



THE MAGAZINE OF THE JOINT WARFARE CENTRE

THE THREE SWORDS

STAVANGER – NORWAY

LAWFARE

SOFTWARE
RESILIENCE
INTO THE
NETWORK

A REVIEW OF NATO EXERCISES



THE ROLE OF SPACE SUPPORT IN NATO OPERATIONS

Space Capabilities and Synthetic Aperture Radar (SAR) Satellites



- WHITE AND GREY CELL
- INFORMATION WARFARE
- STABILITY POLICING CAPABILITY

NATO
+
OTAN



COVER

7 June 2017—The Commander of the Joint Warfare Centre, Major General Andrzej Reudowicz, speaking at the flag-raising ceremony in Stavanger to mark and celebrate Montenegro's accession to NATO. Montenegro became the 29th Member of the Alliance on 5 June 2017. Other photographs featured on the Cover, including the exclusive 17-page Space Special, and the credits to photographers can be found inside the pages of the magazine.



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EDITOR'S LETTER



DEAR READER,

Since my last editorial, NATO has grown into an Alliance of 29 Nations by absorbing Montenegro into its membership. The moment was marked by many colourful flag-raising ceremonies taking place simultaneously across NATO. I sincerely congratulate all Montenegrins and would like to take this opportunity to say, "Welcome to NATO!"

Here at the JWC, we are also excited about another celebration, which is yet to come. As some of you know, we will mark the JWC's 15th Anniversary next year. "Study the past if you would define the future", Confucius once said, and we are excited to look back as we look ahead. Since its inception, the JWC has been a clear demonstration of NATO's Transformation, and we are excited to continue on this path in the future and add to the JWC's legacy as its One Team.

In March and April, the JWC conducted two iterations for TRIDENT JAGUAR 2017 (TRJR17) for the Rapid Reaction Corps France and 1 (German/Netherlands) Corps, respectively. They were each a resounding success. Now, an even larger exercise, TRIDENT JAVELIN 2017 (TRJN17), is on the horizon for us, and with the ongoing planning for TRIDENT JUNCTURE 2018 all upon us at once, the JWC is approaching a schedule that will be its most intense this year.

TRJN17 is indeed a very ambitious exercise, which aims to train nearly the whole NATO Command Structure in a Major Joint Operation 'Plus' (MJO+) Article 5 scenario, involving a large number of Training Audiences. I would like to draw special attention to Royal Navy Captain (Ret.) Stuart Furness' article (page 26) on future NATO exercises, including those with the MJO+ scale.

Our modified organizational structure, which has been in place since August 2015, ensures all JWC mission areas are stronger and fit for purpose to meet NATO's requirements now and in the future. As Paul Sewell explains so well in his interview (page 89), we cannot achieve much by ourselves; we are all part of a greater team, which we call the JWC's One Team. This 32nd issue of The Three Swords is itself a celebration of our collective efforts; it is full of great information and insights. I would like to highlight exclusive insights into the Space Support in NATO Operations by SHAPE (page 57), and the concept of Lawfare by U.S. Army Colonel (Ret.) Jody Prescott, former JWC LEGAD (page 6), not to mention Information Warfare and the White and Grey Cell. Then there is a look at TRJR17, including many interviews and comments on how the JWC's training, in a way, associates to a beautifully sculpted, pulse-quickening Cadillac.

Enjoy #32!

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THE THREE SWORDS MAGAZINE

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The views and opinions expressed in this magazine are those of the authors alone and do not necessarily reflect the official policy of NATO.

The Editor reserves the right to edit or shorten submissions prior to publication.

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Major General Andrzej Reudowicz Polish Army Commander, Joint Warfare Centre

THIS ISSUE OF *The Three Swords* magazine is underpinned by a historic event. On 5 June 2017, Montenegro became the 29th member of the NATO family in what is the first enlargement since 1 April 2009, when Albania and Croatia joined the Alliance. This newest accession is a milestone for both Montenegro and NATO. For Montenegro, it bears testimony to her determination and success in achieving her long-term goal of becoming a fully fledged Ally, which happened 11 years after the country regained independence; for NATO, it epitomizes the success of the Alliance's 'open door policy' to further enhance international peace and security. I sincerely hope that Montenegro's accession will pave the way for other nations to join the Alliance.



exercises, contributing to the requisite Lessons Learned process, as well as to the maintenance of joint operational doctrine and standards. Parts of our organization, in effect, function almost like centres of excellence in the wider, new organizational structure which, I am confident to say, is very well suited to the JWC tasks.

Our aim is to preserve NATO's military competence and interoperability through planning, preparation and execution of appropriate phases of the nominated exercises for which I am designated as the Officer Directing the Exercise. For the coming two years, the JWC will focus its efforts on delivering the Alliance transition to the level of Major Joint Operation 'Plus', (MJO+) capability, which includes all of our strands of Joint Warfare Development.

The flag of Montenegro was raised at the Joint Warfare Centre (JWC) on 7 June as flag-raising ceremonies took place simultaneously across NATO, projecting a perfect image of our unity and solidarity. From this day on, until a new member comes along, 29 flags will fly together at the JWC. I am looking forward to seeing Montenegrin officers here in the future, either as part of the JWC's Peacetime Establishment (PE); with our Training Audiences or as EXCON members.

Over the past four months, the JWC led two iterations of Exercise TRIDENT JAGUAR 2017 and conducted planning exercises for TRIDENT JAVELIN 2017 and TRIDENT JUNCTURE 2018. The JWC also supported an ACT-led workshop on NATO's Collective Training Support Programme of Work and re-evaluated its organizational building blocks, including a new JWC mission analysis that will set the conditions for its future success. Today, the JWC's mission as the primary ways and means of delivering the SACT Vision of *Alliance Military Transformation* for the joint operational level of warfare is unsurpassed. Nonetheless, we do not sit on our laurels. We must always be ambitious, innovative and outward-looking in order to be able to adjust quickly to the changing security environment and the requirements of NATO. My Vision is that the JWC sustains and enhances its role as NATO's premier provider and enabler for innovation and exercises at the joint operational level of warfare, for the headquarters of the NATO Command and NATO Force Structures, and, when ordered, for any other headquarters of the Alliance.

Facilitating *NATO Joint Warfare Development* for Alliance Military Transformation is at the heart of all of the JWC's exercise and training activities. This is no easy task. It involves incorporating new perimeters of concepts, experimentation and capability development into JWC-led

We have an organizational motto, so our operational motto might be 'Warfare First'. I believe that this is where the JWC compass should be, now and in the future. General Denis Mercier, SACT, captured the full potential of 'Warfare First', when he said on 18 May during a JWC All Hands Call: "What we do is operate and adapt at the same time."

In the short term, our focus is on TRIDENT JAVELIN 2017. This will be the first exercise where most of the command structure will be exercised together in a (MJO+) Article 5 scenario. We are working hard to make sure all participants will get the most out of this major exercise.

One of the most excitedly anticipated events for us is undoubtedly the JWC's 15th Anniversary next year. This already has us ruminate over what it means to be NATO's hub of innovation and transformation at a time when our 68-year-old Alliance is faced with some of the biggest security challenges in its history. We are a young organization, but we were established as a result of the Alliance's biggest reorganization to date, at a time when NATO mapped the way ahead for its future. On the Activation Ceremony of the JWC, 23 October 2003, Admiral Edmund P. Giambastiani, the first SACT, famously described the JWC as "the Jewel in the Crown of Allied Command Transformation".

I believe we stayed true to this most exquisite description of the JWC. NATO is the most successful Alliance in history, but it is not just a security institution. NATO is also committed to the well-being of our transatlantic community and to safeguarding our democratic values.

It is a great privilege to serve at the helm of one of NATO's most unique organizations here in the City of Stavanger, together with the One Team, which is the JWC's main source of strength and what makes us truly who we are.

LAWFARE

Softwiring Resilience into the Network

by COLONEL (RET.) JODY M. PRESCOTT
United States Army
Lecturer, University of Vermont
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The views expressed in this article are those of the author and do not necessarily reflect the official policy or position of the U.S. Department of the Army, the U.S. Department of Defense, any governmental agency or NATO. The author wishes to thank *Christopher Florian, Ilkka Ojala* and *Marja Lehto* for their thoughtful comments and suggestions.

WE FIRST STARTED talking about network-centric operations over 20 years ago.¹ Certain military organizations, such as Special Forces headquarters and units, appear to have incorporated important aspects of networked functionality into their work. Different regular forces' headquarters and units in which I served also attempted to revamp their organizational structures around information to be more flexible and responsive. From my perspective, these efforts had at best uneven and modest degrees of success. Perhaps, this was because of the headquarters' nature, and the lines on their organizational charts—"wire diagrams"—both reflected and reinforced the reality of their

inherent rigidity. Perhaps, however, there is a different approach to incorporating this functionality. Maybe we should just accept the hierarchical structure of regular military formations rather than fighting it. Perhaps, we should view networking not as an alternative organizational structure, but as a reinforcement of existing command and staff processes—reinforcement with flexible connections based on cross-cutting operational themes.

I suggest that in light of the current focus within the NATO Alliance on what is called the "hybrid threat", a decent candidate for this softwiring approach is the notion of "lawfare"; the recognition that rule of law and the role of law have increasingly become aspects of modern warfare.

War Amongst the People and the Hybrid Threat

The hybrid threat is just one aspect of an increasingly complex and interrelated international security environment. U.S. Army Chief of Staff General Mark Milley foresees armed conflicts more likely being "fought in dense urban areas with more robotic weapons and with a large civilian population in the middle of the fighting, a situation that makes the enemy elusive and combines conventional warfare with terrorism and guerilla activities."²

General Sir Rupert Smith has aptly described this as "war amongst the people"; armed conflict in which the civilian population's will becomes both the object of military





“NATO and the EU agree that among the goals to be achieved in dealing with hybrid threats is the building of resilience.”

Soldiers of the Norwegian Brigade North's
2nd Battalion deploy to Latvia for exercise
SABER STRIKE 2016 with one of NATO's C-17
Globemaster III military transport aircrafts.
Photo by Ole-Sverre Haugli, Forsvaret

operations and the environment in which these operations occur.³ The mobilizing capabilities of social media and the growth of the Internet are other aspects of this new operational reality, as is, I suggest, the gendered effects of armed conflict and climate change upon populations,⁴ and the increasing potential for cyber operations to ripple out of cyber space into the geophysical world.⁵ Against this backdrop, in the aftermath of Russia's invasion of Ukraine and annexation of the Crimea, NATO has increasingly focused on the risks to the Alliance posed by hybrid threats.

There is no NATO doctrinal definition of this sort of threat yet, but NATO and the EU have described it as a "mixture of conventional and unconventional, military and non-military, overt and covert actions that can be used in a coordinated manner by state or non-state actors to achieve specific objectives while remaining below the threshold of formally declared warfare." NATO Secretary General Jens Stoltenberg has come up with what actually may be the most useful definition for NATO purposes from a lawfare perspective: "Hybrid is the dark reflection of our Comprehensive Approach. We use a combination of military and non-military means to stabilize countries. Others use it to destabilize them."⁶

NATO and the EU agree that among the goals to be achieved in dealing with hybrid threats is the "building of resilience", that is,

"addressing potential strategic and critical sectors such as cyber security, critical infrastructures (Energy, Transport, Space), protection of the financial system from illicit use, protection of public health, and supporting efforts to counter violent extremism and radicalisation." Related goals include "raising awareness" of hybrid threats, and "stepping up the cooperation and coordination between the EU and NATO as well as other partner organisations, in shared efforts to counter hybrid threats."⁷ Importantly, the recent creation of the European Centre of Excellence for Countering Hybrid Threats in Finland, with Finland, France, Germany, Latvia, Lithuania, Poland, Sweden, the United Kingdom and the United States as its founding participants, provides a locus for research, coordination, training and exercises addressing hybrid tactics and techniques.⁸

The Hybrid Threat and Lawfare

In his cogent article published in this journal's January 2017 edition, Lieutenant Colonel John Moore provided an important perspective into the relationship between "hybrid war" and "lawfare". For Lieutenant Colonel Moore, lawfare, defined by Professor Charles J. Dunlap, Jr. as "the strategy of using—or misusing—law as a substitute for traditional military means to achieve an operational objective"⁹ is a subset

of hybrid warfare. Locating lawfare under the umbrella of hybrid warfare is an important first step in figuring out how to meaningfully assess the operational significance of law in addressing this sort of conflict. As concrete steps forward in this effort, Lieutenant Colonel Moore urges the development of doctrine that includes the role of lawfare, the study of Russian writings on hybrid warfare by planners and LEGADs, and the provision of official NATO guidance to planners and exercise developers on how to incorporate the reality of hybrid warfare into their work.¹⁰ These steps would no doubt be valuable, and would help foster increased resilience in NATO's ability to effectively respond to hybrid threats or even conflict.

However, based on my research on the evolution of international law since the time of Carl von Clausewitz's writing of *ON WAR* and on the now-discarded Effects Based Approach to Operations (EBAO),¹¹ as well as my experiences as an Allied Command Transformation (ACT) and Joint Warfare Centre (JWC) Observer/Trainer and an International Security Assistance Force (ISAF) Chief LEGAD, I suggest a slightly different, but complementary approach.

First, I will describe how working as a trainer taught me that the role of law in operations has both an external and an internal component. Next, I will exhume the bones of my failed effort to effectively use EBAO to assess the development of rule of law in Afghani-



New NATO HQ,
25 May 2017.
Photo by NATO

Photo by NATO Cooperative Cyber Defence Centre of Excellence



ABOVE: Organized by the NATO Cooperative Cyber Defence Centre of Excellence in Tallinn, the LOCKED SHIELDS is the largest and most advanced international technical live-fire cyber defence exercise in the world. This year, the exercise involved 900 participants from 25 nations. While the team from Czech Republic "won" the simulation exercise, NATO's Computer Incident Response Capability (NCIRC) scored the highest in the legal game of the exercise, the German team came out on top of forensic challenges, and the team from the United Kingdom achieved the highest scores in handling the Strategic Communication challenges. (Source and for more information, please visit ccdcoe.org)

stan, and explain the difficulties of effectively gathering, analyzing and measuring the large amount of data that would be needed to generate actionable Intelligence and fully implement lawfare as an operational capacity.

Finally, I will suggest an approach to identify areas in which I believe lawfare has a role to play in making operations in the current complex international security environment more effective and consistent with the democratic values shared by the NATO Partners. I am not advocating "building" resilience in NATO regarding lawfare; this sounds too much like more of the same inflexibility with which we are all familiar. Rather, to be resilient, lawfare needs to be elastic—softwired into the quiet network of functionality that exists side by side with organizational hierarchy in modern operational units.

The Importance & Limitations of Ordinary Training

Serving at ACT and then at the JWC, I worked in the pre-deployment training of both the

large-scale ISAF Headquarters as well as the smaller regional command headquarters. I learned what the operational issues appeared to be and how the different headquarters' Standard Operating Procedures (SOPs) were supposed to work. I also watched them evolve over a fairly short period of time. Importantly, we LEGAD trainers were included across the breadth of the different training development and execution cells. I grew to appreciate the extensive scope of not just training and educating the ISAF Training Audiences in the operational implementation of legal principles, but of accomplishing these tasks among our fellow trainers as well.

The last point should not have surprised me. I had worked in the Implementation Force (IFOR) Headquarters in Sarajevo in 1996 as the Operational Claims Chief. I had come to realize that different Troop Contributing Nations had their own distinct approaches to handling claims, and that this was a reflection of their own domestic legal authorities and policies. What I had not realized at that time, however, was that these differences would often be amplified in operations where the use of

actual force was an everyday occurrence. Further, these differences were largely hardwired—education and training programs had been created, troops had been taught and trained, and significant amounts of money had been invested in implementing the different national legal and policy perspectives.

A LEGAD Struggles Through "ON WAR"

Becoming aware of these different understandings and usages of law caused me to re-engage in my research on von Clausewitz's position on the operational significance of law. As a student at the U.S. Army Command and General Staff College, I had read for the first time *ON WAR* as part of our military history lessons. The re-theorizing surrounding von Clausewitz's writing did not seem particularly useful to me, with the exception of Professor Alan Beyerchen's analysis of *ON WAR* from the perspective of chaos theory.¹² It was this analysis that led me to an understanding of von Clausewitz's work with which I was comfortable.



BUILDING RESILIENCE

- // Strategic Communications
- // Cyber Security Awareness
- // Counter-Terrorism
- // Protection of Critical Infrastructure
- // Protection of Public Health
- // Protection of the Financial System

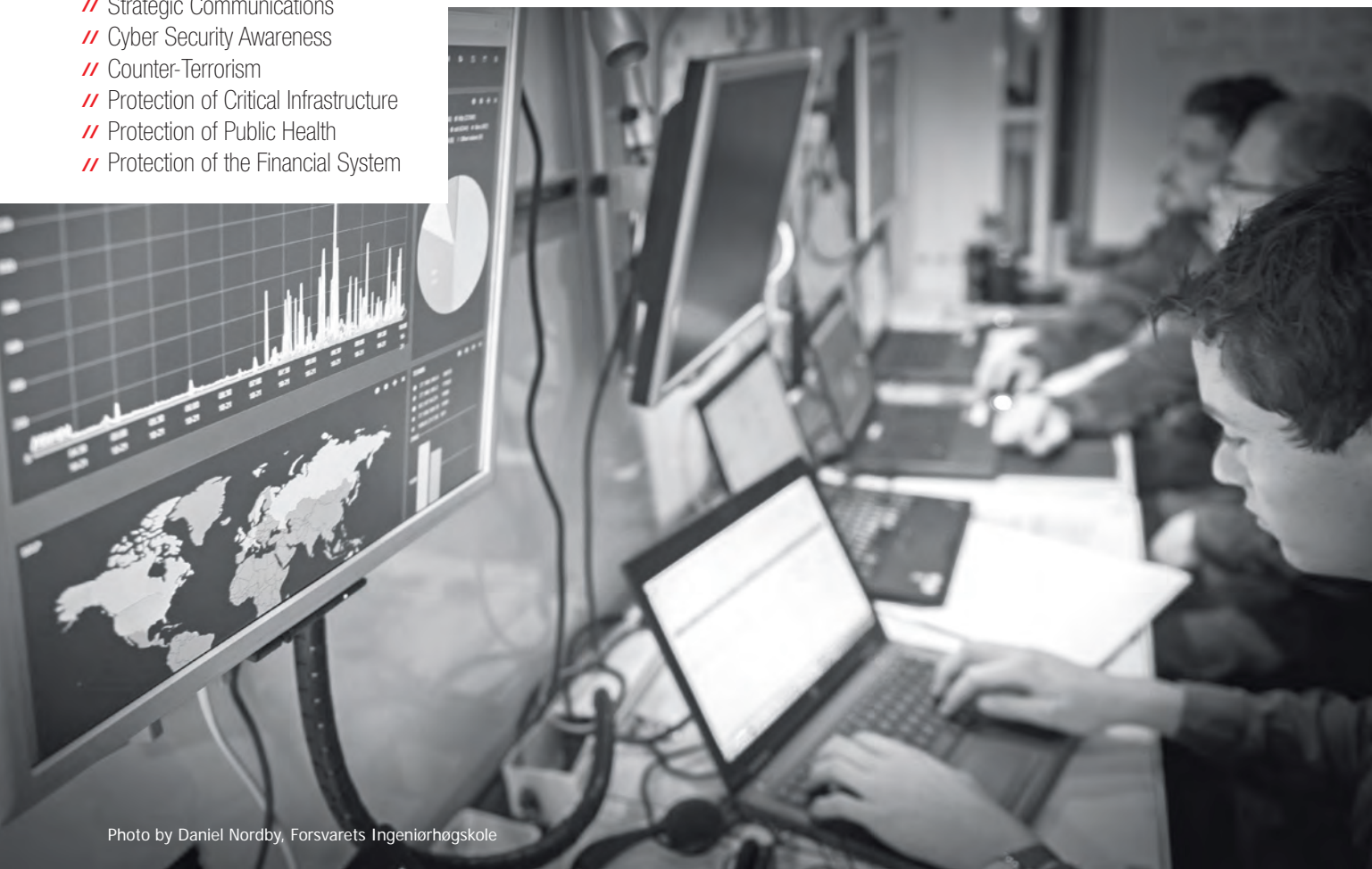


Photo by Daniel Nordby, Forsvarets Ingeniørhøgskole

Perhaps it is too simple, but this is what I concluded were the main points von Clausewitz was driving at. War does not exist other than as an expression of political decisions. War is messy, and inherently unpredictable. The unpredictability of war cannot be tamed, but it can be mitigated through an understanding of history and realistic training. In war, nothing is easy, and human nature and emotion are as much to blame for operational plans failing to unfold in an orderly fashion as is the weather. Commanders must make decisions based on imperfect information, and the lack of Intelligence causes them to be cautious in the deployment of their forces and to rely on their biases and intuition.¹³

As a LEGAD though, I continued to struggle with von Clausewitz's assessment of the operational irrelevance of law in armed conflict. "War is thus an act of force to compel the enemy to do our will," von Clausewitz wrote, and "[a]ttached to force are certain

self-imposed, imperceptible limitations hardly worth mentioning, known as international law and custom, for they scarcely weaken it."

Accordingly, "[f]orce—that is physical force, for moral force has no existence save as expressed in the state and law—is thus the means of war, to impose our will on the enemy is its object."¹⁴

WHEN I EXAMINED the understanding of international law during von Clausewitz's lifetime, I came to appreciate that although his views were blunt, they were not inaccurate. Even the most progressive writers on international law of the time, such as the Swiss diplomat Emmerich de Vattel, recognized the right of sovereign nations to make harsh exceptions to the rules of general humanitarian conduct when necessary to safeguard their interests.¹⁵ Now, nearly 200 years after von Clausewitz wrote *ON WAR*, in-

ternational law has become more like the "real" law that he likely had in mind when he stated his assessment.

First, the nations of the world decided to limit their sovereignty by agreeing to enduring treaties that restricted the means and methods of warfare. Second, the growth in treaty law led to more states accepting that they were bound by the customary international law that developed because of consistent state practice in these matters. Third, the creation of lasting international and regional organizations, such as the UN and the EU, has led to the development of new laws in this area. Fourth, the advocacy efforts of international organizations, such as the International Committee of the Red Cross (ICRC) and non-governmental organizations, facilitated by the explosive growth of the news media, have resulted in important developments in international law regarding the use of armed force, as evidenced by the Ottawa Convention banning landmines, for example. Im-



portantly, this growth in binding law resulted from affirmative political decisions by the states involved, in a manner consistent with von Clausewitz's assessment of the primacy of politics in war.¹⁶

The Effects Based Approach to Operations (EBAO)

Once I had concluded that the operational significance of law had changed markedly since von Clausewitz's time, and that he would likely have been forthright in acknowledging that if he were alive today, I returned to his point about the lack of accurate and timely Intelligence being available to commanders in their decision-making. While serving at ACT in 2005, I had become aware of a new concept that was gaining traction in the U.S. and NATO training and doctrine circles, the "Effects Based Approach to Operations" or EBAO.

The purpose of EBAO was to enhance military planning, the execution of operations, and the assessment of those operations through a more holistic picture of the theater of operations.¹⁷ Ideally, it would allow for synchronization of military efforts with those of governmental, international and non-governmental organizations so that the overall effort could be more effective and more efficient.¹⁸ The func-

tion of EBAO was to create "effects" among the different actors in a theater of operations, which were defined as "changes to perceptions, behavior, and capabilities."¹⁹ Effects were created by "actions", which were defined as the use of "any [NATO] instrument at any level", and which at the tactical level would be conducted as specific tasks and activities.²⁰ Aggregations of effects would lead to achieving the objectives set out by NATO's political leadership.²¹

For example, NATO could decide that establishing the rule of law was one of its objectives in a host nation into which its forces were deployed. A desired effect of this objective could be an end to support of terrorist organizations by the nation. To assess whether this effect was being created, two types of criteria would be used, "Measures of Performance" and "Measures of Effectiveness". Measures of Performance assessed whether the actions designed to create the effects were being accomplished. Measures of Effectiveness assessed whether the actions were being done correctly. So, for example, an action could be NATO personnel bringing up the importance of addressing counter-terrorism in meetings with host nation officials. A measure of performance could be the number of such meetings in which the topic was raised. A measure of effectiveness could be an increased number of

public statements by host nation officials that supported counter-terrorism efforts.²²

EBAO and The Rule of Law

As a NATO LEGAD, the ideas behind EBAO appealed to me immediately. Here was a methodology that held the promise of gathering data, analyzing it, and then acting upon it in a way that could minimize injury or death to civilians, and collateral damage to their property. It provided connection points to civilian efforts in theaters of operation, and suggested that although full synchronization with these efforts might be out of reach, complementing civilian efforts with military initiatives to achieve efficiencies in operations was possible.

Further, EBAO did not appear to require significant re-organization or re-equipping of existing units or infrastructure—it was an approach, *an operational mindset*, to achieving a comprehensive analysis picture of an operational theater. By the time I became the ISAF Chief LEGAD in the summer of 2008, ISAF had already begun using a version of EBAO, and the development of the rule of law in Afghanistan was designated as one of the lines of effort to be tracked by the headquarters. I saw a chance to really engage effectively with EBAO in this important area, primarily because tra-

"What has happened is that in the past, in what I call 'industrial war', you sought to win a trial of strength and thereby break the will of your opponent, to finally dictate the result, the political outcome you wished to achieve.

In our new paradigm, which I call 'war amongst the people', you seek to change the intentions or capture the will of your opponent and the people amongst which you operate, to win the clash of wills and thereby win the trial of strength. The essential difference is that military force is no longer used to decide the political dispute, but rather to create a condition in which a strategic result is achieved."

— General Sir Rupert Smith

International Review of the Red Cross Magazine





ABOVE: A meeting of the White Cell during operational level exercise TRIDENT JAGUAR 2017. White Cell's mission is to ensure the synchronization of military efforts with those of governmental, international and non-governmental organizations, and replicate, as such, the complex civil-military environment. Photo by JWC PAO

ditional military command and staff processes seemed particularly unsuited to such work. Now, my research and study of von Clausewitz told me that he would have found the notion of EBAO, as I understood it, to be folly. As to the impact of the lack of accurate Intelligence upon military decision-making, he had observed that “even if we did know all the circumstances, their implications and complexities would not permit us to take the necessary steps to deal with them.”²³

I was not convinced. Surely, I thought, just as the operational significance of law had changed since von Clausewitz's time, the modern military headquarters infrastructure, with all of its data feeds and analysts, its computers and reach-back capabilities, and its educated, trained and experienced officers, could burn through the “fog of war.”²⁴ Surely, it could create an accurate, real-time picture of the operational environment that would lead to more efficient and effective military efforts across the spectrum of military activity.

I should have listened to the Prussian.

Courts, Corrections and EBAO

Over the course of several months, our Rule of Law LEGAD and I developed Measures of Performance for the Afghan judicial system and the prison system. We did not address the police, the third pillar of the basic “Cops, Courts, Corrections” rule of law structure, because the police were being trained and assessed by the Combined Security Transition Command—Afghanistan, a U.S.-led coalition effort outside of NATO.

Developing these measures was not easy. First, although we received advice from rule of law advisors who had worked in Iraq after the U.S. invasion on developing these sorts of metrics, their metrics were keyed to a country that had had a sophisticated justice system that was present and effective in its own way throughout much of the country, and whose population was largely literate and educated. As an example, for one Iraq-based matrix, if the courts in a particular area had between zero and 25 per cent of their assigned

personnel actually working there, they were categorized as “red” for being largely ineffective. Between 26 and 50 per cent, their assessment was “orange”; between 51 per cent and 75 per cent, their assessment was “yellow” and between 76 and 100 per cent, their assessment was “green” for largely effective. In contrast, just getting a single Kabul-assigned judge present in a local court in many areas of Afghanistan often represented a significant investment in resources and no small triumph under the circumstances. Under the Iraq-based matrix, however, this would only represent a negligible blip in the “red” category.

Second, we consulted widely with different international and non-governmental organizations present in Afghanistan and Afghan rule of law stakeholders as to the types of Measures of Performance they thought would be most useful to capture the most important trends in rule of law development. Unfortunately, we were not able to get much consensus as to what they should be, nor rigorous advice on how to measure them.

So, for example, we reluctantly started using inexact proxies for actual Measures of Performance, such as the square meters of space available per prisoner in correctional facilities instead of detailed studies. We did this despite knowing from our site visits to different Afghan prisons that not only were the figures reported in the most detailed and rigorous open-source assessments likely very approximate, but that the actual conditions in the facilities and the sociology of the very communal Afghan people led to different performance results than had Western prisons been assessed.

The definition of Rule of Law we were given to work with was, “The Government of the Islamic Republic of Afghanistan develops and maintains a justice system that is perceived as fair by the Afghan people, ensures equality before the law, prevents official arbitrariness and is in accordance with international law.” The definition tracked with the approach set out in the Afghanistan National Development Strategy.

Figure 1 is a diagram of the overall scheme that we came up with to both gather rule of law data from subordinate ISAF units and to push back down to them our analysis of the data for their use in operations. The development of this effect would support the high level objective set



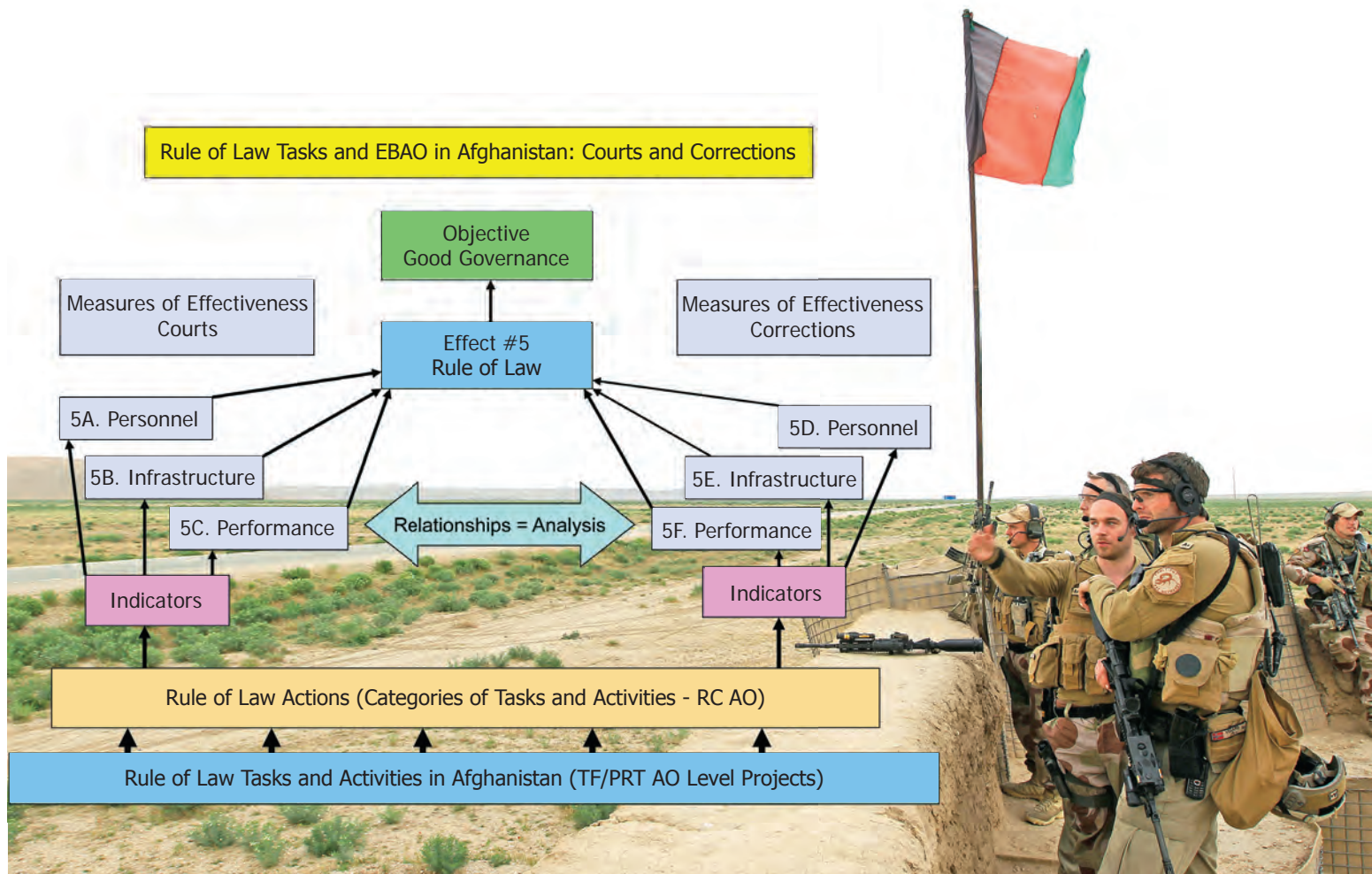


Figure 1 Establishing rule of law and good governance in Afghanistan (HQ ISAF, 2009). RC stands for "Regional Command", AO "Area of Operations", TF "Task Force" and PRT "Provincial Reconstruction Teams". Photo by Torbjørn Kjosvold, Forsvaret

out by the Afghanistan National Development Strategy of establishing good governance, rule of law, and human rights in Afghanistan.²⁵

As set out in *Figure 1*, for both the judiciary and the corrections system, there were three categories of Measures of Effectiveness that would be assessed: Personnel, Infrastructure, and Performance. Supporting the analysis developed in the Measures of Effectiveness were similarly organized Measures of Performance, or "Indicators" as we called them. By exploring the relationships between the judiciary Measures of Effectiveness and the corrections system Measures of Effectiveness, we expected to develop actionable analysis of whether progress in the rule of law was actually being made. The Indicators were to be populated by data received from the regional commands, which in turn collected data on tactical-level rule of law tasks and activities from the task force and provincial reconstruction team level.

As an example, *Figure 2* (on page 14), shows the Measures of Effectiveness we developed for

assessing the performance of Afghan courts. They were a mixture of external polling data, statistics related to training of individuals on substantive law and record keeping systems, statistics on trials of a particularly vulnerable population cohort (women) because of the pervasive inequality they experienced in Afghan society, and information relating to Taliban judges.

Based on our consultations with rule of law stakeholders in Afghanistan, we believed these to be most useful categories against which to collect data and develop analysis—the Measures of Effectiveness most likely to yield the most relevant information. By classifying the scheme as non-sensitive and releasable to the public, we expected to distribute the methodology widely among the different rule of law stakeholders to assist us in collecting data. First, however, we needed to present proof of concept to the very patient Dutch Admiral who was overseeing our work, to give him a snapshot of what this system would generate once implemented.

Data Collection Failure

With a data collection plan in hand, we began searching for useful and reliable data. Our first visit was to the Intelligence shop in ISAF Headquarters itself. We learned that the Headquarters' Intelligence operation was not focused on collecting and analyzing the sort of information we were looking for. Their focus was geared toward collecting data that had been determined to be useful for the conduct of kinetic operations primarily. I pointed out that development in the rule of law was an effect that the headquarters was tracking, but this did not lead to any commitment to change the existing collection processes.

