but noted that this is not a hindrance for MARCOM to continue its focus on its

usual business, as all four of its Standing NATO Maritime Groups were still at sea doing their job, sending a reassuring message to our Allies and a reminder to our competitors that NATO is able to operate and remain resilient at these times. The Admiral did advise the attendees to remember that the world will have to change as a result of COVID-19, and this MSR RT was very well situated to enable the vital discussions needed in order to revisit what has to remain and what will need to change.

## **PANEL 1 – CONTEMPORARY CHALLENGES**

Panel 1 aimed to promote discussions on some of the most conspicuous issues concerning Maritime Security. The principal discussion points of the panel were:

- Share an analysis of Russia’s military posture and security policy in the Arctic;
- Underscore the importance of Collaboration and Coordination when dealing with maritime security issues in a multi-national or multi-agency context; and
- Provide an overview of irregular migration from a global perspective and the policy of Turkey to tackle this maritime security issue.

Panel members:

- Mr. Mathieu Boulegue, Research Fellow, Russia and Eurasia Program, Chatham House.
- Mr. Brian Wilson, Deputy Director, US Global Maritime Operational Threat Response Coordination Center.
- Commander (Turkish Navy) Devrim Akkusoglu, Analyst, Maritime Counter Terrorism, Maritime Security Centre of Excellence.

Mr. Boulegue provided an overview of Russia’s military posture and security policy in the Arctic. He specifically drew attention to the Arctic Zone of the Russian Federation and the implications for NATO’s security policy and protection of the Sea Lines of Communications in the North Atlantic. He stated that Russia has been militarizing the Russian Arctic over the last decade, characterizing this build up as being defensive in nature.

Mr. Boulegue indicated that most of Russia’s Arctic intentions are not really Arctic specific, as they are driven by a changing political environment across the globe and cannot be interpreted in isolation. What happens in the Arctic is not just about the Arctic nor is it for the Arctic. Military deployments, the creation of infrastructure and employment of capabilities by Russia in this region must be understood in this global context.

Concerning the implications of Russia’s posture in the region on NATO and its partners, the posture of Russia is to ensure the security in its own Arctic, a point that has always been addressed from Moscow with an eye on an eventual military threat coming from outside of its borders. In that sense, Russia has two priorities:

- Ensure consistent control over the access of foreign military activity around the Russian portion of the Arctic; and
- Ensure a full, unhampered access for Russian Armed Forces to the region.

Mr. Boulegue remarked that these two priorities set the behavior of the Kremlin, as Russia feels itself in a relative position of strength in the whole region and tries to obtain dividends of this perceived military superiority in the Arctic. This is quite the opposite to the Russian feeling of inferiority in other aspects when compared to NATO and US capabilities. This position of strength explains why Russia tries to ascertain itself, not only in terms of force posture, but also in terms of signaling what its intentions are.

In terms of military approach, Mr. Boulegue mentioned two key priorities for Russia:

- Reaffirm a full and uncompromised perimeter of defense around the Bastion Defense surrounding the Kola Peninsula, something that has a lot to do with Russia's "second strike" nuclear assets. The Kola region hosts about two thirds of the sea-based deterrent forces for this purpose and therefore it needs to be protected at all cost. This explains to what extent Russia has created a very much hardened sea denial and interdiction perimeter around Kola and strengthened its capability over the last years; and
- The assurance of perimeter control and sovereignty enforcement over what is believed to be a new border made possible due to the impact of the climate change that has brought an increase of human activity close to the Arctic. This drives Moscow to ensure security by fear of an increased Allied submarine activity there and the additional presence of surface deployments by foreign forces.

To address these priorities, Russia has gradually fitted its Northern Fleet with a powerful and multi-layered air and coastal defense capability whilst having it hardened to Arctic conditions. This has the effect of increasing Russia's ability to realize situational awareness around the Kola Peninsula, consequently controlling the surrounding maritime and air space in this piece of the Arctic.

Mr. Boulegue underlined that Russia is the only nation that understands the Arctic as a military continuum between theaters of operations, from the Baltic Sea and North Atlantic on one hand, to the North Pacific on the other, when NATO and other nations actually see these theaters as separated. This explains the Russia perspective of a single military command that encompasses them both.

Mr. Boulegue also addressed the way Russia has structured its military deployments in the region, by completely restructuring bases and outposts with increased capabilities (SAR, radar coverage) that serve both civilian (the protection of the Northern Sea Route) and military purposes. As an example, he mentioned the series of autonomous bases built to host the two newly created and well-trained Arctic brigades and other troops and also for civilian purposes. These bases, constructed by military engineers to reduce costs, are made of commercial off-the-shelf products and avoid the long contracting and engineering process required of civilian construction. It was reaffirmed that military construction does not mean they were built for military purposes solely.

Regarding the Northern Fleet, Mr. Boulegue stressed it is not really Arctic specific because it has always been a force multiplier of other fleets. Currently, it is undergoing a transformation process of getting new lighter, more displaceable, adaptable vessels which will enable them to move faster within and out of the Arctic. The goal is to create a multi-layered area air and sea denial capability to protect the Bastion. The hopes are that this will reduce tension in the Russian Arctic, whilst transferring tensions to the North Atlantic and Baltic Sea.

Mr. Boulegue ended his presentation pointing out the fact that NATO has actively woken up to the Arctic potential. It is recreating an agenda for force posture which has brought a new narrative of provoking confrontation in the Arctic which needs to be dialed back. This new situation should not be considered as geopolitical competition, but rather, one aimed to better knowing a region which is poorly understood for the time being. There will be a window of opportunity in the coming years with the chairmanship by Russia of the Arctic Council and the Arctic Security Forces Roundtable.

Mr. Brian Wilson provided a presentation with his views on the need of Collaboration and Coordination in a wide variety of environments (threat, health, security). The aim was to promote a narrative about how we can address the daily challenges and how we plan to tackle crisis emergencies and the novelties through those whose concepts for which there is not an agreed definition or consensus.

Using the current COVID-19 crisis as an example, Mr. Wilson addressed the difficulty to consider who in our Government or those agencies concerned should we contact with when attempting to solve a problem. According to his words, there is no answer on how to address an issue whether or not it is related to illegal fishing, fuel smuggling, illicit drug trafficking, undersea cables. The point is to know who to consult with, who will be making decisions under what parameters, how data sets are going to be shared, acquired, analyzed, thus having the need to share lots of information whilst protecting it.

He further introduced a number of Maritime Information Centers all across the globe such as the UK based National Maritime Information Centre, the US National Maritime Intelligence Integration Office, the Maritime Security Operations Centre in Canada, or the Maritime Analysis Operations Centre - Narcotics, in Portugal, as examples of the importance of sharing information. These centres have shown tremendous benefit whenever they have set in place some kind of coordination when addressing challenges. In making this point, Mr. Wilson highlighted that these centers have focused on the maritime domain as a common denominator, a domain unique in itself due to its inherent complexity, with terms that do not exist elsewhere (\*flag state authority, port state security, etc.). This makes Collaboration and Coordination in the maritime domain more complex and demanding than anywhere else.

Mr. Wilson continued with a series of best practices based on the experience of the above-mentioned centres. When dealing with how to identify collaborative authorities, every exercise should be documented with clear goals and the way to move forward whether we are addressing fuel smuggling, counter narcotics, any contingency, a pandemic, etc. We have to have a clear idea on who is making decisions, how information is shared, and what is the documented process to make decisions. Another valuable tool for developing collaboration and coordination are the Quick Response Checklists (QRCs) provided, noting that the items therein have been drafted, tested, and validated.

He provided a list on how to collaborate, inviting the audience to help refine its items as he found it as an exceptional overview:

- Don't command the presence of interagency personnel on your team;
- Don't segregate interagency staff in separate buildings;
- Don't disrespect smaller partners, because they can make great contributions;
- Don't demand binding agreements on cooperation (at least initially);

- Don't ignore any partner's need to feel they make a contribution;
- Don't make binding decisions without substantial vetting and support;
- Don't forget to build a culture of trust and empowerment; and
- Don't take the credit for collaborative success.

