Framework for Future Alliance Operations (FFAO) Workshop

Joint Warfare Center
Stavanger, Norway
3-5 October 2017

Agenda

- ✓ **Administrative Remarks**

- ✓ **Conference Overview**

- ✓ **Syndicate Back Briefs**

- ✓ **Way Ahead**

- ✓ **Close-out Survey**

- ✓ **Closing Comments**

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Close-Out Administrative Instructions

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- **TASK:** To address the question - In 2035 and beyond, what abilities will NATO forces require in the areas of **prepare, project, engage, sustain, C3, protect, and inform** in order to accomplish NATO core tasks?

- **OUTCOME:** **Refinement** of the draft Chapter 3 of the FFAO *(ADD/ DELETE/ MODIFY)*

- **PROCESS:** **Pre-conference survey** to establish baseline perceptions (quantitative) and a focus group **table-top discussion** (qualitative) with subject matter experts

- **RATIONALE:** Through **full participation and sharing responsibility,** the groups develop **mutual understanding,** and **inclusive solutions** for NATO forces in 2035 and beyond

- **TIME:** Three Days

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Workshop Schedule

2 OCT	3 OCT	4 OCT	5 OCT
	07:15 Transport Departs	**08:00 Transport Departs**	**08:00 Transport Departs**
	07:45 Coffee and Check-In	**08:30 Coffee and Welcome**	**08:30 Coffee and Welcome**
	09:30 Opening Remarks	**09:00 SAS 123-Panel**	**09:30 Out brief**
	11:00 Syndicate Work	**10:00 Facilitators Shift Syndicate Work**	**11:30 Closing Remarks**
13:00 Transport Departs	**12:00 Lunch**	**12:00 Lunch**	**12:00 Lunch**
14:00 Overview Brief/ Room Set-up (Conference Staff)	**13:00 Photograph**	**13:00 Syndicate Work**	**13:00 Transport Departs (to hotel & airport)**
16:00 Transport Departs	**13:15 Syndicate Work**	**16:00 Transport Departs**	
	17:00 Icebreaker		
	18:30 Transport Departs		

Workshop Google+ Group

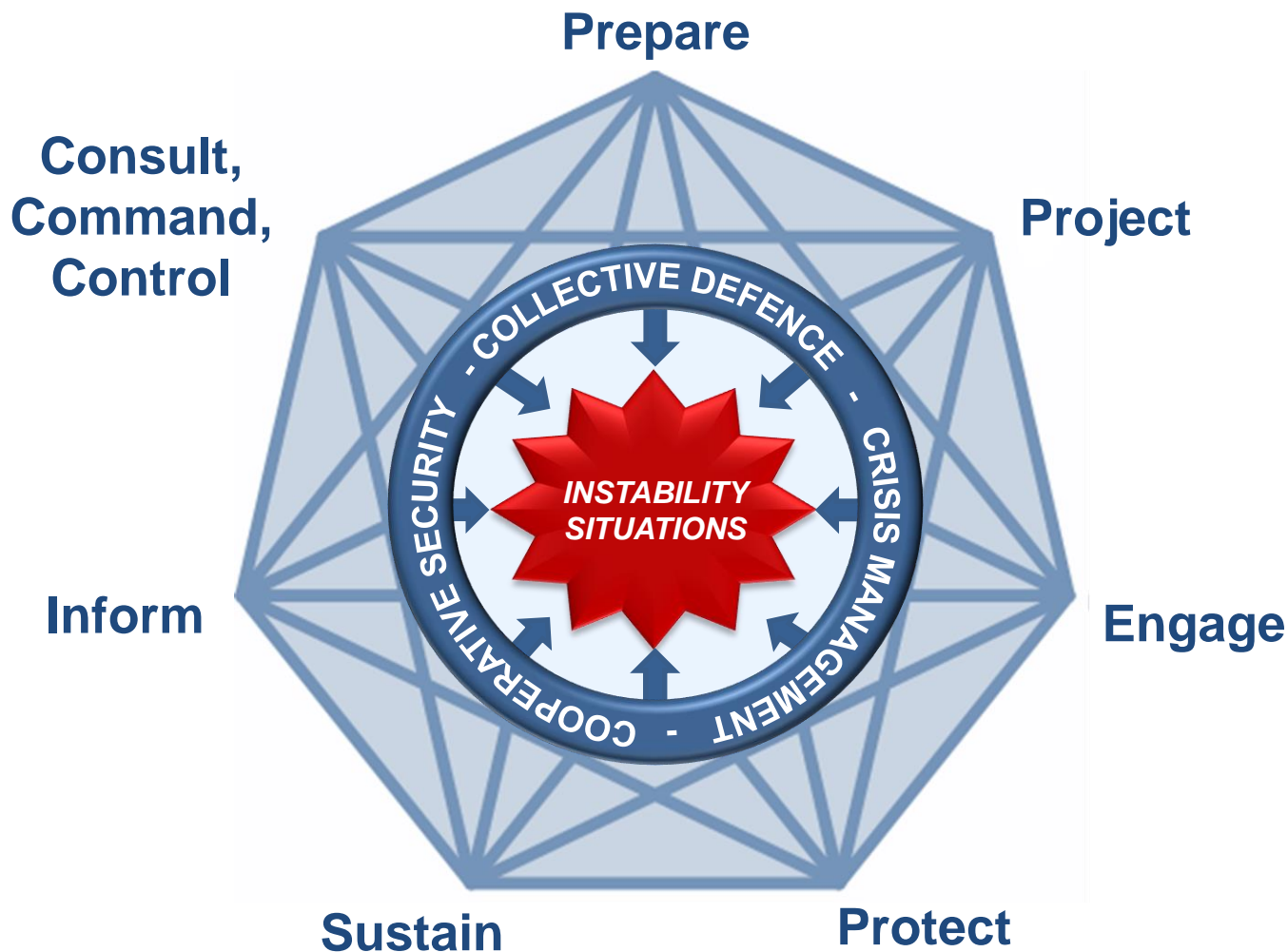## *http://goo.gl/d9sHje*
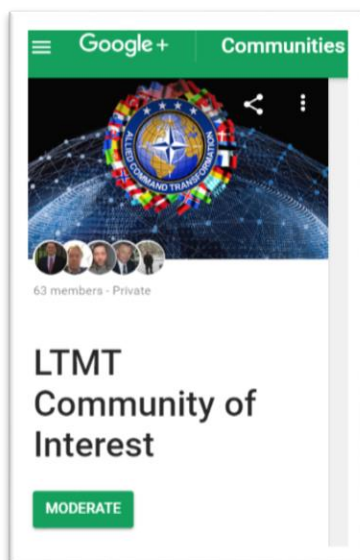
- ✓ **Information and updates**

- ✓ **Slides and read-ahead material**

- ✓ **Discussion forum**

- ✓ **Platform to address your questions and issues**

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LTMT Community of Interest

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Military Implications

Prepare

Consult, Command, Control

Project

COLLECTIVE DEFENCE

CRISIS MANAGEMENT

COOPERATIVE SECURITY

INSTABILITY SITUATIONS

Inform

Engage

Sustain

Protect

NATO forces should have a robust network of operational abilities in order to accomplish the core tasks

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Syndicate 1

Core Ability Definitions

- **Prepare** – The ability to establish, prepare and sustain sufficient and effective presence at the right time, keeping sufficient flexibility to adapt to possible changes in the strategic environment.

