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NATO SCIENCE & TECHNOLOGY BOARD

2017 STO Collaborative Programme of Work

Note by the Secretary

1. Following the recent approval of additional activities for the 2017 STO Collaborative Programme of Work (reference AC/323-N(2017)0001-AS1 (INV)), Enclosure 1 presents the updated summary of all Technical Activities that the STO Panels and Group will address in 2017.

2. For ease of reference, this overview information is structured per Panel and Group (tables 5 through 21), as well as per type of Technical Activity (tables 22 through 30). In addition, the document provides an initial list of Technical Activities that have been approved to commence in 2018.

3. This document is publicly releasable.

(signed)
Dr U. Ehlert
STB Secretary

1 Enclosure: 2017 STO Collaborative Programme of Work

1 Enclosure

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North Atlantic Treaty Organization

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STO

COLLABORATIVE PROGRAMME OF WORK AND BUDGET FOR YEAR 2017

20 FEBRUARY 2017

This document constitutes the entire STB approved 2017 Collaborative Programme of Work (CPoW) and Budget.

Preface:

Mr. Alan R. Shaffer
Director, STO Collaboration Support Office

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Preface

It is my pleasure to present the NATO Science & Technology Organization's (STO) Collaborative Program of Work (CPoW) for 2017. The CPoW is a collective effort of our collaborative network of roughly 5,000 scientists, engineers, and analysts across the NATO nations. The Collaboration Support Office (CSO) continues to operate a collaborative model for the STO – our job is to support the ability of the NATO nations to work together to conduct military and security relevant scientific research and technology development leading to operational capability for our militaries and security organizations. I am pleased to have the opportunity to work with the professionals in the CSO office and the greater network to deliver the most relevant possible program.

As I stated last year, I believe the need to collaborate effectively is growing as the security challenges facing our nations continue to grow. From a resurgent and aggressive Russia to increased pressure from the mass migration to the continued threat of terrorism, the security challenges facing the alliance are as great as any period I can remember. There is an even greater need to collaborate today than at any time since the dissolution of the Warsaw Pact alliance.

The need to collaborate is fuelled by many factors – continued austerity in the nations and the change in the nature and velocity of technology development. The austerity measures result in continued budget tightness in the nations. In spite of the pledge from National leaders, upheld at the Warsaw Summit, that member nations would invest 2% of their Gross Domestic Product in Defence, only 5 of the 28 NATO Nations meet that pledge; over half are at less than 1.5%. Collectively, if the Nations did in fact meet the pledge, NATO nations would invest an additional 148 Billion Euros in defence annually, based on 2015 defence budgets. As Secretary General Stoltenberg has pointed out, several nations have begun to reverse the funding trends, but these are still small upticks.

The change in the velocity of technology development presents a security challenge for NATO. Simply, technology development in the late information era is much faster than twenty or thirty years ago. Additionally, the advanced military capabilities will likely come from system engineering and integration of commercial and unique military technology. Finally, the commercial technology supply chain is global, and NATO nations and their systems will have to rely on technology that does not come from a NATO Nation, and may be of suspect origin.

In essence, the situation is one where there are more requirements, with scarcer resources, and a supply of common technologies available to all Nations. In this context, collaboration – or the collective pooling of NATO people, capabilities and research is one of the best paths for dealing with this type of complex environment.

My vision for the CSO is to continue to be the organization Nation's come to for collaboration. In 2016, the CSO supported over 250 formal activities (task groups, symposia, etc), and we are on track to maintain this output in 2017. The CSO facilitates an open dialogue that aligns the defence research and development of the nations and the capability development elements of the NATO structure. We are pushing to enhance the information technology "tools" to enable enhanced virtual collaboration and meetings – these tools should allow us all to increase our agility and timeliness. We are working hard at shortening the publication process, and at better communicating our military relevance. We are also working hard at better connecting to the operational and requirements community – the people who need our products.

The core of the resulting CPoW remains the seven Level II Technical Committees of the STO (Advanced Vehicle Technologies, Human Factors and Medicine, Information Systems Technology, NATO Modelling and Simulation Group, Systems Analysis and Studies, Systems Concepts and Integration and Sensors and Electronics Technology), each of which is described later. These seven Level II Committees are led, on a part time basis, by voluntary national contributions and supported by full time military voluntary national contributions and NATO civilian staff from the CSO, all of whom do a great job. We are working hard at enhancing the Panels and Group by bringing in more "millennials" – the age demographic we are all building products to support. A highlight of this year is the dramatic increase in the number of activities in Autonomy—supported by all 7 panels and group.

I believe we need to strive to "lead the future" through activities like Technology Watch, under which the CSO has identified a number of technologies that could change the security landscape – these include: hypersonic vehicles, quantum sciences, additive manufacturing, synthetic biology, and human performance monitoring and enhancement just to name a few. It is an exciting time to be part of NATO S&T, and even with the challenges, I am confident that the Panels and Group and CSO team are ready to respond to those challenges.

Alan R. Shaffer
Director, STO Collaboration Support Office

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2017 PANEL BUSINESS MEETINGS

Table 1: 2017 Panel Business Meetings.

ACTIVITY		MEETING DATES	MEETING LOCATIONS
AVT	Spring	15-19 May 2017	Vilnius, Lithuania
	Fall	9-13 October 2017	Amsterdam, The Netherlands
HFM	Spring	02-06 April 2017	Riga, Latvia
	Fall	09-12 October 2017	Prague, CZE
IST	Spring	17-19 May 2017	Oulu, Finland
	Fall	11-13 October 2017	Sibiu, Romania
MSG	Spring	24 - 27 April 2017	Brno, Czech Republic
	Fall	16-20 October 2017	Lisbon, Portugal
SAS	Spring	4-7 April 2017	Brno, Czech Republic
	Fall	4 – 6 October 2017	London, United Kingdom
SCI	Spring	29 May – 2 June 2017	Neuilly-sur-Seine, FRA
	Fall	16-20 October 2017	Oslo, Norway
SET	Spring	10-12 May 2017	Helsinki, Finland
	Fall	TBD	TBD, Slovakia

2017 TECHNICAL PROGRAMME OBSERVATIONS
(as of February 2017)

The STO Collaborative Programme of Work (CPoW) for 2017 includes 248 activities shown in Table 2:

Table 2: CPoW Composition

Task Groups	RTG	187
Symposia	RSY	7
Specialists' Meetings	RSM	15
Specialist Team	ST	2
Workshops	RWS	14
Lectures Series	RLS	15
Technical Course	RTC	2
Agardograph	AG	4
Long Term Scientific Study	LTSS	1
Committee	COM	1
	TOTAL	248

The 2017 STO Collaborative Programme of Work continues to enhance the linkage between STO activities and the priorities/requirements from our customers and the nations. There are 53 new activities for 2017 and 13 new activities already approved and prepared for 2018. The projected on-going program also includes activities from previous years, therefore, during 2017 the Panels/Group will be managing a total program of 248 technical activities. With the intent of sharing the developing knowledge, all but one activity will be open to Non-NATO nations in 2017; including Partner for Peace nations, Mediterranean Dialogue nations, Global Partners and Contact nations.

2017 BUDGET GENERALITIES

(Indicative - for information only)

In accordance with the Medium-Term-Resource Plan 2017, the S&T Collaboration Support Office (CSO) has projected a funding requirement of EUR 5,525,000 for 2017. This represents a slight increase of EUR 72,255 over the 2016 Budget (EUR 5,452,745) and is necessary to meet increased operations & maintenance and CIS cost as well as increased demand in support of collaborative activities. The requested budget was approved by the North Atlantic Council in December 2016.

Table 3: 2017 CSO Budget Projections per category *

Budget Categories	Projected 2017
Personnel	€ 3 350 000
Facility Management	€ 350 000
Operations and Mission Support	€ 315 000
Publications	€ 215 000
CIS	€ 370 000
Collaborative Program of Work	€ 920 000
Total NATO Funded Effort	€5 525 000

* Note: Allocations to categories may vary pending operational requirements

The majority of the STO Collaborative Program of Work (CPoW) activities are open for NATO Partners under the Partnership for Peace (PfP) and Mediterranean Dialogue (MD) programs. Funding for Partner-related activities within the STO CPoW is provided through the Outreach Budget of International Military Staff (IMS). The CSO acts as an agent between the Nations and the IMS for Outreach activities.

