



# THE AVT PANEL

## Applied Vehicle Technology Newsletter



### Dear AVT Community,

The 52<sup>nd</sup> AVT PBM Week was a great success for the AVT Community, as around 500 participants joined us in Båstad, Sweden. Thanks again to our Swedish hosts for all their hard work and support!

On the following pages, you will find a summary of the major outcomes from the Panel Meeting. Don't hesitate to get in touch, if you are interested in joining one of the new activities.

As mentioned during the PBM week, the CSO is implementing a new digital Appointment system called APPOINT. Appointments for Panel membership and participation in STO activities will fully transition to this system by the end of the 2023. You will find further information on APPOINT in this newsletter.

This week, we will conduct our pre-trip to Ottawa, Canada, to meet with the AVT Canadian Principal Panel Member and her team to proceed with the planning of the 53<sup>rd</sup> PBM. We are very much looking forward to the exchange and are excited to prepare for the next AVT meeting!

Best regards,

Erin, Isavela, and Edna

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### Panel Chairs' Corner

Dr Tom Thorvaldsen & Mr Christoph Müller

It was great seeing you all at the AVT Panel Business Meeting (PBM) Week in Båstad, Sweden, 9-13 October 2023. Again, **thanks a lot to our Swedish host**, and in particular the core team, **Dr Jens Mattsson, Dr Kristian Petterson, Ms Malin Bergenudd, Ms Anna Dimitrijevic and Mr Markus Hjelm**, for organising such a perfect week for us. The meeting rooms and conference facilities were splendid, also the Swedish food, and of course the Swedish hospitality. It is always good to visit Sweden. Even the weather was okay and much better than expected this time of year on the Swedish west coast – even though the Panel Chair got a bit wet on Friday afternoon when walking from the hotel to the bus (The Panel Vice-Chair had obviously read the weather forecast and had a rental car ☺).

In total, **498 people attended the PBM and associated events and activity meetings**. Two successful and well-attended events were held; **AVT-373 Specialists' Meeting on "Emerging Technologies for Proactive Corrosion Maintenance"**, and **AVT-369 Research Symposium on "Digital Twin Technology Development and Application for Tri Service Platforms and Systems"**. **54 AVT activities** had one or more meetings during the week.



*Swedish PBM Core Team with AVT Panel Chair*

We had very good discussions in the three Technical Committees (TC-MSM, TC-PSF and TC-PPS), the Strategic Committee, the Scientific Committee, the Support Committee, the Awards Committee and the PBM Plenary sessions. A lot of meetings, coffee break discussions, early morning preparations, and late evening finalisation before the next busy meeting day. This is a typical AVT PBM week in a nut shell. It is hectic and sometimes stressful, but we manage to do a lot of work, discussion and coordination, and strategic foresight – all in one week. AVT is a big panel, but we manage to handle and run the "AVT Megaverse" in a good way. All committees and activities are interlinked, and each group is an essential part of the bigger machinery. The AVT way of working keeps us up to date on new technology and future military needs. We also support ongoing ACT, CSO and other NATO units' processes. **This is AVT – working as one team, being one step ahead!** We are really proud and honored to be the AVT Panel Chairs!

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### Panel Chairs' Corner (continued)

AVT has already started the **implementation of the CPOW2030 Action Plan** that was endorsed by the STB during their Fall meeting. We continue our work in the **AVT Internal Working Group** that takes a deeper dive into the AVT way of working, to see if we can make some adjustments and improvements to our work. The Scientific Committee has plans for **monthly contributions to the STO Review Journal**, which will support the outreach and distribution of the excellent work done in AVT. Also, we established **Women in AVT**, to focus more on diversity aspects in AVT. Professor Dr Melike Nikbay volunteered to chair this group, and the AVT initiative, as a follow-up to the Women in SET initiative, will be coordination with similar initiatives/groups in the other STO Panels and Group.

Currently, the main part of our work is related to the aftermath of the AVT PBM week, including staffing the newly endorsed technical activities for STB approval. Soon, the CSO Executive office will go to Ottawa, Canada, to support the preparations of next year's Spring AVT PBM week (20-24 May 2024). We are also finalising the nomination packages for the individual and team that will be put forward from AVT for the **2024 STO Excellence Awards**. The STB will evaluate and decide who will receive the awards, but the AVT Awards Committee Chairs, together with the AVT Executive Office and the AVT Panel Chairs will do their best to promote and advocate for our AVT nominees. We are also preparing for next year's STO-Level meetings: ACT-STO annual meeting, Plans and Programs Workshop (PPW) and the spring STB meeting.

