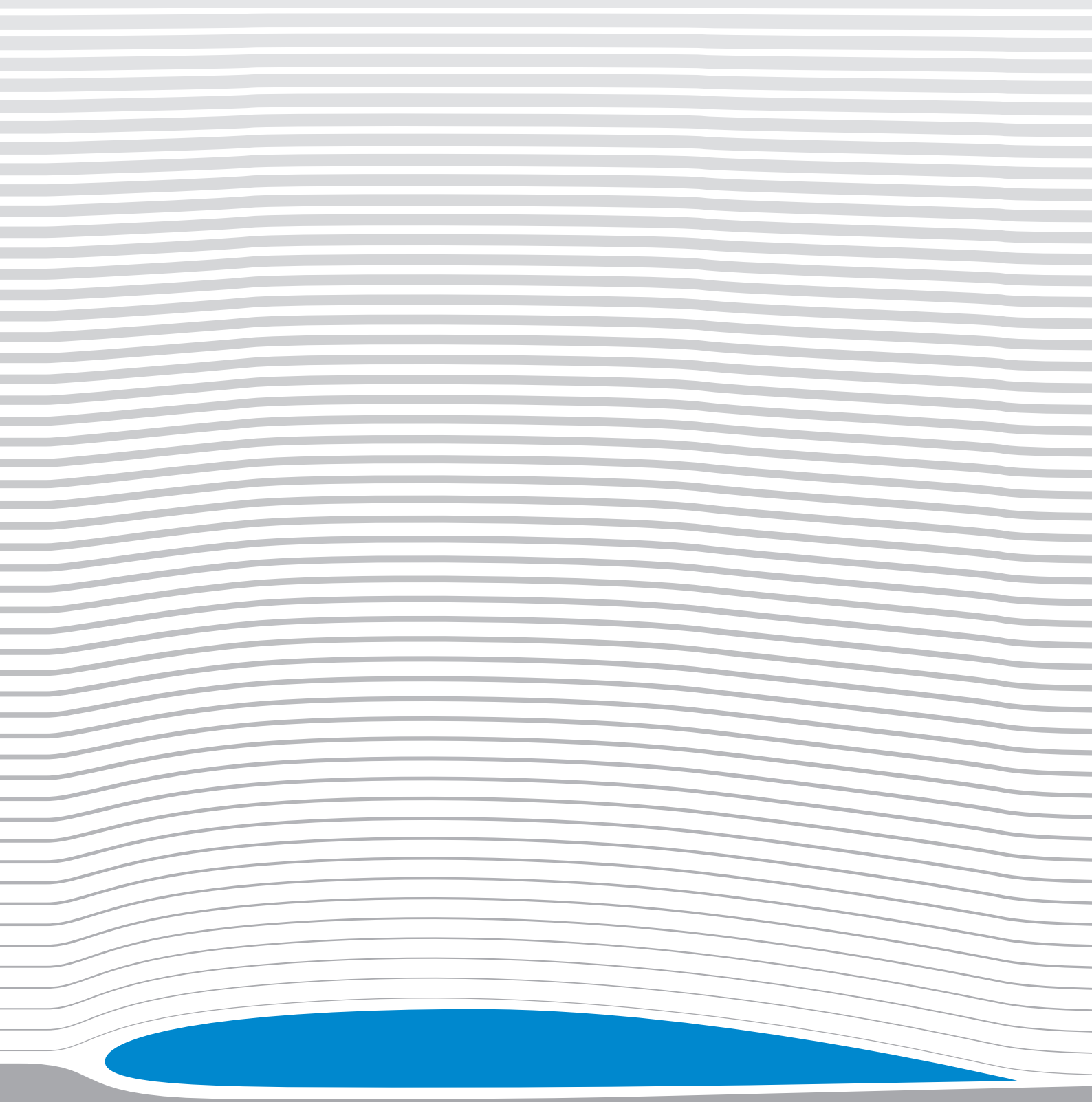
EASA
European Aviation Safety Agency

ANNUAL SAFETY RECOMMENDATIONS REVIEW 2016



EUROPEAN AVIATION SAFETY AGENCY
SAFETY ANALYSIS AND RESEARCH DEPARTMENT

Designed in Luxembourg

EASA
European Aviation Safety Agency

Strategy & Safety Management Directorate
Safety Intelligence & Performance Department

Annual Safety Recommendations Review 2016

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The Annual Safety Recommendations Review is produced by the European Aviation Safety Agency (EASA). This edition provides an overview of the safety recommendations that have been addressed to EASA in 2016. It also presents the replies produced during the year.

This annual review aims at providing a feedback on the follow-up given to safety recommendations in the context of openness, transparency and accountability that characterises the European Public Administration.

Apart from its safety related information character, this review is also expected to provide relevant information related to raised safety concerns, both for EASA itself, as well as its stakeholders, including the European public.

Foreword by the Executive Director

I am pleased to introduce the 10th edition of the Annual Safety Recommendations Review, which provides information on the activity of the Agency in 2016 in the field of safety investigation and follow-up. In addition, the review highlights a range of safety issues and the Agency's safety improvement efforts that are of interest to the European Aviation Community and the public.

During the last 10 years the Agency has become the main actor in safety investigation follow-up within Europe through rigorously processing safety recommendations that have been addressed to it. Owing to EASA's positioning in the system, the Agency is able to take action with respect to systemic problems and other issues in the management of risk.

The implementation of safety recommendations provides tangible improvements in safety as a result of information that has been learned during safety investigations. In Europe, the methodical approach to investigatory work and the implementation of recommendations brings some meaning to the loss experienced as a result of accidents.

During 2016, Safety Investigation Authorities from 18 different States addressed 88 safety recommendations to EASA in the context of the Agency's remit. Therefore, the handling of the safety recommendations in both an expeditious and responsible manner constitutes one of the pivotal responsibilities for EASA.

EASA also monitors safety recommendations issued to other aviation and non-aviation addressees. As during 2015, the number of recommendations that were issued to non-aviation addressees has continued to increase in 2016. Such recommendations include those related to drones, research, crew employment, passenger health and criminal acts. Updating the EASA Basic Regulation will aid the Agency to better regulate, thereby giving effect to safety recommendations.

This further illustrates the dynamic nature of the aviation environment and it also means that the framework in which the Agency operates must be continuously reviewed.

In preparing for the challenges ahead, areas for consideration include the safety of ground handling services and security aspects of aircraft and aviation system design, including cybersecurity. Despite the fluidity of the aviation environment created by external factors and technological changes, the system will continue to ensure safe and secure air transport for passengers and the general public.

Patrick Ky
Executive Director

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Abbreviation list

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AD	Airworthiness Directive
AFM	Aircraft Flight Manual
AAIB UK	Air Accidents Investigation Branch United Kingdom
AMC	Acceptable Means of Compliance
ANSV	Italian National Agency for the Safety of Flight
BEA	Bureau d'Enquête et d'Analyse pour l'Aviation Civile
CAT	Commercial Air Transport
CM	Certification Memo
CRI	Certification Review Item
CRM	Crew Resource Management
CS	Certification Specifications
CS-LSA	Certification Specifications for Light Sport Aeroplanes
CVR	Cockpit voice recorder
DSB	Dutch Safety Board
ELT	Emergency Locator Transmitter
ENCASIA	European Network of Civil Aviation Safety Investigation Authorities
EPAS	European Plan for Aviation Safety
ETOPS	Extended Operation
ETSO	European Technical Standard Order
EU	European Union
FAA	Federal Aviation Administration
FCOM	Flight Crew Operating Manual
FDM	Flight Data Monitoring
GA	General Aviation
GM	Guidance Material
HOFO	Helicopter Offshore Operations
ICAO	International Civil Aviation Organization
ICCAIA	International Coordination Council for Aerospace Industry Associations
ILS	Instrument Landing System
LOC-I	Loss of control-inflight
MOPSC	Maximum Operational Passenger Seating Configuration
MS	Member States
NCO	Non-Commercial operations with Other than complex motor-powered aircraft
PED	Portable Electronic Devices
RE	Runway Excursion
RMT	Rulemaking task
SIA	Safety Investigation Authority
SIB	Safety Information Bulletin
VFR	Visual Flight Rules

Introduction

Introduction

At the European Union level, the principles governing the investigation of accidents and serious incidents are defined in Regulation (EU) No 996/2010 of the European Parliament and of the Council of 20 October 2010 on the investigation and prevention of accidents and incidents in civil aviation.

Regulation (EU) No 996/2010 implements international standards and recommended practices as described in Annex 13 to the Chicago Convention on International Civil Aviation. It sets down an obligation for each Member State of the European Union (EU) to establish an independent permanent national civil aviation safety investigation authority, which shall investigate accidents and serious incidents in order to improve aviation safety and prevent future occurrences without apportioning blame or liability. Investigation reports and the related safety recommendations shall be communicated to the concerned aviation authorities for consideration and appropriate action, as needed.

Regulation (EC) No 216/2008, which established EASA, states that "Results of air accident investigations should be acted upon as a matter of urgency, in particular when they relate to defective aircraft design and/or operational matters, in order to ensure consumer confidence in air transport".

EASA assigns a high priority to the follow-up of safety recommendations and has established effective procedures to that effect:

- EASA delivers the first response to incoming recommendations within 90 days;
- The safety recommendations process is subject to continuous internal monitoring until all corrective actions are closed;
- The Agency receives assessments of its responses from Safety Investigation Authorities and can identify when opinions diverge. In this context, EASA considers the assessment given by the safety investigation authority on the appropriateness of the mitigation measures when closing the recommendation.

All safety recommendations must be taken into full consideration by the organisations to which they are addressed. In this context, the Agency maintains transparency with respect to its decisions and actions, in line with its safety mission. The Agency will maintain the current levels of cooperation in working with the European Network of Civil Aviation Safety Investigation Authorities (ENCASIA) - WG6 on Safety Recommendations.

Furthermore, EASA is also monitoring safety recommendations that are issued to other aviation and non-aviation addressees. The types of safety recommendations that are listed below have noticeably increased over the past 2 years:

- Safety recommendations of Union-wide Relevance (SRUR) and with Global Concern (SRGC), addressing mainly systemic safety concerns;
- Safety recommendations addressing new developments on national level, such as safety recommendations related to increasing number of unmanned aircraft systems (drones/RPAS);

- Interdisciplinary safety recommendations addressing non-aviation entities, such as those relating to cumulative- events or to studies, safety recommendations related to cabin air quality in commercial air transport addressing a wide range of actors in the field of research, crew employment or health of passengers;

- Security related safety recommendations, such as criminal acts affecting (interference) aircraft, crew-members, aviation critical infrastructure or the safety of airspace over conflict zones.

The Annual Safety Recommendations Review provides an overview on the follow-up performed by EASA in response to recommendations addressed to the Agency by Safety Investigation Authorities in relation to the investigation of Accidents and Serious Incidents or originating from safety studies.

The first edition of this review was issued in 2007. This 10th edition reviews the 2016 activity and presents:

- General statistical data on the safety recommendations addressed by safety investigation authorities to EASA in 2016;

- Replies that EASA has given to safety recommendations in 2016 and;

- Safety topics that have been processed with actions taken.

Since 2011, a process to assess and mitigate safety risks at the European level has been established. At the heart of this system is the concept of safety risk management, comprising hazard identification, risk assessment and decision-making resulting in on the best agreed course of action to mitigate those risks. EASA, Member States (MS) and industry work closely together in this process. At the European level, this process is coordinated by the Agency and documented in the European Plan for Aviation Safety (EPAS).

The EPAS identifies the key safety issues as well as the agreed safety actions to resolve or mitigate the hazards.

Safety recommendations are one of the key inputs to the safety risk management process. They provide information on the hazards as well as proposed solutions to mitigate the associated safety risks to the aviation system.

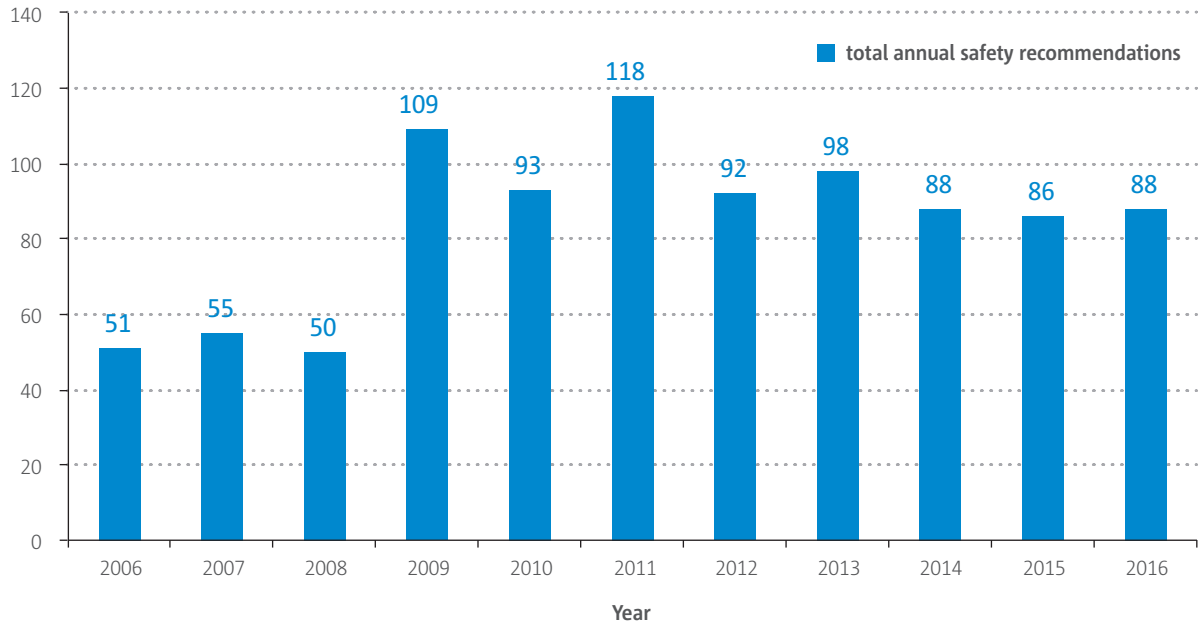
Safety Recommendations received in 2016

Safety Recommendations received in 2016

2.1 Overview of Safety Recommendations received in 2016

During 2016, EASA received a total of 88 safety recommendations. Figure 1 shows the total annual number of safety recommendations that the Agency has received over the last 10 years. The exchange of safety recommendations and the role of EASA in that regard is enforced by the adoption of Regulation (EU) No 996/2010. The issuance of safety recommendations addressed to EASA started to develop shortly before this regulation came into force in 2010.

Figure 1: Safety Recommendations addressed to EASA per year

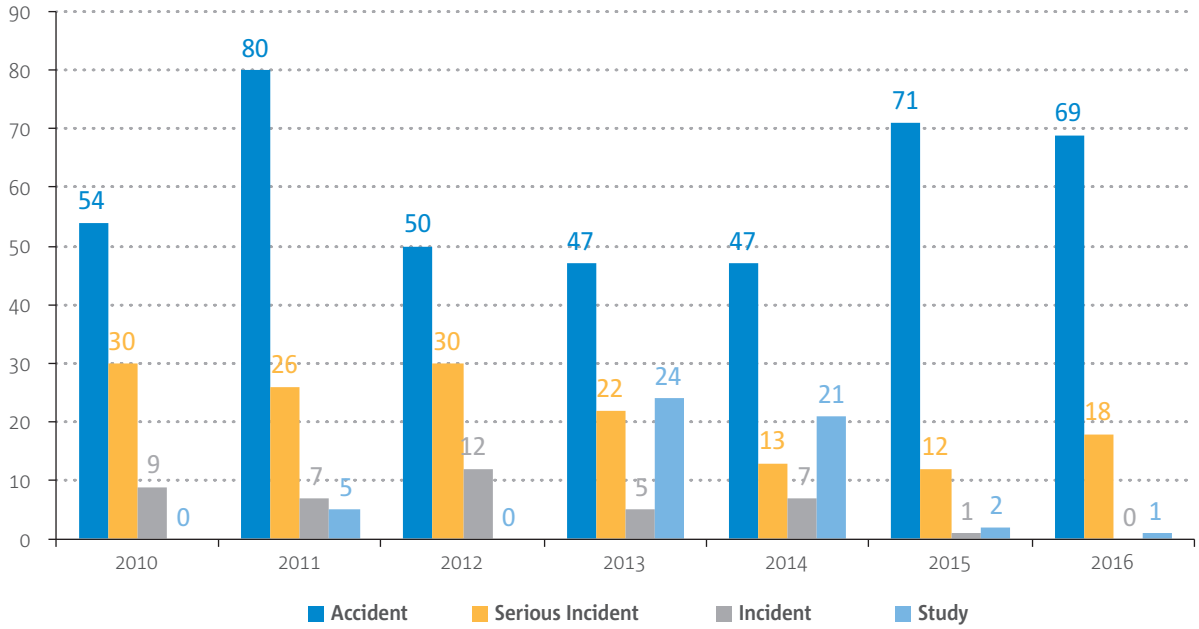


Since 2014, the total annual number of safety recommendations addressed to EASA has remained constant.

In 2016, the safety recommendations were related to one study and 41 different occurrences comprising 30 accidents and 11 serious incidents.

Figure 2 shows the total number of safety recommendations by different occurrence classes since 2010.

Figure 2: Safety Recommendations by occurrence class per year



The aircraft categories involved in the occurrences that led to safety recommendations in 2016 are listed in the table below.

Figure 3: Safety Recommendations received in 2016 by aircraft category

Related to aircraft category	Safety Recommendations received in 2016
Fixed wing	54
Rotorcraft	29
Hybrid	2
Lighter-than-air	1
Other*	2
Total	**88**

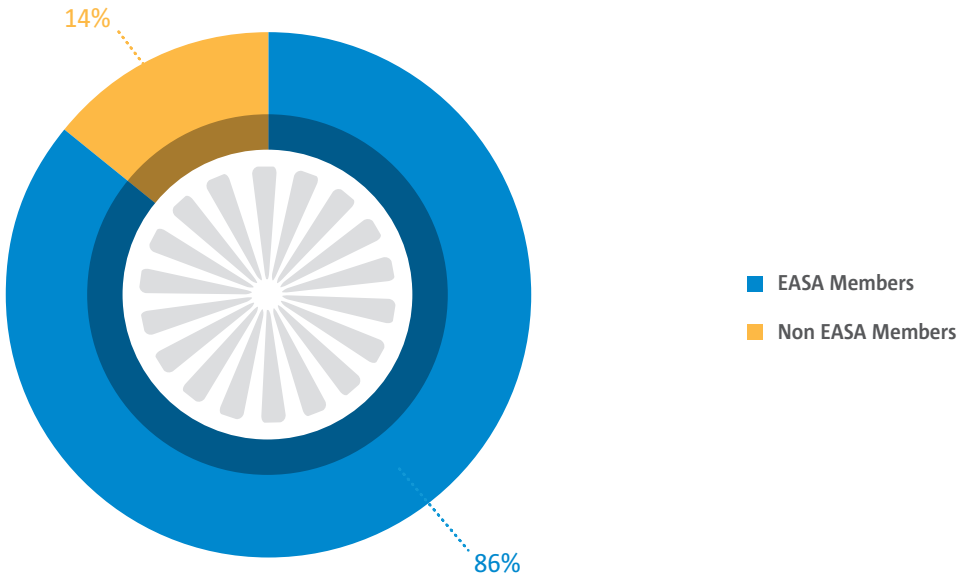
*Including safety recommendations stemming from one study and one collision related to two different aircraft categories [Rotorcraft-Fixed wing]

2.2 Origin of the Safety Recommendations received in 2016

In 2016, Safety Investigation Authorities of 18 different States addressed 88 safety recommendations to EASA.

Figure 4 shows the percentage distribution of safety recommendations between EASA Member States and non EASA Member States that were addressed to EASA in 2016. The chart shows that EASA Member States issued 86 % of the safety recommendations that were received by EASA in 2016.

Figure 4: Origin of Safety Recommendations received by EASA



A safety study with one safety recommendation was also received. This safety study was initiated by the AAIB UK. Within the scope of General Aviation (GA) the study reviewed common airworthiness issues related to several fatal accidents involving aircraft registered overseas, but resident and operated within the United Kingdom (UK).

Almost 35% of the safety recommendations received in 2016 were related to 3 major occurrences as follows:

1. An accident involving a Eurocopter AS332 L2 Super Puma on approach to Sumburgh Airport in the Shetland Islands on 23 August 2013. The subsequent investigation resulted in 20 safety recommendations being addressed to EASA;

2. The crash of an Airbus A320 in the French Alps on 24 March 2015 due to an intentional descent effected via the autopilot until the aeroplane collided with the terrain (accident resulted in 6 safety recommendations to EASA);

3. Loss of control inflight of a Piper PA31T on 28 October 2011 on approach to Toulouse Blagnac Airport (accident with 4 safety recommendations to EASA).

The safety recommendations EASA received from non-EASA Member States are related to the following occurrences:

- An accident involving an MD-83 on 24 July 2014 in Mali, where the aircraft stalled in icing conditions was investigated by the Malian Authority with BEA - France, acting as a technical advisor, resulted in 3 joint safety recommendations to EASA.

- An accident involving an ATR-GIE Avions de Transport Régional ATR72-212A (ATR72-600) on 4 February 2015 in the vicinity of Taipei's Songshan Airport caused by a loss of control during initial climb and subsequent impact with terrain. The accident investigation was conducted by the Aviation Safety Council – Taiwan and produced 3 safety recommendations to EASA.

- The failure of the left-wing landing gear to extend (SCF-NP: System/component failure or malfunction [non-powerplant]) on an Airbus A380 on 9 November 2016 while enroute from London Heathrow to Dubai resulted in a serious incident. The incident was investigated by the United Arab Emirates - AIB and 2 safety recommendations were addressed to EASA as a result.

- The UAE AIB investigated an accident that occurred in Dubai on 22 January 2014, involving an Airbus Helicopter EC-130B4. The accident was caused by a loss of control inflight (LOC-I) followed by an impact/hard landing with the heliport. The investigation addressed 2 safety recommendations to EASA.

- The United States National Transportation Safety Board (NTSB) investigated two separate helicopter accidents that occurred in 2015, involving a AS350 B3e and a EC130 B4. The impact forces were survivable but fatal and serious injuries were suffered by the occupants as a result of the crash impact and post-crash fire. The investigation found the the need for a crash-resistant fuel system for rotorcraft and addressed 1 safety recommendation to EASA.

- On 20 October 2014 at Vnukovo Airport in Moscow a runway incursion (RI): collision between a Falcon 50EX aeroplane, which was taking-off, and a snowplow occurred. The accident was investigated by the Russian Federation Interstate Aviation Committee Commission and 1 safety recommendation was addressed to EASA.

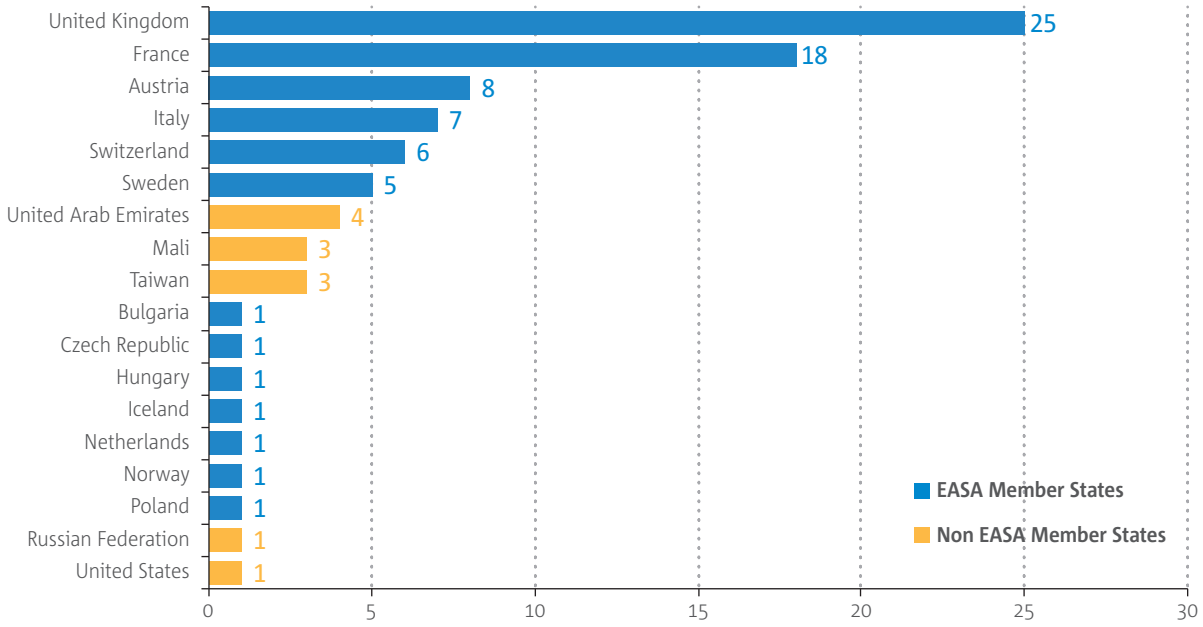
Safety recommendations coming from non-EASA Member States mainly addressed actions that had already been identified by EASA and the safety actions were already in progress. The recommendations were mainly focussed on mandatory upset recovery training, including consideration on initial training, and the extension of the icing environment to be used for the certification of large aeroplanes. In addition, non-EASA Member States recommendations also triggered the development of crash-resistant fuel systems for helicopters to reduce post-impact fire.

Figure 5 shows the contribution of different States world wide to the safety recommendations that were addressed to EASA in 2016. AAIB-United Kingdom and BEA-France issued the highest number of safety recommendations.

The AAIB-United Kingdom issued 25 safety recommendations that were related to 1 study and 3 different occurrences, all of which occurred in the United Kingdom (UK). The high number of recommendations coming from one of the main contributing events, as described in the previous chapter, that resulted in 20 safety recommendations being addressed to EASA. The recommendations addressed a wide scope of different subjects: The certification of rotorcraft, Helicopter Flight Data Monitoring and offshore helicopter survivability. An EASA internal safety action group has been set up with experts from several disciplines, in particular Safety Analysis, Air Operations, Rulemaking and Certification Experts.

The BEA France issued 18 safety recommendations that were related to 7 different occurrences. The amount of safety recommendations is coherent with two of the three main contributing events, as described in the previous chapter.

Figure 5: States contribution to Safety Recommendations received in 2016



2.3 Involvement in the safety investigations

In 2016 several investigations of major fatal accidents have been opened and or conducted. The Agency's role in the field of aircraft accident and incident investigation is mostly focused on following-up on the progress of aircraft accident and incident investigations, for the Agency to be represented in investigations and give technical expertise to investigations whenever needed.

Below is a list of 2016 accident and incident investigations where EASA was closely involved, mainly through the appointment of an EASA Technical Advisor:

- An accident involving AIRBUS Helicopter H225, registration LN-OJF, occurred on 29 April 2016 at Turdøy, near Bergen. The investigation was led by AIBN;
- An accident caused by a loss of control – inflight during a commercial cargo flight from Oslo/Gardermoen Airport to Tromsø/Langnes Airport occurred on 8 January 2016 and involved a Bombardier CL-600-2B19, registration SE-DUX. The investigation was led by the Swedish Accident Investigation Authority – SHK. The investigation is now closed and the final report has been issued;
- An accident involving a B737-8KN, registration A6-FDN, occurred at Rostov on Don (Russia) on 19 March 2016, during go-around. The aircraft was destroyed with no survivors. The Russian MAK is leading the investigation. It was not possible to appoint a technical advisor but EASA is closely following the investigation;

- An accident involving an A320-232, registration SU-GCC, occurred during cruise at flight level 370 on 19 May 2016. The flight data recorder and cockpit voice recorder were both recovered from the Mediterranean Sea and were analysed with the support of the BEA. The investigation is being led by Egyptian Safety Investigation Authority;

- An accident involving a B777-31H, registration A6-EMW, occurred in Dubai during an attempted go-around on 3 August 2016. The aircraft slid off the runway and caught fire. The investigation is being led by the UAE Safety Investigation Authority;

- Two events occurred involving an ATR72 aeroplane, with registrations OY-JZC and G-COBO, and characterised by a partial loss of control during climb in icing conditions. The events occurred on 14 November 2016 in Norway, with the AIBN leading the investigation and on 21 December 2016 in the United Kingdom with the AAIB UK leading the investigation;

- An investigation involving a B787, registration 9V-OJF, occurred on 26 November 2016 and is being led by Singaporean Safety Investigation board. The event is related to the failure of a RR Trent 1000 engine, from which compressor blade detached;

- An accident involving a BAE146, registration CP-2933, occurred on 29 November 2016 on approach to Santa Cruz (Colombia). The Colombian Safety investigation Authority is leading the investigation;

- An accident involving an ATR42-500, registration AP-BHO, that crashed during flight from Chitral to Islamabad (Pakistan) on 07 December 2016. The investigation is being led by the Pakistani Safety Investigation Board.

Thus, ad-hoc actions during an investigation that were taken immediately do not appear in this publication if a Safety Investigation Authority did not issue safety recommendation to EASA.

Safety Recommendations replies in 2016

Safety Recommendations replies in 2016

3.1 Overview of Safety Recommendations replies in 2016

In 2016, EASA issued 196 replies to 177 safety recommendations. Regular updates were provided meaning that there may be several response letters issued for the same recommendation in a given year. The main volume of replies produced in 2016 were EASA responses to recommendations that were received in 2015 and 2016.

However, replies to recommendations from earlier years were also issued, per the table below, for those cases where action follow-up and conclusions were issued, which necessitate updates and or closure of the safety recommendation.

Figure 6: EASA responses to safety recommendations in 2016 by year received

Year Recommendation received in	Number of replies sent in 2016	Including Final Replies
2006	3	2
2007	2	0
2008	4	0
2009	6	3
2010	6	3
2011	20	13
2012	5	2
2013	19	6
2014	21	11
2015	30	18
2016	80	22
total	**196**	**80**

3.2 Status of the Safety Recommendations replies in 2016

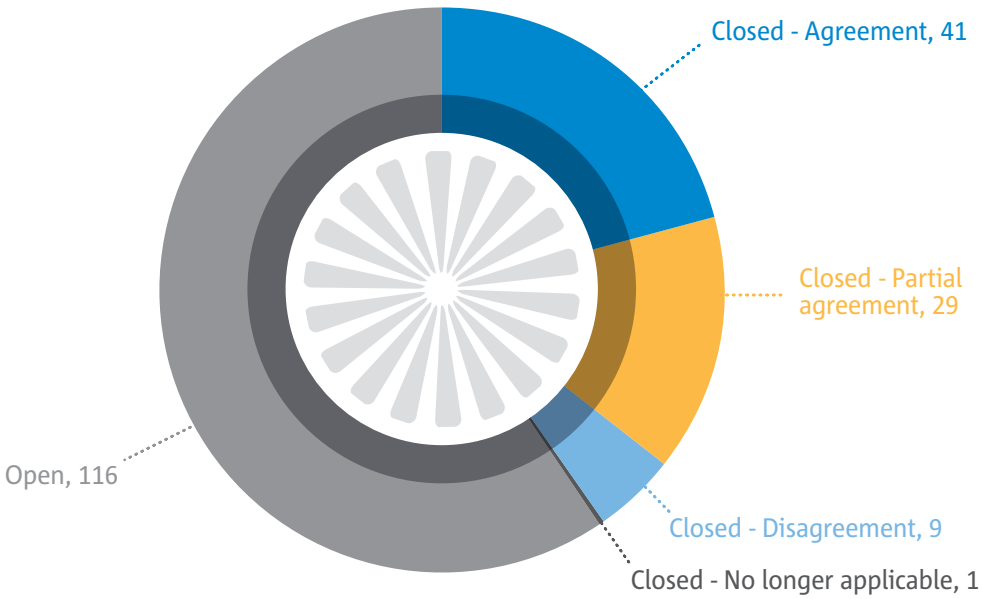
Each reply closing a safety recommendation and the response assessment by the originators classified according to the categories[1] is given in Annex C.

Among the 196 replies summarised above sent by EASA in 2016, 80 were final replies that closed safety recommendations with the following EASA response category distribution:

- EASA agreed to take corrective actions on 70 cases either by directly applying the recommended actions as was the case for 41 of them, or by partially agreeing to take corrective action for 29 of them. In partially agreeing, the Agency recognises the safety issue but took other corrective actions than that which was recommended;

- In another 9 cases, the safety recommendations were evaluated and the safety benefit was not agreed with. Figure 7 below shows this distribution.

Figure 7: Safety Recommendation Responses sent in 2016



In order to monitor safety recommendations, their status remains open until the proposed action related to each recommendation is fully developed and published.

In addition to the 80 closing replies, 116 updating replies were also issued. These updating replies provided information on the progress of the actions decided upon by the Agency and for which the relevant activities were not yet completed.

1 These definitions of classification categories are developed in collaboration with European Safety Investigation Authorities and are part of a taxonomy aimed at facilitating the management of safety recommendations.

To follow-up whether or not the competent Safety Investigation Authority (SIA) considers the response/reply as adequate or disagrees with the proposed action that EASA has implemented in compliance with Regulation (EU) No 996/2010.

Figure 8 shows the total number of response assessments that EASA has received, based on the 80 final replies that were sent in 2016. As assessed, 75% of the responses provided by the Agency were deemed to be "adequate", and 15% as being "not adequate".

Figure 9 provides a more detailed view of the recommendation assessment/classification as determined by the addressee.

Figure 8: Received response assessments of EASA Final Replies sent in 2016 (Status: 14.03.2017)

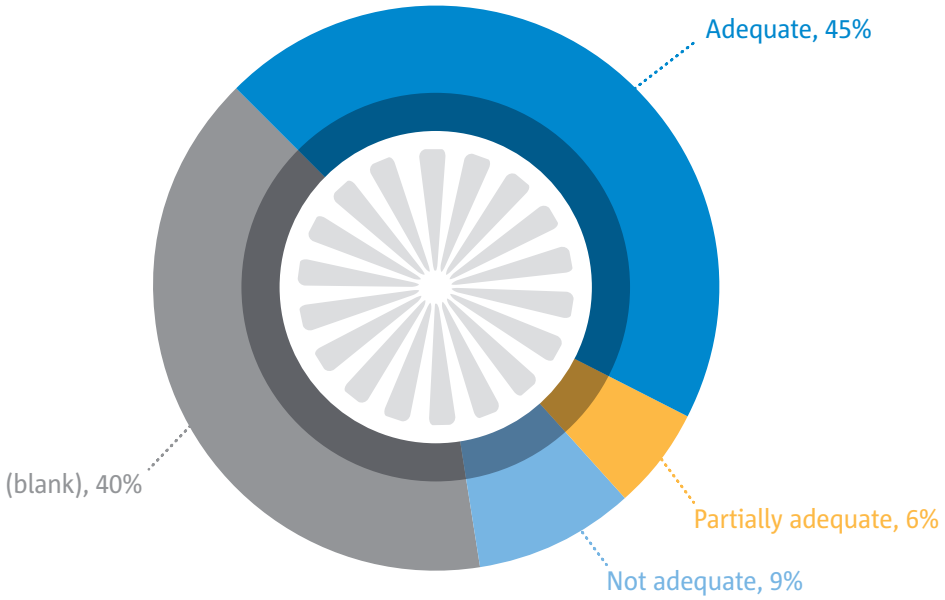
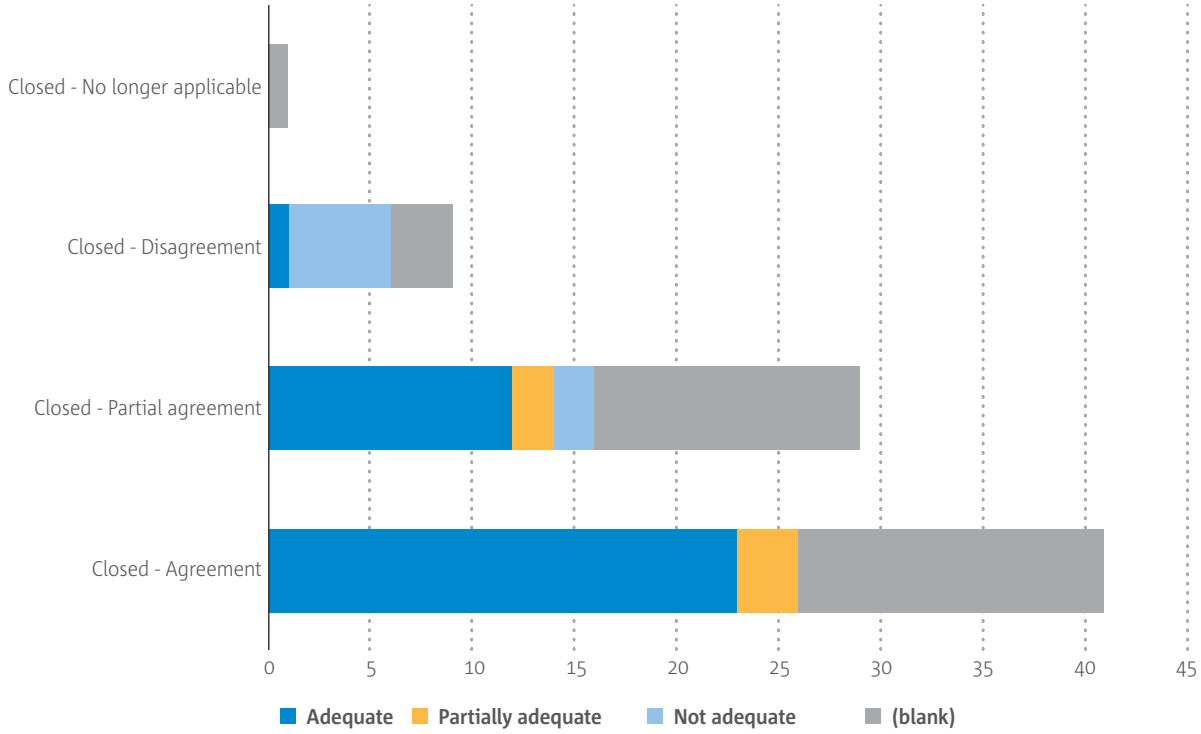


Figure 9: Assessment EASA received on the Final Responses sent in 2016 [total] (Status: 14.03.2017)

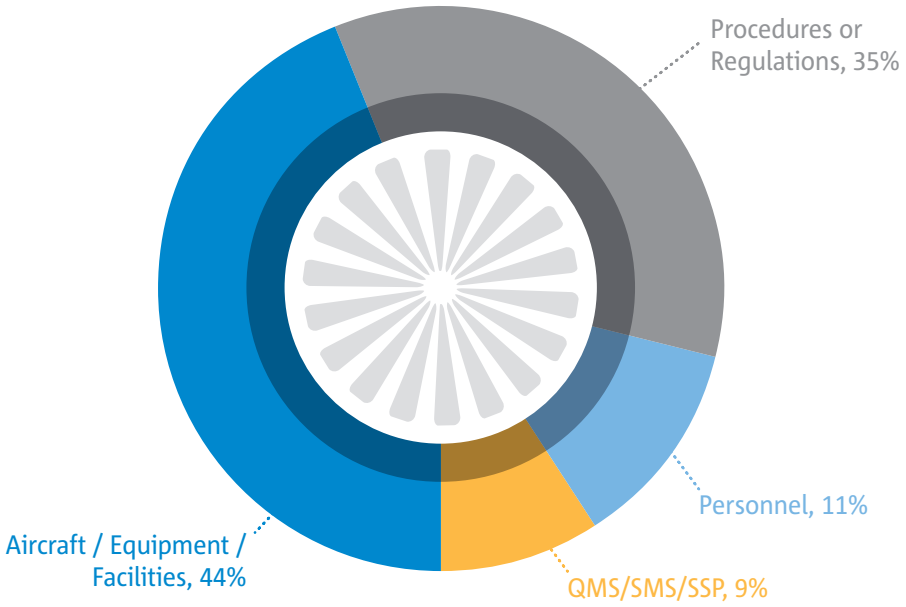


Overview of key safety topics processed and actions carried out in 2016

Overview of key safety topics processed and actions carried out in 2016

In 2016, Safety Investigation Authorities from 18 different States issued 88 safety recommendations to EASA that addressed proposals in all EASA's remits. Figure 10 provides a percentage breakdown of the safety recommendation topics. Among the safety recommendations, 40 were classified as being of Union-wide Relevance and 20 as being of Global Concern (SRGC) by the European SIAs. Thus, the handling of the safety recommendations in both an expeditious and responsible manner constitutes one of the pivotal responsibilities for EASA.

➡ Figure 10: Safety Recommendations addressed to EASA per topic



The figure 10 provides information on the main topics by safety recommendation, according to the taxonomy used in the European Safety Recommendation Information System (SRIS). The majority of safety recommendations that EASA received in 2016 make proposals for aircraft or aviation-related equipment or facilities.

For the safety topic "Aircraft / Equipment / Facilities", the 43 safety recommendations addressing aircraft or aviation-related equipment or facilities are further distributed as follows:

- 30% safety equipment and 26% aircraft equipment that address various topics such as collision warning systems for general aviation, monitoring systems such as sensors, exits and side-floating capability for helicopter,

- 23% - aircraft systems, addressing the design of autopilot system, software, fuel systems, standards for Terrain Awareness and Warning Systems etc.;
- 16% - recorded data systems, addressing flight recorders on light aeroplanes, recording flight crew actions in the cockpit, parameters and design for FDR etc.;
- 5% - other, including powerplant, transmission and rotor systems etc..

Only 20 percent of the safety recommendations that EASA received in 2016 addressed safety topics in the fields of personnel [11% Personnel] and quality, safety management system or the safety plan QMS/SMS/SSP, with 11 percent and 9 percent respectively.

Among the actions taken in 2016, several key safety topics are outlined below with accompanying information on the EASA action that was taken. The description highlights the safety issues stemming from the safety recommendations together with the EASA corrective actions that were taken in response. Further, the follow-up of safety recommendations that are classified as having Global Concern (SRGC) and Union-wide Relevance (SRUR) are also dealt with.

4.1 Medical and psychological conditions of flight crew

The tragic crash of an Airbus A320 in the French Alps on 24 March 2015 due to an intentional descent piloted via the autopilot until collision with terrain, reminded the international aviation community that the medical and psychological conditions of flight crews, if not detected, can lead to a catastrophic outcome.

In the aftermath of the accident investigation led by BEA France 6 safety recommendations were issued to EASA, all classified with Global Concern (SRGC) and Union-wide Relevance (SRUR).

At the date of the publication of this report, all of them have been closed with final replies.

EASA Actions:

In May 2015 an EASA-led taskforce was convened by Transport Commissioner Mrs Bulc. In the summer of the same year the taskforce issued six recommendations, highlighting the need to look more closely at pilot assessment and to develop better support systems for pilots and aeromedical examiners.

The Task Force led by EASA recommended to:

- Maintain the 2-persons-in-the-cockpit recommendation;
- Develop psychological evaluation for airline pilots;
- Mandate drugs and alcohol testing;
- Establish a robust oversight programme of the performance of aero-medical examiners;

- Ensure that an appropriate balance is found between patient confidentiality, the protection of public safety and the creation of a European aeromedical data repository;

- Implement pilot support and reporting systems, linked to the employer Safety Management System.

In response to the safety recommendations issued by the BEA and the taskforce recommendations, EASA issued an Action Plan on 07 October 2015 to implement the recommendations in the areas of air operations, aircrew, information technology (IT) and data protection[2].

In compliance with this plan, EASA hosted two global Aircrew Medical Fitness workshops in December 2015 and in June 2016 to discuss the implementation of the recommendations

EASA launched a survey for operators on the 2-persons-in-the-cockpit recommendation on 29 January 2016, which led to a revised Safety Information Bulletin (SIB No.: 2016-09) on Minimum Cockpit Occupancy in July 2016.

Finally, EASA published two Opinions as part of Rulemaking Task RMT.0700 'Aircrew medical fitness'. The first Opinion includes an update of the rules concerning the medical fitness of pilots, Annex IV (Part-MED) of Commission Regulation (EU) No 1178/2011, and was published in August 2016. The second Opinion was published in December 2016 and includes proposals for new operational rules to better support psychological wellbeing of pilots. EASA is also developing a data repository of medical certificate. More information is available on the EASA website: **https://www.easa.europa.eu/easa-and-you/aircrew-and-medical/follow-up-germanwings-flight-9525-accident**.

4.2 Helicopter Offshore Operations

In 2016, EASA received 20 safety recommendations stemming from the AAIB UK investigation of the accident on AS332 L2, registered G-WNSB, on approach to Sumburgh Airport on 23 August 2013. These proposals addressed survivability after ditching, image recording in cockpit, safety management, maintenance and training for offshore passengers.

From EASA, the main development was the publication of the EASA ED Decision[3] 2016/022/R of 6 October 2016 amending the EASA Acceptable Means of Compliance and Guidance Material to Definitions, Part-ARO, Part-ORO, Part-CAT, Part-SPA, Part-NCC, Part-NCO and Part-SPO of Regulation (EU) No 965/2012. This was done in order to address the safety risks that were identified for helicopter offshore operations (HOFO) while taking into account new technologies, with a view to establishing a level playing field. The decision has been developed in consideration of the current industry best practices and the additional national requirements of certain Member States. The most significant changes are related to training alternatives for passenger briefings, airborne radar approaches, and survivability in the event of a helicopter capsize.

EASA Actions:

In the context of the internal Safety Action Project on "Offshore Operations in the North Sea", the following related actions have already taken place in 2016:

2 https://www.easa.europa.eu/newsroom-and-events/news/report-task-force-germanwings-flight-9525-european-commission

3 https://www.easa.europa.eu/document-library/agency-decisions/ed-decision-2016022r

- Commission Regulation (EU) 2016/1199 of 22 July 2016 was published with regard to offshore helicopter operations, with a focus on operating procedures and crew training, flight data monitoring, and occupant survivability on impact with water.;

- The Helicopter Accident Data Collaborative Analysis Group (HADCAG) was established to consider appropriate actions to improve the safety of offshore helicopter operations and an offshore helicopter operations safety risk portfolio (SRP) has been compiled, using the occurrence data to assess the risk;

- For several years, EASA has been encouraging manufacturers of larger rotorcraft to provide information on how the rotorcraft should be operated and develop Flight Crew Operating Manuals (FCOM) or similar. EASA welcomed that manufacturers of helicopters used by the offshore industry have voluntarily agreed to produce FCOMs.

- EASA performed in 2016 an industry survey dedicated to the implementation of FDM programmes at helicopter offshore operators. Based on the survey results, first steps were taken to promote FDM good practice toward helicopter offshore operators. In the meantime the Civil Aviation Authority of United Kingdom (CAA-UK) announced its intention to produce 'guidance on best practice' for FDM: refer to CAP1386[4]. This guidance material is foreseen to include 'new or revised "events" or "measurements" to monitor for adherence to company Standard Operating Procedures'. EASA is supporting this CAA-UK project.

- EASA has conducted a Preliminary Impact Assessment (PIA) on the use of Helicopter Terrain Awareness Warning Systems (HTAWS) in helicopter operations. Consequently, rulemaking task RMT.0708 'Controlled flight into terrain (CFIT) prevention with helicopter terrain avoidance warning systems (HTAWS)' has been introduced in the RMP-EPAS 2017-2021.

- EASA has been actively supporting the ICAO task on developing standards for the recording of images in the cockpit that are less susceptible to misuse.

- The EASA NPA 2016-01 was published on 23rd March 2016 for public consultation. Although RMT.0120 was initiated prior to the AAIB UK safety recommendations, this rulemaking task will address a number of the issues that have raised related to the certification specifications for the design of new helicopters. The work of finalising the amendments to the Certification Specifications based upon the comments that were received is on-going. Proposed amendments related to the safety recommendations include the automatic arming and activation of flotation equipment, the size of exits, passenger seat-to-exit ratio, and easier deployment of life rafts;

- The Agency established a working group to review the existing research into pilot instrument scan techniques, particularly with respect to glass cockpit displays. The objective is to identify any potential need for revised training in pilot instrument scan techniques that could improve the effectiveness of the crew monitoring functions.

In addition, EASA also intends to take the following actions:

- EASA is investigating the possibility of amending CS 29 to align it with the Certification Specification and Acceptable Means of Compliance for Large Aeroplanes (CS 25), with regard to the provision of operational information in Flight Manuals and options and is considering launching a study on this subject.

4 Safety review of offshore public transport helicopter operations in support of the exploitation of oil and gas: Progress report 2016.

- EASA intends to assess guidance that is publicly available for helicopters Flight Data Monitoring (FDM) programmes and already established industry initiatives. A survey will also be prepared and circulated to establish the expectations of European helicopter operators with regards to FDM.

- EASA plans to launch a study regarding the recommendation to instigate a research programme to provide realistic data relating to evacuation and survivability of occupants in commercial helicopters operating offshore, to examine the feasibility of such a project considering the limitations on conducting research trials with humans.

4.3 Collisions warning systems for general aviation to mitigate the risk of Mid-air collision/Near mid-air collision (MAC/NMAC)

In 2016, 6 safety recommendations stemming from several occurrences have been received that propose the need for collision warning system for general aviation. In order to mitigate the risk of airborne collisions, these safety recommendations address a wide range of measures, such as general promotion, implementation of standards, expanding requirements for installation (extending minimum equipment) as well as certification of cost-efficient collision warning systems.

EASA Actions:

The European Aviation Safety Plan (EPAS) 2011-2014 contained preliminary actions on mid-air collision/near mid-air collision (MAC/NMAC) by improving the “see and avoid” for general aviation. Among the actions already taken, EASA is facilitating the voluntary installation of electronic conspicuity devices via Standard Changes, as defined in 21.A.90B of Commission Regulation (EU) 748/2012 (refer to CS-SC002a, CS-SC051a in CS-STAN Issue 1 dated 8 July 2015) and installation approvals of this type of devices.

EPAS 2016-2020 is further addressing the issue under the umbrella of “General Aviation Safety”. The latest version of the plan (EPAS 2017-2021) addresses and takes further actions on MAC/NMAC in general aviation, under the umbrella of “General Aviation - Preventing mid-air collisions”.

In addition, EASA is in the process of publishing a CS-ETSO for Traffic Awareness Beacon System (TABS). There are currently several technical solutions for general aviation for electronic conspicuity devices with varied strengths and weaknesses. The main concern is the interoperability between all these solutions.

EASA continuously monitors the development of new technologically cost-effective solutions and has begun work on examining all possible actions that might reduce the number of airprox and of mid-air collisions in the uncontrolled airspace in Europe.

4.4 Erroneous Parameters at Take-off

The investigation reports and studies related to a number of accidents and serious incidents worldwide have highlighted a safety issue related to the use of erroneous mass data or take-off performance data. The analysis conducted showed also that various aircraft types have been involved making this a general safety concern.

This SIB focuses mainly on errors induced by flight crew when entering data in the Electronic Flight Bag (EFB) or Flight Management system (FMS) during the flight preparation phase and the lack of efficient cross-check between flight crews. The main contributing human factors to such errors are time pressure and task interruptions with the consequences being take-off initiation without adequate thrust, or attempted rotation at an airspeed which is too low for the actual aircraft mass, or with insufficient runway length remaining. In some cases there were no further consequences, but in many of the cases investigated the safety issue resulted in a tail strike, a collision with obstacles, a runway overrun following an aborted take-off and, in the most severe situations, the loss of the aircraft.

The investigators found that, in most cases, the flight crew had entered inadequate values related to take-off mass, safety speed values or target take-off thrust into the Flight Management System (FMS) in relation to the runway in use.

EASA Actions:

On 16 February 2016 EASA published SIB No.: 2016-02, in conjunction with procedures and guidance as provided by the aircraft manufacturers, with the purpose of:

- Raising awareness of the specific hazard to flight crews, operators and competent authorities;
- Providing recommendations to operators on the completion of a specific safety risk analysis and assessment related to this issue in order to assess the effectiveness of mitigations in place and to determine the need for additional or alternative actions;
- Providing recommendation on training items to be emphasised during flight crew initial and recurrent training in order to increase awareness on the issue; and
- Providing recommendations on the use of the operator's Flight Data Monitoring (FDM) programme in order to identify precursor events.

As a follow-up, EASA launched an EU survey later in the year to obtain feedback from operators on actions that were taken following the publication of the SIB. The results of the survey are being analysed in the framework of a PIA and will be used to determine whether additional actions should be defined.

Further, EASA is supporting EUROCAE in developing a Minimum Operational Performance Specification for Onboard Weight and Balance Systems. Currently, the deliverable is expected in Q2 2018.

4.5 Cabin Air Quality

Cabin air quality in commercial air transport continues to be topical with reports of 'fume', 'smoke', or 'bad smell' events observed every year. Recommendations have been made on training crews to recognise and manage a cabin air contamination (CAC) event, the mandatory usage of emergency protective equipment, the installation

of technical air monitoring systems, such as sensors that have been combined with appropriate filter systems, and also to conduct further research on toxicity aspects.

In 2016 interdisciplinary safety recommendations were also addressed to other 'non-aviation' entities, e.g. in the field of occupational safety and health, that recommended research on the impact of contaminated cabin air in aircraft on the human body in order to minimise the potential negative health effects for persons affected.

EASA Actions:

EASA decided to commission two studies, launched in 2014 and 2015 respectively, in order to eaxmine the quality of cabin air in large transport aeroplanes, together with associated health and safety implications and the studies are complementary.

In-flight cabin/cockpit air measurements (ref EASA.2014.OP.16): The study aims to determine if there are any safety and or potential long or short-term health risks resulting from the exposure to normal operating conditions, cabin air contaminations and or to cabin air contamination (CAC) events.

The study encompasses the following tasks:

Task 1: The development of a knowledge base and inventory of potential contaminants and detecting instruments

Task 2: Measurement Campaign

- The preparation of preliminary measurement campaign
- The implementation of preliminary measurement campaign

Task 3: Developing recommendations for a large scale project plan and or design

Aviation turbine engine oil toxicity (ref. EASA.2015.HVP.23): The study aimed to understand and describe the toxic effects of chemical compounds that are released into the cabin or cockpit of transport aeroplanes. The study is aimed at understanding the toxic effects of aviation turbine engine oil as a mixture of compounds, including potential pyrolysis breakdown products. The toxic effects of the mixture will be characterised at the pulmonary and neuronal level, considering the primary routes of exposures and mode of toxicity. Additionally, identification of suspected toxic individual compounds is provided to assess individual susceptibility. The overall aim is to integrate these aspects based on already available material and experimental results, to provide a solid basis for steps towards a recommendation of Threshold Limit Values for the identified chemicals.

The study encompasses of the following tasks:

Task 1. Performaing a scientific literature review and selecting applicable engine/APU oils

Task 2. Designing a testing methodology for the chemical characterisation and toxic effects of these oils after pyrolysis

Task 3. Performance of the chemical characterization and toxic effects of the oils after pyrolysis

Task 4. Analysis of the human sensitivity variability factor

The final reports from these two EASA studies is on the EASA website: **http://www.easa.europa.eu/newsroom-and-events/press-releases/easa-publishes-two-studies-cabin-air-quality**

Furthermore, as a follow-up to the studies, the European Commission, supported by EASA, published a Call for Tenders N° MOVE/C2/2016-363 for a new project, entitled 'Investigation of the quality level of the air inside the cabin of large transport aeroplanes and its health implication'.

The overall objective is to ascertain potential safety and or long and or short-term health risks resulting from the contamination of bleed air in both routine and cabin air contamination ("CAC") incident flight conditions. This includes:

1. A reliable characterisation of the composition and concentration of contaminants of bleed air;
2. An identification of potential short- and/or long-term health effects;
3. A strategy for simulating CAC-events;
4. A toxicological risk assessment methodology;
5. A cabin air quality risk mitigation strategy.

A contract has been awarded and the project started in February 2017.

In the meantime, it is necessary to ensure timely and accurate occurrence reporting of fume related events. To support communication and training, EASA provided support during the drafting of ICAO Cir 344-AN/202 on "GUIDELINES ON EDUCATION, TRAINING AND REPORTING OF FUME EVENTS", which includes detailed guidance for crew members on how to recognise, manage and report CAC events.

