RPAS LATIN AMERICA 2013

Latin American RPAS Policy Forum

Co-organised by

In the framework of UVS International's

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CONFERENCE PROGRAMME

DAY 1 - TUESDAY 29 OCTOBER 2013

07.30-08.50 Registration
08.40-09.00 Opening Speech

RPAS: A Brazilian Perspective
Carlos Magalhães da Silveira Pellegrino, ANAC, Brazil

Session 1 - Regulatory Activities in Brazil

01 09.00-09.25 ANAC: Airworthiness Rulemaking Status
Livia Camargos Rodrigues de Oliveira, ANAC, Brazil

02 09.25-09.50 Certificate of Experimental Flight Authorization of the Nauru 500A & ECHAR 20A RPAS based on ANAC IS-21-002
Fabio Henrique de Assis, Xmobots, Brazil

03 09.50-10.15 Joint Operational Requirements for RPAS
MajGen Sergio Almeida, Ministry of Defence, Brazil

10.15-10.30 Panel discussion: Questions & Answers
10.30-11.15 Break

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04 11.15-11.40 Plans for Integration of RPAS into Brazilan Airspace
Captain Jerônimo Inácio Nunes, DECEA, Brazil

05 11.40-12.15 The European Approach & Euro RPAS Roadmap
Peter van Blyenburgh, UVS International, France

12.15-12.30 Panel discussion: Questions & Answers
12.30-14.00 Lunch

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Antonio Castro, ABIMDE, Brazil

07 14.25-14.50 Overview of the Current Technologies & Applications for RPAS
Marcelo Lopes de Oliveira e Souza, National Institute for Space Research, Brazil

08 14.50-15.15 Concept of Operation of RPAS in the Brazilian Army
Ten Cel Francisco Wellington Franco de Sousa, High Staff Brazilian Army, Brazil

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Carlo Siardi, Selex ES, Italy

10 16.55-17.20 RPAS: A Strategic Driver for the Development of the Brazilian Industry Base
Nelson Gomes da Silveira, Harpia Sistemas, Brazil

11 17.20-17.45 HEF80 VTOL RPAS: A View from the Sky with your Feet on the Ground
Jan Verhagen, HighEye, The Netherlands

17.45-18.00 Panel discussion: Questions & Answers

DAY 2 - WEDNESDAY 30 OCTOBER 2013

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12 09.00-09.25 JARUS: Activity Update
Ailton José de Oliveira Junior, ANAC, Brazil (on behalf of JARUS)

13 09.25-09.50 RPAS Airspace Integration: Israeli Case Study & Lessons Learned
Matan Orian, UASpace, Israel

14 09.50-10.15 SRVSOP's Roadmap to Regional Latin American Regulatory Framework on RPAS
Javier Puente, SRVSOP, Peru

10.15-10.30 Panel discussion: Questions & Answers
10.30-11.00 Break

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15 11.00-11.25 Development of a Multi-Purpose Portable Electric RPAS
Rodrigo Kunts Rangel, BRVANT, Brazil

16 11.25-11.50 The Center for Unmanned Aircraft Systems: Overview & Research Progress
Tim McLain, Brigham Young University, USA

17 11.50-12.15 Multi-Platform RPAS for High Voltage Power Transmission Lines Inspection
Geraldo José Adabo, ITA, Brazil

12.15-12.30 Panel discussion: Questions & Answers
12.30-14.00 Lunch

Session 7 - Light RPAS Pilot & Operator Qualification

18 14.00-14.20 Commercial RPAS Operators & Operations + Related Responsibility, Liability & Insurance
Peter van Blyenburgh, UVS International, France

19 14.20-15.00 Qualified Entity & Its Activities Relative to RPAS, Pilot & Operator Certification?
André Clot, EuroUSC, UK

20 15.00-15.45 Panel discussion - Theme: Qualified Entity Issues & Benefits
Panel Members: André Clot, Fabio Almeida, Antonio Castro, Ulf Bogdawa

15.45-16.30 Break

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21 16.30-16.55 How to Achieve DO-178C Objectives when Developing RPAS Applications Using MBD Tools?
Everaldo Simoes Gaspar, Esterel Technologies, Brazil

22 16.55-17.20 How to make Compliance to DO-178 and DO-254 easy for RPAS?
Tony Baghai, Atego Systems, USA

23 17.20-17.45 Recent Research & Development in Autonomous Flight at IAE
Major Fabio Almeida, Air Force, DCTA/IAE, Brazil

17.45-18.00 Panel discussion: Questions & Answers

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24 09.00-09.25 Sensors Onboard RPAS: What is expected for the Amazon?
Eristelma de Jesus Barbosa Silva, Ministry of Defence, CENSIPAM, Brazil

25 09.25-09.50 Using RPAS for Monitoring and Enforcement of Mineral Activities
Cristina Prando Bicho, DNPM, Brazil

26 09.50-10.15 Operational Experience & Lessons Learned
Agente Alvaro Marques, Federal Police, Brazil

10.15-10.30 Panel discussion: Questions & Answers
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Session 10 - RPAS Operations & Research

27 11.15-11.40 Use of RPAS in Environmental Disaster-Xerem-Duque de Caxias-RJ Flood Case
Benedito Maciel, Flight Technologies, Brazil

28 11.40-12.05 Possibilities and Advantages of RPAS for the Civil First Responders Market
Ulf Bogdawa, SkyDrones Tecnologia Avionica, Brazil

29 12.05-12.30 Use of Tethered Aerostats for the Surveillance of Crowded Events
Bruno Avena de Azevedo, Altave Industria, Comercio e Exportaçao de Aeronaves Ltda, Brazil

12.30-12.45 Panel discussion: Questions & Answers
12.45-13.00 Conclusion & Closing Remarks

07.30-08.30 Registration
08.30-08.40 Conference Opening by:
Luiz Alberto Cocentino Munaretto, DCA-BT, Brazil &
Peter van Blyenburgh, UVS International, France

08.40-09.00 **RPAS: A Brazilian Perspective**
Carlos Magalhães da Silveira Pellegrino, ANAC, Brazil

Bio data: Carlos Eduardo Pellegrino is the Aircraft Operations Director of ANAC – National Civil Aviation Agency – Brazil. His experience in Flight Standards and Safety comes from serving as ANAC's Operational Security Superintendent where he led several activities to enhance safety, including the preparation for ICAO USAP and FAA IASA. Since 2008, he is the vice-chairman for the Regional Aviation Safety Group – Pan-American, the ICAO body tasked to implement the Global Aviation Safety Plan in the Pan America region.
In the Brazilian Air Force he worked more than 13 years in air traffic control units, in parallel of his duties as pilot flying Transport and Fighters in different Air Force Squadrons. Pellegrino received his Masters in Aeronautical Science from the Air Force University. He also holds a Bachelor of Electrical Engineering from the Technical Aeronautics Institute, and Air Force Officer from Air Force Academy all in Brazil.

Abstract: The introduction of RPAS in the Brazilian civil aviation system is driving ANAC - Brazilian Civil Aviation Agency - efforts in regulation and certification. The roadmap of the RPAS certification will be shown and also the four main certification areas: Economic Regulation, Airworthiness, Licensing and Operations. The final goal is enhance the partnership with the industry.

