NORTH ATLANTIC TREATY ORGANIZATION

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Strategic Foresight Analysis (SFA) Workshop Report, 19-20 April 2016

**Strategic Foresight Analysis (SFA) 2017 Report
Workshop - I
19-20 April 2016
Lucerne, Switzerland**

1. **Background**.

   1.1. ACT released the SFA 2015 Update Report in the beginning of 2016. It is based on the in-depth review of the trend monitoring results conducted by the SFA team while taking into account the discussions and findings of the Vienna and Helsinki Workshops. The SFA 2015 Update Report highlights the changes in the global security context and major political, social, technological, economic, and environmental developments that continue to challenge decision makers and defence planners. These changes will also significantly alter how NATO will fulfil its role and core tasks in the future.

   1.2. The joint SFA/FFAO Workshop in Lucerne was the initial step in development of the SFA 2017 Report. The SFA and FFAO will be delivered in time to inform the development of the Political Guidance aligned with the NATO Defence Planning Process.

   1.3. The aim of the SFA portion of the workshop was to:

   1.3.1. Conduct a complete review/refresh of all the trends identified in the SFA 2015 Update Report;

   1.3.2. Finalize the review of the ideas within the 2015 Report that required further analysis to reach consensus on whether to include them in the SFA 2017 trend list or discard them outright;

   1.3.3. Commence initial discussions on the SFA 2017 Report list of implications; and

   1.3.4. Maintain transparency through open collaboration with member and Partner Nations, academia and industry.

2. **SFA 2017 Report, Workshop – I, Participants.**

Attendees	
ACT (including SEE & STRE)	13
ACO	1
NATO HQ	1
16 COEs	21
26 Nationalities	67
Total:	**103**
Member Nations	BEL, BGR, CAN, CZE, DEU, DNK, ESP, EST, FRA, GBR, HUN, ITA, LVA, NLD, NOR, POL, ROU, SVK, SLO, TUR, USA
Partner Nations	AUS, AUT, CHE, FIN, SWE
COEs	C2, Joint CBRN, CCD, CIMIC, CJOS, CSW, DAT, ENSEC, EOD, JAPCC, MilEng, MILMED, MP, MW, SP, STRATCOM

Academia/Industry	Austrian Institute of Technology, Fraunhofer Society, Peace Research Institute Oslo, Czech University of Defence, Finnish Defence Research Agency, Old Dominion University Norfolk, Northwestern University, Reporting and Analysis Centre for Information Assurance, Canadian Defence Research and Development Centre, UK Development Concepts and Doctrine Centre, European Defence Agency

3. **Foundational documents:** The SFA 2013 and SFA 2015 Update Reports were used as the basis for the discussions.

4. **Workshop Findings:** The attendees of the SFA workshop were divided into groups and assigned one of the five SFA themes to research and discuss in breakout sessions. Prior to the event, attendees were asked to prioritize to which theme they wanted to be assigned. Most assignments were based on choice as well as expertise backgrounds. A Subject Matter Expert (SME) and moderator, supported by ACT SPP Strategic Analysts, were assigned to run and report the findings of each respective breakout session. The findings are summarized within the following sub-sections. The majority of the overall findings will be used to set the foundation of the SFA 2017 Report research and development.

    4.1. **Political Theme**. The Political Theme breakout session was divided into two sub-groups. The breakout session started with a review of six trends and five ideas that required further analysis. Based on the discussions the existing trends were either merged, renamed or rephrased. It was concluded that the Alliance remains the primary tool to address the Trans-Atlantic security and defence issues associated with the future security environment. Therefore, NATO has to engage proactively with its security environment to succeed. What makes this difficult for NATO is that many adversaries and potential adversaries are already actively shaping the security environment. This is complicated further by the fact that domestic and international politics are interconnected, fluid and can change rapidly. To understand how global political trends connect and interact with other trends, the SFA becomes critical to thinking strategically about how the future security environment is likely to be shaped. The following points summarize the outcome of the review of the Political Theme trends.

        4.1.1. **The Re-distribution of Geostrategic Power**. The 'Shift of Global Power' trend was renamed to explain better that the shift is multi-directional and could be reversed. Geostrategic power embraces both hard and soft power including military, economic, diplomatic and normative aspects that serve the pursuit of national interest in an instrumental fashion. Although this trend has ebbs and flows, the change is persistent and accelerating. These developments may result in a challenge to access of the global commons – high seas, air, space and cyber space – restricting freedom of movement worldwide. Additionally, multiple conflicts could occur at the same time in more than one region with geostrategic importance requiring prioritization of resources. The potential exists for rapid changes in relations between nations and the emergence of new cooperation frameworks. Establishing new dynamic partnerships

could help to address regional challenges and mitigate capability deficiencies. Potential implications of accelerated re-distribution of geostrategic power for NATO might include:

4.1.1.1. Alliance cohesion and consensus could be challenged, increasing recourse to "coalitions of the willing."

4.1.1.2. NATO will need to innovate, be more proactive (shape), and tell its story more effectively.

4.1.1.3. NATO may need to continue to cooperate with other actors in order to maintain its legitimacy.

4.1.2. Challenges to Governance. 'The Shifting Political Structures' trend was renamed because the context includes not only political structures but also focuses on governance as a function. Existing governance structures, particularly in developing countries, are not sufficiently addressing the requirements of the masses. Governance deficiency is resulting in a lack of trust in the system. Compounded with corruption, the youth bulge, and chronic unemployment, challenges to governance extend beyond political structures to include economic and social structures. Lack of effective governance in these disciplines may result in more failed or failing states in regions of strategic importance to NATO such as the Middle East and North Africa (MENA) and Sahel. In these regions, it will be increasingly difficult to identify the right entity as a formal counterpart to engage or support. NATO's support to the countries in these regions may include defence capacity building. Increasing challenges to governance in the MENA and Sahel regions might result with following potential implications for NATO:

4.1.2.1. There will be an increasing requirement for a comprehensive approach to address challenges in these countries/regions.

4.1.2.2. NATO may need to continue to cooperate with other actors to actively secure its base of legitimacy. Although opportunities exist to enhance partner capacity, results take time to deliver.

4.1.2.3. Extremism (e.g. religious, ethnic, etc.) will continue to increase and impact the security environment.

4.1.2.4. These countries and regions are expected to be more prone to instability that might cause large-scale migration to Europe.

4.1.3. Non-state Actor Influence in Domestic and International Affairs. 'The increasing role of non-state actors both in domestic and international affairs' was rephrased and accepted as a strong trend. Non-state actors include benign and non-benign entities that have economic, political and/or social power and are able to influence national and sometimes international levels but do not belong to or ally themselves to any particular country or state. They represent a wide spectrum of entities from individuals to Non-governmental (NGO), International (IO)

and Inter Governmental Organizations (IGO), to Transnational/Multinational Corporations that are mostly benign entities. They are likely to be involved and play an increasing role in addressing future crises that might require NATO engagement. Terrorist and transnational crime organizations are also considered as non-state actors and could be used as state proxies to work counter to NATO Nations' interests and the Alliance's security. Even in some cases, antagonistic non-state actors may compete with states, as they increasingly possess state-like qualities. Overall, non-state actors represent a complex phenomenon and should be defined further in order to identify their influence in the international system better. Increasing non-state actor influence in domestic and international affairs might have the following potential implications for NATO:

4.1.3.1.   NATO may be required to develop a clear understanding of political/legal issues in its relations with non-state actors that could be supportive, benign or confrontational.

4.1.3.2.   NATO will likely be required to cooperate more closely with non-NATO organizations, including within the realm of security networking and intelligence sharing.

