NEWSLETTER

July 2023









EDITORIAL

Dear ESASI Members and Friends,

We were glad to meet again in person for another successful seminar in Bratislava, which attracted a large group of ESASI Members and Friends. I would like to thank again our Slovakians hosts for having proposed such a nice venue in this beautiful city along the Danube. Yes, ESASI travelled upstream on that well-known river, from Budapest, Hungary, to Bratislava, Slovakia. Will our next Regional Seminar be in Vienna, Austria? The next European capital on the Danube River when you navigate upstream! This would be for 2025, as your Committee is now focussing on the organisation of the International Seminar, ISASI 2024, that will take place in Lisbon, Portugal. It will replace the Regional Seminar in 2024. Already, I would like to invite our Corporate Members to sponsor this large event and I thank them in advance for their generosity.

Looking in the mirror, the 71 feedback forms that we collected following ESASI 2023 were very positive, in particular regarding the technical programme. In terms of suggestions, we noted an interest in Safety Recommendations, Search and Rescue (connection to Annex 13) and UAVs, which could be good topics for future FocusOn… or Seminars. The high number of participants (140) showed that our success had reached some kind of limit, if we want to keep ESASI seminars human sized, held in affordable medium-sized hotels and with reasonable registration fees. The ESASI Committee agreed that future registrations should be capped at 130-140 participants. Also, the next ESASI Seminars will have two rates: for members and for non-members. In that respect, the ESASI Committee will closely work with the ISASI international office to maintain the lists of Members and Corporate Members up to date. Since our previous Newsletter, ESASI has 7 new members and Aer Lingus as the latest corporate member.

You will read in this Newsletter three obituaries about the sad losses of Don Bateman, Gary DiNunno and Mykola Bortsov.

This Newsletter contains a summary of FocusOn… ICAO kindly drafted by Rob Carter. The full video of this event is made available on the new ESASI YouTube channel along with the previous two FocusOn… sessions.

For those you could not go to Bratislava, you will also read summaries of the excellent three sessions that were held and the MASI meeting that gathered about 50 participants.

Finally, I would like to inform you that ESASI held its Annual General Meeting (AGM) in Bratislava at the end of the first day. The AGM report was sent to ESASI Members after the meeting. If you have not received it, please contact me and I will send you a copy. On Tuesday 22 August during the time devoted to National/Regional Societies at the end of the first ISASI 2023 session, we will have the opportunity to discuss ESASI matters, notably the upcoming ESASI elections scheduled for November 2023.

I look forward to seeing you again soon in Nashville,

Olivier Ferrante

ESASI President

Index for July 2023 NewsLetter

ESASI Airlines Group	page 02
ESASI New Members	page 02-03
ISASI 2023, Nashville	page 03
In Memoriam	page 04
ESASI 2023, Bratislava	page 05-13
'FocusOn…ICAO'	page 14-19

Call for expressions of interest in forming an ESASI Airlines Network / Group

During the recent ESASI seminar in Bratislava, interest was raised to the ESASI committee in establishing a Network or Group for Airline Safety Investigators. Whilst the specifics of the group are as of yet undefined, the intent of the Network or Group will be to create a forum in which Airline Safety Investigators can collaborate in a more structured manner, share knowledge, reach out for support, and contribute to advancing the field of conducting internal safety investigations within the airline environment. The intent is to expand the scope to also include events that, whilst they may not meet the classification of being a Serious Incident or Accident, they may be seen as a potential precursor to such events, or otherwise of significance to an Airline.

The Network or Group will likely meet annually (aligned with the ESASI seminar), with an initial focus on developing the scope and goals of the Network or Group. Outside of this, the intent will be for the members to collaborate and share information with each other as required. The Aims and Mission of the Network or Group will be aligned with those that are the focus of ISASI & ESASI

If you work for an airline within a safety-based role, or you work closely with airline safety departments then get in touch and let us know that you would like to participate.

Please contact Leigh Dunn at leigh.dunn2@jet2.com or John O'Toole at jlotoole@eircom.net

ESASI New Members

ESASI is glad to welcome several new members who have recently joined ISASI.

Ms. Toni Flint, United Kingdom

Toni is a Senior Inspector of air accidents at the UK Air Accidents Investigation Branch (AAIB). At the AAIB she is responsible for investigating the human factors aspects of accidents and serious incidents and developing the AAIB's capability in human factors investigation. She joined the AAIB in 2018. Prior to that she worked for 16 years as a human factors specialist in road and rail transport applications. Toni is the new chair of the ISASI human factors group which is a group for networking and peer to peer learning about human factors investigation. If you are interested in this group please contact ISASIHFWGChair@aaib.gov.uk.

Mr. Kevin Hayes, United Kingdom

Kevin Hayes has been working for the UK Defence Accident Investigation Branch (DAIB) as an engineering investigator since 2020. He has over 20 years of engineering experience working with military rotary wing platforms and remotely piloted air systems and has recent safety investigation experience on fast jet aircraft. He holds an MSc in Ergonomics and Human Factors and has a particular interest in organisational behaviour and how it relates to accident investigation.

Mr. Niall Miranda, United Kingdom

Niall Paul Miranda is a recipient of the ISASI Kapustin Scholarship award for 2023 and is currently pursuing an MSc in Safety and Human Factors in Aviation at Cranfield University. He is an aeronautical engineer having interned at an aircraft maintenance facility and apprenticed

at a defence aircraft production company. He has also handled operations at an International Airport in India. Niall aspires to be an aviation ergonomist and safety investigator and looks forward to engaging with fellow professionals to enhance safety measures in the industry by advocating the cognizance of human interaction with their operating environment.

Mr. Michail Sachinis, Greece

Michail is a safety officer who works in the Private Aviation Sector for VVIP Operations. He has the following qualifications and ratings: EMBRAER 135 LEGACY 650, ATPL(A) - Instructor, CRMI /Examiner-Human Factors.

Since our last newsletter, the following individuals have also joined ESASI:

- Mr. Marc P. Stumboeck, Germany
- Mr. Kyle Hu, United Kingdom
- Ms. Osi Schafer, Germany

ESASI also welcomes Aer Lingus which is the latest corporate airline member to join ISASI/ESASI. Here is a brief note from our friends at Aer Lingus:

Aer Lingus

"*One of Europe's oldest airlines, Aer Lingus, has recently renewed its corporate membership of ISASI/ESASI.*

The Director of corporate Safety and Security at Aer Lingus is Capt. Conor Nolan, who is also the most recent past Chair of the Board of Governors at the Flight Safety Foundation. He is assisted by Corporate Safety & Risk Officer, Ms. Mutsumi Saga-Walsh.

Aer Lingus is usually represented at ISASI/ESASI seminars by Capt. John O'Toole, an air safety investigator and instructor/examiner on the Airbus fleet. John is a graduate of Cranfield University's MSc. program in Safety and Accident Investigation.

