Event Guide

29 – 30 April 2015
Zadar | Croatia
17 April 2015

Dear Delegates,

On behalf of the National Protection and Rescue Directorate, I wish to extend my warmest welcome to all participants of the Aerial Fire Fighting conference & exhibition held in Zadar, Croatia, at the Športski Centar Višnjik.

The Aerial Fire Fighting conference & exhibition has been designed as an opportunity for international aerial fire fighting experts to network and learn about the latest solutions in technology, safety, training, operations and the development of an inter-operability strategy.

I am personally delighted to see key delegations from the world’s Aerial Firefighting community participating in this conference & exhibition. Your presence will certainly provide an opportunity for all of us to update ourselves with what the contemporary and future technologies could offer. The National Protection and Rescue Directorate, along with all our partners in this sector, endeavour to achieve the highest state of preparedness by constantly upgrading and modernizing our assets.

I sincerely hope that all of you will benefit from the conference & exhibition and that we will all make the most of this opportunity to discuss issues and identity solutions available to address common concerns and challenges that we are experiencing.

I take this opportunity to thank the eminent speakers and exhibitors for all their contributions. Distinguished participants, I hope that your stay in Croatia will be beneficial and a memorable experience.

Thank you and best wishes to all.
Conference Presentations

The 2015 AFF Conference Presentations will be available online from 11 May. An email with download instructions will be sent to your registered email address. Please ensure Tangent Link have all your relevant contact details.

Previous AFF Conference Presentations from our international series are also available to download. Please enquire with any of the on-site event delivery team.

Conference Registration

The registration desk can be found outside Halls 1 and 2 of the Športski Centar Višnjik. Registration will open from 0830 on 29 April and from 0800 on 30 April. All attendees must wear their badges at all times.

Conference Dinner & Drinks Reception

The 2015 AFF Drinks Reception will be taking place within the exhibition hall at the Športski Centar Višnjik from 1730 — 1900 on 29 April 2015.

Following this, all AFF attendees are cordially invited to attend the DynCorp sponsored Conference Dinner which is taking place on 29 April 2015 from 1930 — 2200. The Dinner will be taking place at the Arsenal, Zadar. Complimentary return transfer services are available to collect from outside the Športski Centar Višnjik returning guests to Hotel Kolovare, Hotel Donat and Hotel Club Funimation Borik.

Dress Code

The dress code for the event is business suit or if applicable, uniform which helps to promote networking and service recognition amongst delegates.

Feedback

Feedback questionnaires will be distributed on 30 April, please complete this form with your feedback and hand back to the registration desk.

Photography and Video Recording

Photography and video recording are not permitted within the conference room without prior consent. If you wish to take photos in the exhibition then please contact the relevant stand representatives.

Refreshments

Early morning, mid-morning, lunch and afternoon refreshments will be provided at the event. All refreshments will be served in the exhibition area.

Static Display & Aerial Demonstrations

The Static Display and Aerial Demonstrations will be taking place from 0900 — 1100 on 30 April 2015 at the Zadar Air Base. All attendees must report to the Športski Centar Višnjik at 0800 to collect the complimentary transport service to the Demonstrations. Attendees will be returned to the conference venue at approximately 1100.

All attendees must present the on-site event delivery team with a copy of their passport / ID prior to the demonstrations.

Transportation

Complimentary return transfer services will be available to collect from our recommended hotels. At the end of day, the same transfer service will return all attendees. The collection times are as follows:

29 April — 30 April 2015
Hotel Donat & Club Funimation Borik: 0800
Hotel Kolovare: 0815

On-site Event Delivery Team

If you have any queries during the event, please do not hesitate to contact any of the Tangent Link team on the details below:

Lauran Allen, Operations Manager
T: +44 7515 502 049

Sophie Spence, Operations Manager
T: +44 7718 107 768
### Wednesday, 29 April 2015

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<tr>
<th>Time</th>
<th>Session</th>
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<tr>
<td>0830 - 0915</td>
<td>Registration &amp; Coffee</td>
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</table>
| 0915 - 0930 | **Chairman’s Introduction**  
Rear Admiral Terry Loughran CB FRAeS, Royal Navy, UK |
| 0930 - 0950 | **Keynote Address**  
Dr. Sc. Mr. Jadran Perinić, Director General, National Protection & Rescue Directorate (DUŽS), Croatia |
| 0950 - 1015 | **Towards a Coordinated Approach in International Aerial Firefighting Missions: Results of the Interoperability Workshop**  
Prof. Dr. Johann Georg Goldammer, Director, Global Fire Monitoring Center (GFMC), Germany |
| 1015 - 1045 | **Out-of-Area Aerial Firefighting Operations**  
Major Davor Turković, Firefighting Squadron Commander & CL 415 Pilot, Croatian Air Force, Croatia |
| 1045 - 1115 | Refreshment Break & Networking                                                             |
| 1115 - 1145 | **Role & Perspectives of the EU Civil Protection Mechanism in Aerial Firefighting**  
Dimitrios Pagidas, Policy Officer – SNE, European Commission/ECHO, Belgium |
| 1145 - 1205 | **Operating the World’s Largest CL-415 Fleet In & out of the Italian Borders: the Model of Inaer’s Mission Critical Services**  
Major General (Ret.) Antonio Urbano, CL-415 Captain & Deputy General Director, Inaer Aviation Italia – Fixed Wing Division, Italy |
| 1205 - 1235 | **The Legacy & Challenges of Aerial Fighting Wild Fires in Bosnia & Herzegovina involving Land Mines**  
Dr. Sc. Samir Huseinbasic, Head of Department for Structure & Training, Protection & Rescue Sector, Ministry of Security, Bosnia and Herzegovina (BiH) |
| 1235 - 1400 | Buffet Lunch & Networking                                                                  |
| 1400 - 1430 | **Helicopter Firefighting Operations**  
Elsa Enriquez Alcalde, Head of the Spanish Forest Fire Service, Ministry of Agriculture, Food & Environment, Spain |
| 1430 - 1450 | **Next Generation Fire Fighting Airtankers**  
Wayne Coulson - on behalf of DynCorp International, CEO, Coulson Aviation, Canada |
| 1450 - 1520 | **Ground to Air Firefighting Management**  
Prof. Nikola Nikolov PhD, Director, Regional Fire Monitoring Center (RFMC), Republic of Macedonia |
| 1520 - 1545 | Refreshment Break & Networking                                                             |
| 1545 - 1615 | **Development of Aerial Firefighting in Lebanon & the Impact of Conflict Refugees on Wildfire**  
Sawsan Bou Fakhreddine, Director General, Association for Forests, Development & Conservation (AFDC), Lebanon |
| 1615 - 1640 | **Key Factors to Success in Fire Fighting**  
Hugo Arceo, Sales Manager, Air Tractor Europe, S.L., Spain |
| 1640 - 1710 | **Communications Management**  
Captain Francisco Javier Chico Chamón, Pilot, Spanish Air Force, Spain |
| 1710 - 1730 | **Question & Answer Session**                                                               |
| 1730 | **Chairman’s Closing Remarks**                                                             |
| 1730 | Conference Dinner sponsored by DynCorp International  
including the presentation of The Walt Darran International Aerial Firefighting Award |

*Speaker subject to final approval  
N.B. It may be necessary to change the speakers, topics & timings of the programme for reasons beyond our control. We cannot be held liable for these changes should they occur.*
THURSDAY, 30 April 2015

0800 – 0900  Registration & Coffee

0900 - 1100  Dynamic display:
- CL 415, CI 215T, AT 802 and Mi 8
- Live fire demonstration
- Local Firefighters demonstrating at scene deployment (heli transport and rope disembarkation)

Static Display to include:
- AT 802F Fireboss double seater
- Bombardier CL 415
- Mi 8 helicopter with firefighting bucket
- Pilatus PC 9 trainer
- Bell 206 Jet Ranger