4.1.4. Power Politics. 'The return of power politics, challenges to the liberal world order and increasing potential for interstate conflict' was rephrased but remains as a valid trend. Although this trend could be considered under the re-distribution of geostrategic power, the majority of the breakout session participants felt that it merited a place as its own trend. Recent developments in the East and in the South clearly indicate that territory matters and traditional roles of defence and deterrence (including nuclear issues) are likely to increase in importance. The potential for using power to achieve political ends is likely to increase over time. Countries in different regions may use nationalism to legitimize their foreign policy goals. Power politics is returning as a trend that could have the following potential implications for NATO:

4.1.4.1.   The potential for the use force to influence key regions is likely to increase in the future (e.g., high North, global commons, Balkans, etc.). This increased use of force could risk crisis escalation and potential for interstate conflict.

4.1.4.2.   Individual countries may act to protect national interests in ways that are counter to NATO interests and limit response options.

4.1.4.3.   In an environment where power politics is perceived as a tool, NATO needs to review its deterrence measures and decision-making processes continually.

4.1.5. Public Discontent and Disaffection. 'The increasing democratic discontent' trend was renamed and remains valid. Public discontent and disaffection is likely to increase due to income inequality and governments' inability to provide employment opportunities and social security to the masses. Dissatisfaction of the masses may increase domestic political

fragmentation and cause questioning of NATO's legitimacy. In addition, social transformation could occur within a NATO partner nation that could affect their relationship with the Alliance. Finally, the group felt that countries might need to educate and connect with society to increase resilience. The increase in public discontent and disaffection could have the following implications for NATO:

4.1.5.1.   NATO may find it more difficult to reach consensus if national interests prevail over collective interests (e.g. basing, defence spending, etc.).

4.1.5.2.   The willingness to commit new resources to defence could decrease due to changing priorities.

4.1.6. Interconnectedness and Polycentricism. The group saw 'Interconnectedness and Polycentricism' as a strong trend that could also be considered as part of the characteristics of the future. To be successful in a more connected future security environment, the Alliance will need to increase resilience of its critical infrastructure. The role of the state will remain paramount in a more connected and complex world. Overall, domains and actors will be increasingly interconnected and, therefore, discrete operational theatres will decline. The interconnectedness and polycentricism could have the following implications for NATO:

4.1.6.1.   The complexity and ambiguity will increase and it could be difficult to conceptualize the issue.

4.1.6.2.   All institutions, including NATO, will need to adapt and innovate quicker than they have had to in the past.

4.1.6.3.   Due to interconnectivity, chances of failure and unintended consequences are higher.

4.2.   Human Theme. The Human Theme breakout session started with six trends and four ideas for further analysis. Based on the discussions, the existing trends have been merged into four and thereby renamed. The syndicate recommended adding an action verb to each trend to facilitate a better understanding of each trend's direction. This should not only convey a picture comprehension, but clarify what is new in the future that makes the specific issue a trend. The group stated that differentiating between a factor and its development would be helpful for the reader of the SFA because the latter characterizes a factor as a trend. Furthermore, the syndicate emphasized the relevance of the topics expressed by the ideas for further analysis and developed suggestions for their continuing consideration in the development of the SFA 2017. Based on their influence and the consequences, these matters were divided into "Cross Cutting Issues" and "Other Issues". Finally, the group developed multiple security implications for each of the trends which will require further analysis in the ongoing process.

4.2.1. Asymmetric Demographic Change. 'Changing Demographics' as a trend is still valid and was renamed to 'Asymmetric Demographic Change'. Demographics is a factor which is always

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relevant for nations. However, what is new is the asymmetric characteristics associated with demography that might challenge the Alliance in the future. The consequences of population dynamics like diverse fertility rates between Western nations and developing nations, the aging process in the West and the youth bulge in the East/South will influence the future security environment. There is also an increasing imbalance between the sexes within specific areas in the world. The combination of global economic inequality, labour options, education access and healthcare provision might exacerbate the outcome. The syndicate stressed the fact that under these circumstances migration, for example, might lead to destabilization in the nation of origin as well as in transit and receiving countries. In contrast, within NATO Nations, the aging pool might lower the willingness to reform and/or stay committed to long-term engagements, which might negatively impact the Alliance's cohesion. Potential implications of 'Asymmetric Demographic Change' for NATO might include:

4.2.1.1. Aging within Western nations may increase the demand on resources for medical and social welfare. This may negatively influence the willingness to spend on security within the Alliance as well as the willingness to use military forces.

4.2.1.2. Failed integration of migrants within NATO may increase fanaticism, crime and extremism.

4.2.1.3. Asymmetric demographics may lead to instability within and outside of NATO Nations.

4.2.2. Increasing Urbanization. Urbanization as a trend is still valid and was renamed 'Increasing Urbanization'. The increased speed of the urbanization process might not only create new challenges, but also intensify the effort to cope with and solve problems. The syndicate contested the idea that cities may start to cross national borders. However, it was stated that differences between a megacity and the host-state may result in national tensions. Such tensions might be fuelled by an evolving economic polarization between the rural and urbanized region as well as within the different factions inside a megacity. Furthermore, the group stressed the fact that the military impediments to intervention in a megacity are almost insurmountable, not only from the logistical, physical and legislation standpoint but also because of the contested realm of governance. Multiple interconnected networks, creating and supporting non-governmental structures, might manipulate and dominate the information domain. Therefore, a proper understanding of the metabolism of a megacity may be necessary to achieve and preserve strategic objectives. Potential implications of 'Increasing Urbanization' might include:

4.2.2.1. The environment of a megacity may challenge a necessary intervention by merging different responsibility realms (e.g. police vs. military) which demands proper legislation beforehand.

4.2.2.2.   Increasing inequalities within the process of urbanization may not only lead to instability within a megacity but to discontent within NATO.

4.2.2.3.   Within a megacity the information domain may be highly contested.

4.2.2.4.   Most of the megacities in the future will be coastal cities, where control of the sea might be a prerequisite to the control of the city.

4.2.3. Fractured and/or Polarized Societies: 'Fractured Identities' as a trend is still valid and was merged with the emergent trend 'Ideological Polarization'. The trend was renamed to 'Fractured and/or Polarized Societies'. Merging ideological polarization with fractured identities is congruent with the results of the Helsinki Workshop. However, the syndicate established the notion that the effects of polarization are serious enough to consider it in the trends category. Additionally, the discussions indicated that fractionalization and polarization were focused on individuals, thereby restricting the understanding of the challenges implied. Fractures do not only include the individual identity, patriotism, self-interest and allegiances but also religious, cultural and political characteristics. Therefore, the syndicate suggested widening the subject, taking whole societies into account. Increasing societal fractures will stress the fabric that binds society and allows unity to flourish. When fractures become polarized, this fabric may tear. The group highlighted the fact that both processes occur differently, in different rates and different ways. This can create a particular vulnerability for the Western developed nations because of the wider scope of individual actions. Furthermore, fractionalization and polarization may cross state boundaries and find their way into NATO. This might affect the cohesion of the Alliance and result in a loss of will, determination and trust. Increasingly connected human networks will continue to influence fractured/polarized societies. Potential implications of 'Fractured and/or Polarized Societies' on NATO might include:

4.2.3.1.   Due to fractions, the Allied Nations may become distracted and internally focused.

4.2.3.2.   Fractions could lead to a lack of unity which may result in the Alliance's inability to agree on big goals.

4.2.3.3.   Internal fractions and polarization might undermine trust within NATO, potentially making the Alliance vulnerable to adversaries.

4.2.3.4.   Internal fractions and polarization might undermine cohesion and complicate governance and decision-making, which may be exploited by adversaries.