Particularly telling were our efforts to gather information on Measure of Effectiveness 5C.14, Districts with Shadow Governments, and Measure of Effectiveness 5C.15, Shadow Governments Exercising Judicial Capacity. This sort of information was simply not available from the Headquarters' Intelligence staff. This led us to conduct an extensive open source search on the Internet to hunt



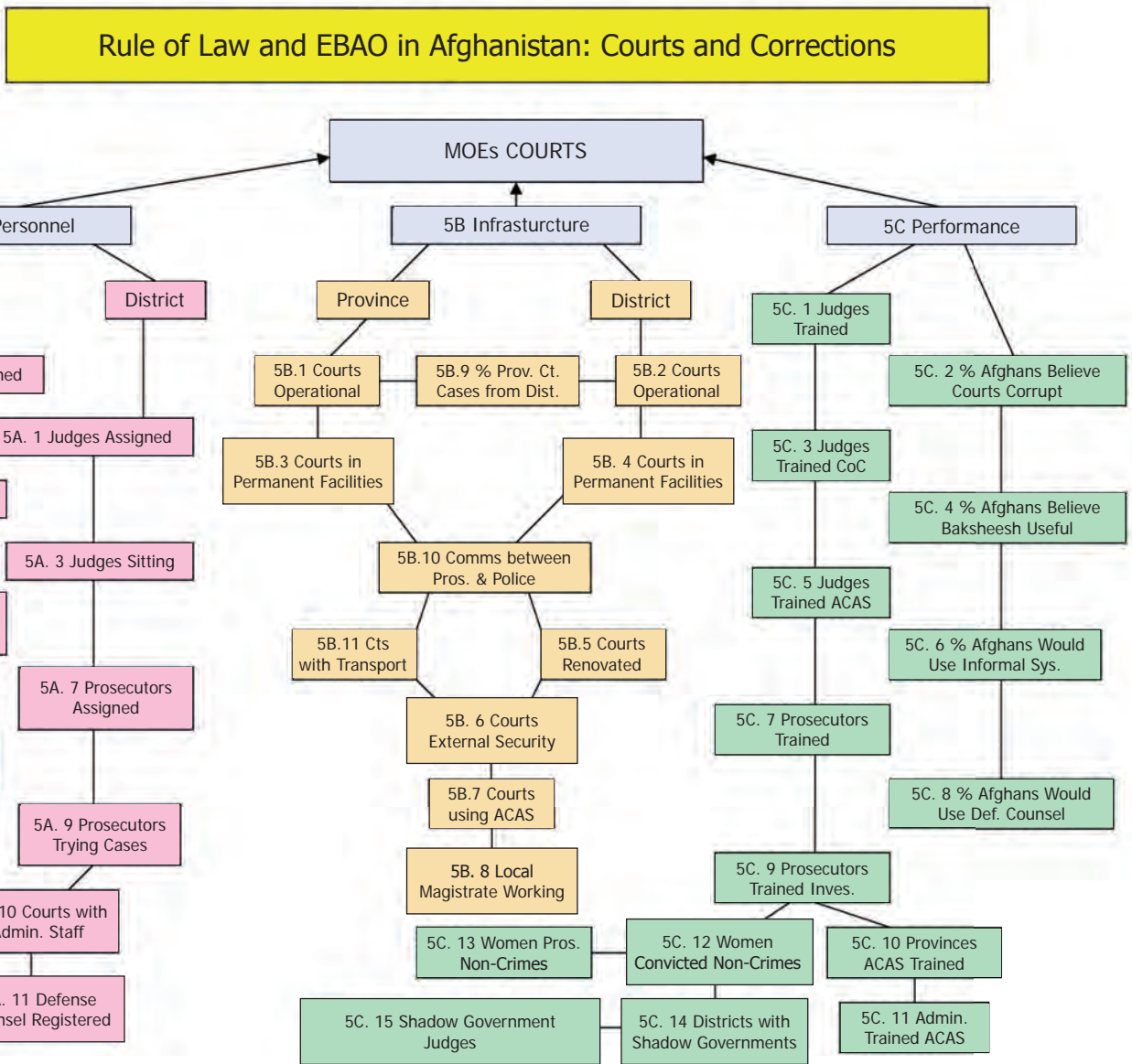


Figure 2 Establishing rule of law and good governance in Afghanistan (HQ ISAF, 2009). The graphic highlights the vast scope of challenges that the development of the rule of law faced in Afghanistan.

down traces of Taliban judges. We found a fair amount of information, mostly press reports, but could only estimate its reliability. Ironically, when we synthesized the information we had developed, it presented a troubling picture of Taliban judges seizing justice market-share in many areas throughout the country—to the degree that we then felt compelled to classify it secret.

Our efforts at pulling data from other sources were at best modestly successful. Assembling the information we could find, and images that would help paint a picture of the challenges that the development of the rule of law faced in Afghanistan, we were still not

able to provide the Admiral with a snapshot. Rather, it was more like an unfinished impressionist painting. Importantly though, it highlighted the vast scope of the challenges that rule of law stakeholders faced in Afghanistan, and identified the data gaps that needed to be fixed before the data collection scheme would work. It was sufficient to receive the Admiral’s approval of our draft SOP for the data collection, and to then distribute it to the subordinate ISAF commands.

Unfortunately, by the time I left Afghanistan in the summer of 2009, we had yet to receive a single report back that we could use in this effects based approach to rule of law

operations. Perhaps it was just as well. By the time we distributed the Rule of Law Standard Operating Procedure, I had realized that our small office would likely be overwhelmed with data corroboration and analysis if we were successful. Further, the ISAF mission was simply not wired to provide us the support that would be necessary to turn the data and any analysis into actionable Intelligence. Finally, despite the promise that EBAO showed in taking a complex process like rule of law and allowing it to be recognized for its operational value, EBAO was not mature enough to deal with a complicated and devastated rule of law situation such as that presented by Afghanistan.²⁶



A Network and Unexpected Target Audiences

While working at ACT and JWC as a trainer, I had become aware that there were certain ISAF Headquarters functions that were recognized as very important and which did receive the legal services they deserved, such as the Dynamic Targeting Cell. Others were also very important in a “war amongst the people” but were not necessarily represented fully in the pre-deployment training we conducted. Once I arrived in Kabul, I sought out opportunities to engage with units and staff sections that I believed to be underserved with legal advice, or whose missions needed to be better publicized so that others in ISAF would understand the important role they played in such a complex and sprawling stability operation.

The ISAF Spokesman’s office was very receptive to discussing how legal advice could be useful in helping best formulate command communications, as was the Public Affairs Office (PAO). Buried in the operations and planning shops we found the more junior action officers who were responsible for drafting changes to SOPs, and provided them assistance in stating what they really wanted to accomplish in a way that made legal sense in their first draft. We worked with the Civilian Casualty Cell, to find ways to gather more accurate information about civilian losses, and to find ways to minimize them. We also worked with the Institute for International Humanitarian Law at San Remo to sponsor an Afghan attorney who worked for U.S. LEGADs as a translator to travel to Italy and participate in an international humanitarian law course, as well as presenting his work in Afghanistan with the rule of law.

Over time, my daily routine of visiting different offices took a path very unlike the one I was accustomed to in a national setting. I would go weeks sometimes without talking to the ISAF Commander, and I worked infrequently with the major staff section heads or their deputies. I realized that I had developed a functional network that bore no resemblance to the Headquarters’ wire diagram, but one that actually allowed me to focus on providing legal advice to its best advantage.

Part of my functional network was the Combined Joint Psychological Operations Task Force (CJPOTF), which was an ISAF

unit located at the far end of the Headquarters compound. German-led and internationally staffed, it created print, television and radio messages published to Afghan audiences on themes that supported Afghan efforts to build its security forces, to suppress poppy cultivation, and to promote licit livelihoods. The CJPOTF Commander convened boards to review draft and final versions of these products and to provide feedback, and was completely willing to have a LEGAD participate.

Over time, I assisted in different CJPOTF projects, such as providing a different English-speaking voice for the English-language voiceovers of Afghan language messages. I was surprised that such things were necessary, but the Commander explained to me that these voiceovers were useful to demonstrate to NATO audiences that the messages were appropriate and well made.

Perhaps the most interesting CJPOTF project I assisted on was its ambitious plan to further rule of law development in Afghanistan through engaging with Afghan audiences on the provisions of the Afghan constitution. The Special Forces project officer secured a budget to print several hundred copies in both Dari and Pashtu, and to have comment collection

BELOW: Afghan National Policewoman stands at attention during a ceremony. Photo by Staff Sergeant Larry E. Reid Jr., U.S. Air Force



“In the midst of the focus on kinetic operations, we were concretely working towards goals that were consistent with our values.”

boxes made. Copies of the constitution were placed with the comment boxes and comment slips in public places in Afghan communities, and people were encouraged to submit their anonymous comments about the constitution and the rule of law. The concept seemed promising as well as inexpensive, and I volunteered to brief it, comment box in hand, at the next command update for the commander and the staff. The briefing was uneventful, but upon returning to my office and opening my e-mail, I found several messages from staff officers whom I did not know personally, but who thanked me for the presentation.

In sum, they were reassured to hear that in the midst of the focus on kinetic operations, we were concretely working towards goals that were consistent with our values. Unexpectedly, although they were not our intended target audiences, at least our rule of law efforts were having an effect on somebody. I re-learned the lesson I had first experienced while serving at ACT and the JWC—it is counterproductive to ignore our internal audiences.

Hardwiring Lawfare

Consistent with Secretary General Stoltenberg’s definition of lawfare, generating effects on the perceptions and attitudes of internal NATO audiences is a proper use of lawfare in a manner consistent with our shared democratic values. Further, as Professor Dunlap has noted, “[a]ssuring troops of the legal and moral validity of their actions adds to combat power.”²⁷

Similarly, Professor Dunlap notes that



“[i]ntegral to defensive lawfare operations is the education of the host nation population, and in effect, the enemy themselves.”²⁸ Professor Joel Trachtman has observed of the current international security environment that “[n]ot only is it a law-rich environment, but it is also a surveillance-rich environment in which information about possible violations and evidence of possible violations are much more readily available than in the past.”²⁹ Accordingly, Professor Dunlap believes that “commanders should aim not to have a [LEGAD] at the elbow of every rifleman, but rather to imbue troops with the right behaviors so they instinctively do the right thing on the battlefield.”³⁰ *How might we best make this happen?*

A review of the literature on lawfare suggests a number of important steps and measures that could be implemented to meet this requirement. As noted above, Lieutenant Colonel Moore advocates the development of doctrine to allow trainers and planners to begin incorporating lawfare into their work with Training Audiences. Professor Dunlap has recommended the establishment of “Operational

Verification Teams” composed of “legal, operational, Intelligence and PA specialists, organized, trained and equipped to rapidly investigate allegations of incidents of high collateral damage.”³¹ With an eye towards the reality of lawfare, Major James Burkart has done superb work explaining the U.S. joint targeting cycle and breaking it down into its legal components so that LEGADs can see where they are supposed to be adding value to the process and in what fashion.³²

Professor Trachtman argues cogently for an actual lawfare “command” that would be tasked specifically with integrating lawfare considerations into operations.³³

These recommendations are worthy of serious consideration. On its face, Lieutenant Colonel Moore’s suggestion to develop new lawfare doctrine might appear to be relatively basic and practicable. However, having experienced in Afghanistan the role that different national caveats to operations play in multinational efforts and how they reflect domestic legal and policy concerns, both published and unpublished,³⁴ I am not optimistic that effec-

tive NATO lawfare doctrine could be developed quickly, if at all. The creation of new teams or commands in the NATO context would presuppose a common operational basis, and would require a dedication of resources that might strike some as unnecessarily expensive. Further, these possibilities all have one thing in common that would work to frustrate the efficiencies they sought to achieve—they are hardwired solutions to a novel cross-cutting operational theme, within the ordinary hierarchical framework of military organizations.

Softwiring the Network

I am mindful of the inevitability of hardwiring in regular military organizations, and grudgingly appreciative of the rigor and predictability that it brings in a headquarters’ regular work. On the other hand, my operational and training experiences in NATO have persuaded me of the value of also taking a functionally-networked path in determining how to best implement lawfare consistent with the Alliance’s Comprehensive Approach.

BELOW: An EXCON meeting between the Gender Advisors of 1 (German/Netherlands) Corps, the Joint Warfare Centre and the White/Grey Cell Humanitarian Affairs representative during TRIDENT JAGUAR 2017. See page 96 to learn more about “Women, Peace and Security”. Photo by JWC PAO





ABOVE: A simulated press conference during TRIDENT JAGUAR 2017. The media focus is on reporting the "effects"; changes to perceptions, behaviour and capabilities, which are created by the "actions". Photo by JWC PAO

AS A FIRST STEP, I do not recommend viewing "lawfare implementation" as just another task to be finely ground and sifted through the typical military staffing process, or so unusual a task that it needs to be handled through some sort of EBAO-like process. Instead, I recommend stepping back, and analyzing NATO headquarters, units and offices, and associated organizations and activities, to first determine what role they might play in lawfare. How do they reflect our shared democratic values and the foundation of the rule of law in what they do?

For example, I am not particularly interested in the operations shop in general. However, I would be most interested to know whether it has a dedicated Rules of Engagement (RoE) officer who is truly working across different staff sections, rather than just serving as the custodian of the caveats. I know that RoE have a formal NATO definition which is quite broad,³⁵ but I also know that the most important rules are largely the implementations of international humanitarian law.

What sort of working relationship does the RoE officer have with the LEGAD? Or, with the officer responsible for traffic control SOPs?³⁶ Does the officer responsible for claims understand that well-trained and effective RoE mean that there will likely be fewer traffic accidents resulting in claims for injury and damage by local civilians?³⁷ Does the RoE officer work with the Gender Advisor (GENAD)?³⁸ Has the RoE officer taken the time to explain the RoE to the personnel in Strategic Communications? What contact does the RoE officer have with the staff officer who would be responsible for monitoring whether any opposing combatants were taken into custody by NATO forces?³⁹ Does the Information Operations section understand the RoE, and why messages to local civilians need to be phrased in particular ways? These staff sections and individuals are all nodes in a functional network based on the cross-cutting theme of law and the operationalization of legal principles. The connections between them are not likely reflected in any wiring diagram, nor do the different nodes necessarily train and work to-

gether as a matter of practice.

Imagine a headquarters staff exercise the purpose of which was not just to train on the hybrid threat, but to also gather data on how realistic events that could occur in hybrid-threat environments actually flow within and are acted upon by the Training Audience from a lawfare perspective. Rather than driving lawfare solutions from the top down, let us first understand how we handle lawfare organically—let us experiment and ensure that whatever doctrine we develop is actually responsive to the way lawfare actually works. Importantly, let us also leverage in this exercise the expertise of the different Centers of Excellence whose work would impact most directly upon this, such as the Cooperative Cyber Defence Centre in Estonia, the Strategic Communications Centre in Latvia, the Civil-Military Cooperation Centre in the Netherlands, and of course the new counter hybrid-threat center in Finland. Only then will we be able to develop educational and training curricula that will better prepare our troops to react to misuses of lawfare in the manner Professor Dunlap envisions.



Conclusion

Importantly, lawfare is nothing new. For example, despite his dismissive assessment of international law, von Clausewitz himself was willing to use it to further military ends.

In 1831, von Clausewitz wrote an anonymous letter to a German newspaper defending the “unofficial” support nominally neutral Prussia gave to Russia during the Polish Uprising that had begun in 1830. Refuting claims by a senior Polish military official that Russia had been supplied with Prussian food and materiel, and that Prussian soldiers were serving with Russian units, von Clausewitz argued that neutrality as understood in international law had been complied with by the Prussian state, since only private Prussian merchants had sold the items to the Russians. At the same time, he pointed out that many European powers had chosen to ignore French assistance being provided to both Polish and Belgian rebels in violation of the law of neutrality.⁴⁰

Lawfare can be both a sword and a shield. The establishment of the European Centre of Excellence for Countering Hybrid Threats in Helsinki is a very positive step forward in resolving some of the hardwiring challenges facing the effective and consistent

implementation of lawfare into NATO operations, and it cannot come soon enough.

In his article on NATO’s forward presence in the Baltic partners, Dr. Martin Zapfe describes the potential challenges these forces might already face in dealing with hybrid threats, including the need for handling the information aspects of potential accidents with local national drivers, unfriendly civilian protesters within ethnic Russian populations, inconsistent NATO partner approaches to situations based on national caveats, and ethnically motivated terrorist violence.⁴¹

Polish municipalities that have hosted U.S. troops as part of the forward deployment of NATO forces have already suffered cyberattacks on upon their websites by unidentified hackers who apparently included pro-Russian content in their efforts.⁴²

Given the importance of lawfare as an aspect of NATO’s Comprehensive Approach, the Joint Warfare Centre would be well positioned to begin exploring a softwiring approach to developing resilience in NATO formations to the misuse of law and understandings of democratic values by potential adversaries. Its ability to test this with various

Training Audiences could provide useful data for the researchers and writers at the European counter hybrid-threat centre, and for national counter hybrid-threat efforts as well. ✦



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COLONEL (Ret.) JODY M. PRESCOTT retired from the U.S. Army Judge Advocate General’s Corps in 2011 after 25 years of active duty service, and now works as an associate legal advisor for U.S. Immigration & Customs Enforcement. In addition to his NATO tours, Prescott served two tours in Germany and two tours in Alaska. He also served as an assistant professor at the U.S. Army Command & General Staff College and West Point. Prescott is now a lecturer at the University of Vermont, where he instructs on environmental law, energy law and climate change, cybersecurity, and cyber conflict. His research and writing focus areas are the operational relevance of gender, cyber conflict, climate change, and ethics and leadership.



Legal Advisor’s from JWC and 1GNC during TRIDENT JAGUAR 2017. Photo by JWC PAO

KEY NATO CENTRES OF EXCELLENCE

- * Cooperative Cyber Defence Centre in Estonia www.ccdcoe.org/
- * Strategic Communications Centre in Latvia www.stratcomcoe.org/
- * Civil-Military Cooperation Centre in the Netherlands www.cimic-coe.org/





ABOVE: The signing of a Memorandum of Understanding for the European Centre of Excellence for Countering Hybrid Threats in the Finnish capital. Photo by Laura Kotila, Finnish Government (Prime Minister's Office)



ABOVE: Matti Saarelainen, the interim Director of the European Centre of Excellence for Countering Hybrid Threats. Photo by Finnish Government (Prime Minister's Office)

An extract from the Speech by Mr Timo Soini, Finland's Minister of Foreign Affairs, at the signing of the Memorandum of Understanding establishing the European Centre of Excellence for Countering Hybrid Threats, 11 April 2017

"Finland will be proud to host, here, in Helsinki, the European Centre of Excellence for Countering Hybrid Threats. We are proud, in particular, for two reasons. Firstly, the Centre represents a concrete step in building resilience to hybrid threats in the EU Member States and NATO Allies. Second, the Centre is a real boost for the cooperation between the EU and NATO, facing the challenge of hybrid threats hand in hand.

"Countering hybrid threats is a European priority. Resilience is one of the pillars of the EU's Global Strategy. Since the Joint Framework in 2016, the EU has created an EU Hybrid Fusion Cell to analyze information on hybrid threats. The Union has also taken steps in Strategic Communication, protection of critical infrastructure, energy security and other fields, relevant to enhancing our resilience. The next step is the establishment of this European Centre of Excellence. It will have a major role in promoting strategic level understanding of hybrid influencing and developing our policies.

"The use of hybrid strategies puts the internal cohesion and resilience of our societies to the test. It seeks to turn our strengths into weaknesses by using as a weapon against

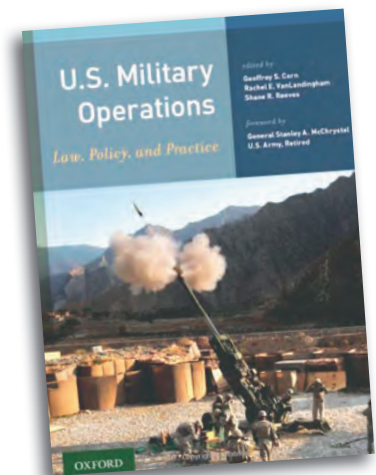
us what is best in our societies—democracy, openness, the free flow of information and freedom of speech, and economic freedom. What is needed in response is not only state, but societal resilience, a comprehensive approach to security. Countering hybrid threats is largely a matter of national competence. Vulnerabilities to hybrid threats, however, do not limit themselves to national boundaries. We believe that hybrid threats need a coordinated response also at EU and NATO levels. Cooperation based on lessons learned and sharing expertise will contribute to aligning national policies, doctrines and concepts.

"In dealing with this challenge, we rely on our national strength: the Finnish model of comprehensive security, which is a whole-of-government approach. Our preparedness is based on inter-agency cooperation, and on co-operation between the government, the business community and the civil society.

"We continue to build on a model that has been developed ever since the Second World War. Resilience is at the heart of our national approach in safeguarding functions that are vital to our society in all situations."

The full transcript of the speech given by Mr Timo Soini can be found at formin.finland.fi

RECOMMENDED READING



Edited by Professors Corn, van Landingham and Reeves; Chapter 8, "Tactical Implementation of Rules of Engagement in a Multinational Force Reality"—*U.S. MILITARY OPERATIONS: LAW, POLICY AND PRACTICE* is described on the Amazon website as follows: "Subject matter experts offer a unique insiders' perspective on how the law is actually implemented in a wide swath of military activities, such as how the law of war applies in the context of multi-state coalition forces, and whether non-governmental organizations involved in quasi-military operations are subject to the same law. The book goes on to consider whether U.S. Constitutional 4th Amendment protections apply to the military's cyber-defense measures. [and] how the law guides targeting decisions." (<https://www.amazon.com/U-S-Military-Operations-Policy-Practice/dp/0190456639>)



END NOTES:

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- 3 Toni Pfanner, *Interview with General Sir Rupert Smith*, 88 *International Review of the Red Cross* 719, 719-22 (2006).
- 4 Jody M. Prescott, *Climate Change, Gender, and Rethinking Military Operations*, 15 *Vermont Journal of Environmental Law* 766 (2014).
- 5 Jody M. Prescott, *Building the Ethical Cyber Commander and the Law of Armed Conflict*, 40 *Rutgers Computer & Technology Law Journal* 42 (2014).
- 6 Secretary General Jens Stoltenberg, *Opening Address*, NATO Transformation Seminar, Washington, D.C. (25 March 2015), quoted in *In Brief*, *The Three Swords Magazine* (May 2015).
- 7 *FAQ: Joint Framework on Countering Hybrid Threats*, European Commission (Fact Sheet) (6 April 2016) http://europa.eu/rapid/press-release_MEMO-16-1250_en.htm
- 8 NATO welcomes opening of European Centre for Countering Hybrid Threats, NATO (11 April 2017), http://www.nato.int/cps/en/natohq/news_143143.htm; Raine Tiessalo, *Finland Prepares for "Manifold Warfare" as Russia Feeds Paranoia*, *Bloomberg.com* (19 January 2017), <https://www.bloomberg.com/politics/articles/2017-01-19/finland-prepares-for-manifold-warfare-as-russia-feeds-paranoia>
- 9 Major General Charles J. Dunlap, *Lawfare: A Decisive Element of 21st Century Conflicts?*, 54 *Joint Force Quarterly* 34, 35 (2009).
- 10 Lieutenant Colonel John Moore, *Lawfare*, 31 *The Three Swords Magazine* 38, 42-43 (January 2017).
- 11 See Lieutenant Colonel Martin Menzel, *Knowledge Development vs. Intelligence in NATO*, 22 *Journal of the Joint Air Power Competence Centre* 38, 40 (Spring/Summer 2016) (citing MCM-0041-2010, *Military Committee Position on the Use of Effects in Operations*, 20 July 2010).
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- 13 Carl Von Clausewitz, *On War* 84, 113, 115, 119-22, 153, 605 (Peter Paret & Michael Howard eds., 1976) (1832) [hereinafter ON WAR].
- 14 *Id.* at 75.
- 15 Emmerich de Vattel, *The Law of Nations, or the Principles of Natural Law* 280-283 (Charles D. Fenwick trans. 1964) (1758).
- 16 Colonel Jody M. Prescott, *The Development of NATO EBAO Doctrine: Clausewitz's Theories and the Role of Law in an Evolving Approach to Operations*, 27 *Penn State International Law Review* 125, 156-157 (2008).
- 17 Michael Romba & Ralph Thiele, *Networked Security in the German Forces*, 5 *Journal of the Joint Air Power Competence Centre* 29, 32 (2007).
- 18 Prescott, *supra* note 16, at 127.
- 19 *Id.*
- 20 *Id.* at 134.
- 21 *Id.*
- 22 *Id.* at 135.
- 23 *On War*, *supra* note 13, at 153.
- 24 Attributed frequently to von Clausewitz, but never actually stated by him in *On War*. Eugenia c. Kiesling, *On War Without the Fog*, *Military Review* 85 (September-October 2001).
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- 31 *Id.* at 37-38.
- 32 Major James A. Burkart, *Deadly Advice: Judge Advocates and Joint Targeting*, *The Army Lawyer* 10 (June 2016).
- 33 Trachtman, *supra* note 29, at 281.
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Flashback: The JWC Office of the LEGAD, 2007, Ms Lone Kjelgaard and Colonel Jody Prescott. Photograph JWC PAO

■ Would there be any difference at all if NATO did not enjoy privileges and immunities?

Soldiers from various NATO Nations march together at a ceremony in Latvia to welcome a new NATO battlegroup. The battlegroup is being led by the Canadians, but also includes soldiers from Albania, Italy, Poland, Slovenia and Spain. The group has been created as part of NATO's enhanced Forward Presence (eFP). Photo by NATO



Privileges and Immunities of International Organizations

by ZDENĚK HÝBL
Legal Advisor
JCBRN Defence Centre of Excellence

THE WARSAW SUMMIT Communiqué, issued by the Heads of State and Government participating in the meeting of the North Atlantic Council (NAC) in Warsaw 8-9 July 2016, describes in Section 37 eight new small headquarters (HQs), called NATO Force Integration Units (NFIUs), to be established on the territory of Allies in the eastern part of the Alliance to assist in training of Alliance forces and in the reception of reinforcements.



The views expressed in this article are those of the author and do not necessarily reflect the official policy or position of NATO or any of its agencies. The author wishes to thank **Mr David Nauta** and **Lieutenant Colonel John Moore** for offering helpful and valuable comments.

continued from page 21

In addition, the existing Headquarters of a Multinational Corps Northeast in Poland has been made fully operational, and the Headquarters of a Multinational Division South-east in Romania has been established to take command of the NIFUs and to provide flexible command and control options in their regions.¹ When reading about newly established units or headquarters, the topic of privileges and immunities arise. Will such entities enjoy immunity from legal process in their respective host nations? Will they enjoy tax privileges? To answer these questions, it may be helpful to recall how privileges and immunities apply to NATO and its HQs.

LET US START by discussing the United Nations (UN), whose Charter in its Article 104 provides that “[t]he Organization shall enjoy in the territory of each of its Members such legal capacity as may be necessary for the exercise of its functions and the fulfillment of its purposes.” Here, we are referring to the *legal personality* of the organization, which seems to be a prerequisite for the organization to act in a domestic legal system.² International organizations should have the right to conclude contracts, to possess property as well as to defend

themselves before national courts. Having legal personality also means that international organizations possess rights, duties, powers and liabilities as distinct from their members and creators on the international plane and in international law.³

According to Article 105, paragraph 1 of the UN Charter: “The Organization shall enjoy in the territory of each of its Members such privileges and immunities as are necessary for the fulfillment of its purposes.”

The wording used—“privileges and immunities as are necessary for the fulfillment of its purposes”—indicates that the UN has functional immunity. This type of immunity is meant to protect the UN against any possible interference from a host nation, which may impact the UN’s ability to conduct its mission. In other words, immunity is required for an organization to be able to exercise a certain degree of freedom and legal security for its assets and headquarters in order to function effectively.⁴ The Convention on the Privileges and Immunities of the UN additionally provides immunity to UN officials and member states’ representatives.⁵

NATO, too, possesses juridical personality⁶ and enjoys privileges and immunities. The Agreement on the status of the North Atlantic Treaty Organization, National Representatives

and International Staff, signed in Ottawa 1951 (Ottawa Agreement) guarantees the inviolability of the premises of NATO and the protection of the archives as well as fiscal privileges, such as exemption from all direct taxes and custom duties. Furthermore, similarly to the Convention on the Privileges and Immunities of the UN, the Ottawa Agreement regulates the privileges and immunities of the Representatives of Member States and the International Staff and Experts on Mission for the Organization.

Article 5 of the Ottawa Agreement reads: “The Organization, its property and assets, wheresoever located and by whomsoever held, shall enjoy immunity from every form of legal process except in so far as in any particular case the Chairman of the Council Deputies, acting on behalf of the Organization, may expressly authorize the waiver of this immunity. It is however, understood that no waiver of immunity shall extend to any measure of execution or detention of property.”

In accordance with Article II of the Ottawa Agreement, “[t]he present Agreement shall not apply to any military headquarters established in pursuance of the North Atlantic Treaty nor, unless the Council decides otherwise, to any other military bodies.” As a consequence, both Supreme Headquarters—Allied Command Operations (ACO) led by Supreme Allied Commander Europe (SACEUR), and Allied Command Transformation (ACT) led by Supreme Allied Commander Transformation (SACT)⁷—as well as any other Allied HQs, are excluded from the provisions of this Agreement [Ottawa Agreement].

In order to cover international military forces and international military HQs, two agreements were adopted. These were the Agreement between the Parties to the North Atlantic Treaty regarding the Status of their Forces, dated 19 June 1951 (NATO SOFA), which defines the status of the forces of one NATO member state while in the territory of another NATO member state⁸, and the Protocol on the Status of International Military Headquarters set up pursuant to the North Atlantic Treaty, dated 28 August 1952 (Paris Protocol), which defines the status of NATO



Commitment to Collective Defence in Eastern Europe

A young Estonian child meets members of the U.S. military police. Photo by NATO





NATO Force Integration Units

- // The NATO Force Integration Units have been active since 1 September 2015.
- // There are currently eight NATO Force Integration Units based in Sofia (Bulgaria), Tallinn (Estonia), Riga (Latvia), Vilnius (Lithuania), Bydgoszcz (Poland), Bucharest (Romania), Szekesfehervar (Hungary) and Bratislava (Slovakia).
- // The decision on their locations was taken by the North Atlantic Council, following invitation by the host nations and a military assessment.
- // Their primary responsibility is to facilitate the rapid deployment of NATO's Very High Readiness Joint Task Force (VJTF) and other NATO Response Force (NRF) elements to support Collective Defence in Eastern Europe, enhance responsiveness and assist in coordinating training and exercises.
- // Each NFIU is manned by around 40 national and NATO staff.

international military headquarters and of the personnel thereof within the North Atlantic Treaty area.⁹ Articles 10 and 11 of the Paris Protocol provide that “[e]ach Supreme Headquarters shall possess juridical personality; it shall have the capacity to conclude contracts and to acquire and dispose of property” (Article 10), and that “[...] a Supreme Headquarters may engage in legal proceedings as claimant or defendant” (Article 11). For this reason, SHAPE and HQ SACT do not enjoy immunity from legal process.¹⁰

The Paris Protocol nevertheless provides that “[t]he archives and other official documents of an Allied Headquarters [...] shall be inviolable, unless the Headquarters has waived this immunity” (Article 13). Another immunity that is granted to any Allied Headquarters is that “[n]o measure of execution or measure directed to the seizure or attachment of its property or funds shall be taken against any Allied Headquarters, except for the purposes of paragraph 6 a of Article VII and Article XIII of the Agreement (NATO SOFA).”

Additionally, in accordance with Article 8, paragraph 2 of the Paris Protocol, the Allied Headquarters shall be immune from customs search and inspection as well as duties, incorporating by reference NATO SOFA, Article XI, paragraphs 3 and 4.¹¹

In summary, the two Supreme Headquarters enjoy only a limited degree of immunity. The privileges and immunities accorded to both Supreme Headquarters also apply to any other subordinate international military Headquarters.¹² Indeed, the Paris Protocol provides that Allied “Headquarters shall be relieved, so far as practicable, from duties and taxes, affecting expenditures by them in the interest of common defence and for their official and exclusive benefit” (Article 8). This article anticipates that separate agreements will be negotiated and concluded in order to give effect to this provision. According to some experts, however, such agreements are not required because public international law provides that international organizations are exempt from taxes in the host nation, which ensures the independent status of the international organization and respects the principle that a nation should not derive revenue from hosting an international organization.¹³

To conclude, NATO HQs enjoy nearly the same privileges and immunities as other international organizations. The privileges and immunities are functional in that they serve to protect the organization and enable it to fulfill its mission. Would there be any difference at all if NATO did not enjoy privileges and immunities? Are privileges and immunities so

indispensable that not having them would put NATO at a disadvantage by hampering its ability to fulfill its mandate?

A living example of an organization functioning without privileges and immunities¹⁴ is the Organization for Security and Co-operation in Europe (OSCE). The OSCE, which has its roots in the Conference on Security and Co-operation in Europe (CSCE), has been operating since 1975, when the Helsinki Final Act was signed. Later on, in 1994, the name was changed from the CSCE to the OSCE following the creation of several institutions, such as the OSCE Secretariat. There have been attempts over the years to address the legal personality issue¹⁵ but these have so far not led to an agreement. As a result, the OSCE is still not a fully-fledged international organization.¹⁶ But, how does this situation affect the OSCE in day-to-day life?

Sonya Brander, a former OSCE Legal Adviser, points out in an article of hers¹⁷ several examples where the legal personality and privileges and immunities of the OSCE were challenged: a bank refusing to open a bank account unless presented with proof that the OSCE is a legal entity; an OSCE official lacking immunity from legal process was subject to being called as a witness in a civil trial; etc.

There are also economic consequences





ABOVE: Joint press point with NATO Secretary General Jens Stoltenberg and the President of Lithuania, Dalia Grybauskaitė, at the Distinguished Visitor's Day of Exercise IRON WOLF 2017, 20 June 2017. In Lithuania, Germany leads forces from Belgium, Luxembourg, the Netherlands and Norway. The battlegroup will serve alongside Lithuanian troops to defend the Alliance and deter any possible aggression. Together with the three other battlegroups in Estonia, Latvia and Poland, these forces form part of the biggest reinforcement to NATO's Collective Deterrence and Defence in a generation (www.nato.int) Photo by NATO

for the OSCE. In accordance with the Chairmanship Food-for-Thought Paper on Strengthening the Legal Framework of the OSCE, dated 18 May 2012, the estimated amount lost annually by the OSCE as a direct result of its lack of uniform privileges and immunities ranges from €1.5 million to €2 million, amounting to over 1 per cent of the total OSCE budget.¹⁸

An even more serious example demonstrating the impact of the lack of privileges and immunities can be found in the Report to the Ministerial Council on Strengthening the Legal Framework of the OSCE in 2014. The Report states that “[t]he consequences of that lack of clarity became sharply manifest during the involvement of the OSCE in the events occurring in Ukraine. [...] By applying urgent efforts, the appropriate legal status, privileges and immunities to enable successful implementation of the mandate and the protection of the OSCE officials deployed, were concluded in record time. Nonetheless, a full 10 weeks passed before the legal arrangements were in place and in force.”¹⁹

The above mentioned examples serve as proof that for NATO, privileges and immunities are not just a slogan. In order to work efficiently, as was demonstrated in the OSCE

examples, the protection of the Alliance and its staff is crucial to the successful accomplishment of the mission or tasks at hand.

As an organization whose essential purpose is to safeguard the freedom and security of its members through political and military means,²⁰ NATO has to have a reliable and institutionalized system of privileges and immunities in place. In case of emergency, there may be insufficient time to negotiate and conclude critical ad hoc agreements. For this reason, whenever new units or HQs are established, due diligence should be taken to make the necessary legal arrangements to cover them in order to prepare and enable them to successfully accomplish their mission.