When it comes to the elements essential to Whole-of-Government Coordination, he listed three: Organizational Structure; Law, Policy and Directives; and Culture. All of considered essential for coordination. He also mentioned Acquiring, Managing and Analyzing Data and disciplined coordination as another necessary focus when dealing with huge amounts of data. He provided as an example, how does one extract useful information (identification of illicit contacts) from within an extraordinary amount of data (AIS signals over a 5-year period).

To finish his presentation, Mr. Wilson offered his point of view that from his experience, agencies and countries cannot address complex issues, using the current pandemic crisis an example though it has also been seen with piracy, drug trafficking, transnational threats.

CDR Devrim Akkusoglu provided a presentation with a view on Irregular Migration from a global perspective, complemented by the policy of Turkey when it comes to addressing this challenge, and provided an in-depth analysis on it in one of the most intense hotspots in the globe, the Aegean Sea. To start, he provided a series of key definitions to pave the way for the rest of the presentation (Irregular Migrant, Migration Crisis, Asylum, Asylum Seeker, Non-refoulement, Push-Back, Refugee). He further identified the causes that trigger "Irregular Migration", namely, war and conflicts; discrimination, threats of death and torture/ill-treatment; economic conditions; family reunification and climate changes.

CDR Akkusoglu provided a set of figures for a better understanding of the problem on a global scale, provided by UNHCR as of June 2019:

- 41.3 million internally displaced people;
- 25.9 million refugees;
- 3.5 million asylum seekers;
- About 80% of refugees live in countries neighbouring their countries of origin;
- 57% of UNHCR refugees come from Syria, Afghanistan, or South Sudan;
- The top refugee-hosting countries are (in order of quantity): Turkey, Pakistan, Uganda, Sudan, Germany; and
- The top African countries of origin by total refugees and asylum seekers: South Sudan, Somalia, Democratic Republic of Congo, Sudan, Central African Republic.

Concerning the Irregular Migration Policy of Turkey, CDR Akkusoglu pointed out that due to its geography, Turkey has a rich experience in the context of hosting mass migration. The vast majority of asylum seekers it receives are Asian or African origin immigrants.

Turkey is implementing the 1951 Geneva Refugee Convention with geographical reservations. The asylum seekers that come into Turkey are divided into two categories: ones coming from Europe and can benefit from the conditions of the Convention; the other group coming from outside Europe and waiting to be re-located in a third country. In this context, Turkey is hosting over 3.5 million Syrian refugees

under temporary protection status. Irregular migrants other than Syrians (mainly Afghanistan, Iran, Iraq, Somalia and other countries) may be granted conditional refugee or subsidiary protection status.

When it comes to Irregular Migration via the Aegean Sea, CDR Akkusoglu stated that migrants prefer this route due to the fact that the distances between Turkey's western coasts and the Greek Islands are very close. Additionally, this route poses less risks in comparison with the other Mediterranean routes. Although the number of irregular migrants from Turkey has substantially decreased after the memorandum signed on 18 March 2016, the Aegean Sea has continued to be an intense corridor for irregular migration between Turkey and Greece. This route saw the largest influx of asylum seekers to the continent after World War II, with 885,000 migrants in 2015.

However, CDR Akkusoglu asserted that with the comprehensive endeavour of Turkey and Greece, this crisis has been taken under control. Today, irregular immigration has decreased around 95% compared to 2016. This number may change a couple of points up and down, depending on the situation in Syria. In his words, Turkey and Greece, as regional states, have demonstrated enough capability and capacity to deal with this problem nationally.

Concerning Human Smuggling, CDR Akkusoglu said that when irregular migrants cannot enter Europe legally, they prefer to contact migrant smugglers belonging to international criminal organizations. 91% of irregular migrants contact the smuggler during at least one stage of their journey. The contact between these migrants and the smugglers is quite easy, via social networks, social media, relatives, etc., and the payment methods have changed over time due to migrants being defrauded by smugglers. It is seen that the payment has adopted to being delivered after reaching the first European Union country. Accordingly, the smuggler who could not get his migrant to the predetermined Greek island, continues his smuggling attempts until getting his money.

At this point, CDR Akkusoglu pointed out that Syrians, with temporary protection status, cannot be detained or held in the holding centers as a result of attempts to leave the country by an illegal method, as long as they are not involved in a crime. Therefore, Syrians who are detected attempting illegal exits may be set free after necessary procedures are completed.

CDR Akkusoglu also mentioned that the Turkish Coast Guard has initiated two operations to prevent fatalities at sea in response to the migration crisis: Op AEGEAN HOPE and Op SAFE MED. Additionally, the Coast guard is being supported by the Turkish Navy by sharing intelligence obtained through reconnaissance and surveillance activities carried out by surface platforms, manned and unmanned air vehicles, as well as coastal surveillance radars. Due to these successful operations, there was a drastic decline of the irregular migrants who crossed to the Aegean islands between 2015 and 2019. He also stated that the struggles are not only limited to the apprehension of migrants, but also the organizers.

As a conclusion, CDR Akkusoglu said that irregular migration is a phenomenon that challenges all countries from the starting point to the destination and has social, economic and national security dimensions. As well, that in the management of irregular migration, it is important to balance between human rights and sovereign right of the states. The factors causing irregular migration are wars, conflicts, political and economic instability, natural disasters and climate changes. At this point, the potential

effects of epidemics and pandemics such the current COVID-19 on irregular migration cannot not be overlooked.

Finally, and as Mr. Wilson had previously said, in coping with migrant smugglers, international cooperation is vital. Irregular migration management is a matter that requires collaboration with governmental and non-governmental organizations at both strategic and operational levels, within a national and international framework.

## **PANEL 2 – INFORMATION SYSTEMS**

Panel 2 aimed to focus on how, mostly due to the increased availability of sensors and information, the maritime has to face the challenge of coping with data of growing volume and complexity. While expert operators are best placed to provide meaningful situational interpretations, advanced information processing techniques are necessary to cope with huge volumes of data, thus ensuring more efficient task execution. The specific focus of the panelists was to:

- Analyze the implications of Artificial Intelligence (AI) for Maritime Security.
- Understand how MSA is built on a foundation of valuable data, accurate computation, and human-centric design and appropriate communication.
- Provide an overview of cyber security in the maritime domain.

Panel members:

- Dr. Michael Linden-Vornle, Head, DTU Space Drone Center, Technical University of Denmark.
- Dr. Catherine Warner, Director, NATO Centre for Maritime Research and Experimentation (CMRE).
- Mr. Scott Blough, Chief Information Security Officer & Executive Director, Center for Cyber Defense & Forensics, Tiffin University.

Dr. Michael Linden-Vornle provided a presentation on the Implications of AI for Maritime Security. He divided his presentation in two parts: first, an introduction to all the new terminology adopted, explaining Artificial Intelligence, Machine Learning, Deep Learning, their meaning and how they should and should not be used, and secondly, on the implications for the Maritime Security and a quick look into the future of its employment in this realm.

Dr. Linden-Vornle started by challenging the audience with why we are talking so much about AI when it is not a new concept (it was adopted in the 1950s). He explained that there are two reasons: because we now have sufficient computing capabilities to use it in a reasonable way, and two, because we now have massive amounts of available data which can be used for training AI.

He explained the parallels existing between natural intelligence and AI, which allows to mimic the brain's ability to create neural pathways that mean that something has been learned. Then, he went on to explain some of the key words used in this discipline (AI, Machine Learning, Deep Learning), as well as the differences existing amongst them.