- **Project** – The ability to conduct strategic (re)deployment of both NATO and national headquarters' forces in support of Alliance missions.

- **Engage** – The ability to perform the tasks which contribute directly to the achievement of mission goals, including all abilities required to defeat adversaries.

- **Sustain** – The ability to plan and execute the timely logistical support of forces.

- **Command, Control, and Consult (C3)**- The ability to exercise authority over and direct full spectrum of assigned and attached forces in the accomplishment of the mission.

- **Protect** – The ability to minimise the vulnerability of personnel, facilities, materiel and activities, whilst ensuring the Allies freedom of action and contributing to mission success.

- **Inform** – The ability to establish and maintain the situational awareness and level of knowledge required to allow commanders at all levels to make timely and informed decisions.

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MC 400, Bi-SC Capability Hierarchy 2015, TT 150806

I   INFORM   The capability to establish and maintain the situational awareness and level of knowledge required to allow commanders at all levels to make timely and informed decisions.

I.1   COLLECTION   Capable of the exploitation of sources by collection agencies and the timely delivery of the information obtained to the appropriate processing unit for use in the production of intelligence and situational awareness.

I.1.1   Acoustic   Capable of collecting timely and accurate information from the acoustic phenomena.

I.1.2   Human   Capable of collecting timely and accurate information from human sources.

I.1.3   Imagery   Capable of collecting timely and accurate information (imagery) acquired by sensors which can be ground based, sea borne or carried by air or space platforms.

I.1.4   Measurement and Signature   Capable of collecting timely and accurate information obtained by quantitative and qualitative analysis of data obtained from sensing instruments for the purpose of identifying any distinctive features associated with the source.

I.1.5   Open Source   Capable of collecting timely and accurate information from publicly available information, as well as other unclassified information that has limited public distribution or access.

I.1.6   Signals   Capable of collecting timely and accurate information from electromagnetic signals or emissions.

I.2   PROCESSING   Capable of receiving, converting and fusing data and information from all available sources into relevant and usable intelligence/knowledge, decision-support and situational awareness products by collation, evaluation, analysis, integration and interpretation through fusion and collaboration.

I.3   DISSEMINATION   Capable of distributing timely data, information, intelligence and specialist and all-source analysis, in an appropriate and accessible form, across and between networks as required.

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COLLECTION - Capable of the exploitation of sources by collection agencies and the timely delivery of the information obtained to the appropriate processing unit for use in the production of intelligence and situational awareness.

- Ability to collect timely and accurate information via robust ISR.
- Ability to collect from multi-intelligence sources from alternative origins (commercial, private, national).
- Ability to detect and identify targets despite technological advances in stealth, camouflage, concealment and deception techniques, especially in virtual (cyber), urban and subterranean environments.
- Ability to collect from open-sources and social media. (to gain, share and fuse information and help set the conditions for future success).
- Ability to detect (adversary) influence activities (information operations), especially in the early stages of development.
- Ability to develop and maintain a recognized information picture, including cyber. (picture of its networks and collectively maintain a shared situational awareness of national system which process or transmit NATO information.)
- Ability to maintain an awareness of NATO cyber capabilities and vulnerabilities.
- Ability to develop and execute a cyber-intelligence collection plan to gain situational awareness of the cyber environment.
- Ability to monitor cyber areas of interest, to detect cyber attacks and cyber espionage against NATO systems.
- Ability to conduct cyber forensics to accurately attribute actions to their sources.
- Ability to rapidly detect "anomalies" in the activities that occur in the global commons, physical or virtual on lines of communication, and at choke points. (as well as within big data flows.)
- Ability to use automated processes to collect data. (probably applies in all areas (processing and dissemination)
- Ability to use cost effective technology including autonomous and disposable assets, remote sensors, and intelligence networks to enable early warning. (Cannot agree. Needs more work.)

- Ability to (train and) cultivate human sources of information. (and particular attention should be paid to threats such as Terrorism, Espionage, Subversion, Sabotage, and Organized Crime.)
- Ability to detect non-conventional threat activities which could be an indication of larger scale adversarial operations.

- Ability to conduct Joint ISR collection from various areas to include the littoral areas, international waters, overland friendly airspace, and overland in contingency Joint Operating Areas.
- Ability to conduct collection operations from within friendly airspace while respecting the sovereignty of member nations over their airspace. Procedures must be in place to identify unique collection caveats or prohibitions.
- Ability to coordinate with regional Air Traffic managers to implement robust Remotely Piloted Aircraft Systems (RPAS) Airspace Integration approach throughout Europe that facilitates effective JISR operational mission accomplishment. (None of these 3 last points are appropriate here)

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PROCESSING - Capable of receiving, converting and fusing data and information from all available sources into relevant and usable intelligence/knowledge, decision-support and situational awareness products by collation, evaluation, analysis, integration and interpretation through fusion and collaboration.
Analysis - Ability to convert information into intelligence.