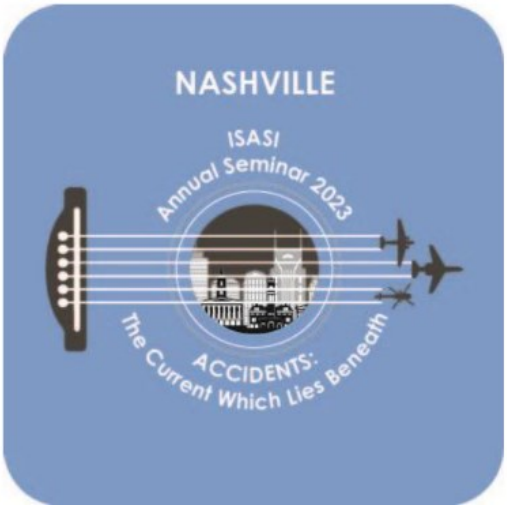
Aer Lingus management is committed to learning from industry events and to sharing its

own lessons learned through high reporting and safety investigation standards. The airline is keen to develop and maintain relationships with the international safety investigation community, particularly the SIAs within its route network. We look forward to supporting and participating in future ISASI/ESASI events."

ISASI 2023, Nashville, Tennessee, USA

Save the dates: August 21 – August 25, 2023

The 2023 Theme is "*Accidents: The Current Which Lies Beneath*". ISASI 2023 will be an "in-person" event with Tutorials on Monday the 21st, the seminar presentations from Tuesday the 22nd through Thursday the 24th, and various evening get togethers during the week.



In Memoriam

Don Bateman (8 March 1932 – 21 May 2023)

ESASI were very sad to learn of the loss of one of the leading figures in Aviation Safety.

C. Donald Bateman (Don) passed away aged 91 on the 21 May 2023. An engineer who spent decades championing aviation safety, Don is best known for being the creator of the Ground Proximity Warning Sensor (GPWS) and the Enhanced Ground Proximity Warning Sensor (EGPWS) –inventions which have prevented countless CFIT accidents and saved thousands of lives.

In 2008, ISASI presented Don with the Jerome F. Lederer award. When presenting the award, ISASI President Frank Del Gandio remarked that '*If Don never did anything else in his career, these tools alone might allow him to say that he has saved more lives in aviation than any other single person who has ever worked in the field*'. But Don did not only create GPWS and EGPWS. He was also a pioneer in the development of angle of attack indicators, autothrottle systems, windshear detection and altitude awareness systems.

As a Chief Engineer at Honeywell Flight Safety Technologies, Don operated a team of 'mavericks'. This was a team of engineers with a passion for aviation safety, who were encouraged to challenge and have intellectual debates. Don was well known for his forensic analysis of CFIT and near CFIT accidents, filming flight paths, collecting data and analysing how each accident could have been avoided. His on-going passion for aviation safety meant that when satellite technology improved, he saw the opportunity to develop GPWS to become a "forward looking" terrain avoidance tool saving even more lives.

Known as a softly-spoken, humble, unassuming gentleman, his contribution to aviation was recognised throughout his life by multiple international organisations and he received many accolades and awards. He is a significant loss to aviation safety and we extend our heartfelt sympathies to Don's family and friends.

Gary DiNunno (22 November, 1946 - 22 May 2023)

It is with sadness that we report that our ISASI Forum Editor, Gary DiNunno, passed away suddenly on 22 May 2023. Gary had previously worked professionally for ALPA and had been producing the Forum journal for the past six years. In addition to his excellent editorial work, Gary was a keen and proficient photographer, doing a fine job of covering ISASI events. He was also a good supporter of ESASI and ensured that ESASI events were well covered in Forum, as the journal for the International Society.

ESASI's best wishes go to Gary's wife, Judy, his sons, Paul and Brian, and his grandson, Matthew. A detailed obituary is being prepared for a future edition of Forum.

Mykola Bortsov (28 January 1960 – 19 March 2023)

ESASI would like to pay tribute to Mr. Mykola Bortsov who unexpectedly passed away on the 19 of March, 2023 at the age of 63.

Mykola was an esteemed colleague and chief of the NBAAI of Ukraine. Loyal to the aviation safety cause, Mykola gained a degree in aviation psychology from the National Aviation University in Kiev, in 2019, and was the SME in human factors at the NBAAI.

He will be missed by his family, NBAAI colleagues and investigators worldwide who worked with him and were touched by his affable nature.

ESASI 2023, Bratislava

ESASI 2023 was held in Bratislava, Slovakia on 26-27 April 2023. Similar to ESASI 2022 in Budapest, Hungary, it followed an ECAC ACC event so that delegates could combine these two events in one trip.

Summary of the first session:

David King moderated the first session by first introducing Igor Benek, Aviation and Maritime Investigation Authority (AMIA), Slovak Republic representing the seminar host country. After welcoming all to Bratislava, Igor presented details of the AMIA, part of the Ministry of Transport including its history, structure and legislation based upon ICAO Annex 13 and Regulation (EU) No 996/2010. Following a brief outline of aviation in Slovakia Igor introduced a video guide to the country – '*Slovakia from Heaven*'.

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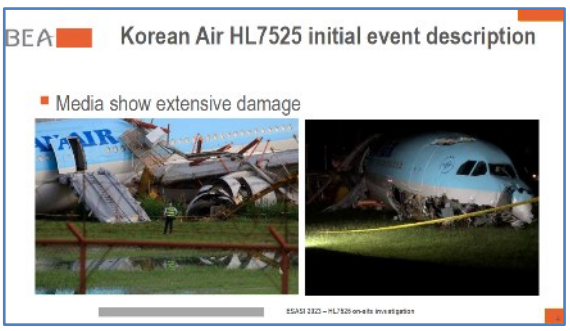
There then followed the mornings technical presentations:

Airbus A330-300 HL7525 On-site Accident investigation – 23rd October 2022, Cebu, Philippines. Joint presentation by Thomas Lepagnot, Accident Investigator, Airbus and Arnaud Blanc, Senior Safety Investigator, BEA France.



The investigation is ongoing and so the presentation concentrated on the on-site phase of the investigation. Initial information indicated that the aircraft had overrun the landing runway following a third approach to land in challenging weather conditions causing extensive damage including to the main landing gear. In accordance with ICAO Annex 13 this was a multinational investigation led by the AIB of the Philippines and included representatives from South Korea, France, USA, UK and Switzerland.

Aircraft damage and accident site hazards made the accident site recording and wreckage analysis particularly challenging. Following interviews with the flight crew and the availability of FDR data downloaded using portable equipment showing that there had not been a 'Hard Landing' the landing zone was re-examined and evidence collected showing that the aircraft had touched down short of the paved surface causing the critical damage to the main landing gears.

This investigation clearly highlighted the benefits of data from the FDR being available to the investigators during the accident site recording phase.

