



69th ANNUAL SESSION

6-9 OCTOBER 2023

SCIENCE AND TECHNOLOGY COMMITTEE (STC) MEETING SUMMARY AND ATTENDANCE LIST

SATURDAY 7 OCTOBER
CONFERENCE ROOM D5

BELLA CENTER
COPENHAGEN, DANEMARK

I. Opening remarks by Agnes VADAI (Hungary), Chairperson of the Science and Technology Committee

1. The Chairperson **Agnes Vadai** (HU) welcomed the participants and thanked the Danish delegation for hosting the 2023 Annual Session in Copenhagen.

2. Agnes Vadai continued by giving a short overview of the agenda and introducing the speakers. She then informed attendants about technical details and procedures of the Committee meeting.

II. Adoption of the draft agenda [142 STC 23 E]

3. **The draft agenda [142 STC 23 E] was adopted unanimously.**

III. Adoption of the [Summary](#) of the previous Committee meeting [099 STC 23 E]

4. **The Summary [099 STC 23 E] was adopted.**

IV. Presentation on *Military Technology and Innovation: A Danish Perspective* by Steen SØNDERGAARD, Director of Defence Research Centre, Danish Ministry of Defence Acquisition and Logistics Organization

5. Noting the ongoing international technology race, **Steen Søndergaard** reminded the Committee how quickly military equipment can become obsolete and be replaced by modern technology as Russia's war against Ukraine shows. Denmark's size, resources, and the need for interoperability with partners and allies leads to an off-the-shelf strategy. The speaker outlined the Danish contributions to NATO and EU initiatives as well as its National Defence Technology Centre (NFC) that brings together universities and government-approved research and technology organisations. Those efforts are bolstered by the Danish Defence Co-Funding Scheme that has an annual budget of around 40 million DKR (approx. 5,36 million EUR). Steen Søndergaard drew several conclusions, including the benefits of failing and learning fast, the need to develop a public-military roadmap and innovation platforms, identify alternative funding systems, expand co-funding schemes, and increase international technological cooperation with allies and friends.

6. Agnes Vadai (HU) inquired how Denmark benefits from NATO's Science and Technology Organisation (STO) and what the main challenges posed by Russia and China are. Steen Søndergaard replied by stressing the benefits of cooperation in the STO. Denmark is good at integrating technologies and in quantum research. Russia traditionally has good radar and electronic warfare capabilities. China is a main competitor and already leads in many emerging and disruptive technologies. **Jarno Linnell** (FI) asked about key learnings regarding cyber warfare from the Russian war against Ukraine. Steen Søndergaard noted amongst others the necessity to cooperate with private entities. Agnes Vadai (HU) asked about steps that politicians should take and the speaker underscored the importance of expanding co-funding schemes and of cooperation to ensure that efforts are not duplicative.

V. Presentation on *Harnessing the Military AI Genie: The Challenge of Balancing Risks and Opportunities of Military AI-Systems in National Governance Frameworks* by Iben YDE, Assistant Professor, Head of Centre for International and Operational Law, Royal Danish Defence College

7. **Iben Yde** addressed the challenge of balancing the benefits and risks of military AI systems. Blanket bans are unlikely to work because innovation is driven by the civilian sector and external

actors may not adhere to them. To identify the right approach to regulation and usage, it is necessary to fully comprehend the benefits and risks of different AI-systems. It is also important to differentiate between technology and governance. Technology relates to the implementation of AI in legacy and novel systems, adaptation of development and acquisition, and experimenting. Governance should adopt a life-cycle approach, differentiate AI-systems according to their risk, and tailor regulation to the national context to promote safe and responsible development and use of AI.