4.6 Aircraft localisation and flight recorders

As a response to the accidents of Air France flight AF447 and Malaysian Airlines flight MH370, new standards were adopted in ICAO Annex 6 Part I to enhance the localisation of an aircraft in distress and to facilitate the recovery of flight recorder data after an accident in a remote or oceanic area. Commission Regulation (EU) 2015/2338 of 11 December 2015 introduced a requirement in the air operation rules that transposes these standards (See Part-CAT, paragraph CAT.GEN.MPA.210). A safety recommendation related to this topic was issued in 2016 following an accident involving a R44 (Robinson) in the Czech Republic, which occurred in 2015. However, the scope of this safety recommendation is understood to be light aircraft while the scope of the new air operation requirement is large aeroplanes.

Independently, a safety recommendation issued following an accident, involving a Super Puma (Airbus Helicopters) close to the Shetland Islands, in 2013 once more highlighted the desire to capture images of flight crew actions in the compartment. Similar safety recommendations had been made by Greek and Estonian investigation authorities.

Two safety recommendations made after the accident of a TBM 700 (Socata) in France in 2014 echoed ten older safety recommendations asking for light aircraft to be equipped with some means of recording flight data.

Five safety recommendations issued by the investigation authorities from the United Kingdom, the Netherlands, Greece and France recommended additional parameters for flight data recorders (Encompassing the following accidents: B737 in 2005, a Boeing 777 in 2008, an AS332 in 2006, and an A330 in 2009).

Finally, following an accident involving an A320 (Airbus) in 2013, Italian investigation authorities recommended the use of a backup power supply for the FDR, similar to that for the cockpit voice recorder. This safety recommendation echoed another recommendation made by Russian investigation authorities in 2015.

EASA Actions:

A. With regards to the localisation of an aircraft in distress and with a view to facilitating the recovery of flight recorder data:

- Within the framework of rulemaking task RMT.0249, the Agency worked on adapting the certification specifications for large aeroplanes (CS-25) in order to facilitate the installation approval of a deployable flight recorder on a large aeroplane. The deployable flight recorder is indeed one solution that is capable of covering both the aircraft localisation need and the flight data recovery need. The publication of the NPA for RMT.0249 is foreseen in Q2 2017. In parallel, the Agency actively took part in industry standardisation activities (EUROCAE WG98/RTCA SC229) in order to support another solution based on the principle of autonomous distress tracking. EUROCAE published ED-237, which provide specifications for criteria to trigger the transmission of a distress signal. WG98/SC229 is also drafting the standard ED-62B/DO-204B that will permit the Agency to approve in-flight triggered ELT as one of the component of this solution. The Agency was also actively involved in the ICAO working group preparing a concept of operation for distress tracking, known as the GADSS advisory group.

- Furthermore, the Agency published Certification Memorandum CM-AS-008 in order to enhance the way ELT are installed and, in turn, to increase the rate of successful transmission of the ELT signal. This is expected to have a positive impact in particular on light aeroplanes and on helicopters.

B. With regard to extending in-flight recording requirements to lighter aircraft:

- Rulemaking tasks RMT.0271 and RMT.0272 ‘In-flight recording for light aircraft’ progressed with an aim to publish the NPA in Q1 2017.

- In addition, Rulemaking task RMT.0690, a new standard change was proposed for the CS-STAN in order to facilitate the voluntary installation of recording equipment on light aircraft (refer to NPA 2016-17).

C. With regard to recording flight crew actions in the cockpit:

The Agency has actively supported the preparation of ICAO Standards on this topic – a related State Letter was issued by ICAO in early 2017. In parallel, with reference to RMT.0271 and RMT.0272, the Agency has worked on introducing a specific framework for the protection of airborne image recordings.

D. With regard to FDR parameters:

An EASA ED Decision introduced an extended list of FDR parameters for newly manufactured aeroplanes and helicopters, hence addressing the safety recommendations and aligning the FDR parameter list with the latest industry standards.

E. With regard to a backup power source for the FDR:

The Agency has initiated a reflection on this topic and it intends to involve an expert group to assess whether requiring a backup power source for the FDR is justified.

4.7 Risks posed by Lithium Batteries on Board

1. Lithium batteries and Portable Electronic Devices (PED) in cabin or as cargo:

A number of events involving lithium batteries occurred in recent years. Related safety recommendations classified as having global concern have raised the need minimise the risks associated when transporting of lithium batteries through increasing the awareness of the airline industry and travelling public.

EASA Actions:

In 2016 the Agency issued SIBs on when a PED becomes dangerous goods due to the battery size and are not allowed as a carry-on item on the aircraft:

- SIB No.: 2016-04 'Carriage of Personal Transportation Devices' to raised awareness on the transport of small lithium battery-powered personal transportation devices, such as hoverboards, self-balancing devices, or gravity boards, that are transported in increasing numbers by passengers in checked or carry-on baggage and that they are also shipped as cargo.

- SIB No.: 2016-08 'Portable Electronic Devices belonging to the Operator' raised awareness about the risks associated with the wide use by aircraft operators of PEDs containing lithium batteries that exceed the limits imposed by the technical instructions (TI).

- SIB No.: 2016-14 (repealed and amended by SR No. 2017-01 on 09 February 2017) 'Safety Precautions regarding the Transport by Air of Damaged, Defective or Recalled Lithium Batteries' to inform aircraft operators about the above decision by Samsung Electronics Co., Ltd. and to advise that the precautions mentioned in the SIB apply to all Galaxy Note7 devices, irrespective of whether they were subject to replacement by the manufacturer.

2. Installed Aircraft Equipment powered by Lithium Batteries:

Several safety recommendations resulted from the investigation of a fire, which was caused by malfunctioning non-rechargeable lithium-metal battery in the ELT on a Boeing B787 that was parked on at London Heathrow Airport on 12 July 2013. The safety recommendations mainly focus on a review of the TSO certification of installed aircraft equipment that are powered by lithium-metal batteries on transport category aircraft.

Other independent events in January 2013 involving rechargeable primary aircraft lithium batteries on a Boeing B787 triggered a review of the certification requirements for those batteries.

In addition, EASA received one safety recommendation in 2016 that addressed the design of the electrical contact of the Emergency Locator Transmitter (ELT).

EASA Actions:

EASA initially issued Airworthiness Directive AD 2013-15-07, directly addressing the product involved and mandating a one-time inspection. Currently, the safety recommendations are all addressed to the Federal Aviation Administration (FAA) but the Agency is working with the FAA to follow-up on this issue. The Radio Technical Commission for Aeronautics (RTCA) is updating the corresponding industry standards for lithium battery testing. EASA is participating in this activity and will update the corresponding ETSOs.

Following a Continuing Airworthiness Review Item request (CARI 25-06) to all JAR/CS25 TC holders for aircraft still in production, a proposed special condition on 'Non-Rechargeable Lithium Battery Installations' was published for consultation on 7 September 2015. This applies to all current CS-25 certification projects within the CRI process, if applicable. With respect to installations of rechargeable lithium cell batteries on aircraft the identified concerns are addressed in CRIs on a case by case basis considering the latest results from the standards development discussions.

In 2016, the Agengy published, following consultation, a Special Condition addressing the specific risks of non-rechargeable lithium batteries for new installations, that is applicable to all new design changes introducing such batteries for CS 25 aircraft.

4.8 Loss of Control Prevention and Recovery Training

An aeroplane upset is a condition where an aeroplane unintentionally exceeds the flight parameters experienced during normal flight. Upsets that are not corrected in a timely manner are likely to lead to loss of control in-flight (LOC-I). Safety recommendations EASA received in 2016 stemming from recent loss of control accident investigations address flight crew training improvements with the specific objective of providing the flight crew with the necessary competencies to identify and prevent stalls and to recover from developing or developed upsets. The aforementioned recommendations refer to the following accidents involving:

- An MD-83 on 24 July 2014 in Mali;
- A Saab 340 on 18 May 2011 in Argentina;
- A Bombardier CL-600-2B19 inflight during a commercial cargo flight from Oslo/Gardermoen Airport; (ENGM) to Tromsø/Langnes Airport (ENTC) occurred on 8 January 2016 and;
- A Piper PA31T on 28 October 2011 during approach at Toulouse Blagnac Airport.

EASA Actions:

Mitigating LOC-I is one of the Agency's highest priorities. On 4 May 2015, the Agency published EASA ED Decision 2015/012/R on 'Upset Prevention and Recovery Training (UPRT)', with the specific objective to ensure that

flight crew acquire and maintain the necessary competencies in order to prevent and recover from developing or developed upsets.

The material takes into account the ICAO Annex 6 amendment 38, ICAO Doc 9868 'Procedures for Air Navigation Services - Training' (PANS-TRG) amendment 3 relating to UPRT, and ICAO Doc 10011 'Manual on Aeroplane UPRT'. Reference is also made to the Original Equipment Manufacturers' (OEMs') Aeroplane Upset Recovery Training Aid (AURTA).

In line with the UPRT development, the flight simulator aspects are currently being considered within the context of RMT.0196 'Update of flight simulation training devices requirements', which was launched on 15 July 2016 with the publication of the associated Terms of Reference.

In addition, the Agency is taking steps to integrate evidence-based training principles into the EU regulations. EASA ED Decision 2015/027/R on 'Implementation of EBT within the European regulatory framework' was published on 16 December 2015. It supports the implementation by operators of EBT, conducted in Flight Simulation Training Devices, according to the principles established in ICAO Doc 9995 'Manual of Evidence-based Training' with the objective of delivering more relevant pilot training in accordance with the aircraft being piloted.

The Agency has addressed the associated 'surprise and startle' effect within the framework of RMT.0411 'Crew Resource Management (CRM) training', which culminated in EASA ED Decision 2015/022/R that was published by the Agency on 25 September 2015.

EASA is also conducting actions addressing risk associated with upset, loss of the normal flight path, or loss of control during the go-around manoeuvres. This risk is being addressed within the framework of:

- Rulemaking task RMT.0647 'Loss of control or loss of flight path during go-around or other flight phases'. The objective is to mitigate the safety risk for large aeroplanes of loss of the normal go-around flight path or loss of control of the aircraft during go-around phases, or other flight phases executed from a low-speed configuration, ensuring that:

  — the design of large aeroplanes is such that the go-around procedure with all engines operating (AEO) can be safely conducted by the flight crew without requiring exceptional piloting skill or alertness. Risk of excessive crew workload and risk of somatogravic illusion must be carefully evaluated, and design mitigation measures must be put in place if those risks are too high;

  — the design of large aeroplanes provides an adequate longitudinal controllability and authority during go-around and other flight phases (focusing on low speed situations).

A Notice of Proposed Amendment (NPA) is expected to be published soon.

- Rulemaking task RMT.0464 'Requirements for air traffic services'. The objective is to propose measures limiting the modifications to published missed-approach procedures, which is an additional element of risk of inadequate management of the go-around, as illustrated for instance in the BEA ASAGA study. The first deliverable, NPA 2016-09(B), was published on 14 September 2016.

4.9 Security Related (SEC) events

The tragic events of Germanwings flight 9525, Metrojet flight 9268 in 2015, and Malaysian Airlines flight MH17 in 2014 showed that aviation is being challenged by new threats and emerging risks.

In accordance with standards and recommended practices in ICAO Annex 13, investigations are conducted with the sole objective of improving aviation safety and are not intended to apportion blame or liability.

In line with this, investigations shall be independent, and be conducted without prejudice to any judicial or administrative action that may be taken to determine blame or liability.

Security related (SEC) events, such as criminal acts affecting (interference, sabotage) aircraft, crew member actions, aviation critical infrastructure or the safety of airspace (acts of war) are more challenging, while concurrently demanding a close coordination between the Safety Investigation and the authorities in charge of the judicial investigation.

With reference to the abovementioned accidents, it is also important to carry out a safety investigation that is independent from the parties involved:

- To be able to gather all relevant elements and;
- To study, within this context, the systemic weaknesses that may have led to the accident.

In this way, safety recommendations were issued in the framework of investigations of security related accidents. This was the case for:

- The crash of Germanwings Airbus A320 in the French Alps on 24 March 2015, where several safety recommendations were issued by BEA-France, all referring to the topic “Medical and psychological conditions of flight crew”.
- The loss of the Malaysian Airlines flight MH17 on 17 July 2014, where the Dutch Safety Board (DSB) determined that the accident was as a result an external cause and included consequences for civil aviation and safety of airspace over conflict zones or armed conflicts. In their final report, the DSB addressed the need to share information regarding the nature and extent of threats in conflict zones, and manage their appropriate dissemination so as to provide information to operators regarding risks to their flights.

EASA Actions:

In Europe, Member States are cooperating with the European Institutions, EASA, and other aviation stakeholders in order to share and distribute intelligence information on risks arising from conflict zones. In this context, a high level meeting was co-organised by EASA and CAA Romania on 29 September 2015, which triggered the creation of a European High Level Task Force on conflict zones. The task force issued its final report to European Commissioner for Transport Mrs Violeta Bulc on 17 March 2016. The report contains recommendations to various stakeholders and a proposal to set-up a European level Conflict Zone Alerting System, with cooperation between Member States, European institutions, EASA and other aviation stakeholders.

In 2016, a Conflict Zones Network of Focal Points (RCZ Network) was established and is composed of focal points from EASA, the European Commission, the European External Action Service (EEAS) and focal points designated by the EU Member States who are willing to contribute. The network serves as a platform for sharing information on conflict zones and consults on draft EASA conflict zones publications (CZIB).

Meanwhile EASA published several Conflict Zone Information Bulletins (CZIB) containing information or recommendations regarding risks to civil aviation arising from Conflict Zones (RCZ).

4.10 Unmanned Aircraft (Systems)

In 2016, 5 safety recommendations were issued by the Italian – ANSV stemming from a study related to "Interference of unmanned aircraft in the Italian airspace with associated risks for the safety of the flight of manned aircraft" addressing the Italian National Aviation Authority covered the safety topics of aircraft certification, aircraft operations, oversight and auditing, and design, production and manufacturing.

EASA is also following-up on these actions as the safety recommendations are classified as having Global Concern (SRGC) and Union-wide Relevance (SRUR).

EASA Actions:

In the context of the European Aviation Safety Agency Task Force the risks resulting from collisions between drones - of varying masses and different categories of manned aircraft, considering their design characteristics and operational requirements - have been assessed.

As a result of this work, the task force has delivered 3 recommendations:

- The task force recommends that an analytical model of the drone threat should be developed that takes into account a more detailed analysis of the construction of drones and an assessment of the dynamic behavior of drones and their components, (in particular their motors and batteries,) during an impact. To gain confidence in the model, the method should be validated against laboratory tests, in particular to validate the behavior of specific drone components such as the batteries or the motors during an impact and to confirm the prediction of the overall frangibility of the drone. This validated analytical model could be used for further impact analysis (see Recommendation 3).

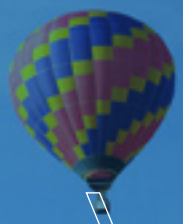
- The task force recommends that a specific risk assessment should be conducted to assess the behavior of lithium batteries on impact with structures and rotating parts, and their possible ingestion by jet engines. The assessment should, if possible, be supported by testing, and should address the risks of explosion, fire and air contamination.

- The task force recommends that further research should be conducted to establish hazard severity thresholds for collisions between drones and manned aircraft. Impact analyses should be performed to determine the effects of a drone threat (as established per Recommendation 1) impacting aircraft critical components, possibly capitalizing on existing computing and software capabilities and other particular risk assessments such as those for bird, tire and engine debris impacts. To gain confidence in the model, the method should be validated against tests on representative aircraft components such as airframe parts, windshields and rotating elements (i.e. rotors, propellers and fan blades).

As a possible way forward, the task force believes that a coordinated and collaborative research program should be established to further assess the consequences of a drone collision on an airborne manned aircraft. The results should be shared in order to inform the responsible parties and to facilitate the development of future safety measures that may be necessary to ensure the safe operation of drones. The outcome of the research could be used to help to:

- Confirm operational limitations associated to drone categories;
- Influence the design of drones to minimize the risk if an impact occurs;
- Categorize new drone designs that utilize new drone technologies; and
- Prevent unnecessary regulatory actions from affecting the drone and aircraft industries.

Conclusions



Conclusions

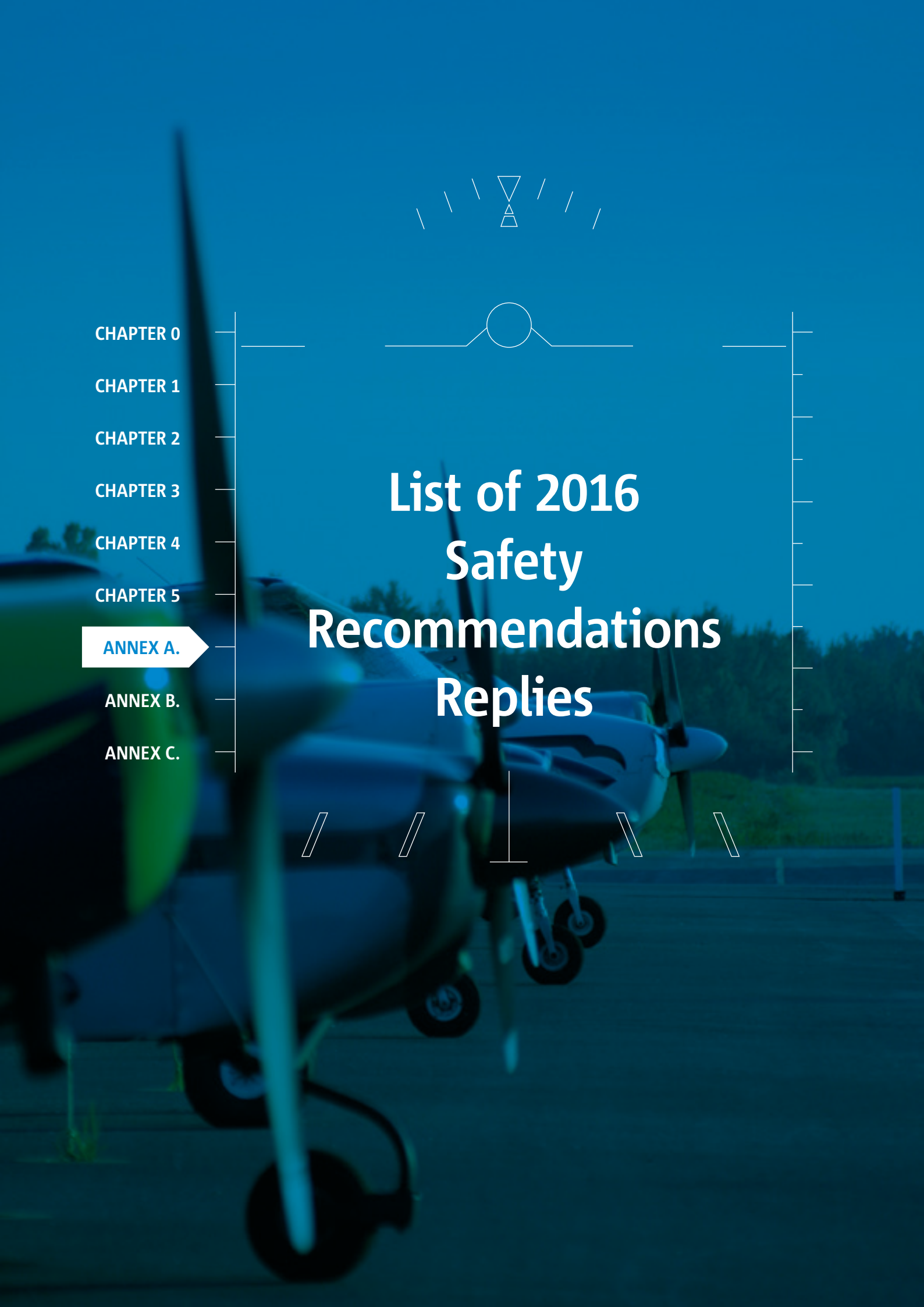
In 2016, EASA received a total of 88 safety recommendations that:

- Originated from 1 study and 41 different occurrences (30 accidents, 11 serious incidents);
- Were addressed by safety investigation authorities of 18 different States;
- 86 % of the received safety recommendations were issued by EASA Member States. Among those, 40 were classified as safety recommendations having Union-wide Relevance (SRUR).
- 20 were classified as safety recommendations of having Global Concern (SRGC) and;
- Were mostly related to aircraft or aviation related equipment or facilities [44%, Aircraft/Equipment/Facilities] and to procedures or regulations [35%, Procedures/Regulations].

In the same year, the Agency issued 196 replies to 177 safety recommendations:

- 80 of them were final replies with more than 51% carrying an agreement assessment, and 36% with partial agreement;
- The remaining 116 updating replies provided information on the progress of the actions decided upon by the Agency and for which the relevant activities were not yet completed;
- 75% of the final response provided by EASA were assessed as “adequate” by the originator of the safety recommendation.

Furthermore, the actions taken by the Agency in response to the safety recommendations outlined several of the key safety topics that are currently part of the EPAS and are included in the safety risk management process.



List of 2016 Safety Recommendations Replies

ANNEX A: List of 2016 Safety Recommendations Replies

The replies EASA sent in 2016 to safety recommendations are listed below. In the case of multiple replies sent during the year (in total EASA sent 196 reply letters), only the latest reply is provided (177 reply letter). They are sorted by country of origin and grouped by occurrence.

Austria

Registration	Aircraft Type	Location	Date of event	Event Type
	AEROSPATIALE AS332	Flugplatz Zell am See, Austria	05/03/2007	Accident

Synopsis of the event:

The mid-air collision between an airplane type DV 20 “Katana” and a helicopter type AS 332 “Super Puma” happened at 09:53 UTC, approximately 1 NM NW of the airport of Zell am See (LOWZ), when the helicopter flew over the traffic pattern in NNE direction on his way from Kaprun, Austria, to Berchtesgaden, Germany. The flight paths of both aircraft converged near the traffic pattern above the southeast slope of the Schmittenhöhe (Schmitten summit, 1.965 m / 6.646,8 ft), at an altitude of 5.090 ft (+/- 50 ft) MSL. At the moment of the collision the airplane was in climb and the helicopter shortly after level-off from climb.

Reduced fields of vision and complex psychological factors have been found to be causal for the inability of both pilots to see the other aircraft and to avoid the collision in time.

Safety Recommendation AUST-2008-002 (VERSA)

[German] Die Empfehlungen aus früheren Untersuchungen der UUB (bzw der FUS) zu einer Verwendung von Zusammenstoßwarngeräten muss nach diesem Zusammenstoß und einem ähnlichen im November 2006 in der Nähe von Wr. Neustadt eindringlich wiederholt werden. So sollten seitens der EASA die Voraussetzungen für die Entwicklung von Vorschriften hinsichtlich Technik, Einbau und Zertifizierung von kostengünstigen Zusammenstoßwarngeräten für die Allgemeine Luftfahrt geschaffen werden. Es sollte auch eine mögliche Subventionierung von Zusammenstoßwarngeräten überlegt werden (Aero-Club, Steuerbefreiung usw). Welches der verfügbaren (auf gegenseitiger Funkabfrage bzw auf Transpondererkennung basierend) oder der in Erprobung befindlichen Systeme (satellitengestützte Verarbeitung von Transpondersignalen, ADS-B, bzw RFID- Technologie in Verbindung mit GPS) zum Einsatz kommen sollen, wird noch zu diskutieren sein. Testflüge mit allen derzeit erhältlichen Systemen durch die UUB haben jedenfalls eindrücklich die Wirksamkeit solcher Systeme bestätigt. (SE/UUB/LF/02/2008 - Zusammenstoßwarngeräte)

Reply No. 3 sent on 08/09/2016:

The European Aviation Safety Plan 2011-2014 (**https://www.easa.europa.eu/system/files/dfu/sms-docs-European-Aviation-Safety-Plan--(EASp)-2011-2014-v1.2.pdf**) already contained first actions on Mid-air collision/Near mid-air collision (MAC/NMAC) by improving the "see and avoid" for General Aviation. Among the actions already taken, EASA is facilitating the voluntary installation of electronic conspicuity devices via Standard Changes, as defined in P21 A.90B of Commission Regulation (EU) 748/2012 (**https://www.easa.europa.eu/system/files/dfu/Annex%20IV%20to%20EDD%202015-016-R.pdf**, refer to CS-SC002a, CS-SC051a in CS-STAN Issue 1 dated 8 July 2015) and installation approvals of this type of devices.

In addition, EASA is in the process of publishing a CS-ETSO for Traffic Awareness Beacon System (TABS). There are currently several technical solutions for general aviation for electronic conspicuity devices with varied strengths and weaknesses. The main issue is the interoperability between all these solutions.

The Network of Analysts whose role is formalised by Regulation (EU) 376/2014 on the reporting, analysis and follow-up of occurrences in civil aviation, performed a study, on Mid-air collision/Near mid-air collision (MAC/NMAC). According to that study MACs/NMACs contributed to 2% of the fatalities in the 2012-2014 period: the largest amount of fatalities involved loss of control (23%) or controlled flight into terrain (15%). EASA recognises that the safety barriers of the Visual Flight Rules (VFR), which rely on the "see and avoid", need to be reinforced and cost-efficient electronic conspicuity devices can be one contributor.

The latest version of the plan, European Plan for Aviation Safety (EPAS) 2016-2020

(**https://www.easa.europa.eu/system/files/dfu/EPAS%202016-2020%20FINAL.PDF**), is further addressing the issue under the umbrella of the safety topic "general aviation safety".

EASA will continue to report progress on this safety topic in the frame of the European Plan for Aviation Safety.

Status: Open – Category:

Registration	Aircraft Type	Location	Date of event	Event Type
	BELL 204	Maria Alm, Ortsteil Hinterthal, Bereich Gabühel	23/07/2010	Accident

Synopsis of the event:

Der Pilot startete nach einer wetterbedingten Pause am 23. Juli 2010 mit dem Hubschrauber der Type Bell 204B zu einem Arbeitsflug (Außenlastflug mit Betonkübel) von einem Außenlandeplatz (Start- und Landeplatz) zum zu errichtenden Fundament einer Seilbahnstütze. Der Pilot als einziger Insasse befand sich am Kopilotensitz und navigierte durch das Bubble Window. An beiden Rändern der steil ansteigenden Lifttrasse befanden sich Bäume. Das vom Piloten ausgewählte Seil mit Gehänge hatte eine Gesamtlänge von 25m. Der Hubschrauber berührte nach dem Entleeren des Betonkübels beim Wegdrehen nach links mit dem Heckrotor einen Nadelbaum. Der außer Kontrolle geratene Hubschrauber drehte sich daraufhin im Uhrzeigersinn und stürzte in den Wald. Der Pilot erlitt tödliche Verletzungen, am Hubschrauber entstand Totalschaden.

Safety Recommendation AUST-2011-011 (VERSA)

[German] - Ergeht an: FAA; EASA. Um dem erhöhten Gefahrenpotential bei Arbeitsflügen (Außenlastflügen) zu begegnen, sollten Hubschrauber mit aufprallresistenteren Pilotensitzen, die zumindest annähernd den gültigen Zertifizierungsvorschriften CS 27 (FAR 27) und CS 29 (FAR 29) entsprechen, ausgerüstet sein. In diesem Zusammenhang

sollte die Gewährung von Grandfather Rights (CAR 7) überdacht und in einem geeigneten, technisch möglichen Ausmaß evaluiert und Verbesserungen im Bereich der Aufschlagsicherheit und der Rückhaltesysteme vorgenommen werden. (SE/UUB/LF/11/2011)

Reply No. 3 sent on 15/03/2016:

All rotorcraft type-certificated to EASA CS-27 or CS-29, JAR-27 or JAR-29, or FAA Part 27 (from Amendment 27-25 dated Nov. 1989) or FAA Part 29 (from Amendment 29-29 dated Nov. 1989), are required to meet the dynamic impact requirements for seats and occupant restraint systems. Where application for type-certification was received before the FAA rules amendments mentioned above, the rotorcraft need not meet these dynamic impact requirements.

In November 2015, a new task has been assigned by the FAA for the Aviation Rulemaking Advisory Committee (ARAC) to provide recommendations regarding occupant protection rulemaking in normal and transport category rotorcraft for older certification basis type designs. The scope of this task includes, among other items, the seating systems improvements to protect occupants during a crash. The Agency is participating in the ARAC Rotorcraft Occupant Protection Working Group created to take care of this task.

The initial focus of the task addresses rotorcraft that are still in production. Depending on the result, this may then be extended to cover in-service rotorcraft.

The analysis and the recommendations from this group will then be taken into account by the Agency to take its decision regarding potential future rulemaking.

Status: Open – **Category**:

Registration	Aircraft Type	Location	Date of event	Event Type
	ENSTROM 280	Kirchham	05/04/2014	Accident

Synopsis of the event:

Am 05. April 2014 um ca. 11:08 Uhr startete der Pilot mit dem Hubschrauber Enstrom 280FX vom Flugplatz Wels (LOLW) mit dem planmäßigen Landepunkt Flugplatz Gmunden (LOLU). Zu diesem Zeitpunkt befanden sich keine Passagiere an Bord. [...]

Der Pilot landete um ca. 11:25 Uhr aus Osten kommend am Flugplatz Gmunden (LOLU), wo er den Hubschrauber südlich des Hangars abstellte. Der Pilot verließ den Hubschrauber und begab sich zu den bereits wartenden Passagieren. Nach einer kurzen Absprache über die Flugroute nahmen die Passagiere (zwei erwachsene Personen), einer am Mittelsitz und der andere am rechten Sitz Platz. Das Doppelsteuer des Hubschraubers war zu diesem Zeitpunkt nicht im Luftfahrzeug verbaut. [...]

Der Abflug zu einem weiteren Flug mit zwei Passagieren vom Flugplatz Gmunden (LOLU) mit planmäßigen Landepunkt Außenlandeplatz Pogusch in der Steiermark erfolgte um ca. 13:10 Uhr. [...] Die Landung am Außenlandeplatz Pogusch erfolgte um ca. 14:10 Uhr westlich von der Straße L 123 Pogusch. Darauffolgend stellte der Pilot den Hubschrauber ab, ließ die Passagiere aussteigen und begleitete diese zum Eingang des dort befindlichen Restaurants. Danach nahm der Pilot das Luftfahrzeug wieder in Betrieb und startete in Richtung Flugplatz Lanzen Turnau, wo er den Hubschrauber um ca. 14:51 Uhr landete. Dort wurde in die

beiden Luftfahrzeug Tanks insgesamt 60 Liter AVGAS 100 LL getankt. Um ca. 15:27 Uhr startete das Luftfahrzeug vom Flugplatz Lanzen Turnau in Richtung Außenlandeplatz Pogusch. Die Landung am Außenlandeplatz Pogusch erfolgte um ca. 15:30 Uhr. Danach stellte der Pilot den Hubschrauber ab und begab sich ebenfalls in das dort befindliche Restaurant, um die beiden Passagiere abzuholen. Diese waren jedoch noch nicht abflugbereit und baten den Piloten, noch ca. 15 Minuten zu warten. Daraufhin begab sich der Pilot zum Luftfahrzeug, um dort zu warten.

Nach ca. 15 Minuten Wartezeit kamen beide Passagiere zum Hubschrauber, dabei wurde der Sitzplatz zwischen den beiden Passagieren getauscht. Der Pilot schnallte beide Passagiere mit einem 4- Punkt Sicherheitsgurt, einen Passagier am Mittelsitz und den zweiten am rechten Sitz an. Danach startete der Pilot das Triebwerk des Luftfahrzeuges, was laut Aussage eines Passagiers ohne Vorkommnisse erfolgte. Der Abflug vom Außenlandeplatz Pogusch erfolgte ca. zwischen 16:00 – 16:40 Uhr in ca. westliche Richtung. Nach ca. einer halben Stunde Flugzeit meinte der Pilot zu den Passagieren, dass es 20 Minuten länger dauern werde als beim Hinflug, da starker Gegenwind herrsche und witterungsbedingt auch diesmal wieder nicht die direkte Flugroute geflogen werden könne. Die genaue Flugroute konnte jedoch nicht rekonstruiert werden. Kurz vor dem Bereich Kogl bat der Pilot beim Flugplatz Gmunden um Landeinformation, diese wurde ihm nach eigenem Ermessen erteilt. Kurz darauf (um ca. 17:54 Uhr) stürzte der Hubschrauber in ein Waldstück nahe Kogl Nr.5. Dabei kippte das Luftfahrzeug auf die linke Seite und kam 180° entgegen der Flugrichtung am Waldboden zum Stillstand. Der Pilot erlitt dabei tödliche, die beiden Passagiere schwere Verletzungen.

Der Unfall ist auf den Ausfall des Triebwerkes durch Kraftstoffmangel zurückzuführen. Eine fehlerhafte Kraftstoffvorratsanzeige trug mit hoher Wahrscheinlichkeit dazu bei. Der Unfallort ermöglichte keine unfallfreie Notlandung.

Safety Recommendation AUST-2015-001 (VERSA)

[German] - Nr. SE/UUB/LF/1/2015 ergeht an:

EASA Europäische Luftfahrtbehörde, Austro Control GmbH

Das verpflichtende Tragen von Schutzhelmen könnte den persönlichen Schutz steigern, da Insassen bei vielen Unfällen in der Vergangenheit schwerste Kopfverletzungen davontrugen. Das Mitführen von geeigneten Schutzhelmen in Hubschraubern sollte ein zusätzlicher Bestandteil der persönlichen Schutzausrüstung sein.

Reply: 1 sent on 15/03/2016:

The safety issue described in the safety recommendation is covered under the existing regulatory framework for air operations, Commission Regulation (EU) No 965/2012 (the air operations regulation), which has been applicable since 28 October 2014 (after the date of the accident). In this regulation, the level of protection provided by individual protective equipment for persons on board takes into account the level of risk associated with the type of operation and the type of helicopter.

Annex VIII Part-SPO (Specialised Operations) of the afore-mentioned regulation applies to any specialised operation where the aircraft is used for specialised activities such as agriculture, construction, photography, and surveying (also known as aerial work). However, Annex VII Part-NCO applies instead for non-commercial specialised operations with other-than complex motor-powered aircraft (NCO). See Article 3 (j) of Regulation (EC) No 216/2008 for the definition of complex motor-powered aircraft.

SPO.IDE.H.205 of Part-SPO requires each person on board to wear individual protective equipment that is adequate for the type of operation being undertaken. The associated guidance material (see GM1 SPO.IDE.H.205) states that personal protective equipment should include, but is not limited to flying suits, gloves, helmets, protective shoes, etc. The adequacy will depend on the complexity of the activity and the associated risks which should be identified through a risk assessment which the operator is required to conduct (see SPO.OP.230). For low level and low speed flying, which is often conducted in a specialised operation, there is less likelihood of a successful auto-rotation. Therefore the risk assessment is likely to lead to extra mitigation which could include the wearing of helmets. Part-SPO shall be applied by all EASA Member States by 21 April 2017 at the latest. Until then, national legislation applies.

Under Annex VII Part-NCO, there is no prescriptive requirement for individual protective equipment to be worn by persons on board. However, before commencing a specialised operation under Part-NCO, the pilot-in-command is required to conduct a risk assessment to determine the hazards and associated risks inherent in the operation and to establish mitigating measures (see NCO.SPEC.105). The wearing of helmets may be part of that mitigation. For NCO operations which are not classified as specialised operations, it is unlikely that consensus would be reached on a proposal to mandate protective helmets for those on board as this would not support the principle of proportionality for general aviation. Part-NCO shall be applied by all EASA Member States by 25 August 2016 at the latest. Until then, national legislation applies.

For Commercial Air Transport (CAT) operations and non-commercial operations with complex motor-powered aircraft (NCC), there is no prescriptive requirement for individual protective equipment for those on board. However, the operator is required to implement a management system that includes identification and management of risks of aviation safety hazards associated with the operation (see ORO.GEN.200 of Annex III Part-ORO (Organisation Requirements for Air Operations). Such risk management could include mitigation through provision of personal protective equipment, including helmets.

It should also be noted that, according to Annex IV Part-CAT, CAT operations with piston-engine helicopters are prohibited over hostile environments during the cruise [see CAT.POL.H.420 and CAT.POL.H.400 (b)]. Furthermore, CAT operations with single-engine helicopters are prohibited at night [see CAT.POL.H.400 (d)(2)].

Additional defences are provided through provisions related to the competent authority's management systems and oversight obligations [see ARO.GEN.200 and ARO.GEN.300 of Annex II Part-ARO (Authority Requirements for Air Operations)] and standardisation inspections by EASA (see Commission Implementing Regulation (EU) No 628/2013).

In summary, the safety recommendation is considered to be suitably addressed by the existing EU civil aviation legislation, through specific provisions on personal protective equipment, or by provisions requiring mitigation of safety hazards identified through risk assessments, and through specific provisions governing CAT operations at night and CAT operations over hostile environments during the cruise.

Status: Closed – **Category**: Partial agreement

Registration	Aircraft Type	Location	Date of event	Event Type
	A) DIAMOND DA42 B) ROBINSON R44	near Katzelsdorf	14/11/2006	Accident

Synopsis of the event:

Pilot A startete am 14.11.2006, um 12:08 Uhr alleine als verantwortlicher Pilot mit dem Flugzeug A nach Sichtflugregeln am Flugplatz Wr. Neustadt-Ost (LOAN) mit dem Flugziel Flughafen Graz-Thalerhof (LOWG).

Zur gleichen Zeit flog Pilot B alleine als verantwortlicher Pilot mit dem Hubschrauber B nach Sichtflugregeln vom Flugplatz Trieben (LOGI) kommend zum Flugplatz Wr. Neustadt-Ost (LOAN).

Flugzeug A kurvte vom Meldepunkt GOLF kommend im Steigflug nach rechts auf südwestlichen Kurs, Hubschrauber B kurvte im Horizontalflug nach links auf nordöstlichen Kurs. Gegen 12:12 Uhr kollidierten die beiden Luftfahrzeuge ca. 2,1 km südwestlich von Meldepunkt GOLF des Flugplatzes Wr. Neustadt-Ost in ca. 1800-1900 ft MSL und stürzten ab.

Beide Piloten erlitten tödliche Verletzungen. Beide Luftfahrzeuge wurden zerstört.

Der Zusammenstoß ist auf das für ein Ausweichen der Luftfahrzeuge zu spätes Erkennen der Zusammenstoßgefahr zurückzuführen.

Safety Recommendation AUST-2016-001 (VERSA)

[German] – SE/UUB/LF/5/2016, ergeht an die im Austrian State Safety Programme (SSP) Steering Committee vertretenen nationalen Zivilluftfahrtbehörden der Republik Österreich und an die EASA:

Auf die anlässlich der Untersuchung des Zusammenstoßes eines Motorflugzeuges Type DV20 und eines Hubschraubers Type AS 332 am 05.03.2007, um 09:53 Uhr UTC im Platzbereich des Flugplatzes Zell am See, Salzburg (GZ. BMVIT-85.121/0002-II/BAV/UUB/LF/2008) von der Unfalluntersuchungsstelle des Bundes herausgegebene Sicherheitsempfehlungen Nr. SE/UUB/LF/02/2008 wird nochmals hingewiesen:

SE/UUB/LF/02/2008 - Zusammenstoßwarngeräte

Die Empfehlungen aus früheren Untersuchungen der UUB (bzw der FUS) zu einer Verwendung von Zusammenstoßwarngeräten muss nach diesem Zusammenstoß und einem ähnlichen im November 2006 in der Nähe von Wr. Neustadt eindringlich wiederholt werden.

So sollten seitens der EASA die Voraussetzungen für die Entwicklung von Vorschriften hinsichtlich Technik, Einbau und Zertifizierung von kostengünstigen Zusammenstoßwarngeräten für die Allgemeine Luftfahrt geschaffen werden.

Es sollte auch eine mögliche Subventionierung von Zusammenstoßwarngeräten überlegt werden (Aero-Club, Steuerbefreiung usw).

Welches der verfügbaren (auf gegenseitiger Funkabfrage bzw auf Transpondererkennung basierend) oder der in Erprobung befindlichen Systeme (satellitengestützte Verarbeitung von Transpondersignalen, ADS-B, bzw RFID-Technologie in Verbindung mit GPS) zum Einsatz kommen sollen, wird noch zu diskutieren sein.

Testflüge mit allen derzeit erhältlichen Systemen durch die UUB haben jedenfalls eindrücklich die Wirksamkeit solcher Systeme bestätigt.

Reply No. 1 sent on 08/09/2016:

The European Aviation Safety Plan 2011-2014 (**https://www.easa.europa.eu/system/files/dfu/sms-docs-European-Aviation-Safety-Plan--(EASp)-2011-2014-v1.2.pdf**) already contained first actions on Mid-air collision/Near mid-air collision (MAC/NMAC) by improving the "see and avoid" for General Aviation. Among the actions already taken, EASA is facilitating the voluntary installation of electronic conspicuity devices via Standard Changes, as defined in P21 A.90B of Commission Regulation (EU) 748/2012 (**https://www.easa.europa.eu/system/files/dfu/Annex%20IV%20to%20EDD%202015-016-R.pdf**, refer to CS-SC002a, CS-SC051a in CS-STAN Issue 1 dated 8 July 2015) and installation approvals of this type of devices.

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The Network of Analysts whose role is formalised by Regulation (EU) 376/2014 on the reporting, analysis and follow-up of occurrences in civil aviation, performed a study, on Mid-air collision/Near mid-air collision (MAC/NMAC). According to that study MACs/NMACs contributed to 2% of the fatalities in the 2012-2014 period: the largest amount of fatalities involved loss of control (23%) or controlled flight into terrain (15%). EASA recognises that the safety barriers of the Visual Flight Rules (VFR), which rely on the "see and avoid", need to be reinforced and cost-efficient electronic conspicuity devices can be one contributor.

The latest version of the plan, European Plan for Aviation Safety (EPAS) 2016-2020

(**https://www.easa.europa.eu/system/files/dfu/EPAS%202016-2020%20FINAL.PDF**), is further addressing the issue under the umbrella of the safety topic "general aviation safety".

EASA will continue to report progress on this safety topic in the frame of the European Plan for Aviation Safety.

Status: Open – **Category**:

Registration	Aircraft Type	Location	Date of event	Event Type
	DE HAVILLAND DHC8	Vienna Int'l Airport (LOWW)	06/05/2015	Serious incident

Synopsis of the event:

Flug XXX meldete wenige Minuten nach dem Abheben von der Piste 29 des Flughafens Wien-Schwechat (LOWW), Rauch in der Kabine als auch im Cockpit des Luftfahrzeuges. Das Luftfahrzeug befand sich zu diesem Zeitpunkt, ca. 2 Minuten nach dem Abheben, mit 43 Passagieren und 5 Besatzungsmitgliedern an Bord im Steigflug unter Sichtflug-Wetterbedingungen (VMC) entlang der Standardabflugroute (SID) SITNI 4C mit dem Flugziel Innsbruck in ca. 5000 ft (Flugfläche 50).

Die Piloten entschieden sich zur Rücklandung des Luftfahrzeuges zum Flughafen Wien-Schwechat. Das Luftfahrzeug landete kurze Zeit später ohne Probleme auf dem Flughafen Wien-Schwechat. Alle Passagiere sowie die gesamte Flugbesatzung konnten das Luftfahrzeug unverletzt verlassen.

Safety Recommendation AUST-2016-008 (VERSA)

[German] - EASA: SE/SUB/LF/8/2016

Die Auswirkungen von kontaminierter Kabinenluft in Luftfahrzeugen auf den menschlichen Körper sollten zeitnah, umfassend und unabhängig untersucht werden, um aus den daraus gewonnenen Ergebnissen Lösungsansätze für den Schutz von Passagieren und Besatzungsmitgliedern aufzuzeigen und verpflichtend umzusetzen. Dies könnte gegebenenfalls mittels einer internationalen Kooperation mit bereits laufenden Forschungsarbeiten erfolgen.

Reply No. 1 sent on 24/11/2016:

The Agency launched two studies:

A flight measurement campaign (ref. EASA.2014.OP.16): The study (launched in October 2014) implements a preliminary measurement campaign setting the scene for a large-scale measurement campaign on-board commercially operated large transport aeroplanes. 68 flights have been planned with measurements of air contaminants (cockpit & cabin) on several types of aeroplanes and engines (mix of short range and long range aeroplanes). The overall objective is to determine if there are any safety and/or potential long/short-term health risks resulting from the exposure to normal operating conditions and/or to cabin air contamination events. It has been contracted to a consortium consisting of Fraunhofer institute and MHH (medical school of Hannover). The conclusions of the study are expected to be available by end of 2016.

A study on the characterisation of the toxicity of aviation turbine engine oils after pyrolysis (ref. EASA.2015.HVP.23): The purpose of this study (launched in November 2015) is to improve the knowledge on aviation oil toxicity and support the analysis of cabin/cockpit air contamination (e.g. flight measurement campaign mentioned above). It has been contracted to a consortium consisting of TNO (Dutch applied science institute) and RIVM (Dutch institute for public health and environment). The conclusions of the study are expected to be available by end of 2016.

Further information on these studies can be found on the EASA Website with the following link: **http://easa.europa.eu/the-agency/procurement/calls-for-tender**.

In addition, EASA has supported the European Commission with the launch of a Call for Tenders N° MOVE/C2/2016-363 for a new project, entitled 'Investigation of the quality level of the air inside the cabin of large transport aeroplanes and its health implication'.

The overall objective is to ascertain potential safety and/or long/short-term health risks resulting from the contamination of bleed air in both routine and cabin air contamination ("CAC") incident flight conditions. This includes:

1. A reliable characterisation of the composition and concentration of contaminants of bleed air;

2. An identification of potential short- and/or long-term health effects;

3. A strategy for simulating CAC-events;

4. A toxicological risk assessment methodology;

5. A cabin air quality risk mitigation strategy.

More information is available here:

http://ted.europa.eu/udl?uri=TED:NOTICE:294886-2016:TEXT:EN:HTML

The Agency will take into account the results of the research mentioned above and will eventually consider the need to amend certification specifications or other regulations.

Status: Open – **Category**:

Safety Recommendation AUST-2016-009 (VERSA)

[German] - EASA: SE/SUB/LF/9/2016

Der Einbau von technischen Überwachungsmöglichkeiten wie etwa Sensoren welche die Zusammensetzung bzw. eine mögliche Verunreinigung der Kabinenluft im Luftfahrzeug in Echtzeit routinemäßig aufzeichnet und die Piloten rechtzeitig warnt, gepaart mit geeigneten Filtersystemen, sollte bei Luftfahrzeugen welche Zapfluft von den Triebwerken für die Kabinenluft verwenden, verpflichtend vorgeschrieben werden.

Reply No. 1 sent on 24/11/2016:

The Agency launched two studies:

A flight measurement campaign (ref. EASA.2014.OP.16): The study (launched in October 2014) implements a preliminary measurement campaign setting the scene for a large-scale measurement campaign on-board commercially operated large transport aeroplanes. 68 flights have been planned with measurements of air contaminants (cockpit & cabin) on several types of aeroplanes and engines (mix of short range and long range aeroplanes). The overall objective is to determine if there are any safety and/or potential long/short-term health risks resulting from the exposure to normal operating conditions and/or to cabin air contamination events. It has been contracted to a consortium consisting of Fraunhofer institute and MHH (medical school of Hannover). The conclusions of the study are expected to be available by end of 2016.

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The Agency will take into account the results of the research mentioned above and will eventually consider the need to amend certification specifications or other regulations.

Status: Open – **Category**:

Czech Republic

Registration	Aircraft Type	Location	Date of event	Event Type
OK-RRJ	ROBINSON R44	Filipova Hut	29/03/2015	Accident

Synopsis of the event:

In the afternoon on the preceding day, the pilot landed the helicopter on a private land near the village of Modrava in the Šumava National Park. He spent the night in a nearby guest house. On the next day, in spite of unfavourable meteorological conditions and insistence of his relatives on postponement of the flight the pilot decided to fly to LKKO. The pilot departed the area without being noticed by anybody. Nearly three hours later, the manager of the guest house found the helicopter wreckage in the forest, approx. 650 m from the place of the take-off. The helicopter was entirely destroyed by a crash against full-grown trees and the subsequent fall to the ground. The pilot succumbed to his injuries on the spot.

Safety Recommendation CZCH-2016-002 (UZPLN)

It is recommended that EASA, with regards EASA RMT.0271 & 0272, examine the possibility the implementation of conditions of the use on-line recording devices based on the current information and communication technology and of the software enabling downloads of the recordings of locations of aircraft used for sporting and recreational purposes.

Reply No. 1 sent on 08/09/2016:

The Agency understands that the aim of the recommendation is to mitigate the risk of search and rescue (SAR) services being unable to establish the crash site coordinates within in a reasonable timeframe, in the event of a survivable accident involving sporting or leisure operations. Such operations are usually performed with light aircraft i.e. certified for a maximum passenger seating configuration of six or less.

Mitigation is already provided through Annex VII, Part-NCO (non-commercial operations with other-than complex motor-powered aircraft) of Commission Regulation (EU) No 965/2012 on air operations. By way of derogation from the applicability date of 28 October 2012, Member States may have opted not to apply the provisions until 25 August 2016, in which case national legislation applied in the meantime.

According to NCO.IDE.A/H.170, aeroplanes and helicopters, certified for a maximum passenger seating configuration of six or less, shall be equipped with a survival Emergency Locator Transmitter (ELT(S)) or a Personal Locator Beacon (PLB), which shall be carried by a crew member or a passenger. The ELT or PLB shall be capable of transmitting simultaneously on 121, 5 MHz and 406 MHz.

The ELT(S) can be manually activated by a survivor or activated automatically (e.g. by water contact) (AMC2 NCO.IDE.A/H.170 (a)(4)). It should operate in accordance with the relevant provisions of International Civil Aviation Organization (ICAO) Annex 10 'Aeronautical Telecommunications', Volume III 'Digital Data & Voice Communication Systems', and should be registered with the national agency responsible for initiating search and rescue or other nominated agency (AMC2 NCO.IDE.A/H.170 (c)).

The PLB is an emergency beacon other than an ELT that broadcasts distinctive signals on designated frequencies, is standalone, portable and is manually activated by the survivors (GM1 NCO.IDE.A/H.170 (b)). Any PLB carried should be registered with the national agency responsible for initiating search and rescue or other nominated agency (AMC3 NCO.IDE.A/H.170 (b)).

Neither the ELT(S) nor the PLB require an equipment approval (NCO.IDE.A/H.100 (b)). However, the functionality should be checked against recognised industry standards appropriate for the intended purpose.

With the above-mentioned legislation, applicable in all Member States by 25 August 2016 at the latest, the Agency considers that the risk of SAR services being unable to locate the crash site within in a reasonable timeframe, in the event of a survivable accident involving sporting or leisure operations with light aircraft, is suitably mitigated.

Status: Closed – **Category**: Partial agreement

Egypt

Registration	Aircraft Type	Location	Date of event	Event Type
SU-283	ULTRAMAGIC N425	Luxor	26/02/2013	Accident

Synopsis of the event:

On February 26, 2013, and almost 05:10 local time, the balloon operator relevant personnel started transferring the balloon parts from the company store (located at "Al Rawageh" village, "Al Karanah" west side of Luxor city) to the departure site at the western side if Luxor. The balloon type is "Ultramagic N425", owned and operated by "Egyptian Airship and Balloon-Sky-Cruise" company and registered as SU-283.

At almost 05:30 local time same day, the company relevant personnel, upon their arrival to the departure site, started preparing the balloon parts for its mission (touristic flight). They were waiting for the passengers, coming from eastern side of Luxor on Nile boats.

At almost 06:15 local time, the balloon started its take off from the balloon departure site, under the command ship of balloon captain [xxx], Twenty (20) passengers were on board of the balloon of different nationalities.

The balloon continued climbing and flying over the monuments area at western side of Luxor city using the wind action effects for horizontal movements. Vertical movements control was made through the control of the burners by the balloon captain.

The balloon flew more than 35 minutes. Communication was established between the ground crew and the balloon captain, using radio means. Ground crew was inquired from the balloon captain about the location for landing. The captain acknowledged that the landing site will be west of the water canal located at the area of "Hager El Dabeyya" at "Alkarana", Luxor city.

Upon crossing the water canal, the captain asked the ground crew to be prepared to receive the Drop Line rope to start the balloon landing procedure on a free lad before the sugar cane fields.

The ground crew started holding the rope to complete the landing procedure. At about 3 meters height for the balloon basket over ground, fire originated in the balloon causing a major injury for the captain. The captain left the balloon basket to the ground, followed by one of the passengers.

The captain was caught by fire. Some of the ground crew, in addition of some other persos that were in the vicinity of the accident site rushed towards the captain in an attempt to rescue him and extinguish the fire.

The balloon continued climbing over the sugar cane fields. A number of passengers jumped from balloon to the ground inside the sugar cane fields, remaining there, affected by the fall.

The balloon continued climbing crossing the area near a house of four stories and some of palm trees. The balloon was burning and still climbing. The balloon envelop was badly influenced and became like a thin piece of clothes, not capable of lifting the parts attached to it. The basket fell down with its content in a wheat field causing a rectangular pit of 2.2 m x 1.8 m size and 0.5 m depth.

The accident resulted in the death of 19 people and complete damage of the balloon.

The probable cause for the accident as seen by the investigation committee is due to a hose fuel leak at the upper portion of the forward right hose connected to burner number 193 capturing its ignition source from burner's fire causing a fire that caused a major and direct injury to the balloon captain.

Contributing factors:

- Maintenance actions that were carried out on the hoses could not indicate the need to replace the hose that was the cause of the accident.
- The P/N of the hose connected to burner 193 was for a hose made in 2005 and therefore, it has accumulated high flight hours and sometimes under adverse conditions. This service life and conditions increase the likelihood that the hose experienced weaknesses/defects, that could have contribute to the gas leak.

Safety Recommendation EGYP-2014-003 (AIB)

Recommendation to balloon manufacturer and its certifying authority: Consider the revision of fuel system component serial number placement in a way, that would avoid loss under different conditions and to ensure proper tracing.

Reply No. 2 sent on 27/04/2016:

The Type Certificate Holder (TCH) Ultramagic S.A. has developed a design solution that improves the installation of the placards that show the serial numbers of the fuel cylinders. The aluminium rivets have been replaced with steel rivets, which are better resistant to fire. This solution is mandatorily installed on newly delivered balloons components and it is introduced to the fleet via Service Bulletin SB01-2015. This action reduces the likelihood of loss of the placard, hence ensuring the proper traceability of the corresponding parts. EASA finds this action adequate.

For remaining fuel components, fuel burners in particular, EASA has assessed together with the TCH the method of placement of the serial number and find it adequate: MK-21 burners with serial number previous to 250 are marked in the burner coil steel strips. Burners with serial number higher than 250 are marked in the block of the burner, keeping a working order number stamped in the burner coil steel strips.

Status: Closed – **Category**: Agreement

Finland

Registration	Aircraft Type	Location	Date of event	Event Type
OH-XDZ	OTHER (Aerocomp Comp Air 8)	Jämijärvi	20/04/2014	Accident

Synopsis of the event:

On Easter Sunday, 20 April 2014 at 15:40 Finnish time (UTC + 3h) an accident occurred at Jämijärvi aerodrome when a Comp Air 8 aircraft, registration OH-XDZ, carrying skydivers crashed into the woods. In addition to the pilot there were ten skydivers on board. The pilot and two skydivers managed to bail out of the aircraft. Eight skydivers died in the collision with the ground.

The cause of the accident was that the stress resistance of the right wing's wing strut was exceeded as a result of the force which was generated by a negative g-force. The force which resulted in the buckling of the wing strut was the direct result of a negative (nose-down) change in pitching moment, in conjunction with an engine power reduction intended to decrease the high airspeed.

The buckling was followed by the right wing folding against the fuselage and the jump door. The aircraft entered into a flight condition resembling an inverted spin, which was unrecoverable. It was impossible to exit through the jump door.