- Ability of NATO Indicators and Warning Systems to better identify the early phases of a crisis and enable timely decision-making. (Is this necessary?)
- Ability to access and analyse data, and share intelligence cross domains at the strategic, operational, and tactical levels. (Is this necessary?)
- Ability to use advanced technological methods, including artificial intelligence, virtual reality, modelling, and simulation to enhance the comprehensive preparation of the operational environment and maintain a single repository of knowledge. (that enables the conduct of collaborative planning)
- Ability to analyze networks, and evaluate potential adversarial command and control structures.
- Ability to develop a detailed understanding of adversarial anti-access, area denial, and integrated air defence systems and networks at the strategic, operational, and tactical levels.
- Ability to (mine and) analyze large amounts of structured and unstructured data (big data). in order to inform decision-making and add awareness at all levels.
- Ability to leverage regional experts to support intelligence collection, liaison, education, and training at all times, including via reach-back. (Move to a general category)
- Ability to exploit multi-intelligence sources from alternative origins (commercial, private, national).
- Ability of NATO to take a collaborative approach to intelligence sharing and may include intelligence exchange, common databases, network knowledge, forensics and biometrics to detect unconventional threats. (Moved from Mapping)

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- **Broad Mapping -** Ability to develop and disseminate geospatial products, "maps of the future" rapidly and include characteristics such as complex 3D urban terrain.
- Ability to tailor reconnaissance and surveillance to ensure the most accurate urban maps.
- Ability to update maps in near real time to account for the impact of changes from operations, natural disasters, and the organic expansion of cities.
- Ability to collect and analyse information on networks such as utilities, resources, and infrastructures including interoperability with local air points of debarkation, sea ports of debarkation.
- Urban assessments should be prepared to inform tailored doctrine, tactics, techniques, and procedures.
- Ability to conduct human network analysis to analyse the relationship between people at the individual, family, tribal, national and international levels (including a range of potentially violent groups.)
- Ability of NATO to obtain early warning through social media and the monitoring of communications.
- Ability to anticipate social unrest and detect rapid gatherings of people.
- Ability to detect, classify, and identify individuals in complex 3D terrain, including urban, using biometrics and other accurate methods.

All good points, but do they fit in this section?

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DISSEMINATION - Capable of distributing timely data, information, intelligence and specialist and all-source analysis, in an appropriate and accessible form, across and between networks as required.
Sharing - Ability to obtain information contributions from other actors and convey information and intelligence to those who need it in a timely manner.

- Better customize products, including visualization, for individual users (including the Internet of Things-IOT)
- Ability of users including IOT to "pull" information. (Should expand on this – relates to providing tailored info to entities)
- Ability of NATO to obtain information which falls outside of the military domain and may require close coordination with other international organizations.

GENERAL

- Ability to develop agreements, <u>legal frameworks,</u> policies, and principles to leverage nations' military and non-military expertise together with relevant actors, partners, and entities in areas such as collection, processing , and dissemination of intelligence amongst stakeholders

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Syndicate 2

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17 **Mounting –** Need to project operationally agile **and adaptable** joint forces capable of conducting the full spectrum of operations **concurrently** across all core tasks of the Alliance.

- **NATO forces should be able to mobilize and mount joint forces in the presence of instability situations within their own territory.**
- Ability of NATO forces to maintain access to, and use of land, sea, air, **cyber,** space **(including ability to launch)**, **and information environments**.
- Ability to mount and project joint forces at range onto land, to gain lodgements where necessary, by means of a broad array of theatre entry options including forcible entry, **in an area of potential instability**, ~~particularly in the urban littoral~~ **in the most challenging environment**.
- **NATO forces should be able to operate across all domains and succeed in hostile anti-access and area denial environments. [ENGAGE & PROTECT]**

18 **Deployment and Redeployment –** ~~Need to rapidly deploy, sustain and redeploy credible joint forces where and when needed~~. <Definition>

- **Ability to deploy, sustain, and redeploy credible joint forces where and when needed.**
- Ability to guarantee access to **sufficient and resilient strategic lift, including air, sea**, **and other technologically available solutions**.
- Ability ~~of forces~~ **to rapidly project advance forces and force liaison capabilities in order to project physical presence** and influence **into multiple areas of operations**.
- Ability of NATO to leverage civilian expertise, including ~~of when Member Nations deploy~~ **critical enablers and civilian crisis response teams, to facilitate and enhance NATO deployment/redeployment.**
- ~~Ability of forces to find areas of cooperation with civilian response teams to maximize unity of effort.~~
- Ability of NATO forces to **adapt to a wide range of conditions from full host-nation support to austere environments**. // ~~cooperate with local national authorities in areas where traditional military forces do not have knowledge, proficiency, or jurisdiction such as energy production, waste management, finance, education, and public administration.~~ [ENGAGE]

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19 **Reception and Staging –** Need to plan and provide reception, staging, and onward movement and integration facilities (in concert with host nations) to support the timely transition of deploying forces including personnel, equipment, and materials. Includes both expeditionary operations and operations on NATO territory

- Ability to work with members, **partner** nations, **and non-NATO entities** to **provide robust and flexible** ~~frequently update their~~ reception and staging ~~plans in order to accommodate changes to force structures and equipment~~.

20 **Basing –** Need to **establish and** maintain a sufficient network of **enabling infrastructure,** bases, ~~and~~ logistics **and other** support facilities on NATO territory and ~~establish~~ expeditionary **bases**, ports, **and** airfields in remote location**s**.

- Ability to rapidly repair ports and airfields, and return them to an operational status.

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21   **Joint Manoeuvre**

- **Ability to provide an enhanced common operating picture (including aerospace, maritime, land, space, cyber, information, etc.) in real-time.**
- Ability of NATO forces to manoeuvre jointly to gain ~~positional~~ advantage over the adversary.
- Ability of NATO forces to maintain access to the global commons and conduct the full range of operations where needed.
- **Ability of forces to be mobile and able to operate across all domains, in the global commons, and in different terrains including arctic, littoral, and urban, at the lowest possible military organizational level.**
- Ability to conduct geographically dispersed operations across a larger geographical area with a minimum of personnel and equipment.
- Ability to conduct distributed operations with enhanced manoeuvrability **including all necessary enablers, such as military** engineering support, tactical air transport assets, long range communications, and agile logistical support.
- Ability to **engage in the full spectrum of cyber operations in order to** maintain freedom of action and influence in all areas of cyberspace, including new and emerging cyberspace areas.
- Ability ~~of NATO Special Operations Forces~~ to quickly project forces to uncertain or contested environments with low visibility and small footprints.

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22 ~~Joint Fires~~ Joint Effects

Kinetic

- Ability of NATO forces to coordinate the efficient application of lethal and non-lethal joint **effects** ~~firepower~~ to deny, degrade and destroy adversary forces, facilities, and infrastructure throughout the operational area thus enabling decisive manoeuver whilst avoiding unwanted collateral effects.

- Ability to maintain and use a broad range of conventional **capabilities** ~~weapons~~ while taking advantage of new technologies which might enhance their **effects** ~~firepower~~.

- Ability to use **precise, discriminatory systems to deliver effects, including at long range, independent of external infrastructure.** ~~Precision Guided Munitions with alternate (non-satellite) navigation capability beyond GPS, and long range strike capabilities.~~

- Ability to field standardized munitions that can be employed for different national platforms and systems.

- Ability ~~of member nations~~ to develop and take advantage of lower cost per shot weapons such as directed energy.