1100 – 1130  Refreshment Break & Networking

1130 – 1135  Chairman’s Opening Remarks
Rear Admiral Terry Loughran CB FRAeS, Royal Navy, UK

1135 – 1205  French Doctrine, Perspective & Current Issues in Aerial Firefighting
Victor Devouge, Head of Aerial Division, Ministry of Interior / Sécurité Civile, France

1205 – 1235  Development of Aerial Fire Fighting Technologies in the Republic of Mari El, Russia
Johann Georg Goldammer, Director, Global Fire Monitoring Center (GFMC), Germany

1235 – 1305  Wildfires in a Jungle Environment
Faizal Izani bin Azizan, Fire Senior Superintendent, Malaysian Fire & Rescue Department, Malaysia

1305 – 1415  Buffet Lunch & Networking

1415 – 1445  Flight Simulation Tests Guidance & Advisory System for the Firefighting Amphibian
Takeshi Ito, Director, Japan Aerospace Exploration Agency (JAXA), Japan

1445 – 1515  Development of Pre-determined Dispatch (PDD) of aircraft in response to the Victorian Bushfire Royal Commission (VBRC)
Wayne Rigg, Operations Officer - CFA Aviation Officer, Victoria County Fire Authority, Australia

1515 – 1545  Refreshment Break & Networking

1545 – 1605  Heads Up Display for Fixed & Rotary Wing Applications
Henrik Näslund, Marketing Executive, Avionics Systems, Saab AB, Sweden

1605 – 1635  Romanian C-27J Spartan Firefighting Capability
Major Florin Ianculescu, Instructor Pilot C-27J Spartan, 90th Airbase, Romanian Air Force, Romania

1635 – 1650  Question & Answer Session

1650  Chairman’s Closing Remarks
DynCorp International is a leading global services provider offering unique, tailored solutions for an ever-changing world. Built on more than six decades of experience as a trusted partner to commercial, government and military customers, DI provides sophisticated aviation, logistics, training, intelligence and operational solutions wherever we are needed. DynCorp International is headquartered in McLean, Va.
Air Tractor Europe, with the support of its sister company Avialsa T-35, with 50 years in Business and over 200,000 hours flown on forest fires and agricultural Operations, handles sales and after sale support to all Air Tractor clients in the east side of the Atlantic, from North Europe to Ecuatorial Guineee and from Portugal to Saudi Arabia.

Air Tractor Europe is proud to have helped create fire fighting aviation units in different countries, starting from “0” background in Aviation to putting his clients with enough skills to procect wildlife.

Our experience is our best presentation card.
Inaer Aviation Italia is the leading mission critical services company providing Air Medical Services, Oil and Gas Transportation, Firefighting and Supporting Services.

Our mission is to provide the highest level of safety while delivering measurable benefits to customers, our employees, our investors and the communities we serve.

Inaer’s legal and business headquarter is based in Milan and the main operational bases are located in Colico (LC), closed to Como Lake, and Rome Ciampino Airport, where daily operations are conducted in conjunction with over 40 bases nationwide and abroad.

We have invested greatly to ensure that our operations are comprised of the finest professionals, processes, technology and aircraft in the industry and the highly skilled staff of pilots and maintenance technicians gives the company great depth in all areas of operation.

Inaer Aviation Italia has been certified by the Civil Aviation Authority with the most comprehensive authorizations and certifications to operate the entire fleet of 45 helicopters and 19 Canadair, to provide pilots and technical training and maintenance services.
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- Saab’s B-share listed on NASDAQ OMX

AT THE FOREFRONT OF CHANGE

- 1941 First B17 delivered
- 1955 Draken first flight
- 1961 Viggen introduced
- 1979 First RBS 15 ordered
- 1990 First laser simulator BT 46
- 1993 First Gripen delivered
- 2002 First contract NLAW
- 2005 Neuron contract
- 2006 Saab 2000 A&EW
- 2008 First flight Gripen Demo
- 2011 RBS 70 NG launch
- 2014 Carl-Gustaf M4 launch
EXHIBITOR LISTING

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IAR is proud to provide firefighting organizations with the premier heavy air tanker solution, the Lockheed C-130 Hercules equipped with the RADS tank system. This combination of a proven platform and an advanced firefighting system provides our customers with the best solution for future aerial firefighting needs.

<table>
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<tr>
<th>C-130 Aerial Firefighting Aircraft</th>
<th>RADS Aerial Firefighting System</th>
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</thead>
<tbody>
<tr>
<td>Upgraded Rockwell Collins avionics package</td>
<td>3,000 gallon constant-flow retardant tank</td>
</tr>
<tr>
<td>Dual moving map displays</td>
<td>Coverage levels from 0.5 to greater than 8.0</td>
</tr>
<tr>
<td>Traffic Collision Avoidance System (TCAS)</td>
<td>SATLOC guidance system recording:</td>
</tr>
<tr>
<td>ADS-B capability to meet future ATC requirements</td>
<td>• Aircraft flight path</td>
</tr>
<tr>
<td>Color weather radar</td>
<td>• Drop location, date, and time</td>
</tr>
<tr>
<td>Satellite communications (voice and text)</td>
<td>External camera system records drop effectiveness</td>
</tr>
<tr>
<td>Real-time flight following system</td>
<td>Easily removed for cargo bay reconfiguration</td>
</tr>
</tbody>
</table>

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**Versatility** – Able to operate from more airfields than any other heavy air tanker thanks to a very light-weight “footprint”. Proven multi-role capabilities include: transport of oversized cargo and vehicles, long-range patrol, airdrop of equipment and personnel, and PCADS deployment.

**Future Growth and Fleet Sustainment**
The sheer number of Hercules being operated around the world means superior global supportability. Our large fleet of RADS-equipped C-130s provides our customers with unmatched reliability and emergency response capacity.

<table>
<thead>
<tr>
<th>IAR Fleet Statistics</th>
<th>Global Sustainability</th>
</tr>
</thead>
<tbody>
<tr>
<td>10 C-130 aircraft currently owned by IAR</td>
<td>Operated by 70 nations and 8 commercial operators</td>
</tr>
<tr>
<td>The lowest-time Hercules fleet available today</td>
<td>Over 2,400 C-130 aircraft produced to date</td>
</tr>
<tr>
<td>Average airframe time: 15,000 hours</td>
<td>Large supply of available OEM &amp; PMA spare parts</td>
</tr>
<tr>
<td>Average wing time: 3,500 hours</td>
<td>Numerous worldwide Hercules repair facilities</td>
</tr>
<tr>
<td>Large inventory of company-owned spare parts ensures uninterrupted operations through 2030</td>
<td>Company-owned Part 145 repair station provides around-the-clock fleet support</td>
</tr>
</tbody>
</table>

For more information:
International Air Response
6250 S. Taxiway Circle
Mesa, Arizona USA 85212
Tel: 1-480-840-9860  www.internationalairresponse.com
Rear Admiral Terry Loughran CB FRAeS
Royal Navy | UK

Rear Admiral Terry Loughran CB FRAeS

Terry Loughran served as a helicopter pilot in the Fleet Air Arm of the Royal Navy and commanded a variety of ships including the Aircraft Carrier HMS Ark Royal. In his final appointment as Flag Officer Naval Aviation he was responsible for the maintenance and operation of the Sea Harrier and Helicopter forces and the training and welfare of their personnel. He is a Fellow of the Royal Aeronautical Society and has been closely involved with the Alliance designing the new large carriers, the CVF. He is resident Chairman for Tangent Link and under the banner of his own company Sabrage Enterprises, he also acts as a Facilitator, Defence Consultant and After Dinner Speaker.
Mr Jadran Perinić was born in Zadar on 22 April 1959 where he completed his elementary and high school education (Machine and Electrical Engineering High School). Upon completing the military service in 1981 he joined the staff of the Fire Protection Center and re-trained for the post of firefighting technician.