He provided an example of a machine learning concept, the neural network, with its typical three layers: input, hidden layer and output, and explained how this construct can be employed in a myriad of applications in Maritime Security. To avoid ambiguous situations, it is necessary to have as much amount

of data as possible to train the system and get the most accurate outputs as possible. Otherwise, neural networks should not be employed since then the risk of failure would even be catastrophic.

Moving on to the second part of his presentation, Dr. Linden-Vornle mentioned some examples on where AI can be useful in the employment of unmanned maritime systems, showing various systems and vessels successfully used for years in mine countermeasures or ISR operations, or some cutting-edge software employed on board ships to identify potential threats using AI (e.g., rapid detecting and tracking of non-cooperative vessels). He mentioned China's intentions to provide its nuclear submarines with AI-based decision support, with the risks this measure poses. Additionally, he remarked that the US Navy budget for the FY 2020 had a 9.5% increase for research and development, including AI.

Dr. Linden-Vornle dedicated the next part of his presentation to Autonomy. He provided additional examples of such systems like the demonstration unmanned combat aerial vehicle X47B. He explained the main problem being faced with the autonomous systems: how to provide a meaningful interaction with the human operators.

Finally, he defined Machine Cognition as the ability of a technical system to sense and perceive its environment, to process these inputs using AI and to produce recommendations for future actions based on this analysis. There is now a debate on how far we should let AI go loose in any decision-making process, for example when talking about autonomous weapon systems. There is a consensus that somehow there must be some meaningful human control. The point in the end is to keep the man in the loop, including when dealing with autonomous systems as defined in the figure.

The next presenter, Dr. Catherine Warner, Director of NATO's Centre for Maritime Research and Experimentation (CMRE), gave an overview on the work in progress at CMRE to enhance MSA. Sponsored by NATO Allied Command Transformation, CMRE was developing guidance including the need for NATO navies to have an MSA picture based on Big Data, information processing and prediction tools. Dr. Warner stated that MSA work at CMRE is based on three pillars: Data, Processing and Human-Machine Teaming. After over 60 years experimentation at CMRE, they have multiple Big Data sets very valuable to be used in Deep learning, Machine Learning and also AI. In MSA, the focus is on explaining multiple data sources coming from many challenges. Their research is looking at how to incorporate these data from multiple sources, tracking and fusion, long term prediction, association, anomaly detection, etc.

According to Dr. Warner, the first thing about Big Data is that it is characterized by several combinations of volume, velocity, variety, veracity and value, which can be obtained from a series of huge volumes of data from satellite data, global surveillance systems, multi-sensor data, robotics, etc. She explained where the sets they have at CMRE are from: AIS databases (terrestrial and satellite), Satellite Imagery, Sonar Data (imagery and echoes), and Oceanographic data (ambient noise, METOC, Rapid Environmental Assessment (REA)).

Dr. Warner switched over to talk about the Signal Processing, or what to do with these data sets, providing some examples of this activity at CMRE:

- Long-term ship prediction and anomaly detection (e.g., detection of anomalous vessel behavior typical of smuggling, waste dumping, illicit fishing, etc.);

- Automatic port recognition (accurate AIS data driven estimates of constantly evolving port areas to support data-driven decision making);
- Automatic target recognition; and
- Automatic ship classification with satellite data, or maritime patterns of life (e.g., Maritime Patterns-of-Life Information Service or MPoLIS, basically a web based interactive visualization service that automatically processes the AIS data and visualizes patterns of life).

As another example, scientists from CMRE have also participated in the International Maritime Exercise (IMX 19) in the Persian Gulf. CMRE contributed to the Common Operational Picture by providing the operational planners with traffic patterns from a study of the evolution of port visits and straits transit, clustered by ship type, automatically computed from AIS data on a user-defined port shape.

The last section of Dr. Warner's presentation addressed Human-Machine Teaming, explaining how they mutually complement themselves. The human is a critical part of a military system, because hardware and software don't do missions: humans do missions. Those systems with a poor human interface can compromise mission accomplishment and induce some failures. However, humans need to trust the machines and the information they are getting from the machines in order to use them. The way CMRE is working is by doing interactive information visualization and also knowledge elicitation by means of table top games with Subject Matter Experts (e.g., analytical games for knowledge acquisition to investigate the impact of information quality on belief state; multi-source information fusion frameworks for reasoning under certainty to detect and solve information conflicts).

Dr. Warner's final comments were dedicated to the COVID-19 crisis. She presented a comparison made between March 2019 and March 2020 of the marine traffic in two fairly busy European ports. The most striking thing they noticed was the fact that even during the height of the COVID crisis, with the governments closing and the travelling restrictions, there was not much difference between the two pictures whilst the air traffic clearly went down to minimums during the same timeframe.

Mr. Scott Blough of Tiffin University started his presentation on Cyber Security in the Maritime Domain by quoting Sun Tzu in his masterpiece "The Art of War", referring to the notion of needing to know the adversary; Mr Blough deems this to be fundamental to understand the cyber piece.

As a first explanation, Mr. Blough depicted the Maritime Transportation System which he broke down in four areas: Headquarters/Offices, Ports and Terminals, Ship Systems, and Supply Chains and Vendors. Each of these areas have cyber components whether be data, sensors, or breaking a ship communications system, etc. He also mentioned examples of major cyber-attacks committed on each of those areas over the last few years: Maersk in 2017; Ports of Barcelona and San Diego in 2018; malware on ships systems of the US Coast Guard in 2019; the Malaysia bunker payment scams in 2017.

According to Mr. Blough, cyber touches every domain and it can be a great power equalizer, with a very low cost of entry (a GPS "spoofers" can be purchased for a small amount of money) which allows cyber criminals an easy entry point with a low chance of retaliation.

Mr. Blough described the typical Ship Threat Vectors or areas that could be attacked: communication systems, bridge systems, propulsion and power control systems, access control, passenger information systems, passenger-facing networks, core infrastructure systems, administrative

systems, and supply chain systems. He further listed the cyber threat actors and their motivations, which can range from geopolitical to profit, ideological (with or without violence), satisfaction or discontent.

Concerning the Threat Actors, these can be broken down into several categories:

- Nation States: Russia (GPS activity mentioning the spoofing attack on GPS in 2017, malware weaponization like *NotPetya* attacks in Ukraine or Maersk, Information Operations), China (telecommunications, intellectual property, GPS activity like spoofing), North Korea (GPS activity, financial gain), Iran (destructive malware like the Saudi Aramco attacks, GPS jamming, Information Operations);
- Hactivist Groups: Anonymous;
- Thrill Seekers: “War Games”;
- Terrorist Groups: Hamas, Hezbollah;
- Cybercriminal Groups: Cobalt Spider, Mummy Spider, Wicked Spider; and
- Insider Threats: employees, contractors.

The main takeaways from Mr. Blough’s perspectives would be:

- Understand what our cyber operating picture is, know what systems we used that can impact on operations.
- Understand our adversaries’ cyber operating picture, what systems do they have, how does that affect to our operations.

### **PANEL 3 – MEDITERRANEAN/NORTH AFRICA UPDATES**

Panel 3 aimed to provide an understanding of the key issues in two significant areas of the world in terms of maritime security, namely the Black Sea, and the Mediterranean and North Africa.

The specific objective of the panel was to provide a description of this critical geographical region, its challenges, and look at future measures to tackle or mitigate them.

Panel members:

- Ms. Anna Davidson, Postgraduate Researcher, Russian and East European Studies, University of Oxford.
- Captain (Navy) Juan Pérez Puig, Chief of Staff, Spanish Navy Maritime Action Command.
- Commander Dimitrios Megas, Staff Officer, NATO Maritime Interdiction Operational Training Centre.

Ms. Anna Davidson talked about Russian efforts in the Black Sea security environment, addressing the perception of the Russian maritime activity on the Black Sea, a comprehension of the meaning of the Russian maritime activity on the Black Sea, and the near future projection of status of Russian maritime activity on the Black Sea.

