The AHS 70th Annual Forum & Technology Display will take place May 20-22, 2014 at the Palais des Congrès de Montréal, Montréal, Québec Canada. The theme of next year’s conference is “Celebrating International Cooperation in Vertical Flight Technology.”

The Forum is a superb chance to present and discuss advances in every area of vertical flight technology, design and its applications. Technical sessions will be sponsored by each of the Society’s Technical Committees.

The Forum Technical Chair for this event is Prof. Marilyn J. Smith, Georgia Institute of Technology, (404) 894-3065; FAX (404) 894-2760; email marilyn.smith@ae.gatech.edu. The Deputy Forum Technical Chair is Mme. Blanche Demaret, ONERA, +33 1 80386760; email blanche.demaret@onera.fr.

Abstracts must be received no later than Tuesday, November 5, 2013. Late submittals will be difficult or impossible to include in the evaluation process. Abstracts are to be submitted to the web site https://submissions.miracd.com/AHS2014. Abstracts may not be larger than 2MB and should be submitted in PDF form. They should be approximately 1,000 words, present the status of the background data to be used, summarize figures and illustrations to be used (with samples), and include a summary of important conclusions. Abstracts that exceed the stated limits may, at the discretion of the committee, be rejected. Please note that several technical committees have additional specifications for abstract submission, so authors should read and follow the guidelines noted under their technical area of interest.

Abstracts will be accepted in a variety of technical disciplines including: Acoustics; Advanced Vertical Flight; Aerodynamics; Aircraft Design; Avionics & Systems; Crash Safety; Crew Stations & Human Factors; Dynamics; Handling Qualities; History; HUMS/CM; Manufacturing Technology and Processing; Modeling and Simulation; Operations; Product Support Systems Technology; Propulsion; Structures & Materials; Systems Engineering Tools/Processes; Test & Evaluation; Unmanned VTOL Aircraft & Rotorcraft and Wind Energy.

Aircraft & Rotorcraft and Wind Energy. Submittal of an abstract is a professional commitment: if the abstract is accepted, the author commits to prepare a final paper, attend the Forum and make a presentation based on that final paper. If an author finds that he or she will be unable to make the presentation, then it is incumbent upon him or her to find a substitute presenter. Abstract acceptance will be based in part on the submitter’s prior history in following through with their previous commitments. Papers presented previously are not eligible for consideration. This ineligibility includes papers or presentations (or facsimiles thereof) that are submitted for presentation at a national meeting of any professional organization at any time prior to the Forum. One author may present no more than two papers.

Other Important Dates:
Authors will be notified of paper selection by Tuesday, December 3, 2013.

Papers must be submitted electronically to the Mira web site by Friday, March 28, 2014.

The AHS Forum is open to an international audience. As such, it is the policy of the AHS that all papers submitted for inclusion in the Proceedings and all presentations made at the Forum are completely unrestricted. That is, they are not allowed to contain any proprietary, sensitive, classified, or otherwise controlled information. Authors should make note of this policy when submitting abstracts. It is the author’s responsibility to obtain appropriate clearances, which sometimes may take as long as two months, of their abstract, paper, and presentation in order to meet all deadlines.

No Paper – No Podium Rule
A general “No Paper –No Podium” policy will be in effect for all contributed papers. This policy means that an author will not be scheduled to speak if the paper has not been properly submitted at the time of the Forum. Any paper received after the final submittal date will not be included in the printed or CD-ROM version of the AHS 70th Annual Forum Proceedings. Please note that there will be no supplemental CD for Forum 70. In the event of extenuating circumstances, exemption to the “no paper, no podium” rule may be
The Advanced Vertical Flight Committee seeks papers that focus on topics relevant to advanced and unconventional vertical flight concepts. Included among these topics are innovations in aircraft configurations, both rotorcraft (such as tilt wing, tilt rotor, compound, and slowed or stopped rotor configurations) and non-rotorcraft systems (such as lift fans, lift engines, vectoring nozzles, and thrust augmentation devices). Additionally, new technologies that enable advances in vertical flight are desired. Special interest subjects include new configurations proposed for the Joint Multi Role (JMR) aircraft, examinations of historical technologies and configurations that present generational leaps in the advancement of vertical flight aircraft, and what future advances may define the next generation of vertical flight aircraft and technologies. Advances in vehicle efficiency, such as those found in "green" technology (i.e., hybrid, all-electric and novel energy storage and conversion device configured aircraft) and human-powered helicopters are also of interest. Other relevant topics include unmanned systems, micro scale vehicles, conceptual air vehicle design and methodologies, flight systems, systems integration, operational analysis, vehicle control systems, piloted flight simulation, full and scaled vehicle ground, wind tunnel and flight testing for advanced vertical flight systems.