Safety Recommendation FINL-2015-011 (SIA)

The Safety Investigation Authority, Finland recommends that the European Aviation Safety Agency prepare specified theoretical knowledge and flight training requirements for pilots-in-command in skydiving operations. A pilot must have to complete a separate type-specific skill test in order to obtain a jump pilot rating. The training and the skill test required for a jump pilot rating must take into account aircraft-specific characteristics and their impact on safe skydiving operations. [FI.SIA-2015-0011]

Reply No. 2 sent on 21/07/2016:

Depending on the specific nature of the undertaking, parachute operations in EASA Member States are covered by the provisions in Part-SPO (Specialised Operations) or Part-NCO (Non-Commercial operations with Other than complex motor-powered aircraft) of Commission Regulation (EU) No 965/2012 (the air operations regulation), applicable from 01 July 2014. However, Member States may opt out from these provisions until 21 April 2017, with national legislation applying in the meantime.

According to Part-SPO and Part-NCO, the operator/pilot-in-command (PIC) is required to carry out a risk assessment and establish standard operating procedures (SOPs) or checklists, respectively, to mitigate the risks related to the specific activity. AMC/GM to paragraphs SPO.OP.230 and NCO.SPEC.105 contain instructions and guidance on the risk assessment and development of specific SOPs and checklists. The mitigation could include additional theoretical training for the PIC, tailored to address the activity and the aircraft-specific characteristics.

The PIC is required to ensure that all operational procedures and checklists are complied with (See NCO.GEN.105 and SPO.GEN.107). It is the PIC's responsibility to familiarise him/herself with the operating procedures under normal, abnormal and emergency conditions and situations as specified in the flight manual associated with the aircraft operated.

Furthermore, according to ARO.GEN.300 in Part-ARO (Authority Requirements for air Operations) of the air operations regulation, the competent authority is required to verify continued compliance with Part-SPO and Part-NCO. Such oversight should detect any non-compliances or safety issues, which should be required by the competent authority to be corrected.

In addition, the 'Aerial Work/ Part Specialised Operations – Aeroplanes' Safety Risk Portfolio (SRP), is described in the EASA Annual Safety Review 2016. Parachuting operations will be subject to specific analysis during 2016 that will involve the EASA Member States through the Network of Analysts. If the outcome identifies the need for action(s) to augment the existing mitigation, this will be introduced into the Agency's strategy and programming process (European Plan for Aviation Safety) and acted on accordingly.

Status: Open – **Category**:

France

Registration	Aircraft Type	Location	Date of event	Event Type
TURB. STUDY			#Missing#	

Synopsis of the event:

Study about Turbulence in Air Transport

Etude sur les turbulences en transport aérien

Les phénomènes de turbulences occasionnent régulièrement des blessures graves parmi le personnel de cabine et les passagers, ainsi que des dommages à la structure de l'avion. Dans certains cas, ils provoquent des blessures mortelles. Cette étude s'intéresse aux accidents et incidents de transport public survenus en croisière au cours desquels les turbulences rencontrées sont d'origine atmosphérique. Sont donc exclus les événements pour lesquels une action sur les commandes est la cause principale des accélérations rencontrées et ceux engendrés par des turbulences de sillage. Dans ce cadre, le BEA a recensé quarante-huit occurrences entre 1995 et 2007 survenues en France ou à l'étranger à des avions exploités, immatriculés ou construits en France. Dix-neuf de ces occurrences pour lesquelles le dossier est particulièrement complet, ont été utilisées pour identifier les facteurs contributifs dans ce type d'événements.

Pour réaliser cette étude, le BEA a également utilisé des informations fournies par Météo France, la DGAC (DSNA et DCS), Eurocontrol, Airbus ainsi que plusieurs exploitants français.

Dans cette étude, les circonstances des accidents ou incidents et le rôle joue par les différents acteurs sont analysés afin d'en tirer des enseignements de sécurité. Les aspects relatifs au contrôle aérien et aux prévisions météorologiques sont abordés dans le contexte français actuel.

Safety Recommendation FRAN-2008-001 (BEA)

[French] - Le BEA recommande que l'AESA et Eurocontrol veillent à la mise en oeuvre de systèmes de communication d'informations météorologiques par liaison de données permettant leur centralisation et leur redistribution vers les postes de pilotages et les positions de contrôle.

Reply No. 2 sent on 17/10/2016:

Currently, there are no European regulations with regard to the provision of weather forecast by data link. The provisions contained in Annex V (Part MET) of Regulation (EU) No 2016/1377 do not include the standards of ICAO Annex 3 Chapter 5 (Communication of meteorological information via data link). Any rulemaking action for data link operations with regard to weather forecast will be initiated when the developments supporting technology and standards become more mature and therefore supporting regulations can be established on a solid basis.

However, since March 2016, the Agency is conducting a project on 'weather information to pilots'. The objective is to propose solutions to, notably, ensure that uplink weather information is readily available in the cockpit, based on the latest technologies available. The project is expected to deliver a European strategy paper, including regulatory actions to implement the proposed solutions. The project, respectively the EASA strategy publication, is expected to be completed and published in 2017.

Status: Open – **Category**:

Registration	Aircraft Type	Location	Date of event	Event Type
F-GVPD	BEECH C90	Besançon - La Vèze	18/10/2006	Accident

Synopsis of the event:

Le 18 octobre 2006 à 22 h 40, l'avion débute son décollage en piste 23 revêtue sur l'aérodrome de Besançon - La Vèze. Après avoir roulé pendant 950 mètres, il quitte le sol mais prend peu de hauteur. Quelques instants plus tard, il heurte la cime d'arbres situés dans l'axe de piste, prend feu et tombe dans un bois. Le pilote n'a signalé aucune difficulté et n'a pas émis de message de détresse.

Safety Recommendation FRAN-2009-007 (BEA)

[French] - Le BEA recommande que l'AESA étudie l'élargissement des conditions imposant la présence d'un équipage à deux pilotes en transport public.

Reply No. 3 sent on 21/07/2016:

The Agency is currently evaluating the effectiveness of the existing provisions on operations requiring two pilots within the context of on-going rulemaking task RMT.0599, which was launched on 05 February 2016, with the publication of the associated Terms of Reference.

Although RMT.0599 was primarily set up to integrate evidence-based training into the EU regulations, the scope has been extended to include evaluation of this safety recommendation, as the rulemaking group includes expertise which is appropriate for the evaluation.

Status: Open – **Category**:

Registration	Aircraft Type	Location	Date of event	Event Type
G-BDXE	BOEING 747	Saint-Denis Gilliot, France	25/10/2004	Incident

Synopsis of the event:

Au décollage de nuit de l'aérodrome de Saint-Denis Gillot, alors que l'avion a atteint une hauteur d'environ 300 ft, le réacteur n° 4 subit un pompage. Des flammes sont aperçues par certains passagers et membres de l'équipage de cabine.

L'équipage de conduite applique la procédure d'urgence « feu, grave dommage ou séparation-réacteur », ce qui le conduit à arrêter le réacteur n° 4.

Il décide de poursuivre le vol sur trois réacteurs, avec comme objectif, dans un premier temps, d'atteindre l'Europe. Arrivé au-dessus de l'Italie, il prend la décision de poursuivre jusqu'à la destination planifiée, Paris Charles de Gaulle.

L'avion atterrit après 11 h 34 min de vol, soit quarante-quatre minutes de plus que la durée prévue au plan de vol, avec une quantité de carburant proche de la réserve finale.

Safety Recommendation FRAN-2009-021 (BEA)

[French] - Le BEA recommande que les autorités européennes imposent aux exploitants de fournir à leurs équipages des consignes opérationnelles détaillées sur la poursuite éventuelle du vol vers un aérodrome autre que l'aérodrome accessible le plus proche.

Reply No. 3 sent on 20/12/2016:

The key safety issue identified by the Agency is related to in-flight fuel management by the flight crew. The Agency has reviewed this incident and other similar events, which occurred while operating four-engined aeroplanes, sharing the same safety issue.

In the reviewed cases, based on the manufacturer's approved aircraft flight manual and quick reference handbook, the Commander has the discretion to continue the flight beyond the nearest suitable airport following an in-flight single engine shutdown. Only in cases of severe engine damage, engine separation or fire does the manufacturer's procedure require the flight crew to "plan to land at the nearest suitable airport".

In Commission Regulation (EU) No 965/2012 (the Air Operations regulation), CAT.OP.MPA.280 "In-flight fuel management — aeroplanes" requires operators to establish a procedure for in-flight fuel checks and fuel management, according to the criteria outlined in the rule, which shall be approved by the Competent Authority together with the operator's fuel policy (CAT.OP.MPA.150).

Furthermore, operators are required to publish procedures in the Operations Manual (OM) (see OM structure in AMC3 ORO.MLR.100), as follows:

- Part - A, chapter 8.3.7 "Policy and procedures for in-flight fuel management";
- Part - B, chapter 3 "Abnormal and emergency procedures"

Moreover, flight crew members are required to receive operator conversion, recurrent and command course training related to the handling of abnormal procedures, including "decision-making" (ORO.FC.220 Operator conversion training and checking, ORO.FC.230 Recurrent training and checking, ORO.FC.205 Command course, and ORO.FC.115 Crew Resource Management training).

The combination of the above-mentioned procedures and training is expected to provide suitable mitigation for the safety issue described in the recommendation.

Status: Closed – **Category**: Partial agreement

Registration	Aircraft Type	Location	Date of event	Event Type
F-GZCP	AIRBUS A330	en route between Rio de Janeiro and Paris	01/06/2009	Accident

Synopsis of the event:

On 31 May 2009, the Airbus A330 flight AF 447 took off from Rio de Janeiro Galeão airport bound for Paris Charles de Gaulle. The aeroplane was in contact with the Brazilian ATLANTICO control centre on the INTOL – SALPU – ORARO - TASIL route at FL350. At around 2 h 02, the Captain left the cockpit. At around 2 h 08, the crew made a course change of 12 degrees to the left, probably to avoid returns detected by the weather radar. At 2 h 10 min 05, likely following the obstruction of the Pitot probes by ice crystals, the speed indications were incorrect and some automatic systems disconnected. The aeroplane's flight path was not controlled by the two co-pilots. They were re-joined 1 minute 30 later by the Captain, while the aeroplane was in a stall situation that lasted until the impact with the sea at 2 h 14 min 28.

The accident resulted from the following succession of events:

- Temporary inconsistency between the measured airspeeds, likely following the obstruction of the Pitot probes by ice crystals that led in particular to autopilot disconnection and a reconfiguration to alternate law,
- Inappropriate control inputs that destabilized the flight path,
- The crew not making the connection between the loss of indicated airspeeds and the appropriate procedure,
- The PNF's late identification of the deviation in the flight path and insufficient correction by the PF,
- the crew not identifying the approach to stall, the lack of an immediate reaction on its part and exit from the flight envelope,
- The crew's failure to diagnose the stall situation and, consequently, the lack of any actions that would have made recovery possible.

The BEA has addressed 41 Safety Recommendations to the DGAC, EASA, the FAA, ICAO and to the Brazilian and Senegalese authorities related to flight recorders, certification, training and recurrent training of pilots, relief of the Captain, SAR and ATC, flight simulators, cockpit ergonomics, operational feedback and oversight of operators by the national oversight authority.

Safety Recommendation FRAN-2011-015 (BEA)

The BEA recommends that EASA and the FAA make mandatory the recording:

- of the position of the flight director crossbars,
- of the parameters relating to the conduct of the flight displayed on the right side, in addition to those displayed on the left side.

Reply No. 3 sent on 17/10/2016:

This recommendation has been addressed within the framework of EASA rulemaking task RMT.0401 'Amendment of requirements for flight recorders and underwater locating devices'. The solution is based on specifications added to European Organisation for Civil Aviation Equipment (EUROCAE) Document 112A (ED-112A) by EUROCAE working group 90, in response to this safety recommendation. The working group decided to specify, in ED-112A Annex II-A, that 'Altitude, airspeed, pitch angle and roll angle displayed on each flight crew member primary flight displays' shall be recorded, and to add flight parameter No 81 to table II-A.1.

The associated EASA Executive Director (ED) Decision 2016/012/R, introducing these parameters for newly-manufactured aeroplanes, was published on the EASA web site on 13 September 2016 (see new parameters 2 'Pressure altitude', 3 'Indicated airspeed or calibrated airspeed', 6 'Pitch attitude' and 7 'Roll attitude' in Table 1, and parameter 81 'Flight director command' in Table 2, of new AMC1.2 CAT.IDE.A.190).

Status: Closed – **Category**: Agreement

Safety Recommendation FRAN-2011-016 (BEA)

The BEA recommends that EASA and the FAA evaluate the relevance of making mandatory the recording of the air data and inertial parameters of all of the sources used by the systems.

Reply No. 3 sent on 17/10/2016:

This recommendation was considered within the framework of EASA rulemaking task RMT.0401 'Amendment of requirements for flight recorders and underwater locating devices'. The conclusion is based on the decision made by European Organisation for Civil Aviation Equipment (EUROCAE) working group 90 in response to this safety recommendation. The working group decided not to modify the specification in ED-112A Annex II-A which specifies that 'Altitude, airspeed and other air data parameters shall be obtained from the air data system used for the operation of the aircraft'. Specifying that air and inertial data from all sources used by the systems should be recorded in addition was not considered necessary by the group.

The associated EASA Executive Director (ED) Decision 2016/012/R was published on the EASA web site on 13 September 2016. This Decision introduced AMC1.2 CAT.IDE.A.190 which states that the operational performance specifications for Flight Data Recorders (FDR) should be 'those laid down in EUROCAE Document 112A (...) or any later equivalent standard produced by EUROCAE'.

Status: Closed – **Category**: Partial agreement

Safety Recommendation FRAN-2012-045 (BEA)

The BEA recommends that EASA modify the basis of the regulations in order to ensure better fidelity for simulators in reproducing realistic scenarios of abnormal situations.

Reply No. 5 sent on 08/09/2016:

The Agency has published new Acceptable Means of Compliance and Guidance Material on flight crew Upset Prevention and Recovery Training (UPRT), with the specific objective to ensure that flight crew acquire and maintain the necessary competencies to prevent and recover from developing or developed upsets (see Executive Director (ED) Decision 2015/012/R, published on the Agency's web site on 04 May 2015).

The material takes into account the International Civil Aviation Organization (ICAO) Annex 6 amendment 38, ICAO Doc 9868 'Procedures for Air Navigation Services - Training' (PANS-TRG) amendment 3 relating to UPRT, and ICAO Doc 10011 'Manual on Aeroplane UPRT'. Reference is also made to the Original Equipment Manufacturers' (OEMs') Aeroplane Upset Recovery Training Aid (AURTA).

In addition, the Agency has launched rulemaking tasks RMT.0581 and RMT.0582 'Loss of control prevention and recovery training'. The outcome is expected to affect the related Flight Simulator Training Device (FSTD) provisions under Commission Regulation (EU) No 1178/2011 on aircrew. The associated Notice of Proposed Amendment, NPA 2015-13, was published on 01 September 2015 and the next deliverable, an EASA Opinion, is expected to be published in the fourth quarter of 2016.

The FSTD aspects are currently being considered within the context of rulemaking task RMT.0196 'Update of flight simulation training devices requirements', which was launched on 15 July 2016 with the publication of the associated Terms of Reference. The next deliverable, a Notice of Proposed Amendment, is planned to be published in the first quarter of 2017.

Status: Open – **Category**:

Registration	Aircraft Type	Location	Date of event	Event Type
SU-BPZ	BOEING 737	Paris Charles de Gaulle Airport, France	16/08/2008	Serious incident

Synopsis of the event:

At night in VMC conditions, the crew of flight AMV6104 to Luxor lined up from intersection Y11 on runway 27L at Paris Charles de Gaulle Airport. The runway distance available for take-off was temporarily reduced because of construction work. During the takeoff run, the airplane struck some provisional lights at the end of the runway then, during the rotation, destroyed some markers on the safety-barrier positioned in front of the construction zone. It took off before a provisional blast fence and continued its flight to its destination.

Safety Recommendation FRAN-2011-019 (BEA)

The BEA recommends that EASA conduct a study on the standards that should be taken into account during certification of on-board performance calculation systems, in order to ensure that their ergonomics and procedures for use are compatible with the requirements of safety.

Reply No. 3 sent on 09/02/2016:

A study entitled 'Electronic Flight Bag (EFB) - Aircraft performance calculations and mass & balance - Best practices for evaluation and use of EFB' has been completed.

The resulting report, dated October 2015, was published on the EASA website on 14 January 2016 under reference EASA_REP_RESEA_2014-1 at **http://easa.europa.eu/document-library/research-projects**.

It provides a generic risk assessment framework for such EFB applications in the context of Commercial Air Transport (CAT) operations with a set of guidelines for the development of risk mitigations.

The results of this study will serve as input for the work on standard approval procedures which are currently being developed by a dedicated International Civil Aviation Organization (ICAO) working group. Specifically, the Electronic Flight Bag Sub Working Group (EFB-SWG) has been tasked to review mitigation measures to address this safety issue.

Status: Closed – **Category**: Agreement

Registration	Aircraft Type	Location	Date of event	Event Type
ASAGA STUDY			#Missing#	

Synopsis of the event:

Study on Aeroplane State Awareness during Go-Around (ASAGA)

Towards the end of the 2000's, the BEA observed that a number of public air transport accidents or serious incidents were caused by a problem relating to "aeroplane state awareness during go-around" (ASAGA). Other events revealed inadequate management by the flight crew of the relationship between pitch attitude and thrust, with go-around mode not engaged, but with the aeroplane close to the ground and with the crew attempting to climb.

Moreover, these events seemed to have some common features, such as surprise, the phenomenon of excessive preoccupation by at least one member of the crew, poor communication between crew members and difficulties in managing the automatic systems.

A study was thus initiated with a view to:

- Determining if this type of event is associated with a particular type of aircraft;
- Listing and analysing the factors common to these events;
- Suggesting strategies to prevent their recurrence.

Safety Recommendation FRAN-2013-017 (BEA)

The BEA recommends that EASA in coordination with manufacturers, operators and major non-European aviation authorities ensure that go-around training integrates instruction explaining the methodology for monitoring primary flight parameters, in particular pitch, thrust then speed. [Recommendation FRAN-2013-017]

Reply No. 3 sent on 21/07/2016:

As a first step, the Agency has published, on 08 April 2014, Safety Information Bulletin SIB 2014-09 'Aeroplane Go-Around Training' to raise awareness on the risks associated with unexpected or poorly executed go-around manoeuvres and to encourage operators to specifically address these risks in their Management Systems. In the SIB, EASA recommends that training organisations and operators place more emphasis on conducting go-around manoeuvres, with all engines operating, in a flight simulator training device, during initial and recurrent training programmes.

Furthermore, the Agency is currently evaluating the effectiveness of the existing initial and recurrent training provisions within the context of on-going rulemaking tasks (RMTs):

- RMT.0188 and RMT.0189 on Part-FCL (Flight Crew Licensing) includes a review of the training syllabi, in Commission Regulation (EU) No 1178/2011 on aircrew, on monitoring of primary flight parameters during go-around. The associated Notice of Proposed Amendment, NPA 2014-29, was published on 17 December 2014 and the next deliverable, an EASA Opinion, is expected to be published in the fourth quarter of 2016.

For recurrent training, the Agency is taking steps to integrate evidence-based training principles into the EU regulations, as follows:

- EASA Executive Director (ED) Decision 2015/027/R on 'Implementation of EBT within the European regulatory framework' was published on 16 December 2015. Its objective was to determine the relevance of existing pilot training and to identify the most critical areas of pilot training according to aircraft generation. It contains new Guidance Material (GM) to support implementation, by operators, of EBT, conducted in Flight Simulation Training Devices, according to the principles established in International Civil Aviation Organization (ICAO) Doc 9995 'Manual of Evidence-based Training'.
- RMT.0599 'Evidence-based and competency-based training', which was launched on 05 February 2016, with the publication of the associated Terms of Reference, is reviewing the associated recurrent flight crew training in Part-ORO (Organisation Requirements for air Operations) of Commission Regulation (EU) No 965/2012 on air operations. The NPA is expected to be published by mid-2017.

Status: Open – **Category**:

Safety Recommendation FRAN-2013-018 (BEA)

The BEA recommends that EASA, in cooperation with the national civil aviation authorities and major non-European aviation authorities, ensure that during recurrent and periodic training, training organizations and operators give greater importance to the assessment and maintenance of the monitoring capabilities of public transport pilots. [Recommendation FRAN-2013-018]

Reply No. 4 sent on 15/08/2016:

Proper assessment and maintenance of the monitoring capabilities of public transport pilots should be achieved through implementation of Crew Resource Management (CRM) training by the operator (see ORO.FC.115, ORO.FC.215, ORO.FC.220 and ORO.FC.230 of Commission Regulation (EU) No 965/2012 on air operations).

Nevertheless, the Agency is currently evaluating the effectiveness of the existing recurrent training provisions regarding monitoring, within the context of rulemaking tasks (RMTs) set up to integrate evidence-based training (EBT):

- As a first step, the Agency has published Executive Director (ED) Decision 2015/027/R on 'Implementation of EBT within the European regulatory framework' was published on 16 December 2015. It reviewed the relevance of existing pilot training and identified the most critical areas of pilot training according to aircraft generation. It contains new Guidance Material (GM) to support implementation of EBT, by operators, according to the principles established in International Civil Aviation Organization (ICAO) Doc 9995 'Manual of Evidence-based Training'.
- RMT.0599 'Evidence-based and competency-based training', which was launched on 05 February 2016, with the publication of the associated Terms of Reference, is reviewing the associated recurrent flight crew training in Part-ORO (Organisation Requirements for air Operations) of Commission Regulation (EU) No 965/2012 on air operations. The NPA is expected to be published by mid-2017.

Status: Open – **Category**:

Safety Recommendation FRAN-2013-022 (BEA)

The BEA recommends that EASA review the regulatory requirements for initial and periodic training in order to ensure that go-arounds with all engines operating are performed sufficiently frequently during training. [Recommendation FRAN-2013-022]

Reply No. 3 sent on 21/07/2016:

As an initial step in response to this safety recommendation, the Agency published, on 08 April 2014, Safety Information Bulletin SIB 2014-09 'Aeroplane Go-Around Training' to raise awareness on the risks associated with unexpected or poorly executed go-around manoeuvres and to encourage operators to specifically address these risks in their safety management systems. In the SIB, EASA recommends that training organisations and operators place more emphasis on conducting go-around manoeuvres, with all engines operating, in a flight simulator training device, during initial and recurrent training programmes.

Initial training provisions are laid down in Annex I Part-FCL (Flight Crew Licensing) and Annex VII Part-ORA (Organisation Requirements for Aircrew) of Commission Regulation (EU) No 1178/2011 on aircrew.

Go-arounds and missed approaches are covered in the appendices and the AMC for LAPL (Light Aircraft Pilot Licence), PPL (Private Pilot Licence), CPL (Commercial Pilot Licence), MPL (Multi-Crew Pilot Licence), ATPL (Airline Transport Pilot Licence), MCC (Multi-Crew Cooperation), IR (Instrument Rating) and type/class rating initial training in Part-FCL.

For recurrent training, the Agency is taking steps to integrate evidence-based training principles into the EU regulations, as follows:

- EASA Executive Director (ED) Decision 2015/027/R on 'Implementation of EBT within the European regulatory framework' was published on 16 December 2015. Its objective was to determine the relevance of existing pilot training and to identify the most critical areas of pilot training according to aircraft generation. It contains new Guidance Material (GM) to support implementation, by operators, of EBT, conducted in Flight Simulation Training Devices, according to the principles established in International Civil Aviation Organization (ICAO) Doc 9995 'Manual of Evidence-based Training'.
- RMT.0599 'Evidence-based and competency-based training', which was launched on 05 February 2016, with the publication of the associated Terms of Reference, is reviewing the associated recurrent flight crew training in Part-ORO (Organisation Requirements for air Operations) of Commission Regulation (EU) No 965/2012 on air operations. The NPA is expected to be published by mid-2017.

Status: Open – **Category**:

Safety Recommendation FRAN-2013-032 (BEA)

The BEA recommends that EASA and manufacturers study the implementation of means to allow flight crew to have access to a virtual representation of the outside environment in IMC conditions. [Recommendation FRAN-2013-032]

Reply No. 3 sent on 15/03/2016:

The Agency, through Rulemaking Task RMT.0379 'All-weather operations', is reviewing the airworthiness and air operations rules to enable the use of advanced vision systems for the benefit of increased situational awareness and operational credits. Account is being taken of the established standards in the field of advanced vision systems [Minimum Aviation System Performance Standards (MASPS) published by the European Organisation for Civil Aviation Equipment (EUROCAE) and the Radio Technical Commission for Aeronautics (RTCA)] the usage of which would improve the perception of the outside environment under poor visibility conditions.

The RMT was launched on 09 December 2015 with the publication of the associated Terms of Reference. The planned deliverables, an EASA Opinion for Implementing Rules and a Notice of Proposed Amendment for Acceptable Means of Compliance and Guidance Material, are planned to be published by mid-2017.

It should be noted that, already today, Commission Regulation (EU) No 965/2012 on air operations does not preclude access to advanced vision systems for the purpose of enhancing situational awareness.

Status: Open – **Category**:

Safety Recommendation FRAN-2013-033 (BEA)

The BEA recommends that EASA, in cooperation with the national civil aviation authorities and major non-European aviation authorities, ensure that the risks associated with dispersion and/or channelized attention during the go-around, to the detriment of the primary flight parameters, be taught to crews. [Recommendation FRAN-2013-033]

Reply No. 3 sent on 21/07/2016:

As an initial step in response to this safety recommendation, the Agency published, on 08 April 2014, Safety Information Bulletin SIB 2014-09 'Aeroplane Go-Around Training' to raise awareness on the risks associated with unexpected or poorly executed go-around manoeuvres and to encourage operators to specifically address these risks in their safety management systems. In the SIB, EASA recommends that training organisations and operators place more emphasis on conducting go-around manoeuvres, with all engines operating, in a flight simulator training device, during initial and recurrent training programmes.

Recurrent flight crew training on the risks associated with dispersion and/or channelized attention during high workload procedures should be achieved through implementation of Crew Resource Management (CRM) training by the operator. The related provisions are included in Commission Regulation (EU) No 965/2012 on air operations and the associated Acceptable Means of Compliance (AMC) and GM on organisation requirements.

Nevertheless, the Agency is currently evaluating the effectiveness of the existing initial and recurrent training provisions within the context of on-going rulemaking tasks (RMTs):

- RMT.0188 and RMT.0189 on Part-FCL (Flight Crew Licensing) includes a review of the training syllabi, in Commission Regulation (EU) No 1178/2011 on aircrew, on the risks associated with dispersion and/or channelized attention during go-around. The associated Notice of Proposed Amendment, NPA 2014-29, was published on 17 December 2014 and the next deliverable, an EASA Opinion, is expected to be published in the fourth quarter of 2016.

For recurrent training, the Agency is taking steps to integrate evidence-based training principles into the EU regulations, as follows:

- EASA Executive Director (ED) Decision 2015/027/R on 'Implementation of EBT within the European regulatory framework' was published on 16 December 2015. Its objective was to determine the relevance of existing pilot training and to identify the most critical areas of pilot training according to aircraft generation. It contains new Guidance Material (GM) to support implementation, by operators, of EBT, conducted in Flight Simulation Training Devices, according to the principles established in International Civil Aviation Organization (ICAO) Doc 9995 'Manual of Evidence-based Training'.
- RMT.0599 'Evidence-based and competency-based training', which was launched on 05 February 2016, with the publication of the associated Terms of Reference, is reviewing the associated recurrent flight crew training in Part-ORO (Organisation Requirements for air Operations) of Commission Regulation (EU) No 965/2012 on air operations. The NPA is expected to be published by mid-2017.

Status: Open – **Category**:

Safety Recommendation FRAN-2013-035 (BEA)

The BEA recommends that EASA, in coordination with manufacturers, operators and major non-European aviation authorities, study whether to extend these measures to other procedures requiring a high workload in a short time frame. [Recommendation FRAN-2013-035]

Reply No. 3 sent on 21/07/2016:

As described in the accident report, the rationale behind this recommendation and FRAN-2013-033 highlights the importance of mitigating the risk of dispersion or channelized attention during high workload which can impede the effective monitoring of the primary flight parameters.

Risks associated with high workload are addressed in Certification Specification CS 25.1523 and Appendix D to CS-25. Systems and controls, including indications and annunciations, shall be designed to minimise crew errors, which could create additional hazards according to CS 25.1302 and CS 25.1309 (c).

Recurrent flight crew training on the risks associated with dispersion and/or channelized attention during high workload procedures should be achieved through implementation of Crew Resource Management (CRM) training by the operator (see ORO.FC.115, ORO.FC.215, ORO.FC.220 and ORO.FC.230 of Commission Regulation (EU) No 965/2012 on air operations).

Nevertheless, the Agency is currently evaluating the effectiveness of the existing training provisions for mitigating the risks associated with dispersion and/or channelized attention during high workload procedures within the context of on-going rulemaking tasks (RMTs):

- RMT.0188 and RMT.0189 on Part-FCL (Flight Crew Licensing) includes a review of Appendix 9 of Commission Regulation (EU) No 1178/2011 on aircrew. The associated Notice of Proposed Amendment, NPA 2014-29, was published on 17 December 2014 and the next deliverable, an EASA Opinion, is expected to be published in the fourth quarter of 2016.

For recurrent training, the Agency is taking steps to integrate evidence-based training principles into the EU regulations, as follows:

- EASA Executive Director (ED) Decision 2015/027/R on 'Implementation of EBT within the European regulatory framework' was published on 16 December 2015. Its objective was to determine the relevance of existing pilot training and to identify the most critical areas of pilot training according to aircraft generation. It contains new Guidance Material (GM) to support implementation, by operators, of EBT, conducted in Flight Simulation Training Devices, according to the principles established in International Civil Aviation Organization (ICAO) Doc 9995 'Manual of Evidence-based Training'.
- RMT.0599 'Evidence-based and competency-based training', which was launched on 05 February 2016, with the publication of the associated Terms of Reference, is reviewing the associated recurrent flight crew training in Part-ORO (Organisation Requirements for air Operations) of Commission Regulation (EU) No 965/2012 on air operations. The NPA is expected to be published by mid-2017.

Status: Open – **Category**:

Safety Recommendation FRAN-2013-036 (BEA)

The BEA recommends that EASA ensure that national civil aviation authorities check, during inflight and simulator checks, that monitoring of the engagement modes of automated systems by pilots is correctly executed. [Recommendation FRAN-2013-036]

Reply No. 3 sent on 13/09/2016:

EASA monitors the implementation of the EU civil aviation regulations through standardisation inspections of Member States' competent authorities, in accordance with Commission Implementing Regulation (EU) No 628/2013.

According to Commission Regulation (EU) No 1178/2011 on aircrew and Commission Regulation (EU) No 965/2012 on air operations, the competent authority is required to verify continued compliance with the applicable requirements of organisations it has certified, of persons, and of flight simulation training devices qualification certificate holders (see ARA.GEN.300 (a)(2) of Part-ARA (Authority Requirements for Aircrew) and ARO.GEN.300 (a)(2) of Part-ARO (Authority Requirements for Air Operations) of Commission Regulation (EU) No 965/2012 on air operations). The competent authority shall establish and maintain an oversight programme for the oversight activities required by ARA.GEN.300 (see ARA.GEN.305 (a) and ARO.GEN.305 (a)). The programme shall include the monitoring of Approved Training Organisation's (ATO's) course standards, including the sampling of training flights with students (see ARA.ATO.105). Operators and ATOs shall also monitor compliance with the relevant requirements (see ORA.GEN.200 (a)(6) of Part-ORA (Organisation Requirements for Aircrew) and ORO.GEN.200 (a)(6) of Part-ORO (Organisation Requirements for Air Operations).

During the above-mentioned oversight and monitoring, the competent authorities, operators and ATOs should check, during inflight and simulator checks, that the monitoring of the engagement modes of automated systems by pilots complies with the applicable Flight Crew Licensing (FCL) provisions of the aircrew regulation (see, for example, FCL.725 (c); (Acceptable Means of Compliance) AMC1 FCL.725 (a) sub-paragraphs (a)(10)(ii)(E), (b)(3)(i)(E), (g)(2) to (5); FCL.1030 (b)(3)(ii)).

Having the right competencies and adapting training methods for piloting skills is recognised as a key safety issue, hence a new systemic threat was introduced in the 2012-2015 European Plan for Aviation Safety (EPAS) in order to review the existing training provisions with regard to the potential degradation of situational awareness and flight path management due to increased reliance on automation by flight crews. This resulted in the publication of an EASA Automation Policy and a Training Implementation Policy addressing the implementation of EU provisions regarding applicable training, testing and checking.

In addition, Commission Regulation (EU) No 69/2014 amending Regulation (EU) No 748/2012 on initial airworthiness, was published on 27 January 2014, in order to allow the Agency to approve Operational Suitability Data (OSD) as part of the type-certification process. The associated Executive Director (ED) Decision 2014/008/R contains Certification Specifications for Flight Crew Data (CS-FCD) and comprises information related to the type specific elements as required under the OSD concept. The CSs include requirements for pilot type rating training for a specific aircraft and operational evaluations for the proposed operations. This, together with the AMC and Guidance Material (GM) in ED Decision 2014/007/R, requires operators to adapt their training with the mandatory elements identified by the manufacturer and approved by EASA in the type certification process. This will ensure that, for sophisticated automation, the training delivered is adequate for the level of complexity. According to Article 9a of the air operations regulation, operators shall ensure that flight crew members who are already in operation and have completed training which did not include the mandatory elements established in the relevant OSD, undertake training covering those mandatory elements not later than 18 December 2017 or two years after the approval of the OSD, whichever is the latest. When establishing the training programmes and syllabi, the operator shall include the relevant elements defined in the mandatory part of the OSD established in accordance with Regulation (EU) No 748/2012 (ORO.FC.145 (b)).

Furthermore, the importance of effective monitoring of the engagement modes of automated systems by pilots was emphasised during the 14th Air Operations Standardisation Meeting in Cologne on 08 October 2015. EASA reminded competent authorities to check, during inflight and simulator checks, that monitoring of the engagement modes of automated systems by pilots is correctly executed. During the presentation, reference was made to the following supporting EASA publications:

- EASA 'Automation Policy - Bridging Design and Training Principles', published on 28 May 2013.
- EASA 'Training Implementation Policy', published on 31 October 2013.
- Safety Information Bulletin (SIB) No 2010-33R1 'Automation Policy – Mode Awareness and Energy State Management', published on 26 June 2015.
- ED Decision 2015/012/R 'Upset Prevention and Recovery Training (UPRT)', published on 04 May 2015. Automation management and associated monitoring are listed as elements to be included in the operator conversion training and checking, and recurrent training and checking.
- Notice of Proposed Amendment 2014-17 from EASA rulemaking task RMT.0411 'Crew Resource Management (CRM) training', published on 26 June 2014. The RMT concluded, on 28 September 2015, with the publication of ED Decision 2015/022/R related to Part-ARO and Part-ORO of the air operations regulation. This ED Decision introduced new and enhanced provisions on CRM training, for example on; qualification and training of inspectors of competent authorities for the oversight of operator's CRM training; CRM training environment and CRM instructors; computer-based CRM training; competency-based CRM training; resilience development; surprise and startle effect. Effective assessment and maintenance of the flight crew's monitoring capabilities should be achieved through implementation of CRM training by the operator (for example, see ORO.FC.115, ORO.FC.215, ORO.FC.220 and ORO.FC.230 of the air operations regulation).

The Agency also published, on 10 June 2014, SIB No 2014-17 'Aeroplane Mode Awareness During Final Approach' to improve awareness of the risks associated with increased reliance on aircraft automation by flight crew members.

Status: Closed – **Category**: Agreement

Safety Recommendation FRAN-2013-039 (BEA)

The BEA recommends that EASA in coordination with national civil aviation authorities ensure that airlines under its oversight once again insist during training on the best practices for manipulating the FCU/MCP. [Recommendation FRAN-2013-039]

Reply No. 3 sent on 08/09/2016:

EASA monitors the implementation of the EU civil aviation regulations through standardisation inspections of Member States' competent authorities, in accordance with Commission Implementing Regulation (EU) No 628/2013.

According to Commission Regulation (EU) No 1178/2011 on aircrew, and Commission Regulation (EU) No 965/2012 on air operations, the competent authority is required to verify continued compliance with the applicable requirements of organisations it has certified, of persons, and of flight simulation training devices qualification certificate holders (see ARA.GEN.300 (a)(2) of Part-ARA (Authority Requirements for Aircrew) and ARO.GEN.300 (a)(2) of Part-ARO (Authority Requirements for Air Operations) The competent authority shall establish and maintain an oversight programme for the oversight activities required by ARA.GEN.300 (see ARA.GEN.305 (a) and ARO.GEN.305(a)). The programme shall include the monitoring of Approved Training Organisation's (ATO's) course standards, including the sampling of training flights with students (see ARA.ATO.105). Operators and ATOs shall also monitor compliance with the relevant requirements (see ORA.GEN.200 (a)(6) of Part-ORA (Organisation Requirements for Aircrew) and ORO.GEN.200 (a)(6) of Part-ORO (Organisation Requirements for Air Operations).

During the above-mentioned oversight and monitoring, the competent authorities, operators and ATOs should check that the training on handling the Flight Control Unit (FCU)/Main Control Panel (MCP) complies with the applicable Flight Crew Licensing (FCL) provisions of the aircrew regulation (see, for example, FCL.725 (c); (Acceptable Means of Compliance) AMC1 FCL.725 (a) sub-paragraphs (a)(10)(ii)(E), (b)(3)(i)(E), (g)(2) to (5); FCL.1030 (b)(3)(ii)). The operator is required to check that the handling of the FCU/MCP by pilots is correctly executed ie in accordance with their Operations Manual (OM). The competent authority, as part of their oversight responsibilities, should also check that the operator's SOPs on manipulating the FCU/MCP complies with the Flight Crew Training Manuals (FCTM), Flight Crew Operating Manuals (FCOM) and operator's Standard Operating Procedures (SOPs) as documented in the operator's OM.

Having the right competencies and adapting training methods for piloting skills is recognised as a key safety issue, hence a new systemic threat was introduced in the 2012-2015 European Plan for Aviation Safety (EPAS) in order to review the existing training provisions with regard to the potential degradation of situational awareness and flight path management due to increased reliance on automation by flight crews. This resulted in the publication of an EASA Automation Policy and a Training Implementation Policy addressing the implementation of EU provisions regarding applicable training, testing and checking.

In addition, Commission Regulation (EU) No 69/2014 amending Regulation (EU) No 748/2012 on initial airworthiness, was published on 27 January 2014, in order to allow the Agency to approve Operational Suitability Data (OSD) as part of the type-certification process. The associated Executive Director (ED) Decision 2014/008/R contains Certification Specifications for Flight Crew Data (CS-FCD) and comprises information related to the type specific elements as required under the OSD concept. The Certification Specifications include requirements for pilot type rating training for a specific aircraft and operational evaluations for the proposed operations. This, together with the AMC and Guidance Material (GM) in ED Decision 2014/007/R, requires operators to adapt their training with the mandatory elements identified by the manufacturer and approved by EASA in the type certification process. This will ensure that, for sophisticated automation, the training delivered is adequate for the level of complexity. According to Article 9a of the air operations regulation, operators shall ensure that flight crew members who are already in operation and have completed training which did not include the mandatory elements established in the relevant OSD, undertake training covering those mandatory elements not later than 18 December 2017 or two years after the approval of the OSD, whichever is the latest. When establishing the training programmes and syllabi, the operator shall include the relevant elements defined in the mandatory part of the OSD established in accordance with Regulation (EU) No 748/2012 (ORO.FC.145 (b)).

Furthermore, the importance of training on best practises on operating the FCU and/or the MCP was emphasised during the 14th Air Operations Standardisation Meeting in Cologne on 08 October 2015. EASA reminded competent authorities to ensure that operators under their oversight put emphasis, during flight crew training, on the best practices for manipulating the FCU/MCP. During the presentation, reference was made to the following supporting EASA publications:

- EASA 'Automation Policy - Bridging Design and Training Principles', published on 28 May 2013.
- EASA 'Training Implementation Policy', published on 31 October 2013.
- Safety Information Bulletin (SIB) No 2010-33R1 'Automation Policy – Mode Awareness and Energy State Management', published on 26 June 2015.
- ED Decision 2015/012/R 'Upset Prevention and Recovery Training (UPRT)', published on 04 May 2015. Automation management and associated handling are listed as elements to be included in the operator conversion training and checking, and recurrent training and checking.
- Notice of Proposed Amendment 2014-17 from EASA rulemaking task RMT.0411 'Crew Resource Management (CRM) training', published on 26 June 2014. The RMT concluded, on 28 September 2015, with the publication of ED Decision 2015/022/R related to Part-ARO and Part-ORO of the air operations regulation. This ED Decision introduced new and enhanced provisions on CRM training, for example on; qualification and training of inspectors of competent authorities for the oversight of operator's CRM training; CRM training environment and CRM instructors; computer-based CRM training; competency-based CRM training; resilience development; surprise and startle effect. Effective assessment and maintenance of the flight crew's auto-system handling capabilities should be achieved through implementation of CRM training by the operator (for example, see ORO.FC.115, ORO.FC.215, ORO.FC.220 and ORO.FC.230 of the air operations regulation).

The Agency also published, on 10 June 2014, SIB No 2014-17 'Aeroplane Mode Awareness During Final Approach' to improve awareness of the risks associated with increased reliance on aircraft automation by flight crew members.

Lastly, the type-specific FCTMs and FCOMs, published by the OEMs (Original Equipment Manufacturers), describe how the FCU/MCP system works and how it should be handled. Together with the operator's SOPs and the flight crew training received, including CRM training, effective handling of the FCU/MCP should be assured.

Status: Closed – **Category**: Agreement

Safety Recommendation FRAN-2013-045 (BEA)

The BEA recommends that EASA, without waiting, in coordination with Eurocontrol and national civil aviation authorities, implement regulatory measures limiting modifications to published missed-approach procedures. [Recommendation FRAN-2013-045]

Reply No. 3 sent on 24/11/2016:

This safety recommendation is currently being addressed within the framework of Rulemaking Task RMT.0464 'Requirements for air traffic services'. The first deliverable, a Notice of Proposed Amendment, NPA 2016-09(B), was published on 14 September 2016 and the consultation period is active until 28th February 2017. The NPA includes proposals to establish a detail regulatory framework with regard to the provision of Air Traffic Services within the framework of Commission Implementing Regulation (EU) 2016/1377 on common requirements for ATM/ANS (ATM/ANS Common Requirements Regulation) within the framework of the ATM/ANS Common Requirements Regulation 2016/1377.

The NPA contains, inter alia, amendments to the upcoming Executive Director Decision issuing Acceptable Means of Compliance (AMC) and Guidance Material (GM) to the ATM/ANS Common Requirements Regulation. In particular, it contains a proposed AMC addressing missed approach instructions (see AMC21 ATS.TR.210(a)(3) Operation of ATC service - MISSED APPROACHES INSTRUCTIONS) which is intended to address the Safety Recommendation FRAN-2013-045.

The EASA Opinion resulting from the regulatory process for RMT.0464 is planned to be published during the course of 2017.

Status: Open – **Category**:

Registration	Aircraft Type	Location	Date of event	Event Type
F-GXES	PIPER PA42	3NM from Saint Martin Grand case aerodrome	05/05/2012	Accident

Synopsis of the event:

Le pilote décolle à 2 h 39 en piste 12 de l'aérodrome de Saint Martin Grand Case à destination de Fort-de-France. Quelques minutes plus tard à environ 3 NM, l'avion entre en collision avec la surface de la mer, légèrement à droite de l'axe de la piste. Le pilote n'a signalé aucune difficulté et n'a pas émis de message de détresse.

L'examen de l'épave n'a pas mis en évidence de défaillance technique susceptible d'affecter significativement les performances de l'avion. L'absence d'enregistreurs de vol n'a pas permis de préciser les circonstances de l'accident.

Les causes de l'accident n'ont pu être déterminées avec certitude. Cependant, l'état d'astreinte quasi-permanent pour les personnels navigants et l'exploitation en monopilote ont pu contribuer à l'accident.

Le BEA a adressé à l'AESA trois recommandations de sécurité relatives à:

- l'obligation d'emport d'enregistreurs de vols à tous les avions exploités en transport aérien commercial;
- l'obligation de présence d'un équipage à deux pilotes en vol d'évacuation sanitaire;
- la prise en compte des réserves autres qu'à l'aéroport dans la future réglementation relative à la sécurité en matière de limitations de temps de vol applicables aux vols d'évacuation sanitaire.

Dans l'attente de la mise en place de cette nouvelle réglementation, le BEA a adressé à la DGAC une recommandation de sécurité relative aux actions de surveillance de la DGAC, afin qu'elle s'assure que les exploitants veillent à ce que leurs pilotes, lorsqu'ils sont en réserve hors aéroport, soient aptes à entreprendre un vol à tout moment.

Safety Recommendation FRAN-2013-052 (BEA)

[French] - Le BEA recommande que L'AESA prévoie la mise en place en priorité de la réglementation imposant la présence d'un équipage à deux pilotes en vol d'évacuation sanitaire. [Recommandation FRAN-2013-052]

Reply No. 2 sent on 21/07/2016:

The Agency is currently evaluating the effectiveness of the existing provisions on air ambulance operations within the context of on-going rulemaking task RMT.0599, which was launched on 05 February 2016, with the publication of the associated Terms of Reference.

Although RMT.0599 was primarily set up to integrate evidence-based training into the EU regulations, the scope has been extended to include evaluation of this safety recommendation, as the rulemaking group includes expertise which is appropriate for the evaluation.

Status: Open – **Category**:

Registration	Aircraft Type	Location	Date of event	Event Type
F-GRZE	BOMBARDIER CL600 2C10	Lorient Lann Bihoue	16/10/2012	Accident

Synopsis of the event:

The crew was cleared for an ILS RWY 25 approach. During the descent, the controller informed them of a wind from 160° at 17 kt with gusts up to 26 kt and a lasting, severe squall. Visibility was reduced to between 2,000 and 3,000 m and the runway was wet with water puddles. The controller reported that the previous aircraft had encountered difficulties during landing due to “aquaplaning”.

The crew made the approach in the flaps 30° configuration. The ILS 25 approach was stable at 1,000 ft. The autopilot was disengaged at around 500 feet. The aeroplane’s main landing gear touched down on the runway about 1,100 m from the end.

The aeroplane overran the runway, its left wing striking the localizer antennae, before coming to rest in a grass field about 200 m from the threshold of runway 07.

An emergency evacuation order was given. The 53 passengers evacuated through the left front door and the overwing exits.

The investigation showed that the accident was due to the crew’s failure to decide to carry out a missed approach when they had not made themselves aware of the runway contamination or of the remaining length of runway available.

Safety Recommendation FRAN-2013-070 (BEA)

The BEA recommends that EASA study, for aerodromes used by commercial civil aviation, the mandatory installation of additional ground facilities to improve night flight support systems for pilots on runways approved for Cat I precision approaches. [Recommendation FRAN-2013-070]

Reply No. 3 sent on 24/11/2016:

In order to address this safety recommendation, the Agency conducted a survey and subsequently consulted its Advisory bodies. Based on the input received, the Agency decided to address this issue through safety promotion activities. To this end, the Agency prepared and published on its website the brochure (**http://www.easa.europa.eu/document-library/general-publications/runway-centre-line-lights**) concerning the installation of centreline lighting systems (dated 26th Aug. 2016).

Moreover, following its publication, the Agency has disseminated the brochure to the Aerodromes Technical Body (ADR TeB), but also during other, aerodrome related, technical meetings that have taken place (e.g. visual aids thematic meeting, Aerodromes physical characteristics thematic meeting, etc.).

Status: Closed – **Category**: Partial agreement

Registration	Aircraft Type	Location	Date of event	Event Type
VP-CAZ	RAYTHEON 390	Near Annemasse aerodrome, in the commune of Cranves-Sales	04/03/2014	Accident

Synopsis of the event:

The pilot and two passengers arrived at Annemasse aerodrome at about 7 h 00 for a private flight of about five minutes towards Geneva airport. The temperature was -2°C and the humidity was 98% with low clouds. The aeroplane had been parked on the parking area of the aerodrome since the previous evening. The taxiing and the takeoff run were nominal. As soon as the main landing gear wheels left the ground, the aeroplane stalled, as a result of the presence of ice on the surface of the wings. The low height reached by the aeroplane did not allow the pilot to exit the stall situation and to avoid the collision with the ground. The pilot and the passenger seated to his right were killed. The female passenger seated at the rear was seriously injured.

The investigation showed that the pilot's insufficient appreciation of the risks associated with ground-ice led him to take off with contamination of the critical airframe surfaces. This may have contributed to the occurrence of 32 accidents recorded since 1989 for which no de-icing of the aeroplane had been undertaken before takeoff.

The investigation also showed that an onboard device for the detection of ice on the ground could have prevented the accident and that Annemasse aerodrome does not have any ground de-icing facilities.

The BEA addressed three safety recommendations to EASA and the DGAC relating to:

- training on the risks associated with takeoff with contaminated wings;
- the installation of ice detection systems;
- the availability of anti-icing/de-icing facilities on aerodromes.

Safety Recommendation FRAN-2014-005 (BEA)

The BEA recommends that EASA, in coordination with national civil aviation authorities, make changes to the training requirements for pilots so as to include periodic reminders on the effects of contaminants such as ice on stall and loss of control on takeoff. [Recommendation 2014-005]

Reply No. 2 sent on 21/07/2016:

It is understood that this Safety Recommendation addresses non-commercial operations with complex motor-powered aircraft (NCC operations).

The Agency is currently evaluating the effectiveness of the existing recurrent training provisions on de-icing/anti-icing procedures within the context of on-going rulemaking task RMT.0599 'Evidence-based and competency-based training', which was launched on 05 February 2016, with the publication of the associated Terms of Reference. The NPA is expected to be published by mid-2017.

Nevertheless, it should also be noted that a number of provisions in Commission Regulation (EU) No 965/2012 on air operations which are applicable to NCC operations, already address, directly or indirectly, the hazard of contaminants such as ice.

In particular, according to NCC.OP.185, the operator shall provide ground procedures for the de-icing/anti-icing of the aircraft. The pilot-in-command shall only commence take-off if the aircraft is clear of any deposit that might adversely affect the performance or controllability of the aircraft, except as permitted under the procedures provided by the operator and in accordance with the Aircraft Flight Manual (AFM).

Status: Open – **Category**:

Registration	Aircraft Type	Location	Date of event	Event Type
F-GBFG	CESSNA F172	Le Hebriers	25/10/2012	Serious incident

Synopsis of the event:

Fuel starvation, forced landing in countryside during aerial work

The pilot, accompanied by a photographer, took off from Lyon Bron airport at about 11h08 for an aerial photography flight. The planned flight represented a distance of 400 to 450 NM corresponding to the maximum flight in an F172M of about 4h30. The pilot had planned to land at Niort aerodrome to refuel. The flight took place without any particular problem according to the [...] vertical profile as indicated by the pilot.

At about 16h15, after photographs had been taken of places in the commune of Herbiers, the pilot decided to refuel at Cholet, which was closer than Niort. He told the AFIS agent of his intention. A few minutes later, he noticed the engine misfiring, followed by loss of power. He undertook some fault-finding, and then looked for a field to land in. He explained that, during the descent, the engine was still running but was not delivering power. The landing took place after five hours and thirty minutes of flight, less than 15 NM from Cholet aerodrome. Once on the ground, the engine stopped.

Safety Recommendation FRAN-2014-013 (BEA)

EASA modify airworthiness regulations CS-23 and CS-VLA to make mandatory the installation of totalising fuel flowmeter indicators or equivalents or low fuel level warnings independent of the main gauge systems in all relevant aircraft. [Recommendation FRAN-2014-013]

Reply No. 2 sent on 15/03/2016:

The Agency considers that a Totalising fuel flowmeter indicator (TFFMI) is a valuable tool to support the pilot when monitoring the fuel consumption and fuel quantity. However, using a TFFMI does not provide protection against all fuel exhaustion scenarios.

A low fuel level alerting function is considered as a more promising source of safety improvement against the risk of fuel exhaustion for general aviation aeroplanes. Such system provides an alert allowing time to find a suitable landing place in a majority of the operational scenarios. Furthermore, the alert is not put at risk by an eventual error from the pilot. Various recent aircraft designs are now equipped with such a function.

Therefore the Agency supports the recommendation to create a new requirement for a low fuel level alerting function in the certification specifications for CS-23 and CS-VLA aeroplanes.

EASA rulemaking task RMT.0498 on the 'Reorganisation of Part 23 and CS-23' started with the publication of its Terms of Reference on 31 October 2013. One of the objectives of the task is to reorganise CS-23 in order to establish a single set of Certification Specifications for Aeroplanes in the range from CS-VLA up to CS-23, that:

- contain requirements based on proportionate performance, complexity, and type of operation;
- make Certification Specifications for Light Aeroplanes less susceptible to changes as a result of technological developments or new compliance-showing methods by defining design-independent safety objectives;
- are complemented by acceptable consensus standards (developed by ASTM F44 Committee) that contain the detailed technical requirements to meet the safety objectives set by the certification specifications.

A standard for a low fuel level annunciation means is being incorporated in the next revision of ASTM standard F3064 (Standard Specification for Control, Operational Characteristics and Installation of Instruments and Sensors of Propulsion Systems). It will be included in the future CS-23 (currently targeted for publication by end of 2016), applicable to all aeroplanes (piston and turbine engines).

In addition, the Agency considers promoting the installation of low fuel level alerting systems on already certified aircraft through the introduction of a standard change into CS-STAN, which will simplify the process for the aircraft owners and will limit the cost to an affordable value.

Status: Open – **Category**:

Registration	Aircraft Type	Location	Date of event	Event Type
PK-WFV	ATR ATR72	Kendari Ujung Pandang	18/09/2013	Serious incident

Registration	Aircraft Type	Location	Date of event	Event Type
9Y-TTC	ATR ATR72	Tobago	04/05/2014	Serious incident

Registration	Aircraft Type	Location	Date of event	Event Type
SE-MDB	ATR ATR72	Sweden- AD Visby	30/11/2014	Serious incident

Synopsis of the event:

On 18th September 2013, the ATR 72-212A MSN 985 registered PK-WFV encountered severe vibrations on engine #2 propeller during descent at a speed of 251 kt as the crew was moving power levers to the Flight Idle position. Vibrations persisted until the engine #2 was shut down after landing. The blade angle actuator forward plate was found bent and one blade was turning freely as its trunnion pin was broken. Two engine fittings were found broken.

On 4th May 2014, the ATR 72-212A MSN 989 registered 9Y-TTC encountered severe vibrations on engine #2 propeller during descent at a speed of 246 kt as the crew was moving power levers to the Flight Idle position. On 5th May 2014, right propeller vibrations were reported by the crew after landing. Propeller pitch change mechanism was found severely damaged after maintenance performed test runs on the ground. The blade angle actuator forward plate was found heavily bent and one blade was turning freely as its trunnion pin was broken.

On 30th November 2014, the ATR 72-212A MSN 822 registered SE-MDB encountered severe vibrations on engine #2 propeller. According to preliminary results, vibrations occurred during descent at a speed around 250 kt when power levers were in Flight Idle position. The crew reported that the level of vibrations made it impossible to read the instruments. Vibrations ceased when the engine #2 was shut down in flight. After landing, the blade angle actuator forward plate was found heavily bent and one blade was turning freely as its trunnion pin was broken. Damages were observed on the engine's compressor housing and on some engine shock mounts.

At least three other incidents, not investigated by a safety investigation authority, that led to vibrations and propeller pitch change mechanism damages have occurred on ATR equipped with 568F-1 propellers since 2012:

- on 4th April 2012 to the ATR 72-212A MSN 880 registered 5H-PWD. The flight crew moved the power levers to Flight Idle position at a speed of 247 kt, but the precise moment the vibrations started could not be determined.
- on 7th January 2013 to the ATR 72-212A MSN 926 registered PR-TKA. Vibrations occurred at 258 kt when crew moved power levers to Flight Idle position
- on 27th August 2013 to the ATR 72-212A MSN 923 registered 5H-PWG. The FDR data was not preserved.