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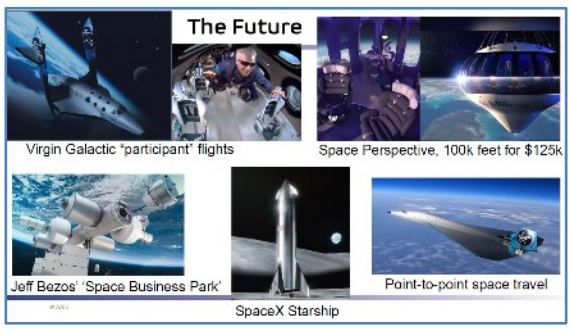
Investigating Space Accidents. Stuart Hawkins, Senior Inspector, AAIB (UK)

Stuart presented on the recent development of space launch endeavours in the UK including an overview of the space industry today, recent launch failures, posed the question – Why investigate?, outlined UK space regulations, summarised the Virgin Orbit case study and considered the future of space investigation.



Stuart noted that in the last 9 years the number of launches globally has doubled with 191 launches in 2022 with 10,000 operational

satellites in Low Earth Orbit. There have been 46 global launch failures between 2018 and 2022 but no injuries.

It was proposed that an SIA should investigate If there was a high probability of injury/fatality to people or actual injuries/fatalities and to make findings and safety actions public. In the UK the AAIB is now required to investigate by regulation. Stuart pointed out that there is currently no Annex 13 equivalent for Space Investigations, but international cooperation in an investigation is sometimes going to be needed.

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NTSB Public Hearing: a challenge facing investigators. Valerie Gros, Flight Safety Engineer Accident/Incident Investigator Safran Aircraft Engines.

Following an overview of Safran Aircraft Engines and an introduction to the Flight Safety Team, Valerie provided an overview of an event involving Southwest Airlines on 27th August 2016 near Pensacola when a CFM56-7 engine suffered a 1st 'Full Fan Blade Out' event. This was a contained failure at the engine level but inlet separation resulted in a fuselage penetration and a slow depressurisation. An Annex 13 investigation was instigated led by the NTSB which identified a long-term fatigue cracking process to be managed with crack detection inspections.

A following 'Full Fan Blade Out' event occurred on 17th April 2018 again contained at the engine level but the inlet + fan cowl separation resulted in window damage and one fatality.

Valerie then focussed on the NTSB Public Hearing, an Official and Public Conference (1 Day) with video and transcript available on the net. Participation for an investigator is exceptional so how to be prepared? An agenda is published in advance enabling detailed preparation.

Valerie concluded - Beware that Public Hearings can occur early in the investigation timeline. Get Prepared:

- Ready to engage additional company support / create the internal team
- To be supported by US lawyers to be aware of US legal system
- Increase communication with other investigation parties
- Get trained in Q/A process to remain neutral / factual
- Prepare any material that can be useful during the public hearing
- Anticipate load impact, organize internal team to maintain investigation process priority
- Stay focussed on role as Technical Investigator.

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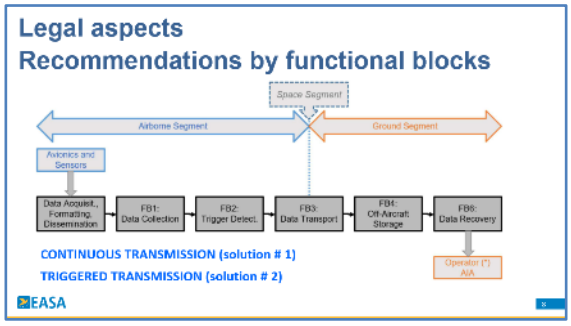
EASA - Research Project; Quick Recovery of Flight Recorder Data. Alessandro Cometa – EASA; Bertrand de Courville – BdC Consulting; Aurelie Girault – Courrege - Foreman

This presentation addressed the challenges of modern investigations where the FDR data is crucial to advancing the investigation but access is sometimes delayed because of the inaccessibility of the recorders. As well as the technical challenges this presentation also looked at the legal challenges of data handling and access.



The technical challenge was to assess some candidate solutions for wireless transmission of FDR data for technical feasibility, maturity, performance, cost and related legal

constraints. The project is coordinated by EASA, receives EU funding and a consortium was formed of Collins Aerospace, Safran Electronics & Defence, Bertrand de Courville consulting and Courrege-Foreman.

The technical challenges of wireless FDR data transmission in flight was the focus of this project although other solutions are also contenders i.e. automatic deployable recorders. Consideration was also given to the legal challenges of cloud storage and access.

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Recent developments of European Network of Civil Aviation Safety Investigation Authorities. John Ahlberk, Director General of SHK Sweden and ENCASIA Chairman

John provided a brief introduction to ENCASIA as although most of the audience were very familiar it was helpful to newcomers and a good reminder to some others. John also covered his role as Chair and indicated his aspirations for ENCASIA in the future.

A short summary of the recent Luxembourg workshop was helpful as it was the first time that judicial authorities from so many different countries joined an ENCASIA event to discuss the implementation of the balancing test for dealing with 'Protected Evidence' among other interesting topics (like the use of final reports in courts, etc.)

This segued well with the interesting EASA study related to the impact (mostly legal) of having flight recordings "in the cloud."

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Electric Flight:- technology and safety Aspects. Vincent Van Hasselt - Pipistrel

The final presentation of the first session was given by Vincent Van Hasselt who outlined the research and product history of Pipistrel starting with the world's first two seat electric aircraft, the Taurus Electro in 2007 through to the first EASA certified electric airplane, the Velis Electro. The Velis Electro benefits from an innovative engine and battery system developed in house by Pipistrel. The cockpit instrumentation has a 'new look' incorporating a novel annunciator panel and the Electric Propulsion Instrument (EPSI) to present the pilot with the necessary information about the propulsion and battery condition.

Vincent highlighted that there are a number of challenges to introducing electric flight into the aviation industry beyond meeting the technical challenges of aircraft design, including airport facilities, ground handling, charging and safety of first responders following an incident or accident.

Besides the human machine interface between pilot and aircraft also other aspects of the daily operation of an aircraft are affected. Battery charging requires adherence to the procedures and appropriate supervision. Similarly, the batteries and electric engine present specific maintenance challenges and, should a fire occur, specific firefighting techniques. Pipistrel is continuously working with all the stakeholders to develop improved operating practices and enhance safety to assure the successful integration of these disruptive and innovative technologies.

Future safety challenges will be met as Pipistrel moves to further develop products that drive sustainable aviation.

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The afternoon session, which was moderated by Arben Dika, covered the following presentations:

Recovery of Cessna 172 accident that crashed in a frozen lake in Iceland. Thorkell Agustsson, Chief Investigator SIA Iceland

Thorkell Agustsson Chief Investigator/Director of SIA Iceland presented the accident of a Cessna 172 that crashed in the frozen lake Thingvallavatn where 4 people on board sustained fatal injuries. Thorkell explained first the search and rescue procedure on finding the aircraft and searching the area and looking for

aircraft wreckage. During the searching process for the aircraft, an indication of possible fuel/oil was seen at the surface of the lake. The divers could not dive because of the cold water but with the use of an Autonomous Underwater Vehicle (AUV – Gavia) the aircraft and bodies were localized and found. Bodies were retrieved by underwater drone a couple of days after the accident.

The aircraft was not retrieved because the lake was covered with ice. This presentation showed the struggles and difficulties that the safety investigators and their team had to face in the process of retrieving the bodies and the wreckage of the aircraft in the frozen lake.