**Registration**

Presenters of all papers to be delivered at technical sessions, both regular and special sessions, must register and are eligible to pay reduced Forum speaker registration fees, whether members or non-members of AHS.

**Annual Forum Technical Sessions**

**Acoustics**

Papers are invited addressing recent advancements in the study of internal and external rotorcraft noise generation, propagation and control (active and passive). Appropriate external noise topics include rotorcraft component and full system noise prediction methodology development and validation, wind tunnel and full scale flight test acoustics measurements, new procedures for acoustic data acquisition, reduction or analysis, active and passive rotor noise reduction techniques and noise abatement flight operations, acoustic propagation models and community impacts of rotorcraft noise. Topics of interest include, but are not limited to: current research contributing to a basic understanding of fundamental aerodynamic noise sources such as rotor harmonic noise, impulsive noise and broadband noise as well as interaction between various rotorcraft noise sources for both manned and unmanned rotorcraft. Papers dealing with the development or implementation of national or international civil noise regulations are also encouraged. Appropriate interior noise topics include the application of numerical techniques to predict noise in rotorcraft cabins, active and passive noise control technologies to reduce cabin noise, studies of human response to cabin noise, and source noise reduction concepts, such as concepts for the engine and transmission.

**Session Chair:** Dr. Marc Gervais, Eurocopter, +33 0 442857957, email: marc.gervais@eurocopter.com; **Deputy Session Chair:** Dr. Charles Tinney, University of Texas at Austin, (512) 471-4147, email: cetinney@mail.utexas.edu.

**Aerodynamics**

Papers are invited that address recent accomplishments in all areas of rotorcraft and vertical and/or short take-off and landing (V/STOL) aerodynamics. Topics of interest include, but are not limited to, computational fluid dynamics techniques, analytical methodology, experimental aerodynamic and/or flight test results, flow visualization methods and results, correlation, aerodynamic design methods for components or complete aircraft, unique aerodynamic modeling, interactional aerodynamics, low Reynolds number aerodynamics, aerodynamic flow control for components or complete aircraft, and computations or measurements of high angle of attack, unsteady, or vortex flows. Please note that the aerodynamics review process is competitive, and abstracts exceeding 5 pages (10 pt., single-spaced, 1 inch margins, all-inclusive) will not be evaluated.

**Session Chair:** Mark Potsdam, US Army AFDD, (650) 604-4455, email: mark.potsdam@us.army.mil; **Deputy Session Chair:** Ed Reed, Sikorsky Aircraft Corporation, (203) 386-3704, email: ereed@sikorsky.com.

**Aircraft Design**

Papers are invited from industry, government, academia, and operators on all aspects of manned and unmanned rotary wing or vertical flight aircraft design including, but not limited to: design and fabrication of dynamic systems or components, airframe components, or entire vehicles; conceptual, preliminary or product design development tools and processes; and analytical modeling leading to advanced rotary wing or vertical flight technologies. Optimization or trade studies focused on new or alternative configurations are likewise of interest. Papers discussing the interaction of technology, configuration and requirements in the design of next generation civil and military rotorcraft are also sought.