Jadran Perinić graduated from the School of Humanities and Social Sciences in Zadar and attended postgraduate information studies from 2007-2011. He received his Master’s Degree in social sciences, in the field of information studies, branch communication studies, with his thesis entitled “Internal Business Communication at the Example of the Sojara d.d. Soy Plant in Zadar”.

He pursued the same field and branch of studies to fulfill all doctoral dissertation requirements in 2008 and the Zagreb School of Humanities and Social Sciences awarded him a PhD in 2010 for the dissertation entitled “Public Opinion as a Subjective Feature of a Crisis Situation – The Impact of Media and Public Relations Services on Public Opinion”.

Jadran has been employed with the Professional Firefighting Unit of the City of Zadar since 1981 where his tasks also included commanding of a fire station. Without interruptions in this position he spent two years as a part-time associate at the Department of Mass Communication of the University of Dubrovnik (academic years of 2008/2009 and 2009/2010) lecturing in Business Communication within the Public Relations Undergraduate Program.

During the Homeland War, as a firefighting unit member, he was mobilized into civil protection units where he remained as a member of the same unit within the Ministry of the Interior from 1 April 1994 to 1 January 2000. He was awarded the Homeland War Memorial Medal and the ‘Storm’ War Operation Medal.

He speaks English and German. He has been registered as scientist with the Ministry of Science, Education and Sports under number 293801.


Since 2007 he has focused on media theory, public relations and public communication in emergencies and crisis situations in general. He has on occasion delivered lectures at schools of journalism and public relations in Zagreb, Dubrovnik and Novi Sad. In addition he has been participating in domestic and foreign scientific and professional gatherings, as well as publishing scientific papers and reports in renowned, mostly international, magazines.

He is married and has two children.
Prof. Dr. Johann Georg Goldammer | Director
Global Fire Monitoring Center (GFMC) | Germany

Johann Georg Goldammer is Director of the Global Fire Monitoring Center (GFMC). The GFMC is a contribution of Germany to the United Nations International Strategy for Disaster Reduction (UNISDR). At Freiburg University he is serving as professor for fire ecology. Since 2005 the GFMC is an Associate Institute of the United Nations University (UNU). Johann Goldammer is also serving as coordinator the UNISDR Wildland Fire Advisory Group and the UNISDR Global Wildland Fire Network. After the phasing out of the UNECE-FAO Team of Specialists on Forest Fire, which he led between 1993 and 2014, he is now working with the Organization for Security and Cooperation in Europe (OSCE) in enhancing fire management capabilities in several OSCE Participating States, notably through the Environment and Security (ENVSEC) Initiative. He is working closely with the a number of specialized UN agencies and programmes, such as FAO and Joint UNEP-OCHA Joint Environment Unit, Emergency Services Branch, and is member of the Steering Committee of the Advisory Group on Environmental Emergencies (AGEE). The GFMC is serving as Secretariat of the International Fire Aviation Working Group (IFAWG), which has developed the International Fire Aviation Guidelines and the International Manual of Common Rules for Fire Aviation.

Since 2014, the GFMC is acting as Founding and Interim Secretariat of the International Wildfire Preparedness Mechanism (IWPM), a non-financial instrument serving as a broker / facilitator between national and international agencies, programmes and projects to exchange expertise and build capacities in wildland fire management and particularly in enhancing preparedness to large wildfire emergency situations.

The GFMC provides a global portal and clearing house for wildland fire documentation, information and monitoring and is publicly accessible through the internet. Besides a comprehensive repository of wildland fire data, reports and “grey literature”, regularly updated national and global wildland fire information is generated and reported by a worldwide network of cooperating institutions.

Some of the GFMC’s tools and products include:

- National fire management policies
- Long-term strategies for wildland fire management
- Community-based fire management approaches
- Voluntary guidelines and competency standards for fire management personnel
- Advanced wildland fire management training.

GFMC has signed interface procedures or MoUs and / or is implementing joint activities with a number of UN agencies and UN-led activities, and other international organizations. For the preparedness and response to wildland fire emergencies the GFMC provides an emergency hotline and liaison capabilities to provide rapid assessment, decision support and follow-up under a cooperation agreement with OCHA’s Emergency Services Branch.
Major Davor Turković

Davor Turković, born 25.08. 1975 in Zagreb, Croatia.

Rank: Major

Position: Commander of the Croatian Air Force Firefighting squadron

Previous position: Platoon commander in CAF FF sq

Occupation: Pilot, Bombardier CL 415 flight instructor and test pilot, Air Tractor flight instructor and test pilot

Experience: 1500 flight hours in Aerial Firefighting Missions

Education:

- Command and Staff College, CDA, Zagreb, 2014.
- Faculty of Transport and Traffic Engineering, Aeronautical engineer, Zagreb, 1999.

Out-of-Area Aerial Firefighting Operations

Republic of Croatia has a total area of 56 594 square kilometers and about 40% of its territory is endangered by wild fires. This endangered territory is mainly coastal region and islands.

Croatia has formidable aerial firefighting force consisting of 6 Bombardier CL 415 and 6 Air Tractors AT 802 (4 of them in amphibious configuration), and MI 8 helicopters (usually two are used). This is allowing Croatia to send humanitarian aid, if domestic situation permits.

Being a NATO and EU member, Croatia is participating in different kinds of international deployments, aerial firefighting being just one of them.

Since 2007, Croatia deployed 9 humanitarian missions of this kind, ranged from Portugal to Israel. Most common deployment through this period was to Bosnia and Herzegovina (3 times).

Interoperability with ground and aerial means during these deployments was of a different variety. This is normal since some of the countries receiving help are NATO members and CL 415 operators, so interoperability level there was very high.

Best type of assistance in the neighboring countries is deployment from home bases (without landing at the territory of the state receiving help). This way impact on local resources is minimized. But this type of operation requires good preparation of deploying force, in advance. Making of Knowledge Bank and Manual of Common Rules is there for top priority.

Out-of-Area Aerial Firefighting Operations
Dimitrios Pagidas

After completing his B.Sc. in Forestry (1997) in Greece, Mr Pagidas proceeded with postgraduate studies in Environmental Management and Sustainable Development at M.Sc and Ph.D (2003) level in the UK.

Upon completion, Dimitrios worked within an academic institution in Greece as lecturer at the fields of Environmental Management and Environmental Legislation.

After three years as lecturer, in 2007, Mr Pagidas joined the Greek National Civil Protection Authority (GSCP) and as policy officer he was following the developments in European Civil Protection Mechanism (HNS, Modules) and NATO civil emergency planning group. At the same, he participated to various EU funded projects on preparedness, prevention and disaster response (e.g. FIRE5, ACR5, RRC7, CIVPRO (Interreg)).

Since March 2012, Dimitrios is seconded, as national expert, at the European Commission - DG ECHO (Humanitarian Aid and Civil Protection). He works as a shift leader at the Emergency Response Coordination Centre (ERCC) and he is the focal point for the files of forest fires related emergencies (preparedness, prevention, and response) and the European Emergency Response Capacities at the Emergency Response Unit.

**Role & Perspectives of the EU Civil Protection Mechanism in Aerial Firefighting**

The main role of the EU Mechanism for Civil Protection is to facilitate co-operation in civil protection assistance interventions in the event of major emergencies which may require urgent response actions. It is therefore a tool that enhances community co-operation in civil protection matters. The EU Civil Protection legislation was revised at the end of 2013 to better respond to the natural and man-made disasters in a swift, pre-planned and effective manner and thus to increase the security of EU citizens and disaster victims worldwide.

When national capacities are overwhelmed, a predictable and reliable system at European level can save lives and optimise financial resources. A well-coordinated response prevents duplication of efforts and ensures that the assistance meets the real needs of the affected region. However, the primary responsibility for disaster management remains with the Member States.