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Investigating language factors in aviation accidents. Elizabeth Mathews, Associate Professor, Applied Aviation Sciences at Embry Riddle Aeronautical University

Elizabeth Mathews presented the role of language as a human factor in aviation and how language factors are addressed and documented in accident investigation reports. Language impacts aviation safety beyond pilot-controller communication. Language factors are less well understood or obscured in accidents reports. The investigation of language factors is not supported by current human factors frameworks.

Through years there have been many fatal aviation accidents due to incorrect phraseology, ambiguous phraseology, difficulty comprehending ATC communication, inadequate plain language proficiency, two languages in the same room. The study shows that between 1990 – 2012 there have been 19 accidents in which investigators identified language factors. When CRM is identified as a contributory factor in an accident, language is a valid investigation question. ICAO pays attention to language as well and states that language is a complex human factor. Language should be considered in accident reports and if problems are not addressed, language will continue to be a threat to aviation safety.

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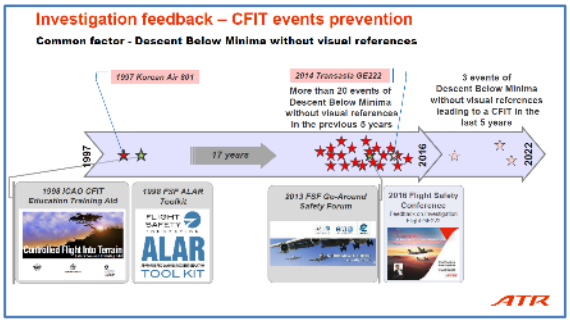
Beyond the flight deck. Christopher McGregor. Flight Safety Officer, ATR

Christopher McGregor presented on the topic of beyond the flight deck. He presented a couple of the ATR fleet accidents. These were serious events in which there was intentional continuous descent below the published glide path, without confirming the visual reference. Go-around was initiated very late and ground contact was made prior to a positive rate of climb being achieved.



The investigation of the recent ATR accident identified the same contributing factors such as:

- Absence of acquisition of visual references below MDA
- High rate of descent at low altitudes
- Lack of CDFA/ Un-stabilized approach
- Loss of situational awareness/insufficient active monitoring
- Late go around decision

The recent investigations concluded that the same contributing factors were identified beyond the flight deck and effective decision making on approach maintains the safety margins, especially during challenging operations. The briefing should include the identification and mitigation of the risks identified for the approach.

Christopher encouraged the investigation community to include the operating context and culture as significant contributing factors. This further re-enforced the need to follow serious incidents which can identify these issues prior to more serious occurrences.

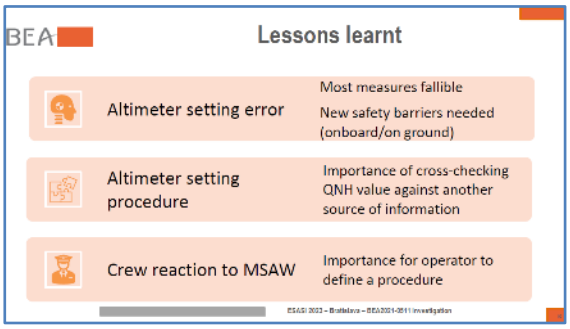
Day 2 summary – 27 April 2023

The morning session started (on time!) with some warm words of thanks for our Slovakian hosts, the previous evening's excellent shared meal at the Bratislava Flagship Restaurant and for Bratislava's excellent tram system. The programme started with:

SINCID case study - Altimeter setting read-back error and MSAW. Jerome Bauer, BEA

This was a significant case in which a Bombardier CRJ-1000 was approaching Nantes-Atlantique airport. Jerome described the initial readback error of QNH pressure setting, not detected, leading to an MSAW (Minimum Safe Altitude Warning) on final approach. The incident occurred in low-pressure storm conditions, on an LNAV approach with baro-VNAV guidance and the crew reacted 30 seconds after the MSAW; the BEA decided to treat this as a Serious Incident.

From recordings, the investigators confirmed that the initial error was not detected either by the crew (high workload and focus on weather conditions) or the ATCO (focussed on traffic conflict elsewhere in control zone). In the turbulence, a 'coherence check' was not carried out by the crew and the 'trajectory shift' remained undetected until the MSAW from air traffic, to which the crew were slow to react.



The BEA concluded there were lessons in the altimeter setting check procedure and the flight crew MSAW procedure that should be defined at the operator level. Safety Recommendations have been made to the Air Navigation Service Provider, to EASA and to ICAO to solve inconsistencies in MSAW phraseology, adding the notion of urgency to response and on the systematic recall of QNH settings.

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When the Field Service Rep met the Safety Investigation. Oskar Haug, Bombardier

Oskar opened with a description of Bombardier's Air Safety Investigation Office (ASIO) and how Auxiliary Air Safety Investigators (AASIs) can be deployed to an accident site and manage small investigations. In Oskar's case, he is a Field Service Rep (FSR) who has now received training as an AASI (Bombardier's first in Europe) and described a small 2021 accident, before his AASI training.

The 2021 case was a landing gear collapse during taxi after flight. The crew had to use the free-fall procedure to extend the gear before landing, which was safe, the passengers disembarked and the crew were taxiing towards the hangar when the gear collapsed. Troubleshooting after the accident identified an issue with the landing gear selector valve and it was removed for further investigation at the vendor. However, the part was mistakenly sent through Bombardier's parts system and key evidence was lost.

Oskar concluded by identifying what he would now do, as an AASI. Communicate – he would have had a telecon with all parties before starting, pulling CVR circuit breaker promptly. Caution – he would have ensured a secure separate location for all parts removed. Confirm – he would have followed up on parts shipped for investigation. Control – he would have requested a technical specialist on site and ensured more detailed troubleshooting documentation.

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Startle or Surprise on the Multi-crew flight deck. Captain Ed Pooley, the Air Safety Consultancy

Ed started by pointing out that in everyday English, pilots' use of the terms 'startle' and 'surprise' about unexpected events in flight has become interchangeable. However, most 'surprise' events can be responded to by the pilots acting together to respond. as trained and according, to checklists but very occasionally a surprise may also trigger a 'startle reflex' in one of the pilots. This is an involuntary neurological and physiological

response where the normal conscious decision-making channel is bypassed, which can trigger an 'irrational' reaction, especially in terms of flight path control. 'Startle reflex' appears to be extremely rare, with no documented cases of it affecting both pilots at the same time. If it happens, recognition of it by the unaffected pilot is key.

Ed gave two accident cases, both occurred in the cruise in dark night conditions with no external visual reference. The first was 'Air France 447' over the South Atlantic, where all three airspeed indicators failed causing autopilot and auto-throttle disconnection. The second was 'West Air 294', where a false pitch-up attitude indication on the PF (pilot flying)'s display (only) caused autopilot disconnection. In both cases the response of the PF was irrational and detected as such by the PM (pilot monitoring) but the PM response was delayed beyond the point where a straightforward recovery was possible.