In this darker and colder period of the year – especially in the northern part of Europe and North America, it might be more challenging to get up in the morning and be motivated for work. In Norway, we got the first snow last days of October, which means a bit more light – and also that the skiing season has started. That really helps. Keep up all the good AVT work, and make sure you also spend some time with your family and friends!

All the best,  
Tom & Christoph





# Updates from the Executive Office

## AVT 52<sup>nd</sup> Panel Business Meeting

Båstad, SWE

The Applied Vehicle Technology (AVT) Panel held its Fall Panel Business Meeting (PBM) and associated events in Båstad, SWE from 9-13 October, bringing together around 500 participants and hosting 54 STO activity teams. During the PBM, the Support Committee (SC) and the Performance, Stability and Control, Fluid Physics Technical Committee (TC-PSF) elected new Chairs and Vice-Chairs for the upcoming two years:

- Support Committee - Chair: Ir. Henk Jan Ten Hoeve (NLD) & Vice-Chair: Lt Col Luis Felix (PRT)
- TC-PSF - Chair: Dr Thomas Fu (USA) & Vice-Chair: Dr Kai Richter (DEU).

We thank the previous SC and TC-PSF Chairs, Prof Dr Melike Nikbay (TUR) and Dr Stuart McIlwain (CAN), for their commitment and leadership to their committees during these last two years.

The Panel also held a Research Symposium on the “Digital Twin Technology Development and Application for Tri Service Platforms and Systems” (AVT-369) and a Research Workshop on “Emerging Technologies for Proactive Corrosion Maintenance” (AVT-373) in conjunction with the PBM. The Panel concluded the week by bidding farewell to its departing Panel members and recognising the AVT Panel Excellence Award winning teams, as well as the recipients of the AVT Young Contributor Awards.



### Outcomes from the AVT 52<sup>nd</sup> PBM Panel Business Meeting

#### New AVT Activities

During the 52<sup>nd</sup> AVT PBM, **four Exploratory Teams (ETs)** were approved by the Panel. **Three Support Projects** were endorsed but are currently pending approval of the CSO Director. In addition, **19 Technical Activities** were endorsed by the Panel and are awaiting approval by the NATO Science & Technology Board (STB), estimated timeline is end of November.

With your STO Science Connect Login, you will be able to find further information following this [Link](#) and selecting the activity by its number. Also, please contact the AVT Panel Office if you are interested in joining one of these new initiatives.

Activity Number	Type	Title	Status	Start Date
AVT-ET-245	ET	Quantum-aided Design for Military Applications	Approved	01 Jan 2024
AVT-ET-246	ET	Engine Integration Improvements due to advanced Engine Concepts	Approved	01 Jan 2024
AVT-ET-247	ET	Three-dimensional aspects of unsteady flow interactions with rigid wings	Approved	01 Jan 2024
AVT-ET-248	ET	Hydrogen as Fuel, Power Source & Infrastructure Challenges to NATO	Approved	01 Jan 2024
AVT-SP-011	SP	Exploring the Potential of Hydrogen as a Sustainable Jet Fuel	Awaiting CSO DIR Approval	01 Jan 2024
AVT-SP-012	SP	Integration and Flight Evaluation of Hybrid Electric Propulsion Technologies for Unmanned Aerial Systems	Awaiting CSO DIR Approval	01 Jan 2024
AVT-SP-013	SP	Development And Evaluation Of Functional Surface Layers For Military Vehicle Needle Bearings	Awaiting CSO DIR Approval	01 Jan 2024
AVT-399	RTG	Assessment of Experiments and Prediction Methods for Naval Ship Transient Maneuvers in Calm Water and Waves	Awaiting STB Approval	01 Jan 2025
AVT-400	RWS	Emerging Propulsion Technologies for NATO Ground Vehicle Platform Systems	Awaiting STB Approval	01 Jan 2024
AVT-MSG-401	RTG	Augmented Reality in land operations: Balancing risks and chances in technical and human systems challenges	Awaiting STB Approval	01 Jan 2025
AVT-402	RTG	Active flow control Applied to Air Inlets for High-speed Propulsion Systems	Awaiting STB Approval	01 Jan 2025
AVT-403	RTG	PFAS In Soil and Water: Mitigation, Remediation and Risk Management for NATO Members	Awaiting STB Approval	01 May 2024
AVT-404	RTG	Enhanced Design Processes of Military Vehicles through Machine Learning Methods	Awaiting STB Approval	01 Jan 2025