Session 1 - Regulatory Activities in Brazil

01 **09.00-09.25** **ANAC: Airworthiness Rulemaking Status**
Livia Camargos Rodrigues de Oliveira, ANAC, Brazil

Bio data: Graduation in Control and Automation Engineering at Universidade Federal de Minas Gerais (UFMG) in 2007, Masters degree in Aerospace Engineering at Instituto Tecnológico da Aeronáutica (ITA) in 2010. Professional background: Embraer employee for one year (2009) in the Flight Controls team. ANAC employee since 2010 in the Airworthiness Rulemaking team. ANAC airworthiness representative at ICAO Unmanned Aircraft Systems Study Group (UASSG) since 2012.

Abstract: This presentation will show the status of the rulemaking process regarding civil Remotely-Piloted Aircraft Systems (RPAS) in Brazil. The applicable laws and existing rules and how they apply to RPAS will be presented, as well as the way ANAC is currently dealing with RPAS and the plans for the near future

02 **09.25-09.50** **Certificate of Experimental Flight Authorization of the Nauru 500A & ECHAR 20A RPAS based on ANAC IS-21-002**
Fabio Henrique de Assis, Xmobots, Brazil

Bio data: Fábio Henrique de Assis is one of the founders of XMobots Aerospace and Defense. He has a Ms in Mechatronics Engineering from the University of São Paulo, and he has been working over the last 8 years with the development of RPAS and underwater vehicles. Currently is the director of Aeronautical Certification at XMobots, and is the manager of the "Experimental Certification Program of Apoena 1000B, Nauru 500A and Echar 20A UAVs".

Abstract: XMobots is a brazilian company specialized in developing, manufacturing, maintaining and operating unmanned systems, including UAVs, AUVs, ROVs, USVs, UGVs and its subsystems such as Autopilots, Avionics, Data Terminals and Ground Control Stations. Since its first UAS developments, XMobots focused on certification. Due to the lack of regulations for UASs at that time, it was used certification standards of manned aircrafts like FAR 23 and DO178B/160F as a guidance for the development of its first UAS Apoena 1000, a tactical UAV with 8 hours of autonomy and 60 km of LOS communication range. XMobots started a CAVE process for the Apoena 1000 in 2010, with the restriction of operation in remote areas and with segregated airspace. This was the first initiative of UAS certification in Brazil. With the experience accumulated in the Apoena process, and based on new regulations from ANAC (IS21-002), Xmobots carry out the process of CAVE emission for Nauru 500A and Echar 20A UAVs restricted for operation in segregated airspace. This paper is focused to describe the main aspects of the both processes. On the other hand, after many iterations with ANAC since 2010, the Apoena 1000 revision B will have new release called revision whose the is focus is the operation in urban areas and in non segregated airspace. The focus is the development of a Certified Avionics System for UASs based on the certification standards of manned aircrafts like DO178B/160G and ARP4761/4754.

03 **09.50-10.15** **Joint Operational Requirements for RPAS**
Major General Sergio Almeida, Ministry of Defence, Brazil

Bio data: Major General Sergio Almeida graduated as a military pilot at the Brazilian Air Force Academy in 1984, and after that he performed all military graduation courses including since the air tactical course till the aerospace politic and strategic course at the Brazilian Air Force University. In addition, he concluded a specialization course in aerospace logistic management at the Fluminense Federal University. In his career he has lead important combat squadrons, such as the First Fighter Group and the 3/3 Aviation Group in Campo Grande, being its very first commander. In 2007, he commanded the Porto Velho Air Force Base and in 2009 he was assigned Brazilian Defense and Air Attaché in Italy. After this, he was assigned in the Air Force Logistics Department. In 2013, he was promoted to General and joined the Ministry of Defense one month later. The presenter has experience in fighter aircraft and has more than three thousand flying hours and despite his large operational specialization as a pilot, he managed to get an equal logistical background. Nowadays, he works at the logistic integration division of the Ministry of Defense, providing support to all military and logistical operations of the Brazilian Armed Forces.

Abstract: Joint Operational Requirements for Remoted Piloted Aircraft (RPA) pursue to put together the Brazilian Armed Forces efforts throughout conceptions, development and jointed actions about RPA use. Even though, most governments have expressed interest in the use of RPA for recognition, surveillance and attack missions, not all modern Armed Forces worldwide have already conceived their use on all those missions. Moreover, considering that RPA would force costs to be lower, monitoring border lines and providing surveillance with it seen to be a tendency, being perfectly adequated to the Brazilian territorial extension. In this way, Joint Operational Requirements for RPA are only the first step. Providing requirements to the Brazilian Armed Forces operations, according to their missions, seem to be the goal to pursue and, meawhile strategists around the world are still concerned about conceptions of RPA use, all governments managed to avoid being trapped by the consequences of its use.

10.15-10.30 Panel discussion: Questions & Answers
10.30-11.15 Break

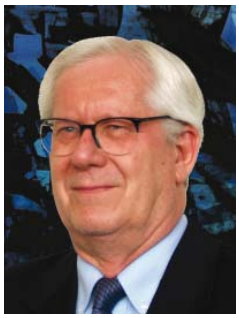
Session 2 - Regulatory Activities - Brazil & Europe

04 **11.15-11.40** **Plans for Integration of RPAS into Brazilan Airspace**
Captain Jerônimo Inácio Nunes, DECEA, Brazil

Bio data: Capt Jerônimo Inácio Nunes is DECEA's representative in the ICAO UAS Study Group and he is chief of Brasilia Area Control Center.
Professional background: air traffic controller, fighter controller (ground control intercept & AWACS), weapons allocator.
Courses followed: air traffic control, area control centre supervisor, air intercept control, air battlespace management, electronic warfare, search and rescue.
International activities: electronic warfare course in Totness, UK; Peru versus Brazil warfare exercise in Pucallpa, Peru; ATC facilities visit in Washington, DC, USA; ICAO UASSG advisor since 2010.
Flight experience: approx. 800 flight hours as fighter controller in AWACS aircraft.

Abstract: The Department of Airspace Control will present the outlining of the plans established for the integration of Remotely Piloted Aircrafts (RPA) into non-segregated airspace in Brazil. Such Integration requires from the aircraft and its pilot the capacity to identify conflicts with collaborative and non-collaborative aircrafts. The presentation will also detail the regulatory framework from the time being until the complete integration. Furthermore the concept of Remotely Piloted Aircraft System will be discussed as part of the structure that links airspace control and its exploration. In the opportunity the speaker will detail the coordination that involves joining different institutions and get benefits for all actors involved in the efforts to permit RPAS to be used through safe rules and standards.