The new small HQs²¹—the NFIUs and the two additional HQs (Multinational Corps Northeast; Multinational Division Southeast)—need privileges and immunities to be able to perform their functions and tasks. NATO SOFA and the Paris Protocol apply, and further negotiations to conclude Supplementary Agreements²² should be seen as an essential tool for confirming the status granted under the Paris Protocol.²³ In conclusion, the existing legal framework in the form of NATO SOFA and the Paris Protocol, together with

concluded Supplementary Agreements, will provide adequate legal protection, including privileges and immunities, for NATO's newly established entities and help them to successfully accomplish their mission. †

END NOTES:

- 1 Warsaw Summit Communiqué, available at http://www.nato.int/cps/en/natohq/official_texts_133169.htm?selectedLocale=en
- 2 August Reinisch, *Convention on the Privileges and Immunities of the United Nations/Convention on the Privileges and Immunities of the Specialized Agencies*, UN (2009), available at http://legal.un.org/avl/pdf/ha/cpiun-cpisa/cpiun-cpisa_e.pdf
- 3 NATO Legal Deskbook (2nd edition 2010, p. 72) [hereinafter NATO Legal Deskbook].
- 4 James Crawford, *Brownlie's Principles of Public International Law* (8th ed. 2012, p. 171), Oxford University Press (2012).
- 5 August Reinisch, *Convention on the Privileges and Immunities of the United Nations/Convention on the Privileges and Immunities of the Specialized Agencies*, supra note 3.
- 6 Agreement on the status of the North Atlantic Treaty Organization, National Representatives and



In Brief

BELOW: Polish Żandarmeria Wojskowa in front of Stryker vehicles, 28 March 2017. Photo by NATO



BOOSTING NATO'S PRESENCE IN THE EAST AND SOUTHEAST

NATO FORCE INTEGRATION UNITS:
BULGARIA, ESTONIA, LATVIA, LITHUANIA,
POLAND, ROMANIA, HUNGARY, SLOVAKIA

ENHANCED FORWARD PRESENCE:
LATVIA, LITHUANIA, ESTONIA, POLAND



// Boosting NATO's presence in the east and southeast:
http://www.nato.int/cps/en/natohq/topics_136388.htm?selectedLocale=en

- International Staff, done in Ottawa on 20 September 1951 [hereinafter Ottawa Agreement], states in its Article IV that the Organization, meaning the North Atlantic Treaty Organization, consisting of the Council and its subsidiary bodies, "shall possess juridical personality; it shall have the capacity to conclude contracts, to acquire and dispose of movable and immovable property and to institute legal proceedings", available at http://www.nato.int/cps/en/natohq/official_texts_17248.htm
- 7 NATO Legal Deskbook, supra note 4, p. 39.
- 8 Agreement between the Parties to the North Atlantic Treaty regarding the Status of their Forces, done in London on 19 June 1951 [hereinafter NATO SOFA], available at http://www.nato.int/cps/en/natohq/official_texts_17265.htm?selectedLocale=en
- 9 Preamble of the Protocol on the Status of International Military Headquarters set up pursuant to the North Atlantic Treaty, done in Paris on 28 August 1952 [hereinafter Paris Protocol], available at http://www.nato.int/cps/en/natohq/official_texts_17300.htm
- 10 NATO Legal Deskbook, supra note 4, p. 105.
- 11 NATO Legal Deskbook, supra note 4, p. 106.
- 12 Paris Protocol, supra note 10, article 1, paragraph c.
- 13 NATO Legal Deskbook, supra note 4, p. 104.
- 14 See The legal framework of the OSCE, available at <http://www.osce.org/mc/87192>
- 15 See <https://www.oscepa.org/documents/all-documents/helsinki-40/seminar-4-diis/2814-helsinki-40-food-for-thought-paper-the-osce-s-lack-of-an-agreed-legal-status-challenges-in-crisis-situations/file>; see also <http://www.osce.org/mc/109366?download=true> and <http://www.osce.org/mc/35520?download=true>
- 16 See The legal framework of the OSCE, supra note 15.
- 17 See Making a credible case for a legal personality for the OSCE, reproduced in OSCE Magazine, March – April 2009, available at <http://www.osce.org/secretariat/36184?download=true>
- 18 See <http://www.osce.org/mc/97950?download=true>
- 19 OSCE Ministerial Council, Report to the Ministerial Council on Strengthening the Legal Framework of the OSCE in 2014, MC.GAL/5/14, dated 2 December 2014, available at <http://www.osce.org/cio/128916?download=true>
- 20 See <http://www.nato.int/nato-welcome/index.html>
- 21 See http://www.nato.int/cps/en/natohq/news_127599.htm?selectedLocale=en
- 22 See https://www.kam.lt/en/news_1098/news_archives/news_archive_2015/news_archive_2015_-_02/minister_of_national_defence_signed_an_arrangement_regulating_legal_status_of_the_international_military_nato_headquarters_in_lithuania.html?pbck=0; see also <http://www.nineoclock.ro/defence-ministry-supplementary-agreement-to-paris-protocol-reflects-romania-s-commitment-to-strengthening-collective-defence/> and <http://www.act.nato.int/latvia-signs-supplementary-agreement-with-nato>
- 23 NATO Legal Deskbook, supra note 4, p. 108

An aerial photograph of a NATO naval exercise. Several large white naval ships are visible on the blue sea, moving in a loose formation. The sky is clear and blue. A red rectangular box is positioned at the top center of the image.

ON THE COVER

A REVIEW OF NATO EXERCISES

What remains the same, what has changed,
and where are we potentially going?

by CAPTAIN (RET.) STUART B FURNESS OBE
Royal Navy
DCOS JFT Programme/Portfolio Manager
Headquarters Supreme Allied Commander Transformation
(HQ SACT)

The 18 warships were just one third of the fleet NATO operated in the Mediterranean during Exercise TRIDENT JUNCTURE 2015 LIVEX. Photo by JJ Massey, NATO



IN SEPTEMBER 2017, it will be nearly seven years since I left the Joint Warfare Centre (JWC), bound for Allied Command Transformation (ACT) to join the newly formed Joint Force Training (JFT) Directorate. The JFT Directorate had been established to provide a coordination role for education and training within NATO. That role was strengthened with the assumption of exercise planning responsibilities with the transition starting in 2012.



Captain Furness (right) and the Senior Mentor of STEADFAST JOIST 2009, General (Ret.) Sir John Reith KCB CBE. Photo by JWC PAO

When the JWC Public Affairs Office asked me to prepare an article for *THE THREE SWORDS* magazine, I immediately thought of the two I had previously written for this publication—one after six months at the JWC in early 2008, and one on leaving in late 2010, taking the main theme as a review of NATO exercises: what remains the same, what has changed, and where are we potentially going?

Recalling my participation in 15 exercises between the years 2007–2010, and looking at the JWC tempo today, it is clear that a busy programme for JWC personnel is a fact of life, and that the key role the Centre plays in NATO operational level exercises is very much, indeed increasingly, in demand and remains very well respected.

In May 2008, I considered the main role of the JWC to be one of project managing the exercise process and setting up and running all elements that are “artificial” in an exercise, releasing the operational commander and his subordinate commanders to concentrate on the operational aspects of the exercise.

The JWC’s public face, the Observer/Trainer teams, were also highly valued by the staffs as they prepared for their periods on standby for operations. Concerning the “artificialities” mentioned above, as the Chief of the Exercise Control (EXCON) Centre, I started

every exercise asking myself two main questions: will the developed scenario and Main Events List/Main Incidents List (MEL/MIL) challenge the Training Audience in all areas, and do I have enough augmentees?

Both questions were very relevant in 2008. There was a constant demand for more data from the scenario developers, minimal direct engagement of the Headquarters about to be trained in the development of the MEL/MIL, and the lack of augmentees over three major exercises had led to “Extended Day” exercises, rather than 24/7 exercises. There were always constant shortfalls of Subject Matter Experts (SMEs) in a number of areas, in particular Logistics, Targeting and Information Operations, which further impinged on the training delivery.

I suspect that those points will resonate with those serving in EXCON today, and that the increased difficulty in obtaining augmentees is *a*, if not *the*, key constraint in the JWC’s exercise capacity, mainly due to reduced numbers in the NATO Command Structure (NCS) and the impact of the current tempo of activity.

I do know that operational Headquarters are now much more involved in the development of the MEL/MIL than before, but suspect that the ever-increasing areas that are now required to be included in the operational level

exercises, such as UN Security Council Resolution 1325, Cyber, Protection of Civilians, Critical Infrastructure Protection, Hybrid Warfare etc, makes the SME support even more critical, though at a point of time when the economic climate makes it harder for Nations to commit to providing the required personnel.

So, what else has changed? From an exercise delivery viewpoint, here I would say that the exercises are now much more complex than in days past, with an almost insatiable appetite for very detailed and “realistic, but fictitious” scenarios, supported by enhanced simulation expertise, covering all potential missions and areas of operations.

This has been driven by the changes in the security situation following Russia’s illegal annexation of Crimea and the complex challenges and threats in NATO’s southern flank. Gone are the days of repeating Crisis Response Operations exercises for each NATO Response Force (NRF) as they rotated every six months. What is now required are exercises to enable the relearning of core warfare skills connected with a faster pace of operations, for example, combined arms and force integration, mobile logistics and the quick but blurred transition from peace to crisis to conflict and back, whilst retaining those skills required for expeditionary operations.





ABOVE: Joint Warfare Centre Situation Centre (SITCEN) during TRIDENT JAGUAR 2017. The exercise dealt with hybrid warfare, crisis and conflict management, post-conflict situations and facilitating humanitarian assistance, all played through the JWC's constructive and virtual simulations. Photo by JWC PAO

Development of NATO's exercise programme has been in constant flux since 2012. First off, the Connected Forces Initiative (CFI), approved in 2013 following a Secretary General initiative for NATO after combat operations in Afghanistan, included an illustrative exercise programme for major NATO Joint Exercises from 2014–2019. Notably, these exercises unfolded as High Visibility Live Exercises (that became TRIDENT JUNCTURE 2015 and 2018) and proposals for the first Major Joint Operations plus (MJO+) level exercise (that became TRIDENT JAVELIN 2017).

The CFI included the caveat that “actual training will be influenced by many factors (...) much of which will become evident after a 2016–2018 trial period.” That prediction was correct, but the timescale was optimistic.

The reality is that NATO, now more than ever, operates in an unpredictable and dynamic world, where threats to the Alliance emanate from a number of sources with varying degrees of credibility. Without doubt, the current threat from Russia has concentrated

minds. It has resulted in clear guidance arising from the 2014 Wales and 2016 Warsaw Summits where NATO Nations agreed to the need to be able to address the full spectrum of conflict, but should focus on MJO+ and Collective Defence in all strategic directions.

The old historical adage of “train for the worst-case scenario and adapt for the most likely” is the paradigm that the Alliance is now collectively shifting towards. Various iterations of NATO's exercise programme have emerged, based on the Readiness Action Plan (RAP) and the many follow-on tasks, all designed to strengthen NATO's assurance and deterrence postures. Future events included an enhanced NRF (eNRF) exercise programme and increasingly a desire for Follow-on-Force (FoF) large scale formation size exercises, where TRIDENT JAVELIN 2017 will be the benchmark to build on in the upcoming years.

Due to the changing security environment and the increasing amount of training requirements emanating from these NATO Summits, as well as an increasingly unsustain-

able resource situation, the Strategic Commands (SCs) realized that there was a requirement to take a hard look at the NATO Exercise Programme. In the spring of 2016, it was agreed that Headquarters Supreme Allied Commander Transformation (HQ SACT) (represented by the DCOS JFT) would lead a Bi-SC review of the NATO Exercise Programme, with SHAPE J7 staff playing a key role throughout. The NATO Exercise Programme Review, NEPR as it became known, is comprehensive and detailed, covering exercise requirements and prioritisation, programming, exercise design and planning, exercise execution and exercise assessment and feedback. It is focused on identifying the right mix of exercises within constrained resources (manning, facilities, materiel, budget and time). The review will conclude soon but, in summary, the key NEPR recommendations concerning operational-level exercises are:

- A multi-year exercise programme that focuses on MJO+ large-scale high-intensity





“ What is now required are exercises to enable the relearning of core warfare skills connected with a faster pace of operations. ”

ABOVE: The November 2014 Cover of The Three Swords Magazine, accompanied by interviews with the former SACEUR and SACT. BACK: Close-up of a training map, photo by JWC PAO.

warfighting. The Major Joint eExercise (MJX) cycle will be a progression, or training continuum, from NRF exercises through MJO+ at the operational-level to MJO+ at the higher-tactical level. The JWC, together with the Joint Force Training Centre in Bydgoszcz, Poland, hold the corporate knowledge on designing an Exercise Planning Process (EPP) for this new MJX cycle.

- A clear, flexible and responsive MJX cycle that is capable of incorporating new requirements, such as Anti-Access and Area Denial (A2AD), Cyber, Conventional-Nuclear Coherence, Enhanced and Tailored Forward Presence, Integrated Air and Missile Defence, and Follow-on-Force, as those concepts become clearer.
- Sufficiently prescriptive and timely SACEUR's Annual Guidance on Education, (Individual) Training, Exercises and Evaluation (the 'SAGE') that ensures a focused, achievable and sustainable exercise programme.

IT IS APPARENT that the exercise programme

changes have significantly altered the way that exercises are perceived in the wider context. There has been a clear desire to improve the tangible effect of exercise activity beyond just force readiness and interoperability, to maximize the desired strategic effects. Strategic Communications (StratCom) is an operational tool that can, when applied appropriately, produce strategic effects. NATO's StratCom processes are evolving to ensure every exercise presents an opportunity to convey a coordinated and synchronized message to the desired audience. However, we have to be careful not to overplay the extent of any StratCom that can be generated from a Computer Assisted eExercise (CAX), and here Live Exercises (LIVEXs) probably have a key role.

THE RECENT exercise programme changes have re-energised the link between NATO and national exercises that had atrophied up until about 2013. At that time, there were only four national exercises in the Military Training and Education Programme (MTEP), but now there are over 150. But to my mind, we can go further. We now have a set of MJXs, numerous specialist exercises in logistics, communications, cyber, intelligence etc; numerous (almost all national) LIVEXs, and therefore, I believe we can do bet-

ter in ensuring a coordinated effect in all areas. For example, if we cannot achieve sufficient logistics training in an MJX, then does the specialist exercise cover that gap and is enough real world logistics achieved in national LIVEXs?

NATO's exercise programme also presents an opportunity for NATO to look to the future; to test and validate future concepts, doctrine, material solutions, and the like. The area of Capability Integration/Transformational Activity Integration is one that has ebbed and flowed over the years, but is very much a growth area at the moment. I do, however, believe that we need to expand our efforts and ensure our resources in this area (manpower and budget) to match our aspirations.

So, what did I forget? Quite a lot I'm sure, but some constants spring to mind. Firstly, I find it encouraging that two decisions made in my time remain: I chose the term "Grey Cell", rather than the more traditional "White Cell", because it included not just exercise international and non-governmental organisations, governmental organisations and police, but also role players from many other non-NATO entities required in the fictitious scenario world. There have been many "Grey Cell" changes connected with the changed exercise content, but the wide-ranging nature of





ABOVE: (from left) The author, Royal Navy Captain (Ret.) Stuart Furness, HQ SACT DCOS JFT Programme Manager; Major General Andrzej Reudowicz, Commander JWC and Major General Stefano Vito Salamida, HQ SACT Deputy Chief of Staff Joint Force Trainer, during their visit to the JWC on 9 February 2017. Photos by JWC PAO

the idea remains.

Next, the Resources and Planning Team, which came out of the Joint Exercise Division, is now a key component of the five-year MTEP working groups. The other constant that springs to mind is the assistance from Real Life Support and the Communications Information System worlds—always great supporters in my time and my frequent visits since.

Perennial discussion points remain that never quite get solved, because of valid points on both sides of the discussion. These include the need to do both “Realistic” versus “Real” training and exercises, the desire for dispersed Response Cells to save travel and per diem costs, and whether the JWC should have permanent Response Cells in all areas as is planned for the Higher Control Response Cell in the RAP.

In the longer term, I think the “Way Forward” paragraph in SACT’s Collective Training and Exercise (CTE) Vision Paper provides much food for thought:

a. Baseline the Programme focusing on outlining and prioritising requirements in a multi-year approach; exploring alternative exercise

approaches, and assessing for sustainability.

b. Develop an Advocacy Process whereby ACT actively solicits Nations for exercise opportunities to meet NATO Command Structure and NATO Force Structure requirements.

c. Develop a transformational programming solution to allow for longer range visibility, planning and resourcing of the respective training activities.

d. Develop a “Common Exercise Picture” encompassing relevant NATO, national, multinational, and Crisis Management Exercise events that can inform political, military, and national decision-making.

e. Review/revise “NATO’s Requirements Management” process to develop an arbitration process to vet newly proposed requirements, prioritise, cost, and absorb them into the baseline.

f. Identify, codify, and implement best practices to facilitate StratCom in exercises.

g. Explore exercise requirements that can be improved through the use of technologies to enhance the exercise experience and to identify efficiencies (e.g. modeling and simulation, trend analysis and distributed EXCONS, etc).

h. Explore modifications to the EPP, developing one that is more responsive to new, prioritised

requirements, and considers exercises by type to achieve resource efficiencies. For example, a Battle Staff Training type operational-level exercise or a smaller NATO Deployment exercise does not need the same complex EPP as a MJO+ operational-level exercise.

i. Conduct a reoccurring assessment of the programme requirements to ensure CTE coverage based on emerging challenges and threats.

IN CONCLUSION, there is one constant in life and that is change! I am writing this article whilst travelling, with the theme of the discussions on this trip being the future training capacity for NATO, and the training roles and responsibilities of the various elements of the NATO Command Structure (NCS) and NATO Force Structure (NFS). Whatever the eventual outcome of these considerations, which are still in their early stages, it has been a real privilege to be associated with the JWC over the last decade and to watch it, in the words of the current Commander JWC, Major General Reudowicz, “sustain and enhance its role as the premier provider and enabler in NATO for innovation and exercises at the joint operational level of warfare.” ✦



JWC.NATO.INT

BELOW: Admiral Haakon Bruun-Hanssen (left) with SACT. Photo by ACT

General Mercier Visit to Norway

ACT and JWC Websites



ON MAY 18TH AND 19TH, General Mercier visited Norway and NATO's Joint Warfare Centre (JWC) in Stavanger, Norway. Landing in Oslo, General Mercier was received by Admiral Haakon Bruun-Hanssen, Norway's Chief of Defence Staff, and was briefed on the Norwegian Armed Forces and the Centre of Excellence for Cold Weather Operations. General Mercier was then received by his Majesty the King of Norway, Harald V, where he invited his Majesty to visit NATO's Allied Command Transformation in the coming months. General Mercier's visit to Norway followed discussions with the Alliance's Chiefs of Defence regarding threats and challenges facing the Alliance emanating from the South, the implementation of Projecting Stability and enhancing NATO's role in fighting terrorism, the RESOLUTE SUPPORT Mission beyond 2018, recommendations on capability development and resource requirements and the NATO Command Structure review.

While in Norway, General Mercier took the opportunity to get an update on the JWC's activities while soliciting staff feedback on how to transform the Alliance to face the challenges of the future. Following an office call with Major General Andrzej Reudowicz, Commander JWC, General Mercier met senior JWC leaders and received a series of briefings on topics ranging

from the JWC's new organizational structure to ongoing preparations for the upcoming exercises TRIDENT JAVELIN 2017 and TRIDENT JUNCTURE 2018. The development by the JWC of new training scenarios relevant to the complexities of the current and future operating environments was also discussed at the morning meeting. During his visit, General Mercier spoke

at an All Hands Call for the JWC staff where he highlighted a full capacity-based approach to Transformation, and discussed his overall priorities and vision, noting that the core task of Allied Command Transformation (ACT) is to "transform the military capacity of the Alliance" to ensure that NATO keeps its edge over any potential adversary. "What we do is operate and adapt at the same time," General Mercier said.

At the end of his speech, SACT presented U.S. Army Colonel Christopher Engen and U.S. Air Force Master Sergeant Christopher Wynn with Certificates of Commendation, recognizing them for their outstanding work and dedication not only to the JWC, but also to NATO's whole Transformation family.

In the afternoon, General Mercier talked to the Three Swords News Channel host Laura Loflin DuBois about topics such as the JWC's mission to deliver training that is relevant and adaptable to emerging threats; the importance of thinking beyond conventional ideas and adopting innovation as well as the JWC's role in warfare and scenario development—all, according to General Mercier, geared towards ACT's own motto, which is "Improving Today, Shaping Tomorrow, Bridging the Two". ✦

[@jwc.nato.int](https://www.youtube.com/@jwc.nato.int)

[WATCH THE INTERVIEW ON YOUTUBE.COM/USER/JWCNATO](https://www.youtube.com/user/JWCNATO)

"Integration of threats has become more complex," SACT underlined during his interview with The Three Swords News Channel host Laura Loflin DuBois. Photo by JWC PAO





General Salvatore Farina, Commander JFC Brunssum and Major General Reudowicz

TRIDENT JAVELIN 2017

Strategy Workshop

Inci Kucukaksoy, JWC PAO

10-12 January 2017 marked important days as representatives from ten NATO organizations, six partner agencies and other stakeholders came together at NATO's Joint Warfare Centre for the TRIDENT JAVELIN 2017 Main Events List/Main Incidents List (MEL/MIL) Strategy Workshop.

THE COMMANDER of Joint Warfare Centre, Major General Andrzej Reudowicz, opened the workshop highlighting TRIDENT JAVELIN 2017 (TRJN17) as one of the top exercises for NATO in 2017, as well as the importance of early-stage networking and idea generation between the JWC planners and the Training Audience (TA). The Strategy Workshop, Reudowicz noted, is a tangible example of how cooperation and mutual understanding can positively impact results. He went on to say, "The Strategy Workshop is a starting point for the development of the overall MEL/MIL structure. TRIDENT JAVELIN 2017 will be the most ambitious of NATO's TRIDENT exercises yet, providing an opportunity to train nearly the whole NATO Command Structure for the first time in decades."

Reudowicz encouraged all participants to exchange expertise and to outline challenges as well as best practices in order to achieve a creative MEL/MIL process. "I am convinced that we have the right brain power gathered here to develop the expected outcome of this Strategy Workshop," he added.

TRJN17 will be a Command Post Exercise (CPX), directed by Major General Reudowicz and conducted at the level of a Major Joint Opera-

tion "Plus" (MJO+) in a NATO Article 5 setting. Sponsored by Allied Command Transformation, it will certify Joint Force Command Brunssum as the enhanced NATO Response Force 2018 Headquarters, together with its Single Service Commands, LANDCOM and MARCOM. Although there will be no troops on the ground, TRJN17 will simulate Article 5 combat situations and actions. According to Royal Air Force Wing Commander Christopher Ball, JWC's Officer of Primary Responsibility for TRJN17, the depth and breadth of the exercise will be impressive. "TRJN17 is an MJO+, it's all in. This is the first time that NATO will exercise a CPX of this scale," said Ball at the completion of the event. "The main aim of the workshop was to look at and flesh out the operational dilemmas across the six PMESII—Political, Military, Economic, Social, Information and Infrastructure—domains. The output was the result of intellectual labour. I think we achieved that really well."

"For the JWC, our next milestone is to paint a specific scenario picture for the TAs so that they can write an overall campaign plan," continued Ball. "The scenario includes a massive repository of information, such as political relationships and the media history. The JWC is making a genuine contribution. We ensure that NATO's forces are tested to the highest standards. TRJN17 will demonstrate NATO's determination and commitment to the Collective Defence of the Alliance."

According to the JWC's Chief MEL/MIL

for the exercise, German Army Lieutenant Colonel Peter Mientus, the Strategy Workshop has put the wheels in motion for TRJN17—from the MEL/MIL perspective. "The Strategy Workshop is the starting point of the deeper content development for us," Mientus said, adding: "I think that brainstorming on operational dilemmas, such as Anti-Access and Area Denial, was the key achievement of the workshop. We evaluate these dilemmas and feed them into the scenario in order to create necessary operational challenges for NATO."

The JWC's overall aim is to reinforce the responsiveness and capabilities of NATO's forces at the operational level. Exercises such as TRJN17 demonstrate that NATO is a determined force, prepared to take on commitments at the largest of scales if and when necessary.

"TRJN17 will have an Article 5 focus and include significant hybrid warfare aspects. As such the MEL/MIL will reflect the most challenging operational dilemmas of modern warfare," Mientus said, adding that he was looking forward to the exercise. ✦



WAGING INFORMATION WARFARE IN THE 21ST CENTURY

by HOPE CARR

Information Environment and
Information Warfare Training Specialist

Information warfare has shifted the reality of modern conflict. It has forced militaries around the world to consider the lethality of new, un-attributable enemies and the penetrating power of the information environment. With that has come a shift in the operational space.

"The point of modern propaganda isn't only to misinform or push an agenda. It is to exhaust your critical thinking and annihilate the truth."

Gary Kasparov

The views expressed in this article are those of the author and do not necessarily reflect the official policy or position of NATO or any of its agencies.

THE INVASION OF CRIMEA in November 2014 changed the way the world saw war. There was no concrete invasion. Instead, the world watched as unidentifiable "little green men" supported the annexation. As the world looked on with minute-to-minute coverage via social media, TV, online news and radio, Crimea was invaded. Images soon emerged showing the takeover of government buildings, airports, television stations and central junctions in Crimea which reinforced by identifiable Russian armored convoys, cargo aircraft and combat helicopters. Still, Russia continued to hide in plain sight.

Political leaders across the globe were left fumbling for their next steps as Russia denied involvement. Plausible deniability was the focus for social media trolls, government-run media/government-financed blogs and research agencies in the early days of the annexation. This government-run information machine pumped out a reality that validated not only the annexation, but the Russian narrative that they had no part in the initial actions in Ukraine.

In Ukraine, Russia capitalized on technological advancements, the evolution of online engagement and a never-ending news cycle that often sacrifices fact checking to fill airtime to shift the front lines of war and conflict. War was no longer fighting between identified soldiers or insurgents on a battlefield.



Photo by Orest lyzhechka, Shutterstock

It was, instead, an intricately woven series of un-attributable information, suggestions and actions. Ukraine provided the perfect opportunity for Russia to push the limits and truly test their ability to influence and shift reality in a global context.

In 2014, people quickly called for and expected Russia to go back or be put back in their box. But in 2017, Crimea remains annexed despite there never being a single declaration of war. As Pavel Antonovich observed in his 2011 article for *Military Thought*, "damage (whatever its nature) can actually be done to an adversary without overstepping formally the line between war and peace."¹

The occupation of Ukraine showed the world that the conduct of war can now leap on to their computer screens through tweets, Facebook comments and never-ending electronic reproductions of new realities. These realities are validated by misappropriated images and strategically placed commentary corroborated through fake studies. Add to this political infiltration, cyber warfare and military decep-

tion on a grand scale. It soon becomes apparent the enemy is no one and everyone in this emerging global battlespace.

While Ukraine wasn't the first time information warfare was used to control and influence, it did raise the profile of this form of conflict. Warfare in the information domain is now being talked about on mainstream television and on every corner of the Internet. The emergence of information warfare into the public conscience has called into question everything citizens read and see. As Gary Kasparov said in one of his December 2016 Twitter feeds, "The point of modern propaganda isn't only to misinform or push an agenda. It is to exhaust your critical thinking and annihilate the truth."²

History of Information Warfare

An early RAND study in 1996 identified "strategic information warfare" as a critical military consideration for the United States and other nations. In the paper, Roger Molander et al. suggest a number of factors were driving the focus to complex information battlespaces and the increasing use of information warfare. These considerations included low entry and sustainment costs, emerging information technology, blurred traditional boundaries between public versus private, warlike versus criminal behaviour and geographic boundaries as well as the expanded role for perception





ABOVE: "NATO does not, and will not, accept Russia's illegal and illegitimate annexation of Crimea. And we condemn Russia's ongoing destabilization in eastern Ukraine," said NATO Deputy Secretary General Rose Gottemoeller, during her speech at the Shevchenko National University in Kyiv, Ukraine, 6 April 2017. Photo by NATO

management and poorly understood strategic information warfare vulnerabilities.³ This information was not news to Russia, who had been using "active measures" (the use of intelligence forces to shape outcomes abroad), propaganda and proxies since the late 1800s. In 2005, they added cyber warfare and the manipulation of social media to their tactics allowing them to expand their sphere of influence.

Bruce McClintock, a former Defence Attaché to Moscow, and Andrew Radin, a political scientist with the RAND corporation suggest Russia is by far the most successful in this area of this type of warfare. "Today, thanks in part to the effective coordination and more aggressive application of these newer techniques, Russia appears to have greater success with its measures short of war than other countries. This means that Western countries and organizations need to work more quickly and coordinate better to offset Russia's capabilities, aggressiveness and success."⁴

A Breakdown of Information Warfare

This model of information warfare is based

on saturation and dominance. Matt Lauder, a Defence Scientist with Defence Research and Development Canada, has called the methodology "highly sophisticated, subtle, pervasive and decentralized."⁵ Lauder suggests the actions can sometimes seem disorganized or sloppy but "the ends justify the means because it is all about effects."⁶

Critical to modern information warfare are active measures and military deception nested in reflexive control, which is used as a behavioural strategy. Active measures include direct action, psychological coercion, influence operations, propaganda, psychological manipulation, information sabotage and subversion, disinformation and misinformation, character assassination and smear campaigns.⁷

This approach uses both civilian and military assets which include political, economic, legal, social and scientific information delivered through multiple disseminators ranging from either official to unofficial. Information and action, covert and overt, all blur together with minimal attribution unless it suits a strategic intent. Most importantly, there are no moral constraints in a strategy where multiple activities are put in play to achieve

objectives; ensuring there is never a single point of failure.⁸

As stated, information warfare can appear disorganized or prone to failure because some initiatives fail to launch. But, its success rate is actually grounded in the sheer saturation of active measures in play through diverse delivery mechanisms and disseminators. No audience is missed and the volume allows for failures along the way without jeopardizing intended strategic effects. The approach evolves, develops, adapts. Successes are reinforced and failures are abandoned. The speed at which the Russian information warfare model expands, adapts and engages new mediums and approaches and lets go of failed measures is central to its success.

What also has to be remembered is that information warfare is about longterm commitment to the use of the information domain as an effective operational environment that can shape the battlespace. While various methods and approaches may be discarded, if they are ineffective, the overall approach is always central to both government and military strategy at the highest levels.

A look at various approaches and smear campaigns by Russia shows the depth of planning, strategy and engagement that goes into active measures. These can be directed towards anyone or any institution that seems to be countering Russian intent.

An example is the smear campaign against Canadian Minister of Foreign Affairs



ABOVE: Chrystia Freeland, Canadian Minister of Foreign Affairs. Photo by Shutterstock



“Information warfare is about long term commitment to the use of the information domain as an effective operational environment that can shape the battlespace.”

Chrystia Freeland that started in January 2017. The campaign launched as Freeland was set to be sworn in and Canada edged closer to its “Enhanced Forward Presence” as part of *Operation Reassurance* in Latvia. The story about Freeland’s secret desire to draw Russia into a fight to avenge her Nazi collaborating Ukrainian grandfather who was also a war profiteer, first started on obscure Kremlin-friendly websites before getting some traction in far-right and “anti-imperialist” North American webzines and then a couple of Polish magazines. The story seemed to trail off but popped back up as Canada announced it would extend its mission in Ukraine to 2019. Propped up by massive online retweeting and sharing, the story managed to make its way into the Canadian mainstream media overshadowing the Canadian announcement about extending their mission in support of Ukraine.⁹

The masterminds of the campaign were Moscow-based freelancer, John Helmer and far-right Luxembourg-based Polish “analyst” Stanislas Balcerac. They have worked together in the past on other “Kremlin Friendly” smear campaigns. This one was extremely effective at burying a story that showed international support for Ukraine. As Terry Glavin of the Ottawa Citizen suggests: “You see how it works? Instead of headlines about Canada’s response to Russia’s brutal violation of Ukraine’s sovereignty and the 10,000 lives lost to Vladimir Putin’s thuggish belligerence, we’re being entertained by salacious innuendo about Chrystia Freeland and encouraged to question whether it is only because of that scheming harridan’s Russophobic impetuousness that we’re being so beastly to the Russians in the first place.”¹⁰



Outcomes of Information Warfare

First and foremost, information warfare and non-linear warfare have changed the game. Traditional military superpowers are undermined when there is no war on a traditional battlefield. Information warfare evens the playing field and provides an advantage for nations who control their information environments and produce “managed democracy”¹¹ or a false sense of freely choosing/supporting what the party in power wants you to choose or support.

Information warfare and non-linear warfare also offer “geo-political raiders” a

means to expand their sphere of influence and connect with non-traditional alliances through information technology.¹²

This domain has redefined the global experience. Proximity is no longer a defining factor in linking groups, ideologies and creating alliances. As Peter Pomerantsev, Senior Fellow at the Legatum Institute’s Transitions Forum suggests, information has redefined powerful alliances in the 21st century. “If in the 20th century the Kremlin could only lobby through Soviet sympathizers on the left, it now uses a contradictory kaleidoscope of messages to build alliances with quite different groups. European right-nationalists such as Hungary’s Jobbik or



Canadian troops from the Theatre Opening Team prepare infrastructure at Camp Adazi, Latvia, on 13 May 2017, in advance of the arrival of NATO’s Enhanced Forward Presence multinational battlegroup in Latvia. Photo by Canadian Armed Forces





France's Front National are seduced by the anti-EU message; the far-left are brought in by tales of fighting U.S. hegemony; U.S. religious conservatives are convinced by the Kremlin's stance against homosexuality. The result is an array of voices, all working away at Western audiences from different angles, producing a cumulative echo chamber of Kremlin support.¹³

While Russia has never come out and articulated their intent for the annexation of Crimea, ongoing attempts at soft annexation in the Baltics and the undermining of critical international structures and superpowers point to a strategic intent. If you control the message and means to create and maintain a state of simmering conflict you can achieve your social, political and economic agendas with less interference and undermine traditionally stronger adversaries through unconventional, non-linear means.¹⁴ Information warfare is central to these efforts directed at NATO, the EU, the United States, the United Kingdom and any other nation with a significant ethnic Russian population or in the boundaries of the former Soviet Union.

Further, the use of information warfare and soft annexation without apology suggest that nations like Russia are banking on the fact there is less of an appetite for old alliances like the EU and NATO in the 21st century.¹⁵ One only has to look to attacks on NATO effectiveness, the Brexit referendum lead up and the present climates in Estonia, Latvia and Lithuania where tensions have escalated under Rus-

sian active measures, to see the full effect of modern information warfare.

Globalization and Information Warfare

The globalization of our economies, cultures and engagements has also complicated traditional warfare and raised the importance of information warfare. The interdependence of enemies and allies in our shrinking global village has made the notion of traditional declarations of war unsustainable. This interdependence, along with emerging information platforms, created the perfect setting for the escalation of informational conflict. Globalization also speaks to a shift towards a greater reliance on coalitions which has increased the vulnerabilities of the security postures of all partners to strategic information warfare attacks, giving opponents a disproportionate strategic advantage.¹⁶

The Future of Military Response to Information Warfare

Information warfare has shifted the reality of modern conflict. It has forced militaries around the world to consider the lethality of new, un-attributable enemies and the penetrating power of the information environment. With that has come a shift in the operational space. The information battlespace, once an afterthought for operators, is now front and centre as nations grapple with comprehensive and integrated approaches that span all information warfare capabilities.

What that means for the future is that key military strategy assumptions are inadequate for confronting the threat posed by those nations conducting information warfare. A fresh approach has to be found.

IN MARCH, Supreme Allied Commander Europe (SACEUR) General Curtis Scaparrotti told the Senate Armed Services Committee that more must be done to “confront Russia’s increasingly sophisticated information warfare attacks,” suggesting “the U.S. should acknowledge Russia’s current superiority in the hybrid information warfare realm and coordinate a counterstrategy.”¹⁷

General Scaparrotti said a recently formed Russian Information Collaborative

Working Group between the State Department and Europe Command is a “good starting point but it doesn’t have *focus* and *priority*.”

Two things we are going to need, if we want to counter the rapidly evolving information warfare threat. †

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VULNERABILITY

Spending for success on cyber defence

by NEIL ROBINSON

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NATO LEADERS HAVE made resourcing cyber defence a top priority. They adopted a Cyber Defence Pledge at the NATO Summit in Warsaw in July 2016 and underlined their commitment to enhance and strengthen the cyber defences of national infrastructures and networks as a matter of priority. The Cyber Defence Pledge comes against the background of the evolving complexity and impact of cyber attacks. In the past few years, attacks against critical energy infrastructures,

telecommunications companies, government authorities and most recently political parties, demonstrate the societal and economic impact of cyber attacks. Closer to home, the 2016 Secretary General's Annual Report notes that last year NATO's own cyber defenders dealt with 500 incidents per month, a rise of approximately 60 per cent compared to 2015.

Cyber attacks serve to undermine the trust and confidence in cyberspace—a fundamental issue given how much we rely upon interconnected technologies, not only for our communications but also for our future economic growth and social model.

How Do We Allocate Resources to Best Effect?