4.2.4. Increasingly Connected Human Networks. 'Human Networks' as a trend is still valid and was renamed to 'Increasingly Connected Human Networks'. It was argued that the existence of human networks is a fundamental characteristic of human beings. The difference in the future security environment is the proliferation of technology that increases the size, scale and

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complexity of connected human networks as well as access. This trend is closely linked to the trends 'Technology Accelerates Change', 'Increased Access to Technology' and 'Centrality of Dynamic Networks'. Based on the flexibility of individuals and the wider scope of individual opponent actions, human networks might increase their ability to influence the security environment. This ability and capacity might also be used increasingly as a venue for proxy actions with non-governmental or governmental purposes. These human networks might contest the intelligence domain to attack and directly challenge the Alliance's cohesion and will, thereby decreasing the effectiveness of NATO's STRATCOM. Monitoring and targeting the relevant human networks in the future might be more difficult because of the quantity and nature of networks (e.g. spider web vs. hierarchy); the widespread availability of encryption; the shortened decision making loops, including reaction times; and the individualized approach. Potential implications of 'Increasingly Connected Human Networks' for NATO might include:

> 4.2.4.1.   Increasing individualism may result in a decreased effectiveness of Alliance STRATCOM, thereby exacerbating the security challenges and affecting unity within NATO.

> 4.2.4.2.   The understanding of human networks, within and outside the Alliance may support security in an unpredicted positive manner.

> 4.2.4.3.   Cultural awareness should become an essential element to the Alliance's professional training curriculum to better understand cultural influences to the future security environment.

> 4.2.4.4.   The increasing demand of monitoring human networks might need the closest cooperation across all possible areas. The increasing demand of monitoring human networks might require the close cooperation between NATO and local/national law enforcement.

4.2.5. Transparency. The discussions indicated that 'Transparency' is less a trend than a reflection of access to information which is covered as a trend in the Science & Technology Theme. Regardless, it is linked to human behaviour and the way individuals deal with their personal information, which does not necessarily include transparency. Individuals and human networks might increasingly use encryption to stay covert. Identities can be created and changed without revealing individual information. Under these prerequisites, transparency seems to affect the demand from the individual to the state. This might be a demand within democracies. In the past, the state was the centre of public information. However, in the future individuals interested in state authority actions, will no longer have to wait for governmental disclosure on issues, due to the increased access to information. Therefore, it was argued that transparency should partly be covered as a factor in the trend 'Increasingly Connected Human Networks' and considered as a characteristic of the individual vs state relationship within the political theme.

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4.2.6. Ideological Polarization. This idea was gauged not to be a stand-alone trend and was merged with 'Fractured Identities'.

4.2.7. Migration. 'Migration' was not considered a stand-alone trend but a part within the whole human theme. It is a factor that has negative and positive consequences for nations and the Alliance. Legal migration can be an asset, if properly managed, but integration might be one of the biggest challenges. Illegal migration might be the cause for instability and a security challenge. Moreover, migration can be easily exploited and weaponized by adversaries to create additional volatilities or exacerbate existing security challenges for Allied Nations and/or NATO. Therefore, migration should be considered in the ongoing development of the SFA 2017 report.

4.2.8. Gender issues. Gender was unanimously considered as a crosscutting topic, not a standalone trend. This matches the findings of the Helsinki workshop. Gender will play a part in the future security environment across all themes and should therefore be a constant consideration for the achievement of the objectives set out in the Alliance's strategic concept.

4.2.9. Human enhancement. The syndicate considered human enhancement as an integral part of Science & Technology.

4.2.10. Increased privatization of security forces. The group argued that the privatization of security forces requires no further analysis. This phenomenon could be considered an economic network as an attribute to human networks. Therefore, it should be included in the trend 'Increasingly Connected Human Networks'. Furthermore, if loss of life is tied to outsourcing security, individual and national perceptions of an imminent danger and/or threat might change. Therefore, the privatization of security forces could be recognized as a characteristic of the future security environment.

4.2.11. Attitude toward Defence. The group communicated the importance of the domestic attitude toward defence for the Alliance. The implications of the human trends could challenge this attitude negatively. The mind-set of a unified defence will need to be maintained in the future. This attitude is closely linked to the Alliance's cohesion and should be addressed in the SFA 2017 report.

4.2.12. Values and the relationship to Alliance cohesion. The discussion within the syndicate indicated very clearly the demand to consider and mention the Alliance's values and cohesion in the SFA 2017 report. Although there are multiple factions within NATO and different threat perceptions, the Alliance stands for solidarity and unity, both in organization and also in effort. This should be reflected in the political theme or the characteristics of the future.

4.3. Science & Technology Theme. Over the two day period, 26 subject matter experts participated in a review of the S&T trends from the SFA 2013 Report and SFA 2015 Update report. The outcome of this work resulted in some modifications to the existing trends and a proposed new trend. Based on

these findings, the group worked to provide additional detail and context against each of the trends. It will become evident in reading of this report that the trends are clearly interconnected, with varying degrees of interdependence. Lastly, the syndicate agreed that technology unto itself does not have an impact; it is the use of the technology that has impact, most often on the social, political, economic, and environmental spheres.

4.3.1. The group observed that, with respect to SFA trends in general, and S&T trends specifically, the idea of convergence needs to be further discussed and better captured. In this context, convergence refers to the coming together of different trends, the outcomes of which may be very challenging to predict but should be considered nonetheless. As an example, in the technology realm there are several technologies, such as synthetic biology and nano-technology, which, when combined, offer up very unique and disruptive opportunities and challenges. When combined with social, political, and economic trends, the resulting analysis could serve to identify potential flash-points that would require more detailed analysis. It was observed that these S&T trends are all increasing and have the potential for a strong impact on the trends within the other areas of SFA, particularly as it is the use of S&T that has an impact. What follows is a summary of the discussions and findings from the syndicate, grouped by S&T trend.

4.3.2. Rate of technology advance (previously Technology accelerates change). There was much discussion on the meaning of the original trend. It was felt that, as originally stated, it implied that technology was causing an acceleration of change of an undefined area. Although technology may serve as a catalyst for change in areas such as the political, human/social, and economic spheres, these are actually trends for those spheres as they are not capturing an S&T trend; the reading being that an S&T trend concerns S&T in some way, not its impact. Consequently, it was decided that this trend should focus on the pace of technological advance. This trend is likely a result of several other trends, namely Dominance of commercial sector in technological development, Access to technology, and Global network development. Further, the greatest increase of rate of advance was observed to be in the areas of consumer electronic and information computing technology domains. Potential defence and security implications may be:

4.3.2.1. The rapid pace of advance poses a challenge across a variety of other domains, such as policy and regulations, societal use norms, and cultural adaptation to name but a few.

4.3.2.2. Defence and security organizations' acquisition processes are challenged to keep pace, potentially resulting in less than state-of-the-art capabilities in some areas. This calls for new approaches to technology monitoring and management.

4.3.3. Access to Technology. This trend is based on the trend with the previous title, but has been re-written with a focus on the increasing global access to technology, i.e. the ability of the individual or state to access technology. The previous trend referred to the increased

dominance of the commercial sector, which was considered to be a separate trend. It was assessed that this trend is increasing due to a variety of factors such as increased economic wealth (e.g. Chinese middle class), continued globalization of the commercial market (e.g. Amazon), and the drive down of manufacturing and purchasing cost on a global scale. With respect to defence and security implications, the following were discussed:

4.3.3.1. Access to technology enables disruptive behaviours, allowing individuals to become non-state actors and acquire capabilities similar to those of states (in some areas).

4.3.3.2. Non-state actors may be less constrained as to how they employ technologies, unlike state actors who are obliged to remain within internationally agreed norms such as the Law of Armed Conflict.