05 **11.40-12.15** **The European Approach & Euro RPAS Roadmap**
Peter van Blyenburgh, UVS International, France



Bio data: Peter van Blyenburgh, a Dutch national residing in Paris, France, was born in The Netherlands ('48), educated in Canada, the Netherlands Antilles and The Netherlands, studied in Switzerland (Business Administration) and has held various management positions with a number of industrial and service supplying corporations in the USA, Europe and the Middle East. He has been involved with remotely piloted (unmanned) systems since 1987 and has supplied advisory services in this field to corporate and/or governmental entities in Europe, the Middle & Far East and North America. In 1995 he instigated & in 1997 founded, the European Unmanned Vehicle Systems Association (EURO UVS), which changed its name to UVS International in January 2004; he is currently in his 8th two-year term as president of this internationally operating non-profit association registered in Den Haag, The Netherlands, and which deploys its activities out of offices in Paris, France. He has instigated and/or participated in many remotely piloted aircraft systems (RPAS) related regulatory working groups and RPAS-related initiatives. He is currently a member of the EC's RPAS Steering Group, the ICAO UAS Study Group, EUROCAE WG93 on Light RPAS (Standing advisor), ULTRA Consortium, the Advisory Board of the

Belgian Royal Military Academy's European Union Projects, the Scientific & Technical Advisory Board of the EU-FP7 ICARUS Project, and honorary member of the European Group of Institutes of Navigation (EUGIN).
He is the founder and Chief Executive of Blyenburgh & Co (B&C), a company registered in Paris, France, to which the UVS International Board of Directors has contractually entrusted the association's administration, as well as the organisation of its remotely piloted systems-related conferences, symposia and workshops. He is a regular speaker at international RPAS related conferences. He is also editor & publisher of the annual RPAS yearbook (RPAS: The Global Perspective). B&C owns and maintains the world's largest open source remotely piloted systems-related web site (www.uvs-info.com) and supplies RPAS-related patent search services (www.uas-patents.org).

Abstract: This presentation will explain the problems and obstacles relevant to the integration of RPA (remotely piloted aircraft) into non-segregated airspace. It will highlight the actions taken by the European Commission and its agencies relative to RPAS (remotely piloted aircraft systems) and the resulting European RPAS Roadmap. The following topics will be covered:

a) ICAO & RPAS-related activities
b) EC's Hearing on Light RPAS
c) UVSI's Survey I on Light RPAS
d) EC's High Level Conference
e) UVSI's Petition to the EC
f) EC's UAS Panel
g) European RPAS Steering Group
h) EASA's Notice of Prior Amendment 2012-10
i) Eurocontrol's activities
j) SESAR Joint Undertaking
k) National Aviation Authorities
l) JARUS
m) EUROCAE WG93 on Light RPAS
n) International Coordination Council on RPAS
o) UVSI's Survey II on Light RPAS
p) The European RPAS Roadmap

12.15-12.30 Panel discussion: Questions & Answers
12.30-14.00 Lunch

Session 3 - Brazilian RPAS Perspective

06 **14.00-14.25** **The Regulation of RPAS in Brazil**
Antonio Castro, ABIMDE, Brazil

Bio data: Business adminstrator. Coordinator of the UV IBrazilian industries. Four years working in a avionic industry witch was making a datalink for RPA. CEO of a RPAS consultancy company.

Abstract: The Brazilian RPAS sector has a rather limited experience in dealing with the national aviation civil authorities (ANAC), but hopes to create a good & constructive relationship with ANAC in order to get a regulation for commercial RPAS flights in place within a short period of time.

07 **14.25-14.50** **Overview of the Current Technologies & Applications for RPAS**
Marcelo Lopes de Oliveira e Souza, National Institute for Space Research, Brazil

Bio data: Dr. Marcelo Lopes de Oliveira e Souza is an Engineer of Electronics by the Instituto Tecnológico de Aeronáutica-ITA, at São José dos Campos, São Paulo, Brazil in 1976. Since then, he is a Registered Professional Engineer in Brazil by the Federal Council of Engineering, Architecture and Agronomy-CONFEA, Section of São Paulo-CREA-SP. He joined the National Institute for Space Research-INPE at São José dos Campos, São Paulo, Brazil in 1977 in the first group to learn and work with satellites there. He was at the first satellite technical mission of INPE/ Brazil to learn and work at the Centre National D´Etudes Spatiales-CNES, in Toulouse, France in 1979. He is a Master in Space Sciences/Orbital Mechanics by INPE in 1980. He is a Ph.D. in Aeronautics and Astronautics by the Massachusetts Institute of Technology-MIT at Cambridge, Massachusetts, USA, in 1985. He is a Professor at the Space Engineering and Technology Course-ETE of INPE since 1985 and a Senior Researcher at the Space Mechanics and Control Division-DMC of INPE since 1991. He is a Graduate in High Studies on Politics and Strategy-CAEPE by the Brazilian Superior School of War-ESG in 1992. Since 1977 he has worked and supervised works at DMC in various aspects of Attitude & Orbit Control of Satellites-AOCS. All this led to his creation of the Laboratory of Computer Environments for the Development of Systems - LABSYSTEMS of AOCS, in 2002 to pioneer and grow such work since then. He is a senior member of societies like the MIT Alumni Association, etc.

Abstract: Since their creation, the RPAS have growing applications in civil and military activities. In this conference, we will present an overview of current technologies and applications for civil RPAS. This will include: flight dynamics, propulsion, communication, computation, guidance, control, etc. This will conclude with some perspectives on the future of new and emerging technologies and applications for civil RPAS.

08 **14.50-15.15** **Concept of Operation of RPAS in the Brazilian Army**
Ten Cel Francisco Wellington Franco de Sousa, High Staff
Brazilian Army, Brazil

Bio data: Graduation - Military Academy/Brazilian Army (1992); Jr Command - Officer Enhancement College/Brazilian Army (2000); Command and General Staff - Command and General Staff College/Brazilian Army (2008); Command and General Staff/Army French - General Staff College/French Army (2010)
Military Courses: Management Aircraft Maintenance - Instruction Center Brazilian Army Aviation (1997); Preparation and Receiving Aircraft Course - Research and Test Flight Institute/Brazilian Air Force (2001)
Civilian Education: Strategic Planning - Getúlio Vargas Foundation (2004)
Main Fuctions Performed: Chief of the Logistics Section at the Army Aviation Command; Commander Forward Support Company of Aviation Maintenance; Instructor Officer Enhancement College/Brazilian Army.

Abstract: The presentation will aim to identify the employment design of RPAS in the Brazilian Army, highlighting the priority categories, typical applications and the main challenges for the use of this weapon system in Full Spectrum Operations.

15.15-15.30 Panel discussion: Questions & Answers
15.30-16.30 Break

Session 4 - RPAS Market Issues

09 **16.30-16.55** **Selex ES Advanced Unmanned Surveillance Solutions**
Carlo Siardi, Selex ES, Italy

Bio data: Carlo Siardi is Head of UAS & Simulation Divisional Marketing in the Airborne & Space Systems Selex ES Division. Born in 1955 in Nairobi (Kenya), he obtained the Private Pilot, Commercial and IFR licenses and started his working career as Commercial Pilot for a Turin-based Corporate. In 1981 he graduated from the Polytechnic of Turin in Aeronautical Engineering and served the Military Service in the Alpine Troops. After an initial experience in a Training Robots Company, he joined Meteor CAE SpA (prior to their merge into Galileo and then Selex Galileo) in 1984, thus becoming, in succession, Head of the Aeronautical Dept., Head of System Integration Dept., Programme Manager of the Mirach 26, Mirach 150 and Mirach 100/4RAM Programmes, North America Regional Manager and Responsible of Business Development & Marketing, directly contributing to the Italian Predator and Falco Programmes, totalling almost 30 years of experience in the field of RPAS.