Summing up on training possibilities, Ed pointed out that a 'startle reflex' which results in an unsafe response **can** be immediately recognised by a colleague who is merely 'surprised' and who can then intervene with appropriate and assertive action. Pilot training needs to ensure that pilots are aware that if a 'startle reflex' affects them, they will be unaware until the initial phase, which typically lasts up to 30 seconds, is over. It must also prepare pilots who are unaffected to recognise and intervene without undue delay. Well-structured simulator sessions can prepare pilots for surprise events but they cannot realistically replicate a 'startle reflex' response.

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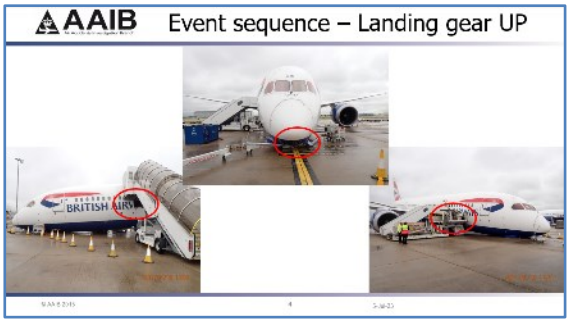
Nose landing gear retraction on the ground. Stephen Connor, AAIB UK



Steve described an AAIB investigation in June 2021, during Covid restrictions, where the nose landing gear of a British Airways 787-9 was inadvertently retracted on the ground. This occurred during ground maintenance operations while preparing for a cargo flight and centred on the mistaken insertion of a landing gear downlock pin into the Apex pin bore hole on the NLG mechanism, rather than the correct downlock pin hole nearby.

Several contributory factors were identified in the investigation, including the small number of previous occurrences and the airframe manufacturer's response in the form of a Service Bulletin (SB) to fit a blank to the Apex pin bore. The FAA issued an Airworthiness Directive in December 2019 to mandate the manufacturer's SB but with a 3-year compliance window.

The remainder of Steve's presentation examined how avoidable this accident was. The presentation outlined multiple issues associated with the SB/AD modification, including delayed installation, staff furlough in Covid, financial pressure and the calculation of the 3-year AD compliance window. There were also factors identified in the maintenance company's interim mitigation, which exposed a limited view of the potential risk to staff and passengers.

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ICAO Policy towards air accident victims and their relatives. Arnaud Desjardin, ICAO EUR/NAT Regional Officer, Safety

Arnaud provided information on the ICAO provisions for assistance to aircraft accident victims and their families. These provisions include ICAO Annex 9 ('Facilitation' – allowing access and assistance), Annex 13 ('Aircraft Accident and Incident Investigations' – visiting the scene and rights to information and the final report) and Annex 14 ('Aerodromes' – principally on Aerodrome emergency plans (AEPs)). Other documents include ICAO Doc 9998 Policy on 'Assistance to Aircraft Accident Victims and their Families', based on ICAO SARPs contained in Annex 9 and Annex 13 and additional information and guidance in ICAO Doc 9973.

The implementation of these provisions is monitored through ICAO's Universal Safety Oversight Audit Programme (USOAP) Continuous Monitoring Approach (CMA). This system is based on formal 'Protocol Questions' (PQs) and two PQs deal specifically with assistance to victims and families. PQ 6.381 deals with the delivery of timely information on the progress of the investigation to be provided to the families and accident survivors, and PQ 6.383 is on the establishment of a comprehensive system for providing assistance (in particular through Family Assistance Plans). In audits in the EUR/NAT region, 53% of responses to PQ 6.381 were satisfactory (41% globally) and only 17% (4% globally) for PQ 6.383.

Arnaud concluded by describing ICAO's Action plans for the future, highlighting particular areas for consideration by States. These plans include the submission of a Corrective Action Plan (CAP) by a State to ICAO, with specific actions and estimated implementation dates to correct deficiencies identified in the audit process, and a 'PQ self-assessment' process for States to monitor and report the health of their aviation system on a continuous basis.

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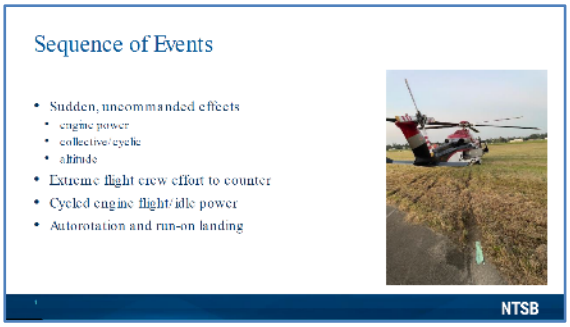
Investigation Update--AW139 Inflight Fire/Smoke. Frank Hilldrup, NTSB

Frank described the ongoing NTSB investigation of this accident in September 2022 where an AW139 helicopter was inbound to Houma, Louisiana from an offshore oil platform. The crew were experiencing extensive engine and flight control problems and attempted an autorotation run-on landing onto grass. The aircraft remained upright, on collapsed landing gear, and there was no post-crash fire.



Examination revealed thermal arcing damage to the 'C3 torque tube', a carbon-fibre flight control component overhead the cabin, which carries the pilots' collective control inputs into the flight control's mixing unit. This thermal damage had resulted from severe wire chafing, due to incorrect installation of power distribution harnesses in the area during manufacture. The accident occurred on 24 September – on 11 October the manufacturer, Leonardo, issued an Emergency Alert Service Bulletin (EASB) and this was followed by an EASA Airworthiness Directive on 12 October and an FAA Airworthiness Directive on 2 November, three weeks later. The EASB and ADs were principally to inspect for proper installation of the power harnesses, to correct where necessary and to look for any chafing or other damage. These inspections did identify a number of airframes with similar misrouting of cables.

Frank concluded by pointing out that this had been a good example of 'Annex 13 at work'. There was good participation and cooperation among States, with the US (State of Occurrence/Operator/Registry), Italy (State of Design/Manufacture—helicopter) and Canada (State of Design/Manufacture—engines), leading to prompt safety action. Frank also noted a number of related NTSB investigations which involved chafing and arcing between aircraft systems.

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ECAC ACC Workshop - Treatment of Serious Incidents. Crispin Orr, ECAC ACC Chair & Chief, AAIB UK

In his role as Chair of the ACC (Group of ECAC Experts), Crispin reviewed the Workshop session that had been held on Tuesday 25 April, the day before the ESASI Seminar and in the same room. The Workshop had attracted some 80 participants, of 29 nationalities.

There was an initial review of the definition of 'Serious Incidents' within the pyramid hierarchy of air safety events and a discussion as to why these investigations by SIAs matter. Factors include that as accidents are (blessedly) rare, these 'Serious Incident' investigations are a good opportunity to maximise learning,

revealing hidden safety issues that may precede accidents. With no injury or loss, it may be possible to establish the circumstances in full, with less emotion, pressure and distraction than following an accident and it is important to understand what may have prevented an accident.

The Workshop moved into discussion of ICAO and European requirements, of the approaches and experiences from different SIAs and looking at the perspectives of operators, manufacturers and safety regulators. This led to discussion of different approaches to the fraught question of 'What do we investigate?' and the assessment of a number of case studies.