**Session Chair:** Dennis McGuire, LORD Corporation, (814) 868-5424 ext. 6630, email: dennis.mcguire@lord.com; **Deputy Session Chair:** Dr. Richard Markiewicz, Defence Science and Technology Laboratory (DSTL), +44 3067704595, email: rhmarkiewicz@dстl.gov.uk.
Avionics & Systems

The AHS Avionics & Systems Technical Committee invites papers that address the following for both manned and unmanned vertical flight aircraft:

• Techniques which improve the efficiency of developing complex software intensive avionics systems and/or which promote software reuse between platforms;
• Partitioned architecture of fielded mission and cockpit management systems, and the success or challenge associated with integrating such systems after aircraft deployment;
• Evolving definitions and options for defining network structures that will provide high bandwidth, worldwide connectivity to serve as the information backbone for netcentric, tactical information sharing;
• Descriptions of applications where commercial off-the-shelf hardware and software have been successfully employed in tactical helicopters with minimal modification;
• Sensors and systems that provide true ‘see-through’ capability in sand, dust, rain, and other obscurants found in Degraded Visual Environments – airborne examples of field trials and operational solutions are of particular interest;
• The current status and future expectations for manned and unmanned surveillance and weapons platforms, especially as interfaced at higher modes to and from helicopters;
• Methods to achieve harmonization of certification requirements which results in systems solutions acceptable to FAA, EASA and military regulators;
• Fly-by-wire and fly-by-light control system architectures and the critical requirements imposed upon the supporting avionics systems and sensors;
• Mission Equipment, including communications, weapons systems, fire control architectures, software, survivability equipment, and other systems critical to successful accomplishment of helicopter missions;
• Methods for addressing obsolescence and other life cycle issues related to aging avionics and systems components;
• Avionics Sensors or Systems Integration or performance testing either in the integrated lab environment or through aircraft ground and flight test;
• Advanced electrical controls, actuator and servo technology;
• International cooperation in avionics and systems programs and technologies aimed at “greening” rotorcraft and reducing their adverse environmental effects.

Session Chair: Dr. Mel Johnson, US Army Aviation Engineering Directorate, (256) 313-8461, email: melvin.l.johnson88.civ@mail.mil; Deputy Session Chair: Dr. Walter Rawle, Ultra Electronics Flightline Systems, (585) 851-1777, email: walter.rawle@ultra-fei.com

Crash Safety

Papers are invited for ALL aspects of crashworthiness and aviation safety relating to rotorcraft, UAVs, and other V/STOL aircraft. Potential application areas include military, civil, offshore transport, mountainous terrain, emergency medical services, and law enforcement. Emphasis will be given to the recent development of new crash safety concepts toward minimizing human impact injury; maximizing post-crash survival; development of new crash-resistant design criteria; development and application of improved and more comprehensive human tolerance and injury criteria; and development of systems that reduce airframe damage while also reducing injury potential. Also of key interest are system integration analyses that demonstrate enhanced occupant safety while minimizing system penalties for aircraft cost and weight. Additional crashworthiness topics of interest include, advancements relating to energy absorbing systems such as landing gears, composite airframe structures, seats, cargo and mass item retention systems, and internal/external inflatable devices; crew, troop, and passenger restraint systems; post-impact flotation; crashworthy fuel systems to include range extension tanks; testing and validation; and methods of mishap data retrieval, collection and analysis. Other safety topics of interest include, but are not limited to, use of mishap data to define crash safety technology deficiencies and to support system safety analyses. Analytical simulation of aircraft crash impacts on rigid, massively sloped (mountainous), soil and water impact surfaces, bird strikes against the canopy and rotor systems, and simulation of aircraft crash protective systems such as landing gear, energy-absorbing seats, landing gears, and inflatable devices are of keen interest. Finally, papers regarding new validated analytical methods that will improve the reliability, accuracy, and expand the scope of computer simulations for crash safety are also sought.

Session Chair: Dr. Akif Bolukbasi, The Boeing Company, (480) 891-5111, email: akif.o.bolukbasi@boeing.com; Deputy Session Chair: Christof Kindervater, German Aerospace Research Center, +49 7116862280, email: christof.kindervater@dlr.de.