The Alliance has recognised at the highest levels that to address these challenges, advanced capabilities, education and training need to

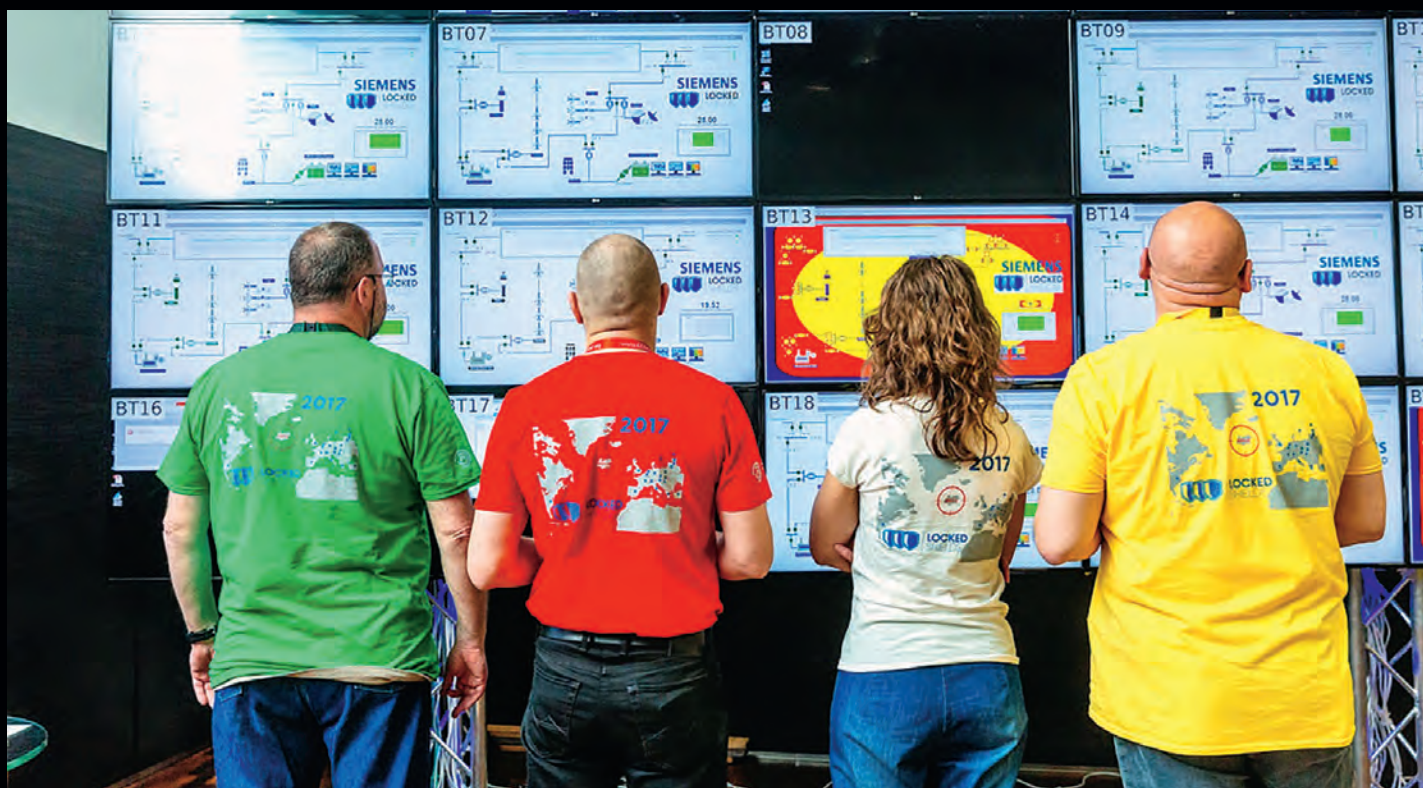
be resourced. To achieve this, policy makers in capitals will need to grapple with a number of important questions. These include: How much should we spend? What is a minimal level of investment? What should we spend it on to achieve a basic level of cyber security, particularly given the dynamic nature of the threat landscape?

From publicly available information, we can see that some Allies have already made progress in answering these questions. For example, the French Pacte Défense Cyber from 2014 included €1 billion dedicated to cyber defence and, in 2016, the UK announced a £1.9 billion investment to underpin its national cyber security programme.

Spending on defence is a complex area which does not lend itself to a simple cost/benefit analysis. However, it is worthwhile to bear in mind that the costs of cyber (in)security may be significant. For example, a 2015 study



BELOW AND RIGHT: LOCKED SHIELDS, the cyber defence exercise led by NATO Cooperative Cyber Defence Centre of Excellence. (ccdcoe.org)



by the Atlantic Council and University of Denver suggested that, under a worst case scenario, by 2030 the costs of cyber insecurity have the potential to knock US\$ 90 trillion off global Gross Domestic Product. More worryingly, their study highlights the possibility that in the future, the costs of cyber insecurity could well outweigh the benefits that cyberspace offers. So, the spending reported above appears small, when compared against the potential total costs of insecurity.

What Can a Cyber Defence Budget Be Spent On?

Prior to answering this question, a few considerations are worth noting.

Firstly, what nations spend on cyber defence may well be driven in part by their dependency on secure and unfettered access to cyberspace and exposure to cyber risks. Or else, only if a nation does not use communications and information technology there is an argument that there is no need to spend anything. Furthermore, the dynamic nature of the threat landscape and the specificity of exposure to cyber risks in any given situation—what the experts call the “attack surface”—makes for complexity

in deciding what to spend. This points to the need for an approach to cyber defence based on assessment and management of risks, so that resources can be prioritised against those threats likely to cause the most damage.

Secondly, from a theoretical perspective, a given amount of a cyber defence budget may well buy more defence relative to the acquisition of other forms of defence capability. Budget spent on a firewall or user awareness helps protect against a range of cyber attacks including those which aim to steal money or disrupt infrastructure. The implication is that for cyber defence spending a little can go a long way.

Lastly, those budgeting for cyber defence need to appreciate that effective cyber defence stems not only from the right technology, but getting the right people, trained to the right level and through the enforcement of good policies. In general, unlike the acquisition of traditional forms of defence capability that places an emphasis on tangible equipment, effectiveness with cyber defence may be more determined by information sharing, cooperation and coordination. These are all things which are somewhat intangible.

In addition to accounting for the nebu-

lous nature of these types of activities, it becomes very challenging to understand the costs of other parts of the cyber defence puzzle: for example the additional costs of the time spent by users conducting basic cyber hygiene or the additional development effort needed to implement cyber defences to the software of military hardware.

Finally, the cycle of upgrades may be more frequent in cyber defence than in other forms of defence capability. Anti-virus software is a good illustrative example: the increasing ubiquity of cyberspace means that the lists of the digital fingerprints of different viruses used by anti-virus software can be updated in real-time. By comparison, major pieces of defence equipment are intended to last years—the Hercules C-130, for example, first flew in 1954 and in its different variants is still going strong.

The Tangible and Intangible Costs of Cyber Defence

With this in mind, cyber defence spending can be spread across a number of different things. These can be both tangible and intangible and may be one-off investments or may recur



monthly, annually or irregularly. People are perhaps the most obvious recipient of spending. This can be either in terms of salaries and other indirect costs such as pensions but also time spent on their training, courses and exercises. Given that recruitment and retention of cyber specialists by government is challenging (due to the attractive salaries that can be offered by the private sector) these costs may be significant: indeed, expert views suggest that they may account for the biggest driver of spending in cyber defence.

The cost of labour also needs to be taken into account: this might include time spent on designing, implementing and maintaining cyber defences, including performing upgrades to security systems, decompiling malicious code or performing certification exercises.

A final type of intangible cost driven by the nature of cyber defence is the time and labour spent on coordination, information sharing, establishing cooperation. It is often said that cyber defence is a “team sport” and that “trust is key”. The importance of these principles is obvious when we come to appreciate the amount of time that goes into creating and establishing a trusted network and exchanging information. Even in the time of video teleconferencing, there is no replacement for a face-to-face meeting to build trust.

The tangible types of cost are often the most obvious, but relative to the activities above may be a small proportion of the total spent on cyber defence. These costs could go to hardware and software, software licences (which can often run into thousands or even millions of dollars or euros) and the customisation and integration necessary for them to work in their intended environment. Increasingly, recurring costs are associated with services offered by Managed Security Service Providers who offer a form of outsourced cyber defence by for example, conducting threat analysis on behalf of their customers. Other costs that might be also labelled under technology include purchase of as yet undiscovered and software vulnerabilities (known as “zero-days”) as a way to avoid them being bought and used by others.

Finally, spending might go toward stimulating innovation—an increasingly important theme which can take advantage of early stage research and development for improving cyber defence. This might be through grants to industry or research and development activities.



The Cost of Doing Nothing

Understanding the imperceptible budgetary implications of cyber defence can be just as challenging as investigating the seemingly ghostly attacks that come from the virtual world. Nonetheless, when we look at some estimates regarding the costs of cyber insecurity and the relative importance that many countries have afforded cyber risks, it is obvious that spending on cyber defence may well be good defence value for money. For example, the cyber attack against the Bangladeshi central bank involving the Swift network cost approximately US\$81 million—a significant sum for that country. In the private sector, following the cyber attack in 2015, UK communications provider TalkTalk reportedly suffered exceptional costs of £40–45 million with £15 million damage to their trading revenue, in addition to the loss of over a hundred thousand customers.

Spending Priorities

To avoid incurring these sorts of economic damage it is important to pay attention to what spending goes on, as well as how much. Spending on human capital—in terms of re-

ruitment, retention, training and education, appears to be key to getting results. Therefore, targeting of spending is necessary—especially now that the global hunt for talent means that the private sector can easily lure away highly skilled and knowledgeable experts. Spending considerations also need to take into account that, like an iceberg, much of cyber defence spending lies “below the waterline” with time (and therefore budget) needed for sustainable coordination, cooperation and information exchange to build trust.

Cyber Defence Pledge

Within NATO these aspects will need to be resolved in the context of wider political discussions about defence spending among the Allies. The Cyber Defence Pledge can provide a platform to stimulate discussion in the Alliance about cyber defence spending and prioritisation. Through the insights that Allies learn from the reporting on implementation of the Cyber Defence Pledge, it will be possible to share experiences and best practices regarding cyber defence spending, thereby contributing to more effective and efficient cyber defence for the Alliance as a whole. †

TRIDENT JAGUAR 2017

By Inci Kucukaksoy
JWC Public Affairs Office



ON 29 MARCH, almost on the heels of the conclusion of the first iteration, which certified Rapid Reaction Corps France as Joint Task Force (Land) Headquarters, the second iteration of exercise TRIDENT JAGUAR 2017 began at the Joint Warfare Centre, this time focusing on sharpening the skills of Headquarters 1 (German/Netherlands) Corps.





TRIDENT JAGUAR is a series of JWC-led operational level exercises designed to improve NATO's deployable joint Command and Control (C2) capabilities provided by the NATO Force Structure (NFS) headquarters. The NFS provides the Alliance with rapidly deployable, sustainable and flexible multinational forces and their C2 capabilities in support of multinational contingency operations. Each year, the NFS headquarters execute a large number of training events to maintain their combat edge, and ultimately, to assume Joint Task Force (JTF) headquarters roles. The high-point of these training events is "JAGUAR" at the operational level; the final exercise before a Land Component Command transitions into a NATO JTF headquarters in combination with elements from Land, Air, Maritime and Special Forces, and takes up a NATO alert stance, ready to plan and command a Small Joint Operation (SJO), should NATO ask.

Complex Spectrum of Challenges and Dilemmas

NATO's Joint Warfare Centre (JWC) conducted the first iteration of Exercise TRIDENT JAGUAR 2017 (TRJR17), which ran 8-16 March 2017 at Novo Selo Training Area, Bulgaria, and at Stavanger, Norway, with Rapid Reaction Corps France (RRC FR) as the core Training Audience (TA).

Headquarters 1 (German/Netherlands) Corps (1GNC), meanwhile, already started its deployment to the JWC before the first iteration finished. That is because TRJR17 was two exercises back-to-back and 1GNC was the core TA for the second iteration, 29 March-7 April, making TRJR17 one of the longest exercises ever hosted and directed by the JWC.

"It was the busiest period for us, following an 18-month preparation, but that's what makes it attractive," said Royal Navy Commander (CDR) Chris Haley. "In total, TRJR17 involved almost 3,500 military and civilian per-



ABOVE: World News Today (WNT) Newscasts are an excellent training opportunity for the TA.
BELOW: 1GNC Air Response Cell. Photos by Maj. Stephen Olsen, Norwegian Army, JWC

sonnel. By 7 April, we had delivered challenging exercises to both RRC FR and 1GNC with very comprehensive sets of operational level challenges and dilemmas, all of which triggered military, political and diplomatic engagements."

Sponsored by Headquarters, Supreme Allied Commander Transformation, conducted by Joint Force Command Naples and directed by the JWC, TRJR17 aimed to exercise and assess the joint operational combat readiness of, first, RRC FR, commanded by French Army Lieutenant General Thierry Corbet and, later, 1GNC, commanded by Netherlands Army Lieutenant General Michiel van der Laan.

"These past few weeks truly exemplified teamwork, and demonstrated how much can be achieved through collaboration and mutual support," said U.S. Army Colonel Christopher Engen, JWC's Deputy Chief of Staff of the Exercise, Training and Innovation Directorate. "It has been amazing to experience this culmi-

nation of effort by the Training Audiences, the Exercise Control (EXCON) elements, and the wide range of Support Units and Agencies."

The Non-Article 5 Command Post Exercise (CPX) was based on the fictitious Skolkan 2.0 scenario created by JWC's Scenario Subject Matter Experts across a broad range of disciplines. As the officer responsible for the Main Events List/Main Incidents List (MEL/MIL), CDR Haley explained that the scenario enabled the Training Audiences to explore how they can gain efficiencies and respond to complex spectrum of challenges in today's evolving combat environment, from strategic/policy to tactical levels.

CDR Haley added that the exercise posed very realistic challenges to both the RRC FR and 1GNC, and encouraged interoperability—the unity of command and effort—across the participating NFS headquarters, allowing them to train as they would fight.





Major General Andrzej Reudowicz,
Commander Joint Warfare Centre, and
Director of TRIDENT JAGUAR 2017.
Photo by Maj. Stephen Olsen,
Norwegian Army, JWC

"A formidable joint effort"

Exercise TRJR17 mainly centered on hybrid threats: a mix of conventional warfare and insurgency type warfare, crisis resolution and rule of law, Strategic Communications (StratCom) and information operations, the Comprehensive Approach, humanitarian civil-military coordination, theatre logistics, Cyber as the fifth dimension of modern warfare and chemical, biological, radiological and nuclear threats. More than 3,000 injects were simulated during TRJR17.

StratCom, at times, became the main focus in this hybrid battlefield and the lines between Operational and Tactical were blurred to the point where "words" sometimes mattered more than firepower.

Pete DuBois, JWC's Chief Media for TRJR17, explained that the media platforms, including television and online media, aimed to shape the public perception of the conflict, providing a measure of general public opinion in various crisis situations and also help the TAs to adjust their StratCom strategies

"Cooperation is strong amongst the NATO countries."

and counter-propaganda methods. Referring to the importance of information battlespace, DuBois added that understanding the exercise information environment, especially how to use the Social Media as a hedge against disinformation campaigns injected by the OPFOR media was not an incidental concern for the TAs, but has always been a key Training Objective in all JWC-led exercises.

Canadian Air Force Lieutenant Colonel (Lt Col) Jocelyn Bergeron, JWC's lead planner of the exercise, argued that it was one thing to train, but quite another to effectively work together for accomplishing shared goals. "Although one focus of the exercise was for the JTF HQ to operate jointly, planning the exercise itself was a formidable joint effort," Bergeron said, adding: "Multiple NATO organizations, encom-

passing many nations, came together at multiple locations and continuously worked jointly over the planning cycle, to make this exercise a success. This effort stimulated joint learning and showed me that despite differences in language and cultures, cooperation is strong amongst the NATO countries."

TRIDENT JAGUAR 2017 was directed by Polish Army Major General Andrzej Reudowicz, Commander JWC. Reudowicz concluded the second iteration of the exercise at a closing ceremony on 7 April. In his remarks he noted that JWC exercises focused on a combat environment covering the entire spectrum of warfare, including hybrid warfare, which involved a total multinational approach supported by UN actions and the EU, pointing directly to a Comprehensive Approach.

"I am content with the Training Audiences' achievements and how the exercise was provided by the Exercise Control team," said Reudowicz, adding: "Without the commitment of our staff we would not have achieved the success of this exercise. There are a lot of lessons learned from the TA and from our staff





Novo Selo Training Area, Bulgaria. Photo by RRC FR PAO



Lieutenant General Michiel van der Laan, Commander 1GNC



The White Cell



Cyber Response Cell



Lieutenant General Thierry Corbet, Commander RRC FR, TRJR17 Opening Ceremony, Novo Selo Training Area, Bulgaria. Photo by RRC FR PAO



Air Response Cell



Uta Filz, UN Office for the Coordination of Humanitarian Affairs (OCHA)





Logistics planning and operational risk assessment briefing. Photo by Maj. Stephen Olsen, Norwegian Army, JWC

on how to continue to improve our performance in creating this complex and very difficult environment in future exercises.”

THE JWC-LED WHITE/GREY CELL is a key element of the complex civil-military environment described by Major General Reudowicz. To effectively simulate it, the White/Grey Cell engages in scenarios ranging from human trafficking at sea to dealing with the host nation into which NATO forces are deployed. The White/Grey Cell participants include a kaleidoscope of Subject Matter Experts and role players who inject realism into the exercise, combining political, civilian and military instruments. Uta Filz, with the UN Office for the Coordination of Humanitarian Affairs (OCHA), said the exercise scenario had a strong connection to humanitarian issues.

“OCHA’s Civil-Military Coordination Section (CMCS) is the focal point in the UN system for humanitarian civil-military coordination. The dialogue between humanitarians, the military and other uniformed personnel is crucial during any major humanitarian response,” explained Filz. “As CMCS is the custodian of internationally-recognized guidelines

that seek to preserve the impartiality, neutrality and operational independence of humanitarian actors, it is vital for us to participate in NATO exercises so that should the need arise OCHA and NATO are sensitized to effectively interact with each other.”

THE FIRST ITERATION of the exercise included a distinguished visitors and media day at Novo Selo Training Area on 16 March, at which President of the Republic of Bulgaria H.E. Rumen Radev and senior leaders from across NATO Allied and Partner Nations attended. During the press conference, Lieutenant General Thierry Corbet highlighted the importance of NATO’s readiness, deployability and interoperability, saying that TRJR17, led by the JWC, pushed his headquarters’ skills and capacity to the limits in achieving the mission.

Later, Lieutenant General Michiel van der Laan reflected similar thoughts to those of Corbet. In his closing remarks on 7 April, van der Laan expressed his deepest appreciation to JWC’s TRJR17 team and the Exercise Control, saying that TRJR17 was IGNC’s best exercise to date. After all, van der Laan went on to ex-

plain, the biggest challenge of modern warfare was the “complexity of coordinating effects in the joint environment” and “integrating kinetic operations and non-kinetic operations” during which a JTF commander grapples with “leading brigades; coordinating effects of the Air and Maritime component commands, and conducting Special Operations while staying connected to the international community” with well made, clear messages and effective key leader engagement—“not only with the host nation and the Senior EU Special Representative, but also with SACEUR, the Nations and with other important players like the International Committee of the Red Cross (ICRC) and the OCHA.”

Van der Laan added: “Thank you for the way you enabled us to experience this [military] operation. We can only do this when the headquarters delivers, and I am very proud of my staff. But, you, *the EXCON*, made this happen and I’m very grateful for that. This was the best exercise this headquarters has experienced for years. And, that was only possible because the scenario was good, the MEL/MIL team did a tremendous job and I had good Component Commanders.” ✦



The Netherlands Secretary General of Defence Mr Wim Geerts and the Chief of Defence General Tom Middendorp visited the JWC on 31 March 2017 in order to observe the second iteration for TRJR17 and also to meet with the Centre's leadership. Photo by JWC PAO



CDR Chris Haley,
TRJR17 Chief
MEL/MIL



The Map Room, pre-briefing discussions



Simulated press conference in Bulgaria with Lieutenant General Thierry Corbet, Commander RRC FR



The After Action Review



Pete DuBois, JWC's Chief Media for TRJR17

3 Question Interview with Pete DuBois about the Information Battlespace of TRJR17

Inci Kucukaksoy, JWC PAO

"JWC Training Audiences face a complex and challenging information battlespace that is unmatched anywhere in NATO."

Why is information environment a top priority for Joint Task Force HQ commanders?

— Commanders understand how the information environment plays a major role in any operation so they appreciate being able to train in the complex and realistic information environment that we create in JWC exercises. We introduce the news and social media environments months before the start of the exercise so that Training Audiences have an early opportunity to begin analysis, enhance their knowledge development of the scenario and even begin engaging on our social media platforms, Chatter and Facepage. Being able to access online news products from local to international outlets and to see and hear from the 'newsmakers' themselves in World News Today television newscasts are excellent training opportunities for Intelligence, Public Affairs, Information Operations, and Psychological Operations, to cite but just a few. Combine that with the level of realism we create, and you have a media environment unequalled anywhere in NATO.

Do you believe that social media can be a game changer?

— The emergence of social media was, and continues to be, a game changer in the information environment and so we have a responsibility to ensure exercise social media play reflects reality. From an Exercise Control (EXCON) perspective, we ensure social media play is effects-based and serves a strategic purpose. Key figures and groups in the scenario have a presence on social media, and their updates provide the Training Audience with additional

perspective and/or Intelligence into what is important to these figures or groups. As EXCON members, we also create and manage accounts from random citizens in the scenario. Updates from these accounts can indicate sentiment trends among groups or the population and act as an early warning system for the Training Audience by introducing short but important pieces of information about events in the scenario or the Main Events List/Main Incidents List. From a Training Audience perspective, Chatter and Facepage offer them realistic platforms to hone their own social media skills, particularly in the fields of Strategic Communications and Open Source Intelligence Gathering. Information Environment Analytics is a requirement for our Training Audiences, and in the near future we look to introduce tools they can use to more realistically gather and analyze social media data, such as sentiment trends, in order to make better informed decisions or plan information strategies.

How do you challenge the Training Audi-

ences, for example, do you take into account real world implications of "fake news"?

— JWC Training Audiences face a complex and challenging information battlespace that is unmatched anywhere in NATO. Our Section's main focus is the news media environment where we replicate television and online news products from the local to international level, including products and perspectives from the Opposing Force (OPFOR). An exciting element of our OPFOR media effort is fake news. This type of journalism has actually been around for centuries but has become a huge factor in mainstream and social media over the past few years, which is why we include it in our simulation efforts. Just as in the real world, fake news in an exercise is based on creating an effect, such as deception or aims to mislead an audience with the content appearing on OPFOR websites, social media accounts and in some instances in traditional news. The Training Audience is responsible for determining what to believe, and how to react to this dynamic reality of today's information battlespace. ✦





By Inci Kucukaksoy
Public Affairs Office
Joint Warfare Centre

“A superb training and learning platform for understanding modern warfare. This is the Cadillac of training.”

Editor's Note: This interview was conducted on 14 March 2017, during the execution of the first iteration of TRJR17.

BELOW: Colonel Alex Brennan, Commander 37 Canadian Brigade Group Headquarters. Photo by JWC PAO



THE ABOVE QUOTE is from Colonel Alex Brennan, Commander of the 37 Canadian Brigade Group Headquarters and a 21-year veteran Police Sergeant of the Royal Newfoundland Constabulary. Brennan came to the Joint Warfare Centre (JWC) to participate in exercise TRIDENT JAGUAR 2017 (TRJR17). *The Cadillac* is one of the most iconic car makes over the last 100 years—its aura was so formidable that the phrase “*the Cadillac of x*” was coined, meaning that something is considered a flagship in its category, or simply the best. This is exactly where the JWC stands when it comes to training, according to Brennan. “The training here prepares us for a myriad of contingencies by delivering operational level challenges through simulated scenarios. This is as realistic as it gets,” he says.

Brennan sits down to talk to us in the JWC Bunker where the exercise takes place,

which is a cross between a Cold War era bomb shelter and a modern-day military headquarters building. He begins by pointing out that the key objective of training is to ensure all elements of NATO’s Order of Battle (ORBAT) remain proficient in their warfighting skills and stay prepared to face any threat.

“My team here all comes from the 5th Canadian Division in Atlantic Canada,” he explains. “In this exercise, I am responsible for the command and control aspects of kinetic and non-kinetic operations of the 4th Canadian Mechanized Brigade Group within the Rapid Reaction Corps France (RRC FR) when NATO is called upon to respond to a crisis in the fictitious country of Arnland.”

The RRC FR’s ability to operate as a Joint Task Force Headquarters (JTF HQ) was tested during the first iteration of TRJR17, which was a distributed Command Post/Computer Assisted exercise. It kicked off on 3 March with





The 4th Canadian Mechanized Brigade Group participating in TRIDENT JAGUAR 2017 at JWC. Photo by Maj. Stephen Olsen, JWC PAO

the Exercise Control (EXCON) training, and ran through 16 March. Approximately 1,000 soldiers from the RRC FR, 5th Canadian Division, 4th French Airmobile Brigade and 6th French Light Armoured Brigade, as well as the Joint Logistic Support Group, were deployed to Novo Selo, a Bulgarian military facility, to carry out a simulated crisis response mission, dubbed as Operation Arnish Resolve—a mission based on a fictitious training scenario created by the Scenario Subject Matter Experts at JWC. The bulk of the EXCON organization remained in Stavanger.

“The TRJR17 is a superb training vehicle that many Canadians will not get access to,” Brennan goes on to say. “To be able to come over to this exercise and apply the warfighting skills that we get from the Army Staff College and the Canadian Forces College is a very rare opportunity, indeed. What’s happening for us here is that we are spending a fair bit of time educating our people, training them as they go along, whilst taking the principles of coaching, mentoring and tutoring and developing them to work within a fighting Brigade HQ. As

such, we are using this exercise as a learning development tool.”

For Brennan, its expertise, knowledge and advanced in-house Communication and Information Systems all together make the Centre NATO’s premier training facility. “As a matter of fact, the learning here is a bit like a hockey stick graph that starts off a little bit flat, picks up and just goes right up. This is an incredible training opportunity and we are making the most of it to actively enhance the warfighting skills required for our contemporary operational environment.”

Brennan says that the main challenge is fitting a Canadian Brigade into a JTF HQ context. “It’s a very fluid environment and for much of the exercise, there has been a lot of cross-component interaction, which allows us to rehearse for war gaming and conduct run-throughs. A couple of the members of my team have never attended a Commander’s Update brief, let alone the Operational Planning Process. In addition to that, there is the aspect of working with other components, Air and Maritime, and quite literally executing the

Arnland mission as the exercise unfolds.”

Drawing from his own experience, Brennan observes that whatever the challenge, it is important for NATO forces to be prepared. Until recently, he headed the Royal Newfoundland Constabulary’s ‘kickass’ undercover squad. Under the motto “Proactive, Not Reactive”, the squad focuses on catching hard-core criminals. The approach to multifaceted threats is the same for both the law enforcement and the military, Brennan explains, adding: “Both crime and warfare are always evolving. One needs to be alert to the changes. It’s like a cat-and-mouse game. Every time the cat figures out what the mouse has done, the mouse tries new tricks, and it’s just like that in warfare. We always need to be one step ahead of the next crime and remain alert.”

“In essence, this is like the OODA loop—the decision cycle of Observe, Orient, Decide, and Act—which is a quintessential battle procedure,” continues Brennan. “We have to move faster than what the opponent does in terms of from the time when we sense what’s going on, analyse it and plan, and then develop a mission.”



EXCON staff briefing on the details of the ongoing mission regarding their specialised areas. Photo by Maj. Stephen Olsen, JWC PAO



The exercise is the final step in the process of certifying the RRC FR as a JTF HQ. It will place the RRC FR on alert status, starting in the summer of 2017 for a period of one year. Directed by Major General Andrzej Reudowicz, Commander JWC, the TRJR17 has allowed all participating NATO Force Structure headquarters to exercise and work through a comprehensive set of operational and tactical level dilemmas, as one team, and be prepared for their potential outcomes.

“In this exercise we are replicating a JTF HQ, which deploys quickly to perform a complex mission. Effective command and control is the key of success for the assigned mission. In dealing with asymmetrical warfare we need drills; we need long and short lead planning, and we need processes, innovation and new concepts. The TRJR17 is one example. We exercise at two levels, conducting a land-heavy NATO Non-Article 5 battle, integrating Air and Maritime assets, whilst simultaneously practising Comprehensive Approach with a Host Nation and dealing with Strategic Communications. This is very impressive. The JWC

“There is so much to learn from each other. This cross pollination will lead to incredible effects in the battlespace.”

team is basically exposing the JTF HQ to every contingency it should be prepared for.”

Although JWC is a renowned virtualization centre in NATO, the exercise “Map Room”, sometimes called the “War Room”, has nothing virtual inside. No touch screen displays, no digital maps. Rather, it’s a simple room with a 5x5 metre map on the floor, where staff from different Response Cells, the Opposing Force and the Main Events List/Main Incidents List, Intelligence, media and Higher Control (HICON) provide blow-by-blow assessments of the

proceeding war in Arnlund, involving the Blue, Red and Green Forces, from their point of view, every day. This setting might feel old-fashioned compared to the Joint Operations Centre one floor down. Brennan, however, claims this style of technology-free briefings refuse to die. “It also reminds me that we have to build some redundant capacities,” he notes, adding: “We don’t always need fancy equipment to do our work; we have to look at where we come from before we look into the future. You are going to lose power and batteries do die. And then you are left with a map and a compass.”

According to Brennan, within the Canadian team supporting the TRJR17, there is a 50 per cent ratio of active duty and reserve soldiers, who, for the vast majority, have operational experience overseas, and some belong to a company or a platoon. He also underlines that, as a whole, they have tried to integrate women soldiers into the team as much as possible because mission success is achieved regardless of gender.

Brennan also describes the military experience of reserve officers as added value for civilian career enhancement and that





A view of the JWC Situation Centre



Lieutenant Colonel Jocelyn Bergeron (right), JWC's lead planner of the exercise



Rear Admiral Brad Skillman, JWC Deputy Commander and Chief of Staff and the exercise Deputy Director

could be further utilized in exercises such as the TRJR17. Giving the example of Canada's new Minister of National Defence, Mr Harjit Sajjan, who is a combat veteran, police officer, and, until recently, a Lieutenant Colonel in the Army Reserves, Brennan stresses an important point: "There is so much to learn from each other. This cross pollination will lead to incredible effects in the battlespace. It's not just about the preparation and the training. What is equally important is testing our ability to work as a team," he adds.

"I think everybody knows that, regardless of whether they have been on multiple missions, or whether they have worked in a Corps headquarters or a Brigade, there are big challenges out there; and what we will do is that we will work together, as a team. So, this is a superb training and learning platform for

"You don't always need real guns hitting real targets to keep the combat edge."

understanding warfare and NATO's operational environment. I can say that this is the Cadillac of training so to speak in terms of our ability to come together and be able to operate. I hope to see more Canadians benefit from future exercises."

Brennan then highlights the essentials for success in a multinational environment: "In my career as an Army Colonel and police officer, I have realized that an individual's ability to build a relationship depends on how friendly

and perceptive he/she is and his/her ability to communicate. That relationship transcends all barriers of language, race, religion and politics. It's just a matter of bonding through training to get that sense of camaraderie, purpose and level of commitment. Once people have got that, we can work our way through any challenge that may be waiting for us. This will establish the standard for us."

Ultimately, when asked about his thoughts on how NATO best adapts its response to emerging and unexpected contingencies, Brennan concludes: "I believe that NATO is well positioned to move forward to that next generation of warfighting. You don't always need real guns hitting real targets to keep the combat edge. NATO exercises are more than live fire performances. The JWC ensures that we also adapt and innovate along the way." †

“We can achieve more Training Objectives here than a LIVEX.”

Inci Kucukaksoy, JWC PAO



CDR Leonardo Rossi

ITALIAN NAVY CDR Leonardo Rossi from Naval Striking and Support Forces NATO (STRIKFORNATO) says that it was great to return to the JWC in order to support the execution of Exercise TRIDENT JAGUAR 2017 (TRJR17). "This is my third exercise here," he says. "I worked with the Opposing Forces during TRIDENT JUNCTURE 2015. Then, I was the officer of primary responsibility nominated by the Maritime Component Command (MCC)."

During the first iteration of TRJR17, Rossi was the Deputy Commander of the simulated MCC, one of the Response Cells in the exercise, role playing the Battle Watch Captain of NATO's Arnlund mission. The focus was constantly on strategic and operational level dilemmas across the full spectrum of Small Joint Operation (SJO) challenges, predominantly those of a non-kinetic nature, but also including the simulated tactical combat.

When asked about his main objectives, Rossi says: "We basically exercise RRC FR's ability to lead as a JTF HQ of very complex joint operations. *Joint* is the key word here as it refers to multi-service. TRJR17 is a land-heavy exercise; nevertheless, maritime forces are also present to trigger the Training Audience (TA) in order for them to accomplish the requirements for a JTF HQ and help them to understand that in a joint warfare the maritime component command and the maritime reality need to be taken into consideration."

At JWC alone, the exercise involved hundreds of work stations, without actual land, maritime and air capabilities of the Alliance, since TRJR17 is a Command Post Exercise (CPX) based on a fictitious training scenario. Maybe there are no real aircraft and real ships during TRJR17, Rossi says, but Skolkan is a "richly cinematic" training scenario and, together with the JWC's realistic simulated news coverage, the warfare gets almost too real.

"Well, we don't get a shot at live fire here (pun intended). But, we can fully exercise the combatant commanders and our battle staffs in joint processes and executing joint

operations for NATO, integrating all elements of a JTF HQ. To do so in a period of 10 days, and achieving more Training Objectives than a LIVEX highlight the importance of a CPX. In a LIVEX, we would have struggled under tactical constraints of a maritime warfare. Here, we have to consider the two levels at all times. No need to say that CPXs are also cost-effective."

The JTF HQ concept was launched in 2012 with the key objective of improving NATO's combat readiness and deployability and was developed further following the Wales Summit in 2014. Today, the enhanced NATO Response Force (NRF) structure includes a deployable JTF HQ, rotated between JFC Brunssum and JFC Naples, the Very High Readiness Joint Task Force (VJTF), an Initial Follow-on Forces Group and the Response Forces Pool.

Rossi says that he is in fact at five days' notice to move—in real life. "As the Maritime Response Cell we also benefit from this training. I work at the STRIKFORNATO Joint

Operations Centre in my daily job and I can be called on as NATO Maritime Forces' Battle Watch Captain as and when required. This is because STRIKFORNATO is the Maritime Component Command for NRF 2017, and also, in its dual-hatted capacity, it is the JTF HQ Maritime Expeditionary Headquarters."

Rossi explains that it is very important that the participating units learn from each other and develop their skills together. "The exercise has been a success thanks to the heavy-duty commitment of the EXCON. JWC provides a premier operational warfighting platform for the JTF Headquarters," he concludes. ✦



The Maritime Response Cell at JWC

“Strategic level is the most challenging area in modern warfare.”

Inci Kucukaksoy, JWC PAO

MAJOR ALLISON GILLAM, an Australian officer, has participated in numerous NATO operations and exercises spanning her career. As a Captain, she deployed in the role of Australian liaison officer to Task Force Uruzgan, which was part of the NATO Multinational Reconstruction Task Force in Afghanistan. While overseeing her duties here, she witnessed tangible changes, which were a glimmer of light in the ongoing fight; Uruzgan was not a one-dimensional war zone. Economic and social development was alive and flourishing. On one occasion, Afghan women invited her to have tea with them following a routine vehicle check.

“The locals were known to be non-permissive a year before my assignment. But now I was able to play peekaboo with the kids. There were more cars on the roads, and women were seen in public,” she said reflecting on her time in Afghanistan.



Major Allison Gillam

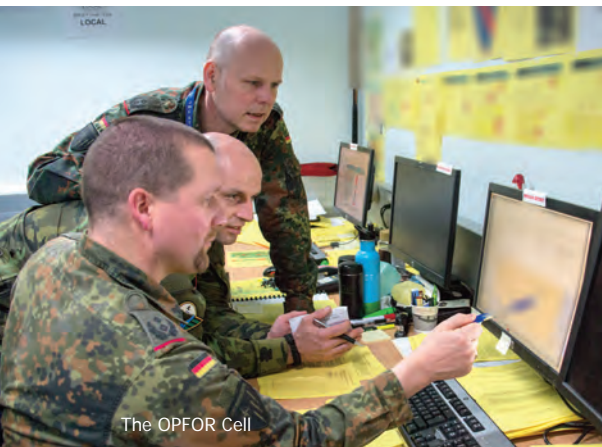
Continuing her work with NATO she took part in many multinational training events following her redeployment from Afghanistan, including the ARRC-led ARCADE FUSION in 2014, and later TRIDENT JAGUAR 2017 (TRJR17). During TRJR17, Major Gillam acted as the Opposing Forces (OPFOR) Staff Officer within a multinational team of JWC-led Exercise Control (EXCON) organization.