- Ability to perform kinetic operations in urban **or densely-populated** areas with minimum possible collateral damage.

- Ability to mitigate ~~Allied~~ numerical inferiority by being able to accurately delivery fires in close coordination with friendly forces delivering the desired effects at the proper time and place.

- ~~Ability to maintain and use a persistent and networked~~ **systems to** ~~identify targets with precision, to assess potential collateral damage and engage targets accurately with~~ **kinetic or non-kinetic** ~~strike capability.~~

- **Ability to maintain a robust, networked targeting capability able to leverage persistent, discriminatory sensors in order to enable enhanced collateral damage estimates, and direct the use of precise kinetic or non-kinetic effects across all domains.**

- Ability of the Alliance to obtain and employ scalable and multi-role weapons to cover a broad range of mission types.

- Ability to vary weapons yield post launch to change their effects from non-lethal through kinetic and to change targets in flight.

- Ability to conduct precise and timely Battle Damage Assessment to **demonstrate transparency where necessary, and** support follow-on actions ~~operations~~.

- Ability to maintain freedom of action in the electromagnetic spectrum.

- Ability to have access and use advanced electromagnetic protection, electromagnetic support, and electromagnetic attack.

- Ability to **innovate and** invest in new technologies to improve engagement capabilities.

- Ability to exploit **remotely-controlled, automated, and** autonomous systems ~~as a force multiplier~~.

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23 ~~Joint Influence~~
Non-Kinetic Effects

[include COP/decision making]

- Ability to coordinate **timely** communications activities **using all available channels in support of** ~~across the~~ Alliance operations.
- ~~Ability to develop and implement a political and military process to produce NAC-approved communications strategies and narratives that can inform national narratives and guide NATO's message to support cohesion, consistency and unity of effort.~~
- Ability to integrate and synchronize information activities to create effects on perceptions, and shape opinions and decision making.
- ~~Ability of forces to gain and maintain public support by communicating timely and credible information to key audiences, while influencing approved audiences and adversaries and conducting counter propaganda activities.~~
- ~~Ability to integrate all specialized communications functions (Strategic Communications, Public Diplomacy, Public Affairs, Military Affairs, Information Operations, and Psychological Operations)~~
- ~~Ability to extend a deliberate well-planned communications strategy to cyberspace to ensure NATO's communications are placed in the right context, maximize deterrent value, and influence key audiences.~~
- ~~Ability of cyber defence operations to assess and analyse cyber activities and effects.~~
- ~~Ability of NATO forces to maintain an holistic understanding of cyberspace that is not limited to technical implications but which also takes into account the effects on human behaviour and decision making.~~
- [Ability of NATO **to initiate and influence debate on international law, policies, and ethics.**] ~~change policies, SOPs, capabilities and training as activities and threats in cyberspace increase.~~ Can be transferred to "Prepare"?
- ~~Ability to engage through a comprehensive approach by providing NATO military contribution in concert with other relevant actors in multiple environments including Diplomatic, Information, Military and Economic.~~
- **Ability of NATO military forces to work with other actors to provide the military contribution towards a comprehensive approach, promoting internationally-accepted norms, such as gender and building integrity.**

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Syndicate 3

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DISCUSSION PRELIMINARIES

- Refine/ redefine the definition of 3rd C? consult (2 way) vs communications (partners vs. member states/ PFP/ NGO ect…)

- Definition of mission command –its in prepare section as well –is it more accurate here OODA loop

- Define unit roles/ responsibility and authority (ability to act autonomously)

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C3

33 Future C3 (vs C3 Systems)- Ability of the Alliance to possess resilient and interoperable C3 systems.

- Ability of Alliance C3 systems to facilitate command and control through automated data and information exchange, and should assist leaders with decision making and data analysis to rapidly make sense of complex problems and support course of action development.

- Ability of C3 to Integrate big data analysis & management.

- Data as strategic fuel

- Ability of C3(C2) ~~systems~~ to automatically and seamlessly transfer vital C3 functions to backup systems via pre-determined alternate paths when C3 is degraded.

- Ability of C3 ~~systems~~ to operate as segregated backup systems or stand alone systems when required.

- Ability of C3 ~~systems~~ to autonomously re-enable following denial or disruption.

- Ability of C3 ~~systems~~ to utilize communications pathways that are reliable, robust, secure and have alternate and backup communications systems available

- C3 integration-differentiation of partners (operational/non-operational)

- Ability to develop new communication capabilities with industrial, academic and individual partners

- Act in inter-domains (across all domains)

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34 Future Decision-Making and Information Processing Tools - Ability of C3 systems to support mission command style decision making and assist leaders in achieving clarity concerning complex problems through automated analysis and decision-making tools.

- Connect with political level to C3 to prioritize instability situations

- Cold (advanced) pre-planning/ immediate action – canned responses needed

- Ability of C3 systems to support the ~~secure~~ transmission of orders/information across multiple security domains (i.e. to NGO other) and facilitate coordination of actions across all command levels

- Ability of Alliance systems to support member nation access to the information necessary to execute their duties as well as to possess an in-depth understanding of the orders and authorizations required to execute Alliance operations.

- Ability of C3 systems to support the secure collection, storage and distribution of Alliance information

- Keep the human in the OODA (Observe Orient Decide Act) loop for certain key decisions

- Utilize wargaming – simulation-modeling to support decision making

C3)

GREEN Equals ADDITION   RED equals DELETION   ORANGE equals MODIFICATION

35 ~~Partner~~ **Actor Integration and C3 -** Ability of the Alliance to coordinate elements of both military and non-military power through an increasing number of actors.

- Ability of C3 systems to support a collaborative environment and the sharing of information ~~amongst~~ with trusted actors and to be able to handle different classifications to meet mission requirements.

- Ability of Alliance C3 systems to facilitate coordination and build trust across local government, non-government and international organizations, as well as businesses and key individuals.

- Ability of Alliance C3 systems to enable communications/consultation amongst all actors and accommodate timely interaction to achieve mutual objectives.

- Interoperability? Mutual understanding and social mapping with other actors

- Maximize human capital –comfort w/ C3-training

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Reduced Organizational Footprint - Ability of C3 systems to support flat organizations structures and accelerate decision making by scalable and modular units, and leaders at lower levels of command required to accomplish the full spectrum of Alliance missions?

- Ability of C3 systems to support senior leaders as they seek to achieve a comprehensive understanding of the operational environment including culture, ethnicity, religion and other considerations such as diplomatic information and economic issues.

- Ability of C3 systems to support real time reach-back to connect experts and senior leaders to geographically separated units operating with smaller and flatter organizational structures.