To begin, she defined the Black Sea as a crossroads between East and West, South and North, with regional and international significance. States surrounding the Black Sea include some NATO members and aspiring NATO members, as well as Russia, making it an extremely significant area economically, geographically and politically speaking.

Regarding our current perception of Russian maritime activity on the Black Sea, Ms. Davidson highlighted that the geostrategic nature of the Black Sea is nothing new; it has existed for centuries. What is new contextually, is the frequency and the intensity of the naval activities of Russia on the Black Sea in recent years in terms of exercises by the Black Sea Fleet stationed in Crimea as well as an increasing effort to consolidate anti access area denial capabilities by the coastal defense cruise missiles. Also significant is the renovation of the Black Sea Fleet construct, with new frigates, corvettes, submarines, the Kaliber cruise missiles and more. She highlighted this by drawing upon recent examples such as the 2018 incident by Ukraine naval vessels trying to enter through the Kerch Strait that encountered Russian vessels, the building of the Kerch Strait bridge itself from Russian mainland to Crimea, and also the extraction of natural gas and undersea resources off Crimea claimed by Russia as belonging to them.

As far as interpreting the meaning of Russia's maritime activity in and on the Black Sea, Ms. Davidson pointed out that the 2015 Russian Maritime Doctrine considered the Black and Azov Seas as regional priority areas and "the foundation of the National Maritime Policy is the accelerated modernization and comprehensive reinforcement of the strategic positions of the Russian Federation, while maintaining peace and stability in the region". This is an idea based on the fact that Russia considers Black Sea an internal lake, not subject to the principles of the 1958 High Seas Commission or the 1982 UN Law of the Seas Convention. Moreover, Russia and Ukraine reached an agreement in 2003 by which both the Black and Azov Seas were considered internal, regional waters and not international waters. In this context, the annexation of Crimea by Russia in 2014 served Russia to claim the EEZ generated by Crimea as theirs, with the inherent rights to conduct permanent naval presence and exploit natural resources, in which the area is rich.

Finally, Ms. Davidson addressed the near future projection of the status of Russian maritime activity on the Black Sea. She remarked that the aforementioned Maritime Doctrine and the State Policy on Russian Naval activities lists several long-term strategic achievements, including:

- Construction and operation of the undersea pipelines in a manner favourable for the Russian Federation international legal regime of the Black and Azov Sea based on the *norms* of the international maritime law;
- Legal regulations and procedures for Russian operation of the Kerch Strait.;
- Black Sea Fleet capability improvements and infrastructure development in Crimea and Krasnodar Territory, which separate the Azov and the Black Sea;
- Enhancement of transport accessibility/potential via developing international transport corridors to ensure a permanent presence in the Mediterranean; and
- Establishing conditions and incorporating regions' capabilities to position and use the components of maritime potential, to ensure sovereignty and Russia's sovereign and international rights in the Black and Azov Seas.

Having said that, the future trends in Black Sea MSA will seek to achieve a series of ambitious goals as stated in the Russian Approval of the Basics of the State Policy of the Russian Federation in the field of naval activities for the period up to 2030, mainly:

- The Russian Federation will not allow significant superiority of foreign naval forces over the [Russian] Navy and will seek to consolidate it as second in the world in combat capabilities; and
- By 2030, the Russian Federation should possess, at all strategic directions, powerful and balanced fleets, consisting of ships designed to perform tasks in near and distant sea zones and ocean areas, as well as naval aviation and coastal forces equipped with effective strike precision weapons and developed basing and support systems.

CAPT Juan Pérez Puig provided an overview on maritime security in the Western Mediterranean (WMED). Highlighting the Spanish Maritime Action Command (the Spanish Navy force in charge of ensuring maritime security within Spain's AOR) perspective, he followed up with a description of the maritime security environment, including its risks and threats in the WMED. He ended with a recap of the Spanish approach to approach maritime security challenges in the near future.

Given that Spain is a country with over 7.800 km (almost 5,000 miles) of coastline and 80% of its borders are coastal, maritime security is of utmost importance to the country. Moreover, two important focal points, the Straits of Gibraltar and Finisterre Traffic Separation Scheme go through Spanish territorial waters with over 250,000 ships crossing them per year, and most of its imports/exports including petroleum and natural gas arrive and depart to the sea.

Given the importance of maritime security, the Spanish State maintains a permanent and comprehensive approach with efforts from civilian and military assets linked with the international community in which coordination between stakeholders plays a key role. In fact, Spain's 2013 National Security Strategy devotes special attention to maritime security, and involves the participation of all authorities in the administration at national and regional levels, along with the private sector NGOs, etc. In the Spanish Ministry of Defense, a single command (Maritime Action Command) leads all the military assets allocated to maritime security tasks.

He went on to highlight the threats and risks to the maritime security in the WMED. An important route, being the main option for migrants coming from West Africa, it has long been used by migrants between Morocco and Spain. More recently, it has also become the main route for narco-criminal networks to smuggle narcotics for destination to EU countries.

In order to foster the fight against illegal trafficking, in 2016 Spain created a National Coordination Center aiming to stop irregular migration traffic at Alborán Sea (South of Spain). It has since fulfilled the objective of coordinating actions of all national assets involved. Regulating flows from the sea to ports and later to the centers for staging of immigrants, the arrival of immigrants has decreased drastically. The efforts are also getting Moroccan authorities involved, both in prevention and rescue.

Captain Pérez also highlighted maritime security in the WMED is an international issue, linked with the European Maritime Security initiatives, such as the European Fisheries Control Agency, European Border and Coast Guard Agency (FRONTEX) with its Operation Indalo, Maritime Security Networking (MARSUR), European Defence Agency, the Mediterranean, European and North Atlantic Coast Guard Functions Fora. As an example of this international dimension, Captain Pérez mentioned the European Union Maritime Security Strategy (EUMSS), a common venture of all EU member states involving civil and military authorities and stakeholders, providing a common framework to ensure coherent development and a joint response. In order to fulfil its goals, the EUMSS promotes multi-

national cooperation with international, regional organizations and third-party countries in the Mediterranean.

One of the main actions of this strategy is the EU Action Plan. It is aimed at developing and putting into practice coast guard functions as defined by the European Coast Guard Function Forum. It is a comprehensive approach that takes into account all agencies with maritime security responsibilities (over 300) all over Europe. Needless to say, there are difficulties in trying to achieve the desired level of coordination and collaboration when employing such a huge number of stakeholders. Captain Pérez closed his presentation by introducing the Action Plan by which Spain seeks to develop her Maritime Strategy and thus, set the guidelines to establish an integral policy at national level.

The attendees were shown a video recording with an introduction from Commodore (Hellenic Navy) Panagiotis Papanikolaou, who recently took over as the Commandant of the NATO Maritime Interdiction Operations Training Centre (NMIOTC). He stressed the complexity and diversity of the maritime environment and pointed out specifically the Middle East / Northern Africa region as a very sensitive area. He finished by highlighting the contributions of NMIOTC to NATO and partner naval units and the enhancements made to capabilities in the field of maritime interdiction operations.

Commander Dimitrios Megas of the Hellenic Navy provided a presentation on “Coping with Maritime Security challenges in the broader Middle East and North Africa (MENA) region”. He started by referring to maritime security as a term that draws attention to different challenges and threats in the maritime domain (i.e. terrorism, proliferation of weapons of mass destruction, illegal trafficking, piracy, hybrid and cyber threats). The challenges are of a transnational and global nature which require a comprehensive approach to finding solutions.

He described maritime security according to NATO policy, as the on-going condition in the maritime environment where international and national laws are adhered to, the right of navigation is preserved, and citizens, vessels, infrastructure, and resources are safe. He further defined Maritime Security Operations (MSO) as those conducted to assist in establishing the conditions for security and protection of sovereignty in the maritime domain. As such, they require close coordination among governments, the private sector, international organizations and non-governmental organizations.