4.3.4. Global network development (previously Centrality of dynamic networks). This trend was renamed to more accurately reflect the text that underpins the trend. It was observed that this trend is still increasing, as more and more global networks (carrying both information and physical items) are being created. Further, these networks are increasingly being created and used in a distributed manner, with no central node or control. With respect to security and defence implications, the discussion was focused on both lack of governance of these networks and the implications on the balance between operational security and privacy. As states try and exert governance and control over these global networks, the networks are rebuilt in other areas such as the 'dark web'[1]. Potential implications are:

4.3.4.1. The increase in global networks results in vulnerabilities from a defence and security perspective. The elements of surprise and covert operations are increasingly challenged due to these networks, which are increasingly difficult to find, monitor, and control.

4.3.4.2. Global networks will have the ability to promote the transfer of knowledge at an unprecedented rate without discrimination based on the intent of the end user; potentially placing dangerous knowledge in the hands of non-state actors with malicious intent.

4.3.5. Dominance of commercial sector in technological development (previously Increased access to technology). This trend was considered still viable and increasing. Commercial investment in technological development and their ability to rapidly turn these investments into new products significantly outpaces the ability of state owned / controlled entities in many areas. It is worth noting that the distribution of commercial investment across the fields of S&T is not equal. Commercial investments are driven by economic and consumer demand considerations. Further, the S&T outcomes of their work are not always readily available for

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[1] The Dark Web is a collection of websites that are publicly visible, yet hide the IP addresses of the servers that run them. Anyone can access a Dark Web site, but where the site is hosted and who is running the site remains unknown and inaccessible.

reasons of intellectual property and trade secret. Basic science research is still being funded and executed by the government sector, but in some areas the commercial sector continues to outpace. The following are potential implications:

4.3.5.1.   State acquisition approaches are not in keeping with the commercial sector, which is driven by and responds to a different market, one that currently demands quick advances over high quality control. Maintaining state-of-the-art capabilities may require serious changes in national R&D and acquisition policies.

4.3.5.2.   Exploiting commercial-off-the-shelf (COTS) may seem appealing due to the lower cost and rapid rate of advance, however, the quality control, security, and fit-for-purpose implications should not be underestimated.

4.3.5.3.   Product support and alignment with national procurement programmes and regulations will remain a challenge in the area of COTS.

4.3.6. Reliance on certain technologies. This trend emerged from the discussions on both society's and also defence and security's increasing reliance on certain technologies. Examples of this are wireless communication technologies, global navigation satellite systems, and the internet. Further, this reliance also places an increased demand on the supply chains necessary to develop and sustain these technologies. Potential defence and security implications are:

4.3.6.1.   Reliance on certain technologies creates vulnerabilities within how defence and security capabilities are delivered, as well as within the operation of first world societies (and in particular their economic and political systems). As militaries fall back onto single stream technological solutions, there is a potential for erosion of skills that would enable the necessary resilience to counter these vulnerabilities.

4.3.6.2.   There is an increased necessity to protect critical infrastructure, as it increasingly becomes part of how military capability is delivered, not just meeting a civil societal use.

4.3.6.3.   Increasing reliance on certain technologies may drive towards an increasing demand by society for the use of technology to solve problems.

4.4. Economics & Resources Theme. The Economics and Resources breakout groups reviewed four trends and a proposed new trend from the last workshop held in Helsinki in Oct 2015. It was decided that the rise of a network based smart economy was not a trend in and of itself, rather an idea and/or a driver for other trends. The group extensively used the Conferences i/o tool to stress-test the themes by proposing questions of future concern pertaining to each theme and then ranking those questions in order of relevance. Many of the questions demonstrated interdependencies and cross correlations between the themes, e.g. there is a common thread in the globalization of financial resources and the resulting impact on global inequality, and vice versa. The increasing challenge within the future security environment arises when considering the links and interdependencies that exist within a globalized

network of nations whose economies rely so heavily on the health of the markets and willingness of those of the "haves" to trade with those of the "have not" nations.

There is an on-going debate over whether the globalized financial markets plunged the world into a deep recession following the crisis that affected the Asian markets, or actually contributed to the market recovery that saw world income increase markedly and continents become stronger than ever. It is not just resource scarcity that can have a profound impact on global markets and thus stability, as recently realized with the sudden abundance of oil and natural gas. The sudden tipping of supply and demand in whatever form has immediate, and consequential follow-on effects in national economies, security, and stability, evidenced in employment opportunity, unrest, and population movement to where a better life can be secured. Over 130 questions were submitted and evaluated for relevance. The discussions are summarized as follows:

> **4.4.1. Globalization of Financial Resources**. 65 questions were submitted on this trend which included 26 questions from the rise of the network based smart economy discussion on the bitcoin and 3D technology. As the financial markets of the world become ever more intertwined, if a problem occurred in one part of the globe it could cascade across the global financial market uncontrollably. This cascade or ripple effect thus has associated disruptive risks beyond the source or national domestic market. There was also the discussion on the potential impacts of on-line financial trends like Bitcoin within the globalized financial markets. The digital currency's potential for cost savings offers a compelling incentive for widespread adoption beside a belief that the global banking system may collapse. Whether it will prove to be a feasible currency and begin to establish itself in everyday business remains an open question that should be monitored. Though the globalization of financial resources offers many opportunities to be a stabilizing force as nations become more intertwined in the future, the following are presented as potential implications:

>> 4.4.1.1.   The threshold for major conflict (state on state) may be rising due to economic interdependencies; i.e., self-interest, the risk to any state is too great, thus providing a stability factor. This also helps explain hybrid warfare, because nations will use those actions that are short of conventional war.

>> 4.4.1.2.   Financing of terrorism and organized crime will become less visible and transactions less tractable by leveraging decentralized networks. The rise of Bitcoin-like on-line, unregulated currencies may erode individual nations' economic strength.

> **4.4.2. Increased Competition for Natural Resources (Increased Resource Scarcity).** There was a lengthy discussion concerning the validity and clarity of this trend. Recommendations for new titles included 'Geopolitical Dimensions of Resources', 'Increased Resource Challenges', 'Increased Complexity to Resource Challenges', or 'Increased complexity in natural resource geopolitics'. A discussion of natural resources and its impact on geopolitics led to the view that natural resource exploitation could lead to the rise of new developing powers. This is already shaping regional rivalries with other powers. There were also considerable discussions about

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oil and its inclusion into "increased" resource scarcity. Additionally, the nuances of "increased" are only useful in context of each individual resource. As a result, the title needed to be changed to 'Increased Competition for Natural Resources'. 23 questions were submitted on this theme. Power, leverage (monopolization), and manipulation of markets by resource rich states was considered, as well as the risks to, and vulnerability of, the stability and national economies of demand dependent nations. A second order effect or risk for example would be the ability of a nation to maintain an adequate defence budget to maintain or build capacity if economically vulnerable to the competition in natural resource markets. The following were determined to be potential implications:

4.4.2.1.　　　With oversupply comes instability, with 2nd and 3rd order effects. Present day example is the impact and upheaval on the economies and stability of oil exporting nations (e.g., Russia, Saudi Arabia) caused by the dramatic reduction in the cost of oil in direct relationship to oversupply and competition with increased natural gas production. A 2nd order effect compounding natural energy oversupply in the United States is the increase in coal exports to Europe, furthering completion. In consequence, cause-effect, a 3rd order effect discussed was environment/climate concerns due to burning natural gas (methane by-product) vs. coal (CO_2 by-product), where methane is four times more damaging to ozone than CO_2.

4.4.2.2.　　　New technologies demand new resources and change geopolitics. This is particularly indicated in rare-earth resources required in advanced electronics. Nations that have an advantage in rare earth resources can leverage this in power politics and hybrid warfare.