37　**Integrated Command Control and Consultation -** Ability of C3 systems to provide robust Strategic Awareness and a persistent operational picture across all domains.

- Ability of C3 ~~systems~~ to integrate command and control and conduct continuous surveillance from multiple arrays of sensors, and fuse data and information about the area of operations into an integrated operational picture.

- Ability of C3 ~~systems~~ to be networked and assist in the command and control of Alliance units making integrated operations of alliance forces more efficient and resilient.

- Ability of Alliance leaders to have awareness and influence beyond alliance forces and operations and have the ability to monitor and interface with non-military organizations such as local governments, non-governmental organizations, and business enterprises.

- Ability of leaders to understand non-military environments including financial, cultural, ethnic, societal, and religious networks.

38 **Communications -** Ability to gain and maintain dominance of the frequency spectrum and access to beyond line-of-sight communications.

- Ability to possess and use robust communications networks and systems including existing civilian infrastructure.

- Ability of NATO forces to be operationally proficient in communications degraded or contested-denied environments.

- Ability of the Alliance to make use of the most advanced mobile communications technology.

- Ability of the Alliance to communicate with long-range communications to facilitate real time reach-back and enable the chain of command to execute C3 over vast distances.

- Ability of NATO forces to posses sufficient bandwidth to allow mobile, secure, rapid and timely information flow between the tactical, operational, and strategic levels of command.

Syndicate 4

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4 **Cooperation With Security Partners -** Ability to operate with partner nations and other international organizations.
   - Ability to be interoperable with partner nations.
   - Ability to develop standardized policies, doctrine, tactics, techniques, procedures, collaborative planning, training, exercises, education, and standardization.
   - Ability to maintain and/or establish formal NATO Partnerships.
   - Ability to engage ad hoc through regular dialogue.

5 **Comprehensive Approach to Military Operations -** Ability to synchronize efforts with partners, international organizations, partner organization, non-governmental organizations, commercial/non-commercial organizations, state agencies, armed and security forces.
   - Ability to exploit full range of potential relationships with a wide range of relevant actors to include academia, industry, international aid, law enforcement, others.
   - Ability to coordinate military actions with diplomatic, economic, social, legal, and information initiatives.

6 **Scalable and Modular Units and Organisations -** Ability to prepare for a wide range of contingencies and offer maximum agility, flexibility, and efficiency at the appropriate level of readiness (at battalion+ level).
   - Ability to adjust forces in scale and capability.
   - Ability to have modular, flexible forces that can be tailored to specific missions and at different echelons.
   - Forces capable of deployment and sustainment across a wide range of environments and capable of operating at small scale and increasing operational tempo to maintain the initiative, as required.

7 **Creative Use of Human Resources -**Ability to increasingly build trust with stakeholders, share information, and be culturally aware
   - Ability to understand and exploit cultural differences including language, religion, history, habits, etc.
   - Ability to build up and rapidly integrate additional forces (e.g., national reservists).
   - Ability to make use of reservist National expertise such as government, medicine, law enforcement, education, and other specializations.
   - Ability to train personnel to perform new and emerging tasks without reducing the individual expertise and proficiency within a primary occupational skill or set of critical abilities.

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8 **Training and Exercises-** Ability to conduct exercises that demonstrate capability and resolve across all domains (including space).

- Ability to facilitate training and simulation in all areas, experiment and test new systems, reduce cost and environmental impact, and increase realism.
- Ability to conduct training and exercises which increasingly integrate emerging technologies into virtual environments into all military areas as required (e.g., AI, human augmentation, autonomous systems).
- Ability to train Allied and Partner forces for the most probable and most demanding operations and to be prepared for a wide array of factors of instability situations.
- Ability to train forces to perform military activities across all of the core tasks and main capability areas.
- ~~to conduct joint intelligence (including surveillance, and reconnaissance, strategic communications intelligence processing, fusion, and sharing) and full-spectrum targeting, including social-media.~~
- Ability to minimize the unintended consequences of operations on the local population and infrastructure through specific training.
- Ability to train forces to preserve their basic military skills and operate independently if necessary in order to overcome the loss of critical systems, such as global positioning systems, communications, and command and control systems.
- ~~Ability to prepare its forces, including Special Operations Forces (SOF), to counter conventional and unconventional warfare.~~ ~~and state as well as nonstate actors by continuing to develop policies, rules of engagement, education, training, and equipment.~~
- Ability to perform a mix of realistic live and simulated training in all areas, including hybrid, cyber, Integrated Air and Missile Defence, Anti-Access/Area Denial in all domains, nuclear, radiological, biological, and chemical, dense urban areas, AI and autonomous systems environment, lawfare.
- Ability to strengthen education training, and exercises by integrating lessons learned and best practices.

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9   **Best Practices -** Ability to quickly incorporate innovative best practices into all Alliance military activities.

- Ability to use and improve a multi-domain network connecting tactical through strategic levels, enable collaborative planning, create synchronized effects, and facilitate the timely exchange of tactics, techniques, and procedures, and best practices.
- Ability to align concepts, doctrine, and tactics, techniques, and procedures.
- Ability to conduct near real time analysis of NATO operations and lessons learned.
- Ability to conduct experiments that include new challenges and opportunities (such as AI, human augmentation, autonomous systems, cyber, hybrid, and space warfare).

10 ~~**Mission Command -** Ability to conduct decentralized execution of operations with a mission command mind-set and flattened command structures.~~

11 **[MOVE] Leader Development -** Ability to develop leaders with greater political, technological, cultural, informational, sociological awareness in order to better identify and mitigate risk while capitalising on opportunities.

- Ability to foster a culture of technological awareness where personnel understand technology and impact on operations and other activities.

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- Ability to train leaders in new technologies and capabilities including autonomous and robotic machines, big data, cyber and space systems.
- Ability of leaders to integrate technology into operations and contribute to the development of new concepts, doctrine and legal frameworks.
- Ability of leaders to improve cultural understanding and knowledge of local languages and train to develop specific regional expertise as necessary.
- Ability of military units to maintain adequate English proficiency to ensure an ability to communicate clearly across the joint force.

12 **Human Factors -** Ability to monitor and explore innovations in human physical and mental enhancement.
- Ability to identify human augmentation applications and risks, including overreliance on technology.
- Ability to explore impacts of human augmentation on the organization and individuals. [Deeper Dive should be done on this topic]

13 **Training for Urban Operations-** Ability to train for operations in urban terrain and densely populated areas.