Abstract: The presentation highlights Selex ES strong capabilities in the unmanned domain for surveillance systems, encompassing their primeship in mission sensors, with particular reference to radars, mission mamagement systems (the novel skyISTAR), avionics, services and complete systems from the Micro RPAS to the Light MALE RPAS. Recent contracts both for systems delivery and services underline the outstanding unmanned systems reliability and performance reached by the Company which is the product of over 50 years of unmanned aerial systems design, production and operations wordwide. Due reference is made to the Falco and EVO Medium Altitude Endurance RPAS and the innovative Micro - Mini RPAS family composed by the ASIO, DRAKO and CREX systems. Civil and military RPAS airworthiness cases are also mentioned as a corner stone of Selex ES policy for next years.

10 **16.55-17.20** **RPAS: A strategic Driver for the Development of the Brazilian Industry Base**
Nelson Gomes da Silveira, Harpia Sistemas, Brazil

Bio data: MBA in Strategic Administration of Information Technology by Getulio Vargas Foundation, a famous Brazilian Think Tank, and graduated both as Data Processing Technologist by the Centro de Ensino Superior do Pará - CESUPA, and as an Aeronautics Science Bachelor by the Brazilian Air Force Academy. A former Brazilian Air Force Pilot, spent his last seven years working in the Committee of Coordination for the Combat Aircraft Program - COPAC, the Brazilian Air Force organization responsible for the development and procurement of new material and systems designed to enhance the operational capability of the Air Force. At COPAC he was assigned as the manager of several important projects such as: A-Darter 5th generation short range air-to-air missile development and certification; VANT FAB Procurement Project; HX-BR Acquisition and Development Project; MAR-1 Missile Development Project; Rohde & Schwarz Data-link Radios Acquisition Project; A-1M PODS Procurement Project.

Abstract: The purpose of the presentation is to present how the local development of a family of RPAS by Harpia Sistemas has the potential to spread innovation among the established industries that form the Brazilian Industrial Base, as well as incentive the rise of new start-ups to deal with products and solutions currently not produced in Brazil. The technologically intensive environment that surrounds all the aspects related to the development of a Remotely Piloted Aircraft System (RPAS) can prove to be an important drive factor in the cooperative research and development (R&D) of products and solutions that not only will be directly used by the RPAS industry, but will surely be used in other technologically oriented industries. Of paramount importance is the possibility of R&D be driven to the development of solutions related to signal intelligence, electronic intelligence, communications intelligence, data-links, simulators, radars, all sort of electro-optics and electro-magnetic sensors.

11 **17.20-17.45** **HEF80 VTOL RPAS: A view from the sky with your feet on the ground**
Jan Verhagen, HighEye, The Netherlands

Bio Data: Jan Verhagen, is a technical engineer with over 30 years of experience in designing and developing, building and flying medium-sized helicopters. He was Dutch champion aerobatic helicopter flying in 1996.In 1984 he started up radiocontroled flying film camera companies in Europe and USA (Flycam and Fly Motion Cam). He founded the first scholl for RC controlled helicopter pilots with official certification and licence in 1994. He has worked for the motion picture companies and commercial tv advertising bureau's.Last 12 years he has worked only with automatic controlled helciopters for inspection and use of serveral sensor equipment. He designs, builds and tests helicopters for a broad field of users all over the world.

Abstract: Examples of film work from before 2001 will be shown as well as the use of automatic flying helicopters. The several brands of helicopters and the possiblities for the several markets will be highlighted. New ways to monitor power lines with lightweight helicopters will be explained, as well as new ways to land on vessels, and sense and avoid with visual systems. The company's newest model HEF80 high level Tier1 helicopter with Tier2 possibilties for a reasenable price will be presented, along with some video about the use of special sensors.

17.45-18.00 Panel discussion: Questions & Answers

DAY 2 - WEDNESDAY 30 OCTOBER 2013

Session 5 - Regulatory Matters

12 **09.00-09.25** **JARUS: Activity Update**
Ailton José de Oliveira Junior, ANAC, Brazil (on behalf of JARUS - Joint Authorities for Rulemaking on Unmanned Systems)

Bio Data: Ailton José de Oliveira Junior graduated in Electrical Engineering - UFSC. Post-graduation in Aviation Safety and Continued Airworthiness - ITA. He is a Civil Aviation Regulation Specialist in ANAC since August 2008, working in the Electroelectronics Systems and Software Engineering Group in the Aeronautical Product Certification Branch, performing certification analysis in various Embraer, Dassault, Cessna and Airbus type designs. He has been engaged in RPAS-related activities since September 2010 and is a JARUS participant since March 2012.

Abstract: The presentation will provide an overview of the JARUS structure, current activites and foreseen next steps.

13 **09.25-09.50** **RPAS Airspace Integration: Israeli Case Study & Lessons Learned**
Matan Orian, UASpace, Israel

Bio data: Matan Orian has been centered in the last 6 plus years on working for and then consulting for the Israeli Ministry of Transportation's Civil Aviation Authority. He gained a wide breadth of knowledge as a Section Manager in the field of Aerial Infrastructure and Airspace Design. This experience, coupled with his background as Civilian and Military Air Traffic Control, and provides a formidable resource. Matan has been a key player in the process of developing an advance UAS infrastructure as well as detailed regulation and standards, used by the Israeli UAS industry as part of the Israel's CAA regulation. Matan's unique military and civil interfaces provide an excellent insight into the competing issues and complex airspace designs required in providing a safe intermodal operating system. Matan's leadership and participation in the design and formalization of procedures and regulation led to the successful deployment the various aspects of UAS operations within Tel Aviv FIR - Israel's airspace. Education: B.S., Industrial Engineering and Management, Technion - Israel Institute of Technology; Certified Aviation Incidents and Accidents Investigator, Ministry of Transport and Road Safety, Israel.

Abstract: Over the past 10 years, Israel has been developing and implementing groundbreaking procedures and regulations for the safe and efficient integration of both civil and military RPAS within the state's airspace. The combined efforts of all stakeholders has led to well defined procedures and regulations that envelops the many aspects of the RPAS integration challenge; based on rich operational experience, dedicated risk assessments and SMS processes. The current status of regulations includes detailed RPAS ATC/ATM standards, RPAS aerial and ground infrastructure, RPAS personnel licensing, airworthiness and RPAS Air Operator Certification. This established regulatory environment is recognized as the foundation of the «fertile ground» that is facilitating the growth of Israeli RPAS industry. An industry that today consists of more than 20 companies and is the largest RPAS exporter worldwide for the last 11 years. Clear regulations and ATC/ ATM procedures allow the industry to perform research and development, training of customers and to deliver services. Every day dozens of civilian RPAS sorties are being performed in Israel's FIR, by a variety of RPAS platforms. UASpace consists of top level experts with vast experience in airspace planning, air traffic control and RPAS operation. As of now they are the only group of people that contains individuals that actually developed such procedures and legislation for the State of Israel, as part of their former employment with the Civil Aviation Authority of Israel (CAAI). The main challenge of RPAS in the world in the next years is embedding the RPAS operations in the airspace safely and efficiently. The state of Israel has moved forward in the most challenging and condensed environment and our experience may help in performing such transition in other territories. The presentation will

concentrate on the characteristics of Israeli regulation of RPAS, the benefits derived, and lessons learned during their development.