4.4.2.3.　　　Increasing interdependencies between energy, raw materials, water and other resources can have either a balancing, stabilizing effect (quid pro quo) or cause further compounding destabilization if held by a single power broker.

4.4.3. Decreasing Defence Expenditures in the West. This trend produced a lot of energetic discussions based on the Wales Summit declaration where nations all agreed to stop the budgetary decline in defence spending and reach the aim of 2% GDP guideline within a decade. There were several arguments that nations who are closer to Russia actually are increasing defence spending. Estonia will meet the 2% target in 2015, while Latvia, Lithuania and Poland are significantly increasing their defence spending. But the problem is that these countries have a relatively small contribution to the cumulative military force structure in Europe, and therefore significant impact will not be realized unless alliance nations with high GDP (i.e., Germany, France, and UK) participate. Relative to the rest of the world, NATO's defence contributions are still declining and given the US's budgetary decline, NATO's overall defence expenditures will fall despite the smaller nations increasing their defence budgets. Additionally, cross trend analysis affirmed that national budgetary constraints limiting defence expenditures are aggravated from the stress on financial resources caused by mass migration, resource

scarcity or the competition for limited resources, and declining revenue caused by income inequalities. Increases in defence spending in the emerging economies of Asia (and particularly in the East Asia region) contribute to rising regional tensions and contrast sharply with defence spending trends in NATO member states. The budgetary stress based on aging demographics, as well as migration stress, will likely continue to lessen funds available in the long term. 26 questions were returned on this theme. Potential implications of decreasing defence expenditures to be explored are as follows:

4.4.3.1. Competition and stressed government budgets limit NATO reaction options, i.e. level of ambition and expectation will have to align with fiscal realities and constraints.

4.4.3.2. Individual nations may be forced to specialize in military capabilities in order to meet sovereign defence requirements and/or form collaborative partnerships with allies to manage costs and limit expenditures in defence spending. This may create potential critical shortfalls in the Alliance Minimum Capability Requirements.

4.4.3.3. A weakening of Alliance resilience through capability and capacity shortfalls.

4.4.3.4. A reduction in defence spending caused by government revenue shortfalls from a declining tax base as jobs are replaced by technology and automation. Additionally, powerful multinational corporations will increasingly use tax avoidance strategies, further constraining national budgets.

4.4.4. Increased Global Inequality. 13 questions were reviewed by the break out group. The group discussions suggest that the consequences, cross trend implications, and follow-on effects of global inequality will continue to increase. The stress on national economies and border state relationships will be aggravated as, for instance, unrest and mass migration ensue. The disparity between the have-have nots will widen, evidenced by access to health care and thus a difference in life spans between the wealthy and the struggling. Burden sharing, particularly that of young income-earning adults caused by aging populations and the dramatic decrease in the ratio of working age (tax revenue paying) adults to pension and benefits aged recipients will continue to be a source of friction between the young and old. Hence, the ability of the younger working age generation to participate in, and stimulate economic prosperity (i.e. be consumers, buy homes, cars, etc.) will be suppressed. Global inequality will affect all aspects of security, stability and crisis avoidance. The following implications were identified:

4.4.4.1. Instability caused by mass migration. Mass population movement either (or both) across national borders, or within, may further mega city trend and urbanization lending to fragmentation and fracturing of political stabilities, cultural (nation state) identification, stress on resources as tax base is reduced.

4.4.4.2.   Terrorism, radicalization, and polarization. A 2nd order effect of mass migration. Hiving of populace, either by design (segregation), or through cultural identities may increase civil unrest, and pose a threat to democratic government systems.

4.4.4.3.   Aging demographics reduces tax revenue caused by more pay-outs than those paying into systems. Amplified by increased life spans, thereby time as a beneficiary. This gives rise to an increased social welfare burden on young adults and young families who increasingly cannot find well paying full time employment. Younger adult job opportunities are in direct competition with a loss of jobs caused by automation.

4.5.   Environment Theme. The environment theme breakout group was a small, but actively engaged group. The theme remains dominated by the subject of Climate Change and there was no doubt that the current first trend of Environment and Climate Change remains valid, crosses into many other themes, has the potential to lead to instabilities and will require action by the Alliance to address the issues, or at least adapt to them. The second part of this theme, Natural Disasters also remain valid as a trend. To aid better clarity and understanding, it was suggested to distinguish between those disasters which may increase or change in nature due to change in climate (floods, droughts, hurricanes), and those for which there is not yet any hard evidence to suggest they will increase (earthquakes and volcanic eruptions). The group was able to send representatives to participate in some of the other theme discussions on the second day, which was a very useful exercise, to emphasize the cross-cutting nature of the Environment Theme.

4.5.1. Environment and Climate Change. This trend has a large and growing body of data to support it, in particular the work presented by the Inter-Governmental Panel on Climate Change in its 5th Annual Report (2014). These have led governments to discuss and agree, under the UN Framework Convention on Climate Change (21st Conference of the Parties, November and December 2015), concerning targets and mitigation measures (i.e. measures to reduce contributing factors in the hope of slowing the change). Of concern is that the trend appears to be continuing out to 2035 regardless of the success of any mitigation measures. Many governments have begun implementing adaptation measures (i.e. measures to adapt to the changing climate) and the Alliance will also have to consider adaptation as part of its Strategic considerations. The changes to our climate continue to pose stresses on existing ways of life and on local governments' abilities to keep pace and provide for the needs of their populations. Power vacuums could be created in some fragile areas, allowing other state and non-state actors to move in and take advantage of the situation. On the positive side, expected global focus on climate adaptation and mitigation measures may offer up improved efficient technologies, which could be of great advantage to defence and security forces, especially if they provide greater energy independence or resilience. Potential implications of Environment and Climate Change include:

4.5.1.1.	Allies will need to consider climate drivers, extreme weather events etc. in their Situational Awareness.

4.5.1.2.	Allies will more frequently be working in areas of humanitarian aid, which will require fully comprehensive (military, governmental and non-governmental) interoperability.

4.5.1.3.	Climate migration away from certain areas may open up ungoverned space and leave power-vacuums or safe-havens for others to fill.

4.5.1.4.	Nations will need to address climate adaptation measures for their defence and security infrastructure and equipment. Increased pressure will probably be placed on the military defence to shoulder its share of climate mitigation plans as well.

4.5.2. Natural Disasters. It was suggested to clarify the wording of previous SFAs, which indicate that natural disasters are on the increase in frequency and severity. This is true for those climate-related disasters, such as floods, droughts and hurricanes, but is not yet proven to be true of other events, such as earthquakes or volcanic eruptions. The issue with increasing climate-related disasters is not just that they will happen more often, but they will happen in areas of the world which have not been traditionally affected. Those regions which routinely experience hurricanes, for example, have developed building and infrastructure standards to cope. However, serious weather events in new regions could have a far more damaging effect due to lack of preparedness. There is also a greater likelihood of co-occurring or cascading disasters (both entirely natural and also natural triggering manmade (e.g. Fukushima Daiichi). As nations are increasingly pressured to respond with the use of their military forces to aid civil powers, there will be a subsequent effect on military availability. This will be particularly marked should a large-scale disaster strike a NATO nation. Potential Natural Disasters implications are:

4.5.2.1.	As nations increasingly respond to disasters with the use of their military forces to aid civil powers, there will be a subsequent effect on military availability. A large scale, environmentally-triggered disaster within a NATO Nation is possible and could affect the collective abilities of the Alliance.