Crew Stations & Human Factors

Papers are invited for all aspects of air vehicle crew stations and/or human factors engineering. Areas of interest include:

• Controls and Displays:
  Heads Down, Head Up, Helmet Mounted, Visor, and other displays; Audio, including Speech Recognition, Synthetic Speech, and Voice Recognition; Electronic Flight Bags; Touch Interfaces
• Graphical User Interfaces, including:
  Vehicle, Sensor, and Tactical Information Management and Presentation Techniques; Degraded Visual Environment, Synthetic Vision, Virtual Reality Displays, etc.
• Furnishings and Equipment:
  Grips, Panels, Seating, Ergonomics, Accommodation, Restraints; Lighting, NVG Compatibility; Design for Safety; Design for Maintainer; Crash Safety & Survivability
• Design Process:
  Human Modeling; Virtual Reality, Prototyping and Simulation; Simulation, Test and Evaluation of the Man-Machine Interface
• Human Centered Operations, including:
  Workload and Situation Awareness; Manned-Unmanned Teaming; UAV/RPV Ground Control Station Design; Battle and Mission Management Techniques; Decision Aids and Associated Systems
• Military and Civilian Standards, Specifications, and Certification
• Human Powered Flight
• Pilot Perspectives

Session Chair: Kristin Little, The Boeing Company, (480) 891-1246, email:kristin.little@boeing.com; Deputy Session Chair: Jeff Erwin, Bell Helicopter Textron, Inc., (817) 280-1928, email: jerwin@bh.com.
Dynamics

Papers are invited in all areas related to rotorcraft dynamics and aeroelasticity, including rotor response and stability, dynamics of coupled rotor/airframe systems, load prediction, vibration reduction, analytic modeling techniques, and experimental measurements as well as computational fluid-structure interaction and reduced order models. Papers reporting on the development of rotorcraft dynamic or aeroelastic analyses and experimental validation are especially encouraged. New experimental results are of particular interest, as are advances in dynamics technology and design methodologies. Papers reporting on dynamic aspects of technologies such as active controls, UAV/MAVs, and unconventional V/STOL aircraft are also welcome. Priority will be given to completed programs where significant conclusions are substantiated and the results contribute to advancing the state-of-the-art. Please indicate in your abstract the current status (completed versus ongoing work). Abstract length should be approximately 1000 words.

Session Chair: Dr. Matthew Floros, US Army Research Lab, (410) 278-7752, email: matthew.w.floros.civ@mail.mil; Deputy Session Chair: Dr. Jinsong Bao, Sikorsky Aircraft Corp., (203) 386-7527, email: jbao@sikorsky.com.

Handling Qualities

Papers are invited that address all aspects of rotorcraft and V/STOL handling qualities from research through engineering design and development to civil certification and military qualification. Handling Qualities encompasses all of the aircraft characteristics which govern the ease and precision with which a pilot is able to perform tasks in support of an aircraft mission. This includes basic vehicle stability and control/response characteristics and the pilot-cockpit-vehicle interface. Papers are encouraged that address significant results from flying qualities-related topics, applications of mathematical modeling to rotorcraft design, development and use of handling qualities flight test data, operational needs and experience, night and adverse weather requirements, the impact of handling qualities on safety considerations, and development of advanced flight control systems.

Session Chair: Dr. Mike Jump, University of Liverpool, +44 1517946845, email: mjjump1@liverpool.ac.uk; Deputy Session Chair: Joseph Driscoll, Sikorsky Aircraft Corporation, (203) 386-7377, email: jdriscoll@sikorsky.com.

Health & Usage Management Systems (HUMS) – Condition Based Maintenance (CBM)

Papers are invited on the following topics within the area of rotorcraft health and usage monitoring, management, and condition based maintenance: (1) advanced monitoring technologies, including sensors, algorithms, processing methods, system architecture, wireless communication, energy harvesting, data fusion, data mining, and decision support methods/tools; (2) life and usage assessment techniques including modeling, analysis, data fusion; (3) aircraft implementation to include verification and validation, certification/qualification; and (4) benefits and success stories to include operational availability, safety, costs, and maintenance benefits. The application areas are Propulsion, Drive Systems, Structures, Rotor Systems, Vehicle Management System/Flight Control, Electrical and Electronic Systems.

Session Chair: Brian Tucker, Bell Helicopter Textron, Inc., (817) 280-4795, email: btucker4@bh.com; Deputy Session Chair: Eric Carney, NAVAIR, (301) 757-0520, eric.carney@navair.mil.