14 **09.50-10.15** **SRVSOP's Roadmap to Regional Latin American Regulatory Framework on RPAS**
Javier Puente, SRVSOP, Peru

Bio data: Javier Puente holds a Post Graduated Degree on Higher Education, a Law School Diploma, and a Commercial Pilot License. Since 2012 he is the Aircraft Operations Specialist of the SRVSOP (Latin America's Regional Safety Oversight Organization) and is responsible for the coordination of several multinational programs, and for the continuous updating of Latin American Aeronautical Regulations (LAR) related to flight operations. He has over 15 years of experience in different fields of commercial aviation including Civil Aviation Authority, flight operations, flight training, regulatory development, and accident prevention & investigation. Before joining SRVOP, he served as Bolivia's CAA Regional Manager, and as advisor for airlines on safety management, regulatory compliance and training development.

Abstract: SRVSOP (Latin America's Regional Safety Oversight Organization) was conceived to operate a regional cooperation system for safety oversight in the Latin America region. During the years, it has developed all the technical, human, and administrative capabilities to fulfil the needs of its members in a wide variety of areas, including: assistance on solving deficiencies identified through USOAP audits; improvement of the operational safety levels; and regional harmonization of regulations.
One of the main SRVSOP activities is regulational development and harmonization. So far, SRVSOP states have reached an 80% level of harmonisation with the Latin American Aviation Regulations (LAR) that includes AIR, OPS, PEL and AGA regulations. Member states are committed to reach 100% harmonisation by 2017. Under this framework, based on ICAO's SARPs, the SRVSOP has an approved roadmap on RPAS regulations development that extends to 2018, and that will be part of the harmonised set of LAR's.

10.15-10.30 Panel discussion: Questions & Answers
10.30-11.00 Break

Session 6 - RPAS Related Research

15 **11.00-11.25** **Development of a Multi-Purpose Portable Electric RPAS**
Rodrigo Kunts Rangel, BRVANT, Brazil

Bio data: Rodrigo Kuntz Rangel was born in Mogi das Cruzes, Brazil. He is a DSc & MSc in Computer & Electronics Engineering. He holds a B.S. degree in Computer Engineering and has specialized in Aircraft Manufacture Engineering through the EMBRAER Engineering Specialization Program. In his research, he has studied Computer, Robotics, Lasers and Virtual Reality systems applied to Flight Simulators at the Institute for Advanced Studies (IEAv) as a São Paulo State Foundation for Research Support (FAPESP) scholar. His hobbies are the development of unmanned air vehicles, robotic systems with virtual reality, artificial intelligence, and Flight Simulators. From 2002 to 2009 he was Product Development Engineer at EMBRAER, working with the development of electronic and software systems to military and civil aircraft. Rodrigo is CEO of BRVANT - Technological Solutions, company specialized at study / development of UAV systems.

Abstract: This work describes the development of a multi-purpose portable electrical UAV system, composed of aircraft, ground station and field support equipment. This UAV can be used in applications such as tactical surveillance and power line inspection. The developed system allows the operator to remotely fly and control the aircraft from a one-man portable ground station. The aircraft is an electric small sized high wing UAV, pusher configuration, category 1. The UAV design uses a modular concept. The operator can assembly and disassembly the wing, tail and fuselage in order to store the UAV in a portable bag that can be carried by a single person. Basically the airborne system is composed of a cryptographic and telemetry system, a GPS receiver, specific electronic boards in charge of all needed system integration functions between the sensors, and by a set of gyroscopes that work in conjunction with servomotors, in order to provide aircraft stabilization and control in any atmospheric condition. The ground station is a one-man portable design, composed of a laptop computer equipped with interfaces, joysticks, virtual reality helmet and special devices which provide real time acquisition of image and telemetry data coming from the aircraft. By means of the specific software installed in the ground station, the aircraft and its associated systems can be constantly controlled and monitored. The ground station software makes real time comparisons between the aircraft actual route and its mission predefined route. In case it proves necessary, the software can command corrections onto the aircraft route and allows a complete pilot immersion into the navigation system.

16 **11.25-11.50** **The Center for Unmanned Aircraft Systems: Overview & Research Progress**
Tim McLain, Brigham Young University, USA

Bio data: Tim McLain is a professor in the Department of Mechanical Engineering at Brigham Young University (BYU) where he formerly served as department chair. He received BS and MS degrees in mechanical engineering from BYU. While completing his PhD work at Stanford University, Professor McLain worked with the Monterey Bay Aquarium Research Institute on the control of underwater robotic vehicles. He joined BYU in 1995. During the summers of 1999 and 2000,

he was a visiting scientist at the Air Force Research Laboratory where he initiated research on unmanned aircraft - an area on which he continues to focus. With Randy Beard, he is the author of the textbook Small Unmanned Aircraft: Theory and Practice published in 2012 by Princeton University Press. He is currently the director of the Center for Unmanned Aircraft Systems under the National Science Foundation Industry/University Cooperative Research Center program. Professor McLain is a senior member of IEEE, an associate fellow of AIAA, and a member of the AIAA Guidance, Navigation, and Control Technical Committee.

Abstract: In March of 2012, Brigham Young University and the University of Colorado Boulder established the Center for Unmanned Aircraft Systems (C-UAS) under the direction of the National Science Foundation (NSF) Industry/University Cooperative Research Centers (I/UCRC) Program. The objective of the I/UCRC program is to bring together university and industry researchers to collaborate on research problems of industrial significance. Under this NSF program, C-UAS seeks to work with top UAS companies and research organizations to address key technical challenges and provide superb training for future leaders in the unmanned aircraft systems industry. Under the NSF I/UCRC model, the focus is on pre-competitive research that is fundamental in nature. Industry members participate in the collective ownership and direction of a shared research portfolio where the research is driven by the ideas and needs of the Industry Advisory Board (IAB). In the case of C-UAS, our intent is to focus on significant technical problems facing the UAS industry as a whole, where successful research outcomes would provide benefits to all participating members. We seek to perform early-phase research to assist our members in identifying potentially strategic directions for their organizations.
The inaugural industry members of C-UAS include AFRL Aerospace Systems Directorate, AFRL Munitions Directorate, AAI-Textron, Boeing, Insitu, L-3 Communications, NASA Dryden Flight Research Center, National Oceanic and Atmospheric Administration, United Technologies Research Center, and Utopia Compression. We look forward to additional industry members joining us.
Research on projects is underway with students and faculty making steady progress and benefiting from regular interaction with IAB members. BYU and CU's work in the center builds on over 15 years of experience in UAS research and development. In this presentation, we will provide an overview of C-UAS and a description of the research projects performed in the center.