8. **Kevan Jones** (UK) asked about the need for NATO standards and set of rules. Iben Yde confirmed that such standards are needed and that NATO actively develops them. **Leo Pieters** (BE) inquired about how to mitigate threats posed by lone wolves and **Matej Tonin** (SI) asked how AI is different in regulating the conduct of hostilities. Iben Yde compared legacy and AI-systems when it comes to lone wolves and noted that international humanitarian law (IHL) provides suitable rules which are also regularly violated with legacy systems. **James Sunderland** (UK) asked how politicians can approach regulation of such a complex field and **John Spellar** (UK) inquired about the decreasing role of humans through the usage of disposable items. Iben Yde argued for broader and ethical principles on the legislative level. Autonomous systems can also enhance the role of humans by providing more situational awareness during targeting processes.

VI. Consideration of the Draft General Report [Protecting Critical Maritime Infrastructure – The Role of Technology](#) [032 STC 22 E rev. 1] by Njall Trausti FRIDBERTSSON (Iceland), General Rapporteur

9. **Njall Trausti Fridbertsson** (IS) opened by stressing that the protection of critical maritime infrastructure is high on NATO's agenda. The Rapporteur explained the relevance of critical maritime infrastructure for our societies and laid out the impact that attacks or acts of sabotage could have. One of the main actors capable of such attacks is Russia, but there are also other (non-) state actors capable and potentially willing to carry out such actions. The Rapporteur outlined the role of technology in protecting critical maritime infrastructure. It can enhance intelligence, surveillance, and reconnaissance, enable the tracking of vehicles, and help in identifying threats in a cost-efficient way. The Rapporteur summarised ongoing efforts and closed by formulating clear recommendations.

10. **Sorin-Dan Moldovan** (RU) proposed to include text relating to off-shore installations (para. 6), off-shore gas platforms, future infrastructure, and the relevance of the Black Sea for energy security (para. 7), and the Russian targeting of Ukrainian ports in the lower Danube in the immediate vicinity of Allied territory (para. 10). The Rapporteur agreed to include the references in the text.

11. **Anne Genetet** (FR) inquired about a possible change of the title of the report and the related resolution to refer to 'underwater' instead of 'maritime' infrastructure. The Rapporteur responded that the Committee follows the terminology used by NATO. Kevan Jones (UK) concurred and noted that the prefix 'sub-' would exclude ports. The Rapporteur proposed to keep the titles for the report and resolution as they are. There were no further questions or comments from the floor.

12. **The draft general report [032 STC 22 E rev. 1] was adopted unanimously as amended.**

VII. Presentation on *The Impact of Quantum Technology on Security* by Jan Westenkær THOMSEN, Chief Operation Officer, NNF Quantum Computing Programme (NQCP), Quantum Coordinator, Niels Bohr Institute, University of Copenhagen

13. According to **Jan Westenkær Thomsen**, quantum technology will enable significant breakthroughs in defence and security. Many countries are investing in the research of this technology. Major Western players include the US, Germany, and Spain. China accounted for about

half of the 2022 global investment in quantum technologies. The Niels Bohr Institute and the Deep Tech Lab in Copenhagen, which is part of DIANA, are active in quantum research. The first quantum generation brought us MRI, lasers, PET scanners, GPS, transistors and chips, the speaker noted. The second generation of quantum technology promises far-reaching advances on sensors, cryptography, and computing. Quantum sensors promise unprecedented levels of accurately measuring minuscule changes, quantum cryptography offers novel ways to secure communication, and quantum computing changes the speed, power, and storage of computation abilities. The speaker provided several practical examples how quantum technology can be employed in the civilian and military realm.

14. Jarno Limnell (FI) asked what Finland should incorporate in its revised strategy on this subject. The speaker noted that NATO is soon publishing a strategy on quantum technologies which can be a valuable resource and recommended the identification of focus areas and close collaboration with leading scientists. **Meelis Kiili** (EE) asked about the ramifications if Allies do not catch up with other actors. Jan Westenkær Thomsen stated that China is not ahead on all technologies, but that NATO Allies have to bet on many horses, which they are currently not doing coherently. **Bart Kroon** (NL) inquired about developers' rights, "ownership" of quantum technology, and necessary legal frameworks. The speaker elaborated upon major companies in this area, the role of governmentally driven research centres, and the importance of continuing dialogue on how to regulate this technology. He emphasised the importance of tech diplomacy for the development of binding legal frameworks. Agnes Vadai (HU) asked about the messages that can be conveyed to voters to advocate for more funding. The speaker underlined the importance of educating people about what quantum technology can and cannot do. He provided examples of how technological knowledge can be disseminated.