The six aircraft involved in these events were all equipped with Hamilton Sundstrand Propellers, model 568F-1, manufactured by UTAS.

A Service Bulletin (ref SB568F-61-67) was issued by UTAS on 2nd October 2014. An Operators Information Message (ref OIM 2014/010 Issue 1) was issued by ATR on 23rd September 2014. Both documents are applicable to all ATR aircraft operating with Hamilton Sundstrand 568F-1 propellers.

Extensive analysis, research, test and design work have been carried out. However, the root cause of these events has not been determined yet.

All events have occurred on the right engine propeller and when it has been possible to determine the moment the vibration started, they appeared during descent at a speed close or above VMO (250 kt) with power levers in Flight Idle position.

Improving the flight crew awareness of the conditions that have led to these vibrations might limit the risk of recurrence of such events.

Safety Recommendation FRAN-2014-019 (BEA)

EASA takes the necessary actions in order to ensure that ATR develops an appropriate operational procedure addressing severe vibrations of a propeller and that airlines operating ATR equipped with Hamilton Sundstrand Propellers, model 568F-1, include that procedure in their operational documentation. [Recommendation FRAN-2014-019]

Reply No. 2 sent on 28/01/2016:

ATR has issued an All Operators Message (AOM), ref 42/72/2015/01 issue 1, dated 23 February 2015.

Among other things, this AOM reminds ATR 42-400 / -500 and ATR 72-212A operators about the issue of aircraft severe vibrations due to propeller blade pitch change mechanism damage, referring to the already published information (ATR Operators Information Message (OIM) 2014-010 Issue 1, and United Technologies Company (UTC) SB568F-61-67). Additionally, this AOM recommends the application of a particular procedure, supported by means of the Operator Engineering Bulletin (OEB) number 25 (attachment 2), aiming at first confirming/identifying the affected engine and then to shut it down.

With the OEB, ATR ensures that pilots are properly informed about these occurrences and guide them in the identification of the affected engine, should they encounter severe vibrations.

EASA deem that the OEB is the right vehicle to address the terms of this safety recommendation. Using the information provided through the AOM/OEB, each operator might update their operational documentation (e.g. FCOM) in coordination with their National Aviation Authorities.

Additionally, EASA has published the updated Safety Information Bulletin (SIB) 2015-03R1, recommending the concerned operators to implement the contents of the ATR OEB No 25 within their operational documentation.

Status: Closed – **Category**: Agreement

Registration	Aircraft Type	Location	Date of event	Event Type
F-GHPN	PIPER PA28	Persan Beaumont Aerodrome	06/03/2013	Accident

Synopsis of the event:

Collision avec la végétation puis le sol en finale, de nuit

Le pilote décolle à 20 h 03 de la piste 10 de l'aérodrome de Persan Beaumont pour une navigation d'environ 12 NM à destination de Pontoise en VFR de nuit. Sept minutes plus tard, le pilote annonce sur la fréquence d'auto-information qu'il a annulé son vol à destination de Pontoise en raison « d'un problème de GPS » et qu'il est de retour en finale pour des posés-décollés en piste 10. Il annonce à 20 h 12 qu'il « remet les gaz », puis à 20 h 16 qu'il est « en finale pour la piste 10 ». L'aéronef est retrouvé dans un champ à 585 mètres en amont du seuil décalé de la piste.

Safety Recommendation FRAN-2015-002 (BEA)

[French] - Le BEA recommande que l'AESA étudie les moyens de sensibiliser les médecins quant aux risques associés à la présence d'une cataracte et notamment de ses signes précurseurs. [Recommandation FRAN-2015-002]

Reply No. 2 sent on 09/02/2016:

The European Aviation Safety Agency (EASA), in collaboration with aero-medical experts from EASA Member States' national aviation authorities, has considered the recommendation to raise awareness amongst the aero-medical certification community about the risks associated with cataract presence.

The existing provisions in Commission Regulation (EU) No 1178/2011 address the risks associated with conditions affecting the visual system (MED.B.070). A comprehensive eye examination is required for initial class 1 applicants and all abnormal and doubtful cases should be referred to an ophthalmologist [AMC1 MED.B.070 (b)]. For class 1 revalidation and renewal examinations, further examination is required if clinically indicated during the routine eye examination [AMC1 MED.B.070 (c)(4)]. A comprehensive eye examination is required for class 2 applicants if clinically indicated during the routine eye examination (MED.B.070 (b)(2)(ii)). Again, all abnormal and doubtful cases should be referred to an ophthalmologist.

Aero-Medical Examiners (AMEs), as medical doctors, through general/professional and aviation medicine training, should be suitably equipped to ensure extended ophthalmological examinations are undertaken on clinical indication. The ophthalmologist should then detect any cataract presence and report this to the AME for assessing the applicant as fit or unfit, depending on whether the condition is likely to interfere with the safe exercise of the privileges of the applicable licence(s). Where clouded crystalline lens/early onset of cataracts has been detected by the ophthalmologist, it is likely that the applicant will be advised to undergo regular eye examinations and/or surgical correction.

Nevertheless, in support of the safety recommendation, the Agency has taken an action to raise awareness amongst the Member States about the flight safety risk posed by the presence of cataracts, including the importance of detection of symptoms of early onset.

This issue was presented during a medical workshop hosted by the standardisation section of the aircrew and medical department of EASA at Cologne on 30 September 2015, which was attended by medical representatives of the EASA Member States.

Attention was drawn to the need to identify those most at risk, through careful check of the applicant's medical history and on clinical indication, especially if they have visual acuity problems and/or are in the high risk age category. A reminder was given about the need for the AME to ensure further examination by an ophthalmologist if there is any indication of cataract presence or early onset.

The Member States were advised to communicate this issue to all Aero-medical Centres (AeMCs) and AMEs under their jurisdiction. The Member States were recommended to encourage the AMEs to use simple tools to detect the early onset of cataracts, especially for applicants aged around 60 years or over, who are most susceptible to the condition. Various simple diagnostic tools/methods are available, such as a slit lamp, or shining an ophthalmoscope at the edge of the applicant's visual field to simulate luminance.

The Agency considers that this action will effectively raise awareness amongst those involved in the medical certification of pilots to ensure that the risks associated with the presence of cataracts are suitably mitigated.

Status: Closed – **Category**: Agreement

Safety Recommendation FRAN-2015-003 (BEA)

[French] - Le BEA recommande que l'AESA modifie l'AMC2 MED.B.070 pour permettre d'identifier les pilotes à risques en procédant à une évaluation qualitative de la vision dans des conditions de luminances extrêmes afin d'informer ces pilotes des risques de détérioration de leur performance visuelle dans certaines circonstances et de leur conseiller des examens complémentaires par un ophtalmologue (par exemple pour détecter la présence d'un voile cristallinien ou des signes précurseurs d'une cataracte). Cette évaluation qualitative peut être faite par la vérification

des antécédents médicaux et sur indication clinique (par exemple des problèmes d'acuité visuelle, résultat d'un test de luminance). [Recommandation FRAN-2015-003]

Reply No. 2 sent on 09/02/2016:

The European Aviation Safety Agency (EASA), in collaboration with aero-medical experts from EASA Member States' national aviation authorities, has considered the recommendation to introduce, in AMC2 MED.B.070 of Commission Regulation (EU) No 1178/2011, a qualitative assessment of vision in extreme luminance conditions to detect cataract presence.

The need for further examination by an ophthalmologist should be identified during the examiner's assessment of the applicant's medical history and if clinically indicated during the eye examination [AMC2 MED.B.070 (a)(2) and (b)(4)]. Specifying the means by which the examiner should conduct the examination should not be necessary, as the examiner should be suitable equipped to recognise the basic indicators of cataract presence. The examiner should be aware, from the mandatory aviation medicine training received, of the need to pay particular attention to applicants in the high risk age category and/or bordering on pass/fail visual acuity measurements.

Furthermore, if luminance testing was introduced in the Acceptable Means of Compliance (AMC), it would need to be supported by scientifically substantiated pass/fail measurements, which would be difficult to establish, as aviation medicine should take account of the holistic approach for individual pilots.

In addition, if detail is added in the AMC, for example, on eye examination methods for detecting cataracts, this would set a precedent for providing the same level of detail for many other medical conditions, which should already be understood by the AMEs from their training.

This issue was presented during a medical workshop hosted by the standardisation section of the aircrew and medical department of EASA at Cologne on 30 September 2015, which was attended by medical representatives of the EASA Member States.

The recommendation to modify AMC2 MED.B.070 was discussed and the feedback from the aero-medical experts indicated that an amendment to the AMC was not required, as implementation experience showed that the current regulatory framework was sufficient for detecting cataract presence or early onset.

Having discussed the recommendation with the aero-medical experts from EASA Member States, and having provided a reminder about the importance of applying the current AMC on visual systems, the Agency considers that no further regulatory action is required.

Status: Closed – **Category**: Partial agreement

Registration	Aircraft Type	Location	Date of event	Event Type
SX-BHS	AIRBUS A321	Lyon Saint-Exupéry Airport	29/03/2013	Accident

Synopsis of the event:

The crew made a Category 1 (CAT I) ILS approach to runway 36R at Lyon Saint-Exupéry Airport. The meteorological conditions were such that low visibility procedures (LVP) were in place.

On passing the stabilisation height at 1,000 ft, the speed of the aeroplane was 57 kt above the approach speed. At 140 ft, an inappropriate increase in thrust by the autothrust maintained the aeroplane at high speed.

The flare was long and the aeroplane touched the runway at 1,600 metres past the 36R threshold. The aeroplane overran the runway and came to rest approximately 300 metres after the opposite threshold.

Safety Recommendation FRAN-2015-021 (BEA)

The BEA recommends that EASA in cooperation with national civil aviation authorities and air traffic control service providers encourage publication throughout Europe of procedures and operational limits on initial or intermediate approach enabling compliance with stabilisation criteria to be facilitated on approach, in the spirit of the document published by the DGAC (Info Sécurité DGAC N°2013/09). [Recommendation FRAN-2015-021]

Reply No. 2 sent on 07/06/2016:

Stabilised Approach is already a subtopic included in the Initial Training content for air traffic controller rating trainings, as stipulated by Commission Regulation (EU) 2015/340 and the related EASA ED Decision 2015/010/R.

Horizontal and vertical speed control are being addressed within the upcoming NPA proposing ATS requirements (RMT.0464), mainly transposed from ICAO relevant documents.

EASA proposes the general ICAO provisions (mainly those from PANS ATM Chapter 4.6 Horizontal speed control instructions and Chapter 4.7 Vertical Speed control Instructions) on these subjects as guidance material, as this is considered to be a subject which should to be addressed in details by local procedures, subject to specific operational needs.

No further regulatory material is foreseen since the practical application of speed control techniques as described for example in the referred DGAC publication is to great extent dependent on the local operational environment and airspace design characteristics.

It has to be noted that awareness and guidance material is already available, such as educational booklet called “Unstable Approaches, ATC Considerations” for Air Traffic Controllers, published by the Civil Air Navigation Services Organisation (CANSO).

Therefore EASA’s opinion is that the matter of stabilized approach is addressed both in the regulatory framework in the content of air traffic controllers training, as well as in the guidance material available for the Controllers.

Status: Closed – **Category**: Partial agreement

Safety Recommendation FRAN-2015-023 (BEA)

The BEA recommends that EASA in coordination with the international working groups in charge of implementation of evidence-based training (EBT) ensure that future training programmes and recurrent training make it possible for crews to better manage the following situations:

- managing the energy during transition from the initial and final approach phases;
- rejecting landings in the flare phase until deployment of the thrust reversers,
- emergency evacuation (carrying out the first items in order to secure the aeroplane). [Recommendation FRAN-2015-023]

Reply No. 2 sent on 15/03/2016:

This recommendation has been addressed within the framework of EASA rulemaking task RMT.0696 'Implementation of evidence-based training (EBT) within the European regulatory framework'.

The associated ED Decision 2015/027/R, was published on the EASA web site on 16 December 2015. It contains new Guidance Material (GM) to support implementation, by operators, of Evidence Based Training (EBT), conducted in Flight Simulation Training Devices, according to the principles established in ICAO Doc 9995 'Manual of Evidence-based Training'. The GM is linked to existing Organisation Requirements for Operators (ORO) sub-paragraph ORO.FC.230 (a);(b);(f) 'Recurrent training and checking' and sub-paragraph ORO.FC.A.245 'Alternative training and qualification programme' (see Commission Regulation (EU) No 965/2012).

The situations described in the safety recommendation are specifically addressed in the recurrent assessment and training matrices in ICAO Doc 9995, which the new GM refers to.

Status: Closed – **Category**: Agreement

Safety Recommendation FRAN-2015-026 (BEA)

EASA, in coordination with the manufacturer, define a period following which it determines the effectiveness of the actions undertaken. Without feedback from operators on their decision to replace the FMGCs concerned, it could then consider issuing an airworthiness directive. [Recommendation FRAN-2015-026]

Reply No. 2 sent on 08/09/2016:

On 21 June 2016, at completion of the assessment of the size of the fleet remaining at risk, the EASA has issued the AD 2016-0122, which mandates the replacement of the concerned FMGCs (Flight Management and Guidance Computer) on all A319, A320 and A321 aeroplanes.

Status: Closed – **Category**: Agreement

Registration	Aircraft Type	Location	Date of event	Event Type
EC-IVT	ROBINSON R44	Valouse (26), in cruise at 4,200 ft	03/09/2012	Accident

Synopsis of the event:

History of flight

The following elements are from witness accounts, radar and radio-communication recordings. The pilot, accompanied by a passenger, took off from Clermont Ferrand Auvergne aerodrome at 9 h 24 for Luc Le Cannet aerodrome. The pilot had entered a route in a touch-screen tablet which went via Feurs, Saint Etienne, Givors, Saint Rambert d'Albon and then Le Luc. He performed cruise at an altitude of 7,000 ft. At 10 h 19, at the level of the Rhône valley and 25 km north of Montélimar, he began descent, carried out a 360° turn and halted descent at an altitude of about 2,300 ft. He then continued south-east and went back into climb.

At about 10 h 35, at an altitude of about 4,200 ft (height of 1,500 ft) and at a ground speed of 115 kt, the helicopter broke up in flight and collided with the ground.

Lessons learned and conclusion

The break-up of the helicopter resulted from mast bumping, which caused interference of one of the main rotor blades with the airframe. This break-up occurred while the pilot was flying at high speed in an area close to hilly terrain where there was strong turbulence and high winds and where he may have gone in order to avoid clouds.

The accident resulted from a combination of the following factors:

- the pilot's wish to reach his aerodrome destination quickly whereas the meteorological forecasts were adverse for the flight;
- the failure to decrease speeds to those recommended by the manufacturer in a turbulent atmosphere;
- the pilot's probable degraded abilities due to absorbing carbon monoxide.

The manufacturer's documentation which mentioned a speed recommended in turbulence solely in Safety Notice SN 32 appended at the end of the flight manual without this information appearing in the Limitations chapter of this manual made this information less visible.

The possible malfunction of the carbon monoxide detection warning may have led to the non-detection of a gas leak by the pilot.

Safety Recommendation FRAN-2015-030 (BEA)

EASA ensure that all European operators of Robinson R44 and R22 are informed of this limitation, which must be strictly observed in a turbulent atmosphere. [Recommendation 2015-030]

Reply No. 2 sent on 08/09/2016:

EASA published Safety Information Bulletin (SIB) No. 2016-10 on 29 July 2016 to remind all EASA Member State operators of Robinson R44 and R22 helicopters to observe the speed in turbulence as provided in Robinson Helicopter Company (RHC) Safety Notice SN-32.

In addition, the Type Certificate Data Sheets (TCDSs) for the Robinson R44 and R22 have been updated (Reference EASA.IM.R.121 issue 5 published on 19th April 2016, and EASA.IM.R.120 issue 4 published on 15th December 2015, respectively).

The TCDSs now include a reference to the mandatory Flight Crew Data report in the section on Operational Suitability Data (OSD). These reports identify the risk of low "G" mast bumping and turbulence encounters as Training Areas of Special Emphasis (TASE) and mention that "in accordance with Safety Notice SN-32, when encountering high winds or turbulence, reduce power and fly at a slower than normal cruise speed (60-70 knots), avoid over control, and avoid flying on the downwind side of hills, ridges or tall buildings".

Status: Closed – **Category**: Partial agreement

Registration	Aircraft Type	Location	Date of event	Event Type
F-HBNI	AIRBUS A320	Bordeaux Airport-France	02/08/2013	Serious incident

Synopsis of the event:

En approche sur l'aérodrome de Bordeaux Mérignac, l'équipage d'un Airbus A320 d'Air France traverse un orage de grêle. L'avion est soumis à un important cisaillement de vent. L'assiette de l'avion augmente jusqu'à environ 25° sous pilote automatique et la vitesse descend jusqu'à 109 kt (VLS - 27 kt). L'avion descend au maximum d'environ 200 pieds. L'équipage remet les gaz. L'alarme de décrochage retentit furtivement et la protection « Alpha Floor » se déclenche. L'équipage poursuit l'approche après être sorti de l'orage de grêle.

L'équipage effectuait le troisième et dernier vol de la journée. Une passagère, qui est copilote dans la compagnie, était présente dans le poste de pilotage lors de la totalité du vol. Elle est intervenue dans les échanges de l'équipage pour décider de la trajectoire à suivre.

L'enquête du BEA a conclu que la décision inappropriée du commandant de bord de débuter l'approche, alors qu'une cellule orageuse se trouvait sur la trajectoire d'approche résulte de la rupture progressive du fonctionnement CRM de l'équipage, qui n'a pas su arriver à une décision partagée sur la trajectoire d'arrivée et d'approche. Les interventions spontanées de la troisième personne présente dans le cockpit, et le souvenir d'une rotation que le commandant de bord et le copilote avaient réalisée ensemble trois ans auparavant ont probablement contribué à cette déstructuration du CRM et à l'inefficacité de leur stratégie TEM.

L'absence d'information de vol précise sur la situation météorologique fournie par le contrôleur, la répétition de messages d'une situation météorologique dégagée sur l'aérodrome ont pu contribuer à la sous-estimation des risques liés à la situation météorologique.

Safety Recommendation FRAN-2015-059 (BEA)

[French] - L'AESA précise, au travers d'AMC, l'interprétation qu'il convient d'avoir pour l'application du CAT.GEN.MPA.135 en matière d'accès au cockpit et d'encadrement d'une tierce personne. [Recommandation 2015-059]

Reply No. 1 sent on 15/03/2016:

The implementing rule CAT.GEN.MPA.135, applicable to commercial air transport operations, on admission to the flight crew compartment, is published in Commission Regulation (EU) No 965/2012 on air operations. The air operations regulation includes additional provisions for mitigating the risks associated with the carriage of persons other than operating crew members in the flight crew compartment, as described below.

The operator is required to implement a management system that includes the identification of aviation safety hazards entailed by their activities, their evaluation and the management of associated risks, including actions to mitigate the risk and verify their effectiveness [see ORO.GEN.200 (a)(3)]. This mitigation should include implementation of operational procedures to mitigate the risks associated with admission to the flight crew compartment [see CAT.GEN.MPA.135 (a)(3) and AMC3 ORO.MLR.100 (8.3.12)].

These procedures should take account of the operator's procedures for a sterile flight crew compartment, as required by ORO.GEN.110 (f), to be applied at specific times when the flight crew members should not be disturbed or distracted, such as during critical phases of flight, final approach and any other phases of flight as determined by the commander [see Annex 1 Definitions (30)]. This should support compliance with CAT.GEN.MPA.135 (b)(1), which requires the commander to ensure that admission to the flight crew compartment does not cause distraction or interference with the operation of the flight.

The procedures for admission to the flight crew compartment must also ensure that all persons carried in the flight crew compartment receive a safety briefing [see CAT.GEN.MPA.135 (b)(2)]. The briefing should take account of the particularities of the additional person, for example, if they hold the required qualification for the type operated at the time or if they are employed by the same airline, the briefing should provide clear expectations for that person, for normal and abnormal situations during the flight.

This aspect should also be addressed during the operator's Crew Resource Management (CRM) training. Of note, the CRM training provisions in the air operations regulation's Acceptable Means of Compliance (AMC) and Guidance Material (GM) have been further strengthened since the date of the accident [see ED Decision 2015/022/R, in particular new AMC1 ORO.FC.115 (a)(5), which states, for multi-pilot operations, that CRM principles should be integrated into relevant parts of flight crew training and operations including checklists, briefings, abnormal and emergency procedures].

Additional defences are provided through provisions related to: the competent authority's management system (see ARO.GEN.200); the competent authority's oversight obligations (see ARO.GEN.300); and EASA's standardisation inspections (see Commission Implementing Regulation (EU) No 628/2013).

On the recommendation to provide AMC for CAT.GEN.MPA.135, the Agency considers that it is more practical and effective for each operator to define their own guidance tailored to suit the specific risks associated with their fleet and operational activities.

After careful evaluation of the safety issue, EASA has concluded that the existing regulatory framework provides the foundation to ensure that the operator implements suitable mitigation for the risks associated with the carriage of persons other than operating crew members in the flight crew compartment.

Status: Closed – **Category**: Partial agreement

Safety Recommendation FRAN-2015-062 (BEA)

[French] - L'AESA définisse les modalités permettant à un exploitant de mettre en oeuvre la formation basée sur les risques telle que précisée dans le doc OACI 9995 de l'OACI. [Recommandation 2015-062]

Reply No. 1 sent on 15/03/2016:

Executive Director (ED) Decision 2015/027/R, published on 16 December 2015, contains new Guidance Material (GM) to support implementation by operators of Evidence Based Training (EBT), to be conducted in Flight Simulation Training Devices, according to the principles established in International Civil Aviation Organization (ICAO) Doc 9995 'Manual of Evidence-based Training'. The GM is linked to existing Organisation Requirements for Operators - Flight Crew (ORO.FC) sub-paragraph ORO.FC.230 (a);(b);(f) 'Recurrent training and checking' and sub-paragraph ORO.FC.A.245 'Alternative training and qualification programme' (see Commission Regulation (EU) No 965/2012).

The EBT concept is being further considered within the framework of EASA Rulemaking Task RMT.0599 'Evidence-based and competency-based training' which was launched on 05 February 2016 with the publication of the associated Terms of Reference. The related Notice of Proposed Amendment concerning EBT is expected to be published by mid-2017.

Status: Open – **Category**:

Safety Recommendation FRAN-2015-063 (BEA)

[French] - L'AESA incite les exploitants de transport aérien commercial à prendre en compte des problématiques relatives au CRM et au cisaillement de vent dans la conception des scénarii EBT. [Recommandation 2015-063]

Reply No. 1 sent on 15/03/2016:

Executive Director (ED) Decision 2015/027/R, published on 16 December 2015, contains new Guidance Material (GM) to support implementation by operators of Evidence Based Training (EBT), to be conducted in Flight Simulation Training Devices, according to the principles established in International Civil Aviation Organization (ICAO) Doc 9995 'Manual of Evidence-based Training'. The GM is linked to existing Organisation Requirements for Operators - Flight Crew (ORO.FC) sub-paragraph ORO.FC.230 (a);(b);(f) 'Recurrent training and checking' and sub-paragraph ORO.FC.A.245 'Alternative training and qualification programme' (see Commission Regulation (EU) No 965/2012).

Crew Resource Management (CRM) and wind shear are specifically addressed in the recurrent assessment and training matrices in ICAO Doc 9995, to which the new GM refers.

Status: Closed – **Category**: Agreement

Safety Recommendation FRAN-2015-064 (BEA)

[French] - L'AESA incite les exploitants de transport aérien commercial à former les équipages à la détection humaine de phénomènes pour lesquels il existe des alarmes qui ne couvrent pas toutes les situations dans lesquelles ces phénomènes peuvent se produire. [Recommandation 2015-064]

Reply No. 1 sent on 15/03/2016:

Flight crew training in the human detection of phenomena for which existing alarms do not cover all the situations in which these phenomena can occur, should already be trained as basic airmanship skills under the existing flight crew licensing, type rating and air operations provisions (see Commission Regulation (EU) No 1178/2011 and Commission Regulation (EU) No 965/2012). Operator training on the subject should be further enhanced with the implementation of the new concept of Evidence Based Training (EBT).

Executive Director (ED) Decision 2015/027/R, published on 16 December 2015, contains new Guidance Material (GM) to support implementation by operators of Evidence Based Training (EBT), to be conducted in Flight Simulation Training Devices, according to the principles established in International Civil Aviation Organization (ICAO) Doc 9995 'Manual of Evidence-based Training'. The GM is linked to existing Organisation Requirements for Operators - Flight Crew (ORO.FC) sub-paragraph ORO.FC.230 (a);(b);(f) 'Recurrent training and checking' and sub-paragraph ORO.FC.A.245 'Alternative training and qualification programme' (see Commission Regulation (EU) No 965/2012).

The surprise and startle effect is specifically addressed in the recurrent assessment and training matrices in ICAO Doc 9995, to which the new GM refers.

Status: Closed – **Category**: Agreement

Safety Recommendation FRAN-2015-065 (BEA)

[French] - L'AESA, en coordination avec la FAA, évalue la faisabilité et l'opportunité d'élargir le domaine de disponibilité des alarmes de détection du phénomène de cisaillement de vent. [Recommandation 2015-065]

Reply No. 1 sent on 15/03/2016:

The Agency is analysing the safety recommendation and will cooperate with RTCA Special Committee 230 (Airborne Weather Detection Systems). This committee of experts is in charge of revising DO-220 (Minimum Operational Performance Standards (MOPS) for Airborne Weather Radar with Forward-Looking Windshear Capability).

The analysis should allow to decide if it would be acceptable to expand the altitude range of availability of the wind shear detection alarm without creating unwanted side effects, like spurious alerts. The FAA is also involved in the SC-230.

Status: Open – **Category**:

Safety Recommendation FRAN-2015-067 (BEA)

[French] - L'AESA impose, pour les avions « fly-by-wire » Airbus déjà en service, de revoir le calage du seuil de l'alarme Stall Warning en loi normale pour que celle-ci se déclenche de façon pertinente. [Recommandation 2015-067]

Reply No. 1 sent on 29/03/2016:

In Normal Law, high Angle of Attack (AOA) Protection is active, avoiding the AOA to exceed the maximum AOA even if the pilot applies full pitch up sidestick deflection. Following this logic, the Stall Warning (SW) AOA is set significantly beyond the actual stall AOA.

In Alternate or Direct Law, this AOA protection is degraded or lost. In these cases, the SW AOA is consequently set before the stall AOA.

The rationale to move the SW AOA setting in normal law closer to the stall AOA is to increase the crew awareness of the aircraft being at excessive AOA, and to request the crew the application of the Stall Recovery (SR) procedure, as a last safety net, in case of aircraft exposure to AOA beyond stall while the high AOA protection is active. This could only happen in very extreme and unexpected conditions, such as:

- In some extreme weather conditions where full pitch down authority commanded by the high AOA protection could be transiently insufficient to recover from stall, the thrust increase requested by the SW procedure would be the only possible additional mean to reduce the AOA.
- In normal law, with high AOA protection active, the triggering of the SW would prompt the crew to timely react and be prepared in case of subsequent reversion to non-AOA protected law (alternate or direct laws).

In the Single Aisle (SA, 320 family) and Long Range (LR, 330 and 340 families) aircraft, the SW AOA setting in normal law has been modified to be closer to the stall AOA for clean and high lift configurations. Those modifications have been certified in August 2013 in the case of the LR family (Flight Warning Computer (FWC) Standard 5), and in the end of 2015 in the case of the SA family (FWC Standard 8); introduced in production and made available for the in service aircraft through dedicated Service Bulletins.

In the A380 and the A350, the SW AOA setting in normal law has been initially defined closer to the stall AOA and computed for all configurations (clean or high lift).

The SW AOA settings have been set up to trigger the SW in normal law in case of extreme and unexpected situations like the ones mentioned above, but preventing the SW activation during avoidance/GPWS manoeuvres and preventing spurious activations of the SW in cruise.

Therefore, all A350 and A380 and newly delivered SA and LR do have a SW AOA setting closed to stall AOA. Although the safety benefit of this change is recognised, it is considered that it would not be enough to justify the retrofit of SA and LR aircraft equipped with previous FWC standard.

Status: Closed – **Category**: Partial agreement

Safety Recommendation FRAN-2015-068 (BEA)

[French] - L'AESA, en coordination avec les autres autorités de certification, évalue le besoin de modifier pour tout avion protégé en incidence les conditions de certification pour que l'alarme de décrochage se déclenche de façon pertinente, y compris en cas d'activation pertinente du système de protection, et qu'elle s'assure que sont définies des procédures et une formation des équipages associés. [Recommandation 2015-068]

Reply No. 1 sent on 29/03/2016:

EASA will contact all EU TC holders with fly-by-wire aeroplanes to initiate an assessment of the adequacy of stall warning settings in normal law (protected envelope), with the exception of Airbus, for which such evaluation has already been completed till the implementation of the appropriate changes.

In parallel, EASA will contact as well the relevant foreign authorities to request them to conduct the same investigation.

The outcome of the assessment will identify the possible need for any further action.

Status: Open – **Category**:

Registration	Aircraft Type	Location	Date of event	Event Type
HB-JFN	DASSAULT FALCON7X	Kuala Lumpur Airport	24/05/2011	Serious incident

Synopsis of the event:

On 24 May 2011 at 08 h 10, the crew of the Falcon 7X registered HB-JFN took off from Nuremberg (Germany) bound for Kuala Lumpur (Subang Airport) for a repositioning flight. The co-pilot was PF.

During the descent, the autopilot (AP) and auto-throttle were engaged and the calibrated airspeed was 300 kt. At approximately 19 h 55, the PF reduced the rate of descent on approaching the cleared altitude (11,000 ft). He selected a rate of descent of 1,300 ft / min and activated vertical mode VS2. A few seconds later, when the aeroplane had passed below 13,000 ft, the horizontal stabilizer (THS3) went from neutral to maximum nose-up position (12 degrees) in fifteen seconds.

The AP remained engaged for the first eight seconds of THS deployment. The flight control laws counteracted the nose-up movement of the THS by a nose-down action on the elevators, which reached approximately two-thirds of their maximum travel before AP was disconnected. The THS continued its nose-up movement. The aeroplane's pitch attitude and load factor increased. The PF applied maximum nose-down input on the side stick and placed the throttle levers in Take-Off position. The auto-throttle disconnected. The PF's nose-down input did not stop the nose-up movement of the THS, which reached its limit seven seconds after AP was switched off. The FCS displayed "TRIM LIMIT" on the PDU.

Between disconnection of the AP and when the THS reached its stop, the calibrated airspeed dropped from 297 to 220 kt. The increased pitch attitude during THS runaway was combined with a slight bank to the right and increased altitude. The PF made a leftwards input on the side stick, causing the aircraft to bank 15 degrees to the left. The pitch attitude reached 25 degrees nose-up. Feeling that his pitch input was ineffective, the PF made a full rightwards input. He explained that he was trying to bank enough to decrease the pitch attitude, increase speed and regain pitch control. During the manoeuvre, the bank angle reached 98 degrees to the right. Meanwhile, the Captain (PNF) made nose-down inputs and roll inputs contrary to those of the PF. These simultaneous inputs decreased the bank input of the PF and increased the pitch attitude, load factor and angle of attack once again. These simultaneous inputs triggered the "DUAL INPUT" alarm. The PF stated that he therefore asked the PNF to stop making inputs on his side stick. He also took over priority of the controls by pressing the appropriate push-button on his side stick for six seconds. The PF maintained the bank angle at 40 to 80 degrees to the right for about twenty seconds. After reaching 42 degrees nose-up, the pitch attitude gradually decreased to 10 degrees. The angle of attack and load factor fell quickly, from 22 to 5 degrees and from 4.5g to between 1.25 and 1.5g respectively. Meanwhile, the calibrated airspeed dropped from 300 kt to 150 kt. The PF then made leftwards roll inputs until the bank angle was stabilised at about 50 degrees. The THS remained in full nose-up position, and the pitch attitude and calibrated airspeed remained stable for around forty seconds, at 10 degrees nose-up and 200 kt respectively. The PNF stated that he attempted to use the manual pitch trim and reengage the flight controls by pressing the "FCS ENGAGE" push-button on the upper panel. Noticing no improvement, the PNF made roll inputs on his side stick, in the opposite direction to those made by the PF, as well as full nose-down inputs. The simultaneous roll inputs of the two pilots gradually brought the bank angle to zero, which caused the pitch angle to increase once again to approximately 30 degrees, and the calibrated airspeed to drop to 125 kt. The crew stated that they heard the "INCREASE SPEED" alarm. This second dual input phase lasted approximately twelve seconds. The Captain then took over the controls. The attitude began to decrease and the altitude reached a maximum of 22,500 ft. When the attitude reached 5 degrees nose-down, the Captain made nose-up inputs. The attitude increased again and the Captain resumed making full nose-down inputs.

For a reason unknown to the crew, the THS began to move towards a level position, going from twelve degrees to one degree nose-up in fifteen seconds. The aeroplane pitch was once again able to be controlled via inputs on the side stick. The crew made the decision to continue in manual flight mode. The approach and landing took place with no any further incidents. 2 minutes and 36 seconds passed between the start of THS nose-up movement and its return to balanced position. During this time: the load factor reached 4.6g; altitude increased from 13,000 to 22,500 ft; the calibrated airspeed went from 300 to 125 kts; the pitch attitude reached 41 degrees. Following this serious incident, the Falcon 7X fleet was temporarily grounded. It returned to service on 16 June 2011.

Safety Recommendation FRAN-2016-002 (BEA)

EASA, in coordination with FAA, SAE and EUROCAE, evaluate and propose alternative or additional methods to the FMEA for electronic equipment and software. [Recommendation 2016-002]

Reply No. 1 sent on 15/03/2016:

System Safety Assessments (SSA), including Failure Modes & Effects Analyses (FMEA) and Common Mode Analyses (CMA), are considered adequate methods when applied in accordance with the recommended practices laid down in industry standard SAE ARP4761.

This industry standard is currently being revised for other reasons under the responsibility of the Working Groups (WG) EUROCAE WG63 and SAE S18. EASA, together with FAA, are involved in these groups. EASA will use this opportunity to discuss the need for alternative or additional methods to the FMEA for electronic equipment and software.

Status: Open – **Category**:

Safety Recommendation FRAN-2016-004 (BEA)

EASA, in coordination with FAA, SAE and EUROCAE, develop means or methods that make it possible to consolidate, during safety analyses, checks on the independence of system control and the monitoring of said system. [Recommendation 2016-004]

Reply No. 1 sent on 15/03/2016:

Since JAR 25 change 16, the JAR/CS 25.1309 requires explicitly that catastrophic failure conditions must not result from a single failure. A system architecture with independent control and monitoring is only one of the available means to comply with this requirement.

The AMC 25.1309 clarifies that a single failure includes any set of failures, which cannot be shown to be independent from each other. The AMC drives then the applicant to the different existing types of common cause analyses to be conducted in order to ensure that independence is maintained. The ARP4761, as referenced in AMC 25.1309 details how to perform these common cause analyses (Particular Risk Analysis, Common Mode Analysis, and Zonal Safety Analysis).

Note that the ARP4761, Appendix K “Common Mode Analysis” indicates that considerations should be given to the independence of functions and their respective monitors.

The Common Mode Analysis is actually the method to check that the necessary independence between system control and monitoring of that said system is correctly implemented.

The means and methods are thus considered already in place.

Status: Closed – **Category**: Disagreement

Safety Recommendation FRAN-2016-005 (BEA)

EASA, in coordination with manufacturers, ensure that future training programmes defined in the context of OSD include initial and recurrent training relating to taking over control of aeroplanes equipped with non-coupled control sticks. [Recommendation 2015-024]

Reply No. 1 sent on 15/03/2016:

EASA acknowledges the need to emphasise procedures for taking over control of aeroplanes equipped with non-coupled control sticks during initial and recurrent training.

Existing Air Operations and Flight Crew Licensing (OPS/FCL) Operational Evaluation Board (OEB) reports and recently approved OSD-FC (Operational Suitability Data - Flight Crew) for aeroplanes equipped with non-coupled control sticks, already include relevant dedicated Training Areas of Special Emphasis (TASE).

In cooperation with manufacturers of aeroplanes equipped with such control sticks, EASA will continue to ensure that the specific TASE is included in the OSD-FC.

Furthermore, EASA published, on 16 October 2015, Safety Information Bulletin (SIB) 2015-17R1 on unreliable airspeed indication at high altitude/manual handling at high altitude, which recommends, amongst other things, that the initial and recurrent training includes procedures for taking over and transfer of manual control of the aircraft, especially for fly-by-wire aeroplanes with independent side-sticks.

Status: Closed – **Category**: Agreement

Registration	Aircraft Type	Location	Date of event	Event Type
OE-FKG	PIPER PA31T	Toulouse-Blagnac	28/10/2011	Accident

Synopsis of the event:

The pilot, accompanied by three passengers who were family members, took off at 16 h 35 from Kassel (Germany) aerodrome for a private flight under IFR to Toulouse-Blagnac. After about three hours of flight, he was cleared for approach and received radar vectoring for the runway 14R ILS. During the last exchange with the controller, as the aeroplane was on final at 900 feet, the pilot stated that he had a problem without specifying what type, as the message was interrupted. Shortly afterwards, radar and radio contact was lost. The wreckage was found close to the threshold of runway 14R.

The pilot and the three passengers were fatally injured.

Safety Recommendation FRAN-2016-006 (BEA)

EASA evaluate the possibility of developing an alternative programme for complex high performance single-pilot aeroplanes for which there is no adequate flight simulator, for example by using a flight simulator from a similar aeroplane. [Recommendation FRAN-2016-006]

Reply No. 2 sent on 08/09/2016:

An alternative programme for complex high performance single-pilot aeroplanes for which there is no adequate flight simulator is currently being considered within the framework of EASA rulemaking task RMT.0196 on flight simulation training device (FSTD) qualifications and their use for training.

The RMT was launched on 15 July 2016 with the publication of the associated Terms of Reference. The next deliverable, a Notice of Proposed Amendment, is planned to be published in the first quarter of 2017.

Status: Open – **Category**:

Safety Recommendation FRAN-2016-007 (BEA)

EASA reinforce the content of training programmes related to complex high performance single-pilot aeroplanes by integrating exercises on management of asymmetrical flight during approaches with a view to a landing. [Recommendation FRAN-2016-007]

Reply No. 1 sent on 07/06/2016:

EASA is currently evaluating the recommendation to integrate exercises on the management of asymmetric flight during final approaches, in the training syllabi for complex high performance single-pilot aeroplanes. This is being considered within the framework of ongoing rulemaking task RMT.0581 'Loss of control prevention and recovery training'.

The associated EASA opinion is expected to be published in the fourth quarter of 2016.

Status: Open – **Category**:

Safety Recommendation FRAN-2016-008 (BEA)

EASA ensure that the competent authorities from time to time check the equivalence between the exercises included in approved type rating training programmes and the flights that are in fact undertaken in an aeroplane and recorded in the trainee's logbook. [Recommendation FRAN-2016-008]

Reply No. 2 sent on 24/11/2016:

EASA used the opportunity of the aircrew standardisation meeting with the competent authorities that took place on 12.10.2016 to review this accident as a case study. It was acknowledged that prescriptive limitations without safety assurance process have limited effect and that awareness and safety promotion are key vectors to help Approved Training Organisation (ATO) in their Safety Risk Management.

As such, EASA informed the competent authorities of the EASA Member States about the BEA recommendation to check from time to time the equivalence between the exercises included in approved type rating training programmes and the flights that are undertaken in an aeroplane and recorded in the trainee's logbook. EASA also shared best practices for approval of a training syllabus i.e. compliance with the regulations; checking the required hours; analysing the course structure and linking the specific training to the aircraft used.

Status: Closed – **Category**: Partial agreement

Safety Recommendation FRAN-2016-009 (BEA)

EASA ensure that information on the number of persons on board non-commercial aircraft is quickly accessible, by requiring that the specific field in part 19 of the flight plan be completed and communicated so that the organisations involved can have access to it as soon as the aeroplane takes off. [Recommendation FRAN-2016-009]

Reply No. 1 sent on 07/06/2016:

Commission Implementing Regulation (EU) No 923/2012 (Standardised European Rules of the Air, SERA), addresses the content of a flight plan as follows:

SERA.4005 Contents of a flight plan

(a) A flight plan shall comprise information regarding such of the following items as are considered relevant by the competent authority:

...

(13) Total number of persons on board

Therefore the Agency considers that the issue is covered from the regulatory point of view and the National Aviation Authority is competent to mandate the necessary information to be included in a flight plan and to exercise oversight to ensure that the requirement is complied with.

Status: Closed – **Category**: No longer applicable

Registration	Aircraft Type	Location	Date of event	Event Type
D-AIPX	AIRBUS A320	Prads-Haute-Bléone	24/03/2015	Accident

Synopsis of the event:

The co-pilot had been flying for Germanwings since June 2014 and was the holder a class 1 medical certificate that was first issued in April 2008 and had been revalidated or renewed every year. Since July 2009, this medical certificate had contained a waiver because of a severe depressive episode without psychotic symptoms that had lasted from August 2008 until July 2009. This waiver stated that it would become invalid if there was a relapse into depression.

In December 2014, approximately five months after the last revalidation of his class 1 medical certificate, the co-pilot started to show symptoms that could be consistent with a psychotic depressive episode. He consulted several doctors, including a psychiatrist on at least two occasions, who prescribed anti-depressant medication. The co-pilot did not contact any Aero-Medical Examiners (AME) between the beginning of his decrease in medical fitness in December 2014 and the day of the accident.

In February 2015, a private physician diagnosed a psychosomatic disorder and an anxiety disorder and referred the co-pilot to a psychotherapist and psychiatrist. On 10 March 2015, the same physician diagnosed a possible psychosis and recommended psychiatric hospital treatment. A psychiatrist prescribed anti depressant and sleeping aid medication in February and March 2015. Neither of those health care providers informed any aviation authority, nor any other authority about the co-pilot's mental state. Several sick leave certificates were issued by these physicians, but not all of them were forwarded to Germanwings.

No action could have been taken by the authorities and/or his employer to prevent him from flying on the day of the accident, because they were informed by neither the co-pilot himself, nor by anybody else, such as a physician, a colleague, or family member.

In the cruise phase of the accident flight, the co-pilot waited until he was alone in the cockpit. He then intentionally modified the autopilot settings to order the aeroplane to descend. He kept the cockpit door locked during

the descent, despite requests for access made via the keypad and the cabin interphone. He did not respond to the calls from the civil or military air traffic controllers, nor to knocks on the door. Security requirements that led to cockpit doors designed to resist forcible intrusion by unauthorized persons made it impossible to enter the flight compartment before the aircraft impacted the terrain in the French Alps.

The BEA investigation concluded that the process for medical certification of pilots, in particular self-reporting in case of decrease in medical fitness between two periodic medical evaluations, did not succeed in preventing the co-pilot, who was experiencing mental disorder with psychotic symptoms, from exercising the privilege of his licence.

The following factors may have contributed to the failure of this principle:

- the co-pilot's probable fear of losing his right to fly as a professional pilot if he had reported his decrease in medical fitness to an AME;
- the potential financial consequences generated by the lack of specific insurance covering the risks of loss of income in case of unfitness to fly;
- the lack of clear guidelines in German regulations on when a threat to public safety outweighs the requirements of medical confidentiality.

The BEA has addressed eleven safety recommendations to the WHO, IATA, the European Commission, EASA, BMVI and BÄK relating to:

- medical evaluation of pilots with mental health issues;
- routine analysis of in-flight incapacitation;
- mitigation of the consequences of loss of licence;
- anti-depressant medication and flying status;
- balance between medical confidentiality and public safety;
- promotion of pilot support programmes.

Safety Recommendation FRAN-2016-011 (BEA)

EASA require that when a class 1 medical certificate is issued to an applicant with a history of psychological/psychiatric trouble of any sort, conditions for the follow-up of his/her fitness to fly be defined. This may include restrictions on the duration of the certificate or other operational limitations and the need for a specific psychiatric evaluation for subsequent revalidations or renewals. [Recommendation FRAN-2016-011]

Reply No. 1 sent on 27/04/2016:

An EASA-led task force was established on 06 May 2015 to examine the preliminary findings of the technical investigation by the French Bureau d'Enquêtes et d'Analyses, and to assess the adequacy of the current European air safety regulations.

Six recommendations were proposed in the resulting task force report which was published on 17 July 2015. EASA published an action plan on 07 October 2015 to implement these recommendations.

Annex IV Part-MED and Annex VI Part-ARA (Authority Requirements for Aircrew) of Commission Regulation (EU) No 1178/2011 and the associated Executive Director Decisions already contain provisions which are intended to ensure that suitable conditions/limitations are imposed if a class 1 medical certificate is issued to an applicant with a history of psychological/psychiatric trouble of any sort [see MED.B.001, MED.B.055 and ARA.MED.125 and the related Acceptable Means of Compliance (AMC) and Guidance Material (GM)].

Nevertheless, this will be re-evaluated within the framework of Rulemaking Task RMT.0700, which is part of EASA's action plan, to assess the extent to which existing implementing rules, AMCs and/or GM could be improved. Specific psychiatric evaluations for revalidations or renewals will also be considered within this RMT, which is planned to be launched in April 2016 with the publication of the associated Terms of Reference.

In the short term, as a preliminary step and in order to ensure that any necessary improvements are implemented in a timely manner, EASA is also considering initially issuing an Operational Directive (OD) in accordance with ARA.GEN.135 (b) which requires competent authorities to take adequate measures in accordance with ARA.GEN.135 (c) to ensure psychological/psychiatric evaluations will be performed for all applicants whose class 1 medical certificate has ever been denied, suspended or limited for psychological/psychiatric issues. More in-depth analysis, as part of RMT.0700, will further address the need for long term comprehensive and systemic improvements where identified.

Consideration is also being given to ensure that psychological evaluations are undertaken by an accredited and/or registered psychologist with acquired knowledge in aviation medicine.

Additional short term mitigation is being considered through another OD, under ARO.GEN.135 (b), requiring competent authorities to take adequate measures in accordance with ARO.GEN.135 (c) to ensure that, before the recruitment of flight crew, air operators conducting commercial air transport operations ensure that flight crew members undergo psychological evaluation as part of the safety risk management required by ORO.GEN.200.

The EASA deliverables to implement possible improvements in the existing regulatory framework will be published in the form of EASA opinions for amending regulations, EASA ODs, EASA Executive Director Decisions for new or revised AMC and/or GM, EASA safety information bulletins, promotional leaflets, or a combination of all of these.

EASA expects to complete the actions related to this safety recommendation by the end of 2016.

Status: Open – **Category**:

Safety Recommendation FRAN-2016-012 (BEA)

EASA include in the European Plan for Aviation Safety an action for the EU Member States to perform a routine analysis of in-flight incapacitation, with particular reference but not limited to psychological or psychiatric issues, to help with continuous re-evaluation of the medical assessment criteria, to improve the expression of risk of in-flight incapacitation in numerical terms and to encourage data collection to validate the effectiveness of these criteria. [Recommendation FRAN-2016-012]

Reply No. 1 sent on 27/04/2016:

Regulation (EU) No 376/2014 on the reporting, analysis and follow-up of occurrences in civil aviation, requires crew incapacitation occurrences related to the operation of the aircraft to be reported when these occurrences may represent a significant risk to aviation safety [see Article 4 (1)(a)(vii)].

The associated Commission Implementing Regulation (EU) 2015/1018 requires reporting by aircrew of incapacitation of any member of the flight or cabin crew that results in the reduction below the minimum certified crew complement [see subparagraph 4 (10) of Annex I).

Analysis of accident and incident data is systematically performed by the European Aviation Safety Agency (EASA) and also by the Network of Analysts (NoA) as required in accordance with their role under Regulation (EU) No 376/2014, to support the continual development and monitoring of Safety Risk Portfolios, which in turn supports the development of the European Plan for Aviation Safety (EPAS). The Annual Safety Review 2014 introduced the EASA Safety Risk Portfolio for fixed wing Commercial Air Transport which identifies crew impairment as a contributory safety issue which is undergoing deeper analysis by EASA.

Depending on the results of this analysis, an action for EU Member States' Network of Analysts to perform routine analysis of in-flight incapacitation with particular reference, but not limited to, psychological or psychiatric issues, will be introduced into the EPAS.

Furthermore, as part of the mechanism to implement the EPAS, Member States are required to address the major risk areas for fixed wing Commercial Air Transport in their State Safety Programmes (SSP) and periodically report on the progress they have made. This includes providing feedback on the identified safety issues that contribute to the risk areas in their State, the safety actions they have undertaken, as well as how they measure their effectiveness.

EASA is aware of the challenges associated with such data collection and analysis. It requires a clear understanding of 'incapacitation', which is the term commonly used to describe the inability of a pilot who is part of the operating crew to carry out their normal duties because of the onset during flight of the effects of physiological factors. Furthermore, the anticipated or perceived consequences of reporting occurrences related to psychological or psychiatric issues could also deter full reporting.

Some of these challenges are expected to be overcome through the implementation of aircrew support and reporting systems linked to the employers' management systems. EASA is currently considering introducing this during implementation of the action plan coming from the recommendations from an EASA-led task force which was established to examine the preliminary findings of the accident investigation by the French Bureau d'Enquêtes et d'Analyses. Work is underway to ensure that pilots, their families and peers have access to peer support groups to report and discuss personal and mental health issues, with the assurance that information will be kept in-confidence in a just-culture work environment, and that pilots will be supported and helped with the aim of allowing them to return to flying duties without jeopardising flight safety. Such support systems might also augment the available data, albeit whilst respecting confidentiality issues.

EASA expects to complete the actions related to this safety recommendation by the end of 2016.

Status: Open – **Category**:

Safety Recommendation FRAN-2016-013 (BEA)

EASA, in coordination with the Network of Analysts, perform routine analysis of in-flight incapacitation, with particular reference but not limited to psychological or psychiatric issues, to help with continuous re-evaluation of the medical assessment criteria, to improve the expression of risk of in-flight incapacitation in numerical terms and to encourage data collection to validate the effectiveness of these criteria. [Recommendation FRAN-2016-013]

Reply No. 1 sent on 27/04/2016:

Regulation (EU) No 376/2014 on the reporting, analysis and follow-up of occurrences in civil aviation, requires crew incapacitation occurrences related to the operation of the aircraft to be reported when these occurrences may represent a significant risk to aviation safety [see Article 4 (1)(a)(vii)].

The associated Commission Implementing Regulation (EU) 2015/1018 requires reporting by aircrew of incapacitation of any member of the flight or cabin crew that results in the reduction below the minimum certified crew complement [see subparagraph 4 (10) of Annex I].

Analysis of accident and incident data is systematically performed by the European Aviation Safety Agency (EASA) and also by the Network of Analysts (NoA) as required in accordance with their role under Regulation (EU) No 376/2014, to support the continual development and monitoring of Safety Risk Portfolios, which in turn supports the development of the European Plan for Aviation Safety (EPAS). The Annual Safety Review 2014 introduced the EASA Safety Risk Portfolio for fixed wing Commercial Air Transport which identifies crew impairment as a contributory safety issue which is undergoing deeper analysis by EASA.

Depending on the results of this analysis, an action for EASA Member States' Network of Analysts to perform routine analysis of in-flight incapacitation with particular reference, but not limited to, psychological or psychiatric issues, will be introduced into the EPAS.

Furthermore, as part of the mechanism to implement the EPAS, Member States are required to address the major risk areas for fixed wing Commercial Air Transport in their State Safety Programmes (SSP) and periodically report on the progress they have made. This includes providing feedback on the identified safety issues that contribute to the risk areas in their State, the safety actions they have undertaken, as well as how they measure their effectiveness.

EASA is aware of the challenges associated with such data collection and analysis. It requires a clear understanding of 'incapacitation', which is the term commonly used to describe the inability of a pilot who is part of the operating crew to carry out their normal duties because of the onset during flight of the effects of physiological factors. Furthermore, the anticipated or perceived consequences of reporting occurrences related to psychological or psychiatric issues could also deter full reporting.

Some of these challenges are expected to be overcome through the implementation of aircrew support and reporting systems linked to the employers' management systems. EASA is currently considering introducing this during implementation of the action plan coming from the recommendations from an EASA-led task force which was established to examine the preliminary findings of the accident investigation by the French Bureau d'Enquêtes et d'Analyses. Work is underway to ensure that pilots, their families and peers have access to peer support groups to report and discuss personal and mental health issues, with the assurance that information will be kept in-confidence in a just-culture work environment, and that pilots will be supported and helped with the aim of allowing them to return to flying duties without jeopardising flight safety. Such support systems might also augment the available data, albeit whilst respecting confidentiality issues.

EASA expects to complete the actions related to this safety recommendation by the end of 2016.

Status: Open – **Category**:

Safety Recommendation FRAN-2016-014 (BEA)

EASA ensure that European operators include in their Management Systems measures to mitigate socio-economic risks related to a loss of licence by one of their pilots for medical reasons.

Reply No. 1 sent on 27/04/2016:

An EASA-led task force was established on 06 May 2015 to examine the preliminary findings of the technical investigation by the French Bureau d'Enquêtes et d'Analyses, and to assess the adequacy of the current European air safety regulations.

Six recommendations were proposed in the resulting task force report which was published on 17 July 2015. EASA published an action plan on 07 October 2015 to implement these recommendations. This action plan was discussed with the aviation community at an EASA 'Aircrew Medical Fitness' workshop which took place 07 to 08 December 2015. A dedicated EASA-led conference is planned for 15 and 16 June 2016 in order to capture more stakeholder input for the proposed actions.

One of the recommendations in the task force report concerns the implementation of aircrew support and reporting systems linked to the Commercial Air Transport operators' management systems.

EASA is considering introducing new implementing rules to Regulation (EU) No 965/2012 to ensure that all flight crew members have access to such support systems through requiring operators to provide pilot support systems which will include mitigation of socio-economic risks related to loss of licence for medical reasons. This will be considered within the framework of Rulemaking Task RMT.0700, which is planned to be launched in April 2016 with the publication of the associated Terms of Reference.

The support programme should enable self-declaration in case of a decrease in medical fitness and, if appropriate, allow the crew member to receive temporary relief from flight duties, and to be referred for professional advice. To effectively and efficiently foster self-declaration, the support system should ensure that risks related to fear of loss of licence are properly mitigated.

In support of the new implementing rules being considered, EASA is also assessing the need for providing operators and competent authorities with Acceptable Means of Compliance (AMC) and Guidance Material (GM) on aircrew support and reporting systems. The aim is for the AMC and GM to refer to the enablers of an effective support system, such as:

a. protection of data;
b. essential trust between management and crew being the foundation of a successful support programme;
c. an effective safety culture; and
d. support for consequences of loss of licence.

EASA expects to complete the actions related to this safety recommendation by the end of 2016.

Status: Open – **Category**:

Safety Recommendation FRAN-2016-016 (BEA)

EASA define the modalities under which EU regulations would allow pilots to be declared fit to fly while taking anti-depressant medication under medical supervision. [Recommendation FRAN-2016-016]

Reply No. 1 sent on 27/04/2016:

The existing EU regulatory framework, in particular Commission Regulation (EU) No 1178/2011, provides a foundation for safety in the context of this safety recommendation through provisions on aircrew fitness [Annex IV Part-MED and Annex VI Part-ARA (Authority Requirements for Aircrew)], Aero-Medical Examiner (AME) and Aero-Medical Centre (AeMC) certification and oversight by competent authorities (Annex VI Part-ARA) and AeMC responsibilities [Annex VII Part-ORA (Organisation Requirements for Aircrew)].