MSO can be broken down into seven different tasks, according to the Allied doctrine:

- Uphold Freedom of Navigation.
- Maritime Interdiction Operations (MIO).
- Support Maritime Counter Terrorism activities.
- Maritime Security Capacity Building.
- Support MSA.
- Protection of Critical Maritime Infrastructure.
- Counter the Proliferation of Weapons of Mass Destruction.

Concerning the MENA region, Commander Megas explained that its waterways, which link the Eastern Mediterranean with the Red Sea, Gulf of Aden and the Gulf, are among the most important ones in the world as they facilitate the export of huge amounts of oil and natural gas from the region whilst bridging traders from the Eastern and the Western worlds that transit through the Red Sea and the Suez

Canal. These waterways are also high-risk areas as merchant commerce is threatened by a severe lack of stability. He mentioned the poor economic and security situation in Somalia as an example leading to the development of maritime piracy on commercial traffic in the Gulf of Aden and the broader Indian Ocean. In the Mediterranean, the main issues are related to illegal migration and terrorist activities linked to the situation in Libya and Syria. Other security challenges in that region are the illicit trade (arms smuggling, human trafficking), intelligence threats and critical infrastructure vulnerabilities.

Finally, Commander Megas highlighted NMIOTC, located in the island of Crete, as a NATO Education and Training Facility, and listed its numerous training fields (Weapons of Mass Destruction, Counter Improvised Explosive Devices, Biometrics, Combat Medical, Cyber Defense, Force Protection, amongst others).

#### **PANEL 4 - MARITIME SITUATIONAL AWARENESS AND THE DOMAINS**

Panel 4 aimed to address domain specific points of view on key enablers such as Airborne Early Warning control or Space-based sensors, by providing an overview of some systems currently being used to provide MSA, demonstrating their strengths and weaknesses, including some of the cutting-edge technologies already in use.

Panel members:

- Mr. Torstein Bergli, Project Manager and Military Advisor, Saab Airborne Solutions.
- Ms. Janel Brown, Director, Government Programs, Maxar.

Mr. Torstein Bergli led the panel with a presentation on SAAB's Global Eye Airborne Warning suite. Global Eye is a unique airborne sensor suite with a multi domain Command and Control system. Mr. Bergli spoke on the evolution of early warning systems, from simple airborne early warning functionality with the ability to control offensive and defensive counter air to Air Battle management systems which encompasses a much broader host of capabilities.

He also discussed the need for improvement on radars to provide mobility and low-level coverage to provide detect small targets at sea and the need for authorities to see more information at real time due to issues they are facing at sea. He utilized the following three examples: piracy, illegal fishing and missile attacks.

Mr. Bergli re-iterated the need to have the whole picture (land, air, sea) in one location like Global Eye. He talked about how Global Eye can support cross domain exchanges with military, government and civil authorities.

In closing Mr. Bergli stated that safety and security are linked together and that governments are facing changing threat environments where timely and relevant information is crucial. He reiterated Global Eye from SAAB is the most modern AEW&C solution to support civil/military authorities in peace, crisis and war.

Ms. Janel Brown spoke next about space-based earth observation intelligence solutions. She first described two types of customers that Maxar serves. The first has an existing observation, satellite imagery and ground plans but wants to be more innovative and efficient but does not know how. The second is frustrated at not being able to identify vessels in their area of responsibility. She stated that

both customers need persistent detection and positive identification of vessels with high degree of confidence.

Ms. Brown introduced the audience to Maxar's Synthetic Aperture Radar (SAR)-based dark ship detection. Satellite AIS is helpful in meeting her customer's requirements but most vessels of interest in the AOR simply turn it off. In Southeast Asia about 35% of the vessels operating in the AOR are not required to have AIS. SAR based dark ship detection is a radar satellite fine tuned for ship detection mode with broad area search capability. The satellite can search an area of 200,000 sq. km in 60 seconds. The satellite can track vessels that are experiencing AIS spoofing at 80% confidence.

She then spoke about Next Generation commercial maritime security, indicating that Nex-Gen commercial maritime security is coming online with RADARSAT-2 with Iceye small sats which is a broad area search satellite with high resolution small satellites. She also introduced Worldwide EO constellation with Legion that can provide a 30cm resolution imagery. Other capabilities include automated SAR and EO detection and advanced SAR imaging processing. She demonstrated how using Nex-Gen Maritime Security Satellite image can lead to positively identifying illegal activity. In addition, users can have streaming data via API using Maxar's secure watch portal.

#### **PANEL 5 – OPERATIONS AT SEA.**

This panel's main objective was to inform the audience on different practical challenges to executing maritime security in an operational context, from the Gulf of Guinea to the Northern Arctic. Panelists discussed:

- Shortage in NATO's Auxiliary Oiler Replenishment ships;
- Conversion of modern container ships;
- Piracy in the Gulf of Guinea;
- Trends in attacks and differences in reporting criteria;
- Impact of melting Arctic ice and the opening of sea routes; and
- Russia's influence in the Arctic.

Panel members consisted of:

- Mr. Spencer Fraser, Director of Business Development, Inoceca Group of Companies.
- Dr. Dirk Siebels, Senior Analyst, Risk Intelligence.
- Lieutenant Commander (Swedish Navy), Stefan Lundqvist, PhD, Joint Warfare Division, Swedish Defense University.

Mr. Spencer Fraser led off the panel with a discussion about Davie Shipbuilding and the conversion of a container ship into a NATO compliant AOR ship for the RCN. Davie Shipbuilding is one of the largest ship building companies in Canada and Federal Fleet Services are part of the Inoceca Group of companies.

Davie and Federal Fleet are all about innovative solutions to fill NATO maritime operational shortcomings. One of the contemporary shortcomings in the maritime enterprise is the non-availability of AOR assets to NATO's Joint Task Groups. The thinking needs to change to more of a sharing of assets like the AWACS aircraft but in an innovatively and cost-efficient way.

Project RESOLVE was the conversion of a 1,700 TEU container ship into a replenishment ship that is a corporately owned and Crown operated (COCO) vessel supporting the RCN. The ship deployed in 2018 mostly to the western Pacific conducting 132 supply operations with zero downtime on a 502-day deployment. The ship was manned by alternating civilian crews of 36 persons and augmenting the military mission specialists.

Mr. Fraser talked about the benefits of converting a container ship like fast delivery, more cost-effective, larger pay-load capacity and having a double hull. Also, the ship is built with great amenities like a 3500 sq. ft gym to recruit and retain a mostly millennial age workforce. In closing Mr. Fraser reiterated the fact that NATO does not have enough deployed assets and Davie Shipbuilding and Federal Fleet services can help by converting container ships into NATO compliant AOR ships.

Dr. Dirk Siebels spoke about the recent history of piracy attacks in the Gulf of Guinea and the media coverage surrounding them. However, he states that there has been no significant change in the frequency and types of attacks in 2019 and the first part of 2020.

He spoke on the differences in reporting of attacks between IMB Piracy reporting Center and Risk Intelligence. He makes a point that there is no right or wrong on reporting criteria only that it is different. These different criteria could lead to misuse of figures when comparing organizations reporting incidents. It is important to have a close look at the particulars of the criteria in order to make valid comparisons.

Dr. Siebels explained the different factors that affect the evolving piracy threat like weather conditions, traffic patterns, security situation on land and others. For example, during the rainy season the seas are usually rougher which pushes piracy attacks closer to shore. Although this pattern is not new, it is important that shipping companies are aware of them.

Explaining current trends, Dr. Siebels demonstrated that the average number of hostage situations from piracy has steadily increased to about 8 incidents in 2019. The significance is that shipping companies' contingency plans are increasingly making ransom money available to release hostages as soon as possible. Another trend is the increasing number of attacks taking place outside of Nigerian EEZ. There is no preferred time of day for perpetrators to attack however most successful kidnappings happen at night. This is important for crews to be more vigilant at night.