- Ability of NATO forces to train to understand force restraint, apply proportional response and be proficient with non-lethal means.
- Ability of forces to train for close human interaction, and interface with large distressed populations.
- Ability to train for crowd control and understand crowd mobilisation and be able to cope with large movements and concentrations of people including Internally Displaced Persons/ refugees and armed civilians.
- Ability to train for humanitarian assistance and effective quarantine measures in case of a pandemic.
- Ability to train to adopt constabulary and forensics, for use in supporting local police when requested.

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14 **Train for Integrated Cyber Operations-** Ability to fully integrate ~~defensive~~ cyber operations with all other alliance operations.

- Ability to develop and share a cyber common operational picture (including cyber intelligence) and cyber best practices, and develop new operational cyber organizations as required.
- Ability to educate personnel in cyber-security, and modern communications threats and opportunities.
- Ability to perform cyber operations as a partner capacity building task.
- Ability to train and certify cyber experts to gain an enhanced understanding of emerging technologies and new areas of cyberspace.
- Ability to identify and request adaptations of cyber policy, including Standard Operating Procedures when required.

15 **Rules of Engagement/Military Authorities -** Ability to provide military leaders with sufficient guidance and rules of engagement to prepare them to act within their designated authorities in environments where adversaries employ lawfare against NATO.

- Ability to understand and deconflict national rules of engagement.
- Ability to adapt rules of engagements/Military authorities in new domains and to include emerging technologies.
- Ability to clearly define authorities and jurisdictions to enable leaders to make sound decisions rapidly.

16 **Military Acquisitions and Procurement -** Ability to coordinate closely with Member Nations to ensure assigned forces are properly equipped to meet operational requirements and have the necessary capabilities to perform all required tasks. Provide best military advise to political leadership concerning procurement efforts utilizing the NATO Defence Planning Process.

- ~~Ability to pursue collective procurement projects in order to make best use of limited resources.~~
- ~~Ability to keep procurement processes flexible, and closely consult with industry to maintain a technological advantage on the battlefield.~~
- ~~Ability to rapidly surge procurement and acquisitions to support changes in size or adjust capability.~~
- ~~Ability to exploit collaborative programs and advances in technology for their potential to shorten acquisition cycles, reduce cost, and provide greater economies of scale, while enhancing effectiveness and performance.~~

17. **Logistics COP**. Ability to develop and share a logistics common operational picture of the battlefield.

Syndicate 5

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Proposed new structure

1. Introductory remarks
    - Who and what to protect; against what and why; requirement for resilience in protection
    - Multi-dimensional approach (from tactical to strategic level; from individual to alliance; from natural disaster to nuclear war) (connection between prevent and protect)
    - Threat perception (360 degrees) to include doctrine
2. Mission
3. Personnel
4. Materiel
5. Infrastructure & Facilities
6. Information & Cyber
7. Disasters & Hazards
8. WMD and weapons of mass effect
9. Outlook of potential threats

2. Mission

- **CoG** - Ability of NATO to protect the Centre of Gravity, the cohesion of the Alliance, and the political will

- **Partnerships** - Ability to protect and sustain the cooperation with partners

- **Freedom of maneuver**

  (39) Counter A2AD ~~Area Denial~~ - Ability of NATO forces to create a permissive environment for their operations.

  - Ability of NATO forces to counter A2AD systems and to enter, maintain and operate in an area of operations despite anti-access and areal denial methods.

  - ~~Ability of NATO forces to counter A2AD systems detect, locate, exploit, and neutralise or destroy the effects of landmines, naval mines, antiship and anti-aircraft weapons, Improvised Explosive Devices included conventional and improvised CBRN devices, electronic warfare, and other area denial systems.~~

  (40) Lines of Communication - Ability of NATO to retain assured access to the global commons (specify: e.g. incl. space) and continued use of its lines of communication.

- **Support to governance**

  (42) Ability of NATO to assist local authorities when crisis overwhelm civilian response and support in protecting civil infrastructure

  (42) Ability of forces ~~to extend a "security bubble"~~ to protect key services including: governance, health, emergency, security/law enforcement, finance, transportation, power, communications, utilities, agriculture and food, national monuments and icons.

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3. Personnel

(41) ~~Expeditionary~~ Force Protection and Base Defence - Ability of the Alliance to establish superior force protection measures, physical security, and access control in high-threat environments to minimise risk to Alliance Forces.

- ~~Ability of NATO to coordinate across international boundaries and with public and private entities to ensure critical infrastructure is protected.~~
- ~~Ability of NATO to coordinate reception and staging plans in advance of NATO force deployment.~~ *PREPARE ?*

– Protection of Civilians - Ability to take efforts to avoid, minimize, and mitigate negative effects of operations, and protect civilians from conflict-related ~~physical~~ violence from hostile actors.

- ~~Ability of NATO forces to understand the human environment by persistent monitoring and assessment, engagement and coordination, and information sharing.~~
- ~~Ability of NATO forces to mitigate harm to civilians by controlling their own actions and through providing active and passive protection – this includes the ability to assist in the preservation of civilian property that is culturally and historically important.~~
- ~~Ability of NATO forces to facilitate the access to basic needs by easing any adverse footprint, providing humanitarian access, and humanitarian assistance.~~
- ~~Ability of NATO forces to contribute to a safe and secure environment by building stability and security, defence related security and capacity building, and developing functional institutions.~~

4. Materiel

– Ability to protect military equipment and capabilities (incl. strategic reserves)

5. Infrastructure & Facilities

(42) Ability of NATO forces to ~~defend~~ protect critical infrastructure (incl. "outsourced capacity" & military industry), logistic facilities (list?), vital networks, natural resources, and essential lines of communication against a full range of threats ~~when requested~~.

– Ability to assist* in the **preservation of civilian property** that is culturally and historically important (* not unanimous agreed)

6. Information & Cyber

(43) Security of Communication and Information ~~Systems (CIS) including Cyber Defence~~ - Ability to ~~Units and headquarters should be able to their~~ protect and validate information ~~data and perform non-repudiation~~ to ensure information is available, accurate, reliable, and from trusted sources.

- Ability of NATO to protect against manipulation of data and information ~~within the cyber domain.~~
- Ability to operate in an informationally ambiguous environment/ contested information

– EM Defence - Ability of NATO to protect the EM environment

- Ability of the Alliance to detect, investigate, and defend against all forms of EM attack.
- Ability to operate in an EM degraded/denied environment

(43) Cyber Defence - Ability of NATO to ~~operate in a cyber-degraded or denied~~ protect the cyber environment ~~and be able to contribute to a comprehensive cyber security strategy across all domains~~.

