Applied Vehicle Technology (AVT) Panel

Preliminary Meeting Announcement and

CALL FOR PAPERS

AVT-245/RSM-037 SPECIALISTS’ MEETING

on

Future Rotorcraft Requirements

organized by the Members of the Applied Vehicle Technology Panel (AVT)

AVT-245 Programme Committee

to be held in Prague, Czech Republic

12-15\textsuperscript{th} October 2015

Contributions and participation are invited from NATO Nations only

\textit{Note: Final date for submission of abstracts is 6\textsuperscript{th} March 2015}

For further details please consult the following sections regarding
General Scope of the Meeting
Deadlines and Schedule
Procedures
AVT-245 Programme Committee
Abstract Submission Form
The NATO Science and Technology Organization:

Science & Technology (S&T) in the NATO context is defined as the selective and rigorous generation and application of state-of-the-art, validated knowledge for defense and security purposes. S&T activities embrace scientific research, technology development, transition, application and field-testing, experimentation and a range of related scientific activities that include systems engineering, operational research and analysis, synthesis, integration and validation of knowledge derived through the scientific method.

In NATO, S&T is addressed using different business models, namely a collaborative business model where NATO provides a forum where NATO Nations and partner Nations elect to use their national resources to define, conduct and promote cooperative research and information exchange, and secondly an in-house delivery business model where S&T activities are conducted in a NATO dedicated executive body, having its own personnel, capabilities and infrastructure. The mission of the NATO Science & Technology Organization (STO) is to help position the Nations’ and NATO’s S&T investments as a strategic enable of the knowledge and technology advantage for the defenses and security posture of NATO Nations and partner Nations, by conducting and promoting S&T activities that augment and leverage the capabilities and programs of the Alliance, of the NATO Nations and the partner Nations, in support of NATO’s objectives, and contributing to NATO’s ability to enable and influence security and defense related capability development and threat mitigation in NATO Nations and partner Nations, in accordance with NATO policies.

The total spectrum of this collaborative effort is addressed by six Technical Panels who manage a wide range of scientific research activities, a Group specializing in modelling and simulation, plus a Committee dedicated to supporting the information management needs of the organization as follows:

- AVT - Applied Vehicle Technology Panel
- HFM - Human Factors and Medicine Panel
- IST - Information Systems Technology Panel
- NMSG NATO - Modelling and Simulation Group
- SAS - System Analysis and Studies Panel
- SCI - Systems Concepts and Integration Panel
- SET - Sensors and Electronics Technology Panel

These Panels and Group are the power-house of the collaborative model and are made up of national representatives as well as recognized world-class scientists, engineers and information specialists. In addition to providing critical technical oversight, they also provide a communication link to military users and other NATO bodies. The scientific and technological work is carried out by Technical Teams, created under one or more of these eight bodies, for specific research activities which have a defined duration. These research activities can take a variety of forms, including Task Groups, Workshops, Symposia, Specialists’ Meetings, Lecture Series and Technical Courses.
Applied Vehicle Technology (AVT):

The Applied Vehicle Technology Panel strives to improve the performance, affordability, and safety of vehicles through advancement of appropriate technologies. The Panel addresses vehicle platforms, propulsion and power systems operating in all environments (land, sea, air, and space), for both new and ageing systems. To accomplish this mission the members of the AVT community exploit and focus their joint expertise in the fields of:

1. Mechanical Systems, Structures, and Materials:
   Vehicle and platform design; structural loads and dynamics; noise and vibration control; smart and multifunctional materials and structures; structural materials and manufacturing processes; non-structural materials; corrosion; fatigue and other degradation mechanisms; affordability, availability, survivability and supportability; reliability and maintenance.

2. Performance, Stability and Control, Fluid Physics:
   Performance; stability and control; aerodynamic and hydrodynamic analysis and design; theoretical, experimental and computational fluid dynamics; aerothermodynamics; aero- and hydro-acoustics; aeroservoelastics.

3. Propulsion and Power Systems:
   Engineering and testing of propulsion systems; fuels and energy conversion; fluid and gas dynamics addressing airbreathing engines; auxiliary onboard power generation units; solid and liquid propellant rockets; electrical systems; and fire protection and suppression.

Under the Performance, Stability and Control, Fluid Physics focus of AVT, a Specialists’ Meeting is planned on the subject of “Future Rotorcraft Requirements”.