**5.	Conclusions and the Way-ahead.** The SFA Lucerne Workshop provided an open and transparent environment that allowed extremely useful discussions on the SFA 2015 Update Report. It also enabled discussions on potential implications for consideration in development of the SFA 2017 Report. However, this report should be read as a reflection of the discussions during the workshop and breakout sessions and should not be perceived as the views of the Alliance or ACT on any particular subject. It is recognized that the trends are evolving on different trajectories and the travel of direction of each trend is affected by regional, global, economical and technical events that have taken place over the last years.

6.   The findings outlined in this paper will be further analysed and captured in detail to form a solid foundation in the development of the SFA 2017 Report. The SFA 2017 Report will reflect the changes in trends in the SFA 2013 and SFA 2015 Update Reports and will include the discussions and outcome of the workshops.

7.   The SFA 2017 Report will be released in autumn 2017.

8.   Office of Primary Responsibility (OPR). The OPR for this document is Strategic Analysis Branch, Strategic Plans and Policy Division, Headquarters, Supreme Allied Commander – Transformation. Points of contact are Colonel Tibor Szabo, tibor.szabo@act.nato.int and Mr Mehmet Kinaci, Mehmet.kinaci@act.nato.int

9.   Conference slides are available at http://www.act.nato.int/futures-ws-4

NORTH ATLANTIC TREATY ORGANISATION

ENCLOSURE 2 TO
5000/TSC-PAX-0100/TT-160708/Ser:NU 0490
DATED   13 MAY 16

**HQ, Supreme Allied
Commander Transformation
7857 Blandy Road, SUITE 100
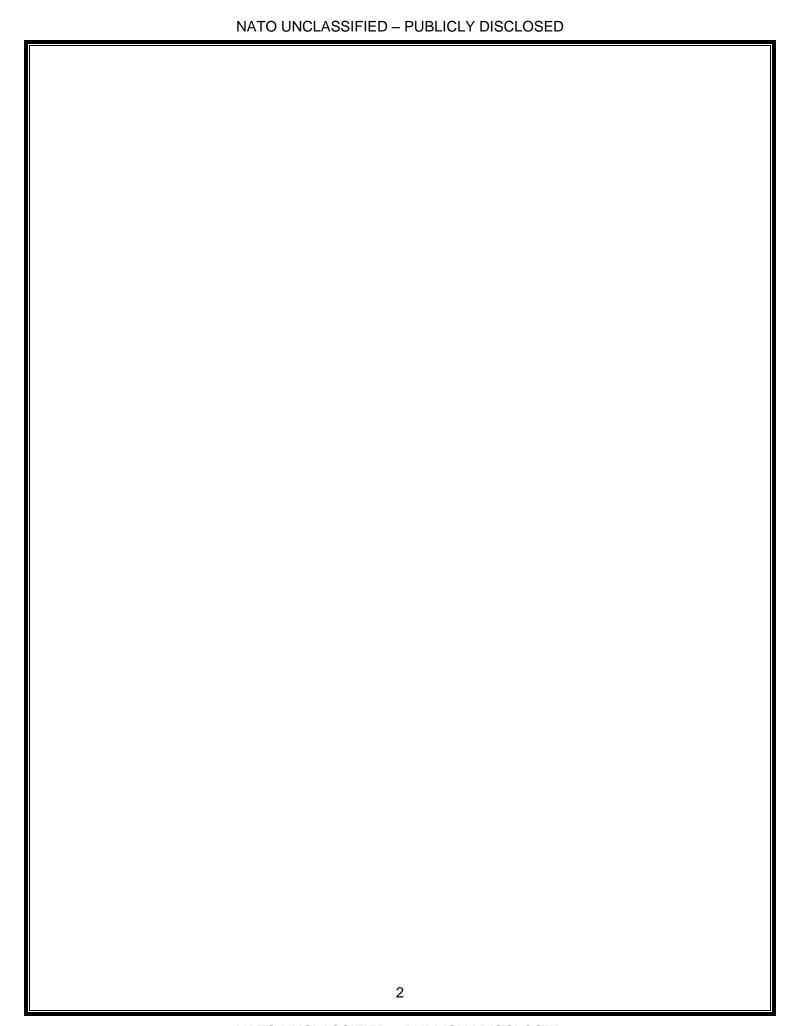Norfolk, Virginia 23551-2490
United States of America**

Framework for Future Alliance Operations (FFAO) Workshop Report, 21-22 April 2016

**Framework for Future Alliance Operations (FFAO) 2018
Workshop - I
21-22 April 2016
Lucerne, Switzerland**

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1. **Background.**

    1.1 **The FFAO workshop focused on the following problem statement.** What are the recommended additions and deletions in the Framework for Future Alliance Operations (FFAO) in both research methodology and findings from the 2015 report? To develop a prudent and suitable answer to this question the workshop divided into four syndicate groups each focused on one of the following sub-questions.

    1.1.1 What is the general feedback on FFAO 2015? What is the best methodology to use for the development of FFAO 2018? (Syndicate 1)

    1.1.2 In the FFAO 2015 report, what are the recommend additions and deletions for Chapter 1 - The Future Security Environment Towards 2030 and Instability Situations? (Syndicate 2)

    1.1.3 In the FFAO 2015 report, what are the recommend additions and deletions for Chapter 2 - Strategic Military Perspectives? (Syndicate 3)

    1.1.4 In the FFAO 2015 report, what are the recommend additions and deletions for Chapter 3 - Military Implications? (Syndicate 4)

    1.2 There were two primary products for the FFAO workshop. The workshop discussed, developed, and refined the overall methodology that ACT will apply to develop FFAO 2018. The second product was a list of recommended addition and deletions for consideration during the development of FFAO 2018.

2. **FFAO Workshop – II Participants.**

Attendees	
ACT (including SEE & STRE)	15
ACO	1
NATO HQ	6
12 COEs	16
Nationalities	57
Total	95

Member Nations	BEL, BUL, CAN, CZE, DEU, DNK, ESP, EST, FRA, GBR, GRC, HUN, ITA, LTU, LUX, NLD, NOR, POL, ROU, SVN, TUR, USA
Partner Nations	AUS, AUT, CHE, FIN, SWE
COEs	C2, CJOS, CIMIC, CMDR, CSW, DAT, ENSEC, EOD, JAPCC, MILENG, MILMED, MP
Academia/Industry	Austrian Institute of Technology, University of Bologna, Armasuisse, IBM Watson, Peace Research Institute Oslo, Czech University of Defence, Finnish Institute of International Affairs, Old Dominion University Norfolk, Atlantic Council

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3. Workshop Findings.

3.1 General Feedback and Methodology.

3.1.1 General Feedback. The seminar participants gave their general feedback on the FFAO in numerous areas.

3.1.1.1 The FFAO has intended and unintended audiences including many outside of NATO. The document was originally intended for defense planners. However, since its publication, Nations, partners, and strategic leaders have used the document in unexpected ways. Furthermore, since the document is publicly disclosed, the general public should be considered a secondary and important audience.

3.1.1.2 It is critical that the FFAO clearly describes and clarifies the links and inputs into NDPP, and that this should include a detailed diagram.

3.1.1.3 The group felt that the classification level of the document was correct, but that classified supplements could be added if required.

3.1.1.4 The group recommended that the next FFAO should include a list of definitions to aid understanding by non-native speakers, and a few key graphics to highlight the salient points.

3.1.1.5 The group also felt that the FFAO should provide a more complete picture of needed abilities. To better incorporate Science and Technology (S&T), the FFAO should describe the long-term military problems. In turn, the S&T community should provide an assessment of the military implications to highlight the opportunities that future technological developments could create for the Alliance.

3.1.1.6 The group also noted that time scales differ between stakeholders. The group recommended that the use of the terms "short-term," "medium-term," and "long-term" only confuse the reader and should be stated the time framework for clarification purposes.

3.1.1.7 Finally, the group recommend that in the development of the FFAO that the Strategic Analysis branch should continue to get and give feedback throughout the entire development process.