VIII. Consideration of the Draft Special Report on [Novel Materials and Additive Manufacturing](#) [033 STC 23 E rev. 1] presented by Joe WEINGARTEN (Germany) on behalf of Sven CLEMENT (Luxembourg), Special Rapporteur

15. **Joe Weingarten** (DE) began by explaining what novel materials and additive manufacturing are and how they can be used in the military domain. Novel materials and additive manufacturing feature prominently on NATO's agenda which is reflected in the initiatives in this realm pursued by Allies. He reminded the Committee that these technologies are important to address the energy crisis, to provide sufficient defence equipment, and to reduce the dependence on external actors for critical raw materials. In addition, Allies should ensure that they remain positive emerging disruptive technologies. Joe Weingarten then presented several recommendations that would allow NATO to ensure sufficient resources for research and investment, the sharing of best practices, and cooperation with partners. These include raising awareness for the potential risks and the need to develop or strengthen international regulations and governance mechanisms.

16. **The draft special report [033 STC 23 E rev. 1] was adopted.**

IX. Future activities of the Science and Technology Committee and the Sub-Committee on Technological Trends and Security for 2024

17. Agnes Vadai (HU) and Kevan Jones (UK) provided an overview of the Committee and Sub-Committee visits in 2023 to Iceland, the United States, and Germany and an outlook for 2024. The General Report of the Committee will address technological competition with China with a specific focus on semiconductors, the Special Report will cover Artificial Intelligence, and the Report of the Sub-Committee will focus on synthetic biology. The Sub-Committee is planning to visit Italy and the Republic of Korea while the Committee will visit the Czech Republic in 2024.

X. Panel: Autonomous Systems

Consideration of the Draft Report of the Sub-Committee on Technology Trends and Security [Developing Future Capabilities: Robotics and Autonomous systems](#) [034 STCTTS 23 E rev. 1] presented by Joe WEINGARTEN (Germany), Rapporteur

Presentation on *Sanitising the Battlefield? The Mirage of Robotic Warfare* by Andreas GRAAE, Professor, Royal Danish Defence College, FAK institute for Military Technology

18. Joe Weingarten (DE) began by clarifying what robotics and autonomous systems are and how they differ and discussed several driving factors behind their increasing relevance for our societies, including the military realm. The Rapporteur then explained the different military tasks that can be performed, drawing particular attention to uncrewed vehicles as well as swarms. Joe Weingarten then summarised the research pursued by both NATO Allies and peer competitors in the area of autonomous systems. Against this background, the Sub-Committee Rapporteur identified three particular aspects on which the Alliance should focus. First, ensuring the proper integration of legacy and modern systems and striking the right balance between expensive and affordable systems. Second, preparing for countering attacks by malign actors. Third, addressing the issue of proliferation in the absence of regulation.

19. Andreas Graae began with an overview of how AI is currently being operationalised on the battlefield. In his view, Russia's war against Ukraine offers several lessons on drone operations. On the one hand, there are still physical dangers and risks of psychological traumata for operators. On the other hand, the ongoing hostilities show that drones will, despite their importance, not make conventional systems obsolete. However, the use of drones makes operations more complex. Moreover, countering unmanned aerial systems, especially in swarms, remains a challenge. The speaker concluded that robots will not "sanitise" war, that we are not yet witnessing killer robots, and that the focus should be on human-machine teaming and on building trust in such systems.

20. **Turhan Comez** (TR) suggested to add a reference to the report that such systems can operate continuously for extended periods (para. 25). He also proposed to insert an additional paragraph to highlight the importance of education and training (para. 74(f)). The Rapporteur accepted both proposals. Matej Tonin (SI) followed up on drones and asked why legacy systems continue to play such a central role. Andreas Graae clarified that it is about combining and integrating legacy and novel systems. Joe Weingarten (DE) underlined that it is not an "either-or" but a "both-and" question.