“Predominantly, throughout the exercise together with my French and Italian colleagues we’ve been required to respond to requests for information from both the Training Audience (TA) and also from other EXCON elements, to provide clarity on scenario injects and ensure that the TA received accurate information and figures when it came to attrition of enemy forces. We also produced additional

injects or context to previous serials to ensure a realistic scenario was maintained for the duration of the exercise.”

25 Nations participated in the exercise from both NATO and Partner Nations, including Australia from beyond the Euro-Atlantic area. Major Gillam said the JWC conducted operational level training exceedingly well, a very challenging area of expertise in modern warfare. “One of the benefits of working with the JWC was an opportunity to gain exposure to corps and strategic level operations within the NATO and EU context. An opportunity rarely afforded while working in Australia,” she added.

Major Gillam said one of the most important elements in TRIDENT JAGUAR 2017, apart from NATO’s goal of maintaining a high state of readiness at all times, was the opportunity to engage with Allies. “I’ve been very fortunate to have an opportunity to work with NATO both in Afghanistan, as had many other Australians, and then again on exercises such as this one. I had a fantastic experience here, working with some phenomenal and brilliantly intelligent people. It was also an outstanding networking opportunity, and an opportunity to catch up with people I had deployed with in Afghanistan,” she said. ✦



The OPFOR Cell





WHAT A GOAL AND A GAME IT WAS!

What is it like to plan for an exercise? Italian Air Force Lt Col Giovanni Granello, TRJR17 Event Manager, explains how each exercise is a new frontier!

Stavanger, 25 February 2017

We are only a few days from the start of exercise TRIDENT JAGUAR 2017, the first iteration of which will bring into play Rapid Reaction Corps France, and I am now looking back at the work accomplished so far together with Nils (*Lt Col Nils Erik Hodneland*) with whom I have exchanged opinions on all topics discussed at the meetings we have attended.

Indeed, no sooner had we completed exercise TRIDENT JUNCTURE 2016 than we dived headlong into the arena of a new enterprise: build a joint exercise for two NATO Training Audiences (TAs) to be carried out under the same conditions and within the same

scenario, the two TAs being Rapid Reaction Corps France based in Lille, France, and I (German/Netherlands) Corps based in Münster, Germany. The task was so enormous and so essential that it kept me away even from watching the Italian team's games in the six-nation rugby tournament running parallel to it!

Was there a common factor linking all of our TA participants? The results they had achieved, of course, but also their experience and knowledge, which received much attention from our side when scrutinizing the professional experiences of people we had never met, but whose professionalism was immediately recognisable. One big question was how to manage the strong personality of each par-

ticipant and mix different professionals from different origins; people carrying different experiences, people whose visions, directions and guidance were definitely not equal; and all this in order to establish a common database to be used across various exercise contexts.

Working long days side by side with colleagues reminded me of life in a sailboat where coexistence can be challenging at times. In this exercise planning effort, starting from the principle that all the military present had come together to bring the events across the finishing line, the only critical point assessed as carrying a risk was how to get the best out of dictating guidelines during the period ahead of us. Putting people, let alone experts from





The author, Lt Col Giovanni Granello



CDR Chris Haley (left) and Lt Cdr Ian Fraser



Lt Col Nils Erik Hodneland

"The opportunity to put to use, in the course of a few days, all the knowledge accumulated during more than 30 years of aviation service crowns a dream. It stands out as an exciting moment."

a number of functional areas under pressure may at times create interpersonal problems, hence our decision to adopt a risk management technique. Also, working with several projects simultaneously meant that we had much excitement waiting. Different cultures and experiments and stories all claim respect. Soon enough, however, obstacles were overcome and the ice was broken already at the first workshop, devoted to the definition of "Incidents". Only a few days were available for this purpose, so we had to carefully manage time from day one while planning the activities "to be performed," which was done in detail although some natural reluctance was exhibited. By the end of the allotted time, we had reached a first result, though. Indeed, the professionalism and the seriousness of all those present had paid off.

NEXT, IMMEDIATELY AFTER the Christmas break, we were sucked back into the workshop universe, preparing for scripting every single event. There were long working hours and challenges and Joint Warfare Centre and all aspects of its values and professionalism were called into question at times. We felt the responsibility was ours to keep up its good name, a fact that was weighing heavily on our shoulders. Reading and reading over again the work hitherto done, analysing each

and every detail, reporting it all using such a convenient tool as the Joint Exercise Management Module (JEMM)—that was our job.

And, as in every race, also at this stage, we gave the best of ourselves. Those moments reminded me of my days as a hockey player, in particular when the coach was urging our team to strive to win. You put together a few dozen people within a window of time of ten days trying to get the best from every individual without losing your focus on the quality of the finished product. You also have to ensure that all are coordinated, synchronised and trained to operate together, and that any uncertainties or problems that arise can be resolved without jeopardising the two exercises concerned.

14 March 2017, the execution

Once again, JWC's "One Team" approach proved successful. Working simultaneously with two NATO Training Audiences to hone already written stories was a little like a tailor adjusting the outfit of two gentlemen who are getting ready for their wedding, which clearly is the most important day of their lives.

Now, following on my PC screen every single piece of the puzzle we were trying to put together at the time brings back the days when the design was discussed and finalized. While doing so, we were sitting side by side sipping freshly-made espresso from an in-room ma-

chine while revising every single step and enjoying the fabulous espresso blend made in my colleague Jeff's home. The burden of having to carry out joint training with my team and the Training Audiences in order to prepare the planning and execution of the exercise is about to be lifted from our shoulders, at least with regard to the first half.

However, just like with every game, we must come to terms with how we did it; take control of the first impressions, catch our breath, hydrate the body, clear the mind and then get ready for the second leg of this incomparable game of professional experience.

As for me, the opportunity to put to use, in the course of a few days, all the knowledge accumulated during more than 30 years of aviation service crowns a dream. It stands out as an exciting moment, made possible thanks to my greatly cooperative MEL/MIL team members Chris, Jeff, Carlos, Stefan, Miroslaw, Nils, Ian, and Kristo. The team's strong performance made it possible to capitalize on each individual's efforts and also made us happy enough not to feel frustration over details.

A brilliant way to exploit this experience would be to build on it in view of the next and even more important exercise of the year, namely TRIDENT JAVELIN 2017. First, however, we need a refreshment break to enjoy a tiramisu, hoping that it will not come with a wooden teaspoon! ✦

SPACE PRODUCTS:

Synthesized and processed Space System data used for operations.



SPACE SERVICES:

Services provided by Space Systems to users in order to enable them to conduct operations.

THE KEY ROLE OF

SPACE SUPPORT

IN NATO OPERATIONS



From left: NOBLE JUMP 2015, photograph by Evert-Jan Daniels (MCD). SEA SHIELD 2017, photograph by HQ MARCOM. NASAMS II during exercise JOINT VIKING 2017, photograph by Kristian Berg. The launching of a surveillance drone during NATO UNIFIED VISION 2014 trial, photograph by NATO.

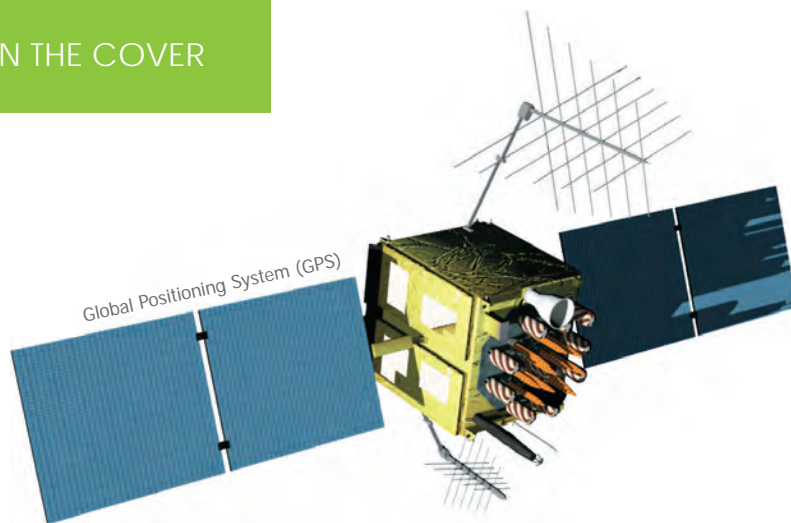
SPACE CAPABILITIES

SYNTHETIC APERTURE RADAR SATELLITES



by **FLAVIO GIUDICE**
Aerospace Engineer
J3 Space Operations
HQ SHAPE

LT COL JOHN PATRICK
United States Air Force
J3 Space Operations
HQ SHAPE



WITH NEARLY 12,000 TRACKABLE OBJECTS and 1,300 satellites orbiting the Earth, the Space domain is highly “congested, competitive, and contested”.¹

Over 80 countries and organisations operate Space Systems, which provide a host of services to billions of people. Space Systems and their related technologies are now an integral part of the global critical infrastructure and continue to grow exponentially.

SPACE SYSTEMS ARE no longer exclusively used for military purposes. It is fair to say that civilian exploitation of Space surpasses military use. Therefore, it is no surprise that Space systems continue to expand into a range of activities, including communications, navigation, surveillance, environmental monitoring, and early warning, to name but a few. However, since the end of the Cold War, risks to Space systems continue to increase and these risks are no longer limited to national security. Today, a disruption in services provided by Space systems will affect not only large organisations, but individual citizens as well.

The use of Space capabilities allows NATO to achieve both political and military objectives with increased effectiveness and efficiency, resulting in a decrease of resources required and a reduction of time necessary to achieve the desired end state as outlined by political guidance.

Over the last ten years, NATO has increasingly relied on Space capabilities and products during operations to achieve its mission objectives. NATO dependencies on Space require attention to assure assets and

capabilities are available throughout all phases of a campaign or operation, from planning to execution to transition. The absence of Space capabilities and products will inhibit the ability of NATO to achieve overall objectives in the most efficient and effective means possible. The sentence “No single NATO operation without Space” best summarizes the effects that lack of Space capabilities would have on NATO operations. It does not mean that no operation can be conducted without Space capabilities, but that the level of warfare will



Soldiers operate a tethered aerostat, in order to provide persistent ground surveillance. Photo by NATO

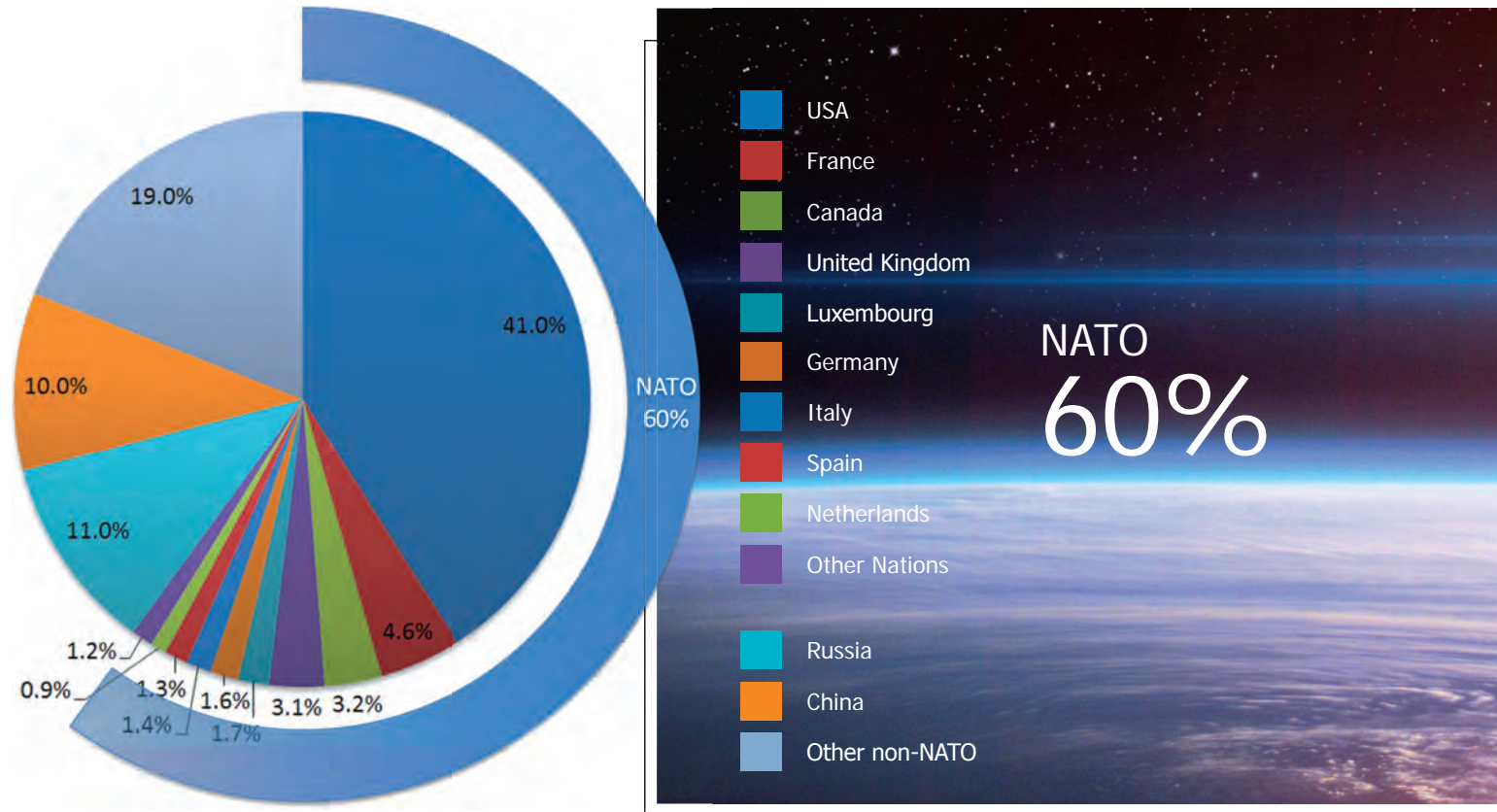
downgrade to early post-WWII era military employment and tactics. Given the key role of Space in NATO operations, the NATO Bi-Strategic Command Space Working Group (Bi-SCSWG) was formally established in September 2012. Led by the Strategic Commands, the Bi-SCSWG was tasked² by the NATO Military Committee to increase Collaborative Space Support to NATO Operations by studying operational requirements and improving Space training and education.

The following principles or fundamental considerations are intended to provide a baseline to understand the complexity of Space in NATO:

- NATO does not own any Space-based assets or capabilities, though it does lease capabilities from NATO Nations and operate both fixed and deployable ground stations with NATO equipment and personnel.
- Nations agree, on a voluntary basis, to offer Space products³ and Space services⁴ intended to provide the desired effects in support of the mission and its objectives.
- While providing Space support to NATO



BELOW: Distribution of national Space assets



operations, Nations retain Command and Control (C2) over their assets. NATO can request products and services by sending a Request for Space Support (RSS) to member countries whose Space capability makes it possible to accomplish the task.

— In the Operations Planning Process (OPP) commanders should grant Space full consideration as a domain that is currently afforded to Air, Land, Maritime and Cyber. Space should be an element of all aspects of the OPP, from development of the comprehensive picture of the operational environment to the centre of gravity analysis.

— National Space products and services expand the effectiveness of NATO operations, and thus adversaries will continue to actively seek to deny NATO's access to Space while at the same time using their counter-Space and Space assets and capabilities to achieve their objectives against the Alliance.

— All NATO operational domains are greatly reliant on Space capabilities for their activities.

NATO NATIONS OWN 60% of the currently operational satellites in orbit. USA represents

approximately 70% of NATO "Space Force". NATO operations depend on Space-capable member countries to provide Space capabilities. These include, but are not limited to: Satellite Communications (SATCOM), Positioning, Navigation, and Timing (PNT), Intelligence, Surveillance, and Reconnaissance (ISR), Terrestrial and Space Environmental Monitoring (METOC), Space Situational Awareness (SSA) and Shared Early Warning (SEW).

1 Satellite Communications (SATCOM)

SATCOM provides global coverage and critical connectivity, which allow the Alliance to maintain strategic situational awareness and to convey its intent for tactical manoeuvre of forces whose rapid movement and wide area deployments require Beyond Line of Sight (BLOS) communications. For these reasons, SATCOM is considered an essential enabler to NATO missions. NATO does not own any SATCOM satellites, but owns and operates both fixed and deployable ground terminals.

NATO Uses and Effects

- Command, Control and Communications (C3) Systems
- Remotely Piloted Aircraft (RPA) operations
- Deployed/BLOS communications

Advantages

- A constellation of three geostationary⁵ communication satellites spaced evenly provides near-total Earth coverage between 65 degrees north and south latitude. In general, a mixture of geosynchronous and polar (Low Earth Orbit⁶/Highly Elliptical Orbit⁷) satellites is required for full global coverage. If required, satellites can provide focused capacity in areas of special interest.
- SATCOM systems provide real time BLOS transmission without the need for long terrestrial communications architecture.

Disadvantages

- Limited capacity: Exponential growth of user requirements outpaces the current capabilities of on-station SATCOM systems. This necessitates the Alliance to supplement SATCOM capacity with commercial, inter-





HNOMS Skudd puts up blind to train "navigation without visibility" during JOINT VIKING 2017. Photo by Jakob Østheim, Forsvaret

national, and civil systems.

- **Transmission path:** Due to the distances travelled on a SATCOM, significant latency is introduced into the communication link.
- **Antenna size:** NATO commanders often must compromise either information flow rate or mobility. Generically speaking, the bigger is the antenna, the higher can be the information flow, but the less is the mobility.
- **Jamming:** SATCOM systems are susceptible to jamming; an emission of radio frequency signals intentionally interfering with wireless communications.
- **Terrestrial weather:** Precipitation not only degrades the signal but, if heavy enough, can cause a complete outage. The higher the frequency, the greater the effect.
- **Space weather:** Solar activity can disrupt SATCOM for short periods of time or, in extreme cases, can cause communications outages. This mostly affects receivers in the Arctic and equatorial regions.
- **Sun conjunctions:** Satellite alignment between the Earth and the sun causes communications disruptions and outages.

2 Positioning, Navigation and Timing (PNT)

NATO's use of PNT is pervasive throughout its operations. A Global Navigation Satellite System (GNSS) establishes a "common reference grid" within the operational area, and enables

a "common time", thus facilitating synchronization of operations in challenging environments. Space-based PNT systems support strategic, operational, and tactical missions by providing precise three-dimensional location and navigation capability in all four physical domains (Land, Maritime, Air, and Space), as well as a highly accurate time reference, which is fundamental in cyberspace, cryptography and to SATCOM signal acquisition. Signals (L-band: frequency=1-2 GHz) from at least four satellites placed in Medium Earth Orbit⁸ are required to build a three-dimensional position and navigation picture, while only one signal is needed for timing.

Today, NATO primarily uses the Nav-Star Global Positioning System (GPS) signals for PNT. A complementary capability to GPS is the European Galileo System, which has been operating since 2016, and whose full capability will be in place by 2020. The signals on both GPS and Galileo were designed to be interoperable, meaning a receiver could use any combination of both constellations to determine position and timing in order to increase performance in terms of accuracy (up to less than 1 metre) and availability. These two factors can be improved by using ground and Space-based regional systems: USA's Wide Area Augmentation System (WAAS) and European Geostationary Navigation Overlay System (EGNOS) are the two main systems.

NATO Uses and Effects

- **Precision strike:** The accuracy and precision of fire are improved through GNSS-aided artillery and reduce target location error.
- **Force navigation:** NATO means (*i.e.* tanks and ships) can precisely plot their position and movements.
- **Logistic support:** Re-supply efforts, personnel recovery, combat search and rescue.
- **Network timing.**
- **Navigation Warfare (NAVWAR):** It encompasses various offensive, defensive and support operations to ensure unimpeded availability of PNT information for the Alliance and, when necessary, deny PNT information to an adversary. NAVWAR is a cross-domain (Land, Sea, Air, Space, and Cyberspace) and should be a consideration in all joint planning phases.
- **Land and coastlines accurate survey.**
- **Countering Improvised Explosive Devices (C-IED):** Mines can be precisely plotted for efficient retrieval.
- **Ballistic missile warning and defeat.**
- **Cryptographic support (key generation).**

Advantages

- **Global coverage:** The GNSS constellation provides continuous global service.
- **Accuracy:** Service is provided by the type of receiver used, the number of satellites in view, and the geometric configuration of those satellites.
- **Because GNSS equipment is passive,** it is capable of providing continuous real-time information to a potentially unlimited number of users. Any user with a receiver has access to the information.
- **Graceful degradation:** In the event the GPS constellation cannot be updated, accuracy will gradually degrade with time.
- **Grid reference:** The default navigation grid used by GPS is the WGS-84, which can be easily converted.

Disadvantages

- **Adversary:** Exploitation of the GNSS can reduce the Alliance military advantage.
- **Jamming:** GNSS signal is very susceptible to jamming. The stronger the jammer, the larger the affected geographic area.
- **Environment:** Dense vegetation or steep terrain may diminish GNSS capabilities due to the lack of reception of signals.





Satellite communication station at Joint Warfare Centre during TRIDENT JAGUAR 2014. Photo by JWC PAO

- GNSS signals: Affected by atmospheric phenomena (especially during solar events) and signal multipath issues (signal bouncing between mountains or high buildings).
- Spoofing: An adversary could generate false signals to mislead an authorized user with respect to positioning or timing information.

3 Intelligence, Surveillance and Reconnaissance (ISR)

ISR systems enable through imagery to obtain information about activities and resources of an adversary and to secure data concerning the geographic characteristics of a particular area of interest, including denied areas where little or no data can be obtained from other sources without putting at risk personnel and means.

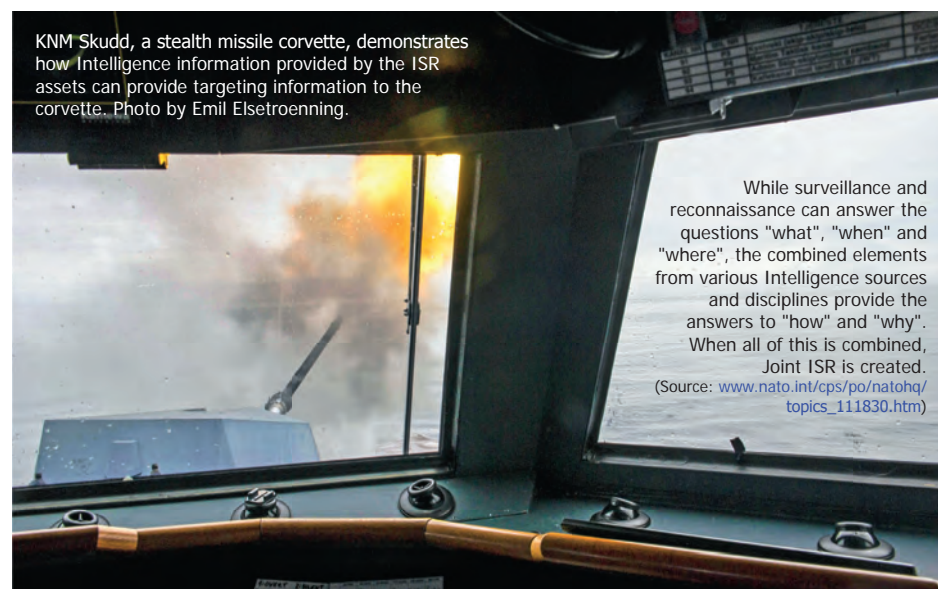
Space-based sensors provide long-term wide or narrow area surveillance, at a range of resolutions (up to less than 1 metre) and spectra. Satellites in LEO (Low Earth Orbit) and MEO (Medium Earth Orbit) can provide coverage of targets within minutes, and GEO satellites can provide continuous surveillance because their orbits give them the persistent access to large portions of the Earth, even though with a worse resolution.

When using ISR capabilities, the following factors should be considered: what kind of information is required (e.g. what type of im-

agery, resolution and coverage) and how often the information is required (*i.e.* revisit time). Both factors are strongly interconnected with each other and will determine what type of product is received. For planning purposes, it is important to note that a product with a better resolution usually coincides with smaller coverage and an increased revisit time. Vice versa, a lower resolution usually is associated with a larger area of coverage and shorter revisit time. It is possible to increase the resolu-

tion by pointing the sensor towards the area of interest during the satellite's orbit, but this limits the coverage.

The most common ISR sensors are Electro-Optical (EO), Infrared (IR) and Synthetic Aperture Radar (SAR). EO sensors provide photography-like imagery by using the visible wavelengths, *i.e.* wavelengths that the human eye can capture. The main advantage of this type of product is the simplicity of reading the image, so the information needed can be extracted



KNM Skudd, a stealth missile corvette, demonstrates how Intelligence information provided by the ISR assets can provide targeting information to the corvette. Photo by Emil Elsetroenning.

While surveillance and reconnaissance can answer the questions "what", "when" and "where", the combined elements from various Intelligence sources and disciplines provide the answers to "how" and "why". When all of this is combined, Joint ISR is created.
(Source: www.nato.int/cps/po/natohq/topics_111830.htm)



immediately. IR/thermal sensors provide imagery by exploiting the temperature of bodies, which makes observations possible during low light conditions. One factor to consider is that EO and IR sensors are impacted by terrestrial weather conditions and can result in a poor image/product. SAR satellites offer a significant advantage over EO and IR satellites. Since they are not affected by weather conditions such as clouds and fog, they can penetrate vegetation (foliage penetration), and they are able to capture pictures also during hours of darkness. SAR data can be used to reveal things like camouflage, disturbed dirt or even tire tracks on grass fields and underground features, which optical satellites cannot distinguish. A factor to take into consideration is that SAR imagery necessitates significant processing time and analysts.

NATO Uses and Effects

- Operation preparation
- Battle Damage Assessment (BDA)
- Intelligence
- Targeting
- C-IED

Advantages

- Coverage: Global and wide-area coverage over denied areas where little or no data can be obtained from other sources. Due to various UN Space treaties, any Space asset can overfly any territory on Earth without authorization, which allows them to take images and gather Intelligence without authorizing border crossing authority, or risking any Earth-bound ISR assets (Maritime, Air and Land).
- ISR systems enhance planning capabilities by providing updated information regarding terrain and adversary force dispositions.
- 3D-imagery and feature measurement. Stereo imagery provides 3D-imagery and features identification and measurement.
- Feature characterization: Panchromatic, multispectral, and hyperspectral imagery are

contributing sources of data for the development and update of Geo-Information Systems (GIS). This type of imagery provides information on terrain (e.g. soil composition and surface moisture conditions), oceanic conditions, vegetation, ice coverage, and even sub-surface/underground conditions.

Disadvantages

- Orbits: Depending on their orbit, ISR satellites may suffer gaps in surveillance periods.
- Predictability: Overfly schedule dictated by the satellite orbit. By their nature, satellite revisit times are predictable. Therefore, a threat-aware adversary could adjust its activity to avoid intelligence gathering.
- Resolution: Depending on the type of sensor and orbit, different levels of resolution can be achieved. EO and radar-based sensors can reach sub-metric resolution, while IR sensors have lower resolution of approximately 20 metres.
- Spectrum constraints: EO sensors have a limit in operating during daylight and in good weather conditions. IR sensors also require good weather, but can operate in day or night. Radar sensors can collect in every light and weather conditions.
- Atmospheric disturbances: Fog, smoke, electrical storms, precipitation and clouds affect the ability of imaging systems.
- Priority conflicts: High demand—Low density (HD/LD) assets may lead to conflicts on the use of satellite ISR capabilities. During a crisis, geospatial information producers are in direct competition with Intelligence activities for national collection systems. In some cases, this competition could be mitigated by the use of civil and commercial imagery sources.
- Vulnerability: Anti-Satellite (ASAT) weapons and Space debris represent two sources of vulnerability for ISR satellites.

Meteorology and Oceanography (METOC)

Environmental monitoring satellites are typically placed in either sun-synchronous or GEO orbits, and provide terrestrial environmental monitoring, which include both atmospheric and oceanographic assessments. Understanding METOC-derived information is crucial for operational planning due to the impact it can have on a Space system's ability to complete its mission.

METOC is also in charge of the Space weather forecast service. Space weather consists of various phenomena which affect the near-Earth environment, the satellites themselves and their capability to operate effectively. Examples of phenomena referred to as "Space weather" include charged particles from sun activity like cosmic rays and the Van Allen radiation belts. Space weather can cause a shutdown or loss of services that could seriously affect communications, navigation accuracy and sensor performance.

NATO Uses and Effects

- Mission planning
- Munition selection
- Terrestrial (atmospheric and oceanographic) and Space weather forecasting
- Humanitarian assistance

Advantages

- Coverage: Environmental satellites gather data in remote or hostile areas, where little or no data can be obtained via, for example, terrestrial-based means.
- Manifold data: Environmental satellites typically gather data in three main spectral bands: the visual band (coverage and extent of clouds, ice fields, snow, etc), the infrared band (thermal characteristics of atmospheric features), and the microwave bands (sea surface winds, ground moisture, ice char-

	EO	IR	SAR
Resolution	High (<1 metre)	Low (20 metres)	High (<1 metre)
Operational Time	During daylight	All day	All day
Weather Conditions	Only clear sky	Only clear sky	All weather
Image Processing	Easy	Easy	Requires time and expertise

ABOVE: Main characteristics of EO, IR, and SAR sensors. For more information see page 67.



Turkish-led maritime exercise, MAVI BALINA, involving NATO and regional forces in the Eastern Mediterranean to improve interoperability and proficiency in anti-submarine warfare scenarios. Photo by CPO Christian Valverde, HQ MARCOM (Source: U.S. Naval Forces Europe-Africa Website at <http://www.c6f.navy.mil/news>)



acteristics, atmospheric temperatures, and water vapour profiles).

Disadvantages

- Resolution: The biggest limitation of METOC capability is represented by the need for a compromise between resolution and time over target. Polar-orbiting satellites have periodic revisit rates over the target area, and therefore have a limited time over target for observations. However, these satellites provide global coverage and high-resolution data at all latitudes. On the contrary, geosynchronous satellites provide lower resolution images, but they maintain a constant view of their coverage area. Coverage at polar latitudes is poor.

5 Space Situational Awareness (SSA)

Space capabilities have become essential to many operations, and this dependency will only increase in the future. Monitoring of Space provides the ability to detect and mitigate the impacts that Space objects have on satellites and their services. SSA includes information from both ground-based sensors

(e.g. radars and telescopes) and Space-based sensors (i.e. sensor payloads on board of satellites). SSA capability gives satellite controllers time to employ effective countermeasures against potential hazardous events in order to assure the operational capability and protection of the Space system.

Much of the existing debris and micrometeorites in Space are too small to track using current sensor capabilities. About 30,000 man-made objects in Earth orbit are estimated to be large enough (10 centimetres or larger) to cause a total destruction of a Space asset in a collision. As orbits around the Earth become increasingly congested, a future collision may generate a runaway chain of events that creates collision after collision, rendering some orbits unusable for centuries. For this reason, it is vital for NATO to monitor the Space environment.

NATO Uses and Effects

- Space assets defence, including notification of potential collisions with Space debris.
- Surveillance of Space.
- Prevention of an adversary's ability to use Space systems and services for purposes hostile to a Nation's security interests.

6 Shared Early Warning (SEW)

USA is the only NATO Nation at present with dedicated Space-based assets for missile warning. NATO and USA have an established SEW policy, which assures that USA will provide Integrated Threat Warning and Attack Assessment (ITWAA) for all European NATO populations, territories and forces.

NATO Uses and Effects


- Force protection
- Early missile warning detection

Threats and Vulnerabilities

Space capabilities are vulnerable to both natural phenomena and man-made threats. Almost all natural hazards within the Space segment come from the sun. Various specific effects associated with solar activity are listed below:

- Individual charged particles can penetrate and damage electronic circuits, or reduce the reliability of electronic components.





"Multiple countries have developed and are frequently using military jamming capabilities designed to interfere with satellite communications and global positioning systems (...) To effectively deter adversaries – and potential adversaries – from threatening our Space capabilities, we must also understand their capabilities and their intent and make it clear that no adversary will gain the advantage they seek by attacking us in Space. We must apply all instruments of power and elements of deterrence."

**Admiral Cecil D. Haney
Former Commander USSTRATCOM**

F-22 Raptor photo by
U.S. Air Force Technical
Sergeant David Salanitri

- Increased electromagnetic noise and ionospheric interference.
- The continuous impact of solar particles on the satellite's outer surface can cause physical damage.
- Increased solar activity warms the outer layers of the atmosphere, causing it to expand outwards from the Earth. This can affect orbits by increasing drag.

Space debris is the main man-made hazard, however, this is not the only threat for satellites. Orbits around Earth have become increasingly cluttered with debris. Space systems provide a tremendous advantage to NATO and Nations and therefore are a high priority target for our adversaries. Allies must protect their national assets by anticipating adversary attempts to degrade, disrupt or deny friendly force access to Space capabilities (*i.e.* Defensive Counter-Space), while doing the same against the enemies (*i.e.* Offensive Counter-Space). Defensive Counter-Space (DCS) includes every action taken in order to deny adversary capacity the possibility attacking Space assets and capabilities, and it is mainly an Earth-to-Earth activity. DCS aims to protect and preserve friendly Space capabilities, withstand or suppress enemy

attacks, and restore/recover from it. Offensive Counter-Space (OCS) aims to deny, degrade, destroy or deceive an adversary's Space capability or the Space support provided by a third party. It can be reversible or non-reversible, kinetic or non-kinetic, and is mostly an Earth-to-Earth activity. OCS capability includes:

- **Jamming:** An electronic signal consisting of the intentional emission of radio frequency signals to interfere with wireless communications, thus leading to disruption or denial of service.
- **Spoofing:** It is the process of identity falsification, put in place in order to gain illegitimate advantage on the use of the adversary's devices and information.
- **Anti-satellite (ASAT) Weapons:** Weapons designed to incapacitate or destroy satellites for strategic military purposes. They can be subdivided into Kinetic-Energy Weapons (KEW) or Directed-Energy Weapons (DEW). Both types of ASAT weapons can be ground-, air- or Space-based.⁹ KEWs are usually designed to incapacitate or destroy the satellite while DEWs are designed to permanently damage or disrupt the satellite's communications or sensors. DEWs

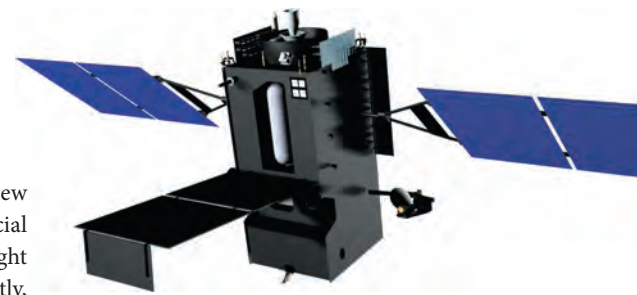
have the advantages of being discreet (*i.e.* less traceable), as radiation above and below the visible spectrum is invisible and does not generate sound. These include:

- **Ground-based kinetic energy attacks (also referred to as direct-ascent):** Ballistic missiles can carry a warhead above the atmosphere into LEO and release it in the direction of the target satellite. Satellites in LEO are well within range of ballistic missiles. Access to the MEO and GEO.
- **Space-based kinetic energy attacks:** These types of ASATs could be used in all orbits up to GEO and are deployed in space well before they are intended to be used. They are capable of delivering the same effects as ground-based kinetic energy attacks, but with much greater kinetic energy.
- **High-altitude nuclear explosion:** The intense electromagnetic pulse (EMP) resulting from a nuclear explosion would likely destroy all unshielded satellites in LEO that are in line of sight.
- **Laser attacks:** High-power lasers attacks can upset the delicate thermal balance of satellites in LEO long enough to damage the satellite's components.