LECTURE SERIES/TECHNICAL COURSES/SYMPOSIA/ WORKSHOPS/ SPECIALISTS' MEETINGS FOR 2017

The following table provides a forecast of STO Collaborative Program Lecture Series, Technical Course, Symposia and Workshop activities for 2017 for which the broadest possible participation is desired and highly encouraged. To aid in participation planning, the dates and locations for the activities have been included.

Table 4: Lecture Series/Technical Course/Symposia Forecast for 2017

ACTIVITY	TITLE	MEETING DATES	MEETING LOCATIONS	DISTRIBUTION and PARTNER PARTICIPATION
AVT-272 RSM	Assessment of Volcanic Ash Effects on Military Platforms	15-18 May 2017	Vilnius, Lithuania	NATO UNCLASSIFIED Non-NATO Invited
AVT-273 RSM	Approval of RPAS Operations: Airworthiness, Risk-based Methods, Operational Limitations	15-18 May 2017	Vilnius, Lithuania	NATO UNCLASSIFIED Non-NATO Invited
AVT-265 RSM	Integrated virtual NATO Vehicle Development	15-18 May 2017	Vilnius, Lithuania	NATO UNCLASSIFIED Non-NATO Invited
AVT-268 RSM	Advances in Munitions Health Management Technology and Implementation	9-11 October 2017	Amsterdam, The Netherlands	NATO UNCLASSIFIED Non-NATO Invited
AVT-270 RWS	Validation of Thermal Models for Military Power Systems	9-11 October 2017	Amsterdam, The Netherlands	NATO UNCLASSIFIED Non-NATO Invited
AVT-302 RWS	Paint Removal Technologies for Military Vehicles	9-11 October 2017	Amsterdam, The Netherlands	NATO UNCLASSIFIED Non-NATO Invited
AVT-286 RTC	Securing Supply Chains, Materials, and Technologies, with a particular emphasis on Rare Earths	6 February 2017	ACT, Norfolk VA - USA	NATO UNCLASSIFIED Non-NATO Invited
AVT-285 RLS	Rare Earths: Securing Supply Chains, Materials, and Techniques	19-20 January 2017	Seville, Spain	NATO UNCLASSIFIED Non-NATO Invited
		16-17 March 2017	Munich, Germany	
		May 2017	Quebec City, Canada	
AVT-274 RLS	Unmanned Air Vehicles: Technological Challenges, Concepts of Operations and Regulatory Issues	Spring 2017	Lisbon, Portugal	NATO UNCLASSIFIED Non-NATO Invited
		May 2017	London, UK	
		October 2017	Montreal, Canada	
AVT-276 RLS	Environmental Management of Munitions and Greener Approaches to Design	2-3 May 2017	Maryland, USA	NATO UNCLASSIFIED Non-NATO Invited
		16-17 May 2017	Rijswijk, NLD	
		23-24 May 2017	Bucharest, ROM	
AVT-287 RLS	Design and operation of aeroacoustic wind tunnel tests for ground and air transport	22-24 May 2017	von Kármán Institute, BEL	NATO UNCLASSIFIED Non-NATO Invited
AVT-289 RLS	Multiphysics phenomena analysis on boundary layer stability in hypersonic regime	12-16 June 2017	von Kármán Institute, BEL	NATO UNCLASSIFIED Non-NATO Invited

ACTIVITY	TITLE	MEETING DATES	MEETING LOCATIONS	DISTRIBUTION and PARTNER PARTICIPATION
AVT-288 RLS	Liquid fragmentation in gas flows	11-15 September 2017	VKI, BEL	NATO UNCLASSIFIED Non-NATO Invited
AVT-304 RSM	Graphene Technologies and Applications for Defence	15-19 May 2017	Vilnius, Lithuania	NATO UNCLASSIFIED Non-NATO Invited
		09-13 October 2017	Amsterdam, The Netherlands	
HFM-265 RLS	Lecture Series on "Rotary Wing Brownout Mitigation"	04 April 17	Oslo, NOR	NATO Unclassified Non NATO Invited
		06 April 17	Braunschweig , DEU	
		25 April 17	Fort Rucker, USA	
HFM-275 RSY	Symposium on "Suicide Prevention"	03 - 05 April 2017	Riga, Latvia	Public Release
HFM-280 RTC	Technical Course on "Aerospace Medicine – One for All, and All for One!	20-24 March 2017	Ramstein AFB, DEU	Public Release
HFM-282 RSM	Specialists' Meeting on NATO Medicine and Human Domain Futures	09 - 11 Oct 2017	Prague, CZE	Public release
HFM-284 RLS	Moral Decisions and Military Mental Health	April 2017	Ottawa CAN, Amsterdam NLD, Budapest HUN	Public Release
HFM-289 RSM	Operation Oriented Simulation of Extreme Flight Conditions	May 2017	Soesterberg, The Netherlands,	Public Release
IST-143 RLS	Cyber Security Science and Engineering	13-14 Mar 17	Bordeaux, FRA	Public Release
		05-06 Apr 17	Budapest, HUN	
		May 2017	Warsaw, POL	
		June 2017	Tallinn, EST	
IST-145 RSM	Predictive Analytics	October 2017	Sibiu, Romania	Public Release
IST-153 RWS	Cyber Resilience	23-25 Oct 17	Munich, DEU	Public Release
IST-156 RWS	Modelling and Simulation S&T Critical enabler for Cyber Defence	September 2017	Portsdown, GBR	NATO Unclassified Non NATO Invited
IST-158 RSM	Content-based Real-time Analytics of Multimedia Streams	June 2017	London, GBR	NATO Unclassified Non NATO Invited
MSG-141 RLS	C2 to Simulation Interoperability (C2SIMI)	04-08 September, 2017	Australia New Zealand	NATO UNCLASSIFIED Non-NATO Invited
		Fall 17	Romania	
MSG-148 RSY	MSG/MSCO Support to International Training & Education Conferences ITEC, I/ITSEC and CAX Forum 2017	26-29 Sep 2017	Florence, Italy	NATO UNCLASSIFIED Non-NATO Invited
MSG-149 RSY	Symposium on "M&S Technologies and Standards for enabling Alliance interoperability and pervasive M&S applications"	19-20 Oct 2017	Lisbon, Portugal	NATO UNCLASSIFIED Non-NATO Invited
MSG-151 RWS	Workshop on "Cyber Effects in Campaign and Mission Simulations"	June 2017	Great Britain	NATO UNCLASSIFIED Non-NATO Invited
MSG-153 RWS	Workshop on "Commercial Technologies and Games for Use in NATO and Nations - 15th WS"	26-29 Sep 2017	Florence, Italy	NATO UNCLASSIFIED Non-NATO Invited
SAS-131 RWS	Threshold concepts for and by smaller forces	3-4 Apr 2017	Brno, CZE	NATO RESTRICTED Non-NATO Invited
		Fall 2017	Tartu, EST	
SCI-276 RLS	Systems of Systems Engineering for NATO Defence Applications (Extended)	20-21 April 2017	Arcueil, France	Public Release

ACTIVITY	TITLE	MEETING DATES	MEETING LOCATIONS	DISTRIBUTION and PARTNER PARTICIPATION
SCI-296 RSM	Autonomy from a System Perspective	23-25 May 2017	Lillestrom, Oslo (NOR)	NATO UNCLASSIFIED Non-NATO invited
SCI-299 RWS	SCI Panel Analysis of the Specialists Meeting on Autonomy from a Systems Perspective	16-20 Oct 2017	Oslo (NOR)	NATO UNCLASSIFIED Non-NATO invited
SET-216 RLS	Cognition and Radar Sensing	February	United Kingdom	NATO UNCLASSIFIED Non-NATO Invited
			Netherlands	
		March 2017	United States	
SET-235 RLS	Radar and SAR systems for airborne and space-based Surveillance and Reconnaissance	3rd Quarter 2017	Australia	NATO UNCLASSIFIED Non-NATO Invited
			Australia	
			Italy	
SET-241 RSY	9th NATO Military Sensing Symposium	May 2017	Canada	NATO RESTRICTED Non-NATO Invited
SET-243 RLS	Passive Radar Technology	4th Quarter 2017	Poland	NATO UNCLASSIFIED Non-NATO Invited
			Italy	
			United States	
SET-244 RSY	Bridging the gap between TDA development and operational deployment by the Navy	November 2017	The Netherlands	NATO RESTRICTED Non-NATO Invited
SET-247 RSM	Remote Intelligence of Building Interiors	8-9 May 2017	Helsinki, Finland	NATO SECRET Non-NATO Invites
SET-248 RWS	Panoramic optical systems for military application	30 May 2017	Quebec City, Canada	NATO RESTRICTED Non-NATO Invited

*Note for activities designated "Non-NATO Invited": the activity may not be open to Non-NATO members in its entirety. Final determination is contingent on publication of the final agenda for each activity.