21. **The draft report [034 STCTTS 23 E rev. 1] was adopted unanimously as amended.**

XI. Presentation on *A Practitioner's Viewpoint on Technological Innovation and Adaptability* by Rune Pilgaard NIELSEN, Military Analyst, Department of Military Technology, Royal Danish Defence College

22. **Rune Pilgaard Nielsen** recognised that we live in an ever more complex world in which we cannot control technological developments but only shape them. Against this background, the speaker reflected how complexity and innovation can be managed. The speaker proposed Mission Command as a promising approach, where direction is limited to the overall intent and the implementation is left to subordinate organisational levels. This requires mutual understanding and trust, competence, and tolerance for failure. Similarly, technological innovation and operational effectiveness must go hand in hand and include academia, the military, and private entities. The speaker advocated for less restrictive regulations for the military which requires trust that should be built through dialogue.

23. James Sunderland (UK) stressed the importance of clear political direction for Mission Command, Meelis Kiili (EE) asked how this can be implemented on the state and alliance level, and

Agnes Vadai (HU) inquired how less restrictive rules could look like. Rune Pilgaard Nielsen called for consideration on the political level how detailed their orders should be and called for exchanges and mutual trust. Leo Pieters (BE) asked how trust can be build when politicians frequently change, to which the speaker responded that underlying cultures often remain. **Rich McCormick** (US) noted that democracies have an advantage because they trust the lowest tactical level more than autocracies and **Rebecca Patterson** (CA) said that politicians should allow themselves flexibility. Agnes Vadai (HU) asked about the influence of AI and James Sunderland (UK) noted the impact of AI on the targeting process for drone strikes. The speaker underlined the importance of embracing AI. **Tom Vandenkendelaere** (EP) asked about the definition of dual-use systems which the speaker saw as an example of less clear boundaries between military and civilian use.

XII. Consideration of the Draft Resolution [Enhancing the Protection of Allied Critical Maritime Infrastructure](#) [153 STC 23 E] by Njall Trausti FRIDBERTSSON (Iceland), Rapporteur

24. Njall Trausti Fridbertsson introduced the Draft Resolution. Four amendments were submitted which the Committee considered and discussed. It accepted the following: Amendment 1 (Francken, BE), amendments 2 and 4 (Genetet/Cambon, FR), and amendment 3 (Cesa, IT).

25. **The Draft Resolution [153 STC 23 E rev. 1] was adopted as amended with one abstention.**

XIII. Election of Committee and Sub-Committee Officers

26. The Chairperson announced the electoral procedure. All Committee and Sub-Committee officers eligible for re-election re-elected by acclamation and the following candidates were elected:

Science and Technology Committee

Chairperson	Agnes Vadai (HU)
Vice-Chairpersons	Matej Tonin (SI) Wendy Morton (UK) Rich McCormick (US)
General Rapporteur	Njall Trausti Fridbertsson (IS)
Special Rapporteur	Sven Clement (LU)

Sub-Committee on Technology Trends and Security

Chairperson	Kevan Jones (UK)
Vice-Chairpersons	Bardhyl Kollçaku (AL) Robert Kralicek (CZ) Leo Pieters (BE)
Rapporteur	Joe Weingarten (DE)

Ukraine-NATO Interparliamentary Council

Full members	Joe Weingarten (DE) Agnes Vadai (HU)
Alternate members	Vladan Raicevic (ME) Pawel Bejda (PL)

XIV. Closing remarks

27. There was no other business to discuss.

28. The Chairperson thanked the rapporteurs, speakers, and staff of the NATO PA. The next meeting of the Committee will take place at the Spring Session in May 2024 in Sofia, Bulgaria.
29. The Chairperson closed the meeting of the Science and Technology Committee.