The revised legislation creates a European Emergency Response Capacity, moving from the current ad hoc arrangement to a more predictable and reliable system that allows for better planning. A voluntary pool of response capacities will be established and available for immediate deployment as part of a collective European intervention. The Member States are asked to voluntarily commit to the pool core resources for standby following a certification procedure. The voluntary pool will enable a faster and more coherent disaster response. It will also allow for better coordinated disaster response planning at European level and in all Member States.

The operational hub of the Mechanism is the Emergency Response Coordination Centre (ERCC) which monitors emergencies around the globe 24/7, and coordinates the response of the participating countries in case of a crisis. Thanks to its pre-positioned and self-sufficient civil protection modules, the teams are ready to intervene at short notice both within and outside the EU. They undertake specialised tasks such as search and rescue, aerial forest fire fighting, advanced medical posts and more.

During the forest and wild fires season, the ERCC is constantly monitoring the forest fire risk and incidence across Europe using national monitoring services and tools such EFFIS (the European Forest Fire Information System). In addition, over the summer period and in order to facilitate coordination, the ERCC organises weekly video conferences with the countries that are at high risk of forest fires and whose national capacities could get overwhelmed.
Major General (Ret.) Antonio Urbano | CL-415 Captain & Deputy General Director
Inaer Aviation Italia – Fixed Wing Division | Italy

Major General (Ret.) Antonio Urbano

Antonio Urbano was born in Bergamo, Northern Italy, sixty years ago.

Antonio is currently Deputy General Director for the Fixed Wing Division at Inaer Aviation Italia, a private company part of the Babcock International Group, and conducts the operations of Italy’s CL-415 State fleet, which belongs to the National Fire Corps.

Until 2005, Antonio served in the Italian Air Force as a “combat ready” fighter pilot and Flag Officer. During his career, which ended with the rank of Major General, he held important positions, mainly in the field of Operations, Training and Foreign Relations. As Commanding Officer of the Italian Tornado detachment he took part in the Operations “Desert Shield” and “Desert Storm” in 1990-91, for which he was awarded the “Italian Military Order”, currently the highest military decoration. He also served as an Air Force Attaché for the Italian Embassy in Abu Dhabi and Commanding Officer of the “Fighter-Bomber” Air Division.

Since 2005, Antonio has been flying the Italian CL-415’s as a Water Bomber Captain, having held for five years the position of Flight Operation Post Holder. In that position he had the opportunity to direct on-field several missions with detachment abroad, in response to the request of the governments of Greece, Russia, Libya, Lebanon, Albania and several other nations affected by wildfires.

Antonio currently holds the position of Deputy General Director, but still maintains the currency as a CL-415 captain and instructor, with a total of about 5000 flight hours.

Operating the World’s Largest CL-415 Fleet in & out of the Italian Borders: the Model of Inaer’s Mission Critical Services

INAER, part of Babcock International Group (Mission Critical Services), is a leading provider of aerial emergency services and aircraft maintenance for mission critical operations such as medical emergency services, civil protection, sea and mountain search & rescue, coast and fishing surveillance, fire fighting, aerial works, training and aircraft maintenance.

Babcock Mission Critical Services operates a fleet of approximately 350 aircraft throughout Australia, Cyprus, Finland, France, Ireland, Italy, Norway, Portugal, Spain, Sweden and the United Kingdom.

The presentation portraits the activities of Inaer Aviation Italia’s Fixed Wing Division, which is the operator for the State’s firefighting fleet, nineteen specially equipped CL-415’s, which represent the World’s largest fleet for this aircraft type, belonging to the National Fire Corps. With a 32-year background on Bombardier’s amphibious aircraft, Italy has often deployed its aircraft abroad, within the Mediterranean basin and even beyond. Almost 100 CL-415 pilots, 200 technicians, EASA certifications, DOA/POA authorisations, technical & flight training organisations make what is possibly the largest and most knowledgeable reality in the water scooping field of the aerial firefighting industry.

This long and well proven expertise can be shared with other Worldwide governmental agencies and firefighting organizations, from the basic training needs up to turn-key solutions.
The Legacy & Challenges of Aerial Fighting Wild Fires in Bosnia & Herzegovina involving Land Mines

Bosnia and Herzegovina has a very complex organization of State and its constitutional territorial – administrative units are very likely a unique sample in modern history of Constitutional Law, other branches of law and extremely robust public administration. The Dayton Peace Accord brought so necessary peace to Bosnia and Herzegovina in 1995, but left organization of the State that can hardly function (with some typical examples for such qualification).

Legislation is also presented to show relevant laws, by-laws, policies and strategies, programmes, policies and plans.

Anyhow, this title has to take into consideration the prism of different aspects which enable or hinders functioning of different segments of National Security System, involving here the area of the theme in reference.

Therefore, this Paper brings closer on the first place in Introductory organization of the Bosnia and Herzegovina, identifies risks, and then, organisation of the Protection and Rescue System that is organised on 4 layers (bottom – up, from municipality to the State).

Following developing background, explained above, legislation an organisation of the Protection and Rescue system including firefighting capacities (including here elements from Aerial Fighting Fires’ Feasibility Study, land mine situation in BiH and Military Assistance to Civilian Authorities – MACA), the Paper envisages, some images, facts and figures from previous fires in BiH – local and transboundary ones (with neighbours).

The Presentation concludes the theme with bullet itemized Challenges and perspectives (Ways Ahead) of Aerial firefighting in Bosnia and Herzegovina (containing strong cross border cooperation dimension).
HELI OPTER FIREFIGHTING OPERATIONS

Elsa Enriquez Alcalde | Head of the Spanish Forest Fire Service
Ministry of Agriculture, Food & Environment | Spain

Elsa Enriquez Alcalde

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Education: Forest Engineer (Forestry College, Polytechnic University, Madrid). Main subject: Sylviculture

Work Experience:

- From March 2005 to nowadays: Spanish Forest fire Service (from 2012: Head of the department) (Civil servant at the Directorate General of Rural Development and Forest Policy, Ministry of Agriculture, Food and Environment).

- From March 2003 to March 2005: Section Head of the Forest Health Service (Civil servant at the Directorate General for Biodiversity, Ministry of Environment)

- From July 2002 to February 2003: Civil Servant Training at the Ministry of Environment

- From February 2000 to February 2002 Company: TRAGSATEC (Tecnologías y Servicios Agrarios, S.A.) Position: Forest engineer; Forest FIRE Department


Helicopter Firefighting Operations

Introduction to fire fighting system in Spain: regional and state level.

Number and type of helicopters used in Spain: regional and state level.

- Main functions
- Technical aspects
- Tracing system

Operational system of state helitack crews. Real fire example.

Fire fighting aerial accidents in Spain (2011-2014).
Wayne Coulson - on behalf of DynCorp International  
CEO | Coulson Aviation | Canada

Wayne Coulson

Wayne began his career in Forestry 37 years ago and expanded the family business to include Aviation in 1984.

Over the past 31 years, Coulson Aviation has flown in excess of 120,000 safe flight hours on the Sikorsky S-61 Commercial fleet receiving honors from General Electric and Sikorsky aircraft in recognition of the safest and highest utilized fleet worldwide.

The company purchased its first C-130 Hercules in 2012 and has converted the aircraft into the only civilian FAA certified firefighting aircraft with a Coulson XXL 4000 USG SMART tanking system and in 2013 received a USFS Next Generation Contract.

The C-130 has completed 2 fire seasons with the USFS and spent this past winter in Australia with the Federal Government firefighting agency NAFC based out of Victoria State.
Prof. Nikola Nikolov PhD  |  Director  
Regional Fire Monitoring Center (RFMC)  |  Republic of Macedonia

Nikola Nikolov, of Macedonia, is a Full Professor on the Faculty of Forestry in Skopje where he also founded and is leading the Regional Fire Monitoring Center (RFMC). He is an expert in the field of forest protection especially forest fire protection. During his almost 25 years domestic and international activity he had an opportunity to experience and analyze local, regional and international specifics in terms of forest fires. Nikola has been part of several international wildland fire missions (e.g., Armenia, Azerbaijan, Georgia and Serbia) under the mandates of different international organizations (OSCE, UNDP, OCHA).