APPLIED VEHICLE TECHNOLOGY PANEL

Panel Chairman: Mr. Michael HUGGINS (USA)
Vice Chairman: Mr. Hans-Ludwig BESSER (DEU)
Panel Executive: Dr.-Ing. Dirk ZIMPER (DEU)
Panel Assistant: Dr. Veronika GUMPINGER(NATO)

Terms of Reference

MISSION

The mission of the Applied Vehicle Technology (AVT) Panel is to improve the performance, affordability, and safety of vehicle, platform, propulsion and power systems through the advancement of appropriate technologies.

SCOPE

The scope of activity of AVT is to address technology issues related to vehicle, platform, propulsion and power systems operating in all environments (land, sea, air, and space), for both new and ageing systems.

The activities of AVT may be grouped into two broad areas:

Vehicle and platform technologies, including:

- Vehicle and platform design
- Configurational fluid dynamics
- Fluid mechanics
- Stability and control
- Noise and vibration control
- Structural loads and dynamics
- Smart structures
- Structural materials
- Manufacturing processes
- Non-structural materials
- Environmental effects
- Affordability, availability, survivability and supportability
- Reliability, maintenance and repair
- Test facilities, techniques, and instrumentation

Propulsion and power technologies, including:

- Air breathing engine design (piston, gas turbine, ramjet/scramjet)
- Rocket motors and rocket based combined cycles
- Electric propulsion including hybrid systems
- Engine control and thrust vectoring
- Power generation and storage
- Fuels and combustion
- Power plant materials and structures
- Propellants and explosives
- Operation, condition monitoring, reliability, maintenance and affordability
- Environmental impact
- Test facilities, techniques, and Instrumentation

Table 5: AVT activities continuing in 2017

ACTIVITY	TYPE	TITLE
AVT-227	RTG	Balancing energy storage with safety in large format battery packs
AVT-233	RTG	Aeroacoustics of Engine/Rotor Installation for Military Air Vehicles
AVT-236	RTG	Unified generic model and data-base for early screening and basic layout of a missile propulsion subsystem
AVT-237	RTG	Benchmarks in Multidisciplinary Optimization and Design for Affordable Military Vehicles
AVT-238	RTG	Early stage warship design & procurement for operational effectiveness and affordability
AVT-239	RTG	Innovative Control Effectors for Manoeuvring of Air Vehicles
AVT-240	RTG	Hypersonic Boundary-Layer Transition Prediction
AVT-247	RTG	Environmentally Compliant Materials & Processes for Military Vehicles
AVT-248	RTG	Next-Generation NATO Reference Mobility Model (NRMM) Development
AVT-249	RTG	Munitions Related Contamination: Military Live-Fire Range Characterization
AVT-250	RTG	Gas Turbine Engine Environmental Particulate Foreign Object Damage [EP-FOD]
AVT-251	RTG	Multi-disciplinary design and performance assessment of effective, agile NATO air vehicles
AVT-252	RTG	Stochastic Design Optimization for Naval and Aero Military Vehicles
AVT-253	RTG	Assessment of Prediction Methods for Large Amplitude Dynamic Manoeuvers for Naval Vehicles
AVT-254	RTG	Assessment of Plasma Actuator Technologies for Internal Flows
AVT-255	RTG	Unmanned Systems Mission Performance Potential for Autonomous Operations
AVT-264	RSM	Design, Manufacturing and Application of Metallic Lightweight Material Components for Military Vehicles
AVT-265	RSM	Integrated Virtual NATO Vehicle Development
AVT-266	RSM	Use of Bonded Joints in Military Applications
AVT-267	RWS	Future of Manufacturing for Military Applications
AVT-268	RSM	Advances in Munition Health Management Technologies and Implementation
AVT-270	RWS	Validation of Thermal Models for Military Power Systems
AVT-272	RSM	Impact of Volcanic Ash Clouds on Military Operations
AVT-273	RSM	Approval of RPAS Operations-Airworthiness, Risk-Based Methods, Operational Limitations
AVT-274	RLS	Unmanned Air Vehicles - Technological Challenges, Concepts of Operations and Regulatory Issues
AVT-284	RWS	Advanced Wind Tunnel Boundary Simulation
AVT-285	RLS	Rare Earths: Securing Supply Chains, Materials, and Techniques
AVT-286	RTC	Securing Supply Chains, Materials, and Technologies, with a particular emphasis on Rare Earths
AVT-287	RLS	Design and operation of aeroacoustics wind tunnel tests for ground and air transport

ACTIVITY	TYPE	TITLE
AVT-288	RLS	Liquid fragmentation in gas flows
AVT-289	RLS	Multiphysics phenomena analysis on boundary layer stability in hypersonic regime

Table 6: AVT activities starting in 2017

ACTIVITY	TYPE	TITLE
AVT-275	RTG	Continuous Airworthiness of Aging Systems
AVT-276	RLS	Environmental Management of Munitions and Greener Approaches to Design
AVT-277	RTG	Hazard assessment of exposure to ammunition-related constituents and combustion products
AVT-278	RTG	Risk-based safety assessment of operational airworthiness and certification requirements
AVT-279	RTG	Formation Flying for Efficient Operations
AVT-280	RTG	Evaluation of prediction methods for ship performance in heavy weather
AVT-281	RTG	Cross Domain Platform EO Signature Prediction
AVT-282	RTG	Unsteady Aerodynamic Response of Rigid Wings in Gust Encounters
AVT-283	AG	Advances in Wind Tunnel Boundary Correction and Simulation
AVT-295	RTG/ CDT	Demonstration of Innovative Control Effectors for Maneuvering of Air Vehicles
AVT-302	RWS	Paint Removal Technologies for Military Vehicles
AVT-303	RWS	Corrosion Management
AVT-304	RSM	Graphene Technologies and Applications for Defence
AVT-305	RSM	Sensors for Integrated Vehicle Health Management (IVHM)
AVT-306	RSM	Transitioning Gas Turbine Instrumentation from Test Cells to On-Vehicle Applications
AVT-307	RSY	Separated Flow Symposium

Table 7: AVT activities starting in 2018

ACTIVITY	TYPE	TITLE
AVT-290	RTG	Standardization of Augmented Reality for Land Platforms in Combat Environments
AVT-291	RTG	Range Design and Management for Reduced Environmental Impact
AVT-292	RTG	Munition Health Management Technologies: Effects on Operational Capability, Interoperability, Life-Cycle Cost and Acquisition of missile stockpiles of NATO nations
AVT-293	RTG	Effect of Environmental Regulation on Energetic Systems and the Management of Critical Munitions Materials and Capability
AVT-294	RTG	Towards Improved Computational Tools For Electric Propulsion
AVT-296	RTG	Rotorcraft Flight Simulation Model Fidelity Improvement and Assessment
AVT-297	RTG	Development of a Framework for Validation of Computational Tools for Analysis of Air and Sea Vehicles

ACTIVITY	TYPE	TITLE
AVT-298	RTG	Reynolds Number Scaling Effects on Swept Wing Flows
AVT-299	RTG	Assessment of Anti-Icing and De-Icing Technologies for Air and Sea Vehicles
AVT-300	RTG	Naval Ship Maneuverability in Ice
AVT-301	RTG	Flowfield prediction for maneuvering underwater vehicles

HUMAN FACTORS AND MEDICINE PANEL

Panel Chair: BGen Prof Corinne ROUMES (FRA)
As of 6 April 2017 will be replaced by **BGen Rafael Schick (DEU)**
Panel Vice-Chair: Col Prof Dr Rafael SCHICK (DEU)
As of 6 April 2017 will be replaced by **Mrs Alison Rogers (GBR)**
Panel Executive: Lt Col Frank WESSELS (NLD)
Panel Assistant: Ms. Marie LINET (NATO)

Terms of Reference

MISSION

The mission of the Human Factors and Medicine Panel is to provide the science and technology base for optimizing health, human protection, well-being and performance of the human in operational environments with consideration of mission effectiveness and affordability. This involves understanding and ensuring the physical, physiological, psychological and cognitive compatibility among military personnel, technological systems, missions, and environments. This is accomplished by exchange of information, collaborative experiments and shared field trials.