### Outcomes from the AVT 52<sup>nd</sup> PBM Panel Business Meeting

#### New AVT Activities

Activity Number	Type	Title	Status	Start Date
AVT-SCI-405	RTG	Conceptual Aggregated Design of Hypersonic Glide Vehicle (HGV)	Awaiting STB Approval	01 Jan 2024
AVT-406	RTG	Innovative Solutions for Micro-Propulsion Systems for Small Spacecraft	Awaiting STB Approval	01 Jan 2024
AVT-407	RWS	System Qualification and Certification by Analysis	Awaiting STB Approval	01 Jan 2024
AVT-408	RTG	Autonomous Mobility Assessment for Military Ground Systems (CDT)	Awaiting STB Approval	01 Jan 2024
AVT-409	RWS	Life Cycle Analysis of Sustainable Technology for Military Platforms	Awaiting STB Approval	01 Jan 2024
AVT-410	RTG	End-2-End NG-NRMM Demonstration with Autonomous Assist Systems (CDT)	Awaiting STB Approval	01 Jan 2024
AVT-411	RWS	Machine Learning and Artificial Intelligence for Military Vehicle Design	Awaiting STB Approval	01 Jan 2024
AVT-412	RWS	Bonded Joint Design Validation and Inspection Methods to Achieve Certification	Awaiting STB Approval	01 Jan 2024
AVT-413	RTG	Physics and modeling of separated flows around smoothly-curved bodies	Awaiting STB Approval	01 Jan 2025
AVT-414	RTG	Acoustic mission planning and environmental impact analysis for UAS and UCA (<5000kg)	Awaiting STB Approval	01 Jan 2025
AVT-415	RTG	Advanced Noise Reduction Methodologies and Design Efforts for Aircraft Applications	Awaiting STB Approval	01 Jan 2025
AVT-416	RLS	Lecture Series for Computational Collaborations for Complex Aerodynamics Analysis	Awaiting STB Approval	01 Jan 2024
AVT-SET-417	RTG	Materials for Thermal Infrared Camouflage – Development and Characterization	Awaiting STB Approval	01 Jan 2025

### Outcomes from the AVT 52<sup>nd</sup> PBM Panel Business Meeting

#### Extensions Requested

Activity Number	Title	Current End Date	Extension Request	Status
AVT-298	Reynolds Number Scaling Effects on Swept Wing Flows	31 Dec 2023	31 Dec 2024	Awaiting STB Approval
AVT-341	Mobility Assessment Methods and Tools for Autonomous Military Ground Systems	31 Dec 2023	30 Jun 2024	Awaiting STB Approval
AVT-342	Interoperability of Additive Manufacturing in NATO Operations	31 Dec 2023	30 Jun 2024	Awaiting STB Approval
AVT-358	Advanced Computational Fluid Dynamics Methods for Hypersonic Flows	31 Dec 2023	31 Dec 2024	Awaiting STB Approval
AVT-359	Impact of Hypersonic Operational Threats on Military Operations and Technical High Level Requirements	30 Jun 2023	30 Jun 2024	Awaiting STB Approval
AVT-374	More Electric Gas Turbine Engines for Aircraft, Rotorcrafts and UAVs	31 Dec 2023	31 Dec 2024	Awaiting STB Approval
AVT-ET-231	Criteria for Security Evaluation of Tamper Protection Technologies for Military Systems	31 Dec 2023	30 Jun 2024	Approved
AVT-313	Incompressible Laminar-to-Turbulent Flow Transition Study	31 Dec 2022	31 Dec 2023	Awaiting STB Approval

#### Changes Requested

(Pending STB Approval)

Activity Number	Title	Request of Change
AVT-374	More Electric Gas Turbine Engines for Aircraft, Rotorcraft and UAVs	Request to Add a Co-Lead Nation, Prof Hany Moustapha from Canada.
AVT-SET-396	Technological Challenges For Hypersonic Flights	Request for Change of Activity Name and Type to RSY and to "Technological And Operational Challenges Due To Hypersonic Flight And The Related Weapons Threat"



### Events at AVT 52<sup>nd</sup> PBM Panel Business Meeting

## AVT-369 & AVT-373

Research Symposium and Research Specialists' Meeting in Båstad, Sweden

#### Research Symposium (AVT-369) on “Digital Twin Technology Development and Application for Tri Service Platforms and Systems”, 10-12 October

The AVT Panel held a three-day Research Symposium (RSY) on “Digital Twin Technology Development and Application for Tri Service Platforms and Systems” in Båstad from 10-12 October. 29 Authors from 11 different nations had the opportunity to present their subject matter knowledge and were able to exchange ideas and discuss the latest developments on digital twin technology with more than 90 participants.