Nikola has served, as an international expert in forest fires, in many projects for strengthening of the national capacities for forest fire protection. As a result of that he is very active in frame of different organizations and bodies: Deputy Leader of the UNECE/FAO Team of Specialists on Forest Fire (since 2009), Coordinator of the UN-ISDR Regional South East European/Caucasus Wildland Fire Network (since 2005), Member of the UN-ISDR Wildland Fire Advisory Group (since 2006), Member of the International Council of the International Union of Forestry Research Organizations (IUFRO ) (since 2002) and President of Fire Protection Union of Macedonia (since 2009). Also, he is member of the International editorial board of the Croatian international journal “Fire Fighting and Management” (since 2011).

Because of all of this, Nikola has a significant international role for improvement and strengthening of the forest fire protection in terms of prevention and preparedness. Some of the activities of the Regional Network and the Regional Fire Monitoring Center include the support of the development of national fire management policies (e.g., Armenia and Azerbaijan), regional fire management training (Turkey), and national and regional firefighting exercises (Armenia, Bulgaria) for enhancing cross-border dialogue and cooperation efficiency in fire management.

As a result of all of this he was winner of the Green Star award for 2013 (award of the Green Cross International (GCI), the UN Office for the Coordination of Humanitarian Affairs (OCHA) and the United Nations Environment Programme (UNEP).

Ground to Air Firefighting Management

Before the 2010 year for forest fire suppression Macedonia has engaged their own helicopters (from the army and police forces) and airplanes from foreign countries (as international assistance). In the last five years, with procurement of the three aircraft AT-802A Fire Boss in the 2010 year, Macedonia has developed its own system of aerial forest fire fighting.

Many of the deficiencies which were detected in the first couple of years are solved but some of them still exist. One of them is un-harmonized acting of the aerial and ground forces during fire suppression. There are no official tactics and procedures for this or common training for aerial and ground staff.

Very often, beside others, this is one of the reasons for the low efficiency of the aircraft and ground forces although they are engaged in sufficient number and capacity. It’s also happening during international aerial assistance. There is need for harmonization of the procedures and tactics during joint (aerial and ground forces) forest fire suppression but proper training programs and materials, as well.
Sawsan Bou Fakhreddine has been active in the environmental domain since 1997 and currently works as the Director General of the Association for Forests, Development and Conservation (AFDC) — a national organization specialized in forest and forest fire management issues functioning in collaboration with different concerned public authorities and local communities. She worked in close cooperation with the President of the Council of Ministers Bureau since 2007 to develop Lebanon’s National Strategy for Forest Fire Fighting that was approved by the Lebanese Government in May 2009.

Sawsan has acted since 2007 as a liaison between international funding agencies working in Lebanon and various stakeholders in fire management and control. She is a technical consultant in issues related to forest and forest fire management and outreach with different public administrations.

Since 2010, Sawsan has been working as the Chief Technical Advisor to UNDP Disasters Risk Reduction Unit at the Prime Minister’s Office to develop Lebanon’s National Disasters Response Plan in addition to local and sectoral response plans. In addition, in 2014 she’s been providing technical assistance to the Minister of Agriculture in forestry issues.

Development of Aerial Firefighting in Lebanon & the Impact of Conflict Refugees on Wildfire

The presentation includes a background and three major points.

**Background:** includes a brief about the Association for Forests, Development and Conservation (AFDC), general information about Lebanon topography and forest cover and major threats facing forests namely forest fires.

**Firefighting system in Lebanon:** includes a brief about Lebanon’s National Strategy of Forest Fire Fighting and the roles and responsibilities of various stakeholders (government, NGOs and private sector).

**Aerial firefighting in Lebanon:** includes facts and figures about Aerial firefighting in Lebanon, stakeholders involved in addition to the challenges at different levels.

**Syrian Crisis on Lebanon:** As the Syrian crisis imposing a lot of pressure on Lebanon’s social, economic, and environmental levels, this point includes facts & figures about the Syrian Refugees in Lebanon according to the available statistics, the impact of influx of population on natural resources namely on forest fires.
Hugo Arceo has a degree in Marketing and Business Administration and Master in Business Administration and International Trade.

Hugo started his working life inside a family company hot air balloon operator, with passenger rides and publicity.

He then became Sales Manager at Air Tractor Europe, closing nearly 150 MM US$ worth of aircraft sales and services in the last 10 years.

Key Factors to Success in Fire Fighting

Keys to success in fire fighting Operations, excellence in Service. Case study of a 50 year old aerial operator.

Experience, technology, training and the use of flying simulators and fire retardant chemicals.
Captain Francisco Javier Chico Chamón

Captain Francisco Javier Chico Chamón joined the Air Force in 2002 and finished the Academy in 2007 as a Transport Pilot.

Captain Francisco’s unit is the 43rd Group and has been since Captain Francisco left the Academy.

Captain Francisco has 1200 hours of Canadair and 700 as Pilot in Command.

International missions: Portugal 2010 and Israel 2010.

Communications Management

Communications are essential in a firefighting mission.

Safety and efficiency relies in a proper communications management.

Safety for ground and airborne personnel
We have to take in account that we drop six tons of water at 120 knots, which is very dangerous for ground personnel, air assets must be aware if there are people in the drop zone in order to drop at a higher altitude or cancel the drop if necessary. Ground personnel must know when and where, air assets are going to drop in order to leave the zone.

Safety for airborne personnel
A firefighting mission is totally different from an standard air operation, there are many assets in a small zone performing risky maneuvers. Coordination is a MUST.

Efficiency
Clear communications and clear references. Firefighting mission director must be aware that the references are different seen from the ground than from the air.

Three actors

1. The air traffic controller (ATC). Firefighting aircrafts do not need a flight plan, the ATC does it, and they also give priority to our aircrafts and coordinates the flight outside the fire area.

2. The coordination agent. Could be in the ground, usually is the firefighting mission director, orders where to drop the water and gives authorization to drop the water. Could also be airborne, in this case is the liaison between the air assets and the firefighting mission director. If the are many aerial assets an airborne coordination person is essential. He flies in a helicopter or a small aircraft 1000 feet above the firefighting assets.

3. Air assets. Two types, Rotary wing (helicopters), and fix wing (aircraft).

Procedures

Short and clear communications, the radio frequency has to be free, the more the better.

In Spain, there are some autonomous regions, with different languages, for flight safety Spanish is mandatory. If there are assets from different countries English is mandatory

43 Group operates with two radio frequencies, one is the firefighting mission frequency and the other is to speak between our aircrafts. This is very useful in order to not saturate the firefighting mission frequency.

We call 5 minutes before the fire zone. If there are two or more aircrafts of our unit, we work as a formation, so only the first aircraft communicates, except when the last aircraft has dropped, that says free zone. The coordinator tells us where to drop, and gives us authorization, then we drop.

Situational awareness is necessary, we have to pay attention to every communication, and know where are the other aerial assets and what are they doing.
Victor Devouge
Victor Devouge is head of the Aerial Division of the French Sécurité Civile, which oversees maintenance and operations for planes and helicopters dedicated to forest fire fighting and search and rescue missions in France.

Victor is an alumnus of the French Ecole Nationale d’Administration and previously served in the French Ministry of Interior as prefectorial head of cabinet, coordinating security forces and security policies, and as a seconded national expert in Brussels at the European External Action Service, where he followed transatlantic developments in the Justice and Home Affairs area.

French Doctrine, Perspective & Current Issues in Aerial Firefighting

France has a formalised, well-established and multi-pronged forest fire-fighting strategy that includes prevention, rapid containment, damage control, and rehabilitation of forests. Within this framework, the use of planes and helicopters has been formalised into a specific scheme based on targeted aerial patrol, rapid containment at early stages, and mutual reinforcement between aerial and ground forces.