SCOPE

The scope of the HFM Panel is multi-disciplinary and encompasses a wide range of theory, data, models, knowledge and practice pertaining to Health, Medicine and Protection (HMP) and Human Systems and Behaviour (HSB). These two domains are complementary and represent the two 'Area' Committees of the HFM Panel:

1. The Health, Medicine and Protection Area provides the scientific basis for establishing an operationally fit and healthy force, restoring health, minimizing disease and injury, optimizing human protection, sustainability and survivability. This encompasses research in the field of military medicine, physiology, psychology and human protection technology. Areas of interest include, among others, medical diagnosis, prevention, treatment and evacuation. HMP also focuses on enhancing human protection research on physiological and physical influences, e.g. of cold, heat, air pressure, noise, vibration, ionizing and non-ionizing radiation, acceleration, motion, biological and chemical effects on the human body, and developing appropriate countermeasures.

2. The Human Systems and Behaviour Area provides the scientific basis and explores new technology for optimizing the performance of individuals, teams and organizations and their interaction with socio-technical systems to achieve highly effective mission performance. This encompasses research in the fields of human factors, human systems integration as well as cognitive, psycho-social, organizational and cultural aspects in military action. Contributions on Human Systems Integration cover complexity, total life-cycle affordability, human error and fatigue management, intelligent agents, human cognitive and physical resources management, anthropometry, human-machine interfaces, communication and teamwork, performance assessment, enhancement and aiding, training and function allocation in (semi)automated systems. Contributions on individual and team readiness cover values and ethics, leadership, multi-national operations, human enhancement and coping with mental, cognitive and physical demands on the individual. Contributions on organizational effectiveness encompass human resource management, training, interoperability, shared decision-making, synchronized situational awareness, resilience, understanding terrorism, psychological operations and coping with new demands on military organizations.

Table 8: HFM activities continuing in 2017

ACTIVITY	TYPE	TITLE
HFM-194	RTG	Development of Evidence-based Guidelines for the Management of Severely Burnt Patients
HFM-199	RTG	Integration of CBRN Physical Protective Measures to Lessen the Burden on Personnel
HFM-211	RTG	An Applied-Scientific Approach to Field Assessments
HFM-221	RTG	Live-Virtual-Constructive (LVC) Training to Enhance Performance Effectiveness
HFM-226	RTG	Civilian and Military Personnel Work Culture and Relations in Defence Organisations
HFM-230	RTG	Development of Depository of fast and reliable Detection Methods for Zoonotic Agents
HFM-234	RTG	Environmental Toxicology of Blast Exposures: Injury Metrics, Modelling, Methods and Standards
HFM-237	RTG	Assessment of Intelligent Tutoring System Technologies and Opportunities
HFM-238	RTG	Reducing the Dismounted Soldiers Burden
HFM-242	RTG	Technology Alternatives for Medical Training: Minimizing Live Tissue Use
HFM-247	RTG	Human-Autonomy Teaming: Supporting Dynamically Adjustable Collaboration
HFM-248	RTG	Social Media and Information Technology for Disaster and Crisis Response
HFM-250	RTG	Improving Anaesthesia and Sedation through the Battlefield
HFM-251	RTG	Occupational Cardiology in Military Aircrew
HFM-252	RTG	Aircrew Neck Pain
HFM-253	RTG	Medical Chemical Defence against Chemical Warfare Agent Threats
HFM-257	RTG	Modelling and Simulation Technologies for Training Medical/Healthcare Professionals
HFM-258	RTG	The Impact of Military Life on Children from Military Families
HFM-259	RTG	Human Systems Integration Approach to Cyber Security
HFM-260	RTG	Enhancing Warfighter Effectiveness with Wearable Bio Sensors and Physiological Models
HFM-262	RTG	Health Risk Assessment for Chemical Exposures of Military Interest
HFM-263	RTG	The Transition of Military Veterans from Active Service to Civilian Life
HFM-265	RLS	Rotary Wing Brownout Mitigation
HFM-266	RTG	3D scanning for clothing fit and logistics
HFM-268	RTG	Cross Panel Activity on Synthetic Environments for Mission Effectiveness Assessment
HFM-269	RTG	Combat Integration: Implications for Physical Employment Standards
HFM-270	RTG	Framework for Modelling and Simulation of Human Lethality, Injury, and Impairment from Blast-Related Threats
HFM-271	RTG	Injury assessment methods for vehicle occupants in blast-related events
HFM-273	LTSS	Chemical, Biological and Radiological Defence

HFM-274	RTG	The Impact of Hypobaric Exposure on Aviators and High-Altitude Special Operations Personnel
HFM-275	RSY	Suicide Prevention
HFM-276	RTG	Human Factors and ISR Concept Development and Evaluation
HFM-277	RTG	Leadership Tools for Suicide Prevention
HFM-278	RTG	How to prevent and counter radicalisation and violent extremism: Responding to the threat of Western Foreign Terrorist Fighters
HFM-279	RTG	Leveraging Technology in Military Mental Health
HFM-280	RTC	Aerospace Medicine – One for All, and All for One!
HFM-281	RTG	Personalized Medicine in Mental Health and Performance
HFM-282	RSM	NATO Medicine and Human Domain Futures

Table 9: HFM activities starting in 2017

ACTIVITY	TYPE	TITLE
HFM-283	RTG	Reducing Musculo-Skeletal Injuries
HFM-284	RLS	Moral Decisions and Military Mental Health
HFM-285	RTG	Speech Understanding of English language in Native and non-Native speakers/listeners in NATO with and without Hearing Deficits
HFM-286	RTG	Leader Development for NATO Multinational Military Operations
HFM-287	RTG	Developing a Culture and Gender Inclusive Model of Military Professionalism
HFM-289	RSM	Operation Oriented Simulation of Extreme Flight Conditions

Table 10: HFM activities starting in 2018

ACTIVITY	TYPE	TITLE
HFM-288	RWS	Integrated Approach to Cyber Defence: Human in the Loop

INFORMATION SYSTEMS TECHNOLOGY PANEL

Panel Chairperson: Dr. John McCLEAN (USA)
Vice-Chairman: Dr.-Ing Michael WUNDER (DEU)
Panel Executive: Maj Luc DETIENNE (FRA)
Panel Assistant: Mrs. Aysegül APAYDIN (NATO)

Terms of Reference

MISSION

The mission of the Information Systems Technology (IST) Panel is to advance and exchange techniques and technologies in order to:

1. Improve C3I systems, with a special focus on Interoperability and Cyber Security; and
2. Provide timely, affordable, dependable, secure and relevant information to war fighters, planners and strategists.

SCOPE

The scope of responsibility of IST shall include the following domains and disciplines:

Information Warfare and Assurance

- INFOSEC
- COMPUSEC
- COMSEC
- TRANSEC
- Information Assurance
- System Assurance

Information and Knowledge Management

- Decision Support Architectures
- Data Mining
- Data Warehousing
- Information Fusion
- Information Filtering
- Visualization
- Knowledge-based Systems
- Artificial Intelligence

Communications and Networks

- Voice Data and Video over disadvantaged links
- Network Management
- Network Security
- Mobile Communications
- Satellite Communications

Architectures and Enabling Technologies

- Software Engineering Technologies
- Computing Technologies
- Requirements Capture
- Modelling and Simulation Technologies
- Modelling and Simulation Architectures and Standards
- Speech and Natural Language Processing
- Groupware and Collaboration Tools