Background and Justification for the Specialists’ Meeting:

Many of the helicopters operated by NATO countries can trace their origins back to designs which were produced 30 or even 50 years ago and the basic layout of the helicopter has not significantly changed in all of that time.

The fundamental rotor system limitations due to advancing tip Mach number and retreating blade stall are ever present. The most significant recent change in rotorcraft has been the development of tilt-rotor technology. The introduction of the V-22 Osprey and its success on operations has shown the potential for tilt-rotor platforms to offer effective lift capability with increased range and speed compared to conventional helicopters. Meanwhile, the first commercial civil tilt-rotor, the AW.609, continues towards certification. Other new technology is emerging which offers the potential to overcome many of the limitations currently experienced with helicopters. These include platform concept demonstration programs which have emerged in the United States and Europe such as the Joint Multi Role technology demonstrator programme led by the US Army, the X3 compound helicopter developed by Airbus Helicopters, the X2 and S-97 aircraft developed by Sikorsky and AgustaWestland’s “project zero” electric powered unmanned vehicle.
Recent operations have shown the exceptional value of helicopters in supporting the front line by providing an essential lift function (rapid medical evacuation, troop insertion, routine resupply) but also providing an attack capability including close air support in proximity to ground troops or precision strike on specific targets. Thus, the utility of efficient and effective vertical take-off and landing (vertical lift) has been re-affirmed in recent operations. Now, with rotorcraft development on the edge of an exciting new period there is an opportunity to shape the rotorcraft requirements and provide guidance on future roles and functions, against which the next generation of platforms will be designed. This should ensure availability of effective and affordable rotorcraft to support military operations with efficient vertical lift when the current generation of helicopters reaches their out of service dates.

**Objectives:**

The technical team will review activities within NATO participating nations which will inform how the roles and requirements for helicopters and other rotorcraft may evolve in the future. This will be achieved through the delivery of a series of facilitated discussion sessions run under the auspices of an AVT Specialists Meeting. The following paragraphs provide a more detailed description of the work planned under this programme.

**Topics to Be Covered:**

A series of technical themes have been identified that form key themes for the Future Rotorcraft Requirements activity. The facilitated discussions will be focussed on addressing these topics:

- **Technologies** – the technologies session will provide an overview of evolving technologies that contribute to delivering enhanced capabilities for future rotorcraft. These include; advanced sensors, automation and HMI, novel blade technologies, materials for advanced engines and transmissions, electrification, additive manufacturing, etc. We seek papers with particular emphasis on transition of technologies “across the valley of death”.
- **Configurations** – the configurations session provides a forum to discuss present and future evolution of helicopter and rotorcraft architectures to meet the needs of the operators. This ranges from the development of in-service platforms to revolutionary architecture. We seek papers with a particular focus on the matching of operators needs to technology offerings.
- **Programmes** – the programmes session will discuss insights and lessons learned from recent major rotorcraft programmes and develop recommendations for NATO officials to consider when developing the next generation of rotorcraft. We seek papers relating to recent major rotorcraft programmes.
- **Regulation** – the regulation session will cover topics including the certification of advanced technologies, system safety and environmental initiatives. We seek papers relating to airworthiness harmonisation across NATO nations, the overlap between civil and military certification (“as civil as possible, as military as necessary”) and the implications of environmental and sustainability challenges.
AVT-245 Programme Committee

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AVT-245 Specialists’ Meeting

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Invitation and Format of Abstracts

- The initial abstract should describe in 1000 to 1500 words, the aim, results and conclusions of the work. Inclusion of 1 to 2 figures and/or photographs to support the abstract is encouraged. All abstracts should be submitted by email to the Programme Committee Co-Chairs as identified below.

- The full scientific paper (approximately 5-12 pages) will be requested once the Programme Committee has developed the final agenda for the Specialists’ Meeting.

- Both the abstracts and the full scientific paper must also contain a declaration from the author(s) that there are no restrictions regarding presentation neither during the Specialists’ Meeting nor of the publication in the Meeting Proceedings. Authors’ names, complete mailing addresses and other requested information must be included with abstracts. Please use the Abstract Submittal Form (attached) and keep the size of files less than 2 MB.