According to the existing rules, applicants for a medical certificate who have a psychiatric condition such as a mood disorder; neurotic disorder; personality disorder, or mental or behavioural disorder are required to undergo satisfactory psychiatric evaluation before a fit assessment may be considered (see MED.B.055 (c) of Part-MED). An established mood disorder is disqualifying. However, after full recovery and after full consideration of an individual case, a fit assessment, with appropriate limitations, may be considered, depending on the characteristics and gravity of the mood disorder. If a stable maintenance psychotropic medication is confirmed, a fit assessment may also be considered [see AMC1 MED.B.055 (e) of Part-MED].

Furthermore, applicants for a class 1 medical certificate with a psychiatric condition shall be referred to the competent authority that issued the applicant's flight crew licence (hereafter referred to as the licensing authority) (see MED.B.055 (e)(1) of Part-MED). An AeMC or AME may also refer the decision on fitness of the applicant to the licensing authority in borderline cases or where fitness is in doubt (see MED.B.001 of Part-MED and associated AMC). This includes cases where a pilot is undergoing a course of anti-depressant medication. When an AeMC or AME has referred the decision on the fitness of an applicant to the licensing authority, the medical assessor or medical staff designated by the authority shall evaluate the relevant medical documentation and request further medical documentation, examinations and tests where necessary, and the medical assessor shall determine the applicant's fitness for the issue of a medical certificate with one or more limitation(s) as necessary (see ARA.MED.125 of Part-ARA).

Prescriptive requirements providing detailed generic criteria for the decision-making process for the assessment is not considered to be appropriate, as each case should be evaluated according to the individual's entire medical situation. It is important that specialists' examination results are taken into account and that issuance of a medical certificate is endorsed at a suitable level with appropriate limitations. The AeMC or AME should refer the applicant/pilot to their licensing authority and/or request further psychiatric evaluation if they have any doubts about issuing a medical certificate or if the pilot's medication could affect the safe exercise of the privileges of their licence (see MED.B.001 of Part-MED). Professional medical practitioner training augmented by aviation medicine training as mandated under subpart D of Part-MED should already provide AME with the necessary tools for deciding whether to refer the case to the authority instead of independent decision-making leading to an unfit assessment. It should also be noted that the regulatory framework provides for a secondary review if a pilot wishes to appeal against an unfit assessment (see MED.A.025(b)(3) of Part-MED and ARA.MED.325 of Part-ARA).

Status: Closed – **Category**: Partial agreement

Safety Recommendation FRAN-2016-021 (BEA)

EASA ensure that European operators promote the implementation of peer support groups to provide a process for pilots, their families and peers to report and discuss personal and mental health issues, with the assurance that information will be kept in-confidence in a just-culture work environment, and that pilots will be supported as well as guided with the aim of providing them with help, ensuring flight safety and allowing them to return to flying duties, where applicable. [Recommendation FRAN-2016-021]

Reply No. 1 sent on 27/04/2016:

An EASA-led task force was established on 06 May 2015 to examine the preliminary findings of the technical investigation by the French Bureau d'Enquêtes et d'Analyses, and to assess the adequacy of the current European air safety regulations.

Six recommendations were proposed in the resulting task force report which was published on 17 July 2015. EASA published an action plan on 07 October 2015 to implement these recommendations. This action plan was discussed with the aviation community at an EASA 'Aircrew Medical Fitness' workshop which took place 07 to 08 December 2015. A dedicated EASA-led conference is planned for 15 and 16 June 2016 in order to capture more stakeholder input for the proposed actions.

One of the recommendations in the task force report concerns the implementation of aircrew support and reporting systems linked to the Commercial Air Transport operators' management systems. Peer support is one component of such a system. Work is underway to ensure that pilots, their families and peers have access to peer support groups to report and discuss personal and mental health issues, with the assurance that information will be kept in-confidence in a just-culture work environment, and that pilots will be supported and helped with the aim of allowing them to return to flying duties without jeopardising flight safety. This should facilitate the detection and early treatment of mental health issues.

EASA is considering introducing new implementing rules to Regulation (EU) No 965/2012 to ensure that all flight crew members have access to such support systems. This will be considered within the framework of Rulemaking Task RMT.0700, which is planned to be launched in April 2016 with the publication of the associated Terms of Reference.

The support programme should enable self-declaration in case of a decrease in medical fitness and, if appropriate, allow the crew member to receive temporary relief from flight crew duties, and to be referred for professional advice and/or treatment. To effectively and efficiently foster self-declaration, the support system should ensure that risks related to fear of loss of licence are properly mitigated.

EASA intends to refer to existing best practices and approaches that are already well-established within some Member States, with the aim of enhancing aviation safety and optimising pilot mental health while minimising career jeopardy and the stigma of seeking mental health assistance.

In support of the new implementing rules being considered, EASA is also considering assessing the need for providing operators and competent authorities with Acceptable Means of Compliance (AMC) and Guidance Material (GM) on aircrew support and reporting systems. The aim is for the AMC and GM to refer to the enablers of an effective support system, such as:

a. protection of data;
b. essential trust between management and crew being the foundation of a successful support programme;
c. an effective safety culture; and
d. support for consequences of loss of licence.

EASA expects to complete the actions related to this safety recommendation by the end of 2016.

Status: Open – **Category**:

Registration	Aircraft Type	Location	Date of event	Event Type
F-GXEC	TECNAM P2002	Andermos-Les-Bains Aerodorome	26/10/2013	Accident

Synopsis of the event:

Failure of a rudder control component, runway excursion during landing, coming to a standstill in a ditch

The aeroplane landed shortly beyond the displaced threshold on unpaved runway 13, rolled about 100 metres and exited the runway to the right. After crossing the taxiway, it came to rest in the adjacent ditch.

Safety Recommendation FRAN-2016-038 (BEA)

The BEA recommends that EASA ensure that the improvements made in production are effective and places an obligation on the Tecnam P 2002 manufacturer to establish means to detect cracks on aeroplanes in service that are more reliable than those mentioned in the two Service Bulletins relating to rudder pedal linkage inspection. [Recommendation 2016-038]

Reply No. 1 sent on 24/11/2016:

Regarding the improvement to the production process, the Italian Authority, ENAC (Ente Nazionale Aviazione Civile), in charge of the production oversight, is investigating the issue together with the type certificate holder (TCH) Tecnam. EASA is in contact with ENAC and Tecnam and will closely monitor the progress of the investigation. Regarding the quality of the maintenance inspection as established in Service bulletins SB-018 CS and SB-017 UL (related to rudder pedal linkage inspection), EASA is investigating, with the TCH, the effectiveness of the Service Bulletin SB-018 CS, applicable to the certified version of the P2002 type. The conclusion of this investigation is expected for Q1 2017. Regarding the SB-017 UL, since this is related to the version classified as Annex II (according to Regulation (EC) No 216/2008), EASA has asked Tecnam to inform the National Aviation Authorities, where the Annex II version of the P2002 is registered, about the occurrence and about the actions that will be taken on EASA type.

Status: Open – **Category**:

Registration	Aircraft Type	Location	Date of event	Event Type
F-BXIU G-DANT	Reims Aviation F172 COMMANDER 114	Saint-Martin-de-Bréthencourt	08/09/2009	Accident

Synopsis of the event:

Le pilote du F 172 immatriculé F-BXIU décolle de l'aérodrome de Toussus-le-Noble à 12 h 15 pour un vol local en instruction. Lors de ce vol de début de formation, l'instructeur et l'élève effectuent divers exercices de maniabilité, à altitude sensiblement constante. Ils ne sont pas en contact avec un organisme de la circulation aérienne au moment de l'accident. Le code transpondeur affiché est 7000 avec le mode C.

Le pilote du Commander 114 immatriculé G-DANT décolle de l'aérodrome de Montbéliard à destination de l'aérodrome de Lognes où il atterrit en milieu de journée. Un passager le rejoint et, après un repas rapide, ils

décollent à 12 h 12 à destination de Dinard. Le pilote se dirige vers le sud en direction de Melun puis s'établit sur une trajectoire rectiligne au cap 260 en direction de Chartres, à une vitesse sensiblement constante de 100 kt et à une altitude stable de 1 500 pieds QNH. Le pilote est en contact avec le CIV Paris Info avec le code 7010 affiché au transpondeur (mode C en panne).

A 12 h 40, les deux avions entrent en collision en vol au dessus de la commune de Saint-Martin-de-Bréthencourt:

- le F 172 perd une partie de l'aile droite, heurte le sol à quelques centaines de mètres du lieu de la collision en vol et prend feu;
- le pilote du Commander 114 conserve le contrôle de son avion, se déclare en détresse sur la fréquence et annonce avoir heurté « un ULM ou quelque chose comme ça ». Il atterrit dans un champ situé sur la commune de Boinville-le-Gaillard, à environ trois kilomètres du lieu de la collision en vol.

Safety Recommendation FRAN-2016-100 (BEA)

[French] - En conséquence le BEA renouvelle sa recommandation auprès de l'AESA afin d'accélérer l'évaluation des différents systèmes d'aide à la détection de trafics existants et d'assurer la promotion de leur déploiement dans le domaine de l'aviation générale.

Reply No. 1 sent on 27/04/2016:

EASA is investigating on the issue of mid-air collisions in the field of general aviation has supported a study entitled "Scoping Improvements to 'See And Avoid' for General Aviation (SISA)". The report dated 01/12/12 is available on the EASA Website under the reference EASA.2011.07: **https://www.easa.europa.eu/document-library/research-projects**.

The study concluded that 'any on-board equipment to augment the pilot's visual observations shall be light, low cost, and cooperative (non-cooperative will be too expensive)'. It therefore recommended to develop a technical standard for collision warning systems in the field of general aviation and Identified EUROCAE as the standardisation body.

Several systems are already widely used and provide help to the pilot to identify other traffic. EASA has already encouraged the installation of one of these systems (FLARM), by making this system available as a Standard Change (refer to CS-SC051a in CS-STAN Issue 1 dated 8 July 2015)).

EASA continuously monitors the development of new technological solutions and has started a further internal investigation, which will examine all possible actions to reduce the number of airprox and of mid-air collisions in the uncontrolled European airspace.

Status: Open – **Category**:

Registration	Aircraft Type	Location	Date of event	Event Type
F-HKCR	CIRRUS SR22	Salon de Provence	07/04/2015	Accident

Synopsis of the event:

Le 7 avril 2015, une mission de liaison est effectuée avec un Cirrus SR 22. Pendant la phase de décollage depuis le terrain de Salon de Provence, le siège recule violemment ce qui conduit à une perte de contrôle de l'appareil. Celui-ci impacte la piste et est détruit. Le pilote et les deux passagers sont indemnes.

Safety Recommendation FRAN-2016-991 (BEAD-Air)

[French] - BEAD recommande a Cirrus en relation avec l'agence europeene de la securite aerienne (AESA) d'etudier la posibilite de mise en place d'un systeme de securite (macanique, lumineux ou sonore,...) permettant de s'assurer du bon verouillage.

Reply No. 1 sent on 08/09/2016:

EASA will investigate with the Cirrus aircraft manufacturer and the FAA (Federal Aviation Administration), primary Certification Authority for the aeroplane, if there are deficiencies in the design and/or the installation of the flight crew seat and take action as required, including the possibility of an additional safety feature.

Status: Open – **Category**:

Germany

Registration	Aircraft Type	Location	Date of event	Event Type
ELT STUDY		Various Locations	Various	Accident

Synopsis of the event:

During the investigation of aircraft accidents in the last few years, the German Federal Bureau of Aircraft Accidents Investigation (BFU) has determined that 406 MHz emergency locator transmitters (ELT) were activated in a crash and functional. However, the satellite supported Cospas-Sarsat System was not able to receive their signals and locate the transmitters.

Safety Recommendation GERF-2009-019 (BFU)

The European Aviation Safety Agency (EASA) and the Federal Aviation Administration (FAA) should ensure that in case of new installations and refitting of 406 MHz emergency locator transmitters (ELT) in aircraft only ELTs with an additional internal antenna, or an external antenna designed in a way that the emission of the emergency signal is ensured after an accident are installed.

Reply No. 3 sent on 15/03/2016:

Internal antennas and integrated antennas suffer from shielding effects of the aircraft structure which does not guarantee an adequate ELT signal transmission.

Requiring two antennas on automatic ELT (one external and one additional internal antenna) would not bring the guarantee of a better signal transmission during an accident because the internal antenna would probably face the shielding effect mentioned above when the ELT unit is stuck inside the aircraft structure; it would however require an ELT re-design to provide double transmission power and thus induce a cost burden on owners.

It has also to be noted that the accidents examples provided in the BFU report are very severe, as in all but one of the cases where the ELT signal was not transmitted, the aircraft was completely destroyed (sometimes in small pieces) and the pilot(s) were fatally injured.

The Agency performed the following actions in order to support the improvement of ELT transmission reliability.

In 2012, the Agency upgraded the ETSO for emergency locator transmitters (ELT): ETSO C126a ('406MHz Emergency Locator Transmitter') (refer to ED Decision 2012/009/R dated 28/02/2012) specifies performance standards set forth in EUROCAE ED-62A, Minimum Operational Performance Specification for Aircraft Emergency Locator Transmitters 406 MHz and 121.5 MHz.

In addition, the Agency published a proposed Certification Memorandum CM-AS-008 Issue 01 dated 18 February 2016, entitled 'Installation of ELTs' in consultation (**https://easa.europa.eu/document-library/public-consultations**).

This Certification Memorandum provides guidance for the installation of ELTs and recommendations for the maintenance procedures that might improve the reliability of ELTs. Reference is made to the ED-62A installation specifications.

Several categories of installation issues are addressed in the CM. Chapter 3.1.1.3 is dedicated to ELT antenna installation issues. It reminds that the detachment of the antenna from its coaxial cable is a recurrent issue found during accident investigations, and it provides a set of recommendations for the installation of ELT antennas, in particular concerning antenna location, antenna position relative to ELT Transmit Unit, Coaxial cable characteristics, Coaxial cable installation. It is expected that observing these recommendations will improve the availability of the ELT signal transmission.

Status: Closed – **Category**: Partial agreement

Registration	Aircraft Type	Location	Date of event	Event Type
	BEECH 300	Freiburg (Aerodrome, Germany)	12/01/2006	Accident

Synopsis of the event:

At 18:55 hrs on 12 January 2006, the German Federal Bureau of Aircraft Accidents Investigation (BFU) was advised by the Münster Search and Rescue centre that an aircraft accident had taken place in the vicinity of Freiburg Airfield. A BFU investigation team arrived at the accident site at about 01:00 hrs. Aided by local external expert for field investigation who was tasked the location and recording of any volatile traces, the team began the immediate investigation on-site.

The Beech 300 (B300) took off on the morning of 12 January 2006 from its home base at Freiburg im Breisgau (EDTF) Airfield for a commercial flight in which passengers were to be transported from Karlsruhe/Baden-Baden (EDSB) to Braunschweig (EDVE) and return.

The B300 landed back at Karlsruhe at 17:19 hrs. The passengers disembarked at their destination and the flight crew took off again at 17:59 hrs. This latter sector was flown under Visual Flight Rules Night (VFR-Night).

The flight continued south at 4,500 ft in radio contact to Strasbourg Approach (119,450 MHz). Before leaving this frequency at 18:12 hrs, the commander asked the Air Inspection Officer (*'Flugleiter'*) at Freiburg for the current airfield weather. The cruising altitude was reduced to 3,500 ft.

In subsequent radio exchanges, the crew gave position reports to the Flight Information Service at Freiburg and received the current weather information. At 18:16 hrs the aircraft was above the destination aerodrome on a southerly heading.

When above the town, the aircraft then reversed heading to a northerly course to begin an approach to land. This was followed by a further 180 degree turn to intercept the approach path to Runway 16.

The undercarriage was lowered during final approach to Runway 16, and a short time later the commander gave his position to the Flight Information Service at Freiburg as 3 to 4 NM from the airfield.

The aircraft made contact with trees at 18:26 hrs about 450 m from the threshold to Runway 16 at Freiburg Airfield. Both pilots were killed by the impact.

The accident occurred during the final stages of an approach under Visual Flight Rules, when the aircraft made controlled descent and then had contact with trees. The causes of the accident were:

- because the decision was made to undertake VFR Night flight although the weather was marginal, and
- the approach to Freiburg Airfield was continued in conditions of insufficient visibility.

Safety Recommendation GERF-2009-025 (BFU)

The European Aviation Safety Agency (EASA) should regulate to require that "Single-Pilot Aircraft" engaged in EU-OPS 1.940 flights made in accordance with Instrument Flight Rules and at night, must have a minimum crew of two pilots, and that their training is in accordance with JAR-FCL including Multi-Crew-concept (MCC) training.

Reply No. 4 sent on 21/07/2016:

The Agency is currently evaluating the effectiveness of the existing provisions on operations requiring two pilots within the context of on-going rulemaking task RMT.0599, which was launched on 05 February 2016, with the publication of the associated Terms of Reference.

Although RMT.0599 was primarily set up to integrate evidence-based training into the EU regulations, the scope has been extended to include evaluation of this safety recommendation, as the rulemaking group includes expertise which is appropriate for the evaluation.

Status: Open – **Category**:

Registration	Aircraft Type	Location	Date of event	Event Type
FUMES STUDY			#Missing#	

Synopsis of the event:

For the last few years the German Federal Bureau of Aircraft Accident Investigation (BFU) has been receiving an increased number of reports of so-called fume events. These kinds of events include smell, smoke or vapour inside the airplane and/or health impairments of aircraft occupants. In addition, this topic is increasingly discussed among flight crew, occupational unions, the media and in political committees.

In the “study of reported occurrences in conjunction with cabin air quality in transport aircraft” a total of 845 cases were taken into consideration; Accidents, serious incidents and incidents, which have been reported to the BFU between 2006 and 2013.

A conjunction with cabin air could be determined in 663 reports. In 180 reports health impairments were described although a conjunction with cabin air quality could not be determined.

In 460 of the 663 reported fume events, smell development and in 188 cases smoke development was reported. In 15 cases there was neither smell nor smoke but health impairments which may possible have conjunction with a fume event.

For this study, the BFU has divided the reported occurrences into the following categories:

- Fume events affecting flight safety
- Fume events possibly affecting the occupational safety of crew members
- Fume events affecting the comfort of aircraft occupants
- Fume events and possible long-term effects on aircraft occupants.

Safety Recommendation GERF-2014-007 (BFU)

EASA should implement a demonstration of compliance of cabin air quality during type certification of aircraft (CS-25), engines (CS-E) and APU (CS-APU) such that the same requirements apply to all these products and permanent adverse health effects resulting from contaminated cabin air are precluded.

Aircraft, engine and APU type certification should include direct demonstration of compliance of all substances liable to cause cabin air contamination. Certification should be based on critical values which preclude permanent adverse health effects on passengers and crew.

Reply No. 2 sent on 13/04/2016:

The Agency launched two studies:

- A flight measurement campaign (ref. EASA.2014.OP.16). The study (launched in October 2014) implements a preliminary measurement campaign setting the scene for a large-scale measurement campaign on-board commercially operated large transport aeroplanes. A minimum of 60 flights are planned with measurements of air contaminants (cockpit & cabin) on several types of aeroplanes and engines (mix of short range and long range aeroplanes). The overall objective is to determine if there are any safety and/or potential long/short-term health risks resulting from the exposure to normal operating conditions and/or to cabin air contamination events. It has been contracted to a consortium consisting of Fraunhofer institute and MHH (medical school of Hannover). The conclusions of the study should be available 4th quarter 2016.
- A study on the characterisation of the toxicity of aviation turbine engine oils after pyrolysis (ref. EASA.2015.HVP.23). The purpose of this study (launched in November 2015) is to improve the knowledge on aviation oil toxicity and support the analysis of cabin/cockpit air contamination (e.g. flight measurement campaign mentioned above). It has been contracted to a consortium consisting of TNO (Dutch applied science institute) and RIVM (Dutch institute for public health and environment). The conclusions of the study should be available 3rd quarter 2016.

Further information on these studies can be found on the EASA Website with the following link: **http://easa.europa.eu/the-agency/procurement/calls-for-tender**

In addition, EASA is supporting the European Commission with the preparation of a Call for Tenders for a new project. The scope of the project is being defined, and the following topics are under consideration: ground and in-flight measurements of bleed air and cabin air composition, analysis of Environmental Control System contamination, assessment of contamination sources other than engine/APU.

The Agency will take into account the results of the research activities mentioned above and will reconsider the need to amend certification specifications.

Status: Open – **Category**:

Safety Recommendation GERF-2014-008 (BFU)

The European Aviation Safety Agency (EASA) should launch a research project to have an independent institute, e.g. institute of aerospace medicine or a medical university, study and assess the potential causal connection between transport aircraft cabin air contamination and chronic illnesses.

Reply No. 2 sent on 13/04/2016:

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The Agency will take into account the results of the research mentioned above.

Status: Open – **Category**:

Registration	Aircraft Type	Location	Date of event	Event Type
	DALLACH D4	Nausis	11/09/2014	Accident

Synopsis of the event:

Factual Information

The microlight aircraft with two persons aboard took off on 11 September 2014 at 13:21 hrs at Juist Airport with the destination Aalen-Heidenheim/Elchingen. At about 15:30 hrs witnesses observed an airplane crash. At 15:31 hrs the last radar signals were recorded: altitude 3200 ft AMSL, speed 120 kts. The microlight had crashed near Nausis in the district of Schwalm-Eder (Hesse). The two occupants suffered fatal injuries; the microlight was destroyed.

The wreckage distribution and the investigation at the BFU revealed that the right wing had separated during the flight in the area between flap and aileron (in-flight break-up).

The fracture of the wing was caused by the loss of the aileron counterbalance weight which is characterised by a flat plate or spade assisting the pilot in moving the aileron.

The area where the aileron counterbalance weight is welded to the centre tube of the aileron was examined. This centre tube to which the aileron ribs were fastened, consisted mainly of aluminium. A steel tube was riveted to the centre of this aluminium tube. To this steel tube the mounting of the aileron counterbalance weight and the bracket for the aileron controls were welded. The area of the welding seam of the stay tube was corroded. The fracture surface also showed corroded areas which led to the conclusion that the fracture occurred over a longer period of time. Among other things, a scanning electron microscope was used and revealed different deficiencies of the welding seam. Welding beads, incomplete fusion and microshrinkage were found. In addition, fatigue cracks were found in some areas.

Analysis

The fracture of the welding at the mounting of the aileron counterbalance weight had occurred over a longer period of time; the residual fracture had occurred abruptly.

It could not be determined if the insufficient welding was limited to the accident microlight.

The BFU is of the opinion that even though the investigation into the accident is still ongoing, actions to prevent similar accidents are imperative.

Safety Recommendation GERF-2015-001 (BFU)

The European Aviation Safety Agency (EASA) should ensure that the quality of the welding and riveting of the spade mounting of the D4 Fascination airplanes and her derivatives are sound. These parts of the airplanes should also be checked for corrosion.

Reply No. 2 sent on 15/03/2016:

EASA is responsible for the type Dallach D4 Fascination as defined in EASA Type Certificate Data Sheet (TCDS) A.019. Three such aircraft are currently in operation. The Type Certificate Holder is Aircraft Design & Certification ltd (AD&C). Two other non-EASA types of the D4 Fascination exist as microlights: the D4 and the D4BK. Those two D4 derivatives are classified as Annex II aircraft (according to Regulation (EC) No 216/2008), they are under the oversight of the National Aviation Authorities (NAA) and they are not under the control of AD&C. The aeroplane involved in the accident is Annex II and the design of the spade-aileron connection is different from the EASA approved type design.

EASA has reviewed with AD&C the design of the spade-aileron connection of the EASA type and has concluded that it meets the requirements in the Certification Specifications for Very Light Aeroplanes (CS-VLA) regarding structural strength and protection against corrosion.

Regarding the quality of the welding and riveting, the three aeroplanes conforming to EASA type Design have been released to service under the regime of a Part 21 Subpart F [Annex to Commission Regulation (EU) No 748/2012] production. Regarding the corrosion, AD&C has issued a Service Bulletin (ADxC-28-SB-002 Issue A dated 26 March 2015) that will require an additional specific visual and dye penetrant inspection for cracks and corrosion. This action is found appropriate. The service bulletin will be applicable only to aeroplanes conforming to the EASA type and will not cover the Annex II aircraft.

On 21st January 2016 EASA informed the NAAs of EASA Member States about the occurrence and about the actions taken on EASA type.

Status: Closed – **Category**: Agreement

Greece

Registration	Aircraft Type	Location	Date of event	Event Type
5B-DBY	BOEING 737	Grammatiko, Greece	14/08/2005	Accident

Synopsis of the event:

On 14 August 2005, a Boeing 737-300 aircraft, registration number 5B-DBY, operated by Helios Airways, departed Larnaca, Cyprus at 06:07 h for Prague, Czech Republic, via Athens, Hellas. The aircraft was cleared to climb to FL340 and to proceed direct to RDS VOR. As the aircraft climbed through 16 000 ft, the Captain contacted the company Operations Centre and reported a Take-off Configuration Warning and an Equipment Cooling system problem. Several communications between the Captain and the Operations Centre took place in the next eight minutes concerning the above problems and ended as the aircraft climbed through 28 900 ft. Thereafter, there was no response to radio calls to the aircraft. During the climb, at an aircraft altitude of 18 200 ft, the passenger oxygen masks deployed in the cabin. The aircraft leveled off at FL340 and continued on its programmed route.

At 07:21 h, the aircraft flew over the KEA VOR, then over the Athens International Airport, and subsequently entered the KEA VOR holding pattern at 07:38 h. At 08:24 h, during the sixth holding pattern, the Boeing 737 was intercepted by two F-16 aircraft of the Hellenic Air Force. One of the F-16 pilots observed the aircraft at close range and reported at 08:32 h that the Captain's seat was vacant, the First Officer's seat was occupied by someone who was slumped over the controls, the passenger oxygen masks were seen dangling and three motionless passengers were seen seated wearing oxygen masks in the cabin. No external damage or fire was noted and the aircraft was not responding to radio calls. At 08:49 h, he reported a person not wearing an oxygen mask entering the cockpit and occupying the Captain's seat. The F-16 pilot tried to attract his attention without success. At 08:50 h, the left engine flamed out due to fuel depletion and the aircraft started descending. At 08:54 h, two MAYDAY messages were recorded on the CVR. At 09:00 h, the right engine also flamed out at an altitude of approximately 7 100 ft. The aircraft continued descending rapidly and impacted hilly terrain at 09:03 h in the vicinity of Grammatiko village, Hellas, approximately 33 km northwest of the Athens International Airport. The 115 passengers and 6 crew members on board were fatally injured. The aircraft was destroyed.

The Air Accident Investigation and Aviation Safety Board (AAIASB) of the Hellenic Ministry of Transport & Communications investigated the accident following ICAO practices and determined that the accident resulted from direct and latent causes.

The direct causes were:

- Non-recognition that the cabin pressurization mode selector was in the MAN (manual) position during the performance of the Preflight procedure, the Before Start checklist and the After Takeoff checklist.
- Non-identification of the warnings and the reasons for the activation of the warnings (Cabin Altitude Warning Horn, Passenger Oxygen Masks Deployment indication, Master Caution).
- Incapacitation of the flight crew due to hypoxia, resulting in the continuation of the flight via the flight management computer and the autopilot, depletion of the fuel and engine flameout, and the impact of the aircraft with the ground.

The latent causes were:

- Operator's deficiencies in the organization, quality management, and safety culture.
- Regulatory Authority's diachronic inadequate execution of its safety oversight responsibilities.
- Inadequate application of Crew Resource Management principles.
- Ineffectiveness of measures taken by the manufacturer in response to previous pressurization incidents in the particular type of aircraft.

The AAIASB further concluded that the following factors could have contributed to the accident: omission of returning the cabin pressurization mode selector to the AUTO position after non-scheduled maintenance on the aircraft; lack of cabin crew procedures (at an international level) to address events involving loss of pressurization and continuation of the climb despite passenger oxygen masks deployment; and ineffectiveness of international aviation authorities to enforce implementation of actions plans resulting from deficiencies documented in audits.

Safety Recommendation GREC-2006-047 (AAIASB)

EASA/JAA and ICAO require the aircraft manufacturers to also record cabin altitude on the FDR.

Reply No. 4 sent on 17/10/2016:

This recommendation has been addressed within the framework of EASA rulemaking task RMT.0401 'Amendment of requirements for flight recorders and underwater locating devices'. The solution is based on specifications added to European Organisation for Civil Aviation Equipment (EUROCAE) Document 112A (ED-112A) by EUROCAE working group 90, in response to this safety recommendation. The working group decided to add flight parameter No 79 to table II-A.1 of ED-112A.

The associated EASA Executive Director (ED) Decision 2016/012/R, introducing this parameter for newly-manufactured aeroplanes, was published on the EASA web site on 13 September 2016 (see new parameter 79 'Cabin pressure altitude' in Table 2 of new AMC1.2 CAT.IDE.A.190).

Status: Closed – **Category**: Agreement

Hungary

Registration	Aircraft Type	Location	Date of event	Event Type
HA-LOK	BOEING 737	Budapest FIR	23/11/2011	Serious incident

Synopsis of the event:

Having started the engine in Budapest, the personnel failed to turn on the "Pack" switches of the air conditioning system, thus air was not vented into the cockpit and into the cabin. During the climb after takeoff, approaching FL150, the cabin altitude horn went off as a result of excessive decrease in cabin pressure (reaching cabin altitude of 10 000 feet). In spite of this, the crew did neither turn on air conditioning nor did it carry out an emergency descent, thus cabin altitude kept on decreasing. Triggered by that, passing 14 000 feet cabin altitude, the oxygen masks were automatically deployed in the cabin. The crew turned around the aircraft and after a short wait above TPS1, landed in Budapest. There were no personal injuries, but during the turn around, descent, approach and landing, the crew committed several mistakes which might have been provoked by the prior oxygen deficient period. The IC has formulated recommendations to be able to prevent and handle such events more safely in the future.

Safety Recommendation HUNG-2014-001 (TSB)

TSB recommends the Federal Aviation Administration and the European Aviation Safety Agency to consider using an annunciation on the Boeing 737 aircraft, which would indicate to the pilots that air conditioning is not on.

Reply No. 2 sent on 08/09/2016:

EASA has reviewed the FAA position expressed in the letter dated 13 February 2015 in attachment, and concurs with it.

FAA Airworthiness Directives AD 2011-03-14 and AD 2013-02-05 have been adopted by EASA.

Status: Closed – **Category**: Partial agreement

Safety Recommendation HUNG-2014-002 (TSB)

TSB recommends the Federal Aviation Administration and the European Aviation Safety Agency to consider altering the flight manual of the Boeing 737 aircrafts in such a way, that in case of the warning sound indicating a drop in the cabin pressure going off, it becomes possible to check whether air conditioning is turned on, and to switch it on, if necessary.

Reply No. 2 sent on 08/09/2016:

EASA concurs with the FAA position expressed in the letter dated 13 February 2015 in attachment, that during a cabin altitude warning event the flight crew's priority must be focused on maintaining crew consciousness and ensuring safe flight operations before attempting to troubleshoot. Therefore, a revision of the Aircraft Flight Manual (AFM) is not to be warranted.

Status: Closed – **Category**: Disagreement

Registration	Aircraft Type	Location	Date of event	Event Type
YR-ATG	ATR ATR42	Budapest Airport (LHBP)	17/06/2011	Serious incident

Synopsis of the event:

The ATR42-500 aircaft (registration YR-ATG, operated by TAROM) took off from runway 31L of Budapest Liszt Ferenc International Airport for Bucharest (as flight ROT234) at 17:21 UTC on 17 June 2011. The flight crew noticed the failure, flameout and fire of RH engine 11 seconds after rotation. The flight crew acted in accordance with the emergency checklist and declared MAYDAY while making a turn with the intention to land. The passengers panicked when they noticed the smoke in the cabin and the flaming engine through the window. The pilots received clearance for the tower and landed on runway 13L, 3 minutes after takeoff. The engine fire was put off in flight. The aircraft exited the runway and stopped on a taxiway where the captain ordered emergency evacuation of the aircraft. One passenger had medical problems due to the emergency situation and required medical assistance. The aircraft was checked by the fire brigade and then towed to the apron.

The affected engine was removed from the aircraft and shipped to an authorised engine repair facility for disassembly. The power turbine disk assemblies were taken to the engine manufacturer for analysis. The inspections revealed that the engine failure was caused by a broken turbine blade. The blade defect itself was a consequence of microshrinkage porosity and subsequent fatigue crack. The remaining damages were consequential.

In the course of the investigation the IC received information on two other occurrences similar in nature and conditions – aircraft type, engine type, occurrence – that took place in 2011 and one more from 2013. ANSV, AIB Denmark and TSB HU issued five immediate safety recommendations – with agreed text – concerning turbine blade inspections during manufacturing and on-board documentation related to in-flight emergency situations. The IC recommends to issue a safety recommendation – upon closure of the investigation - on training and equipment modification with regard to the Passenger Address system of the affected aircraft type.

Safety Recommendation HUNG-2016-006 (TSB)

TSB recommends to EASA to consider a modification of the Passenger Address system on ATR aircraft and all other aircraft equipped with similar passenger address systems that it allows release of „EMER" blocking with the PA button (situated next to the „EMER" button) or in other suitable way.

As a temporary measure until the above recommendation is implemented, TSB recommends to EASA to apply changes in the Cabin Crew Operating Manuals of the affected aircraft types in order to direct the attention of cabin crew members with more emphasis to the possibility of PA blocking release by replacing the handset back to its holder.

Reply No. 1 sent on 15/03/2016:

For the ATR aeroplanes the current design of the Passenger Address (PA) system is considered acceptable, since the blocking could have been released by replacing the handset back to its holder, as specified by the Cabin Crew Operating Manual (CCOM). ATR will augment and further clarify the CCOM. EASA is investigating if any other aeroplanes have a similar design and if those would require any update of the cabin crew operational procedures.

Status: Open – **Category**:

Iceland

Registration	Aircraft Type	Location	Date of event	Event Type
TF-FIJ	BOEING 757	SSE London Gatwick Airport	04/06/2009	Serious incident

Synopsis of the event:

Icelandair B757-200, TF-FIJ, departed Paris Charles de Gaulle airport (LFPG) France at 11:39 UTC (13:39 local time) on June 4th 2009 for its flight to Keflavik airport (BIKF) Iceland.

Seventeen minutes into the flight the flight crew noticed white smoke entering the flight deck. The smoke intensified rapidly to such an extent that the flight crew could barely see their instruments. Shortly after, smoke also entered the whole cabin section and intensified rapidly. The commander noticed engine #1 surging and shut it down. Shortly thereafter the smoke started to decrease. The airplane diverted and made an emergency landing at London Gatwick airport (EGKK) United Kingdom.

The investigation revealed that the low pressure fuel pump installed on engine #1 had failed due to extensive internal wear damages. This allowed fuel to leak into the engine's oil system. Fuel/oil mixture entered the engine's main bearing chambers, where the seals could not contain it. The fuel/oil mixture then leaked into the compressor section of the engine. Inside the compressor the fuel/oil mixture generated smoke. The smoke propagated to the engine's HP2 port and from there entered the engine's bleed air system. Once in the bleed air system the smoke entered the left air conditioning pack and from there was distributed to the flight deck and the cabin.

The investigation revealed that the low pressure fuel pump had never undergone inspection, repair or overhaul.

The manufacturer of the low pressure fuel pump, as well as the manufacturer of the engine, had issued maintenance requirements for the low pressure fuel pump. The investigation revealed that the operator of the airplane had not implemented into its maintenance program tasks that would individually monitor the low pressure fuel pump utilizations and ensure its required maintenance was being performed.

Safety Recommendation ICLD-2013-001 (ITSB)

EASA and ICAO: Set guiding rule for airframe and engine manufacturers such that Maintenance Planning Document (MPD) and Engine Maintenance Manual (EMM) clearly include recommended maintenance information from subcomponent Component Maintenance Manuals (CMM).

Reply No. 3 sent on 08/09/2016:

This safety recommendation has been evaluated by the sub-group 1 of EASA rulemaking task RMT.0252 (MDM.056) 'Instructions for Continued Airworthiness'.

The current position of this sub-group is summarised below.

The determination of applicable instructions for continued airworthiness (ICA) and maintenance instructions of a product, especially those to be performed on the aircraft, is under the responsibility of the Design Approval Holder (DAH) of this product. This includes appliances which are part of the certified product.

For that purpose, the DAH may consider maintenance instructions provided by suppliers if considered applicable and effective. Those maintenance instructions may be then incorporated either by reference or may be copied (with or without changes) directly into the ICA and maintenance instructions of the DAH.

On the other hand this also means that the DAH may decide not to endorse maintenance instructions provided by suppliers if considered either not applicable or not effective.

Therefore, it is not appropriate to enforce on airframe and engine manufacturers that "Maintenance Planning Document (MPD) and Engine Maintenance Manual (EMM) clearly include recommended maintenance information from subcomponent Component Maintenance Manuals (CMM)."

At this stage, the sub-group 1 intends to propose in guidance material, that DAH should systematically review initial maintenance recommendations provided by suppliers and to consider them if applicable and effective.

This review included European Technical Standard Order (ETSO) articles where certain maintenance instructions may be even required to be picked up by the DAH to ensure that the ETSO article continues to satisfy the terms of its ETSO authorization after installation.

Further information will be provided in the Notices of Proposed Amendment (NPA) dealing with this topic (publication currently planned 01Q2017).

Status: Open – **Category**:

Registration	Aircraft Type	Location	Date of event	Event Type
TF-FIH	BOEING 757	Keflavik Airport, at stand 20 on cargo apron	30/01/2011	Serious incident

Synopsis of the event:

In gusty wind conditions [Wind 282°/35, gusting 42 knots] the main cargo door was damaged and fell uncontrolled down to its closed position.

Safety Recommendation ICLD-2014-001 (ITSB)

The Icelandic Transportation Safety Board (ITSB) recommends EASA to require the STC holder of EASA STC #EASA.IM.A.S.01423 to review the structural design of the main cargo door with respect to the 45 knots maximum wind operation loading and make the necessary design changes in order to meet the requirements of EASA CS, subchapters 25.301(a) and 25.303.

Reply No. 2 sent on 08/09/2016:

The STC holder, Precision Conversions LLC, addressed through Service Bulletin (SB) PC-757-52-0018 a redesign of the cargo door, replacing the aluminium rods of the door with steel rods.

In addition, for both configurations, pre and post SB PC-757-52-0018, the following wind/gust limitations have been established and incorporated in the Aircraft Maintenance Manual and Operations Manual supplements:

- 45 knots up to the door canopy position, 0 (zero) knots beyond the door canopy position, for configuration pre SB PC-757-52-0018 (aluminium rods);

- 45 knots up to the door canopy position, 25 knots beyond the canopy position, for configuration post SB PC-757-52-0018 (steel rods).

These wind/gust limitations, introduced by the Precision Conversions LLC SB PC-757-11-0023, were mandated by the FAA AD 2016-04-24, which has been adopted by EASA.

Design change introduced by SB PC-757-52-0018 and wind/gust limitations mandated per FAA AD 2016-04-24 (SB PC-757-11-0023), are deemed to respond satisfactorily to the intent of this Safety Recommendation.

Status: Closed – **Category**: Agreement

Registration	Aircraft Type	Location	Date of event	Event Type
97005	SUKHOI (Superjet 100)	Keflavik	21/07/2013	Accident

Synopsis of the event:

At 04:03 AM on July 21st 2013, Sukhoi RRJ-95B, of Russian experimental registry 97005, took off from Keflavik Airport (BIKF) for flight certification tests.

The purpose of the flight certification tests was to expand the airplane's capabilities for CAT IIIA automatic approach.

Seven approaches and go-arounds were performed with possible landing gear touchdown to RWY1 20, followed by two to RWY 11. The objective of the last approach to RWY 11 was to assess the automatic flight control system performance during go-around at radio altitude of 2-3 feet above the runway, with the right engine shut down and crosswind exceeding 10 m/s (19.5 knots).

During this last go-around the airplane climbed to 27 feet altitude after the landing gear had been selected to the up position, followed by a loss of altitude. The airplane hit the runway with the landing gear retracted and skidded down the runway on the fuselage aft lower belly and the engine cowlings. The airplane skidded off the end of RWY 11 and came to rest 163 meters beyond the threshold of RWY 29.

The crew evacuated the airplane and during the evacuation one crew member suffered minor injuries.

The ITSB has determined the most probable cause of the accident to be flight crew fatigue.

Nine safety recommendations and one safety action are issued.

Safety Recommendation ICLD-2016-009 (ITSB)

In conjunction with the manufacturer, ensure that necessary changes are made to the emergency escape slide design of RRJ-95B aircraft EASA certified under type certificate EASA.IM.A.176 to meet the maximum wind requirements of EASA CS-25.810(iv).

Reply No. 2 sent on 21/07/2016:

EASA, together with the manufacturer and Interstate Aviation Committee-Aviation Registry, has reviewed the weather conditions during the accident based on the data provided by the Icelandic Meteorological Office. It has been concluded that peaks of wind of speed higher than 25 knots in the most critical angle (as mentioned by Certification Specification CS 25.810 (a) (iv)) were encountered. The state of the slide after the accident is consistent with these wind conditions. EASA has reviewed the certification aspects of the slides and concluded that they effectively meet the requirements of CS 25.810 (a) (iv).

Status: Closed – **Category**: Partial agreement

Indonesia

Registration	Aircraft Type	Location	Date of event	Event Type
PK-AXC	AIRBUS A320	SUB - SURABAYA, Indonesia	28/12/2014	Accident

Synopsis of the event:

On 28 December 2014 an Airbus A320-216 aircraft registered as PK-AXC was cruising at 32,000 feet on a flight from Juanda Airport, Surabaya, Indonesia to Changi Airport, Singapore with total occupants of 162 persons. The Pilot in Command (PIC) acted as Pilot Monitoring (PM) and the Second in Command (SIC) acted as Pilot Flying (PF).

The Flight Data Recorder (FDR) recorded that 4 master cautions activated following the failure of the Rudder Travel Limiter which triggered Electronic Centralized Aircraft Monitoring (ECAM) message of AUTO FLT RUD TRV LIM SYS. The crew performed the ECAM procedure on the first three master caution activations. After the 4th master caution, the FDR recorded different pilot action and the parameters showed similar signature to those on 25 December 2014 when the FAC CBs were pulled on the ground. This pilot action resulted on the 5th and 6th master caution activations which correspond respectively to ECAM message of AUTO FLT FAC 1 FAULT and AUTO FLT FAC 1+2 FAULT

Following two FAC fault, the autopilot and auto-thrust disengaged and the flight control reverted to Alternate Law which means the aircraft lost several protections available in Normal Law. The aircraft entered an upset condition and the stall warning activated until the end of recording.

Participating in the investigation of this accident were Australian ATSB, French BEA, Singapore AAIB and MOT Malaysia as accredited representatives.

The investigation concluded that contributing factors to this accident were:

- The cracking of a solder joint of both channel A and B resulted in loss of electrical continuity and led to RTLU failure.
- The existing maintenance data analysis led to unresolved repetitive faults occurring with shorter intervals. The same fault occurred 4 times during the flight.

- The flight crew action to the first 3 faults in accordance with the ECAM messages. Following the fourth fault, the FDR recorded different signatures that were similar to the FAC CB" s being reset resulting in electrical interruption to the FAC's.

- The electrical interruption to the FAC caused the autopilot to disengage and the flight control logic to change from Normal Law to Alternate Law, the rudder deflecting 2° to the left resulting the aircraft rolling up to 54° angle of bank.

- Subsequent flight crew action leading to inability to control the aircraft in the Alternate Law resulted in the aircraft departing from the normal flight envelope and entering prolonged stall condition that was beyond the capability of the flight crew to recover.

Issues such as flight approval considered did not contribute to the accident and was not investigated. The FDR data did not show any indication of the weather condition affecting the aircraft.

Following this accident, the Indonesia Air Asia has performed several safety actions.

KNKT issued several recommendations to Indonesia Air Asia, Director General of Civil Aviation (DGCA), US Federal Aviation Administration and European Aviation Safety Administration (EASA) and Airbus.

Safety Recommendation INDO-2015-001 (AIB)

The KNKT supports the previous French BEA recommendation (Recommendation FRAN-2015-024) on ensuring that future programs to include initial and recurrent training relating to taking over control of aircraft equipped with non-coupled control stick.

Reply No. 1 sent on 09/02/2016:

EASA acknowledges the need to emphasise procedures for taking over control of aeroplanes equipped with non-coupled control sticks during initial and recurrent training.

Existing Air Operations and Flight Crew Licensing (OPS/FCL) Operational Evaluation Board (OEB) reports and recently approved OSD-FC (Operational Suitability Data - Flight Crew) for aeroplanes equipped with non-coupled control sticks, already include relevant dedicated Training Areas of Special Emphasis (TASE).

In cooperation with manufacturers of aeroplanes equipped with such control sticks, EASA will continue to ensure that the specific TASE is included in the OSD-Flight Crew.

Furthermore, EASA published, on 16 October 2015, Safety Information Bulletin (SIB) 2015-17R1 on unreliable airspeed indication at high altitude/manual handling at high altitude, which recommends, amongst other things, that the initial and recurrent training includes procedures for taking over and transfer of manual control of the aircraft, especially for fly-by-wire aeroplanes with independent side-sticks.

Status: Closed – **Category**: Agreement

Safety Recommendation INDO-2015-002 (AIB)

The KNKT recommend expediting the implementation of mandatory for upset recovery training earlier than 2019.

Reply No. 1 sent on 09/02/2016:

Mitigating Loss of Control In-flight (LOCI) is one of the European Aviation Safety Agency's (EASA's) highest priorities, and the Agency has published new provisions on operator training on flight crew Upset Prevention and Recovery Training (UPRT), with the specific objective to ensure that flight crew acquire the necessary competencies to prevent and recover from developing or developed upsets (see ED Decision 2015/012/R, published on the Agency's web site on 04 May 2015, to be implemented by 04 May 2016).

ED Decision 2015/012/R takes into account the International Civil Aviation Organization (ICAO) Annex 6 amendment 38, ICAO Doc 9868 'Procedures for Air Navigation Services - Training' (PANS-TRG) amendment 3 relating to UPRT, and ICAO Doc 10011 'Manual on Aeroplane UPRT'. Reference is also made to the Original Equipment Manufacturers' (OEMs') Aeroplane Upset Recovery Training Aid (AURTA).

Emphasis is placed on the need to integrate human factor aspects into the training, such as Threat and Error Management (TEM) and Crew Resource Management (CRM) principles, as well as the startle and surprise effect. Moreover, it re-emphasises the importance of the correct use of Flight Simulation Training Devices (FSTDs), particularly to avoid negative transfer of training.

In addition, the Agency published a Notice of Proposed Amendment (NPA) on 01 September 2015 on loss of control prevention and recovery training (see NPA 2015-13, published on the Agency's web site on 01 September 2015).

The NPA addresses the flight crew licensing elements. The newly developed upset recovery training in an aeroplane, which is to be mandated for the Airline Transport Pilot Licence - Aeroplanes [ATPL(A)] training course, and to be a pre-requisite prior to commencing the first multi-pilot type rating course, is an important step towards enhancing a commercial pilot's resilience to the psychological and physiological aspects often associated with upset conditions, and towards providing them with an enhanced ability to not only overcome these human factor aspects, but to also apply appropriate recovery strategies to return the aeroplane to safe flight.

In addition, the NPA introduces new flight and FSTD instructor privileges for the upset recovery training course in an aeroplane. FSTD instructor training standards are to be augmented, notably for those instructors delivering upset recovery training in existing Full Flight Simulators (FFSs), to avoid negative transfer of training.

The related rulemaking task, RMT.0581, is still ongoing, with the next deliverable, which is an EASA 'Opinion', due to be published before the end of 2016. The related regulation is anticipated to be implemented by 2018 at the latest.

Status: Open – **Category**:

Ireland

Registration	Aircraft Type	Location	Date of event	Event Type
N208EC	CESSNA 208	Connemara Airport (EICA), Ireland	05/07/2007	Accident

Synopsis of the event:

The aircraft was returning on a short flight from Inis Meáin (EIMN), one of the Aran Islands in Galway Bay, to Connemara Airport (EICA), in marginal weather conditions when the accident occurred. There had been a significant wind shift, since the time the aircraft had departed earlier from EICA that morning, of which the Pilot appeared to be unaware. As a result a landing was attempted downwind. At a late stage, a go-around was initiated, at a very low speed and high power setting. The aircraft turned to the left, did not gain altitude and maintained a horizontal trajectory. It hit a mound, left wing first and cartwheeled. The Pilot and one of the passengers were fatally injured. The remaining seven passengers were seriously injured. The aircraft was destroyed.

The aircraft was returning on a short flight from Inis Meáin (EIMN), one of the Aran Islands in Galway Bay, to Connemara Airport (EICA), in marginal weather conditions when the accident occurred. There had been a significant wind shift, since the time the aircraft had departed earlier from EICA that morning, of which the Pilot appeared to be unaware. As a result a landing was attempted downwind. At a late stage, a go-around was initiated, at a very low speed and high power setting. The aircraft turned to the left, did not gain altitude and maintained a horizontal trajectory. It hit a mound, left wing first and cartwheeled. The Pilot and one of the passengers were fatally injured. The remaining seven passengers were seriously injured. The aircraft was destroyed but there was no fire.

Safety Recommendation IRLD-2009-002 (AAIU)

It is recommended that the FAA and EASA should require that Flight Manuals, or STC supplements to Flight Manuals, should contain information on the location and de-activation of ELTs fitted to an aircraft.

Reply No. 3 sent on 15/03/2016:

The Agency ensures that information should be readily available on board aircraft equipped with automatic ELTs that are rigidly attached to the aircraft and not deployable, permitting to locate and de-activate the ELTs after an accident.

EASA aircraft Certification Specifications already have provisions meeting the intent of this safety recommendation: CS 23/25/27/29.1501 requires providing information necessary for safe operation to the crew members; CS 23/25/27/29.1561 requires to mark the stowage provisions for the required safety or emergency equipment; CS 23/25/27/29.1581 requires providing information necessary for safe operation or to comply with operating rules in the Flight Manual.

In order to better enforce these provisions to the ELT case, the Agency has included this topic in a proposed Certification Memorandum CM-AS-008 Issue 01 dated 18 February 2016, entitled 'Installation of ELTs' (**https://easa.europa.eu/document-library/public-consultations**) currently under consultation.

Chapter 3.1.5 of the Certification Memorandum addresses Aircraft Flight Manuals (AFMs) and their supplements. The last part of this chapter reminds that AFMs, or STC supplements to AFMs, should contain information on the location and deactivation of ELTs. It is therefore recommended that the AFM or its supplements contain information explaining how to disarm or shut down the ELT after an accident, including when the remote control switch is inoperative.

Status: Closed – **Category**: Agreement

Registration	Aircraft Type	Location	Date of event	Event Type
EC-ITP	SWEARINGEN SA227	Cork Airport	10/02/2011	Accident

Synopsis of the event:

On 10 February 2011, a Fairchild SA 227-BC Metro III registered EC-ITP, was operating a scheduled commercial air transport flight from Belfast City (EGAC) to Cork (EICK) with 2 Flight Crew members and 10 passengers on board. At 09.51 hrs during the third attempt to land at EICK in low visibility conditions, control was lost and the aircraft impacted the runway. The aircraft came to rest inverted in soft ground to the right of the runway surface. Post impact fires occurred in both engine nacelles which were extinguished by the Airport Fire Service (AFS). Six persons, including both pilots, were fatally injured. Four passengers were seriously injured and two received minor injuries.

Safety Recommendation IRLD-2014-003 (AAIU)

The European Aviation Safety Agency should review Council Regulation (EEC) No 3922/91 as amended by Commission Regulation (EC) 859/2008, to ensure that it contains a comprehensive syllabus for appointment to commander and that an appropriate level of command training and checking is carried out.

Reply No. 2 sent on 21/07/2016:

Paragraphs ORO.FC.105 (b) and (c) of Annex III Part-ORO (Organisation Requirements for air Operations) of Commission Regulation (EU) No 965/2012 on air operations specify the conditions to be fulfilled by a flight crew member before he/she can be assigned as commander. The associated Acceptable Means of Compliance (AMC) contains details on the route/aerodrome competence. ORO.FC.205 lists the elements of the command course. The development of a detailed course syllabus is the responsibility of the operator and needs to be approved by the authority in accordance with ORO.FC.145.

Nevertheless, the Agency agrees that further guidance may be beneficial to operators regarding the establishment and content of the command course. This safety recommendation is therefore currently being considered within the framework of Rulemaking Task RMT.0599 'Evidence-based and competency-based training', which was launched on 05 February 2016, with the publication of the associated Terms of Reference.

Although RMT.0599 was primarily set up to integrate evidence-based training into the EU regulations, the scope has been extended to include evaluation of this safety recommendation, as the rulemaking group includes expertise which is appropriate for the evaluation.

Status: Open – **Category**:

Registration	Aircraft Type	Location	Date of event	Event Type
G-SKYE	CESSNA 206	1,6 NM west of Abbeyshrule airfield (EIAB)	21/06/2014	Accident

Synopsis of the event:

The aircraft, a Cessna TU206G, was being used for parachuting/skydiving activities at Abbeyshrule (EIAB) on the day of the accident. Shortly after take-off, the Pilot felt what was described as a "knock" following which the engine lost power. This resulted in the Pilot making a forced landing in a nearby field. There were five people on board the aircraft - the Pilot and four skydivers. The skydivers comprised of two tandem pairs, with each pair being made up of a qualified skydiver and a person skydiving for charity secured to him. Following the forced landing, all occupants successfully evacuated the aircraft, which sustained substantial damage. The Pilot and qualified skydivers reported no injuries at the scene. The two charity skydivers attended a local hospital, but were released a short time later.

The Investigation found that the cause of the engine power loss was a failure of the crankshaft.

Safety Recommendation IRLD-2015-001 (AAIU)

The European Aviation Safety Agency should consider issuing a Safety Information Bulletin highlighting the importance of using the correct sealant/process on the crankcase parting surfaces of engines manufactured by Teledyne Continental Motors.

Reply No. 1 sent on 09/02/2016:

As mentioned in the investigation report, the requirements for type and usage of sealants are described in Continental Motors' Instructions for Continued Airworthiness (ICAs). EASA has reviewed the ICAs and considers that they sufficiently describe the sealant usage on the crankcase parting surfaces. Based on this review and on discussions with the FAA, who is the primary certification authority for this engine type, EASA does not see the need to issue a Safety Information Bulletin.

Status: Closed – **Category**: Disagreement

Safety Recommendation IRLD-2015-002 (AAIU)

The European Aviation Safety Agency should conduct a safety study in relation to the most effective method of occupant restraint in aircraft engaged in parachute operations and consider whether the applicable EU Regulations and Certification Specifications adequately address the safety restraint of parachutists (IRLD2015012).

Reply No. 2 sent on 21/07/2016:

The technical installation of restraints systems are addressed in the Certification Specifications CS-23 supplemented by special condition "Use of aeroplanes for parachuting activities" (Doc. No. SC-023-div-01).

EASA is investigating whether such requirements are sufficient to determine the most effective restraint system for parachute operations, or whether further requirements, and ultimately research activities, are necessary.

Conclusion of the EASA investigation is foreseen by the end of 2017.

Status: Open – **Category**:

Italy

Registration	Aircraft Type	Location	Date of event	Event Type
EI-EDM	AIRBUS A319	Palermo airport	24/09/2010	Accident

Synopsis of the event:

At 18.08 UTC, during final approach for runway 07 with adverse meteorological conditions on Palermo airport, aircraft collided with terrain immediately before the beginning of the runway, hit the opposite RWY localiser antenna, slid on the wet runway with main gear collapsed for about 900 meters before stopping out of the left side of the runway. Passengers evacuation was performed. Aircraft was severely damaged, very minor injuries to persons onboard.