Table 11: IST activities continuing in 2017

ACTIVITY	TYPE	TITLE
IST-121	RTG	Machine Learning Techniques for Autonomous Computer Generated Entities
IST-124	RTG	Heterogeneous Tactical Networks - Improving Connectivity and Network Efficiency
IST-129	RTG	Predictive Analysis of Adversarial Cyber Operations
IST-132	RTG	Multi-Level Fusion of Hard and Soft Information
IST-140	RTG	Cognitive Radio Networks - Efficient Solutions for Routing, Topology Control, Data Transport, and Network Management
IST-141	RTG	Exploratory Visual Analytics
IST-142	RTG	Software Defined Network Architectures for the Federated Mission Networks
IST-143	RLS	Cyber Security Science and Engineering
IST-144	RTG	Content-Based Multi-media Analytics (CBMA)
IST-145	RSM	Predictive Analytics
IST-146	RTG	Electromagnetic Environment Situational Awareness for NATO
IST-147	RTG	Military Applications of Internet of Things
IST-149	RTG	Capability Concept Demonstrator for Interoperability within Unmanned Ground systems and C2
IST-150	RTG	NATO Core Services profiling for Hybrid tactical Networks
IST-151	RTG	Cyber Security of Military Systems
IST-152	RTG	Autonomous Cyber Defence Agents
IST-153	RWS	Cyber Resilience

Table 12: IST activities starting in 2017

ACTIVITY	TYPE	TITLE
IST-156	RWS	Modelling and Simulation S&T Critical enabler for Cyber Defence
IST-157	RTG	Human in the loop Considerations for Artificial Intelligence
IST-158	RSM	Content-based Real-time Analytics of Multimedia Streams

NATO MODELLING AND SIMULATION GROUP (NMSG)

Group Chairman: Mr Leigh Gene YU (USA)
Vice - Chairman: Ing. Agatino MURSIA (ITA)
Group Head: CDR Federico Santiago PEREZ-DUENAS (ESP)
Deputy Head and Scientific Advisor: VACANT
Technical Officer: Mr Adrian VOICULET (NATO)
Assistant: Ms Illeana GANZ (NATO)

Terms of Reference

MISSION

The mission of the NATO Modelling and Simulation (M&S) Group (NMSG) is to:

1. promote cooperation among Alliance bodies, NATO member nations and Partner nations to maximize the effective utilization of M&S, including: M&S Standardization, education and associated science and technology;
2. coordinate customers, users and suppliers in the five areas of Simulation (Support to Operations, Capability Development, Mission Rehearsal, Training and Education, and Procurement);
3. support customers in defining the operational needs regarding M&S, support users to fulfil these operational needs and support suppliers to provide the simulation assets in the five identified areas of simulation, helping NATO M&S stakeholders and subject matter experts to meet to initiate, coordinate and oversee the implementation of the NATO M&S Master Plan (NMSMP);
4. monitor the degree of consistency with NMSMP in NATO organizations, being the Custodian of the NMSMP;
5. report on those situations (and decisions) in which inconsistency with NMSMP can or will introduce interoperability issues between NATO Members (and Partners).

SCOPE

The Group:

1. Is governed by the Strategy and Implementation Plan as approved by the STB;
2. Guides implementation of the M&S Master Plan and promoting best practices in the Alliance;
3. Is NATOs Delegated Tasking Authority for standardization in NATO M&S domain (ref. CNAD Letter DI(2003)243 dated 29 August 2003). Hence, develops, advocates and guides implementation of M&S Standardization documents;
4. Maintains a permanent link with operational people in order to collect operational needs and to validate the work of the Group and disseminate the Group results;
5. Fosters appropriate levels of M&S interoperability and reuse of models and simulations;
6. Develops, advocates and guides programs to facilitate education and information exchange in M&S science and technology, application methods and standards;
7. Identifies, advocates and executes science and technology projects to improve M&S tools, standards, interoperability, network concepts and databases;
8. As required, provides M&S expertise to support pertinent projects of the other STO Level 2 Committees or NATO Bodies and Organizations;

Table 13: MSG activities continuing in 2017

ACTIVITY	TYPE	TITLE
MSG-118	RTG	Development of Common Image Generator Interface (CIGI) v.4 Compliancy Testing Tools
MSG-124	RTG	Developing Actionable Data Farming Decision Support for NATO
MSG-127	RTG	Reference Architecture for Human Behaviour Modelling in Military Training Applications
MSG-128	RTG	Incremental Implementation of NATO Mission Training through Distributed Simulation Operations
MSG-134	RTG	NATO Distributed Simulation Architecture & Design, Compliance Testing and Certification
MSG-135	RTG	NATO M&S Resources/Standards Support Working Group
MSG-136	RTG	Modelling and Simulation as a Service (MSaaS) Rapid deployment of interoperable and credible simulation environments
MSG-139	RTG	M&S Use Risk Identification and Management
MSG-140	RTG	Urban Combat Advanced Training Technology - Live Simulation Standards (UCATT-LSS)
MSG-141	RLS	C2 to Simulation Interoperability (C2SIMI)
MSG-145	RTG	Operationalization of Standardized C2-Simulation Interoperability
MSG-146	RTG	Simulation for Training and Operation Group-Land (STOG-L)
MSG-147	RTG	M&S Support for Crisis and Disaster Management Processes and Climate Change Implications
MSG-150	RTG	M&S Supporting NATO CD&E

Table 14: MSG activities starting in 2017

ACTIVITY	TYPE	TITLE
MSG-148	RSY	MSG/MSCO Support to International Training & Education Conferences ITEC, I/ITSEC and CAX Forum 2017
MSG-149	RSY	M&S Technologies and Standards for enabling Alliance interoperability and pervasive M&S applications
MSG-151	RWS	Cyber Effects in Campaign and Mission Simulations
MSG-152	RTG	NATO M&S Professional Corps Development
MSG-153	RWS	Commercial Technologies and Games for Use in NATO and Nations - 15th WS
MSG-154	RTG	Low, Slow, Small Threats Modelling and Simulation

SYSTEM ANALYSIS AND STUDIES PANEL

Chairman: COL (Ret) Pavel ZUNA (CZE)
Vice Chairman: Dr. Ana MARTINS BOTTO DE BARROS (NLD)
Panel Executive: LTC Timothy POVICH (USA)
Panel Assistant: Mr. Jeroen GROENEVELT (NATO)

Terms of Reference

MISSION

The mission of the System Analysis and Studies (SAS) Panel is:

1. To conduct studies and analyses of an operational and technological nature.
2. To promote the exchange and development of methods and tools for Operational Analysis (OA) as applied to defence problems.

SCOPE

The scope of the Panel's activity is as follows:

System Analysis and Studies

The Panel will conduct studies, analysis and information exchange activities that explore how operational capability can be provided and enhanced through the exploitation of new technologies, new forms of organisation or new concepts of operation. Such studies will, where appropriate, give explicit consideration to financial and other resource issues. The Panel will be responsive to requests for such studies from a variety of sources, including nations, the Science and Technology Board (STB), the Military Committee, the Conference of National Armament Directors (CNAD), the Main Armaments Groups, Allied Command Operations (ACO), Allied Command Transformation (ACT), the NATO Communications and Information Agency (NCIA), the NATO Industrial Advisory Group (NIAG), and industry. The Panel can also perform studies of a more purely technological nature if such studies are not appropriate for another NATO body.

Methodology

The Panel will undertake activities to develop and promote improved analysis methods and techniques to support defence decision-making. This aspect of the Panel's work will focus particularly on the methods required to address the new issues thrown up by the evolving strategic environment and the responses that both individual nations and NATO as a whole are making to it. Activities may include information exchange on OA modelling concepts and best practice, research into new methodological approaches and the development and exchange of models.