17 11.50-12.15 Multi-Platform RPAS for High Voltage Power Transmission Lines Inspection
Geraldo José Adabo, ITA, Brazil

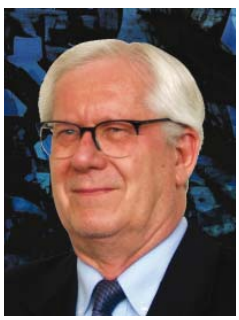
Bio data: Geraldo José Adabo received the B.Sc. degree in Electrical Engineering from the Universidade de São Paulo (USP), São Carlos, Brazil, in 1981, and the M.Sc. degree in Electronics Engineering from the Instituto de Pesquisas Espaciais (INPE), São José dos Campos, Brazil, in 1985. Since 1987, he has been a lecturer with the Division of Electronics Engineering, ITA. His current research interests are aircraft electrical systems, satellite power supply, communication circuits, rf/photonics and unmanned aircraft systems. He was the responsible for the power supply subsystem of the first Brazilian Satellite and has been the technical coordinator of UAS Project for Power Lines Inspection.

Abstract: Having one of the largest aerial power lines structures of the world with length as much as 95,000 km long, there is a large demand for aerial inspection of these structures in Brazil. In this context a R&D Project for a multi-platform unmanned aircraft system to be used for performing complete aerial inspection of overhead power lines is being executed by ITA - Instituto Tecnológico de Aeronáutica (Technological Institute of Aeronautics). Aerial inspection of electric power transmission lines is typically performed using human-piloted helicopters, which is a procedure that is both expensive and prone to accidents. This work is directed to the system conception based on a multi-platform system approach comprising fixed wing, rotary wing and lighter than air solutions. Some topics under consideration are: visible and thermal imaging subsystem constraints, long range relay-based communication subsystem and accuracy improvement of the flight plan and the guidance & control subsystem.

12.15-12.30 Panel discussion: Questions & Answers
12.30-14.00 Lunch

Session 7 - Light RPAS Pilot & Operator Qualification

18 14.00-14.20 Commercial RPAS Operators & Operations + Related Responsibility, Liability & Insurance
Peter van Blyenburgh, UVS International, France



Bio Data: Peter van Blyenburgh, a Dutch national residing in Paris, France, was born in The Netherlands ('48), educated in Canada, the Netherlands Antilles and The Netherlands, studied in Switzerland (Business Administration) and has held various management positions with a number of industrial and service supplying corporations in the USA, Europe and the Middle East. He has been involved with remotely piloted (unmanned) systems since 1987 and has supplied advisory services in this field to corporate and/or governmental entities in Europe, the Middle & Far East and North America. In 1995 he instigated & in 1997 founded, the European Unmanned Vehicle Systems Association (EURO UVS), which changed its name to UVS International in January 2004; he is currently in his 8th two-year term as president of this internationally operating non-profit association registered in Den Haag, The Netherlands, and which deploys its activities out of offices in Paris, France. He has instigated and/or participated in

many remotely piloted aircraft systems (RPAS) related regulatory working groups and RPAS-related initiatives. He is currently a member of the EC's RPAS Steering Group, the ICAO UAS Study Group, EUROCAE WG93 on Light RPAS (Standing advisor), ULTRA Consortium, the Advisory Board of the Belgian Royal Military Academy's European Union Projects, the Scientific & Technical Advisory Board of the EU-FP7 ICARUS Project, and honorary member of the European Group of Institutes of Navigation (EUGIN).
He is the founder and Chief Executive of Blyenburgh & Co (B&C), a company registered in Paris, France, to which the UVS International Board of Directors has contractually entrusted the association's administration, as well as the organisation of its remotely piloted systems-related conferences, symposia and workshops. He is a regular speaker at international RPAS related conferences. He is also editor & publisher of the annual RPAS yearbook (RPAS: The Global Perspective). B&C owns and maintains the world's largest open source remotely piloted systems-related web site (www.uvs-info.com) and supplies RPAS-related patent search services (www.uas-patents.org).

Abstract: This presentation will explain what a commercial Remote (RPAS) Pilot is and what the minimum requirement is for him to operate RPAS legally, as well as his responsibilty, the resulting liability and the influence this has on insurance.

19 **14.20-15.00** **Qualified Entity & Its activities relative to RPAS, pilot & operator certification**
André Clot, EuroUSC, UK

Bio Data: Andre J. Clot is a director of EuroUSC (Qualified Entity) with a solid background in safety critical systems. He gained his initial introduction to computing whilst at university where he also gained his Private Pilots License before joining the RAF in 1979 as a pilot. Later he moved on to a career in safety critical systems in the defence and nuclear industry. In 1988 he joined the UK CAA later becoming the first Head of Engineering Strategy within the National Air Traffic Service (NATS) as an advocate of a systems approach to Air Traffic Operations and a member of the NATS Research and Development Board. In 1998 he formed the UK UAS trade association (UAVS) and in 2003 formed EuroUSC. He is a Chartered Engineer and holds a Masters in Business Administration. He is a member of the Royal Aeronautical Society and former Chairman of its Unmanned Aircraft Systems Specialist Group. In Europe he is Vice Chairman of EUROCAE WG93 on Light Remotely Piloted Aircraft Systems (RPAS) and is the accountable manager in EuroUSC™ that overseas UAS pilot, systems and organisation accreditation for UAS operations within a national context.

Abstract: In August 2009 the United Kingdom (UK) Civil Aviation Authority (CAA) granted EuroUSC™ Qualified Entity Status under the EASA rules (EC 216/2008 Article 13 and Annex V). EC 216/2008 Article 13 allows the use of Nationally recognised Qualified Entities that conform to the same standards of independence, competence and integrity as National Aviation Authorities (NAAs) but which operate under a defined national regulatory context. The business model underlying these Qualified Entities lends itself to areas of the aviation industry that are undergoing tremendous growth and change e.g. European ATM and RPAS. Businesses normally operate on accelerated timescales compared to Governments and are therefore able to respond, innovate and provide implementation routes in timescales that are more appropriate to the challenges these fast changing areas of aviation present. This presentation provides insight into important issues related to the oversight of such Qualified Entities so that NAAs maximise their benefit. The development of standards, the accreditation of organisations and the assessment of pilots and aircraft systems needs a sound, affordable and flexible framework. In the Netherlands and the UK this is provided by a Scheme operated by EuroUSC.

20 **15.00-15.45** **Panel discussion - Theme: Qualified Entity Issues & Benefits**
Panel Members: André Clot, Fabio Almeida, Antonio Castro, Ulf Bogdawa

15.45-16.30 Break

Session 8 - Regulatory Related Matters

21 **16.30-16.55** **How to Achieve DO-178C Objectives when Developing RPAS Applications Using MBD Tools?**
Everaldo Simoes Gaspar, Esterel Technologies, Brazil

Bio Data: Everaldo Simões Gaspar graduated as Electrical Engineer in 2002 and received his Master degree in Automation and Control in 2005, both by Federal University of Itajubá. With 11 years of experience in Automation and Control, he has worked as an application engineer for companies such as GE Energy and Invensys Rail, as well as a researcher for Federal University of Itajubá and National Centre for Plasma Science & Technology - Dublin City University. He is currently the Esterel Technologies Sales and Application engineer for Latin America, supporting customers in the use of SCADE tools in their projects.