History

The AHS History Committee invites scholarly papers and first-hand accounts that facilitate the preservation and understanding of the world's vertical flight history. Of particular interest are papers documenting important but not well-known developments in vertical flight technologies or vehicles, rediscovery of forgotten pioneers, or events involved in understanding specific phenomena. In recognition of the 70th Annual Forum, accounts of early efforts of developing the helicopter industry and/or interactions with AHS are also encouraged. Personal involvement in the subject matter or extensive research and documentation are highly desirable. Exceptions can be made from the no-paper/no-podium policy for first-hand accounts.

Session Chair: Dr. Bruce H. Charnov, Associate Professor Emeritus, Hofstra University, (858) 598-6284, cell (917) 414-3754, email: bruce.h.charnov@hofstra.edu.

Manufacturing Technology & Processing

Papers are invited on novel manufacturing technology and processes including topics of special interest to the vertical lift community such as: integration of manufacturing considerations earlier into the product development cycle; global procurement strategies; low volume lean production cells, rapid prototyping, tooling and learning; cost effective fabrication of improved damage tolerance and fatigue designs; regulatory impacts and environmental issues; quality assurance approaches, and applications of innovative process measurements; rotor and drive system manufacturing; advanced bonding, joining and assembly techniques; manufacturing modeling and simulation; and accelerating readiness levels. Papers from industry, government and academia are solicited.

Session Chair: Prof. Dan Schrage, Georgia Institute of Technology, (404) 894-6257, email: daniel.schrage@aerospace.gatech.edu; Deputy Session Chair: William C. Harris, Sikorsky Aircraft Corp., (203) 386-3568, email: wharris@sikorsky.com.

Modeling & Simulation

The AHS Modeling and Simulation Technical Committee is looking for papers on applications of modeling and simulation to air crew training and mission rehearsal, and on papers using M&S to support and enhance rotorcraft flight operations, and rotorcraft design, safety and certification requirements. Papers on the following topics are invited:

- Rotorcraft simulator fidelity ratings, fidelity metrics, pilot cueing requirements for specific air vehicle configurations or mission tasks, transfer of training, and application of simulation to study pilot-rotorcraft interactions;
- Specialized topics in mathematical modeling, system identification, inverse simulation, and simulation/simulator verification and validation, including the application of
• Improving safety, and application of simulation to flight operations quality assurance;
• Mathematical modeling to simulate slung loads, urban operations, alpine operations, shipboard operations, and other missions;
• Advanced or novel simulation technologies, including in-flight simulation, parallel computing for real time simulation, and distributed simulation;
• Mathematical modeling and application of simulation to UAVs, and evaluation of advanced rotorcraft and future vertical lift concepts, including compound helicopters;
• Application of simulation to integrate rotorcraft design, flight test and certification, and to support virtual engineering lifecycle concepts;
• Quantitative benefits of using simulation toward rotorcraft design, flight-testing and training, compared to traditional practices.
• Applications using M&S to emphasize international programs and to also include programs that demonstrate virtual green technology for rotorcraft.

Session Chair: Dr. Mark White, U of Liverpool, UK, +44 0 1517946848, email: mdw@liverpool.ac.uk; Deputy Session Chair: Daniel Spira, CAE Inc., (514) 341-2000 ext. 6590, email: daniel.spira@cae.com

Operations

Papers are invited that address military and civil rotorcraft operations (manned or unmanned) in the following areas: concepts of operations; tactics, techniques, procedures, tools, technologies, and methodologies; rotorcraft survivability, vulnerability and operational effectiveness analyses; electronic and cognitive decision-aiding; command, control, and communications techniques; intelligence and electronic data gathering applications; aircraft supportability; extreme weather operations; public safety and emergency medical service operations; offshore operations; and continued operational safety/safety management/training.

Session Chair: John Barber, Bell Helicopter Textron, Inc., (817) 280-5828, email: jbarber@bh.com; Deputy Session Chair: Terry Parisher, Northrop Grumman Corp., (858) 204-0512, email: terry.parisher@ngc.com.