3.1.2 Methodology. The seminar participants discussed and debated the methodology for the development of FFAO 2018. The group discussed the background of FFAO 2015, the draft problem statement for FFAO 2018, the overall aim of FFAO 2018, key facts and assumptions that bear on the problem, scope of the document, the overall methodology, the FFAO 2018 outline, and the FFAO 2018 development way ahead. Attachment A - FFAO 2018 Methodology details the specific conclusions of the group and the recommended way ahead.

3.2 Instability Situations. Instability situations link SFA and FFAO by combining trends described in SFA to define potential instability situations that may lead to a NATO intervention in 2030. The instability situations described in FFAO 2015 were Bi-SC approved in June 2014. This workshop "stress-tested" those 2014 instability situations by examining them under a variable array (or combination) of trends from the SFA Update Report 2015 (i.e. expanding on the emerging trends not described in SFA 2013). The objective was to determine the impact of the emerging trends on the instability situations developed two years ago and identify possible new instability situations. The syndicate was divided into three sub-syndicates to conduct detailed discussions. For each instability situation, the major conclusions are listed below.

3.2.1 State-on-State Conflict. The return of power politics trend was identified as a trigger for state on state conflict, aggravated by non-state actors who promote conflict between states. Continued, on-going, or newly emerging environmental concerns, as well as climate change could trigger state on state conflict. For example, environmental spill over from one nation into another's territory, shared use (e.g., rivers). Additionally, nationalism, state interest (e.g., economy, public welfare), and neighbouring failed state attributes could spill over and spark a state-on-state conflict.

3.2.2 Access to Global Commons Challenged. The group identified that autonomous systems could challenge A2/AD systems. Nationalism, self-interest (e.g., resources, economic exclusion zones, manufactured defence zones) all are important factors that may determine if potential adversaries develop A2/AD capabilities and employ them against NATO. A broad, high impact cyber-attack, whether by a nation state or non-state actor, is widely held as a threat to the global commons.   Increasingly, states are often challenging international laws and norms and consequently threatening stability. In addition, instability situations arise when history, treaties and agreements are purposefully re-interpreted or re-defined to shape territorial claims particularly in heretofore international waters or littoral environments (e.g. the North Pole/Arctic Ocean, South China Sea, etc.) benefitting the claiming state actor.

3.2.3 Disruptive Impact of Migration. Disruptive migration is driven by turmoil in failed states that erodes personal and family safety and security, economic disparity and the hope for a better life, natural disaster, disease, and famine.   Non-state actors, and unforeseen events (environment/natural disaster/climate) are principal enablers for disruptive immigration. Migration routes through otherwise stable states may result in the desire to return to stricter border controls and restrictive immigration policies that may further impact the migrating population and neighbouring states. The implementation of restrictive immigration policies may result in changes to the migration patterns exacerbating the original instability situation.

3.2.4 High-Impact Cyber Threat. The syndicate proposed to replace threat by cyber-attack and rather include all combinations of cyber conflict between non-state and state actors (e.g. non-state to non-state cyber-attacks). In addition the syndicate recommended adding the

development of virtual cyber states within the cyber domain where the collaboration of like-minded individuals could wield influence and power of a physical state.

3.2.5 Large Scale Disasters. The culmination of several smaller individual disasters in a concurrent and cascading way may have an effect similar to a large-scale disaster. The Alliance should be equally concerned with large-scale disasters in developed regions as undeveloped regions. Developed states/regions in littorals or highly active geological regions remain as vulnerable as underdeveloped regions. Developed states and regions, due to their interdependence and interconnectedness, may require greater support to return to normalcy than underdeveloped states.

3.2.6 Space Capability Disruption. The group agreed that some nations may challenge the strict international space regulations if they do not serve perceived national interests. Likewise, the group proposed to add that space capability disruption could be executed by non-kinetic means, such as jamming or cyber-attacks to determined satellites.

3.2.7 Megacity Turmoil. Triggers to megacity turmoil are vast, and mega city turmoil may be a 2nd or 3rd order effect of other causalities (e.g., mass migration), contributing or compounding factors (natural disaster, persecution, resource scarcity, economic inequalities). The group proposed to use the results of the ACT project on Urbanization so, therefore, they propose to change the name to "Lack of Control (lack of governance) over Large Urban Areas."

3.2.8 Conflict in the Euro-Atlantic Region. The workshop discussed implications enlarging to NATO-wide and not limited to its borders and could include a wide variety of conflicts across the range of military operations. Additionally, future defence expenditures are best characterized as "limited" or "changing" rather than "decreasing"- recent events are impacting intra-state and interstate security.

3.2.9 Non State Actors Rival States. This group continued to assess much of the impacts from mass migration, global inequality and ideological polarization to non-state actors. Non-state actors affect NATO members on NATO territory as well as the periphery and directly challenge the established international order and authority.

3.2.10 Weapons of Mass Destruction/effect Use or Threat. The syndicate desires to expound upon the threat posed by a cyber-attack that can produce similar effects as a traditional WMDs. Therefore, the group recommended that a cyber-attack should be considered as weapon of mass effect. Finally, the ability of autonomous systems to deliver WMDs or their effects should be considered as an emerging threat.

3.3 New Instability Situation Candidates. The syndicate reviewed the 10 instability situations against the emerging trends of SFA 2015 Update Report, to create new Instability Situations. The proposed new instability situations are to be viewed as raw inputs that must be analysed and developed further. The proposed "raw" instability situations are.

3.3.1   Instability Situation 13. The rapid combination of two or more instability situations in the same region at the same time (e.g., hyper instability).

3.3.2   Artificial Intelligence Society. Artificial intelligence evolves across several phases beginning with general support for AI within society, to AI discontent, to unemployment, and ending in superseded governments.

3.3.3   Structural Disintegration of Economic/Financial Systems. Economic and financial systems degrade and cause instability. For instance, a new energy technology can cause an economic collapse for economies dependent upon fossil fuels.

3.3.4   Changing Nature of Statehood. The redefining nature of Statehood by de-globalization or regionalization can cause a small region or city to succeed from their capitals and become independents.   The changing nature of statehood will influence NATO's action in the future as the Westphalian model of state wanes. However, this could reverse course and states may consolidate their power and become stronger in the future.

3.4 Strategic Military Perspectives. The Strategic Military Perspectives (SMP) breakout session looked at the five existing SMPs. Based on the discussions, the content of the SMPs are perceived to be valid. In regard to potentially missing SMPs, the syndicate concluded that this needs to be analysed further when trends, security implications (SFA), and instability situations are developed. The syndicate expressed that the term SMP is difficult to understand because the title is not precise and the logic link between SMPs and other parts of the FFAO are not expressed clearly.

3.4.1   Content. The title Strategic Military Perspective is a difficult term to understand. The recommendation is to use simple terminology in order to enhance understanding. The SMPs are useful as strategic level characteristics of the desired future NATO military force and are useful in strategic level discussions. For defence planners, SMPs are perceived as less useful. The overall feedback is that all the existing SMPs are valid, although there is room for improvement.

3.4.2   Structure. The recommendation is to write the SMPs in a consistent format, focused on future projection and less on present day. The logic link between the Instability Situations and the SMPs, and the SMPs and Military Implications needs to be stronger. It would help the readability to include infographics. A glossary of terms and footnotes for references will also contribute to better readability. Finally, yet importantly, the FFAO should use NATO definitions when they exist.

3.4.3   Language. The language needs to be more focused towards the future. In addition, the language needs to be simplified to allow for accurate translation to other languages.

3.5 Military Implications (MI).

3.5.1   Syndicate Overview. The MI Syndicate had 22 participants and provided over 138 specific recommendations for improving the Military Implications chapter of the FFAO.