Safety Recommendation ITAL-2011-018 (ANSV)

ANSV recommends EASA and FAA that the aim of such modification is to avoid to establish unsafe condition for passengers and for this reason the modification must be proposed as "mandatory" on all A320-family fleet now in operation (as prescribed by Part 21A.3B - «a document issued or adopted by EASA which mandates actions to be performed on an aircraft to restore an acceptable level of safety, when evidence shows that the safety level of this aircraft may be otherwise compromised»). (ANSV-18/1836-10/1/A/11)

Reply No. 4 sent on 24/11/2016:

To address the potential unsafe condition highlighted by this safety recommendation, the manufacturer developed mod 153724, a structural change which prevents the central vertical strut at FR65 to pass through the cabin floor, and issued Service Bulletin (SB) A320-53-1262 to provide instructions for installation of this modification on aeroplanes in service. To ensure correct manufacturer serial number (MSN) allocations and configuration definitions, this was further revised and two more SBs (A320-53-1333 and A320-53-1334) were issued.

The Agency mandated the modification in compliance with the above mentioned SBs by Airworthiness Directive (AD) No. 2016-0212 issued on 25-10-2016.

Status: Closed – **Category**: Agreement

Registration	Aircraft Type	Location	Date of event	Event Type
I-AIRY	AEROSPATIALE AS350	Lasa, Bolzano airfield	16/05/2011	Accident

Synopsis of the event:

On May 16th 2011, the Eurocopter AS350 B2 registration marks I-AIRY was flying from Merano (BZ, Italy) to Curon Venosta (BZ, Italy). During flight at an altitude of about 4.300 ft, the pilot noticed that the "low oil pressure" light came on, accompanied by a yaw jerk to the right, a loud noise and a NR drop with its audio warning. The pilot immediately lowered the collective pitch and landed the aircraft in autorotation on Lasa airfield that was

directly in front of him. An observer on the ground reported the presence of white smoke from the exhaust pipe. On the ground, the preliminary inspection did not reveal any finding likely to explain the event. Minor damages to the helicopter due to the hit of one of the main rotor blades against the tail boom happened during touch-down. No injuries were reported by the three persons on board (pilot included).

Safety Recommendation ITAL-2013-012 (ANSV)

[Italian] - Destinataria: EASA. L'ANSV raccomanda di valutare l'emissione di un SB finalizzato a prevedere una modifica (opzionale) per la installazione dello schermo di protezione sul bocchettone di rifornimento carburante per le versioni dell' AS350 che non ne siano dotati.

Reply No. 2 sent on 08/09/2016:

It was found that the introduction of an on-condition check is sufficient to address the risk and a Working Card (No 2833-I-28) has been published for helicopters equipped with the optional Service Bulletin N. 28.00.09.

It introduces an on-condition optical check with borescope for contamination at the level of the inlet/outlet of the oil/heat exchanger in case of drop of the fuel pressure without lightening of FUEL P (Fuel pressure too low on pump output) or F FILT (fuel filter clogging) warnings.

Status: Closed – **Category**: Disagreement

Registration	Aircraft Type	Location	Date of event	Event Type
HA-YDJ	TECHNOAVIA SMG92	Casale Monferrato	29/08/2015	Accident

Synopsis of the event:

L'incidente è occorso in data 29 agosto 2015, alle ore 12.00 UTC (14.00 ora locale), nelle immediate vicinanze dell'aeroporto di Casale Monferrato, all'aeromobile di tipo SMG-92 Turbo Finist marche di identificazione HA-YDJ, con 11 persone a bordo (1 pilota e 10 paracadutisti). Il velivolo, subito dopo il decollo, nella fase di salita iniziale, ancora all'interno del perimetro dell'aeroporto e su prua pista, perdeva quota e precipitava in un fossato appena fuori della recinzione aeroportuale. Gli occupanti riportavano lesioni gravi.

Safety Recommendation ITAL-2016-001 (ANSV)

[Italian] - ANSV raccomanda ad EASA di estendere l'applicazione della AD No 2015-0014 anche ad altri S/N del motore M601, eventualmente riconsiderando la validità ed i criteri di individuazione dei parametri che sono stati utilizzati nel risk assessment che ha definito i S/N ai quali applicare la citata AD. (raccomandazione ANSV-1/2354-15/1/A/16).

Reply No. 1 sent on 15/03/2016:

From the information available so far, there is no evidence that the root cause of this failure is similar to the issue with the quill shaft AD 2015-0014. The damage to the quill shaft thread was different in this case (Quill shaft issue in AD is fatigue spiral crack, while in this accident there has not been found any crack but a complete rupture of thread, likely caused by overload).

For determination of the failure mode it is necessary to have information from a metallurgical examination. The Agency requested the ANSV to provide information on the metallurgical examination.

Status: Open – **Category**:

Safety Recommendation ITAL-2016-002 (ANSV)

[Italian] - ANSV raccomanda ad EASA di procedere, in via cautelativa, quanto prima, allo sviluppo di un protocollo finalizzato ad un controllo straordinario di olio, filtri e tappi magnetici, con successive analisi nel caso di eventuale presenza di metallo, secondo modalità che dovranno essere definite dallo stesso costruttore del motore. Tale controllo sarebbe mirato ad individuare preventivamente l'insorgenza di un eventuale disallineamento ed usura dello spline tra il quill shaft ed il PT shaft. (raccomandazione ANSV-2/2354-15/2/A/16)

Reply No. 1 sent on 15/03/2016:

From the information available so far, extra inspections of oil, oil filters and magnetic plugs will not prevent future rupture of the quill shaft. Note, the origin of the AD 2015-0014 for the quill shaft was related to a fatigue cracking failure mode, that would not produce debris that would be detected by the above types of inspection procedure.

Status: Closed – **Category**: Disagreement

Registration	Aircraft Type	Location	Date of event	Event Type
EI-EIB	AIRBUS A320	Fiumicino Airport	29/09/2013	Accident

Synopsis of the event:

On September 29th 2013, at 18.11 UTC, the aircraft A320-200 registration marks EI-EIB, flight AZ063, while approaching the final destination of Rome Fiumicino (LIRF) airport at the end of a flight departed from Madrid airport with 151 passengers and 6 crew on board, experienced a technical problem during the landing gear normal extension. This circumstance was notified to the crew by the Master Warning and the triggering of the ECAM message "L/G GEAR NOT DOWNLOCKED".

During missed approach standard procedure and following holding on Campagnano VOR, the crew carried out a g-force manoeuvre (maximum value of 1.75g – FDR data) with LG lever down, then a LG recycle and later on performed LG gravity extension, but all measures were unsuccessful. Consequentially, the crew requested an emergency landing to Rome Fiumicino airport (LIRF).

Approaching Rome Fiumicino airport RWY 16L, the aircraft touched down on the runway at 19.00 UTC with the right LG only partially extracted (picture 1). At landing, the mass of aircraft was 58.864 kg (FDR data).

The flight crew shutoff both engines just before touchdown. The aircraft came to rest after scraping the right engine just few meters off the runway (RH side); the subsequent evacuation was uneventful and no injuries were suffered.

Safety Recommendation ITAL-2016-003 (ANSV)

[Italian] - l'ANSV raccomanda di introdurre un requisito che assicuri il funzionamento dei registratori di volo (FDR/CVR) anche nel caso di "power failure" e, relativamente all'A320 family, nel caso di velocità insufficiente al funzionamento della RAT.

Reply No. 1 sent on 24/11/2016:

The introduction of a new requirement for a CVR backup power source is already considered in the scope of EASA Rulemaking task RMT.0249 ('Recorders installation and maintenance thereof –certification aspects'). The terms of reference are published on the Agency's website:

https://www.easa.europa.eu/document-library/terms-of-reference-and-group-compositions/tor-rmt0249-mdm051

This is considered to be an improvement to support accident and incident investigations. The rulemaking task will assess the relevance of such a new requirement for new designs only and for production aeroplanes.

Concerning the FDR, recording flight parameters when all aeroplane energy sources (engines, APU, RAT) are unavailable would require the flight parameters sources to be backup powered in addition to the FDR itself.

The Agency will analyse deeper the pros and cons of an FDR backup power. This analysis will include a discussion with the European Flight Recorders Partnership Group (EFRPG). This group includes representation from safety investigation authorities and industry.

Status: Open – **Category**:

Registration	Aircraft Type	Location	Date of event	Event Type
N609AG	AGUSTA (AW609)	Tronzano Vercellese (VC)	30/10/2015	Accident

Synopsis of the event:

On 30th October 2015, the experimental tiltrotor AW609 registration marks N609AG crashed on the ground nearby the city of Tronzano Vercellese (VC), Italy. The two test pilots on board lost their lives in the crash.

Safety Recommendation ITAL-2016-151 (ANSV)

The ANSV recommends, in the framework of the certification process, to verify that the aerodynamic behaviour of the aircraft at high-speed conditions will be reviewed, if necessary making use of wind tunnels tests in addition to updated models and simulations that can be representative of the complex flight conditions of this peculiar aircraft. [ANSV-9/3173-15/1/A/16]

Reply No. 1 sent on 08/09/2016:

The FAA is the primary certification authority for the AW609. Currently, EASA and FAA are working to assess and confirm how, in the framework of the certification process, the aerodynamic behaviour as well as the control laws are validated at high speed and in all flight conditions for which the aircraft is certificated.

Status: Open – **Category**:

Safety Recommendation ITAL-2016-152 (ANSV)

The ANSV recommends, in the framework of the certification process, to verify that the control laws of the aircraft will be reviewed in the management of the extreme flight conditions in which the aircraft could possibly fly. That verification should be addressed to ensure the effectiveness of the flight controls inputs given by the pilot avoiding the possibility of unexpected and un-commanded coupling effects.[ANSV-10/3173-15/2/A/16]

Reply No. 1 sent on 08/09/2016:

The FAA is the primary certification authority for the AW609. Currently, EASA and FAA are working to assess and confirm how, in the framework of the certification process, the aerodynamic behaviour as well as the control laws are validated at high speed and in all flight conditions for which the aircraft is certificated.

Status: Open – **Category**:

Mali

Registration	Aircraft Type	Location	Date of event	Event Type
EC-LTV	DOUGLAS DC9	Gossi (Mali)	24/07/2014	Accident

Synopsis of the event:

On 24 July 2014, the MD-83 registered EC-LTV was performing scheduled night flight AH 5017 from Ouagadougou (Burkina Faso) bound for Algiers (Algeria). The climb towards cruise altitude took place without any significant events, and the crew made several heading changes in order to fly around a storm cell. The autopilot and the autothrottle were engaged. The aeroplane reached FL 310, that's to say about 9,500 m. The autopilot then switched to the mode that maintains the altitude and the autothrottle to the mode that maintains the speed (Mach).

Analysis of the recorded parameters showed that about two minutes after the aeroplane levelled off, at FL 310, the EPR (Engine Pressure Ratio) value became inconsistent and overestimated relative to other recorded engine parameters. This anomaly occurred first on the right engine and then, about 55 seconds later, on the left engine.

The overestimated EPR value is attributed to an obstruction of the PT2 pressure probes located on the engine nose cones. This phenomenon could have been caused by the presence of cold and wet air at the edge of the storm cell. Based on the analysis of the recorded parameters, it is likely that the engine and PT2 pressure probe anti-icing system was not activated. Consequently, the autothrottle system reduced engine RPM in order to maintain the erroneous EPR within the authorised limits, which led to a progressive reduction in the speed and an increase in the airplane's pitch over a period of approximately 5 ½ minutes. The aeroplane subsequently stalled. The 116 occupants were killed.

Safety Recommendation MALI-2016-005 (AIB)

[French] - La Commission d'Enquête sur les Accidents et Incidents d'Aviation Civile du Mali et le BEA recommandent que la FAA et l'AESA imposent que ces particularités des avions de type MD80 soient enseignées lors des qualifications de type et des entraînements récurrents des équipages.

Reply No. 1 sent on 21/07/2016:

The Agency understands that the 'specific features' referred to in the recommendation refer to the features of a stall in cruise on MD-80 type aeroplanes which are linked to the late appearance of buffet, of the stick shaker and of the stall warning and with the non-automatic disengagement of the autopilot after the stall warning.

Part-FCL (Flight Crew Licensing) of Commission Regulation (EU) No 1178/2011 (Regulation Aircrew) establishes the requirements for the issue of pilot licences and associated ratings and certificates, and the conditions for their validity and use. In particular, approach-to-stall and stall recovery training and checking is addressed as follows:

Appendix 9: Training, skill test, proficiency check for multi-pilot aeroplanes, item 3.8 'Early recognition and counter measures on approach to stall (up to activation of stall warning device) in take-off configuration, in cruising flight configuration and in landing configuration'.

Commission Regulation (EU) No 965/2012 (Regulation Air Operations) contains provisions directed to the operator on recurrent training, including proficiency checks on normal, abnormal and emergency procedures.

As a first step to address this safety issue, the Agency has published new provisions on flight crew Upset Prevention and Recovery Training (UPRT), with the specific objective to ensure that flight crew acquire and maintain the necessary competencies to prevent and recover from developing or developed upsets (see Executive Director (ED) Decision 2015/012/R, published on the Agency's web site on 04 May 2015).

The material takes into account the International Civil Aviation Organization (ICAO) Annex 6 amendment 38, ICAO Doc 9868 'Procedures for Air Navigation Services - Training' (PANS-TRG) amendment 3 relating to UPRT, and ICAO Doc 10011 'Manual on Aeroplane UPRT'. Reference is also made to the Original Equipment Manufacturers' (OEMs') Aeroplane Upset Recovery Training Aid (AURTA).

Furthermore, the existing provisions on stall recovery in initial and recurrent training programs for airline transport pilots are being evaluated within the framework of Rulemaking Tasks RMT.0581 and RMT.0582 'Loss of Control Prevention and Recovery Training', which were launched by the Agency on 20 August 2013. The associated Notice of Proposed Amendment, NPA 2015-13, was published on 01 September 2015 and the next deliverable, an EASA Opinion, is expected to be published in the fourth quarter of 2016.

In addition, the Agency has published an Airworthiness Directive (AD) (AD No. 2015-0179) on 27 August 2015. This AD mandates the inclusion of a procedure in the Aircraft Flight Manual for unreliable engine pressure ratio (EPR) indications for specified aircraft types (including the MD-80 family) and a warning to flight crew about the possible consequential stall conditions. The existing EU regulatory framework provides the foundation to ensure that operating pilots receive training in accordance with the original equipment manufacturer's documentation, including, for example, amendments to the AFM.

For more specific measures related to the MD-80, the Agency will contact the FAA and the manufacturer to evaluate the recommended action.

Status: Open – **Category**:

Safety Recommendation MALI-2016-008 (AIB)

[French] - La Commission d'Enquête sur les Accidents et Incidents d'Aviation Civile du Mali et le BEA recommandent que la FAA et l'AESA s'assurent de la représentativité des simulateurs utilisés pour l'entraînement des équipages de MD80 concernant le déclenchement des dispositifs avertisseurs de l'approche du décrochage et l'absence de déconnexion du pilote automatique après le décrochage, en basse altitude et en niveau de croisière.

Reply No. 1 sent on 21/07/2016:

The Agency will contact both the FAA and the manufacturer to consider the recommendation.

Status: Open – **Category**:

Safety Recommendation MALI-2016-012 (AIB)

[French] - La Commission d'Enquête sur les Accidents et Incidents d'Aviation Civile du Mali et le BEA recommandent que la FAA et l'EASA s'assurent que cette modification soit prise en compte par les exploitants concernés.

Reply No. 1 sent on 21/07/2016:

The Agency will contact both the FAA and the manufacturer, to coordinate the implementation of the modification "of the maintenance check procedure for Cockpit Voice Recorders on the MD80, so that all of the recording tracks are tested, including the CAM Track".

Status: Open – **Category**:

Netherlands

Registration	Aircraft Type	Location	Date of event	Event Type
G-JSAR	AEROSPATIALE AS332	the North Sea, near Den Helder, Netherlands	21/11/2006	Accident

Synopsis of the event:

On the evening of Tuesday 21 November 2006 at 11.28 p.m. a helicopter of the Eurocopter AS332L2 "Super Puma" type, registration number G-JSAR, was forced to make an emergency landing in the North Sea, approximately ten nautical miles to the north-west of Den Helder. The four crew members and thirteen passengers were rescued from the sea after approximately 1 hour and carried to Den Helder using different means of transportation. One passenger was admitted to hospital with mild hypothermia symptoms but discharged after a few hours; the remaining occupants were uninjured.

Safety Recommendation NETH-2010-001 (DSB)

The Board recommends that EASA consider expanding the parameters for the flight data recorders of helicopters to include the forces of the steering ("control forces"), as is the case in some categories of fixed wing aircrafts.

Reply No. 4 sent on 17/10/2016:

This recommendation has been addressed within the framework of EASA rulemaking task RMT.0401 'Amendment of requirements for flight recorders and underwater locating devices'. The solution is based on specifications added to European Organisation for Civil Aviation Equipment (EUROCAE) Document 112A (ED-112A) by EUROCAE working group 90, in response to this safety recommendation. The working group decided to add flight parameter No 51 to table II-A.2 of ED-112A.

The associated EASA Executive Director (ED) Decision 2016/012/R, introducing this parameter for newly-manufactured helicopters, was published on the EASA web site on 13 September 2016 (see new parameter 51 'Primary flight controls - Pilot input forces' in Table 2 of new AMC1.2 CAT.IDE.H.190).

Status: Closed – **Category**: Agreement

Registration	Aircraft Type	Location	Date of event	Event Type
STUDY ILS GS			#Missing#	

In 2014 the Dutch Safety Board published the study "Pitch-up upsets due to ILS false glide slope". The Dutch Safety Board launched this investigation based on the investigation to an incident at Eindhoven Airport.

Synopsis of the event:

During the approach to Eindhoven Airport (The Netherlands) on 31 May 2013, a Boeing 737-800 was radar vectored towards runway 21 for a landing with the aid of the Instrument Landing System (ILS). The aircraft was flying under Instrument Meteorological Conditions (IMC). During the latter stage of the approach, the aircraft was above the intended 3 degree Gilde Path. After the Localizer was captured, a Glide Slope intercept from above was

executed. The Autopilot Flight Director System (AFDS) and the Auto Throttle (AT) were engaged. The Approach mode was armed and the aircraft was configured for landing.

At short final, approximately 0.85 NM from the threshold at 1060 feet altitude, the Glide Slope was captured. Upon Glide Slope capture, a pitch increase of 24.5 degrees aircraft nose up (ANU) occurred in about 8 seconds. The crew pressed the 'take-off/go-around' (TOGA) button for a go-around, almost simultaneously followed by the activation of the stick shaker warning. During the following approach to stall recovery manoeuvre there was a second stick shaker activation. The crew made a successful go around and landed at Eindhoven Airport.

The activation of the aircraft's stick shaker during an autopilot coupled ILS approach in close proximity to the runway was a factor of interest that prompted the Dutch Safety Board to start an investigation. The occurrence (henceforth: the Eindhoven incident) has been categorized by the Safety Board as a serious incident.

It became clear during the investigation that the Eindhoven incident was not unique. Four other occurrences with autopilot commanded pitch-up upset during ILS approach from above the 3 degree Glide Slope were identified. These incidents took place with different types of aircraft, operated by different airlines, on approach to different airports.

These findings led the Dutch Safety Board to conclude that little known ILS signal characteristics pose a significant threat to aviation safety, as they may result in unexpected aircraft behaviour and my thus endanger the safety of passengers and flight crews. Because identified occurrences, combined with the potential severity of this hazard, the Dutch Safety Board decided to address this issue separately.

This report (study) represents the investigation into the ILS signal characteristics and the SMS framework. The other findings from the Eindhoven incident are presented in a separate report, issued contemporaneously.

Safety Recommendation NETH-2014-005 (DSB)

To the regulators involved with the manufacturing of transport category aircraft; European Aviation Safety Agency (Europe), Federal Aviation Administration (USA), Agência Nacional de Aviação Civil (Brasil), Civil Aviation Administration of China, Federal Air Transport Agency (Russian Federation), Japan Civil Aviation Bureau, and Transport Canada.

5. Training regulations: Review the applicable regulations on initial and recurrent flight crew training to assess whether they adequately address the potential degradation of situational awareness (basic pilot skills) and flight path management due to increased reliance on aircraft automation by flight crews.

Reply No. 2 sent on 21/07/2016:

Commission Regulation (EU) No 1178/2011 on aircrew provides the framework for teaching and assessing basic airmanship skills through initial training, skill tests, proficiency checks, type training, operator's recurrent training, Line Flying Under Supervision (LIFUS) and line oriented flight training (LOFT).

The trend towards increased automation in aircraft design calls for a review of the provisions to consider training on the potential degradation of situational awareness and flight path management due to increased reliance on automation by flight crews.

The Agency has published the following Safety Information Bulletins (SIBs) to improve awareness of the risks associated with increased reliance on aircraft automation by flight crews:

- SIB 2010-033 'Flight Deck Automation Policy - Mode Awareness and Energy State Management';
- SIB 2014-07 'Unexpected Autopilot Behaviour on Instrument Landing System (ILS) Approach';
- SIB 2014-17 'Aeroplane Mode Awareness During Final Approach'.

This safety recommendation has initially been addressed by EASA through publication, on 04 May 2015, of Executive Director (ED) Decision 2015/012/R 'Upset Prevention and Recovery Training (UPRT)', containing new Acceptable Means of Compliance (AMC) and Guidance Material (GM) for operator conversion training and recurrent training under Annex III Part-ORO (Organisation Requirements for air Operations) of Commission Regulation (EU) No 965/2012. This covers flight path management and situational awareness.

The safety issue is being further considered within the framework of Rulemaking Task RMT.0599 'Evidence-based and competency-based training', which was launched on 05 February 2016, with the publication of the associated Terms of Reference. The next deliverable, a Notice of Proposed Amendment related to evidence-based training, is expected to be published by mid-2017.

In the meantime, the recommendation has been partially addressed within the framework of EASA rulemaking task RMT.0696 'Implementation of evidence-based training (EBT) within the European regulatory framework'. The associated ED Decision 2015/027/R, was published on 16 December 2015. It contains new GM to support implementation, by operators, of Evidence Based Training (EBT), conducted in Flight Simulation Training Devices, according to the principles established in International Civil Aviation Organization (ICAO) Doc 9995 'Manual of Evidence-based Training'. The GM is linked to existing sub-paragraph ORO.FC.230 (a);(b);(f) 'Recurrent training and checking' and sub-paragraph ORO.FC.A.245 'Alternative training and qualification programme' (see Commission Regulation (EU) No 965/2012). The training described in the safety recommendation is addressed in the recurrent assessment and training matrices in ICAO Doc 9995, which the new GM refers to.

The Agency has also addressed the operator training on the recognition of systems and human limitations associated with the use of automation within the framework of RMT.0411 'Crew Resource Management (CRM) training', in ED Decision 2015/022/R which was published on 25 September 2015.

Status: Open – **Category**:

Registration	Aircraft Type	Location	Date of event	Event Type
9M-MRD	BOEING 777	Ukraine	17/07/2014	Accident

Synopsis of the event:

On the 17th July 2014, at 13.20 (15.20 CET) a Boeing 777-200 with the Malaysia Airlines nationality and registration mark 9M-MRD disappeared to the west of TAMAK air navigation waypoint in Ukraine. A notification containing this information was sent by the Ukrainian National Bureau of Air Accident Investigation (NBAAI) on 18 July 2014, at approximately 06.00 (08.00 CET). The NBAAI was notified by the Ukraine Ukrainian State Air Traffic Service (UkSATSE) that communication with flight MH17 had been lost.

A signal from the aeroplane's Emergency Locator Transmitter had been received and its approximate position had been determined.

The aeroplane impacted the ground in the eastern part of Ukraine. The wreckage was spread over several sites near the villages of Hrabove, Rozsypne and Petropavlivka. Six wreckage sites were identified, spread over about 50 km^2. Most of the wreckage was located in three of these sites to the south-west of the village of Hrabove. This is about 8.5 km east of the last known position of the aeroplane in flight. At two sites, post-impact fires had occurred.

All 298 persons on board lost their lives.

The in-flight disintegration of the aeroplane near the Ukrainian/Russian border was the result of the detonation of a warhead. The detonation occurred above the left hand side of the cockpit. The weapon used was 9N314M-model warhead carried on the 9M38-series of missiles, as installed on the Buk surface-to-air missile system.

Safety Recommendation NETH-2015-001 (DSB)

Encourage states and operators who have relevant information about threats within a foreign airspace to make this available in a timely manner to others who have an interest in it in connection with aviation safety.

Reply No. 1 sent on 07/06/2016:

A European High Level Task Force was set-up to define concrete actions that could be taken at European level in order to further mitigate risks to civil aviation arising from conflict zones. The report of this task force contains recommendations addressed to the main involved European stakeholders. It can be accessed under this link: **http://www.easa.europa.eu/system/files/dfu/208599_EASA_CONFLICT_ZONE_CHAIRMAN_REPORT_no_B_update.pdf**

EASA is now developing a process for a "conflict zone alerting system", as described in the report.

Status: Closed – **Category**: Partial agreement

Safety Recommendation NETH-2015-002 (DSB)

Ensure that operators are required through national regulations to make risk assessments of overlying conflict zones. Risk increasing and uncertain factors need to be included in these assessments in accordance with the proposals made by the ICAO Working Group on Threat and Risk.

Reply No. 1 sent on 07/06/2016:

A European High Level Task Force was set-up to define concrete actions that could be taken at European level in order to further mitigate risks to civil aviation arising from conflict zones. The report of this task force contains recommendations addressed to the main involved European stakeholders. It can be accessed under this link:

http://www.easa.europa.eu/system/files/dfu/208599_EASA_CONFLICT_ZONE_CHAIRMAN_REPORT_no_B_update.pdf

EASA is now developing a process for a "conflict zone alerting system", as described in the report.

Status: Closed – **Category**: Partial agreement

Registration	Aircraft Type	Location	Date of event	Event Type
ES-YLS	AERO VODOCHODY L39	Valkenswaard	15/09/2012	Accident

Synopsis of the event:

Being one of seven aircraft of Breitling Jet Team, the L-39C Albatros jet with registration ES-YLS experienced engine problems during flight. These problems became so serious that the flight could not be continued. The pilot then shut down the engine and steered the aircraft towards an open area. Here, he and the second occupants left the aircraft with the ejection seat. The aircraft ended up in a field. Both occupants were unharmed. After extensive investigation it was found that the engine problems were primarily caused by a defective low pressure turbine front bearing. Further it turned out that the assessment of the engine oil quality by a laboratory was done without any written references. Finally it was concluded that the L-39C does not have to comply with European safety level requirements.

Safety Recommendation NETH-2016-001 (DSB)

Limit the possibility to exempt aircraft from the common rules of Regulation (EC) No 216/2008 to those category of aircraft as mentioned in the preamble of the Regulation under (5).

Reply No. 1 sent on 07/06/2016:

The legislator has defined the criteria for the exclusion from Regulation (EC) No 216/2008 in Annex II to this Regulation. The preamble text, namely recital (5), does not contain any decision criteria. The purpose of the recitals is to explain in general terms the reason and/or the background information that support the substantive articles of the regulation.

The Aero Vodochody L-39C has been in the service of the military forces and no civil certification has been performed. Therefore it falls under the scope of Annex II(d) to Regulation (EC) No 216/2008. As a consequence, the aircraft does not fall in the scope of Regulation (EC) No 216/2008 and national Member States regulations apply.

Status: Closed – **Category**: Partial agreement

Norway

Registration	Aircraft Type	Location	Date of event	Event Type
OY-RJC	BOMBARDIER CL600 2B19	Oslo Airport Gardermoen	31/01/2008	Serious incident

Synopsis of the event:

On 31 January 2008, at 1721 hours, a serious aircraft incident took place during take-off from runway 19L at Oslo Airport Gardermoen (ENGM). A Bombardier CL-600-2B19 (CRJ200) aircraft with two pilots and two cabin crew members on board suddenly lost lift on the right wing, causing the wing to drop and sending the aircraft into an uncontrolled 40-degree bank immediately after lift-off. The stall protection system activated, and the crew regained control and continued as scheduled to Copenhagen.

The investigation has shown that satisfactory de-icing took place 15 minutes prior to departure, and that the wings were not cold-soaked in advance. Weather conditions were temperature at freezing, 15 kt wind and continuous precipitation in the form of aggregated, wet snowflakes. The runway was covered by slush and wet snow which had fallen after the runway had been cleared of snow and sanded 30 minutes earlier. Unintentionally, due to distraction, the system for heating the leading edge of the wing was not switched on prior to take-off. The nose wheel was lifted from the ground at the correct speed, but at a higher rotation rate than recommended.

This incident is one in a number of similar cases. From 2002 to 2008, six CL-600 series aircraft crashed in winter conditions. The wing of the aircraft has proven to be especially sensitive to contamination on the leading edge. After the crashes, a number of measures have been implemented to ensure that the wing is clean during take-off, and to ensure that the pilots use the correct take-off technique. On take-off from contaminated runways, spray from the nose wheel will envelop the aircraft's wing root. This source of contamination hits an aerodynamically critical area on the wing, and comes in addition to the precipitation which can adhere to the wing and disturb the airflow. When the de-icing fluid flows off during take-off, it is essential that the leading edge of the wing is heated. The AIBN believes that it is not sufficient to use only "soft" safety barriers such as check lists and memory when one switch position (Wing Anti-Ice ON) can be critical to avoid a crash during take-off. Technical or physical safety barriers in the form of design changes, automatic systems or automatic warning systems are, in the opinion of the accident Investigation Board, necessary to reduce the risk of accidents. Alternatively, greater limitations for winter operations with the affected aircraft models must be introduced.

Safety Recommendation NORW-2011-003 (AIBN)

Experience has shown that contaminated wing leading edges on aircraft of the CL-600 series during take-off can cause a premature stall with an uncontrollable wing drop and a risk of a catastrophic outcome. Activation of the Wing Anti-Ice system is considered a crucial barrier to prevent a contaminated wing leading edge.

In order to increase the safety margins, the AIBN recommends that Transport Canada and EASA require the type certificate holder (Bombardier) to introduce nonprocedural safety barriers (for instance take-off warning or automatic activation) to ensure that the wing anti-ice system on affected CL-600 series aircraft is activated on take-off in certain winter conditions. [Safety recommendation SL no. 2011/03T]

Reply No. 3 sent on 21/07/2016:

Bombardier has developed a corrective action to prevent take-off with contaminated wings. This consists of a design change that installs the Supplemental Low Temperature Ground-Wing Anti-Icing System (LTGWAIS) for Take-Off Safety Enhancement (TOSE). It provides automatic activation of the wing anti-ice system while on the ground under certain weather conditions. This design change is mandated by the TCCA AD number: CF-2016-19R1 that has been adopted by EASA.

Status: Closed – **Category**: Agreement

Registration	Aircraft Type	Location	Date of event	Event Type
STUDY.WIN.OP		various locations	various	various

Synopsis of the event:

Winter operations, friction measurements and conditions for friction predictions

Over a 10-year period, the Accident Investigation Board Norway (AIBN) has received 30 reports of accidents and incidents related to operations on contaminated and slippery runways.

Nine of these concerned accidents and serious incidents. In the same period AIBN has published 12 investigation reports and issued 36 safety recommendations.

Although the majority of the incidents were less serious in which the pilots regained control of a sliding aircraft, or the aircraft left the runway or taxiway at a low speed causing limited damage to personnel and aircraft, the accident at Stord Airport in 2006 shows the potential for a fatal accident following a runway excursion. Internationally, runway excursions are considered as being one of the high risk areas.

In 2006, the AIBN decided to perform a theme investigation into the theme *'winter operations and friction measurements and conditions for friction predictions'* to supplement the individual safety investigations. The individual safety investigations focused on the operators and their possible safety actions. The theme investigation focuses on the general framework for operations on contaminated and slippery runways and the potential for safety improvements in general. The AIBN has accumulated and analysed a large volume of documentation, reports, test and research data from various national and international sources in addition to consulting expertise in the field of micrometeorology

Safety Recommendation NORW-2011-010 (AIBN)

The AIBN recommends that FAA, EASA and CAA Norway consider, on the basis of risk assessments, whether all available reverse thrust should continue to be included in part or in whole when calculating the required landing distance on contaminated and slippery runways.

Reply No. 2 sent on 16/11/2016:

The Agency has raised the generic Certification Review Item (CRI) on "Reverse Thrust Credit when Operating on Contaminated Runway Surfaces", which the manufacture should take account of.

The above mentioned CRI aims to provide clarification of AMC 25.1591 and to limit the reverse thrust credit when landing on a contaminated runway to the one-engine inoperative condition.

The above mentioned CRI, that applies when credit is being sought for reverse thrust application for accelerate-stop and landing distances on contaminated runways, provides interpretative material of AMC 25.1591 in line with the principles laid down in paragraph CS 25.125(c) (3) and (g), which require account to be taken of the one-engine inoperative configuration.

Status: Closed – **Category**: Agreement

Safety Recommendation NORW-2011-011 (AIBN)

The AIBN recommends that FAA, EASA and CAA Norway evaluate the airlines' crosswind limits in relation to friction values and consider whether they should be subject to separate approval by the authorities.

Reply No. 4 sent on 16/11/2016:

This safety recommendation is currently being considered within the framework of Rulemaking Task RMT.0296 'Review of aeroplane performance requirements for commercial air transport operations'. The first deliverable, a Notice of Proposed Amendment, NPA 2016-11, was published on 30 September 2016.

Operational crosswind limits are either based on manufacturer's approved data or on manufacturer's advisory data; thus, an additional approval by the competent authority is not considered necessary.

Nevertheless, the NPA includes a proposal to introduce new Guidance Material (GM) on how to use the information available from manufacturers to establish operational crosswind limits in the operator's operations manual and to relate such limits to the runway surface conditions (see proposed GM1 ORO.MLR.100 Operations manual - general - CROSSWIND LIMITATIONS IN THE OPERATIONS MANUAL).

The next deliverable for RMT.0296, an EASA Opinion with proposals for amendments to Commission Regulation (EU) No 965/2012, is planned to be published in the third quarter of 2017. Pending adoption and publication of the related amending regulation, the associated EASA Executive Director Decision, which is expected to contain the above-mentioned new GM, will be published.

In the meantime, guidance on crosswind limitations is provided in Safety Information Bulletin (SIB) No 2014-20, which was published by the Agency on 23 June 2014.

Status: Open – **Category**:

Registration	Aircraft Type	Location	Date of event	Event Type
LN-BCD	CIRRUS SR20	Sirdal	28/05/2010	Accident

Synopsis of the event:

The private aircraft was en route from Stavanger airport Sola to Tønsberg airport Jarlsberg when clouds made it necessary to turn back to maintain visual references. When turning, the aircraft entered clouds with severe icing and turbulence. Control was lost as the pilot in command, who had no experience with instrument flying, suffered from vertigo and as ice built up on the wing and most likely made the aircraft stall prematurely. A probable total loss with a fatal outcome was prevented by the pilot's activation of the aircraft's rescue parachute. The aircraft came down in rough terrain north of Ådneram in Sirdal with significant structural damage, but none of the four occupants sustained injury.

The opinion of the Accident Investigation Board Norway is that insufficient planning ahead of departure and too little distance to rapidly growing clouds (towering cumulus) were contributing factors to the accident.

Safety Recommendation NORW-2012-001 (AIBN)

If the rescue parachute is deployed during the flight, the aircraft is in a serious emergency. The probability of the emergency and position being noticed by the alarm and rescue services increases if the emergency locator transmitter (ELT) is triggered automatically at the same time.

The AIBN recommends that Cirrus Aircraft develops an automatic system that ensures that the ELT is triggered when the Cirrus Aircraft Parachute System (CAPS) is engaged. [Safety recommendation No. 2012/01T]

Reply No. 2 sent on 15/03/2016:

EASA acknowledges the recommendation to Cirrus Aircraft. Cirrus has developed such system with change number "E00000269", and this has been approved under the FAA (Federal Aviation Administration) system. The change is classified as major change level 2 and it is considered approved by EASA under the provisions of the Bilateral Agreement between the United States of America and the European Union. Since such automation function is not warranted by an unsafe condition, EASA considers this action adequate.

Status: Closed – **Category**: Agreement

Registration	Aircraft Type	Location	Date of event	Event Type
LN-OJF	EUROCOPTER EC225	Turoy	29/04/2016	Accident

Synopsis of the event:

HKS241 was enroute from Gullfaks B (ENQG) to Bergen Airport Flesland (ENBR). The helicopter was cruising at 2000 ft when the Main Rotor Head (MRH) and mast suddenly detached.

The helicopter impacted on a small island and caught fire. The main wreckage thereafter ended in the sea where it came to rest at a depth of 1-9 meters. The accident was not survivable.

The CVFDR (Combined Cockpit Voice and Flight Data Recorder) was salvaged from the tail section of the helicopter the day of the accident. The recorder was taken to the Air Accidents Investigation Branch (AAIB) at Farnborough, UK for read-out. Two days after the accident, a complete data set of both voice and flight data was successfully downloaded.

The recordings on the CVFDR showed that everything appeared to be normal until a sudden catastrophic failure developed in 1-2 seconds. The CVFDR recordings ended abruptly at the same time. There are no indications that flight crew actions were a factor in the accident.

Safety Recommendation NORW-2016-001 (AIBN)

Recent metallurgical findings have revealed features strongly consistent with fatigue in the outer race of a second stage planet gear in the epicyclic module of the MGB. It cannot be ruled out that this signifies a possible safety issue that can affect other MGBs of the same type. The nature of the catastrophic failure of the LN-OJF main rotor system indicates that the current means to detect a failure in advance are not effective.

The AIBN therefore recommends that EASA take immediate action to ensure the safety of the Airbus Helicopters H225 Main Gear Box.

Reply No. 1 sent on 21/07/2016:

Pending further investigation to determine the root cause(s) of the reported damage, and development of mitigating measures by Airbus Helicopters, EASA has decided, as a precautionary measure, to temporarily prohibit flights of the Airbus Helicopters AS 332 L2 and EC 225 LP helicopters. An Emergency Airworthiness Directive (2016-0104-E) has been published accordingly.

Status: Closed – **Category**: Agreement

Poland

Registration	Aircraft Type	Location	Date of event	Event Type
SP-BDF	KUBICEK BB42	Niezabitów near Nałęczów	23/04/2014	Accident

Synopsis of the event:

The pilot performed a flight with seven passengers. About 18:00 hrs LMT, after takeoff from the town of Nałęczów, the balloon was flying in a south-west direction. After several dozen minutes of flight, the wind speed increased and the pilot decided to land in a suitable area. During the landing the pilot assessed the horizontal speed of the balloon for 10 - 12 m/s. During the landing one of the passengers suffered serious injury and three passengers suffered minor injuries.

During the investigation SCAAI determined the following causes of the accident:

1. Planning and performing the flight despite forecast of dangerous weather phenomena;
2. Instructions for passengers prior to the landing partly incompatible with the appropriate emergency procedure.

Contributing factors:

- Pilot's knowledge insufficient to read typical civil aviation meteorological information;
- Too many passengers in the basket.

Safety Recommendation POLD-2016-001 (PKBWL)

Check the compatibility between the provisions of the Flight Manual - document No. B2102, Section 2 Operating Limitations, paragraph 2.10 and Appendix 2, regarding the maximum number of persons which may be present in the basket.

Reply No. 1 sent on 07/06/2016:

EASA has investigated the issue with the Type Certificate holder (TCH) Balony Kubicek. The TCH has confirmed the discrepancies between section 2 and appendix 2 of the Flight Manual (Doc. No. B.2102) and these have been fixed in rev.23 of the flight manual which has been approved through EASA major change n. 10057624 to the Type Design.

Status: Closed – **Category**: Agreement

Romania

Registration	Aircraft Type	Location	Date of event	Event Type
YR-BNP	BRITTEN NORMAN BN2A	In the vicinity of Horea village, Alba County	20/01/2014	Accident

Synopsis of the event:

On 20.01.2014, the Civil Aviation Safety Investigation and Analysis Center (CIAS) was notified indirectly by phone about the accident. Subsequently CIAS received an „Air Safety Report" (ASR), from the operator representing the written communication of the accident in which it was involved a BN-2A-27 aircraft, registered YR-BNP.

BN-2A-27 aicraft, radio call indicative "RFT 111", performed a flight from Bucharest – Băneasa Airport to Oradea Airport, having on board a crew of two pilots and 5 passengers. The flight was performed based on an IFR flight plan, the aircraft took off at 13.38 LT. The last radio communication between the aircraft and the air traffic agencies was made at 15.34.51 LT, at the distance of approximately 52 NM from the point ROŞIA (air radio reporting point). At 15.47 LT a passenger of the aircraft informed by phone that the aircraft crashed, but without being able

to communicate their exact location. The wreckage of the aircraft was located after almost 5 hours from receiving the information, in the vicinity of Horea commune, Petreasa village, Alba County.

As a consequence of the accident, the aircraft was destroyed, five of the persons on board were injured and two died.

The cause of the accident occurrence consisted in the engine shutdown due to the severe icing of carburettors based on the following favouring causes:

- incorrect decision of the aircraft Captain to continue the flight mission in weather conditions that favored the severe icing of carburettors;
- incorrect decision of the aircraft Captain to fly for a long period of time in icing conditions;
- incorrect decision of the aircraft Captain to take off with a weight over the maximum admitted limit and with gravity center position outside the limits calculated and imposed by the manufacturer;
- incorrect decision of the aircraft Captain to continue the mission in IMC flight conditions on IFR flight rules below MSA;
- large flight interruption and lack of experience of the crew on this MEP class aircraft.

Safety Recommendation ROMN-2015-053 (CIAS)

EASA should consider to establish some requirements for the air traffic service providers on the management of unintentional situations, such as possible infringements of the routes provided in the flight plan, of the minimum flight levels, of the minimum navigation requirements, and so on, determined by problems such as weather conditions, technical ones, determined by the aircraft performances and/or by other factors through which the air traffic controllers would require these crews confirmation on the flight rules they followed.

Reply No. 2 sent on 07/06/2016:

The Commission Implementing Regulation (EU) No 923/2012 (SERA) contains the requirements for the flight crews with regard to adherence to the flight plan (SERA.8020, Adherence to flight plan). In addition, the proposal for SERA Part-C, (EASA Opinion 04/2014) which is currently in the adoption process, further implicitly requires the flight crews to advise the Air Traffic Services (ATS) in case of failure, or degradation, of navigation, communications, altimetry, flight control or other systems, or if the aircraft performance is degraded below the level required for the airspace in which it is operating.

With regard to the requirements for the ATS providers and Air Traffic Controllers, the Agency has included the transposition of the provisions in PANS-ATM 8.7.1 regarding ATS surveillance services in the NPA for PART-ATS (RMT.0464). More specifically, they will address providing ATS surveillance in order to enhance safety, provide vectoring to assist pilots in their navigation, maintain flight path monitoring of air traffic and to receive information regarding any significant deviations by aircraft from the terms of their respective ATC clearances, including their cleared routes as well as levels, when appropriate. The expected publication date for the NPA is during the second quarter of 2016.

It has to be noted that SERA Part-C will also transpose the following provision (Change from IFR flight to VFR flight): “No invitation to change from IFR flight to VFR flight shall be made by ATS either directly or by inference.”

Status: Open – **Category**:

Safety Recommendation ROMN-2015-054 (CIAS)

EASA should consider the necessity to complete:

- the (EU) Regulation NO. 965/2012 of the Commission of 5 October 2012 for establishing the technical requirements and administrative procedures on air operations under Regulation (CE) no. 216/2008 of the European Parliament and Council, with an article providing clear references for MEP class, containing also restrictions for flight on a MEP class aircraft depending on the interruption from flight, and these restrictions should be generally applicable whether considering types, variants or aircraft,

and /or

- the provisions of EU Regulation no. 1178/2011 of the Commission of 3 November 2011 for establishing the technical requirements and administrative procedures concerning civil aviation flight crew under Regulation (CE) no. 216/2008 of the European Parliament and Council on pilots' licensing in MEP class, in the passage referring to license validity, by introducing some additional requirements on its validity for the situation in which a pilot accumulates a longer-time flight interruption than three months on one of the aircraft in the class.

So that in future to avoid such situations in which after accumulating a long-time flight interruption on an aircraft in the class to have the possibility to perform directly a commercial flight without previous additional training on that aircraft.

Reply No. 1 sent on 09/02/2016:

The existing EU regulatory framework provides the foundation to ensure that EU Commercial Air Transport operators mitigate the safety risks associated with operations with a mixed fleet of aeroplanes which are within the Multi-Engine Piston (MEP) class (see Commission Regulation (EU) No 1178/2011 for Flight Crew Licence (FCL) references and see Commission Regulation (EU) No 965/2012 for all other references).

A pilot shall only operate an aircraft if he/she has carried out, in the preceding 90 days, at least 3 take-offs and landings in an aircraft of the same class or a Full Flight Simulator representing that class [FCL.060 (b)].

In order to extend his/her privileges to another type/variant of aircraft within the MEP class rating, the pilot is required to undertake differences training [FCL.710 (a)]. According to FCL.710 (b), if the type/variant has not been flown within a period of 2 years, further differences training or a proficiency check is required before flying the different aircraft. This is the minimum requirement.

However, in addition to this minimum requirement, for an operator, ORO.FC.125 also applies. Flight crew members are required to complete differences training when changing equipment or procedures requiring additional knowledge on types/variants within a class currently operated [ORO.FC.125 (a)]. The operator is required to specify, in the operations manual, when such differences training is required [ORO.FC.125 (b)]. The differences training schedule should take into account the risks associated with the specific nature of the operation and the fleet used. This should address situations where pilots are required to operate a type/variant within a class after having routinely been operating another type/variant within the same class. The schedule should be documented in the operator's approved Operations Manual Part D (AMC3 ORO.MLR.100).

These risks should have also been identified and mitigated through effective implementation of the operator's Management System (ORO.GEN.200).

It should be noted that, according to ORO.FC.145 (c), the competent authority is required to approve all training and checking programmes.

All commercial operators and operators of complex motor-powered aircraft are required to conduct operations in accordance with their Operations Manual (OM), which must be compliant with the Aircraft Flight Manual (AFM) (see points 4.a and 8.b of Annex IV to Regulation (EC) No 216/2008). This shall take account of the differences between different aircraft within the MEP class.

In addition, the operator is required to establish a checklist system for each aircraft type to be used by crew members in all phases of flight under normal, abnormal and emergency conditions [Annex IV (1b) of Regulation (EC) No 216/2008, and CAT.GEN.MPA.105 (a)(8) and ORO.GEN.110 (h)]. The checklists/Operations Manual, which the flight crew should adhere to (Annex IV (1b) of Regulation (EC) No 216/2008), should also reflect limitations, such as, prohibiting flight in severe icing conditions, as prescribed in the Aircraft Flight Manual for the BN-2A 27. In addition, CAT.OP.MPA.255 of Commission Regulation (EU) No 965/2012 requires the operator to establish flight procedures for icing conditions.

Each flight crew member should anyway be periodically checked to demonstrate competence in carrying out normal, abnormal and emergency procedures [ORO.FC.130 (b)].

It is the operator's responsibility to ensure that all personnel assigned to flight operations are properly instructed and have demonstrated their abilities in their particular duties. Furthermore, the operator is required to establish procedures and instructions for the safe operation of each aircraft type [ORO.GEN.110 (e) and (f)].

Lastly, oversight of the operator by the competent authority should also detect any weaknesses in the operational control (ARO.GEN.300), for which the authority should require corrective action to be taken.

Implementation of the above-mentioned provisions shall provide suitable mitigation for the risks associated with operations with a mixed fleet within the MEP class.

Status: Closed – **Category**: Disagreement

Russian Federation

Registration	Aircraft Type	Location	Date of event	Event Type
VP-BYZ	ATR ATR72	Roschino (Tyumen) airport	02/04/2012	Accident

Synopsis of the event:

On 02.04.2012, at 01:35 UTC (07:35 local time), at day time, under VMC after the take-off from the Roschino (Tyumen) airport RWY 21, the ATR72-201 VP-BYZ aircraft, operated by JSC "UTAir Aviation" (further referred to as "UTAir") crashed while performing the scheduled passenger flight UTA120 from Tyumen to Surgut.

According to the load sheet the A/C TOW and centre of gravity were 18730 kg and 30.72 % MAC correspondingly and that was within the aircraft operation limits. On board there were 4 crew members (PIC, F/O and two flight attendants) and 39 passengers, all RF citizens.

After the landing gear and the flaps retraction the aircraft started descending with a significant left bank and then collided with terrain. The ground collision first led to the structural damage of left wing followed by the fuel spillage and fire, and further to the complete destruction of aircraft with the right wing, cockpit and rear section with empennage separation.

Out of the 43 persons on board, 4 crew members and 29 passengers were killed. Others received serious injuries.

Safety Recommendation RUSF-2013-002 (AIB)

IAC recommends EASA and other simulator certification authorities to consider the possibility to add into the simulator data-package the capability to simulate an unexpected or sudden aircraft stall at any stage of flight.

Reply No. 5 sent on 08/09/2016:

The Agency has published new provisions on flight crew Upset Prevention and Recovery Training (UPRT), with the specific objective to ensure that flight crew acquire and maintain the necessary competencies to prevent and recover from developing or developed upsets (see EASA Executive Director (ED) Decision 2015/012/R, published on the Agency's web site on 04 May 2015).

The material takes into account the International Civil Aviation Organization (ICAO) Annex 6 amendment 38, ICAO Doc 9868 'Procedures for Air Navigation Services - Training' (PANS-TRG) amendment 3 relating to UPRT, and ICAO Doc 10011 'Manual on Aeroplane UPRT'. Reference is also made to the Original Equipment Manufacturers' (OEMs') Aeroplane Upset Recovery Training Aid (AURTA).

In addition, the Agency has launched rulemaking tasks RMT.0581 and RMT.0582 'Loss of control prevention and recovery training'. The outcome is expected to affect the related Flight Simulator Training Device (FSTD) provisions under Commission Regulation (EU) No 1178/2011 on aircrew. The associated Notice of Proposed Amendment, NPA 2015-13, was published on 01 September 2015 and the next deliverable, an EASA Opinion, is expected to be published in the fourth quarter of 2016.

The FSTD aspects are currently being considered within the context of rulemaking task RMT.0196 'Update of flight simulation training devices requirements', which was launched on 15 July 2016 with the publication of the associated Terms of Reference. The next deliverable, a Notice of Proposed Amendment, is planned to be published in the first quarter of 2017.

Status: Open – **Category**:

Spain

Registration	Aircraft Type	Location	Date of event	Event Type
G-BYAG	BOEING 757	Girona Airport, Spain	14/09/1999	Accident

Synopsis of the event:

The aircraft made an approach and landing at Girona Airport, Spain, at night through heavy thunderstorms with rain. At a late stage of the approach the airfield lighting failed for a few seconds. The aircraft touched down hard simultaneously on the nose and main wheels and bounced. A second harder touchdown on the nosewheel displaced the nose landing gear and its support structure. Resultant aircraft systems damage caused the loss of virtually all electrical power, interference with controls and uncommanded forward thrust increase.

The aircraft ran off the side at high speed around 1,000 metres after the second touchdown. After crossing a number of obstacles it landed heavily in a field outside the airfield boundary and come to rest after having travelled almost 1,900 metres from the second touchdown. The fuselage had been fractured in two places and there was considerable disruption to the cabin. There was no fire. Evacuation of all the occupants, initiated by the cabin crew, was completed rapidly. Emergency services had difficulty in locating the aircraft in the adverse conditions and arrived on the scene after evacuation had been completed.

Safety Recommendation SPAN-2004-030 (CIAIAC)

It is recommended to EASA that they evaluate the possibility of making mandatory requirements to train flight crew in go-around manoeuvres even from below the decision height, with the aim of reducing the response time when faced with unforeseen events.

Reply No. 2 sent on 21/07/2016:

The Agency published, on 08 April 2014, Safety Information Bulletin SIB 2014-09 'Aeroplane Go-Around Training' to raise awareness on the risks associated with unexpected or poorly executed go-around manoeuvres and to encourage operators to specifically address these risks in their safety management systems. In the SIB, EASA recommends that training organisations and operators place more emphasis on conducting go-around manoeuvres, with all engines operating, in a flight simulator training device, during initial and recurrent training programmes.

In addition, the Agency has published, on 04 May 2015, Executive Director (ED) Decision 2015/012/R 'Upset Prevention and Recovery Training (UPRT)', containing new Acceptable Means of Compliance (AMC) and Guidance Material (GM) for operator conversion training and recurrent training under Annex III Part-ORO (Organisation Requirements for air Operations) of Commission Regulation (EU) No 965/2012. This includes go-around exercises from various altitudes, such as below Decision Height, during the approach.

Recurrent flight crew training to reduce response time when faced with unforeseen events should be achieved through implementation of Crew Resource Management (CRM) training by the operator. The related provisions are included in Commission Regulation (EU) No 965/2012 on air operations and the associated Acceptable Means of Compliance (AMC) and GM on organisation requirements.

Nevertheless, the Agency is currently evaluating the effectiveness of the existing initial and recurrent training provisions within the context of on-going rulemaking tasks (RMTs):

- RMT.0188 and RMT.0189 on Part-FCL (Flight Crew Licensing) includes a review of the training syllabi, in Commission Regulation (EU) No 1178/2011 on aircrew, on the risks associated with go-around. The associated Notice of Proposed Amendment, NPA 2014-29, was published on 17 December 2014 and the next deliverable, an EASA Opinion, is expected to be published in the fourth quarter of 2016.

For recurrent training, the Agency is taking steps to integrate evidence-based training principles into the EU regulations, as follows:

- EASA Executive Director (ED) Decision 2015/027/R on 'Implementation of EBT within the European regulatory framework' was published on 16 December 2015. Its objective was to determine the relevance of existing pilot training and to identify the most critical areas of pilot training according to aircraft generation. It contains new Guidance Material (GM) to support implementation, by operators, of EBT, conducted in Flight Simulation Training Devices, according to the principles established in International Civil Aviation Organization (ICAO) Doc 9995 'Manual of Evidence-based Training'.

- RMT.0599 'Evidence-based and competency-based training', which was launched on 05 February 2016, with the publication of the associated Terms of Reference, is reviewing the associated recurrent flight crew training in Part-ORO (Organisation Requirements for air Operations) of Commission Regulation (EU) No 965/2012 on air operations. Although RMT.0599 was primarily set up to integrate evidence-based training into the EU regulations, the scope has been extended to include evaluation of this safety recommendation, as the rulemaking group includes expertise which is appropriate for the evaluation. The NPA is expected to be published by mid-2019.

Status: Open – **Category**:

Registration	Aircraft Type	Location	Date of event	Event Type
EC-HFP	DOUGLAS DC9	Madrid-Barajas Airport	20/08/2008	Accident

Synopsis of the event:

On 20 August 2008 at 14:24 local time, a McDonnell Douglas DC-9-82 (MD-82) aircraft, registration EC-HFP, operated by Spanair, suffered an accident immediately after takeoff from Madrid-Barajas Airport, Madrid (Spain). The aircraft was destroyed as a result of impact with the ground and the subsequent fire. Of the aircraft's occupants, 154 were killed, including all six crew members, and 18 were seriously injured.

The investigation has determined that the accident occurred because:

The crew lost control of the airplane as a consequence of entering a stall immediately after takeoff due to an improper airplane configuration involving the non-deployment of the slats/flaps following a series of mistakes and omissions, along with the absence of the improper takeoff configuration warning.

The crew did not identified the stall warnings and did not correct said situation after takeoff. They momentarily retarded the engine throttles, increased the pitch angle and did correct the bank angle, leading to a deterioration of stall condition.

The crew did not detect the configuration error because they did not properly use the checklists, which contain items to select and verify the position of the slats/flaps when preparing the flight.

Specifically:

- They did not carry out the action to select the flaps/slats with the associated control lever (in the "After Start" checklist);
- They did not cross check the position of the lever or the status of the flaps and slats indicating lights when executing the "After Start" checklist;
- They omitted the check of the flaps/ slats when doing the "Takeoff Briefing" in the "Taxi" checklist;
- During the visual check performed as part of the "Final Items" in the "Takeoff Imminent" checklist, the actual position of the flaps/slats as shown on the cockpit instruments was not verified.