- Ability of the Alliance to detect, investigate, and defend against all forms of external and internal cyber-attack.
- Ability to operate in an cyber degraded/denied environment
- ~~Ability to track friendly and enemy activities in congested cyberspace~~.
- ~~Ability to partner with states and corporations to prevent cyber disruption.~~
- ~~Ability to restore cyber access to key areas rapidly once interrupted~~.(Move to Sustain)
- ~~Ability to use celestial or map and compass navigation techniques to provide resilience against cyber threats~~.(Move to Prepare)

Information & Cyber   (Continued)

- Ability of the Alliance to balance system interoperability and ease of use with encryption, segmentation, segregation, or stand-alone systems to mitigate risk.
- Ability to retain a certain percentage of non-networked systems.
- Ability of NATO to understand how systems degrade and be able to transfer vital functions to other systems automatically.
- Ability to use Cyber vulnerability assessment teams to aggressively search for network vulnerabilities and recommend remedial action.
- Ability to develop and use active and passive tools to identify, analyse and react to incursions that occur at electronic speeds.

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7. Disasters & Hazards

(54) Environmental ~~and Hazard~~ Protection – Ability to protect forces from extreme environmental conditions, and health and safety issues, and the ability to minimize the environmental impact due to force operations or collateral damage. (Engage-second half ?)

- ~~Ability of forces to minimize collateral damage to infrastructure where known Toxic Industrial Material is produced, stored, or handled.~~

8. WMD and weapons of mass effect

(53) Protection from WMD and weapons of mass effect - Ability of the Alliance to counter the threat from WMD use and in particular the reemerging threat of nuclear weapons.

- Ability to protect forces from ~~detect, identify, and disable~~ WMD weapons.
- ~~Ability of NATO to take advantage of emerging technologies to enhance force protection against the WMD threat.~~
- ~~For hazard management procedures, the Alliance should consider resource-saving technologies such as enzymatic technologies and nanomaterials for CBRN hardening of material and equipment.~~
- ~~Ability to develop smart materials to enhance individual CBRN protective equipment and detection.~~

9. **Outlook of potential threats**

– Ability to identify, monitor and understand emerging threats coming from new technology to new, creative or innovative tactics, techniques, procedures, capabilities, or doctrine.

Examples of these are sub-surface and subterranean threats, threats from swarm techniques, space based weapons or threats from ~~Ability to monitor technological advancement in areas to monitor include:~~ directed energy, autonomous systems and sensors, quantum computing, unmanned systems, electromagnetically launched projectiles, renewable energy, artificial intelligence, 3D printing, additive manufacturing, biotechnology and nanotechnology.

~~(44) Emerging Technology - Ability of NATO to understand technology and be able to innovate new and creative tactics, techniques, procedures, capabilities, and doctrine.~~

- ~~Ability of the Alliance to be cognizant of the acquisition and innovative use of technology by others.~~

45   ~~**Unmanned Systems -** Ability of the Alliance to exploit advances in unmanned systems, while limiting their advantage to potential adversaries~~

46   ~~**Swarm Techniques -** Ability of NATO forces to use, and counter swarm capabilities in all domains.~~

    - ~~Ability to develop swarm techniques as a possible counter to anti-access and area denial threats.~~

47   ~~**Protection from Surface and Sub-surface Threats -** Ability of the Alliance to exploit new advances in maritime technology. to include manned and unmanned water vehicles, both in deep water and the littorals.~~

    - ~~Ability of member nations to obtain the latest surface and subsurface maritime technologies including anti-submarine detection, underwater warfare capacities, anti-ship systems, and long range anti-ship defence.~~
    - ~~Ability of the alliance to be capable of countering subterranean threats in the land domain.~~

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48 **Integrated Air and Missile Defence -** Ability of the Alliance and member nations to survey its airspace and identify, classify, and share information on air traffic and have the means to counter a wide range of air threats.
  - Ability to possess and use a highly sophisticated network of sensors and shooters.

49 **Protection from Ground Based Air Defence and Integrated Air Defences -** Ability of Alliance air forces to operate despite the proliferation of adversarial air defence systems
  - Ability to perform operations despite adversarial use of complex integrated air defence systems.
  - Ability of the Alliance to counter integrated air defences employed by non-state actors.

50 **Defence Against Guided Rocket Artillery Mortars and Missiles -** The Alliance will require appropriate defensive measures included counter rocket artillery and mortar systems.

51 **Ballistic Missile Defence -** Ability to conduct ballistic missile surveillance and defence.
  - Ability to identify, intercept, and destroy ballistic missiles prior to or during launch.
  - Ability to reduce the hazards of falling debris from successful missile intercepts including those from ballistic missiles loaded with CBRN warheads.

  Ability of NATO forces to share targeting data and be interoperable.

52 **Defence from Space Weapons -** Ability to develop and maintain defences against space weapons.
  - Ability to detect and identify objects from space.
  - Ability of member nations to protect their space based systems and in some cases develop non-space alternatives.

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Syndicate 6

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24 **Innovative Supply of Material and Services and Minimized Logistic Footprint -** Ability to minimise logistics footprints, ensure uninterrupted logistic support, and where necessary create backup sustainment systems.

- Ability to simplify and improve sustainment and logistics, leveraging technologies and autonomous systems and where necessary balance smaller/shorter logistics support against operational risk.
- Ability to establish, maintain and use dispersed logistics hubs when required.
- Ability to contract local sustainment or use host nation support when required.
- Ability to make use of appropriate logistics techniques such as in-theatre production of consumables, and the reduction, exploitation, and conversion of waste to increase self sustainment and reduce environmental impact.
- Ability to reduce unnecessary redundancy and streamline sustainment where possible (e.g. big data/AI/in theater manufacturing).
- Ability to leverage energy efficiency and new technologies to minimize logistic footprint while enhancing military capabilities.

25 **In Theatre Movement and Transportation -** Ability of forces to have assured access to sufficient ground, air, space, and sea transportation assets to support ~~the~~ sustainment, deployment, and redeployment of forces across the whole NATO Area of Operation ~~mission~~.

- Ability for NATO to coordinate and manage movement and transport.

26 **Standardization -** Ability of ~~forces~~ to develop and use interchangeable modular structures, easily repairable standardized equipment and interoperable spare parts across the Alliance, partners, and commercial sector

- Ability to understand and track the different standards for the force
  - Equipment, personnel, procedures.
- Ability to maintain standardization across the Alliance and with the commercial sector during member nation acquisition processes.
- Ability to train to overcome a lack of interoperability in those areas where interoperability cannot be achieved.

27 **Diversification and Impact of Logistics -** Ability of Allied forces to identify and use a network of military and non-military partners to help sustain multi-domain operations with scalable logistics (to include sustainment in a post-CBRN incident).