3.5.2   MI General Feedback on Methodology.

3.5.2.1 FFAO and MI Usage. The syndicate members were unanimous in their view that the FFAO is a very useful document. Of the 22 syndicate members, 11 had used FFAO as an input to national defence planning. Five had used the FFAO in their jobs within NATO Headquarters or COEs.

3.5.2.2 Future Operational Concept. The Syndicate advised that a future concept for NATO military operations is required to fully inform the development of the MIs, as well as to perform concept development and other transformation activities. Furthermore, the syndicate recommended that ACT FOGOs discuss options for creating a Bi-SC approved future operating concept, who would be responsible for its development, and a timetable for its creation.

3.5.2.3 SHAPE/ACO Participation in Workshops. The Syndicate did not recommend changes to the MI development process or to the Bi-SC staffing and approval process. However, the Syndicate did feel that it would be of great benefit to obtain greater SHAPE/ACO participation during FFAO development workshops.

3.5.2.4 Classified Annex. The Syndicate greatly appreciated the value of having a document that was NATO Unclassified – Publically Disclosed.   However, it was recommended to provide additional detail via a classified annex, so that classified issues could be adequately covered.

3.5.2.5 SMP and MI Linkages. The links between the Strategic Military Perspectives and the Military Implications were not clear and should be better identified.

3.5.2.6 Recommended Improvements to the MI chapter. The Syndicate reviewed each MI subsection paragraph by paragraph. The 22 members were split into four small groups who reviewed each section. Then the subgroups reported their findings to the entire Syndicate. Overall the Syndicate identified over 138 recommendations to improve the MIs.

3.5.3   Major MI recommendations.

3.5.3.1 Operational Concept. A future operational concept is needed to outline how the alliance will operate in the future. The Syndicate was unanimous that a future operational concept would add a great deal of value, both for the development of FFAO, but also as a tool for planners to envision and plan for future operations. The group recommended that ACT senior leadership should examine and determine a way forward for developing a future operational concept.

3.5.3.2 Consult. "Consult" needs to be added back into the "C2" section. During the writing of FFAO, "Consult" was removed from the C3 section and the decision was made

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to have a "C2" chapter, thus removing the political dimensions of consultation due to FFAO's military focus. However, the Syndicate felt that consultation should be considered and included, and the chapter renamed to "C3."

3.5.3.3 Emerging Technologies. It was recommended to add an "Emerging Technologies" section to each CH section.

3.5.3.4 Combat Support. The Syndicate felt that combat support was lacking throughout and that combat support should be considered and included.

3.5.3.5 STRATCOM. The Syndicate recommended that STRATCOM needs to be aligned with the ongoing efforts to define STRATCOM and include it into NATO doctrine.

3.5.3.6 Ability Statements. Generally, the Syndicate agreed with using "ability statements" to define Military Implications, but there were several incidents where it was unclear that an ability statement referred to a member nation ability or a NATO military force ability. These incidents should be clarified.

3.5.3.7 Cyber ability statements. The syndicate recommended that references to cyberspace, cyber abilities, and cyber operations needed to be expanded.

3.5.3.8 Nuclear. The original FFAO avoided any reference to nuclear abilities and nuclear deterrence. The Syndicate recommended that FFAO include nuclear abilities and deterrence in the MIs.

3.5.3.9 Shared Awareness. The idea of sharing awareness amongst partners (both official NATO Partners and ad hoc partnerships) needs to be expanded. Specific questions about how to share intelligence and awareness information across various types of partnerships should be answered.

3.5.3.10 Anti-Access and Area Denial. While A2/AD is discussed, A2/AD ability statements need to be expanded across the document. Of particular importance, the Syndicate recommended ability statements about NATO's need to build an integrated A2/AD network over Alliance territory.

3.5.3.11 Post-Conflict Management. The original FFAO did not include any consideration of post conflict management. Post-conflict management should be considered in depth and included.

3.5.3.12 Inform Section. A better consideration of the types of information that is needed for NATO military operations is required. It was recommended that information requirements on "friendly forces and actors," "other actors," "adversaries," and the "environment" should be considered separately and ability statements for each be derived.

3.5.3.13 Capability Hierarchy Functions. The Syndicate agreed with the methodology of using the NDPP's Capability Hierarchy (CH) as a way of categorizing ability statements. However, it was recommended that abilities which span several CH categories need to be identified and their cross-functional nature be explained.

3.5.3.14 NATO Expeditionary Operations versus Operations on NATO Territory. The Syndicate recommended that the MIs better identify ability statements which are expeditionary in nature from ability statements required on/over NATO territory. In some cases, the distinction was not clear.

3.5.4 MI Syndicate Conclusions. Feedback on the MIs was largely positive. The Syndicate felt that stating MIs as ability statements was the correct and best way of articulating future ideas. The syndicate also reported that the MIs were helpful to the NDPP process and national defence planning.

4. Conclusions and the Way-ahead.

4.1 Conclusions. Overall, the development of FFAO 2018 should follow same general development process but with the addition of independent reviews and use of an expanded list of contributors. For the instability situations, there are proposed changes to account for Strategic Foresight Analysis 2015 emerging trends, all of which should be discussed at the next workshop. In addition, the group felt that the assessment of the Future Security Environment should include opportunities and challenges which would put the future in a more positive light, and encourage NATO to innovate where it can. Concerning the Strategic Military Perspectives, the findings indicated that most of the ideas are relevant but the connections to other parts of the FFAO should be clarified. One of the notable recommendations was that the FFAO should include a general operational concept that illustrates how NATO might employ its forces to overcome the challenges of the future. Another positive development during this conference was that NATO STO is engaging more with FFAO, which should improve the quality and rigor of the final product.

4.2 Way Ahead. The next major milestone in the development of the FFAO is to seek approval of the methodology from SACT. Following this, Strategic Analysis Branch will plan coordinate and execute a fall conference focused on development of *Chapter 1 - The Future Security Environment.* The key to this workshop will be to validate the previous Instability Situations, explore new Instability Situations, and identify future opportunities that NATO may be able to exploit. The timeline below illustrates the detailed steps by which FFAO development will proceed with the target of a May 2018 publication date.

SFA and the FFAO will be delivered in time to help develop MC input to next Political Guidance

Fall18 Political Guidance Writing

NDPP

2018

NLT MAY – FFAO 2018 Published

FEB – Bi-SC Final Workshop (TBD)

NOV – Independent Review - Staffing

SEP/OCT - Workshop #4, Military Implications

2017

JUN – Approval of Chapter 2

APR – Independent Review - Staffing

MAR - Workshop #3, Characteristics of the Future Force (TBD)

DEC – Approval of Chapter 1

NOV – Independent Review - Staffing

SEP/OCT – Workshop #2, The Future Security Environment (TBD)

2016

JUN – Approval of Methodology

APR – Workshop #1, FFAO 2015 Feedback and Gap Identification, (Lucerne, Switzerland)

FEB – Engagement FR-GE-NO-UK

5. The FFAO 2018 Report will be released in summer 2018.

6. **Office of Primary Responsibility (OPR).** The OPR for this document is Strategic Analysis Branch, Strategic Plans and Policy Division, Headquarters, Supreme Allied Commander – Transformation. Points of contact are Colonel Tibor Szabo, tibor.szabo@act.nato.int and LTC Aaron Bazin, aaron.bazin@act.nato.int.

7. Conference slides are available at. https://goo.gl/Xkji2L

Attachments.

    A. Methodology Overview Framework for Future Alliance Operations (FFAO) 2018
    B. Strategic Military Perspectives Findings
    C. Military Implications Questionnaire
    D. Military Implications Recommendations