In summary, Dr. Siebels mentioned that kidnapping of seafarers is the main threat for maritime operations. Regional efforts to combat piracy are ongoing but are usually hampered by the lack of financial and human resources. Overall, the threat level is unlikely to change in 2020.

The last panel member was Dr. Stefan Lundqvist briefing on Operations in the Arctic. Dr. Lundqvist opened by stating the Arctic has once again become the geopolitical great power competition influencing regional economic environment security. In this sense, the Arctic is like a geopolitical chessboard.

The ice in the Arctic is melting allowing for northern sea passage routes to be opened for longer periods of time in the near future. The opening of Russia's largest Arctic gas project is just three months away. The Northern Sea Route which passes through Russia's territorial sea and Economic Exclusion Zone will be open 6-8 weeks a year in 2025. In 2012, Russia adopted national legislation regulating the control of the Northern Sea Route and in 2013, the Kremlin issued special protection measures for all shipping.

For environmental reasons, ice breaking assistance may be required at a cost determined by Russia which operates the world's only fleet of four nuclear powered icebreakers. All but one of them will be replaced by 2030 and by 2035, the fleet will include 30 icebreakers.

Russia claims it legally controls the Northern Sea Route (NSR). However, this goes against the interpretation of UNCLOS (the UN Convention on the Law of the Seas). He noted that the United States claims Freedom of Navigation rights in the NSR. Notwithstanding, Russia enjoys military supremacy in the Arctic with numerous bases along the sea route. Additionally, Russia has bolstered their Northern fleet with newly equipped Borei class submarines carrying Bulava ballistic missiles. In the Baltic, Russia has increased the numbers of corvettes equipped with Kaliber cruise missiles.

Dr. Lundqvist goes on to say that in the event of a conflict, Russia will not need to pass through the GIUK gap but instead could launch missiles from the Northern Sea or Norwegian Sea or the Baltic to reach all of NATO's European airports and bases.

In switching focus to China in the Arctic, Dr. Lundqvist poses the question on why would Russia invite China into the Arctic? The simple answer is that in 2017 China over-took the US in the world's leader of crude oil imports and Russia is well suited to feed China's crude oil needs. Dr Lundqvist concluded with an explanation of Sweden's response to Russia's resurgence, and described the bi-lateral defense cooperation with Finland with the establishment of the Swedish-Finland Naval Task group.

This concluded the formal panel presentations.

#### **REPORTS FROM THE MARITIME SECURITY REGIMES WORKING GROUPS.**

The idea of developing the MSR RT into a persistent on-line forum was adopted last year in the form of three standing Working Groups dedicated to MSA, Information Sharing, Interoperability and Integration, and Cyber Defense in the Maritime Domain. The idea behind this was to simply build a framework that would enable continuous dialogue in a regular battle rhythm and thus, maintain the momentum built at the annual MSR RT.

The intention of this panel was to bring together the Chairmen of the three Working Groups (or representatives) in order for them to introduce their groups to the broader audience, provide an update on their scope, their initial steps and their way ahead.

Panel members:

- Mr. Ricardo Karakadze, Senior Director, Global Maritime Security, Carnival Corporation & PLC.
- Captain Edward Westfall (USCG), Deputy Director, National Maritime Intelligence Integration Office (NMIO).
- Commander Neculai Grigore (ROM Navy), Staff Officer, Combined Joint Operations from the Sea Centre of Excellence.

Due to technical complications preventing Mr. Ricardo Karakadze, from joining the conference, CDRE Guy introduced the first of the three Working Groups, the Maritime Situational Awareness Working Group (MSA WG) and provided potential topics to address within the group.

Among others these include:

- Identifying opportunities from recent developments in ISR technology, from coastal radar to satellite imagery, which promise complementary and possibly persistent surveillance capabilities to build a maritime picture. This could include sensor technology deployed on board Maritime Unmanned Systems (MUS), signal processing, data fusion, as well as, artificial intelligence, machine learning, etc. to handle the big data challenges brought on by the ever-increasing volume, velocity and variety of data;
- Sharing best practices concerning high-risk areas with relevant or potential issues to freedom of the seas and freedom of navigation, including strategic sea lines of communications and choke points (the Gulf of Guinea, Libya, the Turkish Straits, the Azov Sea, the strait of Bab-El-Mandeb, the Gulf of Aden, the Strait of Hormuz, the Malacca Strait, the South China Sea, the Arctic, and the canals of Suez and Panama);
- Identifying how nations could exercise enhanced vigilance with regards to vessels conducting prohibited activities in EEZ and “near” TTW;
- Promoting awareness of national Maritime Commands and other governmental organizations with maritime security mandates to better enable collaboration;
- Discussing the role of organizations like the IMO, how to broaden their role to act as global standard-setting authority for safety, security and environmental performance of international shipping, and how to create a regulatory framework for the shipping industry that is fair, effective, universally adopted and universally implemented;
- Working towards developing a common baseline of definitions for identification, classification and tracking of vessels of interest in order to maintain synchronized MSA of potential threats or risks; and
- Carrying out a continuous networking in this realm to broaden the scope of collaboration and to better understand perspectives and ideas and propose speakers and topics for further MSR RTs.

The MSA WG is seeking active participation. All those interested in joining the group should contact its secretary, CDR Jorge Martínez (CJOS COE), at [jorge.martinez.sp@navy.mil](mailto:jorge.martinez.sp@navy.mil).

Captain (USCG) Edward Westfall provided a speech on behalf of the second WG, the Information Sharing, Interoperability and Integration Working Group). He structured his remarks into four parts:

- A brief introduction to NMIO; the importance of MDA (Maritime Domain Awareness);
- American entry for MSA;
- The need of the Information Sharing WG; and
- Results and way ahead of the work of the WG.

The National Maritime Intelligence Integration Office (NMIO) is an organization focused falling under the Office of the Director of National Intelligence. NMIO is the unified maritime intelligence voice to the US Intelligence community. In exercising its role, NMIO works with a wide variety of stakeholders such as academia, private sector, non-governmental organizations, philanthropic organizations, and allied and other nations. It conducts a wide variety of functions such as:

- The US National Intelligence Manager in the Maritime Domain;

- The senior advisor to the Director of National Intelligence on maritime issues;
- the champions for the broader Intelligence Community when it comes to maritime issues on the strategic, resourcing and prioritization level;
- The Intelligence Communities representative for the US Maritime Domain Awareness Executive Steering Committee, chaired by the Director of NMIO and providing national level guidance to bodies at US departmental level in all concerning Maritime Domain Awareness efforts.

Captain Westfall remarked on the importance of understanding the maritime domain for its role with global commerce, the economy and telecommunications. Among all the threats to the freedom of navigation, NMIO is most worried about hybrid warfare or grey zones activities, where illicit activities can be terrorist incidents, piracy, illegal fishing, human trafficking, sabotage, espionage, just to name a few. These grey zone challenges are made to achieve gains without crossing established red lines. They take advantage of seams in the US and International Law or where there is no law relevant to that activity. This challenge is exacerbated when it comes to the maritime activities. A resurgence of global power or nuclear competition in the maritime arena influences all NATO nations. We see China and Russia continuing port constructions, maritime infrastructure ownership and port management that impact national economy and security of our countries.

After having explained this importance of MSA/MDA, Captain Westfall referred to the reasons why an Information Sharing WG is needed. The ability to carry the momentum gained during the seminars, conferences and workshops is required. Why Information Sharing? It creates the structures and the agreements needed that actually enable the different participating nations and organizations to be able to articulate what they are doing and why they are doing anything concerning MSA/MDA.