Abstract: DO-178C, International Safety Standard for Aerospace Industry, has been released in December 2011 and is now adopted by several major Certification Authorities such as EASA, FAA,... This new revision of Standard highlights in particular new techniques (Model-based, Object Oriented, Formal Methods) considered as «the State of the Art» for the Development and the Verification of Safety Critical Embedded Software. The main objective of this presentation is to show how to achieve DO-178C objectives while developing certified avionics UAV's applications with a Model-Based Solution and how to reduce time-to-certification without compromising the required level of Safety.
The following topics will be presented and discussed:

- Overview of the DO-178C context
- How to develop, verify and certify efficiently a safety critical UAV's application by using Model-Based Techniques with qualified Automatic Code Generation and Simulation capabilities

22 **16.55-17.20** **How to make compliance to DO-178 and DO-254 easy for RPAS?**
Tony Baghai, Atego Systems, USA

Bio Data: Tony Baghai is a 25+ year aerospace industry luminary with systems and software experience on over fifty aircraft and two hundred systems. With a BS in Mechanical engineering and an MS in Aeronautical Engineering, Tony had a distinguished career at Boeing Commercial Airplanes and became one of the youngest Designated Engineering Representatives (DER) ever to earn FAA certification as both a Systems and Level A Software DER. His 14 total years as a DER enabled him travel the world as an avionics certification expert, managing the certification division of the largest independent avionics services company in the world. Tony is also a co-founder of HighRely Incorporated (today part of Atego www.atego.com) and is the co-author of the only book solely devoted to DO-178/254: "Avionics Certification - A Complete Guide to DO-178B & DO-254 ". Educated in England and the United States, Tony Baghai makes his home in Scottsdale Arizona with his family.

Abstract: Increased software size and complexity for aircraft systems renders the task of certifying them significantly more challenging and costly, particularly for smaller RPAS. This presentation is aimed at clarifying many aspects of DO-178 and DO-254 compliance for RPAS developers, providing advice on how to achieve the compliance with less cost and schedule, both on new and specially on existing programs. The presentation will develop the following topics:
- Overview of DO-178 and DO-254 and increased efficiency in compliance
- Why the traditional approach to compliance to DO-178/DO-254 may not work in RPAS programs
- The issues with compliance to DO-178 and DO-254 for RPAS developers
- Software/Complex Electronic HW compliance in RPAS systems - using DO-178 and DO-254
The targeted audience are RPAS Development and Test Engineers, Managers, and Support (Quality, CM, Compliance).

23 **17.20-17.45** **Recent Research & Development in Autonomous Flight at IAE**
Major Fabio Almeida, Air Force, DCTA/IAE, Brazil

Bio Data: Major Fabio Almeida was born in São Paulo - Brasil. He is an Aeronautical Engineer - ITA, a Fixed-wing Flight Test Engineer - CTA, and a Doctor in Engineering - Technical University of Braunschweig, Germany.
He has worked for more than 10 years in Flight Test of civilian and military aircraft and systems. He has published one book. The main topics of research: control of constrained systems and autonomous flight.
He is an AIAA Senior Member, Brazilian Delegate at IFAR - International Forum of Aviation Research.
Major Almeida is currently is Chief of Aeronautical Systems Division (IAE) and Professor at ITA.

Abstract: Automation of tasks during process execution and equipment operation is an important characteristic of industrial societies, moving the human operator to the higher levels of strategic planning. This is particularly important in aviation, where the usage of the airspace is becoming more intense, with growing number of passengers and cargo, besides an increased number of new missions with economic and military potential. This presentation shows recent R&D activities at IAE related with automation of flight, particularly the automation of take-off and landing, collision avoidance and on-flight learning of stability and performance characteristics.

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Session 9 - RPAS Operations

24 **09.00-09.25** **Sensors Onboard RPAS: What is expected for the Amazon?**
Eristelma de Jesus Barbosa Silva, Ministry of Defence, CENSIPAM, Brazil

Bio Data: Eristelma T. de Jesus Barbosa Silva is a geographer and consultant in the field of Remote Sensing. She holds a Master's degree in Geology, focused on GIS / Remote Sensing for environmental analysis and currently conducts research focused on identifying clandestine airfields in the Amazon through radar SAR data to obtain a doctorate's degree.Works since 2006 at Operations and Management Center of the Amazonian Protection System (CENSIPAM), Department of Intelligence, managing projects in Image Intelligence / Spatial Geointelligence to identify and monitor illegal activities in the Amazon Region through orbital and airborne sensors. Also worked as a consultant in Remote Sensing for the Interamerican Institute for Cooperation and Agriculture (IICA), and participated in many research projects with the Brazilian Agricultural Research Corporation (EMPRAPA), involving the usage of remote sensing / GIS to support agriculture.

Abstract: The growing number of initiatives involving RPAS in Brazil, even in the absence of specific regulations related to the operation of these systems demonstrates the great expectation of the private sector and government, civil and military, about the possibility of systematic and operational use of the aircraft for various applications. More specifically, given

the characteristics of difficult access and high cost of monitoring the use and occupation of land in the Amazon region, there is a real expectation that the use of RPAS in this region will offer several advantages for government institutions working in the region, especially those with legal powers to combat illegal activities. However, you must carefully evaluate which categories of RPAS fit this scenario, considering the peculiar climatic characteristics of the region, as well as which sensors can be effective in combating the illegal activities of deforestation, mining, drug trafficking, etc. and supporting actions related to mapping and land titling. In this context, we intend to demonstrate in this paper how multiespectral and hyperspectral optical sensors, radar and electro optical sensors are currently used by SIPAM (Amazon Protection System) for the monitoring of the Amazon and what improvements can be expected with the use of RPAS and their sensors within each specific activity. The main goal is to provide companies with RPAS-related activities, especially those preparing for the provision of services, an overview of the survey requirements in SIPAM, which are encompassed all the needs of government institutions that operate in the Amazon and are partners in the system.

25 **09.25-09.50** **Using RPAS for monitoring and enforcement of mineral activities**
Cristina Prando Bicho, DNPM, Brazil

Bio Data: Cristina P. Bicho is a geologist at the Direction Inspection of the National Department of Mineral Production (DNPM). She holds a BA in Geology (UNESP, Rio Claro); and a Masters Degree in Metalogenesis and Geochemistry, focusing on Remote Sensing, at UNICAMP; she also has a MBA in Business Strategy - Getúlio Vargas (FGV). During 13 years worked at Mining Companies with remote sensing, data integration and interpretation. She also was an employee at DeBeers and Rio Tinto, and worked as a consultant in various mining companies, such as AngloGold, Vale, Odebrecht, among others. She worked as a consultant for Threetek, with focus on the representation of Radarsat images and in the developing of projects using radar. She is currently coordinating the VANT project at DNPM.