#### Research Specialist Meeting (AVT-373) on “Emerging Technologies for Proactive Corrosion Maintenance”, 09-11 October

The AVT Panel held a Research Specialists' Meeting (RSM) on “Emerging Technologies for Proactive Corrosion Maintenance” at the same location from 09 to 11 October. During the meeting, participants shared the latest insights in the corrosion risks and the best practices on how it is managed across the NATO nations. The RSM welcomed 50 participants and discussed the way forward to improve corrosion management.



Participants, authors and committee members of AVT-373 in Båstad (SWE).



Participants, authors and committee members of AVT-369 in Båstad (SWE).





### AVT 52<sup>nd</sup> PBM Panel Business Meeting

## Awards and Recognitions

We are pleased to announce the Award Winners of the 52<sup>nd</sup> AVT PBM, who received their awards during the Panel Dinner on Thursday, 12<sup>th</sup> October. Our congratulations go to:

### AVT Panel Excellence Awards

- The Team of AVT-ST-008 on Hypersonic Operational Threats
- The Team of AVT-301 (RTG) on Flowfield Prediction for Manoeuvring Underwater Vehicles



### AVT Young Contributor Awards

- Prof Dr Laura Mainini (ITA)
- Dr Marcel Baltzer (DEU)



# Call for Papers for NATO AVT-SET-396 (+SCI) RSY on 'Technological Challenges due to Hypersonic Flight and the related Weapons Threat'

This Symposium, co-lead by the AVT, the Sensors & Electronics Technology (SET) and the Systems Concepts and Integration (SCI) Panels, is NATO Unclassified and is open to Enhanced Opportunity Partners (EOPs) . It will be held in **Koblenz, Germany from 14-17 October 2024** in conjunction with the 54<sup>th</sup> AVT PBM.

It will bring together experts for discussions on the design, structure and materials for hypersonic vehicles, propulsion and platform technologies, and conceptual design examples for both offence and defence, among other topics. The symposium will also cover the feasibility of hypersonic weapons capabilities, while also demystifying potential threats.

Some topics to be covered are: Aerothermodynamics and effects, design, structures and materials for hypersonic vehicles, propulsion technologies, platform technologies, system architecture challenges, military requirements vs. technical needs and feasibility, launch platforms - options and constraints, guidance and control, communication, onboard sensors and issues, detecting and tracking hypersonic weapons, defence architecture considerations, C3I (Command, Control, Communication and Intelligence) for hypersonic weapons defence, conceptual design examples for offence (HGV,HCM, HR), Conceptual design examples for defence (Interceptors), non-kinetic defence against hypersonic weapons (Laser, Directed Energy, Blinding, Jamming)

**Deadline for abstracts has been extended to 30 November 2023**

You can also find this Call for Papers on our **STO Events website**:

<https://events.sto.nato.int/index.php/upcoming-events/event-list/event/26-cfp/514-avt-set-396-call-for-papers-on-technological-challenges-for-hypersonic-flights>



# Call for Papers for NATO AVT-394 RSM on 'Water Sampling, Monitoring and Control/Remediation for Live-Fire Military Ranges'

This Research Specialists' Meeting is classified as Public Release and is open to NATO nations, Enhanced Opportunity Partners (EOP) and Partnership for Peace (PfP) Nations. It will be held **14-16 October 2024** in **Koblenz Germany** in conjunction with the 54<sup>th</sup> AVT PBM.