- **Cyber-attacks:** Space systems present a possible triple opportunity for hackers; the hardware and software embedded in a satellite (by using bugs and malwares), the information that the satellite transmits, and the network of ground stations it relies upon. Not only satellite data and services make attractive targets for cyber-attacks, but there is also the potential risk that hackers could take physical control of satellites via remotely configurable computers or through a network intrusion of ground stations. Cyber-attacks could even lead to the destruction of a satellite. (An example of how a cyber-attack could do this is by adjusting solar panels to overcharge the energy system or by moving the satellite into the path of another satellite).

Finally, the intense competition to launch new satellite networks may also push commercial actors to develop cheaper solutions that might be less secure and less protected. Importantly, this may also affect the military domain, which increasingly relies on commercial satellites. ✦

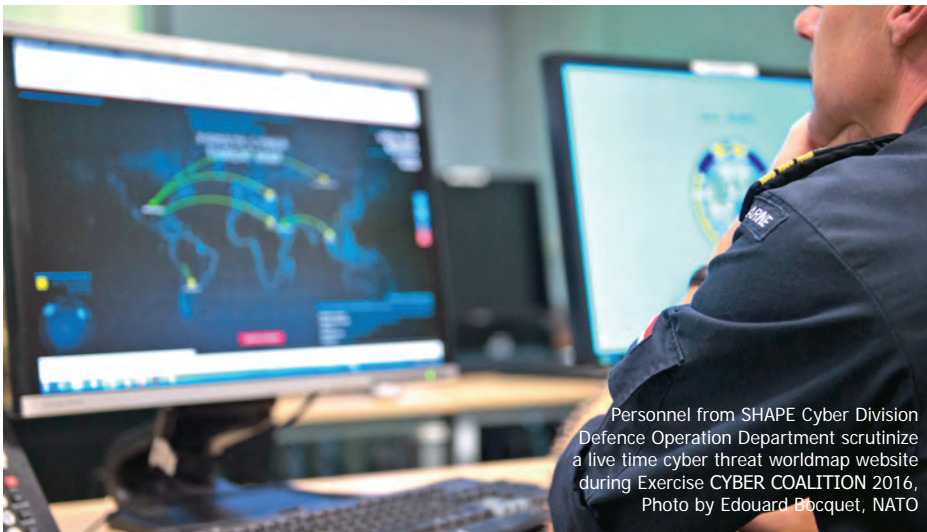


Space Based Infrared Systems

END NOTES:

- 1 Statement of Lieutenant John W. Raymond before the U.S. House Armed Services Subcommittee on Strategic Forces, 25 March 2015.
- 2 MCM 0108-2012 (NATO's approach to Space) and IMSM 0322-2016–(NATO's approach to Space–Follow on Work).
- 3 The result of processed and analysed data originated by Space-based sensors. Space products include but are not limited to Space imagery, and weather maps.

- 4 Space services are represented by a continuous stream of data, provided directly from Space to an end user terminal. Satellite communications and PNT (Positioning, Navigation and Timing) are examples of Space services.
- 5 Geostationary Earth Orbit (GEO): an orbit that matches Earth's sidereal rotation period (approximately 24 hours), placed exactly above the equator, at an altitude of 35,786 km. Satellites in GEO orbit move at the same pace as the Earth rotates. This means that their sensors remain stationary, focused on the same area of the Earth 24/7.
- 6 Low Earth Orbit (LEO): an orbit situated between 100 km and 2,000 km of altitude.
- 7 Highly Elliptical Orbit (HEO): a highly elliptical orbit used to provide 9-10 hours of continuous coverage to high latitudes regions.
- 8 Medium Earth Orbit (MEO): an orbit between 5,000 km and 24,000 km of altitude (PNT satellites are placed at 20,500 km).
- 9 From a legal point of view, the Outer Space Treaty (1967) is widely accepted as one of the primary sources of international Space law. As commonly interpreted, it does not forbid the use of Space capabilities for military purposes. The treaty prohibits the placing of any weapons of mass destruction, including nuclear warheads, in orbit around the Earth, but it does not prohibit the stationing of conventional weapons in orbit.



Personnel from SHAPE Cyber Division Defence Operation Department scrutinize a live time cyber threat worldmap website during Exercise CYBER COALITION 2016, Photo by Edouard Bbcquet, NATO

Capability	Partial or Complete Loss
SATCOM	<ul style="list-style-type: none"> • C3 info delayed, slower • No BLOS C2. Terrestrial land line communication only (if available)—reliant on radios, telephone, telegraph, much slower internet • RPAs radio controlled
PNT	<ul style="list-style-type: none"> • Precise location and ID of forces (no friendly force tracking) • No GPS-aided weapons: less accuracy. Rely on inertial guided radar, laser, personnel for targeting/fires • Must use maps • Personnel recovery goes from minutes/hours to days • C3 much slower and affecting decision/engagement space, actions, etc.
ISR	<ul style="list-style-type: none"> • Complete reliance on Air, HUMINT/ELINT/SIGINT, and Special Operations Forces • Lose overhead, persistent pre-crisis and crisis indications and warning
METOC	<ul style="list-style-type: none"> • Use of legacy weather prediction tools • Constant map surveying required due to global environmental changes
ITWAA	<ul style="list-style-type: none"> • Initial early warning of ballistic missile launch. Lose critical decision space. Approximately first-second minute of ~15 minutes intercept window • Forces and civilians more at risk to attack, damage and destruction

ABOVE: Impacts on operations due to partial or complete loss of Space capabilities.



How to Spot Potential Threats Using SAR for Change Detection

by **FLAVIO GIUDICE**
Aerospace Engineer
J3 Space Operations
HQ SHAPE

WITHIN NATO, Intelligence, Surveillance and Reconnaissance (ISR) is a prime user of Space-based capabilities. ISR systems provide the ability to acquire information regarding activities and resources of an adversary and to extract data concerning the geographic characteristics of a particular area of interest, including denied areas where little or no data can be obtained from other sources without putting at risk personnel and means.

Indeed, due to various UN Space treaties¹, all Space assets can transit any territory on Earth without prior authorization. This allows for Space-based ISR assets to take images and gather Intelligence without request-

ing border crossing authority, thus reducing the vulnerability of Earth-bound ISR assets (Maritime, Air and Land) to adversary actions. These are not the only advantages that Space-based imagery offers as compared to airborne imagery. Indeed, the latter cannot be acquired during degraded weather conditions and planes cannot assure the overflight of an area of interest along the exact same path over time. Additionally, even though terrestrial assets are more flexible in their deployment, they usually require a considerable amount of time to reach the area of interest.

However, some Space-based ISR systems are impacted by terrestrial weather conditions as well, which may result in a poor image collection. This is not the case of Synthetic Aperture Radar (SAR) satellites, whose imagery has been used in the study described in this article. Indeed, a radar signal is able to penetrate clouds, vegetation, and, in specific conditions, even the ground, thus allowing the

detection of underground objects. Additionally, SAR works in all light conditions.

A single satellite in a polar orbit² will overfly all locations on the Earth's surface. However, the revisit time cannot be adjusted and cannot be less than one day. In order to revisit a target more frequently, a constellation of satellites is needed. Additionally, for planning purposes, it is important to note that a product with a higher resolution³ usually coincides with a smaller footprint⁴ and a higher revisit time. Vice versa, a lower resolution usually is associated with a larger area of coverage and shorter revisit time. Finally, unlike aircrafts, satellites assure the passage along the same path every orbit.

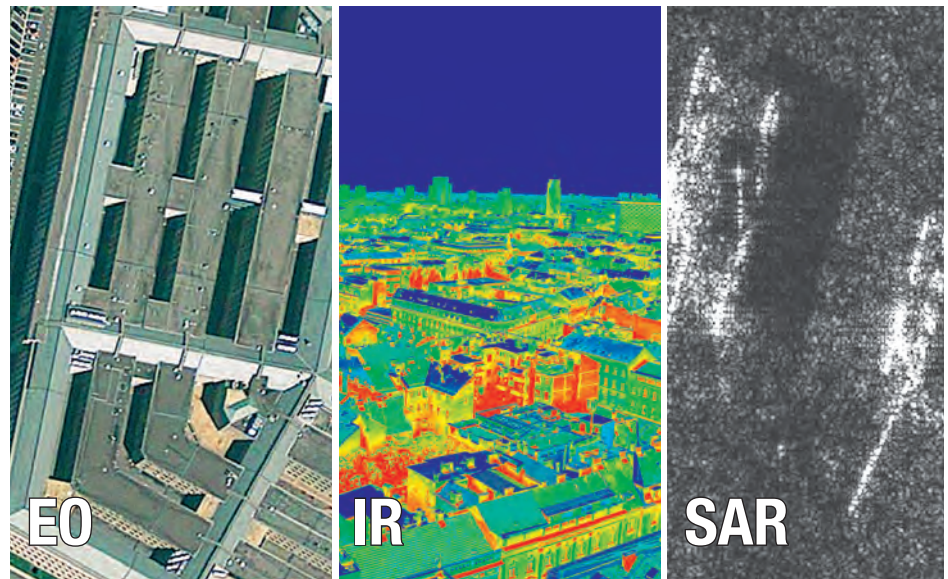
Among the several NATO uses and effects of ISR capabilities, Change Detection (CD) is one of the most useful for targeting, Intelligence and to counter Improvised Explosive Devices (IEDs). CD is intended to automatically or semi-automatically detect changes



over time in an area of interest. Depending on the image resolution, CD allows to spot objects of very small dimensions (*i.e.* less than 50 centimetres) or disturbed dirt and even tyre tracks on grass fields. If a change happens in an area of interest in the timeframe between two observations, it can be detected by imagery processing. Both natural and man-made changes are detectable; usually, natural changes are on large scale, while man-made ones are limited to small portions of the images. This article describes the ability of different techniques to spot small changes in SAR images, whether natural or man-made.

SAR Imagery

A SAR is a radar mounted on a moving platform (*i.e.* a satellite). It uses the motion of the platform over a target region to provide better resolution than conventional beam-scanning radars. The distance the SAR travels over a target in the time taken for the radar pulses to return to the antenna creates the large “synthetic” antenna aperture. In other words, the *size* of the antenna is given as the *sum* of positions that the antenna takes while “illuminating” the same area of interest. As a rule of thumb, the larger the aperture, the higher the image resolution will be, regardless of whether the aperture is physical (a large antenna) or synthetic (a moving antenna). This allows SAR to create high resolution images with relatively small physical antennas, which is a particularly important factor for Space-based assets because it implies a reduction of weight and conse-



ABOVE: Examples of the most common ISR capability products. From Left: Electro-optical (EO) imagery, infrared (IR) imagery and Synthetic Aperture Radar (SAR) imagery. EO sensors provide photography-like imagery, IR sensors provide imagery by exploiting the temperature of bodies, and SAR sensors use microwaves to get the image. The main advantage of EO and IR products is the simplicity of reading the image, so the information can be extracted immediately. On the other hand, they are affected by terrestrial weather. SAR imagery is an all-day, all-weather product, but it necessitates significant processing time and analysts. All these capabilities are fundamental for Space support in NATO operations.

quently of costs of putting such device in orbit. SAR imagery is obtained by exploiting the interaction of a microwave signal (X-band: frequency = 8 to 12 GHz, wavelength = 2.5–3.75 cm) with terrain and objects on Earth. To create a SAR image, successive pulses of waves are transmitted to “illuminate” a target scene, and the echo of each pulse is received and recorded: (1) The radar on board of the satellite (the payload⁵) emits electromagnetic signals, (2) The waves propagate through the

atmosphere (clouds included), (3) The pulse is backscattered by objects on the Earth’s surface, (4) The echo reaches back to the sensor, which creates the SAR imagery.

Significant computational resources are required to process the observations. However, the new technologies with higher computing speed allow such processing to be done in near-real time on board a satellite. The result is a map of radar reflectivity⁶, including both amplitude and phase. The amplitude information, when shown in a map-like display, gives information about ground cover in much the same way that a black-and-white photo does. Unfortunately, the phase differences between adjacent image picture elements (“pixels”) also produce random interference effects called speckle, which is a sort of graininess with dimensions of the order of the resolution.

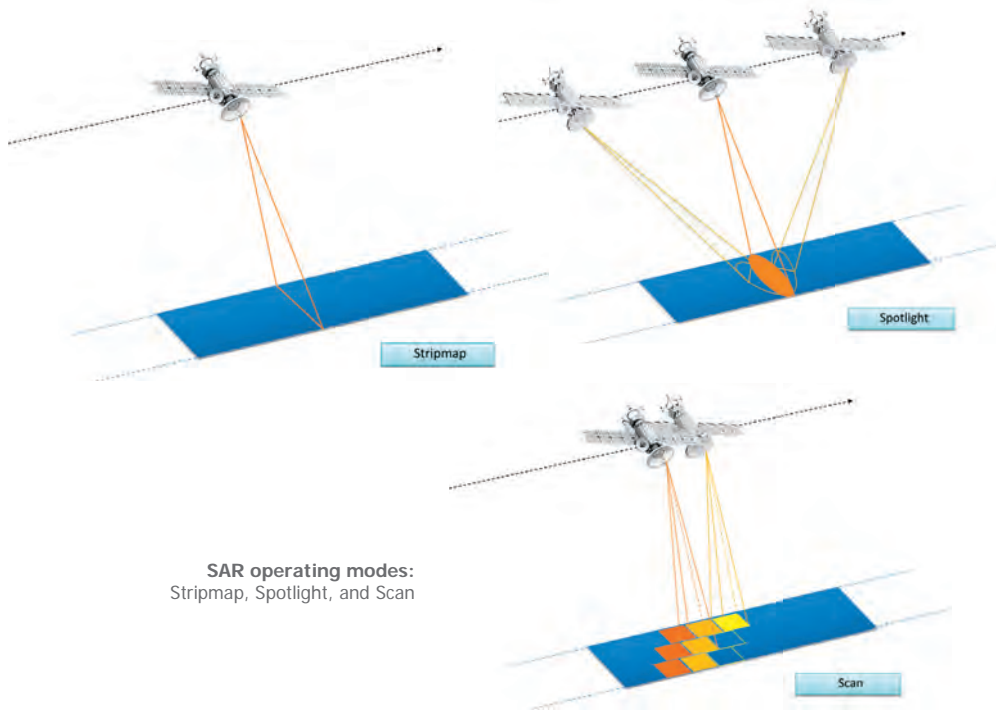
The SAR imagery has wide applications in remote sensing and mapping of the surfaces. Some of the other important applications of SAR are as follows:

- **Topography:** If the two samples are obtained simultaneously (perhaps by placing two antennas on the same satellite, some distance apart), then it is possible to extract terrain



NATO Global Hawk unmanned surveillance aircraft. Photo by © Northrop Grumman





altitude as well as radar reflectivity, producing a Digital Elevation Model (DEM).

- **Geology:** SAR polarimetry is a technique used for deriving qualitative and quantitative physical information for land, snow and ice, ocean and urban applications. Radar waves have a polarization. Different materials reflect radar waves with different intensities, but anisotropic materials such as grass or sand often reflect different polarizations with different intensities. Polarimetry uses the changes in the random polarization returns of some surfaces and between two images of the same location at different times to determine where changes not visible to optical systems occurred. Also, polarimetry allows terrain classification and subsurface imaging. Examples include subterranean tunneling or IED hidden underground.
- **Volcano and earthquake monitoring (interferometry):** If the two samples are separated in time, perhaps from two passes over the same terrain, it is possible to detect and quantify terrain shifts between observations. This is a powerful tool in geology, glaciology and geography, and can be used for mapping land deformations due to earthquakes or to forecast volcanic eruptions and assess their consequences.
- **Environment monitoring:** Such as forestry, which includes forest height, biomass, deforestation; oceanography; oil spills; flooding; urban growth; global change.

- **Military surveillance:** Includes strategic policy and tactical assessment.
- **3D imagery of moving targets (inverse SAR):** By observing a moving target over a substantial time period with a stationary antenna.

Objects in motion within a SAR scene alter the Doppler frequencies of the returns. Such objects therefore appear in the image at wrong locations. Generically speaking, the higher their speed is, the further they will be from their actual position. For example, trains appear away from their tracks, and road vehicles may be depicted off the roadway and therefore not recognized as road traffic items.

SAR mainly operates in three modes:

- **Stripmap mode:** The antenna stays in a fixed position. When the antenna aperture travels along the orbital path, a signal is transmitted and the backscatter of each of these signals is commutatively added on a pixel-by-pixel basis.
- **Spotlight mode:** In this mode, the radar beam is steered continually as the spacecraft moves, so that it “illuminates” the same patch over a longer period of time, thus giving better resolution for a smaller ground patch.

- **Scan mode:** The antenna beam sweeps periodically and thus covers much larger area than stripmap and spotlight modes.

The radar signal can be written as sum of two terms: one term represents the power of the signal itself, and one its phase. By analysing both these terms, it is possible to extract from the image a huge amount of information (*i.e.* the speed of objects on Earth, the presence of camouflaged means, etc). Techniques that exploit both these terms are known as coherent techniques, and allow also the detection of “microscopic” changes (up to the dimension of the resolution cell of the image). If only the term that describes the power is analysed, we talk about incoherent techniques; these are not able to distinguish small changes at the same degree as coherent ones.

Typically, “useful” signals are mixed with disturbances (*i.e.* thermal noise, interferences, clutter, etc). The echoes coming from the same targets are definitely correlated (they are similar) one to each other because they are deriving from the same object. On the contrary, the noise (N), by its nature, is composed by samples that are statistically independent. In fact, by taking into account all the phases coming from the same target, it is possible to significantly increase the performance of the Signal-to-Noise Ratio (SNR), which for the case of this study is most properly called Clutter-to-Noise Ratio (CNR).

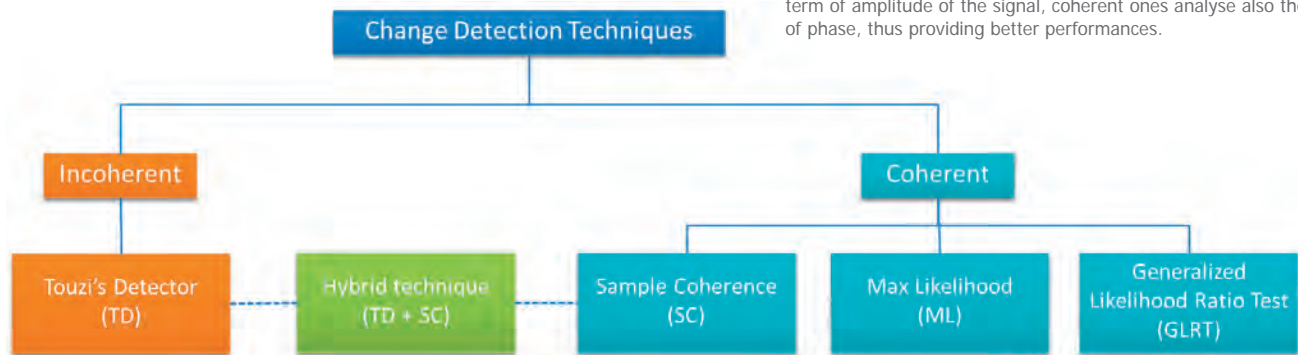
Change Detection Fundamentals

It is necessary to introduce some fundamental concepts of CD. False Alarm (FA) refers to the case in which a change is detected whilst it did not take place in reality. Generically speaking, a false positive error is a result that indicates a given condition has been fulfilled when it has not. The opposite situation, known as misdetection, occurs when a change happened, but it is not detected. This situation is also known as false negative, and indicates that a test condition failed, while it was successful. Any change test must make a trade-off between these two common metrics.

In order to assess the performance of different techniques, this study has been conducted with a probabilistic approach. With respect to the concepts of FA and misdetection,



BELOW: An overview of the Change Detection techniques used. Incoherent techniques exploit only the information contained in the term of amplitude of the signal, coherent ones analyse also the term of phase, thus providing better performances.



we will call them Probability of False Alarm (P_{FA}) and Probability of Misdetction (P_M), indicating the probability that these events happen. P_{FA} represents the proportion of all negatives that still yield positive test outcomes. P_M is the proportion of positives, which yield negative test outcomes.

The probability complementary to P_M is called Probability of Detection (P_D), and represents the probability of detecting a change that actually occurred. It is the key performance indicator in CD analysis. Probabilities range between 0 and 1.

The decision about the presence of an useful signal among disturbances (*i.e.* thermal

noise, interferences, clutter, etc) is based on the overcoming of a threshold (T). Since the P_{FA} depends only on T and noise (N), once N is known it is possible to find the value of T for a fixed value of P_{FA} ($P_{FA}=10^{-3}$ has been considered acceptable for the purposes of this study). Generally speaking, the lower the desired P_{FA} , the higher the T , but at the same time the higher the P_M and consequently the lower the P_D .

For this study, SAR images have been created by modifying one image with different levels of CNR (from 0 dB [decibel] to 40 dB) and different values of the coefficient of decorrelation R (from 0 to 1), which describes the similarity between two images (the higher the value of R is, the more similar the images are). In other words, we create different images starting from one single image, just by varying both the terms of amplitude (CNR) and phase (P) of the signal in accordance with a Gaussian-like probability. Parameters as CNR and R will have subscripts 1 and 2 for the two images compared, respectively.

Readers need not understand the math behind the methodologies, but should be aware that the Monte-Carlo Method (MCM) has been chosen in order to calculate the aforementioned parameters with a probabilistic approach. In particular, according to the Neyman-Pearson Criterion, P_{FA} is taken constant (Constant False Alarm Rate condition $P_{FA}=10^{-3}$) and so that P_M is minimized, thus maximising P_D .

In Bayesian statistics, the Monte-Carlo method is one of the most known and robust methods used in modelling problems that require integration over hundreds or even thousands of unknown parameters. This study is focused on coherent techniques, but includes an incoherent method as well in order to es-

timate the difference in performance between these two approaches. A “hybrid” incoherent-coherent technique has also been assessed.

The process used to assess the performances of all the techniques includes two different phases:

1. **P_{FA} analysis:** Provides the value of T in correspondence to $P_{FA}=10^{-3}$ when CNR and R vary.
2. **P_D analysis:** With the values of T computed in the P_{FA} analysis, the trend of P_D is calculated for the correspondent combinations of CNR and R of the second image, which are called respectively CNR_2 and R_2 .

Touzi's Detector (TD)

The first technique, TD, is incoherent, which means that the decision about the presence of a change is based on the variations of the average backscattering power of the scene. This particular technique considers the ratio between the intensity of signals of the two images. This ratio is then compared with the threshold T , and the hypothesis of change is verified or not, depending on the overcoming of T . As expected, the values of T in correspondence of $P_{FA}=10^{-3}$ are higher for higher values of CNR and R .

Indeed, in these cases the noise has a smaller role than the clutter, and the two images are strongly correlated (more similar); hence it is more likely to detect a change that actually is not a change (FA).

As foreseen, values of P_D are quite low when values of P_{FA} are high, and vice versa. Also, it is normal that the performance decreases for lower values of P , since in this case images are less correlated one to each other and it will be more difficult to detect changes. Likewise, P_D

BELOW: A transmission system radio maintainer mounts a helical antenna to an AM-1 to send and retrieve information via satellite. Photo by Airman 1st Class Zachary Hada, U.S. Air Force.



decreases when CNR decreases, because clutter will be “covered” by noise. The negative peak of performance is placed in correspondence of $CNR_1=CNR_2$. Therefore, TD is sensitive to the variations of power, while it is not to the variations of coherence. This means that it fits more with man-made changes, which usually imply huge variations of the power in the areas of the image where changes actually happen.

Sample Coherence Detector (SC)

This coherent technique uses the cross-correlation coefficient as the main parameter to assess the performances. It quantifies the level of resemblance of two images by describing the correlation between scenes observed at different moments in time. It is also known as “coherence”, and ranges between 0 (total changes) and 1 (no changes at all). Disturbances like tyre tracks on a grass field can potentially cause the complete loss of coherence without any change in the average backscattering power of the image. For this reason, coherent techniques are more performant than incoherent ones.

Performances of SC depend on the ability in distinguishing decorrelation due to man-made disturbances and decorrelation due to other natural factors (e.g. rain, wind, etc). CD

is strongly dependent on the level of contrast between man-made changes and other sources of decorrelation. The coherence depends on the number of pixels considered in the estimation window. The more they are, the more likely is a high contrast between man-made changes and other disturbances. While man-made changes usually cause a total decorrelation localized within few pixels of the observed scene, natural phenomena bring a high level of decorrelations spread over the whole picture.

This is particularly true when the second image refers to a moment very far in time from the first one (e.g. a different season of the year). As a consequence, SC is subject to high level of P_{FA} , while the amplitude of the signal is less affected by environmental phenomena. The poor performance in terms of P_{FA} can be mitigated by doing a vast operation of averaging. However, this operation decreases image resolution. In the same resolution cell there might be pixels that have been changed and others that have not; therefore, this procedure leads to a degradation of performance in terms of P_D .

Areas with no changes will be characterized by a level of coherence between 0.2 and 0.7. It will never reach the theoretical level of 1 because of the speckle, which makes every picture different from the other ones also if no

change happens. Therefore, the bigger the estimation window, the lower is the P_{FA} .

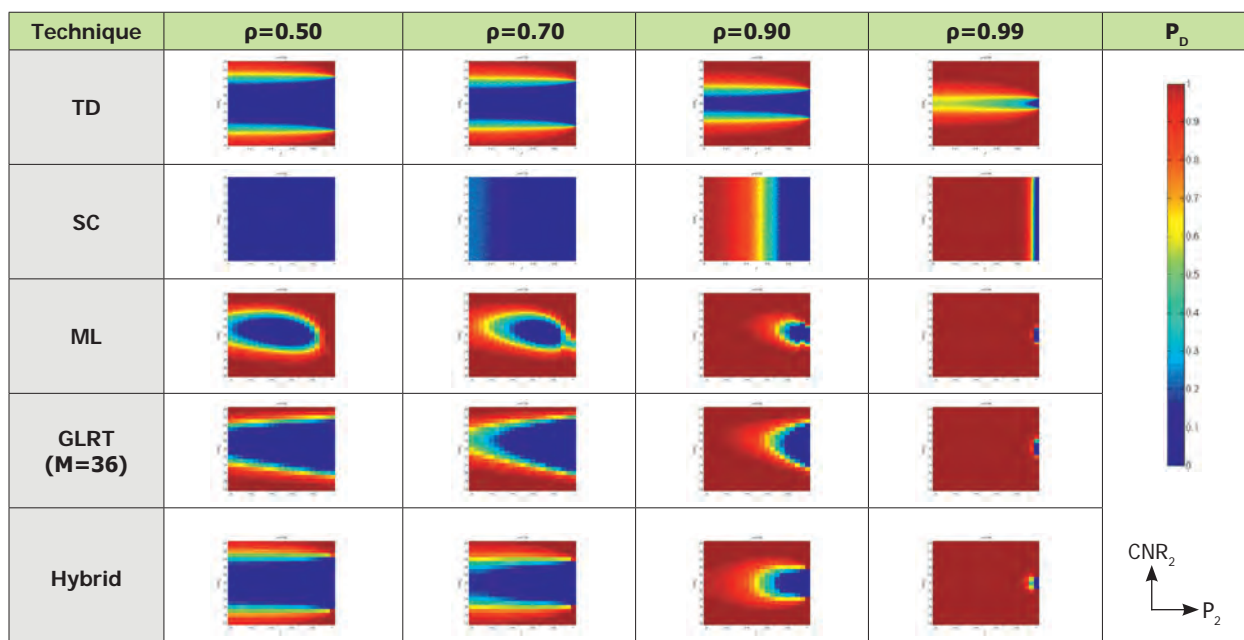
From the P_{FA} analysis, the level of T is generically higher than it was with Touzi’s Detector, so for high values of P we expect a higher level of P_D . Hence, the SC detector is not sensitive to variations of power while it is to variations of coherence.

Max Likelihood Detector (ML)

This method is based on a different approach to the problem. In fact, in order to separate man-made changes from non-man-made ones, we hypothesize that some of the characteristics of the image are known. This is a strong hypothesis, so that this detector is also known as the clairvoyant detector, and is considered the ideal/optimal method.

The P_{FA} is sensitive to the variations of the coherence, more rapidly when R and CNR have higher values. For this technique the cancellation notch is similar to a circle, and it is located in correspondence of $CNR_1=CNR_2$ and $P_1=R_2$ because for that condition the two images are more similar to each other. Performance increases as CNR and P_D increase. This method offers great performances but it assumes the knowledge a priori of some characteristics of the image, which most of the times is an unre-

BELOW: An overview of P_D performances for the different techniques. TD is sensitive to CNR variations, SC to coherence variations, while ML, GLRT and the Hybrid technique are all sensitive both to CNR and coherence variations.



alistic hypothesis, unless in-situ measurements come along with the satellite image.

Generalized Likelihood Ratio Test (GLRT)

This coherent technique can be considered an adaptive version on ML, since the parameters that were (unrealistically) considered known in ML, for this technique are computed by extracting some information directly from the images. More specifically, these values stem from the pixels around the so-called Cell-Under-Test (CUT), a section of the image which slides along the image every step, in order to estimate these parameters considering data from the entire image.

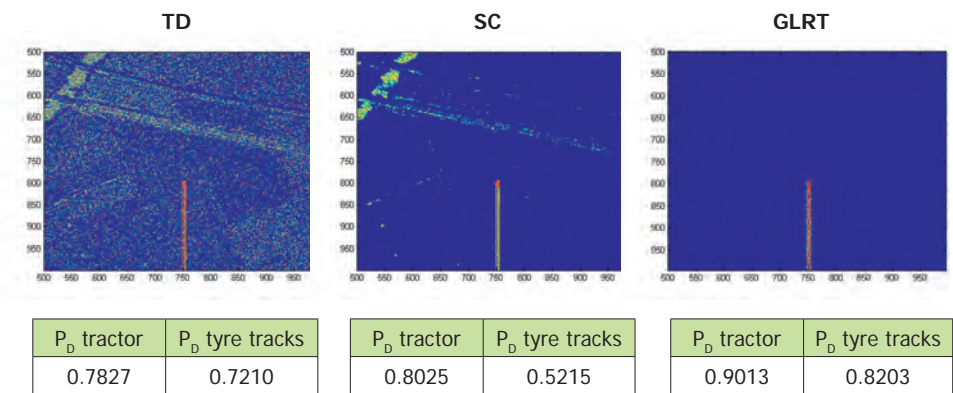
The performance of this detector changes depending on the number (M) of pixels composing the ring around the CUT. This technique has similar performance to ML: it is sensitive to both power and coherence variations, and the main losses (compared to ML) are in the area where R is bigger than P_2 , an area of little interest since it is difficult to think of a change that makes the two images more correlated one to each other.

It is important to notice that the performance of GLRT asymptotically gets closer to the performances of ML as the number of pixels of the evaluation ring increases. If this number is equal to the number of the image's pixels, GLRT's performance coincides with that of ML.

Hybrid Detector (HD)

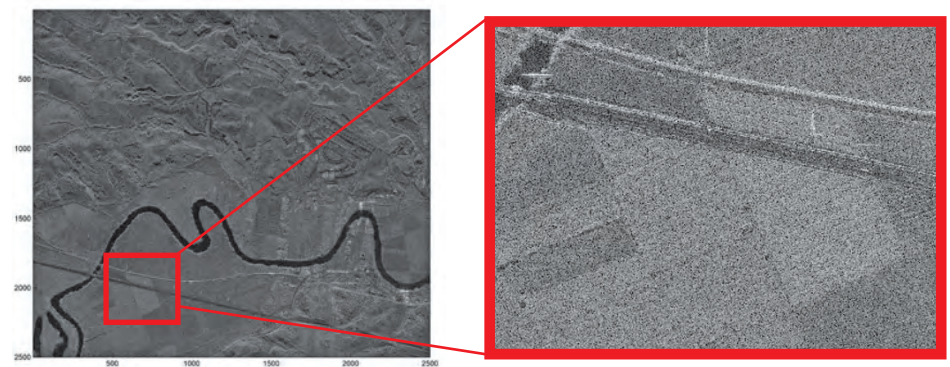
By observing the outcome in terms of PD obtained with the previous techniques, it is worth noticing that we can obtain a good performance by combining TD and SC. Even more advantageous than simply merging the best results stemming from these two techniques, is to combine them through the operation know as logical-or. In other words, the probability is calculated when the condition of TD or the condition of SC is verified. Since two different techniques contribute at the same time, for each technique should be considered $P_{FA} = 0.5 \cdot 10^{-3}$ (half of the P_{FA} used up to now for the other techniques).

For low values of R the hybrid technique presents huge losses compared to GLRT and to ML. However, it has good performances (comparable with the ones from the other two tech-



ABOVE: Performances of TD, SC and GLRT detectors.

BELOW: Cosmo-SkyMed image with the changes introduced (tractor and tyres' tracks on the grass field).



niques) when R assumes high values, which is actually the most interesting circumstance. In this situation, the loss in terms of performance is negligible, while the advantages are huge with respect to simplicity of coding the technique; robustness, and computational cost. Additionally, no knowledge of image's characteristics or a priori assumptions are needed.

Real Case

After this theoretical/probabilistic analysis, the more promising techniques have been applied to SAR images obtained by Italy's Cosmo-SkyMed. For this article we took into consideration a X-band (Frequency=9.6-10.9 Hz) image, captured by the satellite at an altitude of 627 km, having a resolution of 1 metre in one direction, 1.2 metre in the other direction. This resolution is bigger than any kind of tyre, but the techniques are equally valid if imagery with a better resolution is used. The covered area is 7,503 metres x 8,470 metres.

As we did in the previous analysis, we take the image and decorrelate it using a

decorrelation coefficient (P). For this analysis we considered $P=0.9$ and $CNR=20$ dB. We consider a patch of the image, which has been taken so that it includes most of the characteristics of the entire image (e.g. grass fields, motorway, railway, water, etc). From the P_{FA} analysis it results that the performance is comparable to the one obtained with the simulated images. For GLRT we consider an estimation ring composed by 40 pixels, placed around the CUT and sliding along the image.

In the patch two changes have been added: an agricultural mean (i.e. a tractor), which is completely decorrelated with respect to the first image ($R=0$), and its tyre tracks on the grass field, which have a decorrelation factor of about 0.2. In the remaining parts of the image, the decorrelation is about $R=0.9$. Also, the value of power has decreased by 5 dB for the vehicle and by 3 dB for the tyre tracks. All these values have been taken from in situ measurements.

With TD it is possible to distinguish the changes in the image with a good P_D , even though it is an incoherent technique. The number of false alarms is negligible; also, since they



are very sparse within the image, they do not create any ambiguity. With SC the level of false alarms is lowered with respect to TD. Also, they are mostly placed in correspondence to the river, where CNR has low values. However, that area can be easily distinguished from the others, and the presence of false alarms does not compromise the general performance of the technique. The GLRT detector allows to completely remove all the false alarms. The areas close to the changes are an exception, but the value of P_D is still low (around 0.2). From this point of view, the GLTR technique offers the best performance, with average values over 0.9 for the mean and around 0.82 for the tyre tracks, 90% and 82% of probability to detect the change respectively.

In conclusion, no technique can be considered the absolute best. However, the choice depends on different factors: the nature of the target to detect (man-made or natural), the CPU available, which is a non-negligible aspect since often images have dimensions of several GB. More, all the techniques can be applied both over air- and Space-borne images.

How the NATO Joint Force Commander Benefits From the ISR Capability

While Nations are not likely to allocate a satellite to a NATO mission or exercise, they can provide a set or allocation of imagery and data in response to a request for information. NATO's primary source of ISR is the USA National Geospatial-Intelligence Agency (NGA), which uses commercial data from the Digital-Globe satellites. NATO receives data from the NGA to the NATO Intelligence Fusion Centre (NIFC) located in the United Kingdom. With the exception of optical data provided by the

USA via the NGA, NATO does not have any standing agreements related to Space-based ISR neither with governmental entities nor with commercial providers.

Within NATO member countries, the main ISR assets are reported in the table below. Italy's Cosmo-SkyMed, Germany's SAR Lupe, Canada's Radarsat II, the EU's Copernicus, and USA's national means are the most important SAR assets. CD techniques could be very useful in support of NATO operations because they can automatically or semi-automatically provide information about the movement of enemy forces, otherwise impossible to detect.