There was agreement that, as with accident investigation, there is a need for open and responsive communication between all parties in the investigation of Serious Incidents, with clear and timely decisions on whether an Annex 13 investigation is to be launched and on consultation and publication of the Final Report.

Crispin said that 'Next steps' include a Meeting Report to be prepared for the ACC and an update and enhancement of guidance on the investigation of Serious Incidents.

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Closing – Olivier Ferrante, ESASI President, closed the Day 2 morning session, and the ESASI Seminar, with thanks to the participants for coming and to the hotel and organisers. He looked forward to seeing many ESASI friends at the ISASI 2024 main seminar in Lisbon, which ESASI is helping to organise. He commented that many participants would be staying for the MASI (Military Air Safety Investigators) meeting in the afternoon and wished everyone safe travels home.

Summary of the European MASI (Military Air Safety Investigators) meeting – 27 April 2023

The Military Air Safety Investigators meeting followed on from ESASI on the afternoon of 27th April in Bratislava. There were over 50 attendees, either serving military investigators or closely associated with the military air accident investigation community. In addition to the opportunity for networking and "meeting friends before you need them", there were 4 diverse presentations to the meeting:

First up, WO James Cooper from the UK Defence AIB presented on "Exploiting data from a Parachuting Accident". Here he explored the types of data potentially available from a parachuting accident from personal electronic and safety devices with non-volatile memory and the ability to reconstruct a parachute descent as part of an accident investigation. He also illustrated the discovery of stark differences in behaviour and deployment of reserve parachutes depending on the presence (or not) of the main 'chute in the container, using high speed video capture analysis, and the behaviour of drogue or pilot chutes in the dead air or 'burble' behind a person in freefall.

The next presentation was from Jeffrey Kraus and Jim Buse from Boeing Defence, working within the test and evaluation team for unmanned air systems (UAS). They provided an overview of the fly-fix-fly methodology for UAS development with a review of four incidents on three different platforms with a plethora of casual and contributory factors. The investigative process used was the KNOT tool (Know, Need to know, Opinion, Think we know). This was a catalyst for an interesting discussion about accelerated prototyping for small and inexpensive UAVs where it is possible to accept a few mishaps (that you learn from) rather than spend an enormous amount of time and effort trying to prevent the accidents in the first place.

Jose Casado and Roberto Porron from Airbus Defence Services then gave a presentation on their work to understand how teamwork on a flight deck could be modelled during an emergency. With some surprising findings about Crew Resource Management, this study looked at the CVR recordings and FDR aircraft behaviour following a Birdstrike event to examine the human interaction within the crew and with external (ATC) agencies. The study explained a quantitative method to analyse the crew behaviour during the emergency recovery – and determine if the event was managed as a 'single pilot centred' style or a more collaborative 'whole crew' approach that would be recognised as good CRM.

Finally, Matt Robinson from the SCSI shared his experience of a complex marine salvage operation in a contested area (war zone). A US military helicopter accident occurred in the middle of a desert in Iraq, specifically at Lake Habbaniyah. The salvage operation had a time factor due to the aircraft sinking in the muddy lake bed but there were very limited resources in the country at the time and the nearest salvage support would likely take up to 3 weeks to arrive. This was an active operational theatre at the time and 'non-standard' salvage equipment was utilised to affect the recovery – an example of what can be done with initiative and a 'can-do' attitude.

The next MASI meeting will be during the ISASI Annual Meeting in Nashville on Mon 21 Aug 23 – we hope to see you there".

TO JOIN ESASI: Please contact

Ann Schull for ISASI membership: isasi@erols.com - or visit:

http://www.isasi.org/Memberships/Individual.aspx

Summary of FocusOn…ICAO February 1st 2023

This ESASI webinar was introduced and chaired by Kate Fitzgerald of the Irish AAIU. After each presentation there was a short Q&A, using the 'Chat' function in Zoom, and further questions were answered by eMail later. The session was recorded to allow access on the ESASI website.

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'Introduction to the International Civil Aviation Organization' - Padhraic Kelleher - President of the Air Navigation Commission (ANC) at ICAO

Padhraic thanked ESASI for the opportunity to present and gave an overview on ICAO, a 'Specialized Agency' of the United Nations resulting from the 1944 Chicago Convention on International Civil Aviation. Initially 54 States signed the Convention and this has now risen to 193. Padhraic emphasised that ICAO is a facilitator, NOT a Regulator, having no authority or control over States. ICAO's primary means of achieving its universal objectives is by generating and keeping up to date the 'SARPs' (Standards and Recommended Practices) within the 19 'Annexes' to the Convention. It then relies on States to implement the SARPs through national Regulation.

Under 'Aims & Objectives' of ICAO, Padhraic described the Vision ('Achieve the sustainable growth of the global civil aviation system'), the Mission ('To serve as the global forum of States for international civil aviation') and the five Strategic Objectives ('Safety, Capacity & Efficiency', Security & Facilitation, Economic Development, Environmental Protection'). Padhraic then described the governance of ICAO: the ICAO Assembly (meets every three years), the Council and the Air Navigation Commission and the structure of the Secretariat including the Bureaux and the Regional Offices (such as the EUR/NAT office in Paris).

On the working level, Padhraic described the functions of the Air Navigation Commission, which is the main technical adviser to the Council. Its 19 members are nominated by individual States but their role is to represent independent and impartial technical expertise. Answering to the ANC are, currently, 22 technical Panels and Working Groups covering the full scope of 16 of the Annexes. For the 'safety investigation' community, the most important of these Annexes is Annex 13 and the related expert groups are the 'Accident Investigation' Panel (AIGP) and 'Flight Recorder' Specific Working Group (FLIRECSWG). These groupings have a wide input from industry, international aviation organisations and States, and provide the main technical input into the revising of individual SARPs.

Padhraic closed with a description of the process by which a new or revised SARP is generated, from the initial suggestion through the ANC, expert Panels and consultation within ICAO and internationally, with States and international organisations. The revised SARP is then published, becomes effective and, finally, becomes applicable. He also described that a wealth of further useful information is available on the ICAO website (www.icao.int).

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'ICAO Operational Involvement' - Thormodur Thormodsson - AIG Lead ICAO, Montreal

In his opening comments, Thor described some bracingly cold Montreal weather and then changes of personnel in the AIG section in ICAO. Marcus Costa, the previous Chief, retired 2021 and this post has not yet been filled. Andre de Kock (TO/AIG), also well known to ESASI and ISASI, retired in June 2022, leaving Thor (joined August 2022) as the current lead – and sole official AIG staff.

Over its life, ICAO has been involved actively in a number of live safety investigations and Thor described the role and some cases. These have generally occurred in the context of difficult political situations and in cases of 'unlawful interference'. In many cases ICAO acts in a diplomatic capacity to facilitate the resolution of disputes, starting with the ICAO Council requesting investigation under Article 55e of the Convention.