Table 15: SAS activities continuing in 2017

ACTIVITY	TYPE	TITLE
SAS-092	RTG	Costing Support for Force Structure Studies
SAS-093	RTG	Risk-Based Planning
SAS-096	RTG	Key Performance Indicators in Measuring Military Outputs
SAS-097	RTG	Robotics Underpinning Future NATO Operations

ACTIVITY	TYPE	TITLE
SAS-104	RTG	C2 Agility: Next Steps
SAS-107	RTG	Factoring Situational Awareness and Communications in Operational Models of Dismounted Combat
SAS-109	RTG	Risk Analysis for Acquisition Programs
SAS-110	RTG	Operations Assessment in Complex Environments
SAS-111	RTG	Collection and Management of Data for Analysis Support to Operations
SAS-112	RTG	Comparative Analysis of Private-Public Partnership in the Management of Military-Industry Activities
SAS-114	RTG	Assessment and Communication of Risk and Uncertainty to Support Decision-Making
SAS-116	RTG	Military Strategic Level Decision Making within a (future) framework of Cyber Resilience
SAS-117	RTG	Information Operations for Influence (IOI)
SAS-118	RTG	Enhancing Strategic Awareness of Energy Security - A Holistic Approach
SAS-119	RTG	Energy and Defence: Reducing Dependencies & Vulnerabilities – Enhancing Efficiency
SAS-120	RTG	Integration of Women into Ground Combat Units
SAS-122	RTG	Non-Combatant Evacuations: Consular and Military – Operational Research & Analysis
SAS-123	RTG	Futures Assessed alongside Socio-Technical Evolutions (FATE)
SAS-124	RTG	Visual Analytics for Communicating Defence Investment Uncertainty and Risk
SAS-125	RTG	Comparative Analysis of Acquisition Processes
SAS-126	RTG	Operational Research and Analysis Orientation Course - development of additional content
SAS-127	ST	Hybrid Warfare- A Case Study, NATO Implications
SAS-128	RTG	Modelling Personnel Flows; Identifying Potential Solutions to Recruiting and Retention Challenges
SAS-IST-102	RTG	Intelligence Exploitation of Social Media

Table 16: SAS activities starting in 2017

ACTIVITY	TYPE	TITLE
SAS-129	RTG	Gamification of Cyber Defence/ Resilience
SAS-130	RTG	Course of Action Analysis in the 21st Century
SAS-131	RWS	Threshold concepts for and by smaller forces
SAS-132	RTG	Models and Tools for Logistics Analysis
SAS-133	RTG	Assessment/analysis support to facilitate the introduction of NLW by addressing line of development obstacles
SAS-134	RTG	Modelling the Transformation of Resource Inputs into Defence Outputs and Outcomes

SYSTEMS CONCEPTS AND INTEGRATION PANEL

Panel Chairman: Dr Ric SCHLEIJPEN (NLD)
Vice Chairman: Ms Caroline WILCOX (CAN)
Executive: Lt Col Taylor EDWARDS (USA)
Assistant: Ms. Carlotta ROSSI (NATO)

Terms of Reference

MISSION

The mission of the Systems, Concepts and Integration (SCI) Panel is to advance knowledge concerning advanced system concepts, integration, engineering techniques and technologies across the spectrum of platforms and operating environments to assure cost-effective mission area capabilities. Integrated defence systems, including air, land, sea, and space systems (manned and unmanned), and associated weapon and countermeasure integration are covered. Panel activities focus on NATO and national mid- to long-term system level operational needs.

SCOPE

The scope of Panel activities covers a multidisciplinary range of theoretical concepts, design, development, and evaluation methods applied to integrated defence systems. Areas of interest include:

- Integrated mission systems including weapons and countermeasures
- System architecture/mechanisation
- Vehicle integration
- Mission management
- System engineering technologies and testing

Table 17: SCI activities continuing in 2017

ACTIVITY	TYPE	TITLE
SCI-223	RTG	Future Requirements and Options for EW Information Exchange
SCI-224	RTG	EO and IR-Countermeasures against Anti-ship Missiles
SCI-229	RTG	Space Environment Support to NATO Space Situational Awareness
SCI-236	AG	Safety and Risk Management in Flight Testing
SCI-245	AG	Reduced Friction Runway Surface Flight Testing
SCI-246	RTG	Exploration and Development of Denial and Deception Doctrine to Support NATO
SCI-248	RTG	NATO Vulnerability to Hostile Use of Civilian-Space-based SAR
SCI-260	RTG	Platform-level EW Architectures for Joint/Coalition Air Operations
SCI-264	RTG	High Energy Laser Weapons: Tactical Employment in the Shared Battlespace
SCI-266	AG	Application of Digital Data Recorder Standards for Flight Test
SCI-270	RTG	Process Development for D&D Field Trials and Associated Data Analysis

ACTIVITY	TYPE	TITLE
SCI-272	COM	Flight Test Technical Team (FT3)
SCI-273	RTG	Guidelines for Toxicity Testing of Smokes, Obscurants, and Pyrotechnic Mixtures
SCI-276	RLS	Systems of Systems Engineering for NATO Defence Applications
SCI-277	RLS	Store Separation and Trajectory Prediction
SCI-279	RTG	Enabling Technical Considerations for a NATO-Common Space Domain Operating Picture
SCI-280	RTG	System-of-Systems Approach to Task Driven Sensor Resource Management for Maritime Situational Awareness (SoSMSA)
SCI-281	RTG	Solutions Advancing Next Generation Radar Electronic Attack
SCI-282	RTG	Countermeasures Against Anti-Aircraft EO/IR Imaging Seeker Threats
SCI-286	RTG	Technology Roadmaps Towards Stand-off Detection in Future Route Clearance
SCI-287	RTG	Assessment Methods for Camouflage in Operational Context
SCI-288	RTG	Autonomy in Communications-Limited Environments
SCI-291	RWS	Scenarios for Assessment Methods for Camouflage in Operational Contexts
SCI-293	RTG	Scientific Support to NNAG Above Water Warfare Capability Group
SCI-294	RTG	Demonstration and Research of Effects of RF Directed Energy Weapons on Electronically Controlled Combustion Engines
SCI-295	RTG	Development of Methods for Measurements and Evaluation of Natural Background EO Signatures
SCI-296	RSM	Autonomy from a System Perspective

Table 18: SCI activities starting in 2017

ACTIVITY	TYPE	TITLE
SCI-297	RTG	Distributed EW Operations in the Modern Congested RF Environment
SCI-298	RTG	Identification and Neutralization Methods and Technologies for C-IED
SCI-299	RWS	SCI Panel Analysis of the Specialists Meeting on Autonomy from a Systems Perspective
SCI-301	RTG	Defeat of Low Slow and Small (LSS) Air Threats
SCI-302	RTG	DIRCM Concepts and Performances

Table 19: SCI activities starting in 2018

ACTIVITY	TYPE	TITLE
SCI-300	RSY	Cyber Physical Security of Defence Systems

SENSORS & ELECTRONICS TECHNOLOGY PANEL

Panel Chairman: Dr. Augustus W. FOUNTAIN III (USA)
Vice - Chairman: Prof. David BLACKNELL (GBR)
Panel Executive: Lt Col Mauro RODDI (ITA)
Panel Assistant: Ms. Ewelina GLINSKA-LEWIS (NATO)

Terms of Reference

MISSION

The mission of the Sensors and Electronics Technology (SET) Panel is to foster co-operative research, the exchange of information, and the advancement of science and technology among the NATO Nations in the field of sensors and electronics for defence and security. The SET Panel addresses electronic technologies and passive/active sensors as they pertain to Reconnaissance, Surveillance and Target Acquisition (RSTA), Electronic Warfare (EW), Communications, and Navigation and to the enhancement of sensor capabilities through multi-sensor integration and fusion. To fulfil this mission, the SET Panel has three Focus Groups: Radio-Frequency Technology (RFT); Optical Technology (OT); and Multi-Sensors & Electronics (MSE).

SCOPE

Research activities of the SET Panel predominantly address phenomenologies related to target signature, propagation and battlespace environments, electro-optic (EO) / radio-frequency (RF)/acoustic/magnetic sensors, antennas, signal and image processing, components, sensor hardening, electromagnetic compatibility, and any other phenomena associated with sensors and electronics that assist NATO warfighters during future warfare and peace-keeping scenarios. In particular, the scope of activity in the SET Panel includes the following disciplines:

Phenomenology:

- Target/background signatures;
- Propagation;
- Battlespace environment characterisation;
- Sensor hardening; and
- Electronic protection measures and electromagnetic compatibility.

Sensors:

- EO sensors (ultraviolet, laser radar (ladar), lidar, imaging infra-red (IR), IR search and track);
- RF sensors (radar, radiometers, goniometers) and related technologies, including passive RF sensors;
- Acoustic, seismic, magnetic, chemical, and inertial sensors;
- Urban, indoor, and subterranean navigation sensors;
- Terahertz (THz) sensors (from the point of view of military technology, especially in the context of urban warfare and DAT);
- Communications, electromagnetic warfare devices (electronic attack, electronic support measures, electronic intelligence), and dual-use sensors for a wide range of applications (urban/high intensity to security/low intensity).

Electronics: Processing:

- Antenna processing and aperture control;
- Signal processing;
- Image processing;
- Multi-sensor fusion;

- Pattern recognition, including automatic target recognition.

Components:
- EO (optics, integrated optics, fibre optics, focal plane arrays, lasers);
- RF (antennas, amplifiers, filters, digital radio frequency memories (DRFMs), monolithic microwave integrated circuits, high-power microwave sources);
- Micro-electronics;
- Micro-mechanics;
- Displays;
- Mechanical, chemical, etc.