- Ability of NATO forces to use local/regional commercial venders and third-party logisticians ~~may be able~~ to ~~contribute to delivering~~ enable logistics in austere or urban environments.
- Ability of NATO forces to retain their ability to self-reliant on their own Member Nations' logistics.

28 **Future Force Sustainment -** Ability of forces to operate with smaller, modular, multi-capable, and agile units that will often operate in a distributed or logistically autonomous manner, but that are networked together.

- Ability to develop and use more modular and flexible logistics structures which common stock systems and procedures.
- Ability of leaders to conduct operations from forward areas with limited logistic support, and a reduced reliance on local infrastructure.
- Ability to manage prioritization of logistic resources, including contracting between NATO and national support.

29 **Sea Basing and Resupply from the Sea -** Ability to use sea-based logistics during ~~expeditionary~~ operations provided that sea based assets are protected from ~~long-range anti-ship~~ threats.

30 **Military Engineering -** Ability to possess adequate military engineering to enable Allied operations.

- Ability to ~~conduct~~ accomplish a wide range of military engineering tasks to gain and maintain freedom of movement and support force protection within the theatre. ~~from the operational to tactical level.~~
- Ability of NATO force military engineering to support critical infrastructure and civilian and military life support (including Humanitarian Assistance/Disaster Relief).
- Ability to maintain extensive interoperability and use civilian contracting to compliment organic military engineering capability.

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31 **Networked Sustainable Medical Support -** Ability of NATO to rapidly deploy medical personnel, equipment and facilities.

- Ability of medical personnel, equipment, and facilities to deploy to austere environments under degraded conditions.
- Ability to exploit new technologies that improve medical care while reducing logistical footprint. New technologies may include (but are not limited to) robotics, information systems, cameras or other devices which may make delivering healthcare viable even when health care providers are not ~~be~~ physically present.
- Ability of ~~forces~~ NATO to manage and coordinate closely with local civilian and military health care providers, local governments, or international organizations, and ensure best medical practices which may include local contractor.

32 **Medical Support in Geographically Dispersed Operations and Enhanced Individual Resilience -** Ability of forces to operate while being geographically dispersed, potentially stressing existing medical support capabilities.

- Ability to use new methods of monitoring and enhancing individual health and resilience to ease the stress on medical support, and could include networked health sensors and self-healing (including physical and mental well-being).
- Ability to provide front-line care even where medical specialists are unavailable or impractical through the use of first responders and/or telemedicine.
- Ability to use semi-autonomous assets for patient transportation and medical supply.

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33   **Epidemiological issues (pandemics)**

- Ability for early detection of infectious diseases (via health surveillance systems).
- Ability to share health surveillance information with Host Nation, IOs, and NGOs (medical intelligence).
- Ability for NATO to operate in an area affected by an epidemic situation.
- Ability to deploy and assist local medical healthcare system.
- Ability to sustain Force Health Protection.
- Ability to take and provide rapid countermeasures (PPE, decontamination, medication, vaccination, and quarantine, water and food security, hygienic measures, etc).

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- Defence Budgets (cuts for the last several years)
  - Delete operational capabilities
  - Minimise operational capability by cut across within
    - Spares
    - Maintenance capacity
    - Battle decisive ammunition (MJO+)
    - Live exercises

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- ~~4 SEP 17, 12 Star Meeting, SFA Content Support~~
- ~~14 SEP 17, MCPS, SFA Content Support~~
- ~~17 SEP 17, MC in CHODS Session, SFA Content Support~~
- ★ ~~18 SEP 17, Approval of SFA 2017, IPR TBD~~
- ~~18 SEP 17, SFA Cover letters to SECGEN and Military Committee~~
- ~~28 SEP 17, DCOS Brief to MC, SFA Content Support~~
- ~~18-22 SEP 17, SFA NLR/PNLR information brief to inform and solicit support in spreading message~~
- 3-5 OCT 17, FFAO Workshop Stavanger, Norway
- 18-27 OCT 17, FFAO Team Completes Chapter 3
- 19 - 20, OCT 17, Future of Naval Station Symposium in Norfolk, SFA/FFAO Content Support
- 30 OCT 17 – 6 JAN 18, Staffing of Full FFAO with key stakeholders and ACO
- 16 NOV 17, SFA 2017 Launch Event in cooperation with GWU
- 17 NOV 17, Halifax International Security Forum, SFA Content Support
- TBD (28?) NOV 17, SFA 2017 Launch Event Europe in Brussels (Berlin Sec Conf?)
- 4-8 DEC 17, SFA Staff Development Briefing (ACT)
- 12-14 DEC 17, COTC, SFA Content Support

Blue equals events with anticipated FOGO Involvement

- 6 JAN 18 – 3 FEB 18, FFAO Writing team develops final draft update to SACT (if required)
- (TBD) FEB 18, Partner 360, SFA/FFAO Content Support
- (TBD) FEB 18, Munich Security Conference, SFA/FFAO Content Support
- (TBD) FEB, DEFMINS Meeting, SFA/FFAO Content Support
- 12 - 16 FEB 18, Line-by-Line Review of FFAO with small group from ACO, Brussels
- (TBD) ~25 FEB 18, Final FFAO IPR to SACT, Approval of printing layout
- 16 MAR 18, Final Bi-SC Signature of FFAO, Delivery of STRATCOM Package to all ACT/ACO FOGOs
- ★ (TBD) MAR 18, ACT MC Visit, FFAO Launch Event
- (TBD) APR 18, NAC Away Day, SFA/FFAO Content Support
- (TBD) APR 18, STAFF/NLR/PNLR Briefing
- (TBD) MAY 18, FFAO Tank Brief to U.S. CJCS, and Service Chiefs (if required)
- 1 – 30 MAY 18, SFA/FFAO "Road Show" to Nations
- (TBD) MAY 18, MC/CS, SFA/FFAO Content Support
- (TBD) MAY 18, FORMINS, SFA/FFAO Content Support
- (TBD) JUN 18, DEFMINS, SFA/FFAO Content Support
- (TBD) JUL 18, SUMMIT, SFA/FFAO Content Support
- (TBD) SEP 18, SACT Change of Command, SFA/FFAO Content Support

Close-Out Survey

1. *What is the best part about the FFAO?*

2. *What part of the FFAO needs the most improvement?*

3. *Do you have any feedback on the administrative organization of the workshop?*

4. *Is there any thing else you would like to provide us feedback on?*

Closing Comments

Colonel Tibor Szabo

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Strategic Plans and Policy Division

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