Examples of this 'fact-finding' activity by ICAO include the investigation of the loss of the aircraft carrying the UN Secretary General, Dag Hammarskjöld, in Africa in 1961, the downing of Korean Airlines 007 over the Sea of Japan in 1983 and the downing of an Iran Air A300 in the Strait of Hormuz in 1988. More recently, ICAO experts have acted as advisors or observers in a number of politically sensitive investigations, such as the accident to an ATR 42 in Kosovo in 1999, the downing of a Malaysian B777 ('MH-17') over Ukraine in 2014 and the downing of a Ukrainian B737 near Tehran in 2020.

ICAO has also been involved in a number of investigations to assess or provide assistance, in particular when the aircraft was chartered by the United Nations for humanitarian purposes. An example was the MI8 helicopter in Darfur, Sudan on 29 September 2008

Thor finished with a brief description of ICAO's USOAP (Universal Safety Oversight Audit Programme) activities in which AIG experts actively participate, assessing States' investigation capabilities and developing and updating the audit 'Protocol Questions' (PQs). Related is the issuance of Mandatory Information Requests (MIRs), where a concern has been raised about a State's compliance in the process of a safety investigation. Examples of these are where a State has not been cooperating with a State conducting an investigation, where a State has closed an investigation without the issuing of a final report, where a State has ignored comments on a draft report or where a judicial authority has arrested flight crew involved in an accident.

Thor closed by pointing to where further ICAO AIG information is available and where guidance may be provided. There was then a brief Q&A, including a question on the level of resource available to AIG.

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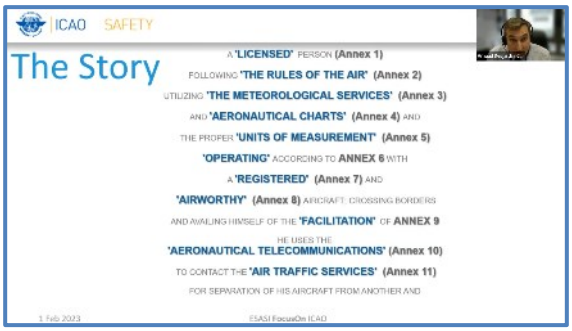
'ICAO & its Annexes' – Arnaud Desjardin - Regional Officer, Safety, ICAO EUR/NAT, Paris

Arnaud laid out the general principles of the 1944 Chicago Convention. These concerned 'Airspace Sovereignty', starting with Article 1, whereby every State exercises sovereignty in the airspace above its territory, with the limits of that territory. On 'Civil & State aircraft', Article 3 confirms that the Convention only applies to civil aircraft and that there may be no use of weapons against civil aircraft in flight. Articles 5 & 6 refers to 'Scheduled and non-scheduled air services' and establish the distinction between them; in Article 12, 'Rules of the Air', States undertake to keep their own rules uniform with those of the Annexes.

It was in Article 26, 'Investigation of Accidents', that the principles were laid down which would form the basis for Annex 13 and Arnaud then laid out the full range of the current 19 Annexes - the most recent, Annex 19, on Safety Management.

To illustrate the scope of the Annexes, Arnaud created a story. A pilot, a 'Licensed' person (Annex 1), makes a flight, following the 'Rules of the Air' (Annex 2), using 'The Meteorological Services' (Annex 3) and 'Aeronautical Charts' (Annex 4), having (of course!) the 'Proper Units of Measurement' (Annex 5). Our pilot continues her flight 'Operating' according to Annex 6 in this 'Registered' (Annex 7) and 'Airworthy' (Annex 8) aircraft, crossing borders and availing herself of the 'Facilitation' of Annex 9, and 'Aeronautical Telecommunications' of Annex 10 to contact 'Air Traffic Services' (Annex 11) for separation, hopefully not needing 'Search and Rescue' (Annex 12) and drawing wisdom from the 'Accident and Investigation' from the Annex 13 community (that's us!).



Before take-off from an 'Aerodrome' (Annex 14), our pilot will have used (we hope!) 'Aeronautical Information Services' (Annex 15) and departed (again, we hope) in an 'Environmentally' sound (Annex 16) aircraft, with 'Security' (Annex 17) checked and with any 'Dangerous Goods' (Annex 18) documents nicely tucked away. Having completed this flight, our pilot knows she can repeat the process throughout her long and enjoyable career thanks, in part, to a useful 'Safety Management' (Annex 19) system.

Arnaud then explained the process of adoption of new and amended SARPs and the adherence to SARPs by States. Article 54 of the Convention deals with adoption and amendment, Article 37 with uniformity of adoption and amendment and Article 38 with State notification of 'differences' from specific SARPs. Finally, Article 90 describes how Annexes are adopted by the ICAO Council (2/3 majority needed) and then how contracting States adopt the changes to SARPs.

With some 10,000 SARPs in the 19 Annexes, the process of amendment and adoption needs to be understood, as well as the meaning of the terms 'Standard', 'Recommended Practice', 'Appendices', 'Definitions', 'Notes' and 'Attachments'. Arnaud showed a flow chart describing the process of making an ICAO Standard, with the roles of member States, the ICAO Council, Assembly Secretariat and the Air Navigation Commission. This process may take from one to five years in the 'Development phase' and then, in general, about two years for Review, Adoption and Publication.

Arnaud closed by describing the use of CMA (Continuous Monitoring Approach) within USOAP. This determines States' oversight and investigation capabilities by verifying the implementation of safety-related SARPs, associated procedures and guidance material. This is largely done through the use of 'Protocol Questions' – 'PQs', with a total of 790 PQs through eight audit areas.

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'ICAO and Protection of Safety Data' – Arnaud Desjardin - Regional Officer, Safety, ICAO EUR/NAT, Paris

Arnaud started by laying out the principles of protection of safety data and information and, particularly for CVRs (Cockpit Voice Recorders) and AIR (Airborne Image Recorders), the protections for Annex 13 and Annex 19 investigations. For Annex 13 (Accidents & Serious Incidents) the 'balancing test' is key, weighing investigation needs against administrative and judicial imperatives, within a State's legal framework. In this 'Prior arrangements' between investigators and the judiciary are important and Arnaud gave examples.

In essence, a 'Balancing test' is not aimed to prevent the administration of justice; it should prevent the violation of privacy of persons involved in an occurrence, ensuring 'moral dignity', and the availability of essential information. As for designating a 'Competent authority' – it needs to be a Governmental entity which administers the 'Balancing test' and Arnaud gave examples of decisions in some prominent ICAO States. Arnaud closed by pointing to resources available within ICAO including ICAO's 'e-Library of Final Reports'. For more on Protection of Investigation records, he pointed to Annex 13 (chapter 5.12 and Appendix 2), Doc 10053 ('Manual on Protection of Safety Information'), Annex 19 ('Safety Management') and Doc 9859 ('Safety Management Manual').

In the brief Q&A, a current investigator raised the active topic of whether 'Action cameras' (such as the popular 'Go-Pro') should be protected, particularly when mounted in their aircraft by a private owner for their own use. The FocusOn… presenters expressed a variety of views on this topic; Olivier Ferrante summarised by saying that protection of image recorders and other devices remains very much a "grey area" and that the AIG Panel has a dedicated working group addressing it.