Abstract: This presentation shows the results of DNPM UAV Project, a partnership between UNB and DNPM to develop a UAV for use in monitoring and enforcement of irregular mineral activities. High degree of informality, inherent to these activities, makes it difficult to get reliable data about production aspects and location area. Use of UAVs offers the possibility to acquire high temporal resolution data at very high spatial resolution, helping to solve these problems. In addition, UAV has low-cost operation and maintenance, and can be used to acquire data even in areas difficult to access or that present a risk to inspection activities. Equipment developed by UNB fits into micro UAVs category and the main features are:1,90 meters wingspan; 1 kg payload; total weight of 2.5 kg; and 90 minutes autonomy. Results exceeded initial expectations, particularly regarding to high quality, high resolution and accuracy of aerial photographs and data processing facility, based on automated methods. The main restrictions to our UAVs operation are the reduced range (4km) and inability to fly with rain and strong wind. Despite these limitations, advantages of using UAVs for mining inspection are incontestable and DNPM will incorporate the technology in their routine.

26 **09.50-10.15** **Operational Experience & Lessons Learned**
Agente Alvaro Marques, Federal Police, Brazil

Bio Data: O Agente de Polícia Federal Alvaro Marques conta com cerca de 17 anos de experiência policial, notadamente nas áreas de inteligência e combate ao tráfico de drogas, tendo trabalhado em diversas operações de inteligência policial. É formado em Direito pela Universidade Paulista e Pós-graduado em Ciência Policial e Inteligência, pela Academia Nacional de Polícia. Possui Lincença de Piloto Comercial com habilitação de voo por instrumentos. É certificado como piloto de Veículo Aéreo Não Tripulado, da Aeronave Heron-I, pela Empresa IAI - Israel Aerospace Industries. Aeronaves voadas: T-25, T-27, C-208c Gran Caravan e Heron-I (Aeroanve Remotamente Tripulada). Atualmente, é o Gerente do Sistema do Veiculos Aeros não Tripulados do Departamento de Policia Federal, e.o. substituto do Chefe da Divisião de Inteligéncia Policial, do Centro Integrado de Inteligéncia Policial e Analise de Estrategica do DPF.

Abstract: O Departamento de Polícia Federal tem a atribuição Constitucional do controle de fronteiras, no que diz respeito à imigração, combate ao tráfico de drogas e crimes transfronteiriços. Tais atribuições tomam um vulto gigantesco quando observamos que o Brasil é um país de dimensões continentais. Sob esse prisma, e aliado ao fato do crescimento da criminalidade organizada, o Departamento de Polícia Federal passou a investir nas áreas de inteligência e a adquirir equipamentos de ponta para apoiar suas atividades. Assim sendo, o uso de VANTS voltados para as atividades de inteligência policial e combate à criminalidade organizada transfronteiriça, torna-se hoje uma realidade e cria expectativas de emprego dessa ferramenta.

10.15-10.30 Panel discussion: Questions & Answers
10.30-11.15 Break

27 **11.15-11.40** **Use of RPAS in Environmental Disaster-Xerem-Duque de Caxias-RJ Flood Case**
Benedito Maciel, Flight Technologies, Brazil

Bio Data: Undergraduate in Mechanical Engineering by University of São Paulo in 1998. Master degree in Electric Engineering by University of São Paulo in 2001. Doctor degree in Aeronautical and Mechanical Engineering by Technological Institute of Engineering in 2008. Nowadays is co-founder and technology director of Flight Technologies. Experience in Control System Engineering, working mainly with the following topics: modeling and simulation of dynamic systems, design and analysis of control systems, parameter identification.

Abstract: Serving a request for support made by the Department of Civil Defense and Brazilian Army in Rio de Janeiro, the brazilian company Flight Technologies provided the RPAS Horus 100 with its operational staff in order to increase the situational awareness on the occurrence of an environmental disaster, with flooding of urban roads and declaration of state of emergency due to rain in Xerem-Duque de Caxias-RJ region. Among the objectives of the mission were: aerial survey of the affected areas and information gathering of bridges and river bed. For the realization of the referred mission, which was of military nature, was obtained authorization from the Department of Airspace Control with issuing of a «NOTAM» for operation in segregated airspace.

28 **11.40-12.05** **Possibilities and advantages of RPAS for the Civil First Responders Market**
Ulf Bogdawa, SkyDrones Tecnologia Avionica Ltda, Brazil

Bio Data: PUC RS, 1988/2 Mechanical Engineer, MBA in Business Management Unisinos, 2010, Amateur Sailer, Private Pilot License, Commercial Director (founder) NBN Automation Industrial Ltda. (1986 - 2011), CEO (founder) SkyDrones Tecnologia Aviônica Ltda, Proposer for Rules to enable Civil work or RPAs in Brazil (2012).

Abstract: Small or Micro RPAS for First Response use include application for everything from traffic accident investigation, police use, forensics, search and rescue, tactical operations, emergency and disaster response, crowd control, HAZMAT/CBRNE management, fire investigation and damage assessment and fire management. These are all vital public safety matters that RPAS, made for the domestic civilian market, are well suited to handle. Cities, towns and municipalities facing strained budgets and smaller resources may more easily be able to afford these systems than traditional more expensive first response equipment and personnel. Consequently, for some local governments, RPAS will be able give these end-users a substantial cost savings and be able to act as important force multipliers.

29 **12.05-12.30** **Use of Tethered Aerostats for the Surveillance of Crowded Events**
Bruno Avena de Azevedo, Altave Industria, Comercio e Exportaçao de Aeronaves Ltda, Brazil

Bio Data: Bruno has an Aeronautical Engineer degree from the Brazilian Technology Institute of Aeronautics - ITA, MSc from the French Aeronautics and Space Superior Institute - ISAE with Master Thesis Research conducted at NASA Jet Propulsion Laboratory, California Institute of Technology. He is director and co-founder at ALTAVE where he coordinates two Brazilian in-company research grants from the Government under Lighter-than-Air subjects, mostly in aerostat multiple uses. Bruno currently works for his PhD at ITA on Flight Mechanics of Lighter-Than-Air Vehicles.

Abstract: The current unprecedented concentration of events in Brazil and the growing use of RPAS recently came into collision. On one hand the RPAS offer the advantages of lowering costs and human pilot risks to tasks such as law enforcement and intelligence data during big events. On the other hand the use RPAS are often accused to cause problems to the air space control and safety of the event participants. Even with certification fully implemented the idea of various unmanned vehicles flying over people is still frightening, and this is true even for the helicopters today in use. Often flying below the regulated 500 ft and over public and stadiums, a failure in the engine may lead to the worst consequences. Helicopters also have the disadvantage of high noise and high cost of fuel, maintenance and pilot. The aim of this presentation is to show the advantages in the use of an ALTAVE HORIZONTE tethered aerostat system for surveillance of crowded events, focusing on the recent use in the final match of the Confederations Cup held in June 2013 in Rio de Janeiro. This propulsion-less unmanned lighter-than-air aircraft, moored to the ground through a special cable, is able to stay aloft for multiple days with no fuel and a fixed amount of lifting gas, and is also capable of being operated by crew with non-complex training. They are a very safe and cost-effective way of performing surveillance missions often let to wing and rotor aircraft. Also, regulation by the Air Force permits its use with almost no restriction below 100 m. As has been shown through experiment results performed by ALTAVE in partnership with DCTA the consequences of fire weapon shots in the aerostat are much lower than one could imagine. Other safety considerations and regulation issues are also addressed.

12.30-12.45 Panel discussion: Questions & Answers
12.45-13.00 Conclusion & Conference Closing Remarks