ATTENDANCE LIST

Chairperson	Agnes VADAI (Hungary)
General Rapporteur	Njall Trausti FRIDBERTSSON (Iceland)
Rapporteur of the Sub-Committee on Technology Trends and Security (STCTTS)	Joe WEINGARTEN (Germany)
Secretary General of the NATO PA	Ruxandra Popa

MEMBER DELEGATIONS

Albania	Bardhyl KOLLÇAKU (<i>Socialist Party</i>)
Belgium	Leo PIETERS (<i>Vlaams Belang</i>)
Bulgaria	Radoslav RIBARSKI (<i>We Continue the Change (WCC)</i>)
Canada	Rachel BLANEY (<i>New Democratic Party</i>) Cheryl GALLANT (<i>Conservative</i>) Rebecca PATTERSON (<i>Canadian Senators Group</i>)
Croatia	Stjepan KOVAC (<i>Social Democratic Party</i>)
Czech Republic	Robert KRALICEK (<i>ANO 2011 (Action of Dissatisfied Citizens)</i>) Ondrej LOCHMAN (<i>STAN (Mayors and Independents)</i>)
Denmark	Peter SKAARUP (<i>Denmark Democrats</i>)
Estonia	Meelis KIILI (<i>Reform Party</i>)
Finland	Jarno LIMNELL (<i>National Coalition</i>)
France	Christian CAMBON (<i>The Republicans (LR)</i>) Anne GENETET (<i>Renaissance</i>) Aurélien SAINTOUL (<i>La France insoumise – New Ecological and Social People’s Union (NUPES)</i>)
Germany	Ulrich MÄURER (<i>SPD</i>)

Joe WEINGARTEN
(SPD)

Hungary **Agnes VADAI**
(DK - Democratic Coalition)

Iceland **Njall Trausti FRIDBERTSSON**
(Independence Party)

Italy **Luciano CANTONE**
(Five-Star Movement)
Fausto ORSOMARSO
(Brothers of Italy)

Lithuania **Vytautas BAKAS**
(Political Group of Democrats "For Lithuania")

Netherlands **Bart KROON**
(Farmer Citizen Movement (BBB))

Portugal **Olga SILVESTRE**
(Social Democratic Party)

Romania **Sorin-Dan MOLDOVAN**
(National Liberal Party)

Slovenia **Matej TONIN**
(New Slovenia)

Spain **Guillermo MARISCAL**
(People's Party)
Carlos ROJAS
(People's Party)
Alejandro SOLER
(Socialist Party)
Maria Teresa RUIZ-SILLERO
(People's Party)

Türkiye **Sevilay CELENK OZEN**
(Green Left Party)
Turhan COMEZ
(Iyi Party)

United Kingdom **Kevan JONES**
(Labour Party)
Wendy MORTON
(Conservative)
John SPELLAR
(Labour Party)
James SUNDERLAND
(Conservative)

United States **Rich MCCORMICK**
(Republican)

ASSOCIATE DELEGATIONS

Austria	David STÖGMÜLLER <i>(The Greens)</i>
European Parliament	Tom VANDENKENDELAERE <i>(Group of the European People's Party (Christian Democrats))</i>

REGIONAL PARTNER AND MEDITERRANEAN ASSOCIATE MEMBER DELEGATIONS

Algeria	Mohamed Faouzi BENDJABALLAH <i>(Front El Mostakbal)</i>
Morocco	Salek EL MOUSSAOUI <i>(Socialist Party)</i>

SPEAKERS

Steen SØNDERGAARD

Director of Defence Research Center, Danish Ministry of Defence
Acquisition and Logistics Organization

Iben YDE

Assistant Professor, Head of Center for International and Operational
Law, Royal Danish Defence College

Jan Westenkær THOMSEN

Chief Operation Officer, NNF Quantum Computing Programme
(NQCP), Quantum Coordinator, Niels Bohr Institute, University of
Copenhagen

Andreas GRAAE

Professor, Royal Danish Defence College, FAK institute for Military
Technology

Rune Pilgaard NIELSEN

Military Analyst, Department of Military Technology, Royal Danish
Defence College

INTERNATIONAL SECRETARIAT

Steffen SACHS	Director, STC
Karen WALKER-LOVE	Coordinator
Moritz NEUBERT	Researcher