The CIAIAC has determined that the following factors contributed to the accident occurrence:

- The absence of takeoff configuration warning resulting from the failure of the TOWS to operate, which thus did not warn the crew that the airplane's takeofff configuration was not appropriate. The reason for the failure of the TOWS to function could not be reliably established.

- Improper crew resource management (CRM), which did not prevent deviation from procedures in the presence of unscheduled interruptions to flight preparations.

Safety Recommendation SPAN-2011-018 (CIAIAC)

It is recommended that the United States Federal Aviation Administration (FAA) and European Aviation Safety Agency (EASA) require takeoff stall recovery as part of initial and recurring training programs of airline transport pilots. (REC 18/11)

Reply No. 4 sent on 08/09/2016:

Annex I, Part-FCL (Flight Crew Licensing) of Commission Regulation (EU) No 1178/2011 on aircrew establishes the requirements for the issue of pilot licences and associated ratings and certificates and the conditions for their validity and use. Approach-to-stall and stall recovery training and checking is covered under these provisions.

Commission Regulation (EU) No 965/2012 on air operations contains provisions directed to the operator on recurrent flight crew training, including proficiency checks on normal, abnormal and emergency procedures. Although stall recovery is not explicitly referred to, it is covered under "automation" in the crew resource management training subjects.

The Agency published, on 04 May 2015, new provisions under the air operations regulation on flight crew Upset Prevention and Recovery Training (UPRT), with the specific objective to ensure that flight crew acquire and maintain the necessary competencies to prevent and recover from developing or developed upsets (see EASA Executive Director (ED) Decision 2015/012/R, which was developed through EASA rulemaking tasks RMT.0581 and RMT.0582 'Loss of control prevention and recovery training').

The material takes into account the International Civil Aviation Organization (ICAO) Annex 6 amendment 38, ICAO Doc 9868 'Procedures for Air Navigation Services - Training' (PANS-TRG) amendment 3 relating to UPRT, and ICAO Doc 10011 'Manual on Aeroplane UPRT'. Reference is also made to the Original Equipment Manufacturers' (OEMs') Aeroplane Upset Recovery Training Aid (AURTA).

Take-off stall recovery training is being further considered through ongoing RMT.0581 and RMT.0582 'Loss of control prevention and recovery training', including an evaluation of the existing relevant provisions in the aircrew regulation. The next deliverable, an EASA Opinion, is planned to be published in the fourth quarter of 2016.

Status: Open – **Category**:

Safety Recommendation SPAN-2011-020 (CIAIAC)

It is recommended that the European Aviation Safety Agency (EASA) establish requirements for flight simulators so as to allow simulator training to cover sustained takeoff stalls that reproduce situations that could exceed the flight envelope limits. [REC 20/11]

Reply No. 4 sent on 08/09/2016:

The Agency published, on 04 May 2015, new provisions under Commission Regulation (EU) No 965/2012 (air operations), on flight crew Upset Prevention and Recovery Training (UPRT), with the specific objective to ensure that flight crew acquire and maintain the necessary competencies to prevent and recover from developing or developed upsets (see EASA Executive Director (ED) Decision 2015/012/R, which was developed through EASA rulemaking tasks RMT.0581 and RMT.0582 'Loss of control prevention and recovery training').

The material takes into account the International Civil Aviation Organization (ICAO) Annex 6 amendment 38, ICAO Doc 9868 'Procedures for Air Navigation Services - Training' (PANS-TRG) amendment 3 relating to UPRT, and ICAO Doc 10011 'Manual on Aeroplane UPRT'. Reference is also made to the Original Equipment Manufacturers' (OEMs') Aeroplane Upset Recovery Training Aid (AURTA).

Take-off stall recovery training is being further considered through ongoing RMT.0581 and RMT.0582 'Loss of control prevention and recovery training', and the outcome is expected to have an impact on the aircrew regulation (Commission Regulation (EU) No 1178/2011) and the related flight simulator training devices provisions. The next deliverable, an EASA Opinion, is planned to be published in the fourth quarter of 2016.

The flight simulator aspects are currently being considered within the context of rulemaking task RMT.0196 'Update of flight simulation training devices requirements', which was launched on 15 July 2016 with the publication of the associated Terms of Reference. The next deliverable, a Notice of Proposed Amendment, is planned to be published in the first quarter of 2017.

Status: Open – **Category**:

Safety Recommendation SPAN-2011-021 (CIAIAC)

It is recommended that the European Aviation Safety Agency (EASA), in keeping with ICAO initiatives, introduce in its regulations the concept of critical phases of flight and define those activities considered acceptable during said phases. (REC 21/11)

Reply No. 3 sent on 08/09/2016:

The concept of critical phases of flights is embedded in Commission Regulation (EU) No 965/2012 on air operations and is defined under Annex I as follows:

'Critical phases of flight' in the case of aeroplanes means the take-off run, the take-off flight path, the final approach, the missed approach, the landing, including the landing roll, and any other phases of flight as determined by the pilot-in-command or commander.

In addition, according to CAT.GEN.MPA.105 (a)(9), the commander shall not permit any crew member to perform any activity during critical phases of flight, except duties required for the safe operation of the aircraft.

In addition, the Agency decided to launch rulemaking tasks RMT.0416 and RMT.0417 'Sterile flight deck procedures' to consider further mitigation for the risks associated with disturbance or distraction of the flight crew during phases of flight where the flight crew must be able to focus on their duties.

The outcome of these RMTs includes the following new definition for 'sterile flight crew compartment' under Annex 1 of the air operations regulation:

'Sterile flight crew compartment' means any period of time when the flight crew members are not disturbed or distracted, except for matters critical to the safe operation of the aircraft or the safety of the occupants.

The air operations regulation was also amended to address the safety issue, as follows:

- The operator shall establish procedures and instructions for the safe operation of each aircraft type, containing ground staff and crew member duties and responsibilities, for all types of operation on the ground and in flight. Those procedures and instructions shall not require crew members to perform any activities during critical phases of flight other than those required for the safe operation of the aircraft. Procedures and instructions for a sterile flight crew compartment shall also be included. [see ORO.GEN.110 (f)];
- The operator shall establish procedures for taxiing to ensure safe operation and to enhance runway safety (see CAT.GEN.MPA.124 on taxiing of aircraft).

The concept of critical phases of flight is therefore considered to be suitably mitigated through the existing air operations regulation, and the operator is responsible for applying suitable measures, tailored to their own operations, to ensure that the flight crew members are not disturbed or distracted, except for matters critical to the safe operation of the aircraft or the safety of the occupants.

Status: Closed – **Category**: Partial agreement

Safety Recommendation SPAN-2011-022 (CIAIAC)

It is recommended that the European Aviation Safety Agency (EASA) and national civil aviation authorities, when evaluating operator training programs, expressly ensure that:

- the concept of sterile cockpit is stressed,

- the importance of adhering to said concept is stressed, along with the consequences of even minor distractions, and

- examples of accidents are included in which non-compliance with regulations involving the sterile cockpit was a relevant factor. (REC 22/11)

Reply No. 4 sent on 08/09/2016:

The Agency decided to launch rulemaking tasks RMT.0416 and RMT.0417 'Sterile flight deck procedures' to consider the risks associated with disturbance or distraction of the flight crew during phases of flight where the flight crew must be able to focus on their duties.

The outcome of these RMTs includes the following new definition for 'sterile flight crew compartment' under Annex 1 of Commission Regulation (EU) No 965/2012 on air operations:

'Sterile flight crew compartment' means any period of time when the flight crew members are not disturbed or distracted, except for matters critical to the safe operation of the aircraft or the safety of the occupants.

The air operations regulation was also amended to address the safety issue, as follows:

- The operator shall establish procedures and instructions for the safe operation of each aircraft type, containing ground staff and crew member duties and responsibilities, for all types of operation on the ground and in flight. Those procedures and instructions shall not require crew members to perform any activities during critical phases of flight other than those required for the safe operation of the aircraft. Procedures and instructions for a sterile flight crew compartment shall also be included. [see ORO.GEN.110 (f)];

- The operator shall establish procedures for taxiing to ensure safe operation and to enhance runway safety (see CAT.GEN.MPA.124).

Prior to the issue of an approval, the competent authority shall verify that the operator's training programme complies with the applicable requirements. Continued compliance shall also be verified by the authority thereafter (ARO.GEN.300 (a)). With this regulatory mitigation, together with the mitigation provided by the operator's safety management system (ORO.GEN.200), the training should be continuously evaluated and improved where necessary.

Status: Closed – **Category**: Partial agreement

Safety Recommendation SPAN-2011-023 (CIAIAC)

It is recommended that the European Aviation Safety Agency (EASA) ensure that national authorities require commercial air transport operators to prohibit their crews from using portable personal electronic devices on the flight deck. (REC 23/11)

Reply No. 3 sent on 08/09/2016:

According to CAT.GEN.MPA.105 (a)(9) of Commission Regulation (EU) No 965/2012 on air operations, the commander shall not permit any crew member to perform any activity during critical phases of flight, except duties required for the safe operation of the aircraft. Critical phases of flight is defined under Annex I as follows:

'Critical phases of flight' in the case of aeroplanes means the take-off run, the take-off flight path, the final approach, the missed approach, the landing, including the landing roll, and any other phases of flight as determined by the pilot-in-command or commander.

The Agency decided to launch rulemaking tasks RMT.0416 and RMT.0417 'Sterile flight deck procedures' to consider the risks associated with disturbance or distraction of the flight crew during phases of flight where the flight crew must be able to focus on their duties.

The outcome of these RMTs includes the following new definition for 'sterile flight crew compartment' under Annex 1 of the air operations regulation:

'Sterile flight crew compartment' means any period of time when the flight crew members are not disturbed or distracted, except for matters critical to the safe operation of the aircraft or the safety of the occupants.

The air operations regulation was also amended to address the safety issue, as follows:

- The operator shall establish procedures and instructions for the safe operation of each aircraft type, containing ground staff and crew member duties and responsibilities, for all types of operation on the ground and in flight. Those procedures and instructions shall not require crew members to perform any activities during critical phases of flight other than those required for the safe operation of the aircraft. Procedures and instructions for a sterile flight crew compartment shall also be included. [see ORO.GEN.110 (f)];
- The operator shall establish procedures for taxiing to ensure safe operation and to enhance runway safety (see CAT.GEN.MPA.124).

Furthermore, according to CAT.GEN.MPA.140 and the associated acceptable means of compliance, the operator shall not permit any person to use a portable electronic device (PED) on board an aircraft that could adversely affect the performance of the aircraft's systems and equipment, and shall take all reasonable measures to prevent such use.

Status: Closed – **Category**: Agreement

Safety Recommendation SPAN-2011-024 (CIAIAC)

It is recommended that the European Aviation Safety Agency (EASA) develop guidance material for the preparation, evaluation and modification of checklists associated with normal, abnormal and emergency procedures that is based on the criteria that govern safety management systems. (REC 24/11)

Reply No. 3 sent on 08/09/2016:

According to ORO.GEN.110 (h) of Commission Regulation (EU) No 965/2012 on air operations, commercial air transport (CAT) operators shall establish a checklist system for each aircraft type to be used by crew members in all phases of flight under normal, abnormal and emergency conditions to ensure that the operating procedures in the operations manual are followed. The design and utilisation of checklists shall observe human factors principles and take into account the latest relevant documentation from the aircraft manufacturer.

The air operations regulation includes provisions on safety management systems and associated risk assessment and mitigation models (see ORO.GEN.200). Air operators are, therefore, required to ensure that the preparation, evaluation and modification of checklists associated with normal, abnormal and emergency procedures is based on the criteria that govern safety management systems. The safety model is further supported by the provisions on oversight by civil aviation authorities (see ARO.GEN.300).

In addition, EASA published, in April 2012, a research project report on 'principles and guidelines relative to the design of checklists and working methods in the cockpit' (EASA.2012/1).

The report provides a summary of the results of studies undertaken, as well as examples of instructions and directives issued by Civil Aviation Authorities (CAAs), which include guidelines for the design of checklists and working methods in the cockpit for fixed-wing and helicopters. The report provides aircraft manufacturers, CAAs and operators with references to state of the art design principles for checklists and guidance on effective application of checklists.

Status: Closed – **Category**: Partial agreement

Safety Recommendation SPAN-2011-025 (CIAIAC)

It is recommended that the European Aviation Safety Agency (EASA) clarify whether or not checklists are subject to the acceptance of national authorities and, if so, that it draft instructions so that said authorities apply uniform criteria and methodologies, such as methods for assessing the systems and procedures in use at the operators for managing checklists and quality assurance systems in general. (REC 25/11)

Reply No. 3 sent on 08/09/2016:

According to ORO.GEN.110 (h) of Commission Regulation (EU) No 965/2012 on air operations, commercial air transport (CAT) operators shall establish a checklist system for each aircraft type, to be used by crew members in all phases of flight under normal, abnormal and emergency conditions, to ensure that the operating procedures in the operations manual are followed. The design and utilisation of checklists shall observe human factors principles and take into account the latest relevant documentation from the aircraft manufacturer.

Acceptable Means of Compliance (AMC) containing the table of contents for the CAT operators' operations manual includes, in Part-B of the operations manual, checklists for normal, abnormal and emergency procedures (see AMC3 ORO.MLR.100).

The operations manual shall be submitted to the competent authority when the operator applies for an Air Operator Certificate (AOC) [see ORO.AOC.100 (b) (6)].

In addition, the operator shall submit a procedure to the authority describing how changes not requiring prior approval will be managed by the operator and notified to the competent authority [see ORO.GEN.115 (b)]. Changes to checklists shall be included in this procedure, since checklists are not required to have a prior approval. The procedure shall be subject to approval by the authority [see ARO.GEN.310 (c)].

Furthermore, ARO.GEN.300/305 on oversight responsibilities of the authority, provides the basis for authorities to apply the appropriate frequency and in-depth checking of operators, their management system (see ORO.GEN.200) and procedures. Checklists, as documented in the operator's operations manual, shall be included in the scope of this oversight.

In addition, EASA published, in April 2012, a research project report on 'principles and guidelines relative to the design of checklists and working methods in the cockpit' (EASA.2012/1).

The report provides a summary of the results of studies undertaken, as well as examples of instructions and directives issued by Civil Aviation Authorities (CAAs), which include guidelines for the design of checklists and working methods in the cockpit for fixed-wing and helicopters. The report provides aircraft manufacturers, CAAs and operators with references to state of the art design principles for checklists and guidance on effective application of checklists.

Status: Closed – **Category**: Partial agreement

Safety Recommendation SPAN-2011-026 (CIAIAC)

It is recommended that the European Aviation Safety Agency (EASA) perform investigations or studies intended to know the status of application of the real effectiveness of the current UE requirements applicable to Crew Resources Management (CRM). The results of these studies should permit to identify on how to strengthen them. (REC 26/11)

Reply No. 4 sent on 08/09/2016:

This safety recommendation was considered within the framework of EASA rulemaking task RMT.0411 'Crew resource management (CRM) training', which concluded on 28 September 2015 with the publication of EASA Executive Director (ED) Decision 2015/022/R related to Part-ARO (Authority Requirements for Air Operations) and Part-ORO (Organisation Requirements for Air Operations) of Commission Regulation (EU) No 965/2012 on air operations.

This ED Decision introduced new or enhanced provisions on CRM training, for example on; qualification and training of inspectors of competent authorities for the oversight of operator's CRM training; CRM training environment and CRM instructors; computer-based CRM training; competency-based CRM training; resilience development; surprise and startle effect.

The air operations regulation also includes provisions on safety management systems and associated risk assessment and mitigation models (see ORO.GEN.200). Air operators are required to ensure that the effectiveness of their CRM procedures and training is routinely measured and improved, where appropriate, through implementation of their safety management system. The safety model is further supported by the provisions on oversight by civil aviation authorities (see ARO.GEN.300).

Status: Closed – **Category**: Agreement

Safety Recommendation SPAN-2011-027 (CIAIAC)

It is recommended that the European Aviation Safety Agency (EASA) standardize the CRM training that must be provided to the operations inspectors of national authorities, and define the criteria that must be met by said inspectors in order to exercise their duties as inspectors in the area of CRM. (REC 27/11)

Reply No. 4 sent on 08/09/2016:

The Agency has reviewed the implementation and effectiveness of the EU requirements for Crew Resource Management (CRM) within the framework of rulemaking task RMT.0411 'Crew resource management (CRM) training'. Any weaknesses identified have been addressed through EASA Executive Director (ED) Decision 2015/022/R which was published on 28 September 2015. This Decision is related to Part-ARO (Authority Requirements for Air Operations) and Part-ORO (Organisation Requirements for Air Operations) of Commission Regulation (EU) No 965/2012 on air operations.

Although oversight of the operators' CRM training by competent authorities, was considered by the Agency to be already adequately regulated by ARO.GEN.300 and the associated Acceptable Means of Compliance (AMC) and Guidance Material (GM), the ED Decision includes, as an additional measure, a checklist for CRM training oversight [see GM3 ARO.GEN.300(a);(b);(c)].

The Agency recognises that, in order to fulfil the required CRM monitoring tasks, the competent authority needs to have qualified and well-trained personnel. Consequently, the Agency has introduced AMC3 ARO.GEN.200 (a)(2) on qualification and training for competent authority inspectors in the area of CRM.

Status: Closed – **Category**: Agreement

Registration	Aircraft Type	Location	Date of event	Event Type
EC-HPX	SUKHOI SU29	Ocana Airport, Toledo	05/03/2001	Serious incident

Synopsis of the event:

On 5 March 2001, a Sukhoi aircraft on a local flight over the Ocana Aerodrome (Toledo) suffered a jammed rudder, which forced the pilot to land using the other control surfaces.

The aircraft had taken off a few minutes earlier from runway 11 at the aerodrome to conduct tests as part of the approval process for certifying the aircraft in Spain.

Over the course of the flight and after some manoeuvres, the pilot noticed that the rudder control was jammed to the right. He reported this on the radio, and it was suggested to him that he parachute from the aircraft. The pilot was able to compensate for the lack of rudder by banking to the left. He made an approach to runway 11 and managed to land. During the landing run, without steering control, the aircraft departed the runway and came to a stop in a grassy area next to the runway.

Once the aircraft stopped, the rudder was unjammed and, there being no apparent damage, the aircraft was taxied to the stand without external assistance. The pilot was unharmed.

Safety Recommendation SPAN-2015-006 (CIAIAC)

It is recommended that EASA ensure that the flight control systems on Sukhoi 29 be designed such that neither the occupants nor objects in the cockpit can cause jamming, chafing or interference in said systems, or if they do, that the pertinent corrective actions be established.

Reply No. 1 sent on 15/03/2016:

The Sukhoi 29 is a Russian type and has been granted a Type Certificate ("CT 60-29" dated 5th May 1994) by IAC AR (Russian National Authority). The Russian Federation is the "State of Design". Sukhoi is the Type Certificate Holder. The Sukhoi 29 is not type certificated in Europe. A limited number of aeroplanes (less than 15) are flying in Europe under Specific Airworthiness Specifications (SAS) EASA.SAS.A.093.

IAC-AR being the Primary Airworthiness Authority for the Sukhoi 29 aircraft type, EASA has informed them of this event and of this safety recommendation.

Furthermore, with respect to the aeroplanes flying in Europe under SAS, EASA has requested to IAC AR and Sukhoi their position on the issue and is investigating with the European aeroplane owners their related service experience.

Status: Open – **Category**:

Sweden

Registration	Aircraft Type	Location	Date of event	Event Type
LN-KKD	BOEING 737	Arlanda airport, Stockholm County	20/12/2009	Incident

Synopsis of the event:

The flight was a regular flight with passengers from Stockholm/Arlanda airport to Nice in France. The airplane was equipped with 148 seats and had 145 passengers on board.

During the preparations for engine start on the apron the electrical power from the airplane's APU-generator ceased, and resulted in that the main lighting in the cabin extinguished and the cabin internal communication- and advertisement system stopped to function.

The pilots continued with the preparations for flight and during start of the right engine short fire flames from engine's exhaust appeared. A small pool of fuel on the ground behind the engine also caught fire, but soon extinct spontaneously.

Some of the passengers observed the fire flames and called "it is on fire". This led to that a number of passengers left their seats and moved forward toward the exits. The cabin crew in the forward part of the cabin could not properly assess the situation, since the passengers prevented both view and passage backward, but concluded that there was a safety risk. An emergency evacuation was therefore initiated by the cabin crew in the forward part of the cabin. The cabin crew member in the rear part of the cabin observed that both the flames from the engine and the fire on the ground soon ceased, considered that there was no further risk for fire. Because of the electrical power loss, there was however no possibility by normal procedures to communicate with the other crew members. The airplane was evacuated through the front doors.

No person was injured in the emergency evacuation. The serious incident to personal injury at the unexpected evacuation of the aircraft was caused by that the cabin attendants were unable to control or prevent the course of events in the cabin, when spontaneous calls about "fire" had started a reaction among the passengers.

Safety Recommendation SWED-2011-011 (SHK)

The European Aviation Safety Agency is recommended to consider the need for expanded information and checking of understanding emergency evacuation procedures, of passengers who are expected to act in emergency evacuation of aircraft. (RL 2010:10 R2)

Reply No. 4 sent on 15/03/2016:

Commission Regulation (EU) No 965/2012 on air operations and Commission Implementing Regulation (EU) No 628/2013 on standardisation inspections include the concept of safety management systems and associated risk assessment and mitigation models. The regulations provide a foundation for safety through provisions on operator responsibilities, oversight by civil aviation authorities and standardisation inspections by EASA.

Nevertheless, this safety recommendation is currently being considered within the framework of Rulemaking Tasks RMT.0516 and RMT.0517 'Update of the rules on air operations'. The applicable Notice of Proposed Amendment NPA 2015-18, sub-NPA (C)' Draft Implementing Rule and Draft Acceptable Means of Compliance/Guidance Material on passenger seating and briefing' was published on 27 November 2015. The next deliverable, an EASA Opinion, is expected to be published in the Autumn 2016.

Status: Open – **Category**:

Registration	Aircraft Type	Location	Date of event	Event Type
EI-DAD	BOEING 737	Skavsta Airport, Södermanland county	25/04/2011	Serious incident

Synopsis of the event:

On 29 April 2011, shortly after take-off, a Ryanair Boeing 737-800 received an indication that one of the aircraft's two electrical systems had lost electrical power. This had been preceded by one of the two generators that supply electrical power to the aircraft being disconnected, upon which a redistribution took place so that the other generator supplied power to both electrical systems. An electronic monitoring and control unit automatically ensured that this took place. The pilots followed the checklist and attempted to reconnect the generator. They also attempted to connect the generator from the Auxiliary Power Unit (APU). Either during the attempt to reconnect the disconnected generator or the connection of the auxiliary power unit's generator, the connection between the two systems was broken, with the consequence that one of the systems lost electrical power. The pilots made a further attempt to reconnect a power source but were un-successful. The decision was therefore made to return and land at Skavsta Airport. Flying with one of the electrical systems not having power meant losing the display of flight instruments on the affected side. Flap indication and pitot heating were among the systems which stopped working during the incident. The electronic monitoring and control units are intended to ensure that both electrical systems are always supplied with power as long as there is at least one power source available. They are also intended to prevent electrical interconnection of the electrical systems as these each have their own power source. The control units' commands are based on status signals from relays, among other things. The incident was caused by the system logic for the Generator Control Unit (GCU) and the Bus Power Control Unit (BPCU) enabling erroneous status signals from the contactor (Generator Control Breaker, GCB) to lead to a transfer bus losing power. A contributing factor was that contactors in certain affected units had no inspection interval.

Safety Recommendation SWED-2012-001 (SHK)

The FAA/EASA are recommended to ensure that Boeing introduces measures so that the logic in the electrical system prevents an X-bus from losing power as a result of an erroneous status signal from GCB. (RL 2012:20 R1)

Reply No. 3 sent on 15/03/2016:

The Agency, in accordance with the FAA, confirms the satisfactory accomplishment of the tests made by the manufacturer on the electrical system of the aircraft.

The testing results showed that erroneous GCB status signal to the Generator Control Unit (GCU) does not cause a loss of electrical power to the right transfer bus, and that the loss of power during the subject event was due to damaged GCU wires.

For the above mentioned reasons it was concluded that no logic changes are needed.

Status: Closed – **Category**: Partial agreement

Safety Recommendation SWED-2012-002 (SHK)

The FAA/EASA are recommended to ensure that Boeing investigates whether a revision of the procedure in QRH for reconnecting IDG can rectify erroneous status signals from GCB. (RL 2012:20 R2)

Reply No. 3 sent on 15/03/2016:

The Agency, in agreement with the FAA, confirms that the procedure for addressing the loss of electrical power contained in the QRH (Quick Reference Handbook) of the aircraft has been tested by the manufacturer to be appropriate to address the loss of a transfer bus. It is then considered that the subject Safety Recommendation has been successfully completed.

Status: Closed – **Category**: Agreement

Registration	Aircraft Type	Location	Date of event	Event Type
EP-IBB	AIRBUS A300	Stockholm/Arlanda Airport	16/01/2010	Incident

Synopsis of the event:

Operational

The incident occurred in connection with a commercial air transport with the airline Iran Air. The aircraft in question, an Airbus A300-600 with the registration EP-IBB, was to commence a flight from Stockholm/Arlanda Airport to Tehran in Iran. Following normal preparations, the aircraft was taxied out to runway 19R for take-off.

The runway conditions were reported as good, with some patches of ice along the runway. The investigation has however revealed that the runway was contaminated and likely had coefficients of friction which fell short of the reported values.

After taxiing out, the crew began routine take-off procedures by increasing engine thrust during acceleration on the runway. After just over 10 seconds, one or more of the edges in a repaired section of the engine – the diffuser aft air seal – separated, thereby triggering a sequence which led to a sudden engine failure.

No warning messages were announced in the cockpit at the time of the failure; the pilots only noticed the engine failure through a muffled bang at the same time as the aircraft began to veer to the left. The initial veer, immediately after the engine seizure, was a result of the nose wheel being unable to gain sufficient force against the contaminated surface to counteract the moment which arose when the right engine – for a duration of approximately 1.5 seconds – supplied full thrust at the same time as the left engine rapidly lost thrust. The highest speed registered during the sequence was 59 knots (110 km/h).

Despite the co-pilot's reactions – retarding the thrust levers after just over a second, at the same time as steering and opposite rudder were applied – the veer could not be corrected and the aircraft ran off the runway, mainly caused by the forces from the moment in combination with the slippery surface. The chances of stopping the continued veer were probably reduced by the fact that the pilots did not apply any differential braking in the opposite direction.

The investigation also showed that the pilots' braking was unintentionally asymmetrical, with a higher brake pressure on the "wrong side", i.e., in the direction in which the aircraft ran off the runway. Even if this fact may have affected the aircraft's movement pattern, such an impact has, however, not been possible to determine with any reasonable degree of certainty. It is, nevertheless, noteworthy that analyzed data from the FDR show that the recorded brake angles (asymmetric braking) were not accompanied or followed by any corresponding change in the rate of heading change.

There are no specific certification requirements for aircraft design organization to show that the aircraft is manoeuvrable in the event of a sudden loss of engine thrust during the initial stage of the take-off sequence. There are also no mandatory requirements for training regarding how to handle sudden losses of engine thrust during the initial stage of the take-off sequence for pilots in training or recurrent training for this class of aircraft.

Technical

Following the event, the engine was sent for examination to Lufthansa Technik (LHT) in Hamburg on behalf of SHK. Following a completed damage analysis, LHT provided a report on the examination. In addition to an analysis of the sequence and the damage, the report also contained an opinion on the probable cause of the engine failure.

According to LHT, it is likely that the diffuser aft air seal had come loose due to micro cracks in the nine attachment lugs that hold the seal against the diffuser.

Neither General Electric Aircraft Engines (GE) nor SHK were in agreement with the LHT's assessment of the recovered hardware for which reason the decision was made for further analysis of the recovered parts of the failed engine at the Volvo Aero Corporation metallurgical labs.

The analysis carried out by Volvo Aero Corporation indicated that the engine failure that occurred – and which was the primary reason for the incident – had probably been caused by fatigue damage in a different part of the diffuser aft air seal.

The engine failure started once the aft air seal separated from the diffuser assembly. Seal fragments began increasing the amount of debris when seal material fractured a six bolt section of the stage 1 HPT1 blade retainer, liberating pieces of bolt threads, nuts and retainer material. This debris quickly got into the engine gaspath resulting in downstream damage from the HPT Rotor aft causing an engine stall.

The engine stall is clearly visible in the films taken by onlookers from the station building. As the liberated debris travelled aft down the engine's gaspath, low pressure turbine blades were being broken / separated. With

the amount of LPT blade damage, fan speed (N1) began to decrease since the LPT didn't have enough blade airfoils to drive the fan.

The overall assessment of the investigation results suggests that the fatigue had started in the repaired seam at the diffuser aft air seal teeth. All documented cases of CF6-80C2 diffuser aft air seal failures have been seals that had been previously repaired.

The incident that occurred was caused by the following factors:

Operational

- Deficiencies in the certification process for large aircraft with wing-mounted engines with regard to requirements for yaw stability in the event of sudden loss of engine power in the speed range below V_{MCG}.
- Deficiencies in pilot training with regard to training for sudden losses of engine thrust in the speed range below V_{MCG}.

Technical

- Deficiencies in the approval and follow-up of the Dabbler TIG Weld repair on the engine's diffuser aft air seal.

Safety Recommendation SWED-2012-006 (SHK)

EASA is recommended to ensure that initial and recurrent pilot training includes mandatory rejected takeoff exercises that cover events of a sudden loss of engine thrust below VMCG. (RL 2012: 21 R6).

Reply No. 3 sent on 21/07/2016:

The Agency is currently evaluating the effectiveness of the existing initial and recurrent training provisions within the context of on-going rulemaking tasks (RMTs):

- RMT.0188 and RMT.0189 on Part-FCL (Flight Crew Licensing) includes a review of Appendix 9 of Commission Regulation (EU) No 1178/2011 on aircrew, which covers rejected take-off exercises for initial flight crew training. The associated Notice of Proposed Amendment, NPA 2014-29, was published on 17 December 2014 and the next deliverable, an EASA Opinion, is expected to be published in the fourth quarter of 2016.

For recurrent training, the Agency is taking steps to integrate evidence-based training principles into the EU regulations, as follows:

- EASA Executive Director (ED) Decision 2015/027/R on 'Implementation of EBT within the European regulatory framework' was published on 16 December 2015. Its objective was to determine the relevance of existing pilot training and to identify the most critical areas of pilot training according to aircraft generation. It contains new Guidance Material (GM) to support implementation, by operators, of EBT, conducted in Flight Simulation Training Devices, according to the principles established in International Civil Aviation Organization (ICAO) Doc 9995 'Manual of Evidence-based Training'.
- RMT.0599 'Evidence-based and competency-based training', which was launched on 05 February 2016, with the publication of the associated Terms of Reference, is reviewing the associated recurrent flight crew training in Part-ORO (Organisation Requirements for air Operations) of Commission Regulation (EU) No 965/2012 on air operations. The NPA is expected to be published by mid-2017.

Status: Open – **Category**:

Registration	Aircraft Type	Location	Date of event	Event Type
ES-PJR	BAE JETSTREAM3100	Sveg Airport	03/05/2013	Incident

Synopsis of the event:

The aircraft departed from Sveg airport for a scheduled flight to Stockholm/Arlanda airport. Shortly after take-off, at an altitude of about 500 feet, engine problems occurred on both engines with substantial fluctuations in power (torque) and engine speed (RPM). The commander stated that during the time that the disturbances lasted it was hard to keep the aircraft flying and that an emergency landing in the terrain could be necessary. The disturbances ceased however after about a minute and the aircraft could return to Sveg airport and perform a normal landing.

After the incident the airplane's FDR (flight data recorder) and CVR (cockpit voice recorder) was cared for by the SHK. The recorded parameters from the FDR however showed unrealistic values depending on the fact that the operator did not have the required documentation to convert the recorded values into useful units. The cockpit voice recorder had not been shut down after the incident which meant that the records in connection with the incident had been recorded over.

SHK carried out a correction and analysis of recorded data from the flight data recorder. Together with a sound analysis from a private film taken at the time, it was found that the take-off was most likely performed with a too low RPM. The dialogue with the airplane manufacturer revealed that it was a previously known problem that a start with a too low RPM in some cases could cause engine problems. There has previously been a serious accident in which a too low RPM setting was found to be the root cause.

The operational documentation of the operator did not contain a requisite level of information on potential risks when starting with too low RPM. The aircraft type has no warning system to identify a faulty engine configuration and the checklist does not contain a "memory item" procedure for immediate action by the crew.

At the examination carried out in connection with the incident, technical deficiencies were also found. Corrosion damage and temporary repairs in some of the aircraft systems were noted at the technical investigation. Furthermore, it was found that there where technical remarks that had not been entered in the aircraft logbook.

The incident was likely caused by a too low RPM during take-off. A contributing factor was that the aircraft type has no warning system for take-off with an incorrect engine configuration.

Safety Recommendation SWED-2014-002 (SHK)

EASA is recommended to investigate the conditions for installation of a warning system on the aircraft type in question which notifies the pilots of an incorrect engine configuration in connection with take-off. (RL 2014:07 R1)

Reply No. 2 sent on 09/02/2016:

The certification of the Jetstream 3100 and 3200 type design is based on the British Civil Airworthiness Requirements, which does not require a take-off warning system that notifies pilots of an incorrect engine configuration. Furthermore, such a requirement is not included in the current EASA certification requirements (CS 23) for this class of small transport aircraft.

According to BAe Systems records and the occurrences history of the Jetstream 3100 and 3200 aircraft fleet, the Agency and BAe Systems have determined that no unsafe condition exists that would warrant a mandatory design change.

EASA has investigated with BAE the feasibility of such installation but the absence of unsafe condition does not justify a mandatory action; it can only be considered as a design improvement.

Status: Closed – **Category**: Partial agreement

Safety Recommendation SWED-2014-003 (SHK)

EASA is recommended to endeavour to revise the emergency checklist for this aircraft type so that measures in the event of engine oscillations in connection with take-off are changed so as to be included as "memory items". (RL 2014:07 R2)

Reply No. 2 sent on 15/03/2016:

British Aerospace (BAe) Systems has revised the emergency checklist to make the existing checklist card (Erratic Engine Torque/EGT/RPM Indications), a memory item. This has been approved under the privileges of the Design Organisation Approval (DOA) of BAe Systems, with approval MOM-3-HP4.16, and provided to the fleet.

After having reviewed, together with BAe Systems, the records and the occurrences history of the Jetstream 3100 and 3200 aircraft fleet, the Agency has determined that the action is adequate.

Status: Closed – **Category**: Agreement

Safety Recommendation SWED-2014-004 (SHK)

EASA is recommended to take measures to ensure that initial and recurrent training on this aircraft type are supplemented with information and training regarding the risks of incorrect engine configurations during take-off. (RL 2014:07 R3)

Reply No. 2 sent on 27/04/2016:

EASA has investigated with the Type Certificate Holder British Aerospace (BAe) Systems the need to revise the training material. BAe have informed that they are no longer producing training material for this type. Since this aeroplane type is no longer in production since 1993, BAe Systems has no obligation to produce training material (as Operational Suitability Data (OSD) / Flight Crew Data (FCD)), as required by regulation 21.A.15(d) of Annex 1 to Regulation (EU) 748/2012, unless this is warranted by an unsafe condition.

Bae Systems has revised the memory item list in the Pilot Operating Handbook addressing the case of incorrect engine configuration during take-off (ref. MOM-3-HP4.16).

The Agency, together with BAe Systems, conducted a review of the occurrences history of the Jetstream 3100 and 3200 aircraft fleet. The Agency has determined that such revision mitigates the risk of incorrect engine configurations and no unsafe condition justifies a mandatory amendment of the training material.

The operators have already been informed of the change to the memory list and they can voluntarily decide to update the training accordingly.

Status: Closed – **Category**: Agreement

Registration	Aircraft Type	Location	Date of event	Event Type
SE-GIC	PIPER PA34	Malmö/Sturup Airport, ESMS	27/06/2015	Accident

Synopsis of the event:

An airplane of model Piper PA 34 took off from Malmö/Sturup airport for a training flight. On board were an instructor, a student pilot and an observer. The intention was to carry out a check flight before the student's skill test, where – among other items – engine failure should be trained. Just after lift off the instructor retarded the throttle to the left engine. The student levelled off at about 100-150 feet, but hesitated on further actions. After the instructor repeatedly had called out "speed", he reduced the power even on the right engine and instructed the student to land.

In this position, however, airspeed and height was insufficient for a controlled flare and landing which resulted in the aircraft struck hard onto the runway and was substantially damaged. Of those on board - who themselves could leave the aircraft wreckage - two got back injuries of varying degrees. The instructor had planned to carry out the simulated engine failure during take-off with the intention that the student himself would retard power on the second engine and land straight ahead, so-called "Decision" procedure. The exercise had not been communicated to the student before the flight. No cameras at the airport were directed against the runway system, and the sequence of events in the report is based solely on witness interviews.

The Swedish Transport Agency had approved the current training organization and exerted continuous supervision of the operations. Rules for flight training are based on common regulations issued by the European Aviation Safety Agency (EASA). The practical execution of flight lessons, with associated risk assessment, is not assessed during supervision but is assumed to be managed by the school's quality system.

The Transport Agency, at standardization meetings with their authorized examiners, have discussed a minimum altitude of 300 feet for simulation of engine failure during skill tests in aircraft. This information had not reached the training organization in question, and reportedly neither to all examiners. There is no guidance material (Guidance Material - GM) regarding the practical execution of flight training issued by EASA.

The accident was caused by the following factors:

- Emergency exercise with a high risk factor,
- Inadequate planning of the flight training session regarding options for the handling of hazardous situations,

- Absence of guidance material from regulatory authorities regarding the practical execution of certain exercises in flight training.

Safety Recommendation SWED-2016-003 (SHK)

EASA is recommended to identify exercises in flight training that might entail an increased risk factor and to issue Guidance Material (GM) for the practical execution of these. (RL 2016:05 R1)

Reply No. 1 sent on 24/11/2016:

EASA has made a comprehensive review of all accidents and serious incidents since the year 2000 related to flight instruction or examination on aircrafts with a maximum take-off weight below 5.7t. This review highlighted more specifically the higher risk related to stall and upset training exercises as well as the in-flight simulation of an engine-out situation.

However, the issuance of one-size-fits-all guidance material is not appropriate as the risks areas vary depending on the type of activity. Each organisation has to define their own procedures tailored to mitigate the risks associated with their specific fleet and operations. The Agency cannot offer the proper level of granularity and substitute for the requirement for an Approved Training organisation (ATO) to implement a hazard identification and risk mitigation process (ORA.GEN.200 Management System).

Therefore, whilst it is acknowledged that prescriptive limitations without safety assurance have limited effect, awareness and safety promotion are key vectors to help ATOs in their Safety Risk Management. EASA used the opportunity of the aircrew standardisation meeting with the competent authorities that took place on 12.10.2016 to present this accident investigation as a case study. The outcome of the review made was shared with competent authorities of EASA Member States to support them in the frame of their oversight responsibilities. EASA shared best practices for approval of a training syllabus i.e. compliance with the regulations; checking the required hours; analysing the course structure and linking the specific training to the aircraft used.

Status: Closed – **Category**: Partial agreement

Safety Recommendation SWED-2016-004 (SHK)

EASA is recommended to investigate the conditions for the installation of operational CCTV cameras for investigative purposes at European commercial airports that are covered by EASA's regulations under Regulation (EC) 216/2008. (RL 2016:05 R2)

Reply No. 1 sent on 24/11/2016:

EASA will assess the feasibility and the conditions related to the installation of CCTV systems for investigative purposes at the aerodromes falling within the scope of Regulation (EC) No. 216/2008.

Status: Open – **Category**:

Switzerland

Registration	Aircraft Type	Location	Date of event	Event Type
9A-CQC	DE HAVILLAND DHC8	Zurich Airport	27/09/2013	Accident

Synopsis of the event:

On 27 September 2013, a scheduled flight with flight plan call sign CTN 464 from Zagreb (Croatia) to Zurich (Switzerland) was conducted using the Bombardier DHC-8-402 aircraft, registration 9A-CQC. On board were two pilots, two cabin crew members and 60 passengers. After an uneventful flight, the aircraft was established on the localiser and the glide path for an instrument approach on runway 14. The pilots extended the landing gear at a distance of approximately six nautical miles from the runway threshold. Although the main landing gear could be completely extended, it was not possible to extend the nose landing gear.

The flight crew aborted the approach and air traffic control offered the crew entry into a holding pattern to troubleshoot the fault. It was not possible to extend the nose landing gear any further using the non-normal/emergency checklist in the aircraft's quick reference handbook (QRH) or according to the guidelines published in a flight operation service letter from the aircraft manufacturer to the aircraft operator. The flight crew then decided on a landing with the main landing gear extended and the nose landing gear retracted. After the passenger cabin was prepared for an emergency landing and air traffic control had been informed of the situation, a second approach was performed.

The aircraft touched down just before 18:18 UTC on runway 14 at Zurich airport and came to a standstill 540 metres after the nose of the aircraft had made contact with the runway surface.

The airport fire brigade was ready to intervene. Fire did not break out. All passengers and crew were able to disembark the aircraft via the front left cabin door. No passengers or crew members were injured. The aircraft was damaged.

Safety Recommendation SWTZ-2013-476 (AAIB)

The Swiss Accident Investigation Board (SAIB) recommends that Transport Canada and the European Aviation Safety Agency, together with the aircraft and the landing gear manufacturers, should take appropriate measures in order to facilitate early detection of damaged weight on wheel cover plates on nose landing gears in levered suspension configuration.

Reply No. 2 sent on 16/03/2016:

Appropriate measures have been taken by the aircraft manufacturer, Bombardier Aerospace (BA), by issuing recommended Fluorescent Penetrant Inspections (FPI) of the cover plates (RD 8/4-32-0217, issue 2) and by issuing a Service Letter to recommend visual inspections of the cover plates prior to flight (DH8-400-SL-32-0.37, Rev. A).

BA has provided Transport Canada (TCCA) with the risk assessment covering the Nose Landing Gear (NLG) Weight on Wheel (WOW) Sensor Cover failure. TCCA has reviewed the risk assessment and concurs with the risk level for the failure of the NLG WOW cover plate being low. As a result, TCCA does not plan to issue an Airworthiness Directive.

EASA agrees with the TCCA conclusion.

Status: Closed – **Category**: Agreement

Safety Recommendation SWTZ-2013-477 (AAIB)

The Swiss Accident Investigation Board (SAIB) recommends that Transport Canada and the European Aviation Safety Agency, together with the aircraft and the landing gear manufacturers, should assess the risks involved with the installation of weight on wheel cover plates on nose landing gears in levered suspension configuration and take appropriate preventive measures.

Reply No. 2 sent on 15/03/2016:

Bombardier Aerospace (BA), the aircraft manufacturer, conducted a review of the Weight on Wheels (WOW) sensor cover plate installation on the Nose Landing Gear (NLG) of the DHC-8 series aircraft. The results of the review shows that the risk level for the failure of the NLG WOW cover plate is low. As a result, TCCA does not plan to issue an Airworthiness Directive.

EASA agrees with Transport Canada (TCCA) conclusion.

Status: Closed – **Category**: Agreement

Registration	Aircraft Type	Location	Date of event	Event Type
1) HB-3373 2)HB-DFP	1) SCHEMPP HIRTH 2) VENTUS2BMOONEY M20J	Approx. 8 km WSW of Airfield Birrfeld (LSZF)	06/06/2013	Accident

Synopsis of the event:

Flugverlauf

Der Pilot der HB-3373 startete um 11:55 Uhr im Birrfeld und beabsichtigte, einen Segelflug entlang des Juras in Richtung Neuenburger See auszuführen. Beim Flug der HB-DFP von Lommis nach Ecuvillens handelte es sich um einen Einführungsflug zwecks Kennenlernen der verschiedenen Systeme und des Autopiloten. Im Raum Villigen leitete die Besatzung der HB-DFP um 12:16 Uhr einen Steigflug mit eingeschaltetem Autopiloten ein. In der

Region Linn steuerte die Besatzung der HB-DFP in Richtung Süden, mit der Absicht, den Regionalflugplatz Birrfeld zu umfliegen.Nachdem der Pilot mit der HB-3373 über dem Chestenberg eine Höhe von etwa 1450 m/M erreicht hatte, folgte er um 12:17 Uhr zwei anderen Segelflugzeugen in westlicher Richtung zur Gisliflue.

Ab diesem Zeitpunkt befanden sich beide Flugzeuge auf einem Kollisionskurs und die HB-3373 war für die Besatzung der HB-DFP bis mindestens 5 Sekunden vor der Kollision durch die Cockpitverstrebung respektive den Magnetkompass verdeckt. Nachdem die HB-3373 die Aare überflogen hatte, blickte der Pilot in Richtung Norden, um das Wetter im Schwarzwald zu beurteilen. Ungefähr eine Minute später nahm der Pilot der HB-3373 im rechten Bereich seines Sichtfeldes ein Flugzeug wahr, das von rechts her kommend auf ihn zuflog.

Um 12:18:52 Uhr kollidierten die beiden Flugzeuge über dem Raum Auenstein auf einer Höhe von 1285 m/M (4216 ft AMSL). Die HB-3373 wurde derart beschädigt, dass sie unkontrollierbar wurde. Der Pilot konnte sich mit dem Fallschirm retten. Die Besatzung der schwer beschädigten HB-DFP konnte die Flugverkehrsleitung alarmieren und flog anschliessend zum Startort zurück. Der Pilot der HB-3373 verletzte sich bei der Landung mit dem Fallschirm leicht, während das Segelflugzeug beim Aufprall zerstört wurde.

Ursachen

Der Unfall ist auf eine Kollision zwischen einem Segel- und einem Motorflugzeug zurückzuführen, weil die beiden Besatzungen den Luftraum zu wenig aktiv überwachten. In der Folge wurde das Segelflugzeug unkontrollierbar und stürzte ab.

Als systemische Ursachen wurden folgende ermittelt:

- Das Motorflugzeug war nicht mit einem Kollisionswarnsystem ausgerüstet.
- Die Transpondersignale des Motorflugzeuges konnten durch das Kollisionswarnsystem des Segelflugzeuges nicht empfangen werden.

Safety Recommendation SWTZ-2016-002 (AAIB)

[German] - Das Bundesamt für Zivilluftfahrt (BAZL) sollte in Zusammenarbeit mit den Anspruchsgruppen und der Europäischen Agentur für Flugsicherheit (EASA) ein Konzept für die Einführung von kompatiblen, auf Standards der Internationalen Zivilluftfahrt basierenden Kollisionswarnsystemen für die allgemeine Luftfahrterarbeiten und einen Aktionsplan für die kurz-, mittel- und langfristige Umsetzung erstellen und umsetzen. [Sicherheitsempfehlung Nr. 499]

Reply No. 1 sent on 27/04/2016:

EASA is investigating on the issue of mid-air collisions in the field of general aviation has supported a study entitled “Scoping Improvements to ‘See And Avoid’ for General Aviation (SISA)”. The report dated 01/12/12 is available on the EASA Website under the reference EASA.2011.07: **https://www.easa.europa.eu/document-library/research-projects**.

The study concluded that ‘any on-board equipment to augment the pilot’s visual observations shall be light, low cost, and cooperative (non-cooperative will be too expensive)’. It therefore recommended to develop a technical standard for collision warning systems in the field of general aviation and Identified EUROCAE as the standardisation body.

Several systems are already widely used and provide help to the pilot to identify other traffic. EASA has already encouraged the installation of one of these systems (FLARM), by making this system available as a Standard Change (refer to CS-SC051a in CS-STAN Issue 1 dated 8 July 2015).

EASA continuously monitors the development of new technological solutions and has started a further internal investigation, which will examine all possible actions to reduce the number of airprox and of mid-air collisions in the uncontrolled European airspace.

Status: Open – **Category**:

Registration	Aircraft Type	Location	Date of event	Event Type
HB-ZLJ	OTHER (Guimbal Cabri G2)	Neuhaus, Municipality Wichtrach	13/07/2013	Accident

Synopsis of the event:

Flight details

While carrying out landing exercises in open terrain, the crew heard a loud bang. A mechanic and the crew carried out in-depth inspections of the helicopter in open terrain. In a recess next to the main rotor transmission, the mechanic found the power supply unit for the strobe light which had come loose from its mounting. The mechanic knocked the power supply unit against the rear bulkhead. The crew associated this sound with the previously heard bang.

During the subsequent test flight, the mechanic noticed an odour, which in his opinion was most likely coming from an electrical fault. After the flight, the mechanic opened the cowling again and inspected the engine bay. In doing so, he noticed that the plastic surface coating of the foam air filter was singed next to the area by the exhaust.

The crew and the mechanic associated the odour of the singed surface coating of the air filter foam with the odour they had experienced several times in flight. They decided to return the helicopter to the base in Bern-Belp. The flight instructor judged the 25 litres of aviation fuel in the tank to be sufficient for the approx. 10-minute return flight to the base.

HB-ZLJ took off at approximately 12:10. Approximately 8 minutes after take-off, the crew once again detected the same odour in the cockpit. The flight instructor opened the right door and looked to the rear. He observed “greyish smoke” coming from the engine cowling. He then took control of the helicopter and informed the aerodrome control tower in Bern-Belp that he would initiate a precautionary landing. At 12:19, when the helicopter was at 2500 ft. QNH, a rattling noise came from the engine bay, followed by marked vibrations. Four seconds later, the yellow warning light for low rotor speed (<515 RPM) came on and another two seconds later the engine shut down. At 12:20 HB-ZLJ performed a glide landing, touching down in a crop field.

Because of suspected fire, the crew released their belts and immediately left the cockpit while the rotor was still turning. The crew remained uninjured.

HB-ZLJ was severely damaged. Fire did not break out.

Causes

The accident is attributed to the disintegration of the cooling fan of the cooling system which led to engine failure with subsequent emergency landing.

The following direct causes for the disintegration of the cooling fan were established:

- Inadequate design of the cooling fan;
- Deficiencies in manufacturing the front disc of the cooling fan.

Safety Recommendation SWTZ-2016-502 (AAIB)

The European Aviation Safety Agency (EASA) should ensure that the manufacturer Hélicoptères Guimbal immediately checks the operational safety of the cooling fan of the cooling system in Cabri G2 helicopters across the entire fleet and draws up an inspection programme for continued operation.

Reply No. 1 sent on 24/11/2016:

Shortly after the accident of HB-ZLJ aircraft, Hélicoptères Guimbal (HG) issued on 18 July 2013, a "mandatory Service Bulletin" (SB) n°13-021 requesting repetitive checks for cracks on the fan external ring. Then HG issued on 10 September 2013 the SB 13-022 requesting the installation on each fan in service of a new external ring with improved mechanical features and including a fibre-glass belt aimed to reduce the risk of fan burst (whatever the cause of the burst). EASA decided to mandate the HG measures defined through the Airworthiness Directive (AD) 2014-0038 issued on 14 February 2014, as described in the final report.

Furthermore, the Swiss Transportation Safety Investigation Board (STSB) recommendations about the improvement of the fan flange manufacturing process were accepted by EASA and later implemented by HG. Moreover, HG has also introduced a polyester shim at the interface between the fan flange and the engine ring gear carrier to suppress the impact wear/fretting observed in this area. This shim is to be installed by operators at the same time as the new external ring through SB 13-022.

Analysis of the second case of fan failure on SE-HJR aircraft in August 2014 confirmed the STSB scenario of cracks initiation. It is to be noted that in this second failure case which happened with a modified fan, the fibre-glass belt of the new external ring did prevent the burst of the fan as expected and no other structural damage has occurred on the aircraft.

Consequently, HB issued SB 14-018 issue A in August 2014 to request a repetitive inspection (every 50 Flight Hours) of the front flange of modified fans. Then, in September 2014, Issue B of that SB was issued to limit the inspection to fans having more than 500 Flight Hours in service. This repetitive inspection was made mandatory by EASA AD 2014-0196, issued on 2 September 2014, which has superseded the AD 2014-0038 and retained its requirement for external ring replacement.

The 500 Flight Hours (FH) threshold was defined based on flight time observed (> 1000 FH) on concerned aircrafts between production - or last detailed inspection during engine overhaul - of the flanges and their failures. The 50 FH interval of the repetitive inspections was defined through engineering judgement and taking into account the observed fail safe behaviour of the modified external ring, but pending a metallurgic analysis for a more precise assessment of the cracks propagation time, especially on the radial parts. Regarding the inspection method, no specific difficulty has been reported by operators or HG, and so far the inspection has allowed to discover several cases of cracks on fans in service, all having a lot more than the 500 FH threshold for starting inspections.

After issuance of EASA AD 2014-0196, results of the metallurgic analysis of the failed parts led to the conclusion that crack propagation depends mainly on engine start/stop cycles. Therefore, an inspection interval expressed in such cycles has been defined by HG to take into account helicopters operated with a number of engine start/stop cycles beyond the assumed figure established during type certification. This has led to issuance of issue D of SB 14-018 on 05 November 2015.

Consequently, the new definition of the inspection interval was made mandatory by EASA AD 2016-0033 issued on 24 February 2016, which has superseded the AD 2014-0196 and retained its modification and inspection requirements. Therefore EASA considers that the current inspection requirement fulfils the STSB recommendation.

Status: Closed – **Category**: Agreement

Safety Recommendation SWTZ-2016-503 (AAIB)

The European Aviation Safety Agency (EASA) should ensure that the manufacturer Hélicoptères Guimbal undertakes appropriate measures to prevent the occurrence of a disintegration of the cooling fan of the cooling system in Cabri G2 helicopters.

Reply No. 1 sent on 24/11/2016:

EASA has taken measures to ensure that Hélicoptères Guimbal (HG) has undertaken appropriate measures to prevent the occurrence of a disintegration of the cooling fan of the cooling system in Cabri G2 helicopters.

Hélicoptères Guimbal has improved its production process of the flange in order get an homogeneous and conformed material thickness and to suppress residual stress induced by the pressing process. Besides, HG has introduced a modified flange with new type of screws and with twice central fitting points in order to improve rigidity and to reduce stress concentration in the cracks initiation area. The modified flange is installed on new production aircraft since the end of 2015 and in replacement of cracked parts detected through Airworthiness Directive (AD) repetitive inspection. This flange is still submitted to the same inspection requirements as the initial design through an airworthiness limitation in the Cabri G2 maintenance manual.

Hélicoptères Guimbal has also developed a new flange in composite material with better static and fatigue structural strengths. Design and installation of this new part has been approved by EASA on July 2016 and is available for retrofit since September 2016 on the whole fleet in service.

Consequently, EASA considers that the design change and production improvements introduced by HG fulfil the recommendation.

Status: Closed – **Category**: Agreement

Registration	Aircraft Type	Location	Date of event	Event Type
HB-WYS	FLIGHT DESIGN (CTLS)	Gland/VD	12/07/2013	Serious incident

Synopsis of the event:

Der Pilot übernahm das Flugzeug, eingetragen als HB-WYS, am frühen Morgen auf dem Flugfeld La Côte (LSGP). Er beabsichtigte einen Flug nach Neuenburg (LSGN) durchzuführen.

Er betankte das Flugzeug mit dem Treibstoff AVGAS UL 91 und füllte dabei in jeden Flügeltank 20 Liter ein. Vor dem Start führte er die vorgesehene Motoren-prüfung (engine check) durch und stellte dabei keine Unregelmässigkeiten fest.

Der Pilot wollte zuerst eine Platzrunde fliegen und startete dazu auf der Piste 04 mit der Landeklappenstellung auf 15° und der Motordrehzahl von 5200 min-1 (revolutions per minute -RPM). Im Steigflug nach der Rechtskurve und der Leistungs-reduktion auf 5000 RPM trat gemäss seiner Aussage die Warnung FUEL PRESSURE LOW auf dem rechten Bildschirm auf.