Product Support Systems Technology

Papers are invited that present the perspective of the air vehicle, powerplant, ground support equipment, training device or mission equipment manufacturer. Because of the nature of the subjects presented during the Product Support Systems Technology Technical Session of the AHS Forum, written papers are encouraged but are not mandatory to support your presentation (priority will go to presentations with written papers). Some of the supportability considerations in product introduction may be entirely new to the user and/or manufacturer, requiring new and innovative support concepts. Key elements are Platform Maintenance Applications (PMA); Performance Based Logistics (PBL); Condition Based Maintenance (CBM); Soldier Focused Logistics (SFL); Contractor Logistics Support (CLS); Fleet Information Management (FIM); Flight Operations Quality Assurance (FOQA); Centralized Automated Flight Records Systems; site activation; pre-operational support planning; service center support, training facilities, lessons learned from previous fields; environmental conditions; support within budgetary constraints; pre-production prototyping and field evaluation programs.

Presenters are reminded that they must submit written papers for publication in the AHS Forum Proceedings in order to be eligible for the Alfred Gessow Forum Best Paper Award.

Session Chair: Treven Baker, US Army AATD, (757) 878-0155, email: treven.e.baker.civ@mail.mil Deputy Session Chair: Jason Johnson, Heli-One, (604) 952-7700, email: jason.johnson@heli-one.ca.

Propulsion

The AHS Propulsion Committee invites papers which present new and innovative information on propulsion for rotorcraft and other vertical flight aircraft, including unique propulsion challenges of Unmanned Aerial Vehicles (UAVs), Future Vertical Lift (FVL), and V/STOL aircraft configurations with variable speed/multi-speed propulsion concepts. Recommended topics for these configurations include rotorcraft engines, rotorcraft drive systems, platform energy requirements, propulsion system integration, and related airframe/engine technologies. Centered around these topics and of specific interest are papers addressing recent approaches or technologies that enhance safety and improve performance, provide methods and design analyses that improve engine and drive system reliability, enable a reduction in customer component-repair/replacement burden, reduce propulsion contribution to fuel/energy cost, provide a reduction in operations and sustainment costs, and/or present weight/noise reduction technologies. Recommended topics also include system integration considerations, environmental impacts and requirements, integrated/advanced electronic control systems (to include sensors), advanced materials, gear and bearing technology, shafting advancements, alternative fuels and lubricants to include non-hydrocarbon energy storage, and alternatives to conventional rotorcraft propulsion/drive systems including hybrid/electric drives. We also request papers which demonstrate the use of simulation to enhance propulsion systems and subsystems, detail design tools that support the above technologies, and provide creative validation/testing methods aimed at reductions in development/qualification costs.

Session Chair: Eric Sinusas, Bell Helicopter Textron, Inc., (817) 280-1309, email: esinusas@bellhelicopter.textron.com; Deputy Session Chair: Michael Spratt, Rolls-Royce Corporation, (317) 230-4515, email: michael.k.spratt@rolls-royce.com.

Structures & Materials

AHS Structures and Materials Committee invites papers which address the development, design, analysis, testing, service experiences, or novel application of structures and materials to manned and unmanned rotorcraft, powered lift and fixed-wing V/STOL aircraft.

Topics of interest include, but are not limited to, durability and damage tolerance; fatigue and fracture mechanics; impact mechanics; advanced metallic and composite materials and structures; probabilistic
mechanics and structural reliability methods; repair concepts and methodology; structural health monitoring/prognosis of remaining useful service life; stress and finite element modeling and analysis; structural design criteria; structural loads development structural optimization verification and validation of structural methodologies.

In general, related topics on affordability, weight reduction, material and structural qualification and stress prediction accuracy improvements are desirable. Papers on practical applications of high strain, high durability, or adaptive materials to advanced structural concepts for improved performance or affordability are also solicited.

**Session Chair:** Jeffery Schaff, Sikorsky Aircraft Corporation, (203) 386-7423; email: jschaff@sikorsky.com; **Deputy Session Chair:** Mark Gurvich, United Technologies Research Center, (860) 610-7459; email: gurvicmr@utrc.utc.com.