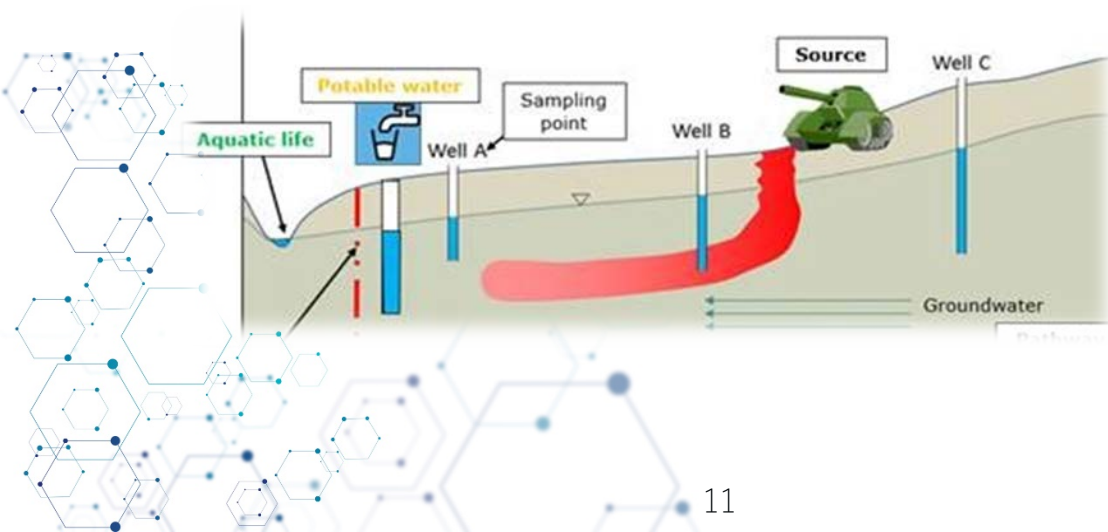
The objective of this RSM is to promote the exchange of knowledge among an audience of experts and specialists on current practices and research on the topics of water sampling, monitoring and remediation techniques concerning munition's constituents.

Some topics to be covered are: water sampling and monitoring techniques; surface water treatment and management; groundwater and active source zone remediation and management; hydraulic control measures to avoid off-site migration of contaminants; emerging munitions constituents as contaminants in water; cold region challenges and climate resiliency for range contamination.

**Deadline for abstracts is 1<sup>st</sup> March 2024**

You can also find this Call for Papers on our **STO Events website**:

<https://events.sto.nato.int/index.php/upcoming-events/event-list/event/26-call-for-papers/531-avt-394-call-for-papers-on-water-sampling-monitoring-and-control-remediation-for-live-fire-military-ranges>

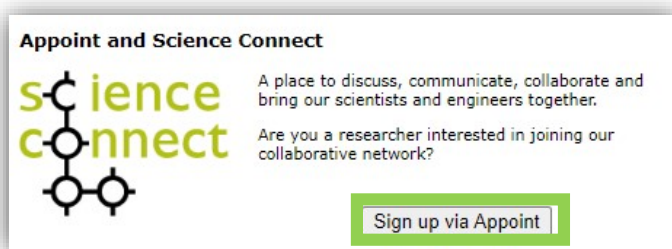




# APPOINT

## New STO Digital Appointment System

The CSO is implementing a new digital Appointment system called APPOINT. Appointments for Panel membership and participation in STO activities will fully transition to this system by the end of the 2023. Most STO National Coordinators have been trained and are already using the platform. AVT Principal Panel members play an important role in identifying and endorsing experts' participation in STO research activities. You can access APPOINT via the [STO Website](#) and clicking "Sign up via Appoint".



**\*\*To have access to the STO Publications, individuals are also invited to submit the request through the same link\*\***

The appointment request is routed as below:

**Step 1** Appointee [submits](#) appointment request via APPOINT

**Step 2** Principal AVT Panel Member endorses national participation in research activity overseen by the AVT Panel

**Step 3** National Coordinator appointment verification

**Step 4** OCO Front Office Assistants confirm appointment



# Upcoming 2024 - 2026 AVT PBMs

Please find below more information regarding the locations of our upcoming AVT Panel Business Meeting through 2026.

PBM	Dates	Location
53 <sup>rd</sup> AVT PBM Spring 2024	20-24 May 2024	Ottawa, Canada
54 <sup>th</sup> AVT PBM Fall 2024	14-18 October 2024	Koblenz, Germany
55 <sup>th</sup> AVT PBM Spring 2025	19-23 May 2025	Washington DC, USA
56 <sup>th</sup> AVT PBM Fall 2025	TBD Late September or October 2025	TBD, Latvia
57 <sup>th</sup> AVT PBM Spring 2026	TBD Apr or May 2026	TBD, France
58 <sup>th</sup> AVT PBM Fall 2026	TBD Late September or October 2026	Antalya, Türkiye



# STO News/Events

## **NATO STO CPoW Challenge - Weak Signals in S&T Foresight Workshop**

**29 November – 01 December 2023, London (UK)**

The workshop will be open to representatives from all NATO Nations, NATO Bodies, NATO Agencies, and Australia, Japan and Sweden. For more information or to register for the event, please visit [STO Events Website](https://stoevents.org/). Registration is open until **15 November**.