Sensor hardening:
- Electronic protection measures;
- Electromagnetic compatibility

Table 20: SET activities continuing in 2017

ACTIVITY	TYPE	TITLE
SET-155	RTG	Advancing Sensing Through the Walls (STTW) Technologies
SET-185	RTG	Maritime Radar Surface Surveillance Techniques and the High Grazing Angle Challenge
SET-193	RTG	THz technology for stand-off detection of explosives: from laboratory spectroscopy to detection in the field
SET-198	RTG	Visible Laser Dazzle Effects and Protection
SET-200	RTG	Electromagnetic scattering prediction of small complex aerial platforms for NCTI purposes
SET-205	RTG	Active Electro-optic Sensing for Target identification and Tactical Applications
SET-206	RTG	Energy Generation for Manwearable/Manportable Applications and Remote Sensors
SET-207	RTG	Advanced situation-specific modelling, sensing and vulnerability mitigation using passive radar technology
SET-208	RTG	Signal processing for implementation in hand-held multi sensor ground penetrating system
SET-209	RTG	Exploitation of Human Signatures for Threat Determination
SET-211	RTG	Naval Platform Protection in the EO/IR Domain
SET-215	RTG	Model-based SAR Automatic Target Recognition
SET-216	RLS	Cognition and Radar Sensing
SET-218	RTG	Interoperability & Networking of Disparate Sensors and Platforms for ISR Applications
SET-219	RTG	Simulation of Active Imaging Systems
SET-220	RTG	Geospatial Information Extraction From space-Borne SAR-Images for NATO-Operations
SET-223	RTG	Adaptive Radar Resource Management
SET-224	RTG	Coherent Mid-Infrared Fibre Source Technology
SET-225	RTG	Spatial and Waveform Diverse Noise Radar
SET-226	RTG	Turbulence mitigation for Electro Optics (EO) and laser systems

ACTIVITY	TYPE	TITLE
SET-227	RTG	Cognitive Radar
SET-229	RTG	Cooperative Navigation in GNSS Degraded and Denied Environments
SET-232	RTG	Computational Imaging and Compressive Sensing for EO/IR Systems NOT ACTIVE - PLANNING
SET-233	RTG	Acoustic Transient Threat Detection Sensors & Signal Processing for Battlefield Situational Awareness
SET-234	RTG	Environmental limitations of fielded EO-TDAs
SET-235	RLS	Radar and SAR systems for airborne and space-based Surveillance and Reconnaissance
SET-236	RTG	Design and Analysis of Compressive Sensing Techniques for Radar and ESM Applications
SET-237	RTG	Printed Standards for Stand-off Detection
SET-238	RTG	Side-Attack Threat Detection Strategies, Technologies and Techniques
SET-240	RTG	Exploitation of Longwave Infrared Airborne Hyperspectral Data
SET-245	RTG	Radar Based Non-Cooperative target Recognition (NCTR) in the Low Airspace and Complex Surface Environments

Table 21: SET activities starting in 2017

ACTIVITY	TYPE	TITLE
SET-217	RTG	Assessing and modelling the performance of digital night vision image fusion
SET-241	RSY	9th NATO Military Sensing Symposium
SET-242	RTG	Passive Coherent Locators on Mobile Platforms
SET-243	RLS	Passive Radar Technology
SET-244	RSY	Bridging the gap between TDA development and operational deployment by the Navy
SET-246	RTG	Short Wave Infrared Technology: a standardized irradiance measurement and compatibility model to evaluate reflective band systems
SET-247	RSM	Remote Intelligence of Building Interiors
SET-248	RWS	Panoramic optical systems for military application
SET-249	RTG	Laser Eye Dazzle – Threat Evaluation and Impact on Human Performance
SET-250	RTG	Multi-dimensional Radar Imaging
SET-251	RTG	Radar signature management – benefit to ships

NEW 2017 ACTIVITIES BY TYPE

Table 22: Lecture Series

ACTIVITY	TITLE	MEETING DATES	MEETING LOCATIONS	DISTRIBUTION and PARTNER PARTICIPATION
AVT-276	Environmental Management of Munitions and Greener Approaches to Design	2-3 May 2017	Maryland, USA	NATO UNCLASSIFIED Non-NATO Invited
		16-17 May 2017	Rijswijk, NLD	
		23-24 May 2017	Bucharest, ROM	
HFM-284	Moral Decisions and Military Mental Health	Beginning April 2017	Ottawa CAN, Amsterdam NLD, Budapest HUN	Public Release
SET-243	Passive Radar Technology	4th Quarter 2017	Poland	NATO UNCLASSIFIED Non-NATO Invited
			Italy	
			United States	

Table 23: Task Groups

ACTIVITY	TITLE	MEETING DATES	MEETING LOCATIONS	DISTRIBUTION and PARTNER PARTICIPATION
AVT-275	Continuous Airworthiness of Aging Systems	15-19 May 2017	Vilnius, Lithuania	NATO UNCLASSIFIED Non-NATO Invited
AVT-277	Hazard assessment of exposure to ammunition-related constituents and combustion products	15-19 May 2017	Vilnius, Lithuania	NATO UNCLASSIFIED Non-NATO Invited
AVT-278	Risk-based safety assessment of operational airworthiness and certification requirements	15-19 May 2017	Vilnius, Lithuania	NATO UNCLASSIFIED Non-NATO Invited
AVT-279	Formation Flying for Efficient Operations	15-19 May 2017	Vilnius, Lithuania	NATO UNCLASSIFIED Non-NATO Invited
AVT-280	Evaluation of prediction methods for ship performance in heavy weather	15-19 May 2017	Vilnius, Lithuania	NATO UNCLASSIFIED Non-NATO Invited
AVT-281	Cross Domain Platform EO Signature Prediction	15-19 May 2017	Vilnius, Lithuania	NATO UNCLASSIFIED Non-NATO Invited
AVT-282	Unsteady Aerodynamic Response of Rigid Wings in Gust Encounters	15-19 May 2017	Vilnius, Lithuania	NATO UNCLASSIFIED Non-NATO Invited
AVT-295	Demonstration of Innovative Control Effectors for Maneuvering of Air Vehicles	15-19 May 2017	Vilnius, Lithuania	NATO UNCLASSIFIED Non-NATO Invited
HFM-283	Reducing Musculo-Skeletal Injuries	March 2017	CSO Paris	Public Release
HFM-285	Speech Understanding of English language in Native and non-Native speakers/listeners in NATO with and without Hearing Deficits	April 2017	CSO Paris	Public Release
HFM-286	Leader Development for NATO Multinational Military Operations	April 2017	CSO Paris	Public Release
HFM-287	Developing a Culture and Gender Inclusive Model of Military Professionalism	April 2017	CSO Paris	Public Release

ACTIVITY	TITLE	MEETING DATES	MEETING LOCATIONS	DISTRIBUTION and PARTNER PARTICIPATION
IST-157	Human in the loop Considerations for Artificial Intelligence	16-18 January 2017	CSO Paris	NATO UNCLASSIFIED Non-NATO Invited
MSG-152	NATO M&S Professional Corps Development	first quarter of 2017	Rome, Italy	NATO UNCLASSIFIED Non-NATO Invited
MSG-154	Low, Slow, Small Threats Modelling and Simulation	April 2017	Rotterdam, NLD	Public Release Non-NATO Invited
SAS-129	Gamification of Cyber Defence/ Resilience	first quarter of 2017	CSO Paris	Public Releasable Non-NATO Invited
SAS-130	Course of Action Analysis in the 21st Century	first quarter of 2017	CSO Paris	NATO SECRET Non-NATO Invited
SAS-132	Models and Tools for Logistics Analysis	April 2017	Stockholm, Sweden	NATO UNCLASSIFIED Non-NATO Invited
SAS-133	Assessment/analysis support to facilitate the introduction of NLW by addressing line of development obstacles	February 2017	NATO HQ, Brussels, Belgium	NATO SECRET Non-NATO Invited
SAS-134	Modelling the Transformation of Resource Inputs into Defence Outputs and Outcomes	first quarter of 2017	CSO Paris	NATO RESTRICTED Non-NATO Invited
SCI-297	Distributed EW Operations in the Modern Congested RF Environment	first quarter of 2017	CSO Paris	NATO SECRET Non-NATO Invited
SCI-298	Identification and Neutralization Methods and Technologies for C-IED	first quarter of 2017	CSO Paris	NATO SECRET Non-NATO Invited
SCI-301	Defeat of Low Slow and Small (LSS) Air Threats	first quarter of 2017	CSO Paris	NATO RESTRICTED Non-NATO Invited
SCI-302	DIRCM Concepts and Performances	June 2017	TNO, Amsterdam (NLD)	NATO SECRET Non NATO Invited
SET-217	Assessing and modelling the performance of digital night vision image fusion	15 Feb 2017	CSO Paris	NATO CONFIDENTIAL
SET-242	Passive Coherent Locators on Mobile Platforms	1 Feb 2017	CSO Paris	NATO CONFIDENTIAL Non-NATO Invited
SET-246	Short Wave Infrared Technology: a standardized irradiance measurement and compatibility model to evaluate reflective band systems	22 March 2017	CSO Paris	NATO UNCLASSIFIED Non-NATO Invited
SET-249	Laser Eye Dazzle – Threat Evaluation and Impact on Human Performance	February 2017	CSO Paris	NATO RESTRICTED Non-NATO Invited
SET-250	Multi-dimensional Radar Imaging	February 2017	CSO Paris	NATO RESTRICTED Non-NATO Invited
SET-251	Radar signature management – benefit to ships	February 2017	CSO Paris	NATO SECRET Non-NATO Invited