The same techniques applied in the case of tyre tracks over a grass field are equally applicable to the case of a convoy driving through a sandy zone, or even to detect the movement of groups of people on smooth surfaces (*i.e.* gravel roads, snowy fields, deserts, etc). Change Detection is only one



Photo by HQ MARCOM

of the many applications that can be taken as example to show how essential ISR capability is in supporting NATO operations. Through this capability, the Joint Force Commander is able to gather a wide range of information, useful for very different purposes, from military operations to humanitarian or disaster relief operations. More, by its nature, Space is the ultimate high ground. This implies that information can be collected anywhere in the world and immediately received somewhere else, thus allowing decision makers to effectively assess the situation in battlefields, natural catastrophe scenarios, and for peacekeeping as well. ✦

END NOTES:

- 1 Mainly the United Nations Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, commonly known as the UN Outer Space Treaty.
- 2 An orbit in which a satellite passes above or nearly above both poles of the body being orbited on each revolution, in this case the Earth.
- 3 This higher resolution provides the ability of distinguishing two objects in the image.
- 4 Area of the Earth covered with a single sight from the satellite.
- 5 The payload houses the mission components consisting of instruments and also the tools designed for the specific mission.
- 6 In general, a measure of the efficiency of a radar target in intercepting and returning radio energy. It depends upon the size, shape, aspect, and dielectric properties of the target.
- 7 Several additional launches are scheduled. Besides, numerous contributing missions provide complementary data.

BELOW: NATO member countries' main ISR assets.

ISR asset	Constellation	Sensor	Resolution	Data provided to NATO
SAR Lupe (DEU)	5	SAR	0.5 m	Special request
Cosmo-SkyMed (ITA)	4	SAR	<1 m	Special request
Helios (FRA, ITA, BEL, ESP, GRC)	2	EO & IR	0.4 m	Special request
Pleiades (FRA)	2	EO	0.5 m	Special request
Radarsat II (CAN)	1	SAR	0.8 m	Special request
National Means (USA)	Several	EO, IR, SAR	<1 m	Special request
Copernicus (EU/ESA)	3 ⁷	EO, IR, SAR	<1 m	Free / Special request

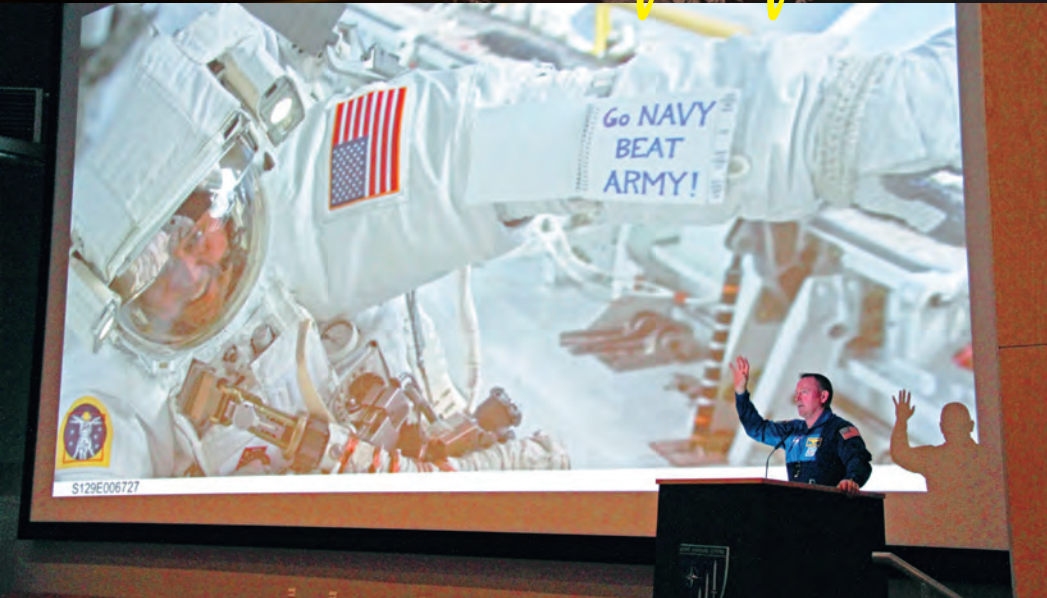


Compiled from various sources, including:

- All About Space Magazine (www.spaceanswers.com)
- NASA (www.nasa.gov)
- Norwegian Space Centre (www.romsenter.no)
- NATO (www.nato.int)
- JWC (www.jwc.nato.int)

SPACE

fun facts



• (Above) NATO Satellite Communications System (SATCOM) becomes operational on 1 January 1973. Photo by NATO.

• (Left) Two astronauts with NASA's STS 129 Mission, U.S. Navy Captain Barry Wilmore and Mike Foreman, visited the JWC on 21 September 2011, to give a presentation about the STS 129 Mission aboard Space shuttle Atlantis, which took place in November 2009. Photo: JWC PAO

• AISSat-2, Norway's second national satellite, was launched on 8 July 2014 to monitor maritime traffic from Space. The price for developing and launching AISSat-2 was NOK 12 Million! (€1.3 million)

• **DID YOU KNOW?** A brand-new version of the NATO Space Handbook ([20131220-NU-BI-SC-Space-Handbook-2013.pdf](#)) is going to be released very soon, written by the author of the two articles in this Issue, Mr Flavio Giudice, who provides an in-depth explanation of Space fundamentals useful to support NATO operations.

• Don't forget to check Allied Joint Doctrine for Air and Space Operations AJP-3.3. Also to note is Space Support to NATO Operations: NATO Dependencies on Space ([20140425-Report-to-MC-NATO-Dependencies-on-Space.pdf](#)).

• One word: Exoplanets! Google "TRAPPIST-1" star and learn more about the recently discovered seven Earth-sized planets at a distance of 40 light years away from Earth. The image at the top is by NASA/JPL-Caltech.

• Civilian exploration of Space will reach new heights with SpaceX's Dragon 2 spacecraft. The private Space company will fly citizens to the Moon in 2018! The journey into Space lasts about a week, 644,000 kilometres (400,000 miles)! And, if you want to explore the latest on Space, try phantom energy, dark gravity and dark radiation.



"Amazing! Well done, NASA!
Send my love to the aliens."

Sir Paul McCartney's message to NASA, following the Space agency's transmission of the Beatles song "Across the Universe" into Space on 4 February 2008, to commemorate the 40th anniversary of the song!



The Truth is Out There

WW

WHITE & GREY CELL

by SQN LDR PETER SEANOR
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THE RIGA SUMMIT Declaration in 2006 stated that “today’s challenges require a comprehensive approach by the international community involving a wide spectrum of civil and military instruments.” Since then awareness of the comprehensive approach has steadily increased within NATO, and in today’s complex security environment it is not difficult to understand why there is a need to adopt such an approach. The difficult part is actually be-

ing able to combine political, civilian and military instruments to defeat a hybrid threat or win an irregular war. If NATO is to accomplish this, then exercises must create training environments, which challenge operational commanders and their staff not to focus simply on the military aspect, but also to consider the political, economic, social, infrastructure and information domains.

One of the main ways the Joint Warfare Centre (JWC) achieves this is by establishing

a “White and Grey Cell” in its exercises. The White and Grey Cell comprises role players from political, civilian and military organizations who hold a series of key leader engagements and working level meetings with members of the Training Audience during both the planning and execution of an operation.

Having originally been called the White Cell (which comprised international organizations [IOs] and non-governmental organizations [NGOs]) the term Grey Cell was subse-



TRIDENT JAGUAR 2017 OLRT.
Photo by JWC PAO



quently introduced to recognize the inclusion of host nation military and non-IO/NGO officials. These days JWC uses the overarching term “White and Grey Cell”, which covers all agencies, organizations and individuals outside of the NATO force structure and outside of the Opposing Force (OPFOR) structures.

Operational Liaison and Reconnaissance Team

For many people at the JWC, the focus is on the final execution phase of an exercise. We are all aware it is happening and almost everyone is involved. “Sub-Phase 3B” represents the culmination of over two years of scenario development, planning conferences, scripting workshops and training. Whilst this phase is also important for the White and Grey Cell, it is not the first time the role players come together to interact with the Training Audience.

A few months prior to Phase 3B, an eclectic group of individuals of different nationalities, ages and backgrounds gather on the third floor of JWC to form the White and Grey Cell. After three or four days of preparation and training, they are ready to adopt their alter egos and meet with members of the Operational Liaison and

Reconnaissance Team (OLRT). The OLRT is a discrete team, formed by the Training Audience to contribute to the process of gaining early, first-hand situational awareness in a designated area that may become a future theatre of operations. The information the OLRT gathers is analyzed and passed back to its headquarters to inform the Crisis Response Planning process. Much of this information is gleaned from face-to-face meetings with members of the White and Grey Cell.

Some Training Audiences, under pressure from their headquarters to obtain specific information, come equipped with a long list of questions and demands for the host nation role players. However, they quickly learn that the flow of information is not just in one direction. As would be the case in the real world, the representatives from the host nations have their own requirements and questions for NATO, and this often challenges the Training Audience. It is much harder to answer questions than to ask them.

During the week, the White and Grey Cell may have as many as thirty to forty face-to-face engagements with the OLRT. These will often be followed up by phone calls and e-mail exchanges to clarify and expand on topics dis-

cussed in the meetings. To maximize use of the limited time available, the meetings on the first couple of days are scheduled prior to the arrival of the OLRT with agendas predetermined. As the week progresses though, and relationships are established, it is up to the OLRT members to arrange follow up meetings as required.

In order to ensure the role players provide the Training Audience with coherent and consistent information, internal White and Grey Cell formal coordination meetings are held twice a day. Under the guidance of Chief White and Grey Cell and supported by members of JWC’s scenario team, these meetings allow the role players to provide feedback about the engagements they have had, and seek further direction and guidance for their future meetings.

Estonia, TRIDENT JUNCTURE

During the OLRT Phase there is always a balance to be struck between reality and ensuring key information is passed to the Training Audience in an efficient and time effective manner. For TRIDENT JUNCTURE 2016, it was decided that the OLRT would break with tradition and not deploy to the controlled en-





TRIDENT JUNCTURE 2014 White Cell with the Estonian Contingent at JWC. Photo by JWC PAO



The author during EXCON situation update presentation. Photo by JWC PAO

vironment of the JWC, but instead travel to Estonia, the “host nation” in the exercise setting. Therefore, the White and Grey Cell, in order to hold face-to-face meetings with the OLRT members, had to do the same and formed up in Tallinn a few days prior to the arrival of the OLRT. The Estonians, already based in Tallinn were joined by representatives from Lithuania and Latvia, a humanitarian role player, and permanent staff from JWC to prepare for engagements with the OLRT from Joint Force Command Naples. Hosted by the recently established Estonian NATO Force Integration Unit (NFIU), the initiative added realism by allowing the OLRT to conduct meetings with officials in government buildings within Tallinn and military staff within their own HQ.

Command Post Exercise (CPX) Execution

After the OLRT phase, the White and Grey Cell members go their separate ways and do not formally come together again under the auspices of the White and Grey Cell until Exercise Control (EXCON) training just before the final execution phase. However, in the interim, nearly all will be invited back to Stavan-

ger as Subject Matter Experts to take part in the “Incident Development” and “Scripting” Workshops. It is at these events they develop the incidents and write the injects, which will form the basis of the White and Grey Cell’s exercise play and interactions during the execution phase.

THE INTRODUCTION a couple of years ago of the White and Grey Cell Section within the Content Branch, under JWC’s optimized structure, formalized the professional approach, which JWC has to leading the White and Grey Cell. The small team of three permanent staff, dedicated full time to planning and managing the White and Grey Cell, builds experience and ensures continuity from one exercise to another.

Although it is advantageous to bring in new people with fresh ideas and currency for different exercises, JWC tries to use the same team for the different events of each specific exercise. Where possible, the people who were in the White and Grey Cell for the OLRT phase will be those who are invited back for the Incident Development and Scripting Workshops and then for the execution phase. This ensures

“The White and Grey Cell, along with the Media Section, represents JWC’s Front-of-House.”

continuity and means that the White and Grey Cell is at a distinct advantage over many of the Response Cells who only come together as a complete cell during EXCON training a few days prior to the start of the execution phase.

The period of time between the training for the OLRT and the final execution phase is normally around six months and during this time the role players will develop an in-depth understanding of the scenario and also have the opportunity to build working relationships with each other and the JWC permanent staff. By the time the start of Phase 3B comes around the White and Grey Cell is operating as a close knit professional team.



Deployed White and Grey Cell during TRIDENT JAGUAR, Istanbul, Turkey. Photo by JWC PAO



It is vital that the role players have an in-depth understanding and awareness of what is happening during the execution phase of an exercise. One of the differences between the White and Grey Cell and the Response Cells in EXCON is that all the White and Grey Cell members will hold face-to-face meetings with the Training Audience. This means they will, at times, be put on the spot. If they are to remain credible and keep the exercise on track, they need to be able to provide answers or give opinions quickly and accurately without the luxury of being able to consult with other people in EXCON. Being aware of the script and future direction of the exercise means there will also be times when they have information which, if revealed too soon, could jeopardize the entire exercise. Knowing what not to say can be just as important as knowing what to say. Preparation is therefore key and whilst synchronization takes place throughout the day, the White and Grey Cell Daily Coordination Meeting is a crucial event in the EXCON battle rhythm for the role players.

Although the White and Grey Cell is normally based at JWC during the OLRT Phase, for the execution Phase, the Cell needs to be at the same location that the Training

Audience deploys to in order that face-to-face engagements can take place. For about half of the exercises this will be at JWC, but for the remainder it will be overseas.

Recent years have seen the White and Grey Cell deploy to Spain, Bulgaria and Turkey. Away from the purpose built facilities of JWC, this can provide several logistic challenges. The main issue though, with the White and Grey Cell travelling to another country, is that it is dislocated from the rest of the EXCON, which remains behind at JWC. This makes it much harder for the team to maintain situational awareness about what is happening in the Response Cells back at JWC and the latest direction from Chief Main Events List/Main Incidents List (MEL/MIL), the events managers and the OPFOR. The important daily White and Grey Cell Coordination Meeting, which allows the role players to discuss issues with the scenario team, event managers and Chief OPFOR, has to be conducted over a speaker phone, which is never easy given there could be over 50 people participating!

The White and Grey Cell Reach Back Coordinator role is also key in maintaining the link between the deployed Cell members and the rest of EXCON.

Composition

The composition of the White and Grey Cell varies depending on the setting and scenario, but will typically include personnel representing host nation military and security forces, which are not under the command of NATO, host nation political personnel and national and regional IOs/NGOs. One of the main factors which determines the make up the White and Grey cell is whether the “host nation” in the scenario is real or fictitious. If the host nation is a NATO country, which is able to support the exercise, then the White and Grey Cell will predominantly comprise military and governmental officials from that country. When the host nation is fictitious (for example *Arnland* in the TRIDENT JAGUAR Series of Exercises, or *Lakuta* and *Tytan* in Exercise TRIDENT JUNCTURE 2015) then these positions will be filled by Subject Matter Experts who have a background, which makes them suitable to role play a fictitious government official or military representative.

The size of the White and Grey Cell is again dependent on the scenario. Numbers normally range from between twenty and fifty. Exercises using personnel from real host na-



TRIDENT JAGUAR 2014
OLRT. Photo by JWC PAO



A meeting on
gender topics
during TRIDENT
JAGUAR 2017,
Phase 3B. Photo
by JWC PAO



tions and scenarios with multiple host nations involved tend to have larger White and Grey Cells. The size also increases when “real world” organizations participate.

Real vs. Role Played

If Training Audiences are asked whether they want to meet with a “role player” or someone from a real world IO/NGO, they will probably opt for somebody from the “real world” because they assume it will be more realistic.

However, the term “role player” can be slightly misleading. There is a danger it conjures up images in the minds of the Training Audience of JWC staff officers wearing wigs, with a penchant for amateur dramatics pretending to be high ranking officials. The reality is the “role players” used are Subject Matter Experts who are carefully selected because they have extensive experience of the roles they play. When the Training Audience enters the room to have an engagement with the UN Special Representative of the Secretary General (SRSG),

they will meet with a former UN SRSG. If they have a meeting with an ambassador, they will encounter a former ambassador or very senior diplomat. Whilst the Cell has not yet had a former prime minister join the team, the people playing senior politicians work or have worked in the various ministries they replicate. In recent exercises the role players from the Baltic States have often known and worked with the ministers they portray.

However, despite the success of using “role players”, there are advantages of augmenting the White and Grey Cell with people from “real world” organizations. Therefore, IOs/NGOs and government organizations are routinely invited to take part in NATO exercises. To a certain extent, even the personnel from the real world organizations have to role play in order to fit in with the scenario, but at the same time, they can just be themselves and represent their organizations in a completely realistic way. Not only does the Training Audience learn a lot from working with real world organizations, but the hope is that the IOs/NGOs also benefit by learning about how NATO operates.

Developing these relationships and understanding in the training environment



Lt Gen (Ret.) Drs Anton van Osch
a.k.a.
His Excellency, Ambassador
Anthony Vochs
EU Special Representative
in the "Skolkan Region"

Former national representative in Military Committees of NATO and EU and Director General EU Military Staff.

Lt Gen (Ret.) van Osch's experience as military advisor to the EU High Representative and Vice President is key in understanding comprehensive planning and operations, including the cooperation with several EU Special Representatives in crisis areas.



The main players of the TRIDENT JAGUAR 2017 White and Grey Cell. Photo by JWC PAO



DRAMATIS PERSONAE

should ultimately make it easier to work together if required on future operations which, as NATO is well aware, will undoubtedly require a comprehensive approach:

"Lessons learned from NATO operations show that addressing crisis situations calls for a comprehensive approach combining political, civilian and military instruments. Building on its unique capabilities and operational experience, NATO can contribute to the efforts of the international community for maintaining peace, security and stability, in full coordination with other actors.

Military means, although essential, are not enough on their own to meet the many complex challenges to our security. The effective implementation of a comprehensive approach to crisis situations requires nations, international organizations and non-governmental organizations to contribute in a concerted effort."¹

Whether they are meeting real world IOs and NGOs, retired ambassadors and generals or political staff from the ministries of NATO countries, members of the Training Audience appreciate the value the White and Grey Cell adds to the exercises. They quickly learn that they need to listen to and take into consideration the host nations' concerns and

be aware of the requirements of the IOs and NGOs. They also appreciate that the role players used are experts in their field who are there to help them learn and not to catch them out. The Training Audience never gets to meet the vast majority of the hundreds of people working away behind the scenes in EXCON to keep the exercise running on track. They will communicate with some members of LOCON and HICON by phone, e-mail or VTC but others in key positions, such as Chief MEL/MIL and Chief OPFOR, they will never communicate with. The White and Grey Cell, along with the Media Section, represents JWC's Front-of-House. These are the people from

EXCON who the Training Audience gets to meet with daily. These are the people who look the Training Audience members in the eye, apply the pressure, challenge them, put them on the spot and at times push them out of their comfort zone. It is at precisely these times that the conditions are set for learning to take place and NATO becomes better trained and equipped to use a comprehensive approach in the future. ✦

END NOTES:

1 A Comprehensive Approach to Crises http://www.nato.int/cps/en/natohq/topics_51633.htm



ABOVE: TRIDENT JUNCTURE 2015 OLRT deployment, Stavanger. Photograph by JWC PAO

CIMIC

in the TRIDENT Exercises

by TOM GOOCH
CIMIC Subject Matter Expert
Scenario Section
Joint Warfare Centre

“Military means, although essential, are not enough on their own to meet the many complex challenges to our security. The effective implementation of a comprehensive approach to crisis situations requires nations, international organisations and non-governmental organisations to contribute in a concerted effort.”¹

THE ABOVE STATEMENT, taken from the NATO Website, makes it clear that the military must understand how it fits into the larger environment. Civil/Military Cooperation (CIMIC) and Civil Military Interaction (CMI) are a vital part of how the military can achieve this. CIMIC is a joint function comprising a set of capabilities integral to supporting the achievement of mission objectives and

enabling NATO commands to participate effectively in a broad spectrum of CMI with diverse non-military actors.² CMI, on the other hand, is a group of activities, founded on communication, planning and coordination that all NATO military bodies share and conduct with international and local non-military actors, both during NATO operations and in preparation for them, which mutually increases the effectiveness and efficiency of their respective actions in response to the crisis.³

In today’s ever evolving security environment where conflict is not restricted to the battlefield, CIMIC functions and CMI activities remain key to NATO mission success. The Warsaw Summit in 2016 gave guidance in a wide range of areas. One such piece of guidance was the following:

“Our efforts to enhance the Alliance’s role in projecting stability will be guided by enduring principles, including a 360-degree approach, commitment to democracy, human rights and the rule of law, complementarity with international actors, in particular with the UN, EU, and the OSCE and focusing on NATO’s added value, local ownership and buy-in, partner involvement, inclusiveness, tailored cooperation, long-term commitment, prioritisation and sustainability, and overall coherence.”⁴

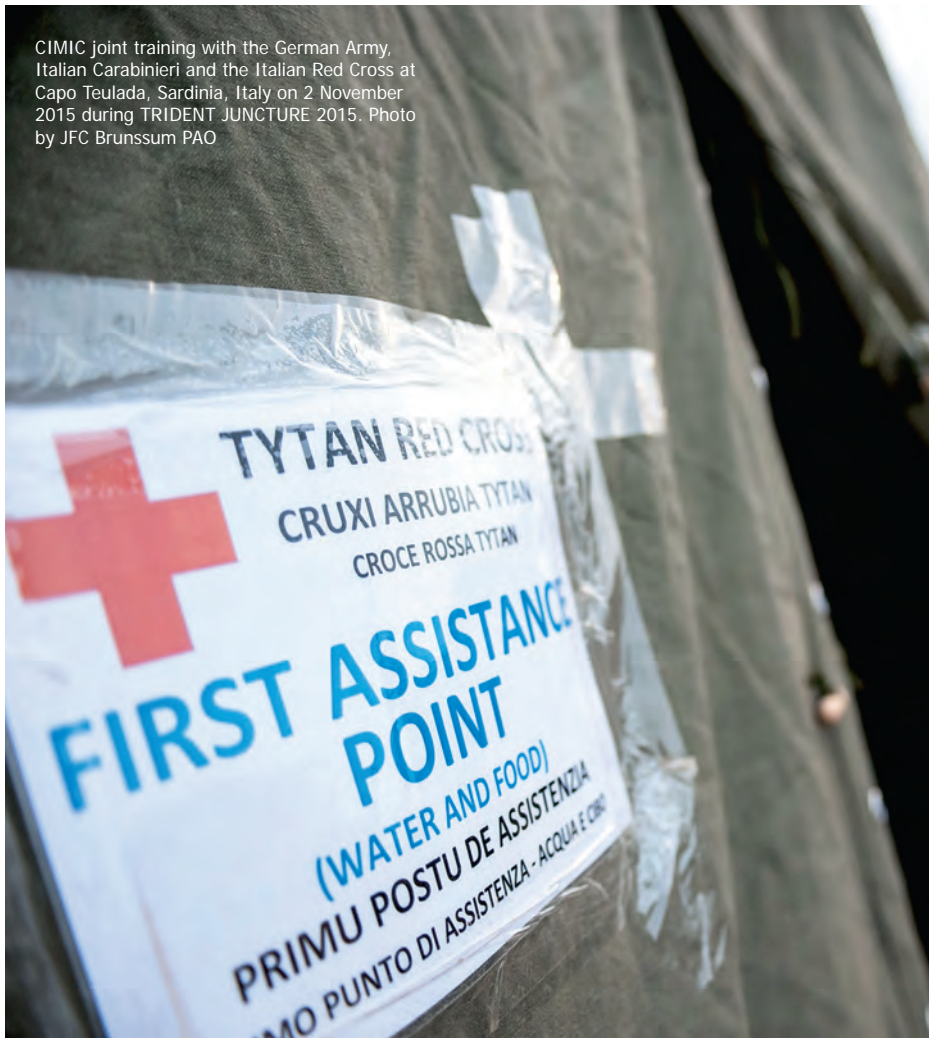
Much of the above relates directly to CIMIC and CMI. There is, therefore, a requirement to exercise CIMIC and CMI in the full range of environments that NATO commanders may find themselves operating in. For the JWC, this means holding Non-Article 5 Crisis Response Operations (NA5CRO) and Article 5 Opera-



Meeting between the OCHA and JWC White/Grey Cell representatives and 1GNC staff during TRIDENT JAGUAR 2017. Photo by JWC PAO



CIMIC joint training with the German Army, Italian Carabinieri and the Italian Red Cross at Capo Teulada, Sardinia, Italy on 2 November 2015 during TRIDENT JUNCTURE 2015. Photo by JFC Brunssum PAO



The replication of the host nations can also challenge the assumption that the resilience of democratic NATO member nations is high. The TRIDENT exercises have to deliver suitable depth in order to fully train and challenge CIMIC. This is achieved by the development of the civil environment.

The Host Nation Structures and Capabilities

No one country in the world conducts its affairs in the same way as any other. Within the exercise environment, a Training Audience may be required to engage with multiple host nations. It is critical that Training Audiences understand these host nation structures and procedures to allow for smoother deployment and sustainment of the NATO force, as well as ensuring NATO force acceptance.

In order to understand the situation in suitable depth and detail, the Training Audiences have the opportunity to engage with all key functions of government; from policing and health to transport and communications. In addition to this, they can engage with national civil society groups on topics such as gender and crisis management.

Impact of Conflict on Civil Environment

Since the end of the Cold War, it is estimated that more than four million people have been killed in violent conflicts. This human cost is not the only price societies pay; conflict also triggers economic, political and social breakdown.⁷ It is those who are most vulnerable who pay the highest price in conflict. Some reports estimate that of the four million killed since the end of the Cold War, two million were children. It can be tempting to see the savagery of war as a remote concept that does not apply to NATO, or Europe. However, it only takes a cursory look into history to show that Europe has a mastery of barbarism in conflict.

All conflicts bring death, destruction and suffering; this is an inescapable truth and our exercises must reflect it. To achieve this, TRIDENT exercises build in population displacement, civilian casualties, destruction of civil infrastructure, violations of human rights, children and armed conflict, conflict-related gender-based violence, violations of international humanitarian law, cultural property protection,



tions (Collective Defence), which is achieved through the TRIDENT Series of Exercises. There are a range of complex environments that can be used to facilitate these exercises.

The challenges for CIMIC differ depending on the type of operation, but these challenges still sit within the core functions of CIMIC: Civil Military Liaison, Support the Force and Support Civil Actors and their Environment.⁵ For NA5CRO operations, CIMIC maybe more focused on Support to Civil Actors and their Environment, while on Article 5 operations this focus may shift to Support the Force activities.

The findings of the CIMIC Centre of Excellence report on “CIMIC in Collective Defence” highlighted that in an Article 5 setting, NATO would be a *third responder* to any civil issues after the host nation, EU or the OSCE and other state and non-state actors.⁶

NA5CRO Exercises

These exercises are designed to replicate the complex environment that NATO might encounter when operating outside NATO member countries.

Article 5 Exercises (Collective Defence)

The Warsaw Summit gave very clear strategic directions towards greater emphasis on the core NATO task of Collective Defence. These settings are designed to replicate a sovereign NATO member nation (or nations) as the host nation. This necessitates Training Audiences to understand that CIMIC activities require nation-specific adaptations. The exercises also create friction between NATO and host nation authorities due to the natural tensions between a deployed force and the civil environment.



The ugly face of war: It was this building the Norwegian United Nations Preventive Deployment Force soldiers moved into March 1992 when they arrived at Sarajevo. The building was evacuated later when the siege of Sarajevo made the presence dangerous. Photo by Torbjørn Kjosvold, Forsvaret

building integrity and many other civil themes. Training Audiences, therefore, must have an appreciation of the effects of their actions on the civil environment and, where appropriate, mitigate these effects. Where mitigation is not possible, a commander must be able to justify any actions that have had a negative impact on the civil environment and population.

“Training Audiences must have an appreciation of the effects of their actions on the civil environment and where appropriate mitigate these effects.”

International State and Non-State Actors

In coordination with SHAPE and individual Training Audiences, real world international organisations and non-government organisations are invited to take part in JWC exercises. These organisations contribute to the civil environment and bring in-depth knowledge on a range of topics. These topics span security force assistance, international humanitarian law, humanitarian assistance, protection and access, use of the UN cluster system, international policing, disarmament, demobilisation and reintegration, children and armed conflict, women, peace and security, and protection of civilians. The understanding of who these organisations are and what they do within the operating environment is vital for any Training Audience.

The involvement of these organisations also allows for the relationship-building outside of the exercise environment. It is within these realistic but artificial worlds that Training Audiences get to experience the full range of challenges they might find in a real conflict. The civil environment is just one of these challenges.

As the JWC moves forward with its set-

tings and exercises, so does the civil environment we replicate. The depth and detail that we present to the Training Audiences gets better all the time, as do the interlinkages with other parts of the exercise environment. This improvement is a constant process reliant on the JWC maintaining global situational awareness, as well as a detailed knowledge of NATO policies and doctrine. We must continue to strive to better challenge Training Audiences in the civilian domain, to push commanders out of their comfort zone, and to ensure that our exercises are truly comprehensive. ✦

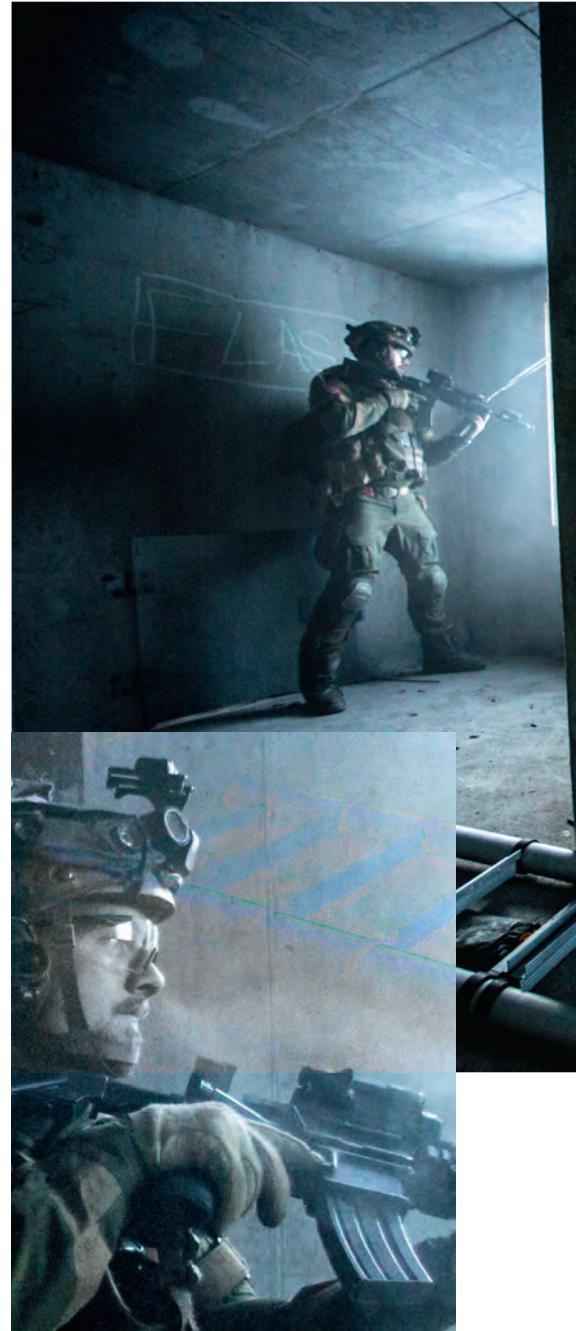
END NOTES:

- 1 http://www.nato.int/cps/nl/natohq/topics_51633.htm
- 2 NATO (2014b). MC 411/2
- 3 NATO (2014b). MC 411/2
- 4 Warsaw Summit Communique, July 2016.
- 5 CIMIC Handbook V4.0
- 6 CIMIC Considerations in Support of Collective Defence, CIMIC Centre of Excellence, 2016.
- 7 <http://un.org/esa/socdev/rwss/docs/2001/15%20armed%conflict.pdf>

Challenges and opportunities of developing a NATO Stability Policing Capability

Constant changes to the international security environment require NATO to deal with new challenges on a daily basis. On the one hand, the Alliance is engaged with worldwide asymmetrical threats and non-state actors such as terrorists, insurgents, and various other criminals, including those that operate by exploiting new cyber communication technologies. The roles these people play both in domestic and international affairs have been identified as an emerging security instability trend.¹

by COLONEL VITTORIO STINGO
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Headquarters of the Supreme Allied Commander Transformation
(HQ SACT)



On the other hand, there are human and economic themes² that are dominating the world scene: changing demographics, urbanisation, human networks and fractured identities will continue to shape global, regional and local security considerations. Resource scarcity, energy issues and shortages of food and water will exacerbate existing tensions and may lead to increased competition to control and/or retain access to vital resources. The societal, political, military and economic environment





Photo by Olav Standal Tangen, Forsvaret

concept and demand a new body of specialised assets capable of increased operability in extremely uncertain environments.⁵

THE NATO STABILITY Policing concept development and experimentation project, recently established by HQ Supreme Allied Commander Transformation, Norfolk, Virginia, U.S., is aimed at filling this gap. This one-year project will consist of four workshops (Rome 24-27 October 2016, Bucharest 27 February-3 March 2017, Amsterdam 15-19 May 2017 and Vicenza October 2017) to foster the new concept and empower NATO with a new capability and new capacities.

The workshops recently held in Rome, Bucharest and Amsterdam achieved resounding success and were attended by 120 international experts, military, civil servants and police officers from over 42 worldwide organisations and institutions. Some of the main highlights focused on what the future operational goals of Stability Policing should target: border control, counter-terrorism and hybrid activities. Notably, such police and law enforcement actions can be performed in pre-crisis settings or settings undergoing transition and are more akin to typical law enforcement activities carried out during conflicts and in post-crisis environments.

Policing and its role in the wider rule of law, society and justice system is a key issue in crisis states or conflict-ridden environments. Remarkably, the police are frequently the main government interlocutor with citizens and represent the institution that most affects the population. As they exert a pivotal role in leveraging the relationships with the citizens, the police can have exceedingly positive or painfully negative effects.

As the Afghan theatre has shown, a lack of trust between the general public and a police force that is too military-oriented and inadequately equipped to solve crimes, will provoke a deterioration of the security situation. As a result, there is a need for police reform strategies that are more civilian police oriented, aimed at community policing, administrative and leadership roles and able to provide a safe and secure environment, as well as economic well-being and freedom.

For all the said reasons, it is critical that local police learn how to gain people's trust

will, in the future, most likely be influenced and shaped by this fast growing evolution and profound transformation.

Among the biggest challenges are the public security gap and the spoiler threat from criminalised power structures, as defined by Professor Mike Dziedzic in several of his publications³. The public security gap, as defined by the late U.S. Ambassador Bob Oakley and Professor Dziedzic in *POLICING THE NEW WORLD DISORDER*⁴, plagued most international interventions up to 1998. The described gap had three very different components: a deployment gap, an enforcement gap, and an institutional capacity gap.

In his publications about criminalised power structures (CPS), Professor Dziedzic examines ten case studies that demonstrate CPS is a predominant cause of the failure of

peace and stability operations. CPS and spoilers generally are not monolithic: they vary in their orientation toward the peace process and in their propensity to use violence. Stability police forces are essential to deal with this leading threat.

One of the most decisive tools in coping with CPS is criminal Intelligence-led policing, which cannot be accomplished successfully without the capabilities of a stability police force. Mass migrations, evolution in technologies, cyber threats and social engineering, natural disasters, weapons of mass destruction, sprawling urbanisation, transnational organised crime and unaccountable and ineffective governments are generating persistent instability and potential new conflicts around the globe. These emerging factors and associated uncertainty and instability require a new





General Denis Mercier, SACT. HQ SACT leads the NATO Stability Policing Concept Development and Experimentation. Photo by NATO

as the activities, conducted throughout the full spectrum of the conflict, aiming at establishing a safe and secure environment for the local population, restoring public order and security, countering irregular activities, and creating the conditions for improved governance and development. Such activities may include the reinforcing or temporary replacement of the indigenous police forces in order to contribute to the restoration and/or the maintenance of public order and security, rule of law and protection of human rights. Under a Comprehensive Approach, a combination of military and non-military actors will be employed to achieve this goal.