**System Engineering Tools/Processes**

The AHS System Engineering Tools/Processes Technical Committee invites papers that will promote the advancement of the practice of system architecture, design, development, integration and management, across the multiple disciplines and specialty areas associated with the engineering of systems within the AHS technical community. Papers of interest can range from understanding and documenting of customer requirements and design, through the life cycle to include manufacturing, field support, upgrades and disposal.

Specific areas for consideration may include:

- Requirements development and management; system architecture, especially at the System-of-Systems level; system modeling and simulation; system verification and validation; systems reliability; system qualification and certification; program / project management for System-of-Systems; risk management; systems engineering tools, processes and best practice; systems engineering quality management; systems engineering education and training; “Systems Thinking” benefits.

**Session Chair:** Oxana Fedak, The Boeing Company, (610) 591-1182, email: oxana.s.fedak@boeing.com; **Deputy Session Chair:** Dr. Joan Pham, Sikorsky Aircraft Corp., (203) 386-5508, email: JPham@sikorsky.com

**Test & Evaluation**

Papers are invited that address all aspects of legacy and future vertical lift aircraft test and evaluation. This includes the evaluation of advanced technology (components, subsystems) and vehicles (manned and unmanned rotorcraft, V/STOL, etc.) in laboratory, ground, and flight test scenarios. Insightful papers illustrating the applied methodology for testing of advanced technologies and vehicles are highly desirable. The Test & Evaluation Committee strongly encourages papers covering research agency, industrial, academic, and military activities performed in representative operational and environmental conditions. Aspects of the complex flight envelopes of conventional and unconventional vehicles (low-speed, transition, maneuvering, conversion, and high-speed) vertical lift context are of interest.

Abstracts should not exceed 5 pages (10 pt., single-spaced, 1 inch margins, all-inclusive) in length.

**Session Chair:** Paul Taylor, QinetiQ, +44 1980 664667, email: ptaylor6@qinetiq.com; **Deputy Session Chair:** Marc Alexander, National Research Council of Canada, (613) 998-3014, email: MarcDavid.Alexander@nrc-cnrc.gc.ca.

**Unmanned VTOL Aircraft & Rotorcraft**

Papers are invited on the concepts, design, development, operation, and robotics aspect of VTOL and rotary-wing UAVs in the following general areas:

- Autonomy, Collaboration, and Architectures; Reliability and Robustness; Payloads and Sensors; Agility and Performance; Survivability and Operability

Topics of interest include, but are not limited to:

- Guidance, navigation and control; design concepts, including small and micro air vehicles; mechatronics integration; reasoning, decision-making, autonomy, and multi-vehicle collaboration architectures; embedded perception and data/information fusion; guidance, navigation and control; autonomous operation, tasking, and control (C4); manned-unmanned teaming; flight testing, modeling, and simulation; data links and communications; airworthiness, safety and certification, operation in civil airspace; international cooperation and compatibility; reduced environmental impact.

**Session Chair:** Patrick Fabiani, ONERA, +33 562252561, email: patrick.fabiani@onera.fr; **Deputy Session Chair:** Chad Goerzen, San Jose State University, (650) 604-5318, email: chad.l.goerzen.ctr@mail.mil.

**Special Session: Wind Energy Technology**

In the spirit of the theme of Forum 70, the adaptation and use of rotorcraft-related technology in the wind industry is a direct example of how technology developed for rotorcraft is having an impact on “green” applications. Due to the presence of rotating blades, wind energy and rotorcraft researchers encounter many of the same issues in the design, analysis, manufacture and maintenance of their systems. Indeed, some of the same structural dynamics, acoustics and aerodynamics analysis tools are already in use by both communities. However, researchers in the wind energy and rotorcraft communities may not be aware of their counterpart’s research and technology focused on addressing common challenges. Technical papers are invited that include, but are not limited to, technologies, modeling tools, experimental data, and concepts that are relevant to both rotorcraft and wind turbines.

**Session Chair:** Glen Whitehouse, Continuum Dynamics, Inc., (609) 538-0444 ext. 126, email: glen@continuum-dynamics.com; **Deputy Session Chair:** Prof. Jonathan Naughton, University of Wyoming, (307) 761-2326, email: naughton@uwyo.edu.