CAPT Westfall concluded by mentioning the way the group is organized, the growing list of members, and the activities they are already engaged in. The WG has proposed three priorities: selecting a single platform for maritime tracking; finding the best way to add private party information to that platform and using the WG to set up longer term international collaboration on these issues. All those interested in joining this WG should contact its secretary, Lieutenant Commander Hatice Gomengil (CJOS COE) at [Hatice.gomengil.tu@navy.mil](mailto:Hatice.gomengil.tu@navy.mil).

CDR Neculai Grigore provided an overview on the third group, the Cyber Defense in the Maritime Domain WG (Cyber WG). He underlined that digital technologies help the maritime industry become more cost effective and efficient, but not safer. At the same time, the broader military enterprise considers these technologies as a force multiplier and enablers in multi-domain operations and cyber defense domain operations. The result of this is an increasing interest in Maritime Cyber Security amongst many key maritime security stakeholders. Thus, there is a definite need to establish this WG.

CDR Grigore went on to analyze the projects that CJOS COE, has or will be conducting concerning Maritime Cyber Security. In particular he showcased the following:

- Cyber Security of merchant ships, harbour IT infrastructures and maritime supply chain;
- Cyber Security on board warships;

- Cyber Interoperability in the maritime domain; and
- Cyber threats on command and control of unmanned maritime systems.

However, the existing issues in Maritime Cyber Security require integration of different thoughts, perspectives and approaches of various relevant experts on this matter. This is the reason behind the creation of the Cyber WG, which will provide the necessary networking and collaboration and thus, increasing mutual trust and improving information sharing.

Amongst the challenges and topics that this WG will be facing:

- Maritime cyber security gaps and seams;
- Cyberspace as a new and major operational domain;
- Common vulnerabilities of networked maritime systems;
- Training of personnel from military and civilian organizations;
- Update of organizations' cyber security policies;
- Cyber threat information sharing; and
- Networking and collaboration.

All those interested in joining the group should contact its secretary, CDR Neculai Grigore (CJOS COE), at [Neculai.grigore.ro@navy.mil](mailto:Neculai.grigore.ro@navy.mil).

## CONCLUSIONS.

The following are the conclusions drawn from the discussions and subsequent CJOS COE team's analysis:

**Objective 1.** *Understand the main hot spots of the world in terms of Maritime Security, the issues found there and the challenges they pose, to agree coherently on the best ways to tackle those issues that affect global commerce and prosperity at a global scale.*

Discussion Points:

- Russia is militarizing the Arctic zone to ensure the security in that region;
- The priorities of Russia in the Arctic are to ensure control over the access of foreign military activity and ensure unhampered access to own armed forces;
- Russia is currently re-fitting its Northern Fleet to make it more adaptable to Arctic conditions;
- Due to its geography, Turkey is a hotspot concerning irregular migration and the Aegean Sea is one of the preferred routes for immigration and illegal activity;
- Cooperation between Greece and Turkey is keeping the migrant crisis in the Eastern Mediterranean under control;
- There has been an increase in the frequency and intensity of the naval activities of Russia on the Black Sea in recent years;
- Russia's security policy in the Black Sea states that it will not allow significant superiority of foreign naval forces over the Russian Navy;
- Waterways in the Middle East and North Africa region are among the most important ones on a global scale due to its geographical position;

- Increased acts of piracy in the Gulf of Guinea is a challenge to maritime security. Regional efforts to tackle this issue are usually hampered by the lack of financial and human resources; and
- The Arctic has become the geopolitical great power competition, a kind of geopolitical dashboard. Climate change will allow Arctic sea routes to be opened for longer periods in the near future.

**Objective 2.** *Provide a Multi-Domain perspective of MSA as it affects a wide variety of interests and organizations.*

- A Multi-Domain perspective ensures collaboration and coordination in a wide variety of environments, and even more in such a complex environment as the maritime; and
- Cyber touches every domain and it can be a great equalizer with a very low cost of entry whilst at the same time, it provides opportunities to cyber criminals with a low chance of retaliation.

**Objective 3.** *Present and discuss technical and operational challenges, advanced technologies and knowledge gaps, in order to facilitate future collaboration and research activities.*

- Artificial Intelligence is proving to be a useful tool in the employment of unmanned maritime systems;
- The main problem being faced with the autonomous systems is how to provide a meaningful interaction with the human operators;
- There is a debate on how far Artificial Intelligence should be allowed to go unchecked in any decision-making process, as well as a consensus that somehow there must be some meaningful human control in that process;
- Systems with a poor human interface can compromise the mission accomplishment and induce failures; and
- The conversion of merchant vessels into AORs has proven to be an innovative solution to address the lack of these type of ships operating in Allied maritime groups.

**Objective 4.** *Introduce the recently formed Maritime Security Regimes Working Groups to all stakeholders.*

- The MSR WGs are considered a valuable tool to maintain momentum between annual MSR RTs. Three WGs have been established and Information Sharing WG is fully operational; and
- The Audience is encouraged to join one or more of these groups to maximize the engagement of the maritime community of interest with the objectives of the MSR RT and convert them into tangible outcomes.

## **CLOSING REMARKS.**

The MSR RT is CJOS COE's primary tool for discussing maritime security concerns with a focus on identifying gaps in global maritime situational awareness, facilitating better information exchange, increasing overall communication between stakeholders, and providing an interconnected network across all of them. Our process is based on identifying the key stakeholders (nations, NATO, IOs, NGOs, etc.), developing an engagement matrix, and identifying what information exchange requirements and protocols should be established for the purpose of building MSA. We would encourage you to share your expertise and your organization's best practices and join one of the Working Groups. The time commitment is relatively small, but the benefits could be exponential.

We sincerely hope you enjoyed the content and construct of this year's MSR RT. We look forward to hearing from you through the Working Groups, or do please feel free to contact us directly. Either way, we look forward to staying in touch.

*Yours aye,  
Tae Guy*

TJ Guy  
Commodore, RN  
Deputy Director, CJOs COE

## **ANNEX A.**

### **A MARITIME RESPONSE TO THE COVID-19 CRISIS.**

Given the current global pandemic, it was felt appropriate to take advantage of this gathering of maritime expertise and have a discussion regarding ideas from a maritime perspective, of how we could collectively do something to help combat this crisis. We have published this special annex on behalf of

our maritime partners as a means of providing a maritime voice to the contributions to the Global COVID 19 relief effort.

In order to facilitate this discussion, the following question was posed to the audience:

*Are there any ideas or thoughts about the current COVID-19 crisis or indeed future similar crises that should be driving us to accelerate changes, to accelerate things that we are currently thinking about or doing around the maritime security or anything else to do with the activity in the maritime domain?*

The following is a collection on shared observations, comments and suggestions regarding COVID 19 received from the collective body over the two-day event:

- An area to look at to improve in the aftermath of COVID-19 is establishing 'Zero Trust' Networks from ship to shore and beyond. In this virus spurned environment, we are currently working in, more remote workers are connecting to more organizational applications and IT.
- Contrary to training for nuclear attacks, there is a lack of exercises against biological attacks.
- COVID-19 and Strategic Intelligence. Both China and Russia now know how many sailors must become sick before both American and French Aircraft Carriers are recalled or rendered inoperable. What other sources of strategic intelligence did Russia and China gain by observing NATO's response to the outbreak? Do we need to think about hiding our responses better when the next wave/outbreak occurs? Can we learn anything about Chinese or Russian strategic behavior in such environment? Have we thought to look?
- Crews onboard are critical to the world trading and should be treated as such. Our concern now during the COVID-19 pandemic is how we can carry out crew changes. There is a lot of crews that have been more than two months over their contracts. But due to the closed borders and less planes we are not able to change the crew. Several countries around the world have a 14-day quarantine when entering into their countries. This should not be considered acceptable. There should have been hubs around the world where the crew can access direct to the vessels/ports.
- Our ability for information sharing from a common maritime picture will assist in maintaining COVID. We should endeavor to find more opportunities to utilize common sharing portals and systems at the unclassified level. If we continue to think regionally, we will fail to see the true maritime picture. Everyone can make a difference. Industry, inter-agency, coalition, NATO, and DoD all have a part to play.
- There is an urgent need to define a reliable protocol for Navy ships preparing for long deployments.
- Good sources of information on COVID-19 can be found at the daily briefings online and the webinars from Lloyd's Maritime Intelligence.
- It is necessary to balance the welfare and safety of crew. There are cases of seafarers being denied emergency medical treatment ashore due to port authorities' fears of coronavirus infection that have prompted labour and maritime employer groups to issue an urgent call for crew rights to be respected.... As an example, "potentially a life or death situation" involved a seafarer with stroke symptoms on a vessel off Sumatra who was not allowed to disembark for almost four days due to COVID-19 restrictions.
- If a COVID-19 presence is detected onboard a vessel, this jeopardizes the capacity for that vessel to competently engage in defense and security operations. Thus, physical contact with personnel not onboard presents a vulnerability for our defense capabilities. This needs to be

borne in mind for certain strategic vessels whose capable presence and operation is necessary for maintaining or securing an environment and whose temporary inoperability we cannot risk.