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'ICAO and its Impact on Industry' – Simon Lie - Member of AIG Panel

Although Simon was covering some of the same areas as the previous ICAO presenters, he brought a fresh approach, with his background as a safety investigator for Boeing.

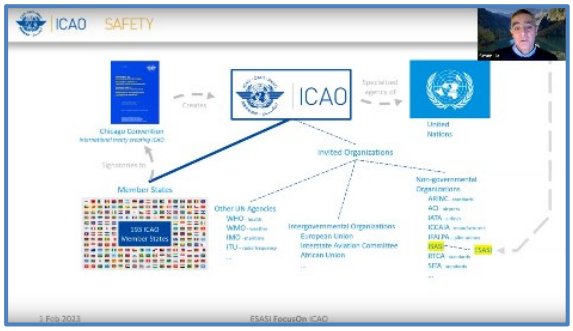
As Simon described it, in simple terms ICAO publishes Annexes (containing Standards and Recommended Practices), performs audits of member States' compliance with these standards and advocates for, educates and assists member States. He also commented on ICAO being a 'Specialized Agency of the United Nations' and that it currently has 193 contracting member States and a number of 'Invited Organisations'. These 'Invited Organisations' include other UN Agencies (such as WHO, WMO, IMO ……), Intergovernmental Organizations (like the European Union, African Union, Interstate Aviation Committee ……) and 'Nongovernmental Organizations' such as ARINC, IATA and ISASI.

Simon pointed to the distinction between the 'Mandatory' and 'Permissive' functions of ICAO. 'Mandatory' functions are analogous to 'Regulation' ('the Council shall …') in Articles 37

& 54 on Annexes and SARPs. ICAO's 'Permissive' functions such as Article 55 ('the Council may …') such investigating specific events when requested by contracting States.

Simon also described how ICAO Standards (and recommended practices) are typically reflected in national "Regulations" whilst ICAO Guidance Material is typically reflected in 'Advisory Circulars". In other words, the Annexes guide development of regulations and ICAO Documents guide development of advisory circulars.

Simon went on to describe the complex impact of ICAO's Annexes on industry at different levels. This occurs through the various roles of ICAO at the international level and the governments of States at the national level. The Corporate level includes Airport operators, Airlines, Manufacturers, Air Traffic providers and at the 'Standards Organisations' level includes groups such as RTCA, ARINC and EUROCAE. He described that there are instances where ICAO is perhaps moving towards actual standards lying within organisations like EUROCAE rather than within the Annex structure.



Simon closed with a useful and simple diagram showing the ICAO Process for changes to SARPS and Guidance material, through the States (and 'Invited Organisations') and through ICAO (Assembly, Council, Air Navigation Commission, Air Navigation Bureau and Technical Panels).

In the brief Q&A, there was a question suggesting that in industry ICAO "can seem remote" and asking how individuals in industry might get, or feel, involved.

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'Annex 13 and the ICAO AIG Panel' - Olivier Ferrante - Chair of AIGP

The final presentation was by Olivier, who is also the current President of ESASI, about his role as Chair of the AIGP.

Olivier started by explaining further some of the basic tenets of ICAO – that key features, of Annex 13 at international level are as a 'diplomatic tool', that ICAO addresses socio-political issues at a national level and that, in its 'overarching safety dimension', it provides validated feedback to safety actors, paving the way for safety data analysis.

He added that Annex 13 provisions are based on very practical aspects and common sense. Investigators need to get access to the information where it is located, which is in the States where the aircraft is registered, operated, built and designed. Likewise, the regulator, operator, manufacturer, and others, need access to the data collected by investigators in case they have to take remedial actions to fix an urgent safety issue. This international two-way flow of safety data is one characteristic of the Annex 13 system with the privileges and duties of Accredited Representatives and Technical Advisors. This is really a diplomatic tool where ICAO contracting states talk to each other via their accident/incident investigation authorities, the Technical Advisors remaining under the control of independent authorities. The overall consultation process enables all parties to have access to data and to comment. The process is transparent while the control of communication remains the privilege of the State conducting the investigation, generally the State of Occurrence. This balanced system

has worked well along the years as Annex 13 is well known and accepted by contracting States as it respects sovereignty.

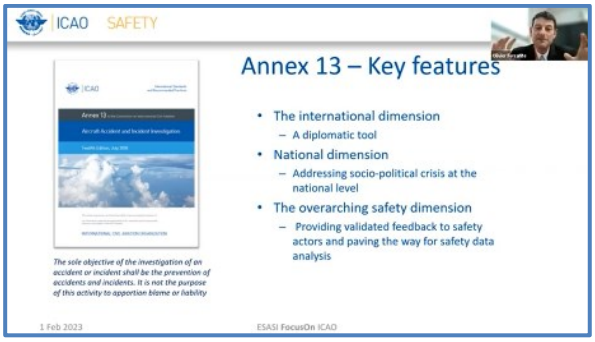
Discussing the AIG Panel, Olivier pointed to the 'Directives for Panels of the Air Navigation Commission' (Doc 7984); this explains how a Panel is a technical group of experts formed by the ANC, to advance solutions to problems and develop Standards. The work programme is approved by the ANC, the Panel is supported by the ICAO Secretariat and another flow chart showed that it generally takes 'about 2 years' between draft SARPs being issued by the AIGP and final implementation of the Revised Annex. AIG Panel meetings are typically 'in person' (this was somewhat disrupted during the COVID period) and over 4 days, usually in Montreal. The next AIGP meeting is scheduled for May 2023.

Article 38 of the Convention enables ICAO States to notify 'differences' from international standards. In this process, States notify ICAO of differences to Standards and ICAO notifies other states by publishing these differences; a 'difference' is normally equivalent to a 'finding' in the ICAO USOAP audit program. The process is now done electronically, rather than through the Annexes, and ICAO maintains an EFOD (Electronic Filing of Differences) database.

Olivier then discussed current AIGP work, including the 'State Letter' of October 2022 which carries the content of current proposed amendments. These include: 'Investigations involving unmanned aircraft', 'Release of investigative information', 'GADSS data and information', 'Consultation period of Final Reports' and 'International Dissemination of Final Reports'. He also laid out some current topics within the AIGP, including 'unlawful interference', 'investigations in conflict-of-interest scenarios (aircraft downings)', 'regional co-operation', 'transparency & protection of sensitive information', 'timely release of final reports' and 'follow-up from the symposium on family assistance'.

Olivier concluded with his views on the strengths of Annex 13 – that it is relatively concise, well known to ICAO States, flexible to cope with all types of situations and that it can evolve to address a fast-changing environment.

In the brief Q&A, Olivier was asked about "any chance to reduce time for rule changes where technology is changing rapidly?". He replied that the AIGP is trying to improve timeliness – but a proposal does need to be understood all the way around the world in different languages. 'Too fast' can result in misunderstanding and poor interpretation – Olivier had seen examples where he read discussion in English but sometimes translation into French can bring in unexpected differences.



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Kate Fitzgerald, chairing, closed this ESASI 'FocusOn…' webinar with thanks to the presenters and participants.

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