While this approach remains valid, France is at a turning point in the management of its fleet, which will be partially renewed in the coming years and moved to a new base in 2017.

In view of evolving technological advances, new challenges and questions arise, such as the use of live images for observation of forest fires and operational coordination, the rise of drones and their possible applications, the need for aircraft geolocation, new possibilities to pool and share capacities at the European level.
Johann Georg Goldammer is Director of the Global Fire Monitoring Center (GFMC). The GFMC is a contribution of Germany to the United Nations International Strategy for Disaster Reduction (UNISDR). At Freiburg University he is serving as professor for fire ecology. Since 2005 the GFMC is an Associate Institute of the United Nations University (UNU). Johann Goldammer is also serving as coordinator the UNISDR Wildland Fire Advisory Group and the UNISDR Global Wildland Fire Network. After the phasing out of the UNECE-FAO Team of Specialists on Forest Fire, which he led between 1993 and 2014, he is now working with the Organization for Security and Cooperation in Europe (OSCE) in enhancing fire management capabilities in several OSCE Participating States, notably through the Environment and Security (ENVSEC) Initiative. He is working closely with the a number of specialized UN agencies and programmes, such as FAO and Joint UNEP-OCHA Joint Environment Unit, Emergency Services Branch, and is member of the Steering Committee of the Advisory Group on Environmental Emergencies (AGEE). The GFMC is serving as Secretariat of the International Fire Aviation Working Group (IFAWG), which has developed the International Fire Aviation Guidelines and the International Manual of Common Rules for Fire Aviation.

Since 2014 the GFMC is acting as Founding and Interim Secretariat of the International Wildfire Preparedness Mechanism (IWPM), a non-financial instrument serving as a broker / facilitator between national and international agencies, programmes and projects to exchange expertise and build capacities in wildland fire management and particularly in enhancing preparedness to large wildfire emergency situations.

Forests are one of the most important among all natural systems of the Russian Federation and represent an important genetic resource of flora and fauna. Wildfires constitute the most important disturbance factor affecting protected (managed) forests and other lands, e.g. natural peatlands, natural pastures and agricultural lands, and may result in high economic and environmental damages. The average area of Russia’s protected forests annually affected by fires is about 2 million hectares (ha). In 2014 the area burned was over 3.5 million ha. The Republic of Mari El, located in the European part on the left bank of Volga River, is one of the regions of Russia with high natural forest fire risk. The dominant type of forest stands in the Republic are pine forest (Pinus sylvestris) ecosystems that are characterized by high natural fire risk. Half of the forest territory is determined as “Aerial Fire Management Zone”, since there is limited access for ground forces. In 2010 472 fires burned 74,900 ha in the forests of Mari El of which 32 large fires (by definition: fires >200 ha) affected 70,200 ha. These are dramatic losses for a region that has a total forest area of 1.2 million ha.

However, there are sufficient natural water resources in the forests (lakes, rivers and ponds) that can be used for aerial firefighting operations.

Recent evaluation reveals that during the extreme fire season of 2010 sufficient technical resources were available to respond to wildfire emergencies, including aerial assets of the Regional Forest Ministry, the Ministry for Emergency Situation and the Armed Forces that were equipped with helibuckets. The problem was that during long term dry period the water level of most rivers and lakes came down to less than 1 m depth. For filling helibuckets it is required to have a minimum depth of 1.5 m. Thus it took about 20-30 min flight time for helicopters from deepest points of a few large lakes and Volga River to attack the fires, thus firefighters did not have the needed aerial support in time.

Continued..
That issue initiated further development of helibucket that could be filled with water from natural water resources with a minimum depth of 0.3 m. Experts of Avialesookhrana jointly with helibucket constructors developed the VSU-5A system with a mobile pump attached at the lowest hard ring of the helibucket. If required the attached device pumps water into the helibucket instead of scooping. In addition Avialesookhrana together with local forest authorities and the Watershed Management Department of the local Government analysed natural water sources and developed a map displaying these resources for water uptake by helibucket and airtanker Be 200 scooping. The digital map of water sources supports pilots to reduce the flight time between natural water resources to any wildfire location in the Republic to a maximum of 3 minutes, allowing them to engage the helibucket VSU-5A most efficiently. The map is particularly useful and an essential support tool for those aircraft crews coming in from different regions and agencies during wildfires emergency situations in the frame of inter-regional support and who are not familiar with the region.

Avialesookhrana together with the St Petersburg Forestry Research Institute studied the brand-new technology provided be the Federal Center “Soyuz”, a helicontainer attached to the helicopter by cable. The helicontainers are available with capacities ranging from 1,500 to 7,000 litres, thus adjustable to the payload limitations of the different helicopter types involved in aerial fire suppression. The helicontainer pumps pressurized foam and/or water on fires by remote control from the helicopter cockpit. The unhooked helicontainer can be used also separately from the helicopter by fire fighters on the ground and feed hose lines.

The helicontainer may also be used by firefighters for personal protection and survival during critical situations. For instance if ground firefighters are trapped by the fire without having an escape route, the container may be used to establish a safe site by wetting, direct water attack or backfiring from a wet line. Additional flight and deployment experiments are planned to develop the operational guidelines for the use of the helicontainer attached to the helicopter (optimal speed, altitude, pressure, etc.) and for its use on the ground.

The most recent technology tested in the region is the use of fire-resistant screens for fireline building by helirappellers and smokejumpers in the areas with limited water resources and natural fire breaks. The screen is 0.5 m high and 100 m long, has light metal sticks every three meters to place it vertically to the ground ahead of an approaching firefront in a safe distance. The fire screen for 97% consists of Silicium and can withstand temperatures of up to 1500°C for short time of extreme heat exposure and for longer times of heat exposure in the range of average temperatures of surface fires of around 900°C. Field experiments in the Republic of Mari El showed that fire front could be stopped after reaching the screenline even if the flame length reached nearly 3 meters. The screen is packed in containers and delivered to fire sites by helicopters and/or paracargo as required by aerial fire fighters (helirappellers / smokejumpers).
Faizal Izani bin Azizan

Currently holding the appointment of Chief of Operation for Air Unit FRD Bertam, Flight Operation Manager for AW139 and also as an Aircraft Commander of AW139 helicopter. Faizal joined the Malaysia Fire And Rescue Department (MFRD) in December 2004 with a Degree in Building Science. Faizal underwent training as an officer cadet for 1 year in Fire and Rescue Academy Malaysia (FRAM) in Wakaf Tapai, Terengganu and graduate by December 2005.

Faizal’s first appointment was as a Superintendent in MFRD and was posted at Air Unit Subang. Faizal was the candidate for pilot training and was selected during the cadet training in FRAM. Being attached at Air Unit MFRD Subang as a training pilot candidate, Faizal learnt a lot of things from the senior and experienced pilot before himself. Faizal started to undergo the pilot training in July 2006 and graduated as a pilot by April 2008 with 150 flight hours. During the flight training, Faizal has flown 50 hours on fix wing aircraft Eagle 150B and 100 hours on helicopter EC 120.

After completed his training, Faizal started to fly as a co-pilot of Mi-17 helicopter since June 2008. By April 2009, Faizal was the operational co-pilot of Mi-17 helicopter. Faizal has been involved in many kinds of operation such as search and rescue, medical evacuation, flood relief and also forest firefighting. It has given Faizal a lot of experiences to fly with this helicopter.

During Faizal’s time with Mi-17 helicopter, he was involved in forest firefighting using the water bucket technique to help extinguish the fires. Faizal also contributed towards the operation by transferring the ground firefighters and equipment from outside of operation area into nearby the operation area. It has been a challenging operation since most of the forest burning in Malaysia involves mainly a smouldering combustion and ground fire. The fire can remain until two feet under the ground and can always start the flame if it does not really extinguish.