Programme Committee Co-Chairs

Questions related to technical aspects of the programme or the papers should be addressed to the Programme Committee Co-Chairs:

Mr Pat Collins
Helicopters Operating Centre,
Defence Equipment & Support,
MOD Abbey Wood,
Bristol BS
United Kingdom
Email: DESHELSCG@mod.uk

Mr Marc Höfinger
Institute of Flight Systems,
German Aerospace Centre,
Braunschweig
Germany
Email: Marc.hoefinger@dlr.de

Paper Preparation and Procedures including Classification

It is the responsibility of the author to ensure that the paper/abstract submitted receives the necessary clearances before it is forwarded. Please allow sufficient time for the clearance to be issued before deadlines. In this case, the NATO classification for this Specialists Meeting has been declared as NATO Unclassified which means that distribution will be to NATO Nations only.
• Authors submitting abstracts should ensure that financial support for their attending the Specialists’ Meeting will be available.

• Please send an electronic copy of the abstract together with the completed Questionnaire (Parts I and II) herewith attached as Annex B to the Technical Program Committee Chairs, Mr Pat Collins (DESHELS-SCG@mod.uk) and Mr Marc Höfinger (Marc.hoefinger@dlr.de) and to the AVT Panel Assistant, Ms. Sandra Cheyne (sandra.cheyne@cso.nato.int) early enough to reach them by 6th March 2015.

• Authors will be notified of acceptance by 1st May 2015.

EXCEPTION: Authors from the United States must comply with US procedures. (Refer to the Instructions in Annex A)

Papers and Presentations

Twelve papers will be presented, each author being allocated 25 minutes, with usually twenty minutes for the presentation of their paper and five minutes for discussion. After the presentation of the papers within each topic session, the presenters will participate in a topic roundtable structured discussion. All selected, presented and finalized papers will be published. Papers must be written and presented in English. A number of these presentations will be from invited speakers but the organisers are keen to engage with a wide range of potential speakers. A poster session is planned to run during the meeting, submissions are invited for posters and those authors whose papers are not selected for presentation will be invited to present a poster.

Detailed instructions (Authors Briefing Package) and necessary material will be sent to each “Lead Author” of papers before 15th May 2015.
Deadlines and Schedule

31 October 2014  Distribution of Call for Papers
To solicit abstracts from NATO Nations
After: authors to send their abstracts to the Programme Committee Co-Chairs (see above)

6 March 2015  Abstract Submission Deadline

1 May 2015  Authors informed of Selection Decision
Programme Committee to inform selected and well as rejected authors of their decision and CSO/AVT will dispatch “Authors Briefing Package” to selected authors so that they can prepare their papers, presentation and clearances

4 July 2015  Submission of Advance copies of US papers to US National Coordinator
(Deadline for the US authors to submit their copy of their advance paper to the US N.C. for approval and clearance)

7 August 2015  Electronic Advance copy of paper due at CSO/AVT
Deadline for all authors to send an advance copy of their full scientific paper to CSO/AVT
After: the Technical Evaluator of the Specialists’ Meeting to review all submitted papers

11 September 2015  Submission of Final Version of all Papers to CSO/AVT
Deadline for all authors to send their final papers to CSO
After: CSO to pre-release all papers on the CSO website making them accessible to all registered participants to the Specialists’ Meeting
Note that no paper copies will be available at the meeting site

12-15 October 2015  Specialists’ Meeting to be held in Czech Republic

13 November 2015  Submission of corrected manuscripts
Deadline for all papers to be included in the Meeting Proceedings
After: CSO to edit, prepare and produce the Meeting Proceedings which will be made accessible through the CSO website
Papers and Presentations

Approximately 12 papers will be presented, each author being allocated 25 minutes, with usually twenty minutes for the presentation of their paper and five minutes for discussion. After the presentation of the papers within each topic session, the presenters will participate in a topic roundtable structured discussion. All selected and finalized papers will be published regardless of whether they were presented or not. Papers must be written and presented in English. Authors whose papers are accepted will be asked to provide a full version of their paper electronically by e-mail. Detailed instructions (Authors Package) and necessary material will be sent to each “Lead Author” of papers before 12th May 2015.

Poster Session

We are planning on having a poster session during the intervals at the specialists meeting; those authors whose abstracts were not selected for inclusion in the technical sessions will be invited to present during the poster session. Applications from authors who wish to present a poster but do not wish to present a formal paper will also be considered.