THE NEED FOR NATO to establish a military capability of Stability Policing emerged during the Stabilisation Force (SFOR) operation in Bosnia and Herzegovina. In 1997, Allied Command Europe identified the so-called security gap. This grey area emerged between the SFOR military capabilities and the UN International Police Task Force mission. Both groups lacked executive powers and local police force capabilities and were often either incapable or unwilling to enforce the law. In this grey area nobody could or would take responsibility. The gap was filled by a military unit capable of performing some typical police

and confidence through appropriate and specialised training in order to effectively respond to the needs and help develop the society in terms of security and prosperity. An unaccountable, ineffective and repressive police force, often associated with corruption (bribes, mismanagement and embezzlements) could trigger violence and fuel radicalisation.

NATO MISSIONS AND involve-ments respond to numerous complex situations in fragile and war-torn countries, thus contributing extensively to crisis management and to coherence and coordination of the international community's efforts to re-establish security, development and control. When it comes to NATO's involvement in such situations, the Alliance needs to establish its role and procedures on how to intervene, contribute and assist in support of international global efforts for security and stability. These types of operations consist of post-conflict security stabilisation, as was done in the Balkans, training of local security forces, as currently being done in Afghanistan, and development of security policies for new governments, much like what NATO has begun to implement in some countries.

These initiatives represent Stabilization and Reconstruction (S&R) activities, as intended by NATO.⁶ They may be components of operations conducted within the framework of Peace Support Operations, Humanitarian Assistance, Defence Against Terrorism Opera-

tions, Counterinsurgency and Major Combat Operations, and, in some cases, will overlap with their activities. S&R includes support to establishing long-term stability and strengthening governance, local capacity building, and the promotion of ownership by the relevant national authorities, encouraging rule of law and providing the basis for economic, human and social development.

This is the area in which the new Stability Policing concept is growing. It is defined⁷

RECOMMENDED READING

* Joint Urban Operations and the NATO Urbanisation Project (Wg CDR Gordon Pendleton and Lieutenant Colonel Jozsef Bodnar, HQ SACT)

The Three Swords Magazine, Issues 29 and 31: These articles can be found at www.jwc.nato.int/media/Selected_Articles

A demonstration of a Special Patrol Insertion/Extraction System (SPIES) exercise in Tampa, Florida. Photo by NATO





"The police are frequently the main government interlocutor with citizens and represent the institution that most affects the population."

Photo by Shutterstock



Framework Nations of the
NATO Stability Policing
Centre of Excellence
www.nspcoe.org

tasks, *i.e.* the NATO Multinational Specialized Unit formed by gendarmerie forces, which are paramilitary forces with full police capabilities. Since then, this model has been implemented several times and has received contributions from military police units and infantry forces trained to perform specific security missions. This approach has evolved into the current Stability Policing.

In this context, Italy, through the Carabinieri Corps, together with France, the Netherlands, Poland, the Czech Republic, Romania, Spain and Turkey supported NATO with the establishment of the NATO Stability Policing Centre of Excellence (NATO SP COE) in Vicenza, Italy.⁸ The NATO SP COE contributes to the Alliance's efforts to provide stabilisation and reconstruction support in post-conflict scenarios by serving as a doctrinal hub and think tank for the development of studies and

projects related to the new capability. Through this initiative, NATO will be better able to tackle future challenges generated by failing or collapsed nation-states, which will allow the Alliance to engage in capacity building programmes by providing injections designed to help stabilise a failing state by reinforcing or replacing critical institutions and indigenous police forces. Moreover, the application of the Stability Policing concept is not just a matter for the military, but requires, as stated, a Comprehensive Approach uniting all international and local institutions and agencies, military and police forces, as well as the judiciary and penitentiary systems, in a joint effort to create a safe environment.

NATO needs a coherent and focused strategy to support the institutions of failing countries by carefully selecting certain areas of intervention where the Alliance truly can provide added value and critical resources while simultaneously making a significant and valuable impact on security. In order to achieve this, NATO will project stability through stability operations with the aim to prevent crises and major military engagements.

It is no secret that stabilisation and reconstruction support internal security, and both have become the essential factors for the success of lasting peace. NATO's Supreme Al-

lied Commander Transformation (SACT)⁹ recently stated that "[...] the breadth of instability affecting the Euro-Atlantic area together with challenges such as hybrid warfare and aggressive non-state actors compel the Alliance to increase the pace of its adaptation. From a military perspective, the complexity [of the scenario] requires us to change our mind-set and the way we conduct warfare. [...] My intent is to rapidly enhance and sustain a modern and agile system by supporting and improving today's operational capability, understanding and shaping the future, and bridging the two."¹⁰

Stability Policing provides the Alliance with a holistic approach to crisis response that includes the availability of military forces with a special capability of policing. NATO Stability Policing will, in many respects, have a decisive function in the forthcoming operational campaign horizon.

Another pivotal takeaway from the Stability Policing workshops so far was the need to have common principles, understanding, and international standards, as well as equipment and procedures within all the Stability Policing players, *i.e.* assets that will be employed in supporting improvement of security and rule of law, in upholding justice and respect of human rights and in providing support to the civilian population in affected countries. A further



broad resolution stems from this remarkable purpose: Partnering. A particularly important aim in the workshops was not only fostering a community of interest that will be called upon to discuss and develop the above-mentioned main topics and those to come in the ensuing workshops, but also to promote cohesion among partners.

NATO missions have seen the involvement of many national players and other stakeholders that have contributed to operations together with external partners and participants. Future campaigns will require a more tight-knit cohesion of very empowered and multi-field actors, ranging from industry, international organisations, non-governmental organisations and international think tanks.

Partnerships are needed in particular across the criminal justice chain supporting investigations (software and other technical means), the activities of public prosecutors and judges (mentoring and advising these high officials on how to ensure a smoother cooperation with local police units and to manage files with international standards), the prosecution services and, finally, prisons and correctional facilities (gender responsive and meeting socially acceptable standards).

All the latter tasks can be performed by police forces with military status, civilian defence contractors or international organisations; they will, however, require the support

"Future campaigns will require a more tight-knit cohesion of very empowered and multi-field actors, ranging from industry, international organisations, non-governmental organisations and international think tanks."



and critical commitment of the industry (engineering, manufacturing) and use of state of the art technical development.

The overall aim of the Stability Policing concept development project is to produce a NATO-approved concept, which provides the necessary overarching framework and guidance leading to developing a NATO Stability Policing capability for activities, conducted throughout the full spectrum of conflict, aimed at establishing a safe and secure environment, restoring public order and security, countering irregular activities, and creating the conditions for improved governance and development. This may include both the re-establishment of law and order (replacement missions) and

reinforcing rule of law (reinforcing missions). Under a Comprehensive Approach, a combination of military and non-military actors will be employed to achieve this goal.

Currently, NATO does not have a specific capability; nor does the NATO Defence Planning Process have a dedicated capability code. ACT, in conjunction with the NATO Stability Policing Centre of Excellence, as the lead external actor, and in conjunction with a wide range of international actors (United Nations, European Union, African Union, Academia and industry) will complete the concept development process this year and publish the NATO Stability Policing Concept by December 2017. ✦

NATO's role in Kosovo: NATO has been leading a peace-support operation in Kosovo since June 1999 in support of wider international efforts to build peace and stability in the area. Photo by Erik Skjerve, Forsvaret



END NOTES:

- 1 Stingo, V. (2016) Description in Crisis Response Journal.
- 2 As defined by the NATO ACT Strategic Foresight Analysis 2015 Update Report (www.act.nato.int/strategic-foresight-analysis-2015-report).
- 3 Dziedzic, M. (2005) The Quest for Viable Peace.
- 4 Oakley, B. and Dziedzic, M. (1998) Policing the New World Disorder: Addressing Gaps in Public Security during Peace Operations. Ilford.
- 5 Pani, M (December 2016) Stability Policing: Toward new operational capabilities. NRDC-ITA magazine "Everywhere rapidly".
- 6 NATO Allied Joint Publication (AJP)-3.4.5 Military Support to Stabilization and Reconstruction.
- 7 Several NATO Allied Joint Publication (AJP)-3.22 Stability Policing.
- 8 <http://www.nspcoe.org/>
- 9 General Denis Mercier, French Air Force
- 10 SACT's Intent and Vision.



An interview with **Paul Sewell**, responsible for the JWC's organizational development and culture work:

"Nothing we do is in isolation; we are nothing but teams."



Matching staff to mission requirements:

Any organization is as good as its workforce, the people. The JWC's Organizational Development Programme has been a great success, helping staff to identify their common values and assist each other across divisions and branches, with an eye on improving overall performance and better exploiting capabilities. Paul Sewell explains how.

By Inci Kucukaksoy, JWC PAO

Even though we are all guided by NATO's professional ethos and abiding code of conduct, the overall feel of each NATO headquarters is different when we visit them. Why does each organization feel different?

— I think we have enough experience within the JWC to know that this is the effect of organizational culture at play. As a Centre, we are constantly training different organizations, many of which we have trained many times before. Taking a long-term view, many would argue that the “personality” or characteristics of each HQ remains relatively the same, even if most of the military staff has rotated out after some years. Edgar Schein, the modern father of organizational culture, sees these codes of conduct and other products like these as artefacts of the organization. But these are only on the surface and may not even be read or absorbed. However, at the core of each organization are its underlying beliefs and values and these are what make up the organization's culture. This is where the leadership is so important in my opinion, because they can have the biggest



influence on shaping the culture both in their actions and their messages.

Can you please give us a little background about the purpose and the scope of the Organizational Development Programme?

— Almost two years ago, after careful and comprehensive planning, the JWC moved into a new trial matrix structure in August 2015. During this time, there was a specific team at the JWC, which was focused on this transition. However, while this project team had a defined end date, there was a recognition that there would be a need to continue to focus on the JWC's development; not only because of the trial structure, but the leadership recognised that there was a need for a function that existed outside the normal immediate exercise schedule to look further out and anticipate future changes. From this focus, the Organizational Development function was trialled. Overall, the purpose is simple: to continually match the staff to the mission and to understand this; it is important to consider both sides of this equation.

Although the JWC mission remains relatively the same, the depth and complexity of the exercises continue to evolve. Balancing this requirement, therefore, requires a workforce that is able to adapt to these needs. But to do this we need to know the strengths and

skills of our ever-changing staff so that we can optimize our output with who we have.

Why is it important to focus on our organizational development and our culture?

— It is clear NATO and its HQs are facing external challenges. Some may argue that the geopolitical environment is now more unstable than it was in the last two decades. Our nations and the political process are focused on these external factors; they have, however, only so much influence. To my mind NATO's internal challenges are equally important and should always be within our focus.

The first challenge is the diversity of the staff. The diversity across the Alliance is so huge that it is sometimes surprising that we actually get things done. An Alliance comprised of 29 Nations, with different military services and national cultures, a mix between civilian and military, differences in rank and so on. These are typical group differences. However, we also have to consider all of our individual differences that come into play, such as our personalities, values, beliefs and experience. Each one of these differences can distort how we see the world and work with others.

A second challenge is the constant military rotation. Every year we lose a considerable cohort of our staff who often takes with them their three to four years of knowledge from

their HQs. Their replacements can then take anything from a handful of months to a year to get up to speed in a position for which they may have had no background.

A third challenge is NATO's relationship with the traditional military chain of command. Anyone who has had any form of leadership role within NATO knows how differently the chain of command is perceived compared to their national contexts. Some would argue that in NATO, the chain of command is not sufficient. Instead, NATO's leaders, at all levels, must more than ever be able to communicate clearly and with impact to get through these internal challenges we all face.

These three factors can have a considerable drain on the corporate knowledge of the organization, reducing its effectiveness to respond to external challenges NATO faces. Without doubt these three challenges, of which there are indeed many more, also represent enormous opportunities. However, within an organization, such opportunities do not naturally develop on their own. In fact, they need to be harnessed and this is where I see the value of focusing on our organizational development. It simply cannot be left to chance or good will.

For this reason, I think we need a constant conscious focus on improving how our organization functions. Otherwise, we are left to the individual levers and forces pulling us



Major General Reudowicz, Commander JWC, meets members of his civilian staff, 22 May 2017. Photo by JWC PAO





Colonel Jan Østbø, Director of Management, briefs at a senior leadership level organizational development meeting. Photo by JWC PAO

in different directions, at the mercy of all of the sharp edges of our differences. Our movement into this trial matrix organization is a strong positive example of organizational development in action. This has also been helped by the focus on our JWC One Team culture, which has shown to be a force multiplier. However, once again, neither of these would be possible without this conscious effort or focus.

A lot of your work is with teams. Why do you think they are so important?

— Let's be clear here: nothing we do in NATO is in isolation; we are nothing but teams. Everything requires a team on some level or another and yet the formation and development of teams is something that I think we seriously overlook in NATO. It is as if we assume that our teams will just work out because we are all professionals with a great deal of experience behind us. In many ways this is understandable. Those with a military background are brought up working in teams and leading them. However, it is common that when we all come to NATO, this is no longer the focus. This is unfortunate because we are constantly building new teams and each new team has its own unique fingerprint made up of personalities, skills and experience. So, when we fail to stop and take stock of who we have in our teams, then the common problems with teams often arise: where personality differences are seen as challenges rather than opportunities; where differences in skillsets can be perceived

as threatening rather than valuable, leading to miscommunication and unnecessary tension so that the overall effectiveness of the team wanes.

We focused heavily in the last few years on our JWC One Team Programme and will continue to do so since it gives us, as individuals, a good foundation for working together better. However, I think we are now moving into the next level of our organizational development with our ongoing focus on developing our teams. This is where we will find the real value and innovation in the interactions that lie between us.

For the last two years we have been running a variety of custom-made team programmes at all levels. This ranges from our senior leadership level, across the organization with our branch heads, as well as true cross-functional team programmes for our exercise planning teams. In all cases, we have found that giving a group an opportunity to step outside of their normal working battle rhythm is always time well spent. If facilitated well, groups can discuss issues that they normally do not have time or focus to look into. Having a facilitator external to the team can help bring in new ideas and challenge those accepted norms held by the team.

I also think that another advantage of the Organizational Development role is that it reaches out across the whole HQ so it can also offer relevant connections and perspectives that are out of the range of sight for certain teams be-

cause of the filters and blind spots we have been talking about earlier.

Earlier on, an initial complaint was that to do this kind of team development takes valuable time, away from the daily work. Having done this for some years now, I have discovered that this objection is mostly unfounded. For example, some of our recent branch sessions focusing on capturing corporate knowledge have only taken one hour, and still we were able to extract a great deal of valuable information in that relatively short time. This is an extreme example, but we have also run many of these events, some running from half a day to even up to two days, which in the scheme of things is still a relatively short amount of time in the fullness of a year.

Is there an example of how the Organizational Development programme inspired a specific project at the JWC?

— Yes. We have conducted climate surveys among the staff for the last few years now as a part of our ongoing organizational development. Such surveys provide us with “temperature check” of the staff’s thoughts about the functioning of the JWC and are used to help refocus us for the year ahead. This year we found that our staff was most concerned about the maintenance of our corporate knowledge, an issue that is endemic across all of NATO in my opinion. So, we broadened our online Handover-Takeover (HOTO) programme





ABOVE: JWC's leadership (from left) Rear Admiral Brad Skillman, Deputy Commander/Chief of Staff; Commodore Hans Helseth, Special Advisor to Commander JWC; and Major General Andrzej Reudowicz, Commander JWC. Photos by JWC PAO

to include a more comprehensive plan for both capturing and exploiting our corporate knowledge for the benefit of our newcomers and more broadly for the JWC. This includes branch exit interviews, a simplified Welcome Handbook designed to give newcomers targeted information about the JWC, a set of guidelines for branch sponsors and a comprehensive newcomers and cultural programme. Incidentally, our HOTO form has been copied by other HQs over the years, with SHAPE taking it on board this year as they experience a relatively large turnover as well.

Our introduction of exit interviews has also shown to be valuable. You would be surprised how much you learn by sitting down with a person over a coffee and ask them about their experience at the JWC. I think those being interviewed also appreciate someone listening to them, maybe for the first time during their time here. This year we have brought the whole branch together, so that those that remain after summer can learn from those that are leaving. It turns out to be a much more immediate and richer conversation amongst these people who have been working together for the past few years.

We can always improve, though, and I am interested to see the fruits of our corpo-

rate knowledge plan post summer, including the reintroduction of the branch sponsors and their ability to help the newcomers get up to speed as soon as possible with their position and how it fits into the JWC mission.

What future do you see for the focus on organizational development within the JWC?

— When we started developing ideas about this function and what purpose it might solve, one of the initial thoughts I had was that, when people leave the JWC, both the organization and the person are better, the organization for having the person here, the person for having worked here; that is, the organization has benefited from this person's contribution and, equally, the person has grown from having been here. For me, this is still a worthy ideal.

"Our Commander has mentioned on a number of occasions that the JWC should be seen as a place where people come to get an education at the joint and operational level. I definitely agree."

Our Commander has mentioned on a number of occasions that the JWC should be seen as a place where people come to get an education at the joint and operational level. I definitely agree. The JWC is unique in this regard in that it is a hub where NATO's operational HQs come through our doors. This exposure means that we can learn from all of these HQs, but also have the opportunity and honour of helping them with their own development based on this exposure.

Due to our warfare component, we also have strong links with HQ SACT, the JALLC, JFTC and NATO's Centres of Excellence, all of which help improve how we pursue our mission. Ideally, then, I would like the JWC to be seen as a unique institution where people will be trained and be given meaningful work, and from where they leave with an enviable education in modern warfare, which they can bring back to their nations. ✦

RECOMMENDED READING

* JWC's One Team Culture (By Boris Diekmann)

The Three Swords Magazine (Issue. No 26, May 2014): This article can be found at <http://www.jwc.nato.int/media/selected-articles-from-the-three-swords-may-2014-issue>

airshow inSTAVANGER



Welcome to the Alliance!

Flag-raising ceremony at the Joint Warfare Centre marking and celebrating the accession of Montenegro to NATO.
Photo by JWC PAO

Sola Airport in Stavanger celebrated its 80th Anniversary this year with an international Air Day featuring F-16 Fighting Falcon, P-51D Mustang, Airbus A-400M and more!
Photos by Maj. Stephen Olsen, Norwegian Army, PAO



FAREWELL ADDRESS

to the North Atlantic Council by the NATO Secretary General's Special Representative for Women, Peace and Security, Mariët Schuurman

Madame Chair, Ambassadors,

Thank you for the opportunity to bid farewell in person to this Council. As I said before: "partir, c'est mourir un peu" and this, without any doubt, is the most painful death I ever died—as it has been such an inspiring, if not life changing experience to be part of the NATO story of fostering "inclusive security", from the inside out.

Indeed, if there is one message I would like you to remember, it is to assure you that NATO has a story to tell in this respect. A story that is at the same time hands-on, ambitious and daring.

Hands-on, as we strive to translate the principles of UNSCR 1325 on Women, Peace and Security into practical tools—for training, planning, monitoring and reporting. Practical tools that are in high demand outside the Alliance—and we have no problem sharing them.

Ambitious, as we have set ourselves as end-state: (1) To enhance gender literacy as a matter of professionalism, as a basic skill in the toolkit of every security provider and policy maker. (2) To

foster equal participation as a core security strategy, building on the lesson that the only sustainable way to protect, prevent and project stability is to empower and help create a safe and secure environment in which men and women can equally contribute to the resilience of their society. (3) To promote equal participation in-house as the new normal.

[Ambitious] so that we move from the "first ever" female leader, the first ever female Deputy Secretary General, Commander, 1-2-3-4 star General, to mixed, gender balanced leadership as the standard, as a sign of our excellence, as a demonstration that indeed the Alliance manages to attract the best and the brightest from our Nations. But also [daring], the NATO story is a story of guts, of daring to be principled. By recognising gender equality as a fundamental principle, in a time when those fundamental principles are under direct attack.

We have a world to lose: our peace and prosperity, our way of life are founded on the principles of individual freedom, democracy and rule of law. We can only effectively defend those fundamental values, if we live them, and lead by example. But that is not only the right thing to do but also the smart thing to do, as mixed teams are smarter and perform better. They are more innovative and creative, and we need all creativity our societies have to offer to better address the complex challenges of today. We simply cannot afford to leave any talent untapped. Promoting equal participation, inside-out, is a matter of credibility and resilience.

There are no stronger reminders of the importance of this community of values than the partners who strive to become part of it. During my visit earlier this month to Georgia, Julia Karashvili, a core member of the civil society advisory panel, gave us the biggest compliment: "Visa liberalisation will allow us to travel to Europe freely, but for us, NATO is our window to Europe: it is the community we strive to be part of, the country we want to be, where we respect fundamental freedoms and the rule of law."

Our partners remind us, that the respect for equal rights and freedoms is what unites us and makes us strong.

It has been a privilege to have been part of this NATO story, so hands-on, ambitious and daring. That is what makes it so difficult for me to let go. I always said that my measure of success would be to make myself redundant. I never thought though, that I would make myself redundant so quickly. But I did—and that is good news for NATO: I am confident that you will keep up the momentum gained over the past two years, that you will continue the story. As Ambassador [Douglas Edward] Lute in his farewell address to this Council freely quoted Lawrence of Arabia: "Nothing is written—we write."

I am confident that you will continue to write the story, to lead by example, daring to be principled. As that is what will keep the Alliance together and strong. + (29 March 2017)

http://www.nato.int/cps/en/natohq/news_142106.htm

ABOVE: Anne Rosner, NATO Cultural and Sports Clubs President, Ambassador Mariët Schuurman and Corporal Pellegrina Caputo, 8 March 2017, International Women's Day. Photo by NATO

#BeBoldForChange

Det er mange tøffe damer i den amerikanske hæren.

Hun som er tøffest nå, har jobbet ved JWC*



The story below is partly an excerpt of the original article written by **MARIE BERBEREA**, Editor of the Fires Bulletin, TRADOC, and published online at army.mil on 30 March 2017.

Marny Skindrud, who served in the JWC's Joint Training Division from 2009 to 2012, was promoted to the rank of Lieutenant Colonel last September, thus becoming the highest ranking active-duty female field artillery officer in the United States Army. Skindrud currently serves as the Chief of Fires in the CJOC, within HQ Resolute Support in Kabul, Afghanistan. She says the JWC has been one of her best deployments ever. "I remember my time at the JWC every single day! I miss it very much and would come back in a heartbeat, if I could," she says.

Skindrud credits her mother and grandmother and other female relatives as women who inspired her the most. "All of them are/were strong in their own ways, but I know above all I learned the value of hard work from them."

Due to being a member of a combat arms branch, Skindrud says she did not have a lot of interaction with female leaders. She nevertheless names Lieutenant Colonel Marci Miller, whom she met during her first deployment; Canadian Lieutenant Colonel Katherine Vigneau, her supervisor at the JWC; and Senior Assistant Legal Officer Lone Kjelgaard, a former JWC employee currently working at the Office of Legal Affairs, NATO HQ, as examples of women she looks up to for their knowledge, character and work ethics.

"I consider them to be among the smartest women I know and I am so lucky my career allowed me the opportunity to meet and work with them," Skindrud says.

Inci Kucukaksay, JWC PAO

MARNY SKINDRUD was promoted to Lieutenant Colonel September 1, to become the highest ranking active-duty female field artillery officer in the [United States] Army. Like other "female firsts," piloting in new lanes of history doesn't feel awkward to Skindrud because her way of navigating is the only way she knows.

"I just try to see myself as a Soldier and a leader. Yes, I know I'm female, other people know I'm female, but I don't really differentiate between those roles," said Skindrud.

She shares this mentality with Colonel Andrew Preston, a former 214th Field Artillery Brigade Commander, who told his troops he didn't have female leaders and male leaders. *He had leaders.*

[Skindrud] said her upbringing by her Norwegian mother and being raised on a farm instilled that type of confidence in her abilities. "On the farm there were never any boy-jobs or girl-jobs, and my parents never told me that I couldn't do anything because I was a girl. That was important," said Skindrud. She has made a habit of taking on challenges.

Almost as impressive as her military career is the myriad other activities [Skindrud] have tackled. From college soccer,

national-level tug-of-war, jiu jitsu in the European championships, playing on a men's rugby team, weightlifting competitions, snowboarding competitions, joining and becoming an instructor in hula and her latest adventure, roller derby, Skindrud is not afraid of new frontiers.

She recognizes the sacrifices of women before her and is thankful that discrimination has not affected her path. The closest she felt any ignorance regarding her gender was hearing that Iraqis believed the women on the mobile transition team before her were only on the team to service the men. "I know there are people out there that have crazy views on females in the military, but I don't feel like I've ever been specifically discriminated against as a female. As soon as I'm working alongside (male Soldiers) and they see that I'm putting in the same amount of effort as everyone else, I feel like it calms the waters."

Skindrud understands her position as a role model, but she doesn't believe any suggestion of being an example applies just to junior ranking women. "There are a lot of male leaders that I admire their qualities," she said. "That's what I want; someone who wants me to be their mentor because they admire the qualities that I show." ✦

* There are many tough ladies in the U.S. Army. The toughest one right now, used to work at the JWC.

Women, Peace and Security: Shifting from Rhetoric to Practice

by CHRISTINE CHINKIN

Director of the Centre for Women, Peace and Security
London School of Economics

EDITOR'S NOTE: This article was first published in *NATO Review Magazine*, 6 March 2017.

LAUNCHED IN FEBRUARY 2015, the Centre for Women, Peace and Security at the London School of Economics (LSE) developed out of the Preventing Sexual Violence Initiative championed by former UK Foreign Minister William Hague and the Special Envoy for the United Nations High Commissioner for Refugees, Angelina Jolie. However, the Centre is not solely focused on the issue of sexual violence but on the wider agenda for Women, Peace and Security set out in United Nations Security Council Resolution 1325, adopted in 2000. This Resolution brings issues relating to women and armed conflict directly into the political agenda of the Security Council, which has primary responsibility for the maintenance of international peace and security. An important objective of the LSE Centre is to be a hub of cross-sectoral partnerships and engagements, to support the policy agenda through academic thinking, research and education.

Resolution 1325 was widely celebrated by women's non-governmental organisations, which had advocated globally for its adoption. It was the first time that the Security Council had devoted a full session to debating women's experiences during and after conflict, and drawn attention to what have been termed the "inextricable links between gender equality and international peace and security". It has been supplemented by further resolutions:



General Petr Pavel,
Chairman of the
NATO Military
Committee, speaking
at the annual
conference of the
NATO Committee on
Gender Perspectives,
30 May 2017.
Photo by NATO

1820 (2008), 1888 and 1889 (2009), 1960 (2010), 2106 and 2122 (2013) and 2242 (2015).

The Four Pillars

These Resolutions build on each other and underpin what are often termed the "four pillars" of the Women, Peace and Security agenda set out in Resolution 1325:

- **Participation:** Full and equal participation and representation at all levels of decision-making, including peace talks and negotiations, electoral processes (both candidates and voters), UN positions, and the broader social-political sphere.

- **Conflict prevention:** Incorporation of a gender perspective and the participation of women in preventing the emergence, spread, and re-emergence of violent conflict as well as addressing root causes including the need for disarmament. Addressing the continuum of violence and adopting a holistic perspective of peace based on equality, human rights and human security for all, including the most marginalised, applied both domestically and internationally.

- **Protection:** Specific protection of the rights and needs of women and girls in conflict and post-conflict settings, including reporting and prosecution of sexual and gender-based



violence; domestic implementation of regional and international laws and conventions.

- **Relief and recovery:** Access to health services and trauma counselling, including for survivors of sexual and gender-based violence.

The four pillars are therefore an essential subject of contemporary foreign and military policy. There has been some shift in emphasis in the Resolutions between the two key pillars on Participation and Protection. The pillar on Participation and Representation, especially emphasised at the outset of Resolution 1325 itself, presents women as agents, as active players, in issues of peace and security. It stresses the importance of their “equal participation and full involvement in all efforts for the maintenance and promotion of peace and security”.

Protection

In contrast, the pillar on Protection focuses on women as victims who need to be protected, especially from sexual violence as a tactic of war. Resolution 1820 gives greater prominence to this pillar, setting out a number of demands on all parties to conflict to take measures to enhance such protection including:

- enforcing appropriate military disciplinary measures;
- upholding the principle of command responsibility;
- training troops on the categorical prohibition of all forms of sexual violence against civilians;
- debunking myths that fuel sexual violence;
- vetting armed and security forces to take into account past actions of sexual violence; and
- evacuation of women and children under imminent threat of sexual violence to safety.

Both the Women, Peace and Security agenda and the Preventing Sexual Violence Initiative give some effect to the recognition of conflict as gendered—understood and experienced by women and men differently because of their gender. Both recognise how the incidence of sexual violence in armed conflict undermines international peace and security through its contribution to the displacement

of people’s and refugee flows, and without steps to address it post-conflict, through its continuing divisiveness on communities and society. Accordingly both initiatives emphasise the importance of making accountable and prosecuting perpetrators of genocide, crimes against humanity, and war crimes (including such crimes involving gender-based and sexual and other violence against women and girls) to put an end to the impunity so often enjoyed by such persons.

However, the Preventing Sexual Violence Initiative is explicitly a gender neutral initiative. Its focus on prevention of and tackling impunity for conflict-related sexual violence is with respect to all victims, women and girls, men and boys, and those targeted for their (real or perceived) sexual or gender identity. But only one of the Women, Peace and Security Resolutions refers to the reality that such violence also affects men and boys as well as “those secondarily traumatized as forced witnesses of sexual violence against family members” (Resolution 2106).

As an important output of the Preventing Sexual Violence Initiative, an International Protocol on the Documentation and Investigation of Sexual Violence in Conflict was adopted to increase effective criminal prosecutions, both to enhance deterrence and to deliver justice in individual cases. This is a practical tool kit setting out good practice in response to the reality that criminal trials of perpetrators of sexual violence are seriously impeded by the lack of evidence appropriate for use in criminal processes and, moreover, that any trial may only be possible long after the commission of the offences by which time evidence may have been lost or become unusable. The Protocol has been tried in some pilot areas, gaps and other deficiencies identified, and a second edition has recently been completed.

Participation and Representation

The Women, Peace and Security agenda has also given rise to institutional innovation, especially with respect to Representation and Participation. One example is the nomination of Gender Advisers in military forces and women protection officers in peacekeeping operations to support commanders in ensuring that a gender perspective is integrated into all aspects of an operation.

The appointments of the Special Representative of the UN Secretary-General on Sexual Violence in Armed Conflict (following the adoption in 2009 of Resolution 1888) as well as a Special Representative to the NATO Secretary General on Women, Peace and Security in 2012 are further external indications of the significance accorded to issues related to women and conflict.

In 2015, the Security Council welcomed efforts to increase the numbers of women in militaries and police in UN peacekeeping operations and urged further efforts in this regard (Resolution 2242). This, of course, assumes the importance of women within armed forces, an approach that NATO has long fostered with its formation in 1976 of the Committee on Women in NATO Forces (now the NATO Committee on Gender Perspectives).

A Global Study (‘Preventing Conflict, Transforming Justice, Securing the Peace’)—commissioned to inform the discussions of the UN High-level Review of the implementation of Resolution 1325, fifteen years after its adoption—pushes for greater participation of women in peace processes to increase the chances of producing sustainable peace or stable post-conflict societies. It notes that “more than half of peace processes that reach an outcome lapse back into conflict within the first five years.”

Arguments for the inclusion of greater numbers of women in peace processes and post-conflict state-building (as well as in peacekeeping operations) have tended to rest on one of two grounds: that women ‘are good at peace’, are in some sense instinctively able to foster peace, or that this is required by general principles of equality and specifically by the 1979 Convention on Elimination of All Forms of Discrimination, articles 7 and 8. Neither of these arguments necessarily carries much weight. The first, an essentialist concept of biological determinism, is strongly contested as having no empirical basis while the second, the equality argument, is too often disregarded as having no practical benefit.

Recent research has made the case in strong instrumental terms that highlight the illogicality of premising the possibilities of peace on a narrow base that reinforces the pre-conflict power structures and fails to take into account the widest possible range of views,





ABOVE: Ambassador Marriët Schuurman stepped down as the NATO Secretary General's Special Representative for Women, Peace and Security on 30 March 2017, after two and a half years in post. Photo by NATO

capabilities and lived knowledge of those who endured the conflict. The Global Study cites evidence-based research to the effect that in 40 peace processes adopted since the end of the Cold War there was not one single case where organised women's groups had a negative effect on the process, which was not the case for other social actors. Specifically, women's inclusion in peace-making creates a greater chance of agreement being reached and of that agreement lasting. Other research has shown that, when controlling for other variables, peace processes that included women as witnesses, signatories, mediators, and/or negotiators demonstrated a 20% increase in the probability of a peace agreement lasting at least two years. The percentage increases over time. A substantive gender perspective is also more likely where women have been involved.

The Global Study refers to the peace agreement reached between the Government of the Philippines and Moro Islamic Liberation Front (MLF) in March 2014 after many years of conflict in Mindanao and 17 years of negotiations, by which time one third of the people at the table were women. The Agreement has strong provisions on women's rights with eight out of its 16 articles providing for women in positions of governance and protection against violence. It also sets out special economic programmes for decommissioned female fighters from the MLF—a category of women often

overlooked in programmes for disarmament, demobilisation and reintegration or for protection against violence. Nevertheless, and despite some slow progress, such instances are rare and women remain greatly under-represented in peace-making and peace-building.

Identifying Gaps and Addressing Challenges

The Preventing Sexual Violence Initiative and the Global Study on Resolution 1325 have both identified gaps that remain to be filled. The latter also highlighted emerging trends and priorities for action. It asserted that "Resolution 1325 was conceived of and lobbied for as a human rights resolution that would promote the rights of women in conflict situations." As such, Women, Peace and Security is a human rights agenda for the enhancement of women's human rights, elimination of discrimination on the basis of sex and gender and promotion of women's empowerment. However, it is located within the security framework of the UN Security Council. The two dimensions—human rights and security—may be in tension giving rise to the warning in the Global Study that "attempts to 'securitize' issues and to use women as instruments in military strategy must be consistently discouraged."

As indicated, much research on Women, Peace and Security has been carried out but more knowledge is needed. The LSE Centre

seeks to become a world-leading education provider and a research forum that brings together scholars, activists, UN experts, practitioners and policy-makers. We need to shift rhetoric to practice by asking and exploring further questions, for instance, about:

- how patterns of sexual and gender-based violence relate to different forms of contemporary conflict and how different responses are needed—one size does not fit all victims and survivors;
- the connections between the political economy and violence in conflict and post-conflict;
- how to change social attitudes that allow perpetrators to continue their lives with impunity while survivors live with stigma, isolation and poverty throughout their lives;
- what capacity building is needed in different contexts to develop effective programmes for combatting violence against women in conflict; and,
- how National Action Plans on Women, Peace and Security (and those of organisations, such as the plan for the implementation of Resolution 1325 developed by NATO together with partner countries in 2010) can be made more inclusive, more effective and adequately resourced.

The Centre aims to take advantage of its position as an academic research body with direct links to government, the military, international governmental and non-governmental institutions to contribute to the intellectual development of conceptual foundations and practical tools. It is envisaged that its normative input—with an emphasis on peace, justice and women's human rights—will contribute to reshaping and enriching the discourse on issues related to women and conflict. In this way, it will help secure more effectively the transformative ambitions of the United Nations Women, Peace and Security agenda. ✦

RECOMMENDED READING

* EXCLUSIVE INTERVIEW: Ambassador Marriët Schuurman (By Inci Kucukaksoy, JWC PAO)

The Three Swords Magazine: (Issue. No 31, January 2017) this article can be found at <http://www.jwc.nato.int/media/selected-articles-from-the-three-swords-may-2014-issue>



SPORTS DAY 2017

Photos by Tudor Jelescu, JWC Media Simulation Section





**COMMANDER OF THE JOINT WARFARE CENTRE,
MAJOR GENERAL ANDRZEJ REUDOWICZ, MEETS
MEMBERS OF HIS CIVILIAN STAFF, 22 MAY 2017**

Photo by Maj. Stephen Olsen, PAO

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