By January 2010, Faizal’s organization planned to buy two AW139 helicopters. This helicopter is more sophisticated to compare with Mi-17 helicopter in terms of the flight display management. Faizal had been selected as the pilot that who went for type rating training in Agusta Training Facility in Sesto Calende, Italy. Before the training started, Faizal had taken the opportunity to fly with Agusta A109e for 20 flying hours from January to February 2010 to familiarise himself with the aircraft system.

In June 2010, Faizal started to fly with AW139 helicopters. During that time also, Faizal was appointed as a Training Officer at Air Unit FRD Subang. All the training that involves helicopter and the special team of Air Unit is under Faizal’s responsibilities.

By 2012, Faizal was appointed as Chief of Operation at Air Unit FRD Subang and as the Flight Operation Manager of AW139 Helicopter. The responsibilities are to control all of the operation of Air Unit FRD and mainly regarding the air operation. MFRD has opened a new air base in Bertam, Penang in 2013 that will cover the operation of the northern region of Peninsular Malaysia and Faizal has been appointed to control the air operation of this new base as a Chief of Operation until now. As a Chief Of Operation, Flight Operation Manager and as an Aircraft Commander as well, Faizal has learnt a lot of experiences and is still willing to learn new things that come ahead of his life.

Continued..
Faizal Izani bin Azizan | Fire Senior Superintendent
Malaysian Fire & Rescue Department | Malaysia

Continued...

Wildfires in a Jungle Environment

Malaysia’s ecology is mega diverse, with a biodiversity range of flora and fauna found in various ecoregions throughout the country. Tropical rainforests encompass between 59% to 70% of Malaysia's total land area, of which 11.6% is pristine. Malaysia has the world’s fifth largest mangrove area, which totals over a half a million hectares (over 1.2 million acres).

In the last three decades however, large tracts of forestlands have been planted to monoculture crops. Some 1.65 million hectares of rubber and 2.62 million hectares oil palm have been established, posing higher fire risks than the natural forests. Also logging activities in the natural forests produce a lot of waste, thereby increasing flammable material and the opening of canopies reduces the water retention capacity of the forests, which thus become more susceptible to fire. In human settlements located close to forests, where land is cleared through burning for agriculture, fire breaks out often into the natural forests.

The causes of wildfires can be divided into two categories - natural and human. Wildfires are not like the other hazards, unlike earthquakes/volcanoes/storms, people can cause wildfires. Experts have suggested that 90% of wildfires are actually caused by people.

Natural causes of wildfires can be caused by lightning or spontaneous heating which can start wildfires. Wildfires are more common on south-facing slopes because the sun dries out the vegetation. Steep slopes also help fires to spread as the flames hit the upslope vegetation. There are many human causes of wildfires including arson-deliberate fire-starting, or because the human poor sensitivity towards the nature.

The effects of wildfires can be classified using either the primary/secondary categories or the social/economic/environmental classification. Primary effects of wildfires such as loss of life and injury to people and animals who are caught in the flames. Destruction of property and possessions. Burning of vegetation and crops.

Different fires are fought differently, but the big idea is usually the same that is to deprive the fire of its fuel and let it go out by itself. Bomba Malaysia try to achieve in many ways such as fire lines or firebreaks, firing out, aircrafts water dumping, using technology and the firemen itself.

The aim of fire suppression is to minimise impacts from unwanted bushfire. Fire suppression resources include ground personnel, incident management teams and technology (hand tools, ground transport, heavy equipment and aircraft). Ground personnel are the essential ingredient with technology offering options to increase their suppression capacity. The factors influencing the effectiveness of aerial fire fighting include fire intensity, fuel characteristics, fire perimeter, aircraft specification and productivity. Aerial firefighting is most effectively used in conjunction with ground-based efforts, as aircraft are only one weapon in the firefighting arsenal.

Meanwhile now Bomba Malaysia is having four helicopters equipped with water buckets and ready for wildfires operations. We have been fighting the forest fires in Malaysia since 1997. Currently we are planning to buy two more helicopters which tentatively will be arriving by 2017. Ever since the form of Malaysian Maritime Enforcement Agency (MMEA) and the CL-415 amphibians that ready to serve the country, Bomba and MMEA has coordinated joint aerial operation during forest fire fighting.
Takeshi Ito | Director
Japan Aerospace Exploration Agency (JAXA) | Japan

Takeshi Ito

Takeshi ITO graduated from Department of Aeronautics in the Faculty of Engineering of Nagoya University in 1988, and received the Degree of Doctor of Engineering by presenting a thesis from the Graduate School of Nagoya University in 1997. He entered to National Aerospace Laboratory (NAL) in Japan as a researcher in 1989, and became senior researcher in 1998. He stayed in school of Aeronautics and Astronautics Purdue university as a visiting scholar from 1998 to 1999.

In 2003, NAL was integrated with ISAS and NASDA to JAXA, and he experienced Manager on Low speed wind tunnels of Wind tunnel technology center from that year, and conducted wind tunnel test of water-dropping and the subsequent flight simulator test of fire-fighting amphibian. His present position is Director of Aerodynamic Research Group from 2014, and continues to manage the research of fire-fighting amphibian in JAXA.

Flight Simulation Tests Guidance & Advisory System for the Firefighting Amphibian

In Japan, the large STOL amphibian designed by ShinMaywa Industries, Ltd. will be able to conduct much safer fire-fighting mission by using its capacity of large mass of water and ability of low speed flying. For efficient firefighting operation by using this kind of amphibian, JAXA, ShinMaywa and JADC had conducted cooperative work of evaluation research of fire-fighting mission, and advanced system to enhance pilot awareness and operations. In this presentation, evaluations of fire-fighting operation for the new amphibian by using flight simulator in JAXA are presented through development of cockpit display system and application of support instruments by using Head-Down Display (HDD) and Helmet-Mounted Display (HMD).

FireFighting simulation for amphibian

In fire-fighting operation, water-dropping phenomena were very complicated and unknown. In our research, the phenomena was investigated using wind tunnel tests when water is dropped from the airplane and a large amount of water splits up into fine particles and spreads in all directions.

The model of spreading pattern by using CFD calculation was made and it was validated by the wind tunnel tests. Then, actual spreading patterns from full-scale airplane were able to be predicted with the CFD along some flight velocity and altitude. These patterns are used to construct water-dropping model for fire-fighting flight in the flight simulator.

Flight profile of fire-fighting operation

To evaluate the mission concept and to search for problems by pilot comment, we chose mountain area near the lake to demonstrate the forest fire and scoop the water at the lake. Mission scenarios of the fire-fighting operation were the scooping of water at the lake and the water-dropping to the fire on the gentle or steep slope. Various flight conditions were investigated such as water-dropping altitude from 100 to 500 ft, velocity from 70 to 110 knts, and also some cross wind conditions. Efficient water dropping methods were evaluated through the simulation of those missions and conditions.

Cockpit display system using HDD and HMD

Cockpit systems for pilot assistance were applied to support the water-dropping operation. Location of fire, which had been determined by other pointing instruments, was displayed on HDD and HMD. The favorable approach path to the fire, the predicted water-spreading pattern, and other guidance, were also indicated. Moreover, tunnel display was shown on the HMD to help accurate flight path to the fire. Those display methods were evaluated by pilots in the flight simulator.

Evaluation results in Flight simulator

Evaluations of simulated flight were conducted by five pilots, in which two pilots had experience of amphibian flight. All pilots did not have any experience of fire-fighting operations. Some pilots were able to conduct effective and safe operation for fire-fighting using HMD system. This information was useful for efficient development of the aid system. These data and pilot comments are very important for future improvement of the system and research of pilot-interface for the fire-fighting missions.
Wayne Rigg | Operations Officer - CFA Aviation Officer
Victoria County Fire Authority | Australia

Wayne Rigg

Operations Officer Wayne Rigg is the CFA Aviation Officer responsible for the strategic and operational planning and delivery of the aviation program for CFA in Victoria working closely with the DELWP Aviation Services Unit.