Table 24: Specialists' Meetings

ACTIVITY	TITLE	MEETING DATES	MEETING LOCATIONS	DISTRIBUTION and PARTNER PARTICIPATION
AVT-304 RSM	Graphene Technologies and Applications for Defence	15-19 May 2017	Vilnius, Lithuania	NATO UNCLASSIFIED Non-NATO Invited
		09-13 October 2017	Amsterdam, The Netherlands	
AVT-305	Sensors for Integrated Vehicle Health Management (IVHM)	15-19 May 2017	Vilnius, Lithuania	NATO UNCLASSIFIED Non-NATO Invited
AVT-306	Transitioning Gas Turbine Instrumentation from Test Cells to On-Vehicle Applications	15-19 May 2017	Vilnius, Lithuania	NATO UNCLASSIFIED Non-NATO Invited
HFM-289	Operation Oriented Simulation of Extreme Flight Conditions	May 2017	Soesterberg, The Netherlands,	Public Release
IST-158	Content-based Real-time Analytics of Multimedia Streams	June 2017	London, GBR	NATO UNCLASSIFIED Non-NATO Invited
SET-247	Remote Intelligence of Building Interiors	8-9/05/2017	Helsinki, Finland	NATO SECRET Non-NATO Invites

Table 25: Workshops

ACTIVITY	TITLE	MEETING DATES	MEETING LOCATIONS	DISTRIBUTION and PARTNER PARTICIPATION
AVT-302	Paint Removal Technologies for Military Vehicles	15-19 May 2017	Vilnius, Lithuania	NATO UNCLASSIFIED Non-NATO Invited
AVT-303	Corrosion Management	15-19 May 2017	Vilnius, Lithuania	NATO UNCLASSIFIED Non-NATO Invited
IST-156	Modelling and Simulation S&T Critical enabler for Cyber Defence	September 2017	Portsdown, GBR	NATO UNCLASSIFIED Non-NATO Invited
MSG-151	Cyber Effects in Campaign and Mission Simulations	June 2017	Great Britain	NATO UNCLASSIFIED Non-NATO Invited
MSG-153	Commercial Technologies and Games for Use in NATO and Nations - 15th WS	26-29 Sep 2017	Florence, Italy	NATO UNCLASSIFIED Non-NATO Invited
SAS-131	Threshold concepts for and by smaller forces	3-4 April 2017	Brno, CZE	NATO RESTRICTED Non-NATO Invited
		Fall 2017	Tartu, EST	
SCI-299	SCI Panel Analysis of the Specialists Meeting on Autonomy from a Systems Perspective	16-20/10/2017	Oslo (NOR)	NATO UNCLASSIFIED Non-NATO Invited
SET-248	Panoramic optical systems for military application	30/05/2017	Quebec City, Canada	NATO RESTRICTED Non-NATO Invited

Table 26: Symposia

ACTIVITY	TITLE	MEETING DATES	MEETING LOCATIONS	DISTRIBUTION and PARTNER PARTICIPATION
AVT-307	Separated Flow Symposium	15-19 May 2017	Vilnius, Lithuania	NATO UNCLASSIFIED Non-NATO Invited
MSG-148	MSG/MSCO Support to International Training & Education Conferences ITEC, I/ITSEC and CAX Forum 2017	26-29 Sep 2017	Florence, Italy	NATO UNCLASSIFIED Non-NATO Invited
MSG-149	M&S Technologies and Standards for enabling Alliance interoperability and pervasive M&S applications	19-20 October 2017	Lisbon, Portugal	NATO UNCLASSIFIED Non-NATO Invited
SET-241	9th NATO Military Sensing Symposium	May 2017	Canada	NATO RESTRICTED Non-NATO Invited
SET-244	Bridging the gap between TDA development and operational deployment by the Navy	November 2017	The Netherlands	NATO RESTRICTED Non-NATO Invited

Table 27: Agardographs

ACTIVITY	TITLE	MEETING DATES	MEETING LOCATIONS	DISTRIBUTION and PARTNER PARTICIPATION
AVT-283	Advances in Wind Tunnel Boundary Correction and Simulation	15-19 May 2017	Vilnius, Lithuania	NATO UNCLASSIFIED Non-NATO Invited

NEW 2018 ACTIVITIES BY TYPE

(FIRST MEETING)

Table 28: Task Groups 2018

ACTIVITY	TITLE	MEETING DATES	MEETING LOCATIONS	DISTRIBUTION and PARTNER PARTICIPATION
AVT-290	Standardization of Augmented Reality for Land Platforms in Combat Environments	April 2018	Italy	NATO UNCLASSIFIED Non-NATO Invited
AVT-291	Range Design and Management for Reduced Environmental Impact	April 2018	Italy	NATO UNCLASSIFIED Non-NATO Invited
AVT-292	Munition Health Management Technologies: Effects on Operational Capability, Interoperability, Life-Cycle Cost and Acquisition of missile stockpiles of NATO nations	April 2018	Italy	NATO UNCLASSIFIED Non-NATO Invited
AVT-293	Effect of Environmental Regulation on Energetic Systems and the Management of Critical Munitions Materials and Capability	April 2018	Italy	NATO UNCLASSIFIED Non-NATO Invited
AVT-294	Towards Improved Computational Tools For Electric Propulsion	April 2018	Italy	NATO UNCLASSIFIED Non-NATO Invited
AVT-296	Rotorcraft Flight Simulation Model Fidelity Improvement and Assessment	April 2018	Italy	NATO UNCLASSIFIED Non-NATO Invited
AVT-297	Development of a Framework for Validation of Computational Tools for Analysis of Air and Sea Vehicles	April 2018	Italy	NATO UNCLASSIFIED Non-NATO Invited
AVT-298	Reynolds Number Scaling Effects on Swept Wing Flows	April 2018	Italy	NATO UNCLASSIFIED Non-NATO Invited
AVT-299	Assessment of Anti-Icing and De-Icing Technologies for Air and Sea Vehicles	April 2018	Italy	NATO UNCLASSIFIED Non-NATO Invited
AVT-300	Naval Ship Maneuverability in Ice	April 2018	Italy	NATO UNCLASSIFIED Non-NATO Invited
AVT-301	Flowfield prediction for maneuvering underwater vehicles	April 2018	Italy	NATO UNCLASSIFIED Non-NATO Invited

Table 29: Symposia 2018

ACTIVITY	TITLE	MEETING DATES	MEETING LOCATIONS	DISTRIBUTION and PARTNER PARTICIPATION
SCI-300	Cyber Physical Security of Defence Systems	Spring 2018	USA	NATO UNCLASSIFIED Non-NATO Invited

Table 30: Workshops 2018

ACTIVITY	TITLE	MEETING DATES	MEETING LOCATIONS	DISTRIBUTION and PARTNER PARTICIPATION
HFM-288 RWS	Integrated Approach to Cyber Defence: Human in the Loop	16-18 April 2018	Sofia, Bulgaria	Public Release