Publication of Meeting Proceedings

Complete instructions will be sent by the AVT Panel Assistant to the authors of the papers selected for the Specialists’ Meeting. The “Briefing for Authors” will detail all requirements and deadlines for the preparation of the final manuscripts and presentations. All authors will need to provide CSO with a final version of their Paper by 11 September 2015 together with the Presentation/Publication Release and Clearance Certificate (Form 13e). Please be reminded that papers must be written and presented in English. A week before the Specialists’ Meeting, CSO will pre-release the papers on the CSO website. These papers will be available through a login and password which will be provided by the AVT Panel Office. The final publication (Meeting Proceedings) will be at a URL address which will be given later, together with a login and password. This will represent the official reference of the Meeting Proceedings of this Specialists’ Meeting including the presentations, an Executive Summary, abstract and the Technical Evaluation Report (TER). Please take note that CSO reserves the right to print in the Proceedings any paper or material presented at the meeting. Any questions on the technical aspects of the scientific program or the contents of papers should be addressed to the Programme Committee Chairman and members. Questions on the administrative aspects of this Specialists’ Meeting or requests for further information on

STO activities should be addressed to the AVT Panel Office:

Ms. Sandra Cheyne
AVT Panel Assistant,
CSO Paris
Tel: +33 (0)1 55 61 22 87
Sandra.cheyne@cso.nato.int
ANNEX A

Special Notice to U.S. Authors
And
Non-U.S. Citizens Affiliated With U.S. Organizations

Ref.: Specialists’ Meeting (AVT-245) on “Future Rotorcraft Requirements”
to be held in Prague, Czech Republic, 12-15 October 2015

ABSTRACTS OF PAPERS FROM THE U.S. MUST BE SENT ONLY TO THE FOLLOWING P.O.C.:

NATO STO U.S. National Coordinator

United States contributors should initiate their organization’s and their sponsor’s (if government-funded) internal review and release process through their local public affairs or foreign disclosure office or its equivalent early enough to meet the required deadlines identified in the author’s package. Upon completion of this clearance process, forward a copy of all internal documentation along with the front, reverse side of this form (CSO Form 13) completed by you through Section 3 and a copy of the manuscript and presentation materials (only if non-classified) to:

NATO STO U.S. National Coordinator
OASD(R&E) / International Technology Programs
4800 Mark Center Drive, Suite 17D08
Alexandria, VA 22350-3600
Tel: +1 (571) 372-6538 / 6539
Fax: +1 (571) 372-6548
Email: osd.pentagon.ousd-atl.mbx.usnatcor@mail.mil

For Packages being sent by commercial postal carriers (i.e. FedEx, DHL, UPS) use the following:

NATO STO U.S. National Coordinator
OASD(R&E)/International Technology Programs
4800 Mark Center Drive
Alexandria, VA 22311

The internal documentation from your organization’s local public affairs or foreign disclosure office or its equivalent should clearly show the title of the paper or presentation, level of clearance (e.g. “Approved for Public Release”) and the name, title and organization of the approval authority. Your package should arrive not later than three weeks prior to the submission deadline given in the author’s package for this form (CSO Form 13). For classified documents contact the office above for instructions.

Once satisfied that proper clearance has been achieved, the U.S. National Coordinator will sign below and send a copy to the CSO. Any questions about this process should be directed to the U.S. National Coordinator.
ANNEX B/page 1

PAPER QUESTIONNAIRE

For consideration of a paper submitted for the Applied Vehicle Technology Panel Specialists’ Meeting on: Future Rotorcraft Requirements

AVT-245
Czech Republic, 12-15 October 2015

Please attach a copy of this Questionnaire to each copy of abstract

On each Abstract, authors should be listed in the order they will appear on the program. Unless specified otherwise, the first listed author will be presumed to be the LEAD AUTHOR having the major responsibility regarding the content of the paper.

(Please use the Word version of this document which is attached to this .pdf file)

PART I

TITLE OF PAPER: ________________________________________________________________

What is the Nature of the work reported in the paper? (Indicate with ✓)

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Specialists Meeting Topic Area Addressed by Paper: (Indicate with ✓)

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## PART II: DETAILS OF AUTHORS

### TITLE OF PAPER:

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### AUTHORSHIP:

**Lead Author:** (The author having the major responsibility regarding the content of the paper and the contact person for all NATO or AVT-245 Program Committee correspondence.)

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