Victoria contracts 46 State Fleet Aircraft during the bushfire season with up to 150 additional aircraft available on a call when needed basis.

Operations Officer Rigg is accredited as an Air Operations Manager, Air Attack Supervisor, Air Observer and one of five State Aircraft Coordinators for the State of Victoria.

Operations Officer Rigg is the CFA lead on the implementation of PDD and will speak on the success of PDD process during the 12/13 fire season and the rollout into 10 locations across Victoria for the 14/15 fire season and the challenges faced in changing systems, ideas and opinions within a deeply imbedded aviation culture.

Development of Pre-determined Dispatch (PDD) of aircraft in response to the Victorian Bushfire Royal Commission

Recommendation 20:–

- Establish a system that enables the dispatch of aircraft to fires in high-risk areas without requiring a request from an Incident Controller or the State Duty Officer.

A team was established and trial objectives set:–

- Rapid initial attack.
- Have processes in place that utilise aircraft in a safe, efficient and cost effective manner.
- Collect trial data that enables determination of trial outcome.

A number of operational gains were identified during the trial:–

- The deployment of the aircraft via pager resulted in rapid initial attack of fires and did not have to rely on ground crews arriving on scene and undertaking a size up before requesting aircraft.
- Within suppressible limits, fire size and duration were significantly reduced, with a large reduction in cost, damage and committed resources.
- Immediate intelligence from the Air Attack Supervisor to the fire ground enabled faster and more accurate decisions. This assisted with the issuing of community warnings and decisions around resource requirements.

The average dispatch time from pilot notification to aircraft airborne was 8.4 minutes, compared to an average of 34 minutes via conventional methods.

Since the successful 2012/13 trial PDD was expanded to 5 locations throughout Victoria in 13/14 and is in the process of being expanded into 10 locations for the 14/15 bushfire season.

PDD has shown that traditional methods of dispatching aircraft can be improved, however a range of issues need to be addressed when changing deeply embedded systems and cultures.

Regardless of the benefits resistance remains within some ranks and changing attitudes and demonstrating the benefits of rapid deployment of aircraft in support of ground crews continues to be a challenge.

Demonstrating the cost benefit analysis by investing in aircraft early in the fire require further in depth research and modelling to demonstrate what the use of aircraft in support of ground crews saved rather than what they cost.
Henrik Näslund is the head of Saab Avionics Heads Up Displays capture team. In this role he has spent the last couple of years spreading the word about the merits and advantages of flying with the help of Heads Up Systems. Not being a pilot himself he has been able to perform in depth studies and interviews of pilots and operators without predetermined opinions which have had a big impact on the Saab Avionics systems Heads Up roadmaps.

Roadmaps which are heavily influenced by requirements from Civil and Military authorities as well as economical and “soft” requirements from operators.

Henrik has a solid background from Engineering and project management within world famous Swedish company Husqvarna from 1988 to 2002. In 2002 he left Husqvarna to join the automotive accessory industry where he tuned his skills to communicate with big international OEM’s until he joined Saab in 2009.

Education

Erik Dahlbergs, Jönköping:
Four year Technical Gymnasium/College, majoring in Machine/Mechanics

Chalmers/Lindholmen University College:
Project Management

Heads Up Display for Fixed & Rotary Wing Applications

Situational Awareness has become a buzzword among people addressing flight safety issues. Modern intuitive HUD graphics will alleviate many of the difficulties related to sudden loss of visual cues. Many systems are also prepared to combine HUD graphic with Audio warnings. Flight path vector in combination with artificial horizon and trend vectors are themselves tremendous features helping spatial awareness. This is extra evident in CFIT situations caused by “Single reference” related difficulties.

Enhanced Vision Systems based on IR sensors are available already today. For some applications the right sensor in combination with a HUD will bring the operator huge operational benefits. The regulations are not 100% applicable to firefighting; neither are the requirements on the EVS (EFVS) sensors. Seeing approach lights is, as an example, not the main issue here. Nevertheless, the systems developed for operational credits are useful also for aerial firefighting. The good news is that firefighters do not need the cooled shortwave IR sensors necessary to certify for credits. Even the simplest IR sensor will outperform NVG’s in smoke, dust etc. In addition several avionics companies are today working on ways to combine EVS/EFVS with synthetic vision systems. Synthetic Vision Systems are available, and the technology to show this data Heads Up is available with many if not all, HUD suppliers on the market.

Aerial Fire Fighting at night is even more dangerous than during the day. The smoke that would deprive us all visual cues is usually not seen until you are in it. Since we don’t see the smoke it’s more difficult to prepare for sudden wind bursts that may throw you of balance. A bright spot in the distance will appear as a deceitful single reference luring aircrafts like sirens used to lure ships in Greek mythology. Now, what about if the HUD symbology helps you maintain your “balance” even when surprised by that wind burst? What if the flight path vector more or less eliminates the difficulties with a single reference? What if a cost effective Infrared sensor helps you see thru the smoke even if you fly straight in to it?

Urban firefighting among hi rise buildings represents another hot topic among our HMI developers. The problems are closely related to issues during construction work where the helicopter for no apparent reason backs or drifts in to a fully visible crane, tower or even building. There are also similarities with attack helicopters crashing in to their targets. We are now working with the development of a special Hover mode for helicopters. This mode is based on traditional hover symbology in combination with an obstacle database. In near future this database will be easy to build or procure by local authorities.
Major Florin Ianculescu | Instructor Pilot C-27J Spartan, 90th Airbase
Romanian Air Force

Major Florin Ianculescu


Major Florin has an operational experience on different types of missions performed in Romania, International and on different Theater of Operations like Afghanistan and Balkans.

Types of missions performed:
- Logistic transport missions, paratroops, aerial evacuation and formation flights.
- Fire fighting training flights.

Flight experience: +2000 FH.

Romanian C-27J Spartan Firefighting Capability

The briefing will present you the Romanian Firefighting capability developed for the C-27J Spartan aircraft.

The main points of my presentation will be related to the history of firefighting program, basic information regarding the PCADS (Precision Container Airdrop System), guidelines for using the system and a standard mission profile for these flights.

Aimed by increasingly disaster caused by fire Romania began the acquisition program for new firefighting capability. In the late 2012 the program started with the PCADS Training Course performed in collaboration with Alenia Aeronautica and Caylym Company which is the actual manufacturer of the product, on the request of the Romanian MoD. The program was approved by the Romanian Air Force on the 7th of November 2013 with the Consolidation Practical Activities on Guardian PCADS.

Since 2014 the Romanian Air Force continued the training for qualifying other crews and ground technical staff.

By certifying the C-27 Spartan for the firefighting missions, Romanian Air Force gained an efficient and rapid solution for fighting the fire without making any modification to their aircraft.
Organiser Information

Tangent Link Limited provides a fresh approach to conferencing, networking, event organisation and management.

The company has pioneered an art of connecting businesses with it’s exclusive client support programmes and strategic partnerships.

Working primarily in the Aerospace and Defence industries and incorporating a unique blend of professional conference organisers together with experienced and specialist Aerospace and Defence personnel, it believes that 'people do business with people' and is constantly developing ways to generate the right environment for our clients to network effectively with their target customers.

Consultancy Services

Our consultancy services support various organisations around the world. Tangent Link can help clients from State Governments to Universities to Corporate Clients identify new business opportunities for their respective business development departments.

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Offered to a few key companies that have core business ethics and objectives which closely complement our own, where partnership can bring mutual benefits. In addition to event related benefits, it is a strategically structured partnership program that ensures the client receives high brand exposure, business introductions, development consulting and access to Tangent Link’s wide and impressive contact base.

Most importantly, a Strategic Partnership allows the client’s messages to gain momentum through consistency and repetition and for our key contacts to become brand converts.

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