- The commercial maritime industry is feeling the effects of COVID-19, but there will be a time lag. Ports are trying to stay open, there is an increasing shortage of cargo containers globally which will get worse impacting the global supply chain. Certain nations and organized criminals are taking advantage of reduced warships at sea, especially in the South China Sea.
- The impact of the COVID Pandemic on maritime trade, particularly port operations, should be a study topic.
- The UN Office on Drugs and Crime (UNODC), Global Maritime Crime Programme, held a Webinar on “COVID19 and Maritime community” recently (16 April). The audience was regional Maritime Law Enforcement agencies within the Indo Pacific region, SE Asia and Indian Ocean. Among its outputs, Sharing of Best practices, particularly by South Korea, was deemed very useful to the audience.

## **ANNEX B.**

### **FINDINGS AND RECOMMENDATIONS.**

The following findings and recommendations are drawn from the discussions and subsequent CJOS COE team's analysis and are forwarded as possible items for discussion/action by the Working Groups, Stakeholders or captured in MARSEC or CJOS COE's Program of Work 2021:

**Finding 1.1.** Russia has been establishing an increasingly active posture in the Arctic, driven by the changing geopolitical environment surrounding this region, including its militarization, in a process that is not yet finished.

- **Recommendation 1.1.1.** Continue to monitor the evolution of Russia's presence and posture in the Arctic, including implications for NATO, and deliver the main facts on a regular basis at MSR RT gatherings or within the MSA WG framework.

**Finding 1.2.** Quick Response Checklists are a valuable tool for developing collaboration and coordination when a wide variety of agencies, organizations and stakeholders are involved when tackling a maritime security challenge.

- **Recommendation 1.2.1.** Promote the drafting, testing and validation of QRCs to address the different Maritime Security challenges. The Information Sharing WG would be best suited for this concept.
- **Recommendation 1.2.2.** Once developed, Information Sharing WG could disseminate these QRCs amongst the Maritime Community of Interest and present the results at the 2021 MSR RT events.

**Finding 2.1.** There is a debate on how far Artificial Intelligence should be used in any decision-making process, i.e., when talking about autonomous weapon systems.

- **Recommendation 2.1.1.** CJOS could explore possible implications of this issue within the scope of the employment of AI in systems relevant to Maritime Security and Freedom of Navigation. The aim would be to have an idea on to what extent they could be employed and to what extent man should continue to remain in the loop of the decision-making process.

**Finding 2.2.** One of the main conditions to achieve an acceptable level in Maritime Cyber Security is to understand our adversaries' cyber operating picture, what systems they operate, and how their actions can impact on our operations.

- **Recommendation 2.2.1.** The Cyber WG could work to foster the education of the maritime community on the knowledge of the cyber capabilities of our adversaries and the best practices on how to mitigate potential threat vectors.

**Finding 3.1.** Russia's Black Sea Fleet is undergoing a modernization process of its Black Sea Fleet and a surge of its naval activities within the Black Sea as a result of the importance of this strategic region for Russia.

- **Recommendation 3.1.1.** In parallel to Recommendation 1.1.1., MSA WG could monitor the evolution of Russia presence and posture in the Black Sea and Azov Sea, including implications for NATO, and deliver the results at MSR RT events or within the MSA WG framework.

**Finding 3.2.** The EU Action Plan aims at developing and putting into practice coast guard functions defined by the European Coast Guard Function Forum within a comprehensive approach that takes into account over 300 agencies with maritime security responsibilities all over Europe.

- **Recommendation 3.2.1.** CJOS COE could invite an expert or authority accountable to the planning and execution of the EU Action Plan to next MSR RT, to explain the objectives, challenges, achievements of the Plan

**Finding 4.1.** Information is a high commodity with everyone wanting all then can get and in near real time if possible. How can we horizon scan and share developments on immerging technology

- **Recommendation 4.1.2.** MSA WG could monitor immerging command and control platforms and deliver the results at MSR RT events or within the MSA WG framework.

**Finding 4.2.** Satellite imagery greatly enhances situational awareness to any command. It is readily available and widely used.

- **Recommendation 4.2.1.** MSA WG with CJOS COE support could research the feasibility and affordability of using commercial satellite imagery. Can satellite imagery companies provide persistent, secure imagery to our warfighters and rear echelons.

**Finding 4.3.** With unmanned aircraft becoming more prevalent in the aviation industry do we still need manned aircraft in the inventory. Can unmanned aircraft do everything that manned aircraft can?

- **Recommendation 4.3.1.** CJOS COE could do a study to determine the need for manned versus unmanned aircraft in particular situations and weigh the pros and cons of each.

**Finding 5.1.** One of the most recurring NATO maritime operational shortfalls is the non-availability of AOR assets to the naval forces deployed in its Area of Responsibility.

- **Recommendation 5.1.1.** CJOS COE could do a study on possible solutions to overcome this shortage like the conversion of vessels into AOR ships, the availability of facilities ashore, or any other way in which the industry could support to naval forces.

**Finding 5.2.** Regional efforts in the Gulf of Guinea to combat piracy are ongoing but are usually hampered by the lack of financial and human resources.

- **Recommendation 5.2.1.** MARSEC COE could identify the ways and stakeholders that could be involved in finding a solution to tackling piracy in the region.

**Finding COVID-19.1.** The impact of the COVID-19 pandemic on maritime trade, particularly port operations, should be a study topic.

- **Recommendation COVID-19.1.1.** MARSEC COE or CSW COE could study the impact of COVID-19 on maritime trade.

**Finding COVID-19.2.** There is a lack of exercises to address biological attacks.

- **Recommendation COVID-19.2.1.** CJOS COE could support by forwarding a Food for Thought Paper to the NATO Maritime Enterprise calling for the planning and execution of comprehensive exercises aimed at addressing biological attacks in the maritime domain

**Finding COVID-19.3.** There are no procedures in force concerning how to organize crew changes when in a pandemic crisis like the current one.

- **Recommendation COVID-19.3.1.** As a complement to Recommendation COVID-19.2.1, include the establishing and employment of hubs to facilitate access to vessels for crews handing over.

**Finding COVID-19.4.** There is a need to define a reliable protocol for Navy ships preparing for long deployments.

- **Recommendation COVID-19.4.1.** CJOS COE could draft a Food for Thought paper on how to establish a clear protocol to offer to Allied Navies for employment by ships preparing for long deployments.

**Finding COVID-19.5.** Amid the crisis, there are cases of seafarers being denied medical treatment ashore due to port authorities fears of infection.

- **Recommendation COVID-19.5.1.** Establish a protocol that encompasses all actors involved to manage sea-shore connections in order to ensure medical care ashore of seafarers affected by a medical condition.
- **Recommendation COVID-19.5.2.** Include this protocol as a training objective in the exercises started as per Recommendation COVID-19.2.1.