## **Survey on NATO STO S&T Tech Trends Report**

All NATO STO Panels and Group members (Level 2 and 3) are asked by the NATO Chief Scientist to consider the implications of the recent NATO STO S&T Tech Trends Report on their respective programmes of work and respond to the survey using the QR or link below by **14 January 2024**

**Survey Link:**



<https://forms.office.com/r/dXrV9vYXNz>

## **Links to NATO S&T Tech Trends Report (Vol 1 & 2)**

Report Volume 1:  
[stt23-vol1.pdf](#)  
([nato.int](https://nato.int))

Report Volume 2:  
[stt23-vol2.pdf](#)  
([nato.int](https://nato.int))



### New Publications

#### STO Publications September - October 2023

<a href="#">STO-TR-SAS-157</a>	Automation in the Intelligence Cycle
<a href="#">STO-TR-SAS-147</a>	Analysis of Anti-Access Area Denial (A2/AD) Assessing the Consequences – Addressing the Challenge
<a href="#">STO-TR-SAS-164</a>	21st Century Force Development
<a href="#">STO-TR-AVT-330</a>	Impact of Munitions and Explosives of Concern (MEC) on Maritime Safety, Security and Sustainable Remediation
<a href="#">STO-TR-SAS-145</a>	Soldier Weapon Equipment Assessment Tool: Recommendations for Performance Test and Evaluation
<a href="#">STO-TR-AVT-315</a>	PRE-RELEASE: Comparative Assessment of Modelling and Simulation Methods of Shipboard Launch and Recovery of Helicopters
<a href="#">STO-TR-SET-252</a>	Design of a Validation Model of a Stealth UCAV
<a href="#">STO-TR-HFM-329</a>	PRE-RELEASE: A Psychological Guide For Leaders Across The Deployment Cycle
<a href="#">STO-TR-MSG-164-VOL-III</a>	PRE-RELEASE: Business Model for the Allied Framework for M&S as a Service
<a href="#">STO-TR-MSG-164-VOL-II</a>	PRE-RELEASE: Modelling and Simulation as a Service (MSaaS). Technical Reference Architecture
<a href="#">STO-TR-MSG-164-VOL-I</a>	PRE-RELEASE: Modelling and Simulation as a Service (Phase 2)
<a href="#">STO-TR-HFM-304</a>	Factors Affecting Ethical Leadership
<a href="#">STO-TR-SCI-281</a>	Solutions Advancing Next Generation Radar Electronic Attack
<a href="#">STO-TR-HFM-307</a>	Integrating Gender and Cultural Perspectives in Professional Military Education Programmes

# New Publications

STO Publications September - October 2023

<a href="#"><u>STO-TR-SAS-143</u></a>	PRE-RELEASE: Agile Multi-Domain C2 of Socio-Technical Organizations in Complex Endeavors operating in a Contested Cyberspace Environment
<a href="#"><u>STO-TR-SAS-161-VOL-V</u></a>	The NATO STO SAS-161 Research Task Group (RTG) – Military Aspects of Countering Hybrid Warfare: Experiences, Lessons, Best Practices Volume V: Military Implications
<a href="#"><u>STO-AG-300-V36</u></a>	Flight Testing of Helmet Mounted Displays
<a href="#"><u>STO-TR-SAS-161-VOL-III</u></a>	The NATO STO SAS-161 Research Task Group (RTG) – Military Aspects of Countering Hybrid Warfare: Experiences, Lessons, Best Practices Volume III: Comprehensive Defence, Capacity Building, and Enhanced Forward Presence
<a href="#"><u>STO-TR-HFM-ET-201</u></a>	PRE-RELEASE: Human Security – Frameworks, Concepts, Actors and Challenges in Relevance to NATO
<a href="#"><u>STO-TR-SET-242</u></a>	PRE-RELEASE: Passive Radar on Moving Platforms





### Contact Us!

For content suggestions, contributions,  
or if you have any questions please  
contact [avt@cs0.nato.int](mailto:avt@cs0.nato.int).

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 [sto.nato.int](https://sto.nato.int)

Dr Tom Thorvaldsen  
AVT Panel Chair



Mr Christoph Müller  
AVT Panel Vice-Chair



Ms Erin Boldi  
AVT Panel Executive Officer



Ms Isavela Kontolaimaki  
AVT Panel Executive Assistant



Ms Edna Ferraz  
AVT Panel Assistant