Anschliessend fuhr er die Landeklappen ein und in der Folge sei diese Warnung verschwunden. Er führte die Platzrunde weiter, landete mit einer Landeklappenstellung von 35° und verliess die Piste. Beim Ausfahren der Landeklappen ertönte kein Alarm. Auf dem Rollweg bis zum Haltepunkt 04 waren alle Motorparameter normal.

Flugverlauf

Der Pilot startete nun zum Flug nach Neuenburg auf der Piste 04, wiederum mit der Landeklappenstellung 15° und der Startleistung 5200 RPM. Beim Überfliegen der Bäume am Pistenende begann der Motor zu stottern. Gleichzeitig wurde wie-derum eine Warnung angezeigt. Gemäss Aussage des Piloten vermutlich die Warnung „oil pressure failure“, aber er war sich dessen nicht sicher. Der Pilot senkte die Flugzeugnase, um die Geschwindigkeit von 62 kt zu halten. An-schliessend stellte der Motor schlagartig ab. Der Pilot konnte das Flugzeug auf einem Getreidefeld notlanden und blieb unverletzt. Das Flugzeug erlitt keinerlei Beschädigungen. Es entstand leichter Flurschaden am Getreidefeld.

Ursachen

Der schwere Vorfall ist darauf zurückzuführen, dass der Motor auf Grund einer unzureichenden Kraftstoffversorgung ausfiel, was eine Notlandung zur Folge hatte.

Als Ursache der unzureichenden Kraftstoffversorgung wurde die Auslegung des Kraftstoffsystems ermittelt, die entstehende Gasblasen nicht ausreichend eliminieren konnte.

Safety Recommendation SWTZ-2016-505 (AAIB)

[German] - Die Europäische Agentur für Flugsicherheit (European aviation safety agency – EASA) sollte in Zusammenarbeit mit dem Flugzeughersteller Flight Design GmbH sicherstellen, dass dieser geeignete Massnahmen trifft, um die Entstehung von Gasblasen im Kraftstoffsystem von Flugzeugen des Musters Flight Design CTLS zu minimieren und sicherzustellen, dass allfällig vorhandene Gasblasen ausreichend eliminiert werden. [Sicherheitsempfehlung Nr. 505]

Reply No. 1 sent on 07/06/2016:

EASA has investigated the issue with the Type Certificate Holder (TCH) Flight Design.

The TCH has performed several tests with bubbles present in the fuel system (these tests have been performed on the aeroplane involved in the accident) and the "LOW PRESS" warning was never shown nor the engine shut-down. Furthermore, the proper engine and fuel system functioning has been verified during the Type Certification activities.

Based on the above considerations, EASA believes that while the presence of bubbles cannot be excluded, this fuel system has proven under these conditions to be robust and to work as intended.

In addition, more than 1700 serial numbers (in different versions, including the non-certified ones, as well) are in service with the same fuel system design and this event was never reported, according to the records and occurrence history of the fleet.

Therefore, EASA believes that no further actions are necessary.

Status: Closed – **Category**: Disagreement

Registration	Aircraft Type	Location	Date of event	Event Type
HB-WAR	OTHER (DynAero MCR-ULC)	airfield Locarno (LSZL)	13/12/2015	Accident

Synopsis of the event:

Der Pilot des Schleppflugzeuges, ein Segelfluglehrer und mehrere Segelflugschüler der Segelfluggruppe Tessin (gruppo volo a vela Ticino – GVVT) trafen sich am Morgen des 13. Dezember 2015 auf dem Flugplatz Locarno. Es war vorgesehen, auf einem Segelflugzeug mit den Schülern mehrere Schulungsflüge im Flugplatzbereich durchzuführen. Nach den üblichen Flugvorbereitungen und einer Fluganmeldung beim C-Büro bereitete der Pilot die Schleppmaschine DynAero MCR-ULC mit dem Kennzeichen HB-WAR für den Einsatz vor und betankte das Flugzeug.

Um 09:58 Uhr erfolgte auf der Graspiste 26L der erste Start der HB-WAR mit dem Segelflugzeug im Schlepp. Weitere sieben Schleppflüge folgten, bei denen sich das Segelflugzeug jeweils auf einer Höhe von rund 500 m/M ausklinkte, der Schlepppilot im Sinkflug das Schleppseil mittels der eingebauten elektrischen Winde einzog und das Schleppflugzeug wieder auf der Piste 26L landete. Am Boden zwischen den Flügen liess der Schlepppilot den Motor der HB-WAR jeweils laufen, um das Landen des Segelflugzeuges und dessen Bereitstellen mit wechselnden Flugschülern abzuwarten.

Für den letzten Flug reihte sich der Schleppzug wie üblich auf der Piste 26L auf und der Pilot rollte das Schleppflugzeug langsam vorwärts, bis sich das Schleppseil zum Segelflugzeug gespannt hatte. Die Landeklappen der HB-WAR waren für den Start gesetzt und die elektrische Treibstoffpumpe (fuel pump 2) eingeschaltet. Nach dem Setzen der Startleistung um 11:53 Uhr beschleunigte der Schleppzug wie gewöhnlich.

Wenige Sekunden nach dem Abheben des Schleppzugs bemerkte der Schlepppilot, wie der Flugzeugmotor unregelmässig zu laufen begann und gleichzeitig die Sicherungsautomaten (circuit breaker – CB) des Funkgeräts und der Zigarettenanzünder-Steckdose im Instrumentenbrett herausprangen. Er versuchte erfolglos, die beiden CBs wieder hineinzudrücken. Wenige Sekunden später versagte der Motor der HB-WAR auf einer Flughöhe von rund 20 m über Grund.

Der Fluglehrer im Segelflugzeug bemerkte die Verringerung der Steigrate und entschied sich zum sofortigen Ausklinken und für eine sichere Aussenlandung auf einer gemähten Wiese, die rechts der Abflugroute in der Verlängerung der Graspiste 26C in etwa 100 m nach deren Pistenende lag. Das Segelflugzeug blieb dabei unbeschädigt.

Der Schlepppilot flog geradeaus weiter und landete in einer Wiese ungefähr 310 m nach dem Ende der Piste 26L. Nach weiteren 55 m Ausrollstrecke kollidierte das Flugzeug mit geringer Geschwindigkeit mit einem leicht erhöhten Feldweg, der quer zur Pistenverlängerung verlief. Dabei brach das Bugfahrwerk ab, die beiden untenstehenden Propellerblätter knickten ab und beide Flügelenden wurden beschädigt.

Der Schlepppilot konnte das Wrack sofort und unverletzt verlassen. Es entstand weder ein Brand am Flugzeug auf noch trat Kraftstoff aus. Es entstand ebenfalls kein Flurschaden.

Safety Recommendation SWTZ-2016-511 (AAIB)

[German] - Die Europäische Agentur für Flugsicherheit (European Aviation Safety Agency – EASA) und das Bundesamt für Zivilluftfahrt (BAZL) sollten durch geeignete Massnahmen sicherstellen, dass das elektrische System der mit Rotax-Motoren des Baumusters 914 betriebenen Luftfahrzeuge mit einer redundanten Spannungsversorgung der beiden elektrischen Treibstoffpumpen ausgerüstet ist. [Sicherheitsempfehlung Nr. 511]

Reply No. 1 sent on 07/10/2016:

EASA is investigating the issue in cooperation with the manufacturer of the engine, and conducting a thorough review of the existing requirements.

Status: Open – **Category**:

Taiwan

Registration	Aircraft Type	Location	Date of event	Event Type
B-22816	ATR ATR72	Taipei Songshan Airport (RCSS)	04/02/2015	Accident

Synopsis of the event:

On February 4, 2015, about 10.54 Taipei Local Time, TransAsia Airways (TNA) flight GE 235, an ATR-GIE Avions de Transport Régional ATR72-212A (ATR72-600) aircraft, registered B-22816, was loss of control during initial climb and impacted Keelung River, three nautical miles east from its departing runway 10 of Taipei's Songshan Airport. Forty-three occupants were fatally injured, including three flight crew, one cabin crew, and 39 passengers. The remaining 13 passengers and one cabin crew sustained serious injuries. One passenger received minor injuries. The aircraft was destroyed by impact forces. The aircraft's left wing tip collided with a taxi on an overpass before the aircraft entered the river. The taxi driver sustained serious injuries and the only taxi passenger sustained minor injuries. Flight 235 was on an instrument flight rules (IFR) regular public transport service from Songshan to Kinmen.

The accident was the result of many contributing factors which culminated in a stall-induced loss of control. During the initial climb after takeoff, an intermittent discontinuity in engine number 2's auto feather unit (AFU) may have caused the automatic take off power control system (ATPCS) sequence which resulted in the uncommanded autofeather of engine number 2 propellers. Following the uncommanded autofeather of engine number 2 propellers, the flight crew did not perform the documented abnormal and emergency procedures to identify the failure and implement the required corrective actions. This led the pilot flying (PF) to retard power of the operative engine number 1 and shut down it ultimately. The loss of thrust during the initial climb and inappropriate flight control inputs by the PF generated a series of stall warnings, including activation of the stick shaker and pusher. After the engine number 1 was shut down, the loss of power from both engines was not detected and corrected by the crew in time to restart engine number 1. The crew did not respond to the stall warnings in a timely and effective manner. The aircraft stalled and continued descent during the attempted engine restart. The remaining altitude and time to impact were not enough to successfully restart the engine and recover the aircraft.

Safety Recommendation TAIW-2016-001 (ASC)

Require a review at industry level of manufacturer's functional or display logic of the flight director so that it disappears or presents appropriate orders when a stall protection is automatically triggered. [ASC-ASR-16-06-014]

Reply No. 1 sent on 08/09/2016:

A design change is planned in the avionics suite, addressing the intent of the Safety Recommendation. The current schedule is to have this design change approved before the end of 2017.

Status: Open – **Category**:

Safety Recommendation TAIW-2016-002 (ASC)

Study the content and the duration of the minimum requirement regarding a differences training program between a conventional avionics cockpit and an advanced suite including enhanced automated modes for aircraft having the same type rating. [ASC-ASR-16-06-015]

Reply No. 1 sent on 21/07/2016:

The Certification Specifications for Flight Crew Data (CS-FCD) require aircraft manufacturers to submit Operational Suitability Data (OSD) for pilot type rating training for a specific aircraft. The OSD is subject to approval as part of the type certification process. It defines a minimum syllabus for a type rating, as well as training areas of special emphasis. EASA has reviewed the provisions regarding the content and duration of the differences training program within type ratings, and has concluded that they provide an acceptable level of safety.

Furthermore, the current set of EU civil aviation safety regulations, reflecting the International Civil Aviation Organization (ICAO) Annexes 1 and 6, provides the framework for teaching and assessing basic airmanship through initial training, skill tests, proficiency checks, Crew Resource Management (CRM) training, type training, operator's recurrent training, line flying under supervision (LIFUS) and line oriented flight training (LOFT).

Additional defences are provided through the EU provisions on operator's safety management systems including the associated risk assessment and mitigation models. This should ensure that any weaknesses related to the issue described in the safety recommendation are identified and corrected.

The applicable regulations are:

- Commission Regulation (EU) No 748/2012 on airworthiness, relevant AMC and GM and the associated Certification Specifications for Flight Crew Data (CS-FCD);
- Commission Regulation(EU) No 1178/2011 on aircrew;
- Commission Regulation (EU) No 965/2012 on air operations.

Status: Closed – **Category**: Partial agreement

Safety Recommendation TAIW-2016-003 (ASC)

Require a review of manufacturer's airplane flight manual (AFM) to ensure that a rejected take off procedure is also applicable to both engines operating. [ASC-ASR-16-06-016]

Reply No. 1 sent on 08/09/2016:

The current Aircraft flight manual (AFM) procedures associated with rejected take-off are applicable to one or both engines operating. The AFM will be modified to enhance clarity on the subject topic.

Status: Open – **Category**:

United Kingdom

Registration	Aircraft Type	Location	Date of event	Event Type
G-UKFI	FOKKER F28	Manchester Airport	01/04/2002	Serious incident

Synopsis of the event:

During taxi for takeoff at Manchester International Airport, the aircraft passenger cabin filled with smoke and an emergency evacuation of the aircraft was carried out. The evacuation was carried out expeditiously, but the cabin crew had difficulty opening the Galley Service Door and some passengers using the overwing escape hatches were unsure of how to descend to the ground. The smoke had originated from a damaged Auxiliary Power Unit (APU), which had allowed oil from the unit to leak into the bleed air system.

Safety Recommendation UNKG-2002-043 (AAIB)

The CAA and JAA should review the requirements for passenger safety cards to ensure that, for aircraft with over-wing exits, the safety card is required to clearly depict the emergency escape route(s) from the cabin, via the wing, to the ground.

Reply No. 4 sent on 15/03/2016:

Commission Regulation (EU) No 965/2012 on air operations and Commission Implementing Regulation (EU) No 628/2013 on standardisation inspections include the concept of safety management systems and associated risk assessment and mitigation models. The regulations provide a foundation for safety through provisions on operator responsibilities, oversight by civil aviation authorities and standardisation inspections by EASA.

Nevertheless, this safety recommendation is currently being considered within the framework of Rule-making Tasks RMT.0516 and RMT.0517 'Update of the rules on air operations'. The applicable Notice of Proposed Amendment NPA 2015-18, sub-NPA (C) 'Draft Implementing Rule and Draft Acceptable Means of Compliance/Guidance Material on passenger seating and briefing' was published on 27 November 2015. The next deliverable, an EASA Opinion, is expected to be published in the Autumn 2016.

Status: Open – **Category**:

Registration	Aircraft Type	Location	Date of event	Event Type
G-BOMG	BRITTEN NORMAN BN2B	7.7 NM NW of Campbeltown Airport, United Kingdom	15/03/2005	Accident

Synopsis of the event:

The Glasgow based Islander aircraft was engaged on an air ambulance task for the Scottish Ambulance Service when the accident occurred. The pilot allocated to the light had not flown for 32 days; he was therefore required to complete a short light at Glasgow to regain currency before landing to collect a paramedic for the light to Campbeltown Airport on the Kintyre Peninsula.

Poor weather at Campbeltown Airport necessitated an instrument approach. There was neither radar nor Air Traffic Control Service at the airport, so the pilot was receiving a Flight Information Service from a Flight Information Service Officer in accordance with authorised procedures. After arriving overhead Campbeltown Airport, the aircraft flew outbound on the approach procedure for Runway 11 and began a descent. The pilot next transmitted that he had completed the 'base turn', indicating that he was inbound to the airport and commencing an approach. Nothing more was seen or heard of the aircraft and further attempts at radio contact were unsuccessful. The emergency services were alerted and an extensive search operation was mounted in an area based on the pilot's last transmission. The aircraft wreckage was subsequently located on the sea bed 7.7 nm west-north-west of the airport; there were no survivors.

The investigation identified the following causal factors:

1. The pilot allowed the aircraft to descend below the minimum altitude for the aircraft's position on the approach procedure, and this descent probably continued unchecked until the aircraft flew into the sea.

2. A combination of fatigue, workload and lack of recent lying practise probably contributed to the pilot's reduced performance.

3. The pilot may have been subject to an undetermined influence such as disorientation, distraction or a subtle incapacitation, which affected his ability to safely control the aircraft's flightpath.

Safety Recommendation UNKG-2006-102 (AAIB)

Considering the circumstances of air ambulance flights, the Civil Aviation Authority in conjunction with the JAA should review the circumstances in which a second pilot is required for public transport flights operating air ambulance services.

Reply No. 2 sent on 21/07/2016:

The Agency is currently evaluating the effectiveness of the existing provisions on air ambulance operations within the context of on-going rulemaking task RMT.0599, which was launched on 05 February 2016, with the publication of the associated Terms of Reference.

Although RMT.0599 was primarily set up to integrate evidence-based training into the EU regulations, the scope has been extended to include evaluation of this safety recommendation, as the rulemaking group includes expertise which is appropriate for the evaluation.

Status: Open – **Category**:

Safety Recommendation UNKG-2006-103 (AAIB)

The Civil Aviation Authority in conjunction with the JAA, should consider mandating the carriage of a radio altimeter, or other independent low height warning device, for public transport IFR flights operating with a single pilot.

Reply No. 2 sent on 20/12/2016:

Since the Air Operations regulation (Commission Regulation (EU) No 965/2012) became applicable (28 October 2014 at the latest for Commercial Air Transport (CAT) operations with aeroplanes), the following organisational, operational, flight crew training and equipment provisions provide mitigation for the safety issue of the pilot's situation awareness (including terrain) in single-pilot CAT operations:

- ORO.GEN.200 Management system, where the operator is required to identify aviation safety hazards entailed by its activities, evaluate them and manage the associated risks, including taking actions to mitigate such risks and verify their effectiveness (see subparagraph (a)(3)).
- AMC2 ORO.FC.115 on crew resource management (CRM) training for single-pilot operations, where situation awareness is one of the training elements (see subparagraph (b)(2)(i)).
- ORO.FC.202 Single-pilot operations under instrument flight rules (IFR) or at night, where:
  - training is required on autopilot management, if applicable, and single-pilot CRM;
  - IFR recency or checking requirements are prescribed for the preceding 90 days;
  - night recency or checking requirements are prescribed for the preceding 90 days.

- ORO.FC.A.250 Commanders holding a commercial pilot licence for aeroplanes, where minimum flight time and pilot-in-command time experience requirements are set for acting as commander in CAT on a single-pilot aeroplane.
- AMC5 CAT.OP.MPA.110 on aerodrome operating minima, where additional criteria are established for minima applicable to single-pilot operations, including the requirement for use of autopilot for a runway visual range/visibility of less than 800m (see subparagraph (a)(8)).
- CAT.IDE.A.135 Additional equipment for single-pilot operation under IFR, where an autopilot is required with at least altitude hold and heading mode.

Furthermore, aeroplanes with an MCTOM (maximum certified take-off mass) of more than 5 700 kg or an MOPSC (maximum operational passenger seating configuration) of more than nine, operated for CAT, are required to be equipped with a Terrain Awareness Warning System (TAWS) (see CAT.IDE.A.150). This does not prevent operators from installing a TAWS in lighter aeroplanes or a radio altimeter when the pre-threshold terrain is appropriate for its use, taking into account the risks associated with their types of operation, as identified through their safety management systems.

Status: Closed – **Category**: Partial agreement

Registration	Aircraft Type	Location	Date of event	Event Type
G-EUOB	AIRBUS A319	London Heathrow, United Kingdom	22/10/2005	Incident

Synopsis of the event:

As the aircraft climbed to Flight Level (FL) 200 in night Visual Meteorological Conditions (VMC) with autopilot and autothrust engaged, there was a major electrical failure. This resulted in the loss or degradation of a number of important aircraft systems. The crew reported that both the commander's and co-pilot's Primary Flight Displays (PFD) and Navigation Displays (ND) went blank, as did the upper ECAM1 display. The autopilot and autothrust systems disconnected, the VHF radio and intercom were inoperative and most of the cockpit lighting went off. There were several other more minor concurrent failures.

The commander maintained control of the aircraft, flying by reference to the visible night horizon and the standby instruments, which were difficult to see in the poor light. The co-pilot carried out the abnormal checklist actions which appeared on the lower ECAM display; the only available electronic flight display. Most of the affected systems were restored after approximately 90 seconds, when the co-pilot selected the AC Essential Feed switch to Alternate ('ALTN'). There were no injuries to any of the 76 passengers or 6 crew. After the event, and following discussions between the crew and the operator's Maintenance Control, the aircraft continued to Budapest.

Safety Recommendation UNKG-2007-062 (AAIB)

It is recommended that the European Aviation Safety Agency should, in consultation with other National Airworthiness Authorities outside Europe, consider requiring training for flight by sole reference to standby instruments to pilots during initial and recurrent training courses.

Reply No. 2 sent on 21/07/2016:

The Agency is currently evaluating the effectiveness of the existing recurrent training provisions within the context of rulemaking tasks (RMTs) set up to integrate evidence-based training into the EU regulations:

- As a first step, the Agency has published Executive Director (ED) Decision 2015/027/R on 'Implementation of EBT within the European regulatory framework' was published on 16 December 2015. Its objective was to determine the relevance of existing pilot training and to identify the most critical areas of pilot training according to aircraft generation. It contains new Guidance Material (GM) to support implementation, by operators, of EBT, conducted in Flight Simulation Training Devices, according to the principles established in International Civil Aviation Organization (ICAO) Doc 9995 'Manual of Evidence-based Training'.
- RMT.0599 'Evidence-based and competency-based training', which was launched on 05 February 2016, with the publication of the associated Terms of Reference, is reviewing the associated recurrent flight crew training in Part-ORO (Organisation Requirements for air Operations) of Commission Regulation (EU) No 965/2012 on air operations. This will also include a review of the initial training provisions on training for flight by sole reference to standby instruments. The NPA is expected to be published by mid-2017.

Status: Open – **Category**:

Registration	Aircraft Type	Location	Date of event	Event Type
G-YMMM	BOEING 777	London Heathrow, United Kingdom	17/01/2008	Accident

Synopsis of the event:

Whilst on approach to London (Heathrow) from Beijing, China, at 720 feet agl, the right engine of G-YMMM ceased responding to autothrottle commands for increased power and instead the thrust reduced to 1.03 Engine Pressure Ratio (EPR). Seven seconds later the left engine thrust reduced to 1.02 EPR. This reduction in thrust led to a loss of airspeed and the aircraft touching down some 330 m short of the paved surface of Runway 27L at London Heathrow. The investigation identified that the reduction in thrust was due to restricted fuel flow to both engines.

Safety Recommendation UNKG-2008-049 (AAIB)

It is recommended that the Federal Aviation Administration and the European Aviation Safety Agency review the current certification requirements to ensure that aircraft and engine fuel systems are tolerant to the potential build up and sudden release of ice in the fuel feed system.

Reply No. 2 sent on 07/06/2016:

Since this accident, a generic Special Condition (SC) "Water / Ice in Fuel system" is raised for applicable large aeroplane certification projects. The SC requires the applicant to demonstrate that:

- the free water (or ice) remains evenly dispersed in the fuel under all operating conditions, or
- the amount of ice that could be released as a slug is minimised. The applicant must establish the threat(s) (quantity of ice, temperature) that can be released. The complete fuel system (including the engine) must be shown to be tolerant to such sudden release of ice, without significant adverse effect(s) on the powerplant system.

Furthermore, research studies have been launched to better understand the involved mechanism (ice accretion and release) and identify design precautions to mitigate the risk of icing in fuel.

This includes two EASA studies:

- EASA/2010/1 'WAFCOLT - Water behaviour in aviation fuel under cold temperature conditions'. The report, dated 20 March 2013, is available here: **https://www.easa.europa.eu/document-library/research-projects**
- EASA.2012.OP.14 'Ice accretion and release in fuel systems'. The report will be published by end of 2016.

In addition, the European Commission FP7 project 'SAFUEL', aimed to develop, test and validate technologies for the Safer Fuel System of the future, includes one objective to improve water detection in fuel tank and gain knowledge on icing phenomena in the fuel system. This project characterised and analysed the risk of icing in fuel in addition to other risks for the fuel system. It provides design rules based on the knowledge gathered, and it also makes recommendations for follow-up studies.

The project has been completed in February 2016 and the report should be published in a near term.

The results of these studies and others need to be analysed by a group of experts in order to define an acceptable means of compliance (AMC) with the requirements of the SC which will bring harmonisation among certification projects.

Status: Open – **Category**:

Safety Recommendation UNKG-2009-091 (AAIB)

It is recommended that the European Aviation Safety Agency introduce a requirement to record, on a DFDR, the operational position of each engine fuel metering device where practicable.

Reply No. 4 sent on 17/10/2016:

This recommendation has been addressed within the framework of EASA rulemaking task RMT.0401 'Amendment of requirements for flight recorders and underwater locating devices'. The solution is based on specifications added to European Organisation for Civil Aviation Equipment (EUROCAE) Document 112A (ED-112A) by EUROCAE working group 90, in response to this safety recommendation. The working group decided to add flight parameter No 35i to table II-A.1 of ED-112A.

The associated EASA Executive Director (ED) Decision 2016/012/R, introducing this parameter for newly-manufactured aeroplanes, was published on the EASA web site on 13 September 2016 (see new parameter 35i 'Engine fuel metering valve position' in Table 2 of new AMC1.2 CAT.IDE.A.190).

Status: Closed – **Category**: Agreement

Registration	Aircraft Type	Location	Date of event	Event Type
G-XLAC	BOEING 737	Runway 27, Bristol International Airport, United Kingdom	29/12/2006	Serious incident

Synopsis of the event:

Resurfacing and re-profiling work was taking place on parts of the runway at BIA as part of a major project to resurface the manoeuvring area pavements, and sections of the runway surface were ungrooved 'base course' asphalt. From 14 November 2006, there were reports from flight crew of a variety of problems related to the friction characteristics of the temporary runway surface, though no serious incidents occurred until 29 December 2006. On that day, the flight crew of G-XLAC experienced poor stopping performance during landing. Later that day, the flight crew of G-BWDA experienced stopping and lateral control difficulties during landing, and the aircraft departed the runway surface and came to rest on the grass area at the side of the runway. Later still, the flight crew of G-EMBO experienced lateral control difficulties during landing, and the aircraft partially left and then regained the runway. On 3 January 2007, another flight crew, also operating G-XLAC, experienced poor stopping performance. The airport was subsequently closed whilst grooves were cut in the base course. After it re-opened there were no further incidents.

Safety Recommendation UNKG-2008-076 (AAIB)

The European Aviation Safety Agency should require operators to ensure that flight crews are provided with guidance material on aircraft performance when operating on a runway that is notified as "may be slippery when wet", or has sections thereof notified as "may be slippery when wet".

Reply No. 3 sent on 16/11/2016:

This safety recommendation is currently being considered within the framework of Rulemaking Task RMT.0296 'Review of aeroplane performance requirements for commercial air transport operations'. The first deliverable, a Notice of Proposed Amendment, NPA 2016-11, was published on 30 September 2016.

The NPA includes proposals for amendments to Commission Regulation (EU) No 965/2012 to introduce in-flight check of the landing distance at the time of arrival (see proposed new CAT.OP.MPA.303, Acceptable Means of Compliance (AMC) and Guidance Material (GM)) and runway braking action reporting (see proposed new CAT.OP.MPA.311 and AMC). New definitions to support these amendments are also proposed, including a definition for `slippery wet runway` (see proposed amendments to Annex 1 'Definitions' and associated GM).

The NPA also proposes to introduce new Certification Specifications (CS) on performance information for the landing distance assessment, and new AMC on the derivation and methodology of performance information for landing distance assessment at dispatch and at time of arrival (see proposed amendments to Decision No. 2003/2/RM of the Executive Director (ED) of the Agency, linked to Commission Regulation (EC) No 748/2012, introducing new CS-25.1592 and AMC 25.1592).

The next deliverable for RMT.0296, an EASA Opinion, which is expected to contain the proposed new CAT.OP.MPA.303, CAT.OP.MPA.311 and definitions, is planned to be published in the third quarter of 2017. Pending adoption and publication of the related amending regulation to Commission Regulation (EU) No 965/2012, the associated ED Decisions, which are expected to contain the above-mentioned new CS, AMC and GM, will be published.

Status: Open – **Category**:

Registration	Aircraft Type	Location	Date of event	Event Type
G-EZAC	AIRBUS A319	near Nantes, France	15/09/2006	Serious incident

Synopsis of the event:

The serious incident occurred to an Airbus A319-111 aircraft operating a scheduled passenger flight between Alicante, Spain and Bristol, UK. The aircraft had experienced a fault affecting the No 1 (left) electrical generator on the previous flight and was dispatched on the incident flight with this generator selected off and the Auxiliary Power Unit generator supplying power to the left electrical network.

While in the cruise at Flight Level (FL) 320 in day Visual Meteorological Conditions (VMC), with the autopilot and autothrust systems engaged, a failure of the electrical system occurred which caused numerous aircraft systems to become degraded or inoperative. Some of the more significant effects were that the aircraft could only be flown manually, all the aircraft's radios became inoperative and the Captain's electronic flight instrument displays blanked.

Attempts by the flight crew to reconfigure the electrical system proved ineffective and the aircraft systems remained in a significantly degraded condition for the remainder of the flight, making operation of the aircraft considerably more difficult. The flight crew were unable to contact air traffic control for the rest of the flight. The aircraft landed uneventfully at Bristol, with the radios and several other systems still inoperative.

The incident was reported to the Air Accidents Investigation Branch (AAIB) by the operator at 1452 hrs local on 15 September 2006. An investigation was commenced shortly thereafter. France, as the state of aircraft manufacture and design, appointed an Accredited Representative from the BEA. Assistance was also given by the aircraft manufacturer, Airbus.

The reasons why the electrical system could not be reconfigured by the flight crew could not be established.

The investigation identified the following causal factors in this incident:

1. An intermittent fault in the No 1 Generator Control Unit, which caused the loss of the left electrical network.

2. An aircraft electrical system design which required manual reconfiguration of the electrical feed to the AC Essential busbar in the event of de-energisation of the No 1 AC busbar, leading to the loss or degradation of multiple aircraft systems, until the electrical system is reconfigured.

3. The inability of the flight crew to reconfigure the electrical system, for reasons which could not be established.

4. Master Minimum Equipment List provisions which allowed dispatch with a main generator inoperative without consideration of any previous history of electrical system faults on the aircraft.

5. Inadequate measures for identifying Generator Control Units repeatedly rejected from service due to repetition of the same intermittent fault.

Safety Recommendation UNKG-2008-089 (AAIB)

It is recommended that the EASA and the FAA require that approved component repair organisations have procedures in place to identify units with an excessive service rejection rate or recurrent faults.

Reply No. 3 sent on 27/04/2016:

On 11 December 2015, the EASA Management Board reviewed Rulemaking Programme 2016-2020, replacing the due rulemaking task covering safety recommendation UNKG-2008-089 by the issuance of a Safety Information Bulletin. This SIB is scheduled to be issued before end of 2016.

Status: Open – **Category**:

Registration	Aircraft Type	Location	Date of event	Event Type
G-VSXY	AIRBUS A330	Gatwick Airport	16/04/2012	Accident

Synopsis of the event:

The aircraft was operating a flight from London Gatwick Airport to McCoy International Airport in Orlando, USA with three flight crew, 10 cabin crew and 304 passengers on board including three infants. Early in the flight the crew received a series of smoke warnings from the aft cargo hold and the commander elected to return to London Gatwick. The crew carried out the appropriate emergency drills, including the discharge of the fire extinguishers in the aft cargo hold, but the smoke warnings continued. The aircraft landed safely, the crew brought it to a halt on the runway and endeavoured to establish the extent of any fire. This produced conflicting evidence and, with smoke warnings continuing, the commander ordered an emergency evacuation.

The passengers all left the aircraft within 90 seconds but two injuries, classed as 'Serious', were incurred. Subsequent examination of the aircraft and its systems showed that the smoke warnings had been spurious.

The investigation identified that injuries were sustained during the evacuation of the aircraft. The evacuation was initiated based on the commander's assessment of the available sources of information, including the repetitive and intermittent nature of the aft cargo smoke warnings.

The investigation identified the following causal factor for the intermittent cargo smoke warnings:

1. A latent fault on the T1 thermistor channel of smoke detector 10WH, in combination with a CAN Bus fault and possible high levels of humidity in the cargo compartment due to the carriage of perishable goods, provided circumstances sufficient to generate multiple spurious aft cargo compartment smoke warnings.

The investigation identified the following contributory factors for the intermittent cargo smoke warnings:

a The thermal channel fault in 10WH was not detected prior to the event by the internal smoke detector temperature monitoring.

b The proximity of the fire extinguisher nozzles to the smoke detectors.

Safety Recommendation UNKG-2014-005 (AAIB)

It is recommended that the European Aviation Safety Agency amend AMC1 CAT.OP.MPA.170, 'Passenger briefing', to ensure briefings emphasise the importance of leaving hand baggage behind in an evacuation.

Reply No. 3 sent on 15/03/2016:

Commission Regulation (EU) No 965/2012 on air operations and Commission Implementing Regulation (EU) No 628/2013 on standardisation inspections include the concept of safety management systems and associated risk assessment and mitigation models. The regulations provide a foundation for safety through provisions on operator responsibilities, oversight by civil aviation authorities and standardisation inspections by EASA.

Nevertheless, this safety recommendation is currently being considered within the framework of Rulemaking Tasks RMT.0516 and RMT.0517 'Update of the rules on air operations'. The applicable Notice of Proposed Amendment NPA 2015-18 sub-NPA (C) 'Draft Implementing Rule and Draft Acceptable Means of Compliance/Guidance Material on passenger seating and briefing' was published on 27 November 2015. The next deliverable, an EASA Opinion, is expected to be published in the Autumn 2016.

Status: Open – **Category**:

Safety Recommendation UNKG-2014-006 (AAIB)

It is recommended that the European Aviation Safety Agency develops recommendations on the content of visual aids such as safety briefing cards or safety videos to include information on how passengers, including those with young children, should use the escape devices.

Reply No. 3 sent on 15/03/2016:

Commission Regulation (EU) No 965/2012 on air operations and Commission Implementing Regulation (EU) No 628/2013 on standardisation inspections include the concept of safety management systems and associated risk assessment and mitigation models. The regulations provide a foundation for safety through provisions on operator responsibilities, oversight by civil aviation authorities and standardisation inspections by EASA.

Nevertheless, this safety recommendation is currently being considered within the framework of Rulemaking Tasks RMT.0516 and RMT.0517 'Update of the rules on air operations'. The applicable Notice of Proposed Amendment NPA 2015-18 sub-NPA (C) 'Draft Implementing Rule and Draft Acceptable Means of Compliance/Guidance Material on passenger seating and briefing' was published on 27 November 2015. The next deliverable, an EASA Opinion, is expected to be published in the Autumn 2016.

Status: Open – **Category**:

Registration	Aircraft Type	Location	Date of event	Event Type
G-REDW	EUROCOPTER EC225	20 NM east of Aberdeen	10/05/2012	Accident

Registration	Aircraft Type	Location	Date of event	Event Type
G-CHCN	EUROCOPTER EC225	North Sea, 32nm southwest of Sumburgh	22/10/2012	Accident

Synopsis of the event:

While operating over the North Sea, in daylight, the crews of G-REDW and G-CHCN experienced a loss of main rotor gearbox oil pressure, which required them to activate the emergency lubrication system. This system uses a mixture of glycol and water to provide 30 minutes of alternative cooling and lubrication. Both helicopters should have been able to fly to the nearest airport; however, shortly after the system had activated, a warning illuminated indicating that the emergency lubrication system had failed. This required the crews to ditch their helicopters immediately in the North Sea. Both ditchings were successful and the crew and passengers evacuated into the helicopter's liferafts before being rescued. There were no serious injuries.

The loss of oil pressure on both helicopters was caused by a failure of the bevel gear vertical shaft in the main rotor gearbox, which drives the oil pumps. The shafts had failed as result of a circumferential fatigue crack in the area where the two parts of the shaft are welded together.

On G-REDW the crack initiated from a small corrosion pit on the countersink of the 4 mm manufacturing hole in the weld. The corrosion probably resulted from the presence of moisture within the gap between the PTFE plug and the countersink. The shaft on G-REDW had accumulated 167 flying hours since new.

On G-CHCN, the crack initiated from a small corrosion pit located on a feature on the shaft described as the inner radius. Debris that contained iron oxide and moisture had become trapped on the inner radius, which led to the formation of corrosion pits. The shaft fitted to G-CHCN had accumulated 3,845 flying hours; this was more than any other EC225 LP shaft.

The stress, in the areas where the cracks initiated, was found to be higher than that predicted during the certification of the shaft. However, the safety factor of the shaft was still adequate, providing there were no surface defects such as corrosion.

The emergency lubrication system operated in both cases, but the system warning light illuminated as a result of an incompatibility between the helicopter wiring and the pressure switches. This meant the warning light would always illuminate after the crew activated the emergency lubrication system.

A number of other safety issues were identified concerning emergency checklists, the crash position indicator and liferafts.

Ten safety recommendations have been made. In addition, the helicopter manufacturer carried out several safety actions and is redesigning the bevel gear vertical shaft taking into account the findings of the investigation. Other organisations have also initiated a number of safety actions as a result of this investigation.

The following causal factors were identified in the ditching of both helicopters:

a A 360º circumferential high-cycle fatigue crack led to the failure of the main gearbox bevel gear vertical shaft and loss of drive to the oil pumps.

b The incompatibility between the aircraft wiring and the internal configuration of the pressure switches in both the bleed-air and water/glycol (Hydrosafe 620) supplies resulted in the illumination of the MGB EMLUB caption.

The following factors contributed to the failure of the EC225 LP main gearbox bevel gear vertical shafts:

a The helicopter manufacturer's Finite Element Model underestimated the maximum stress in the area of the weld.

b Residual stresses, introduced during the welding operation, were not fully taken into account during the design of the shaft.

c Corrosion pits were present on both shafts from which fatigue cracks initiated:

i. On G-REDW the corrosion pit was located at the inner countersink in the 4.2 mm hole and probably resulted from the presence of moisture within the gap between the PTFE plug and the countersink.

ii. On G-CHCN the corrosion pit was located at the inner radius and probably resulted from moisture trapped within an iron oxide deposit that had collected in this area.

Safety Recommendation UNKG-2014-016 (AAIB)

It is recommended that the European Aviation Safety Agency review the installation of the Type 18R MK3 liferaft in the EC225 sponson to ensure that there is a high degree of deployment reliability in foreseeable sea conditions.

Reply No. 2 sent on 09/02/2016:

A thorough review of the design and functioning of the installation of the Type 18R MK3 liferaft in the EC225 sponsons was performed on production rotorcraft at the Airbus Helicopters facility. The assessment of the actual raft installation was performed by progressively removing and replacing items related to the raft installation in order to evaluate possible reasons for a raft to deploy incorrectly. The effects foreseeable in rough sea conditions such as the pitching/heaving/rolling of the rotorcraft, intermittent submerging of the sponson, or wind loading were considered but it was not feasible to perform an inflation test of a raft. However this was not considered to reduce the level of confidence that could be placed in the positive conclusion of the review.

The conclusion of the review was that the installation design considers the combination of inertia and physical interaction effects, and ensures the deployment is effective provided the liferaft is correctly packed and then installed into the helicopter sponson correctly.

The overall deployment reliability is then achieved when taking into consideration that the liferaft manufacturer, Survitec Group Limited, has included in July 2014, in Revision 5 of the Component Maintenance Manual for the 18R Mk3 liferaft, a clearer instruction on the packing procedures including how to route the mooring and rescue pack lines within the pack.

Status: Closed – **Category**: Agreement

Registration	Aircraft Type	Location	Date of event	Event Type
G-CRST	AGUSTA A109	London	16/01/2013	Accident

Synopsis of the event:

At 0820 hrs on 16 January 2013 the Air Accidents Investigation Branch (AAIB) was notified that a helicopter flying over central London had collided with a crane and crashed into the street near Vauxhall Bridge. A team of AAIB inspectors and support staff arrived on the scene at 1130 hrs. The helicopter was flying to the east of London Heliport when it struck the jib of a crane, attached to a building development at St George Wharf, at a height of approximately 700 ft amsl in conditions of reduced meteorological visibility. The pilot, who was the sole occupant of the helicopter, and a pedestrian were fatally injured when the helicopter impacted a building and adjacent roadway.

The investigation identified the following causal factors:

1. The pilot turned onto a collision course with the crane attached to the building and was probably unaware of the helicopter's proximity to the building at the beginning of the turn.

2. The pilot did not see the crane or saw it too late to take effective avoiding action.

The investigation identified the following contributory factor:

1. The pilot continued with his intention to land at the London Heliport despite being unable to remain clear of cloud.

Safety Recommendation UNKG-2014-034 (AAIB)

It is recommended that the European Aviation Safety Agency assess whether mandating the use of Helicopter Terrain Awareness and Warning Systems compliant with Technical Standard Order C194 or European Technical Standard Order C194 would provide safety benefits for helicopter operations within Europe.

Reply No. 3 sent on 20/12/2016:

The Agency understands that, based on the type of operation performed during the accident, this safety recommendation is related to Commercial Air Transport (CAT) operations. Whilst it is acknowledged that the aircraft involved in the subject accident was operating under national legislation at the time, it should be noted that, since 28 October 2014 at the latest, CAT operations are required to be conducted in accordance with Commission Regulation (EU) No 965/2012 on air operations.

Helicopters used in offshore Commercial Air Transport (CAT) operations, with a Maximum Certificated Take-Off Mass (MCTOM) of more than 3175 kg or a Maximum Operational Passenger Seating Capacity (MOPSC) of more than 9, and first issued with an individual Certificate of Airworthiness (CofA) after 31 December 2018, are required to be equipped with a Helicopter Terrain Awareness Warning System (HTAWS) (see SPA.HOFO.160 (c) of Commission Regulation (EU) 2016/1199 amending Regulation No 965/2012 on air operations).

EASA has conducted a Preliminary Impact Assessment (PIA) to determine and prioritise any actions that the Agency should take to address the related safety issues. One of the candidate actions is Controlled Flight into Terrain (CFIT) prevention with HTAWS.

In response to the September 2016 PIA findings, the Agency intends to introduce a new Rulemaking Task (RMT) into its Rulemaking Programme (RMP) for 2017-2021, in order to:

- consider extending the existing HTAWS requirements for offshore helicopter operations to include those helicopters first issued with an individual Certificate of Airworthiness (CofA) on or before 31 December 2018 (ie retrofit).
- consider mandating HTAWS on board helicopters used for CAT other than offshore helicopter operations, including Helicopter Emergency Medical Service (HEMS) operations. The helicopter size threshold will be determined during the task, and may be expressed in MCTOM, MOPSC, Instrument Flight Rules (IFR) or Visual Flight Rules (VFR), or a combination of these criteria. For VFR operations, the PIA results foresee the MCTOM threshold to be between 2 500 kg and 3 175 kg.

It should be noted that research programmes have been taking place to improve HTAWS software in order to increase the time between the first caution or warning and impact without generating more false warnings. Further research may still be needed, and an improved European Technical Standard Order (ETSO) be published, before mandating retrofit for the existing helicopter fleet.

The Agency's Rulemaking Programme for 2017-2021 is expected to be published in the fourth quarter of 2016, after consultation with the EASA Member States' Advisory Body (MAB) and the Stakeholders Advisory Body (SAB).

In the meantime, safety promotion material produced by the European Helicopter Safety Team (EHEST) already addresses some of the root causes of CFIT accidents. For example, 'HE9 Automation and flight path management' for IFR flights (published in September 2015) and 'Helicopter Flight Instructor Manual' for unplanned flying in Instrument Meteorological Conditions (IMC) during VFR flights (published in June 2015).

Status: Open – **Category**:

Registration	Aircraft Type	Location	Date of event	Event Type
G-GAVA	BAE JETSTREAM3100	Doncaster Sheffield Airport, Yorkshire	15/08/2014	Accident

Synopsis of the event:

The aircraft's left main landing gear failed shortly after it landed on Runway 20 at Doncaster Sheffield Airport. The left main landing gear detached from its mounts and the aircraft slid along the runway on its remaining landing gear, left wingtip and luggage pannier before veering off the runway and coming to rest on the adjacent grass. The single passenger and the flight crew vacated the aircraft without injury.

Preliminary findings indicate that the failure was initiated as a result of stress corrosion cracking in the forward yoke pintle at the top of the left landing gear leg. Further analysis is required to determine the precise details of the failure, however, the preliminary findings are of significance because the same aircraft, operating under a different registration, was involved in a similar accident in 2012 during which the right main landing gear failed. The subsequent investigation identified intergranular corrosion / stress corrosion cracking of the forward yoke pintle at the top of the main landing gear leg as the cause of that failure.

Safety Recommendation UNKG-2014-039 (AAIB)

It is recommended that the European Aviation Safety Agency take action to mandate an effective inspection regime for the Jetstream 31 that will detect cracking and prevent failure of the yoke pintle of main landing gear legs manufactured from DTD 5094 aluminium alloy.

Reply No. 2 sent on 24/11/2016:

British Aerospace (BAE) Systems, has revised the current inspection regime (as described in Service Bulletin (SB) 32-A-JA851226 and mandated by the Airworthiness Directive (AD) 2013-0208). The revised inspection regime is defined in revision 7 of SB 32-A-JA851226 and allows detection of cracks of shorter length and corrosion pits of lower depth. It has been mandated by EASA with AD NO. 2016-0224.

Status: Closed – **Category**: Agreement

Registration	Aircraft Type	Location	Date of event	Event Type
G-EUOE	AIRBUS A319	LHR - UK	24/05/2013	Accident

Synopsis of the event:

As the aircraft departed Runway 27L at London Heathrow Airport, the fan cowl doors from both engines detached, puncturing a fuel pipe on the right engine and damaging the airframe, and some aircraft systems. The flight crew elected to return to Heathrow. On the approach to land an external fire developed on the right engine. The left engine continued to perform normally throughout the flight. The right engine was shut down and the aircraft landed safely and was brought to a stop on Runway 27R. The emergency services quickly attended and extinguished the fire in the right engine. The passengers and crew evacuated the aircraft via the escape slides, without injury.

Subsequent investigation revealed that the fan cowl doors on both engines were left unlatched during maintenance and this was not identified prior to aircraft departure.

Safety Recommendation UNKG-2015-002 (AAIB)

It is recommended that the European Aviation Safety Agency requires Airbus to modify A320-family aircraft to incorporate a reliable means of warning when the fan cowl doors are unlatched.

Reply No. 2 sent on 27/04/2016:

In March 2016 EASA issued the Airworthiness Directives (ADs) 2016-0053 and 2016-0069, making mandatory the retrofit installation of new Fan Cowl Door (FCD) front latch and keeper assembly, respectively for IAE and CFM engines. This new design introduced a specific key necessary to un-latch the FCD that cannot be removed unless the FCD front latch is safely closed. The key, after removal, must be stowed in the flight deck at a specific location, as instructed in the applicable Aircraft Maintenance Manual, the Applicable Flight Crew Operating Manual has been amended accordingly.

Status: Closed – **Category**: Agreement

Registration	Aircraft Type	Location	Date of event	Event Type
G-SPAO	EUROCOPTER EC135	Glasgow City Centre, Scotland	29/11/2013	Accident

Synopsis of the event:

The helicopter departed Glasgow City Heliport (GCH) at 2044 hrs on 29 November 2013, in support of Police Scotland operations. On board were the pilot and two Police Observers. After their initial task, south of Glasgow City Centre, they completed four more tasks; one in Dalkeith, Midlothian, and three others to the east of Glasgow, before routing back towards the heliport. When the helicopter was about 2.7 nm from GCH, the right engine flamed out. Shortly afterwards, the left engine also flamed out. An autorotation, flare recovery and landing were not achieved and the helicopter descended at a high rate onto the roof of the Clutha Vaults Bar, which collapsed. The three occupants in the helicopter and seven people in the bar were fatally injured. Eleven others in the bar were seriously injured.

Fuel in the helicopter's main fuel tank is pumped by two transfer pumps into a supply tank, which is divided into two cells. Each cell of the supply tank feeds its respective engine. During subsequent examination of the helicopter, 76 kg of fuel was recovered from the main fuel tank. However, the supply tank was found to have been empty at the time of impact. It was deduced from wreckage examination and testing that both fuel transfer pumps in the main tank had been selected off for a sustained period before the accident, leaving the fuel in the main tank, unusable. The low fuel 1 and low fuel 2 warning captions, and their associated audio attention-getters, had been triggered and acknowledged, after which, the flight had continued beyond the 10-minute period specified in the Pilot's Checklist Emergency and Malfunction Procedures.

The helicopter was not required to have, and was not fitted with, flight recorders. However, data and recordings were recovered from non-volatile memory (NVM) in systems on board the helicopter, and radar, radio, police equipment and CCTV recordings were also examined.

During the investigation, the EC135's fuel sensing, gauging and indication system, and the Caution Advisory Display and Warning Unit were thoroughly examined. This included tests resulting from an incident involving another EC135 T2+.

Despite extensive analysis of the limited evidence available, it was not possible to determine why both fuel transfer pumps in the main tank remained off during the latter part of the flight, why the helicopter did not land within the time specified following activation of the low fuel warnings and why a MAYDAY call was not received from the pilot. Also, it was not possible to establish why a more successful autorotation and landing was not achieved, albeit in particularly demanding circumstances.

The investigation identified the following causal factors:

1. 73 kg of usable fuel in the main tank became unusable as a result of the fuel transfer pumps being switched off for unknown reasons.

2. It was calculated that the helicopter did not land within the 10-minute period specified in the Pilot's Checklist Emergency and Malfunction Procedures, following continuous activation of the low fuel warnings, for unknown reasons.

3. Both engines flamed out sequentially while the helicopter was airborne, as a result of fuel starvation, due to depletion of the supply tank contents.

4. A successful autorotation and landing was not achieved, for unknown reasons.

The investigation identified the following contributory factors:

1. Incorrect management of the fuel system allows useable fuel to remain in the main tank while the contents in the supply tank become depleted.

2. The RADALT and steerable landing light were unpowered after the second engine flamed out, leading to a loss of height information and reduced visual cues.

3. Both engines flamed out when the helicopter was flying over a built-up area.

Safety Recommendation UNKG-2015-030 (AAIB)

It is recommended that, when the European Aviation Safety Agency requires a radio altimeter to be fitted to a helicopter operating under an Air Operator's Certificate, it also stipulates that the equipment is capable of being powered in all phases of flight, including emergency situations, without intervention by the crew.

Reply No. 3 sent on 15/03/2016:

The legal framework on equipping helicopters with a radio altimeter is contained in Commission Regulation (EU) N° 965/2012 and related Acceptable Means of Compliance (AMC) and Guidance Material (GM), as follows:

- Annex IV Part-CAT (Commercial Air Transport operations): for flights over water under certain conditions (refer to CAT.IDE.H.145), and for 'coastal transit' operations (refer to CAT.OP.MPA.137 as further detailed in GM1 CAT.OP.MPA.137(b)).
- Annex V Part-SPA (Specific Approvals): for operations with night vision imaging system (NVIS) (refer to SPA.NVIS.110)

The Agency certifies any radio altimeter installation proposed by applicants, whether it is required by the operational regulation or not. In this frame, the Agency investigates systematically the criticality of radio altimeter availability both in normal and emergency situations.

When a procedure is proposed which requires the pilot to use the radio altimeter, the procedure is assessed to check if it is feasible and can be performed by pilots without requiring exceptional piloting skills. If it appears that the radio altimeter must be available without pilot action, the Agency requires that the radio altimeter remains powered in the scenario considered, included emergency if applicable. There may be emergency scenarios where the main electrical generation is lost and it is preferable not to automatically power the radio altimeter, because it is not a critical system and the battery must be preserved in order to support continued safe flight and landing.

Furthermore, it is reminded that a radio altimeter only provides accurate information over flat surfaces, as opposed to congested areas covered with buildings and other obstacles. There is therefore no guarantee that its availability contributes to reduce the risk associated with an autorotation carried out over an area covered with obstacles like urban areas.

The Agency therefore considers that it is not appropriate to universally mandate an automatic powering of the radio altimeter in emergency situation.

The Agency considers that current certification specifications contain adequate provisions to ensure that, when equipment such as the radio altimeter is installed, it can be readily available and used by the flight crew without creating excessive workload in all phases of flight, including emergency situations.

Status: Closed – **Category**: Disagreement

Safety Recommendation UNKG-2015-035 (AAIB)

It is recommended that the European Aviation Safety Agency mandate the ICAO Annex 6 flight recorder requirements for all helicopter emergency medical service operations, regardless of aircraft weight. The last two hours of flight crew communications and cockpit area audio should be recorded. The cockpit area audio recording should continue for 10 minutes after the loss of normal electrical power.

Reply No. 2 sent on 09/02/2016:

This safety recommendation will be considered within the framework of rulemaking task RMT.0271 'In-flight recording for light aircraft'. The associated Notice of Proposed Amendment is expected to be published in the Summer of 2016.

Status: Open – **Category**:

Registration	Aircraft Type	Location	Date of event	Event Type
G-FRAK	DASSAULT FANJET FALCON	Portland range near to Bournemouth, UK	25/04/2015	Accident

Synopsis of the event:

The aircraft was undertaking target towing operations for a military exercise and was recovering the target whilst flying in an assigned danger area over the English Channel. With the target approximately 40 m from the aircraft, the target winch accelerated rapidly and the target struck the leading edge of the wing before detaching and travelling over the wing. Although, the launcher and the droop leading edge on the wing were damaged, the aircraft landed safely. The target winch is powered by a turbine, and the speed of the turbine is controlled by vent doors. The target winch had oversped due to a fault with the closed limit switch on the vent doors which prevented the doors from closing. The operator and manufacturer have carried out several safety actions as a result of the investigations and one Safety Recommendation is made.

Safety Recommendation UNKG-2015-037 (AAIB)

It is recommended that the European Aviation Safety Agency, require that Meggitt Defense Systems Inc review the design, maintenance and operation of the RM30 and similar winches to reduce the possibility of an uncommanded target acceleration during recovery.

Reply No. 1 sent on 07/01/2016:

EASA has contacted Meggitt Aerospace and the STC holder of the STC which approves the installation of the RM30 in the Falcon 20. A modified design of the winches reducing the possibility of an un-commanded target acceleration during recovery is expected to be ready by the first half of 2016. This modified design will be introduced in all the F20 that have the mentioned STC embodied.

In the meantime, the operator which operates those F20 with the STC embodied has modified its operational procedures for the target recovery anticipating the transition to the winch slow speed and requesting the pilot not flying to assist the tow operator by monitoring the position of the gill doors that control the winch speed; in addition, a test of the micro-switches that confirms the closed position of the gill doors has been introduced, and improvements in the visibility of the gill doors position have been achieved by painting markings on the gill doors and by re-alignment checks and enhanced lens cleaning procedure of the cameras that record the gill doors positions.

Status: Open – **Category**:

Registration	Aircraft Type	Location	Date of event	Event Type
CAW STUDY	several		#Missing#	

Synopsis of the event:

Airworthiness of aircraft registered overseas and resident in the UK

Since 2008, the AAIB investigations of several general aviation (GA) fatal accidents involving aircraft registered overseas revealed common airworthiness issues. A safety study was initiated by the AAIB to determine if these issues were associated with aircraft not registered in the UK, but resident and operated within it.

Safety Recommendation UNKG-2015-039 (AAIB)

It is recommended that EASA determine the extent to which airworthiness standards of aircraft resident within a Member State but registered elsewhere are being applied consistently across Member States, and publish its findings.

Reply No. 2 sent on 24/11/2016:

In addition to the answer provided on 13 April 2016 to Safety Recommendation UNKG-2015-039 and following the meeting held on 26 August 2016 between EASA and the UK AAIB, the following EASA actions and measures have been considered:

1. For all aircraft:

EASA and the Competent Authorities of the EASA Member States (MS) routinely analyse occurrences (Accidents, Serious Incidents and Incidents) reported under Regulation (EU) 376/2014 into the European Central Repository, as mandated within this regulation, in order to identify the main safety issues for each operational domain. This is done through the Network of Analysts (NoA), which is established in this regulation. This analysis and the associated safety issues are discussed at the NoA Meetings at least twice per year. So far, it has not identified any concerns related to the airworthiness of non-EU registered aircraft operating in an EU MS, or aircraft registered in an EU MS but resident in another EU MS.

The NoA, however, will raise this issue with the MS at the next meeting on 1 December 2016. The NoA will also perform additional analysis of the differences between the occurrences where State of Occurrence and State of Registry are the same and where they are different.

2. For aircraft registered in an EU MS, but resident in another EU MS:

EASA plans to collect aircraft reference data to support safety analysis activities within the NoA. This project was initially designed to capture fleet and movements data but to support better understanding of the issue, EASA will also request information from National Aviation Authorities on the numbers of aircraft where the registered owner resides outside their territory.

3. For foreign (Third Country) registered aircraft resident in an EU MS:

EASA will continue to work with the US FAA and other countries from where registered aircraft have accidents in an EU MS to better evaluate the size of their fleets operating in Europe.

4. Regarding the AAIB Safety Study – 1/2016:

On 06 September 2016, formal contact was made with the Competent Authorities of the Hungarian NAA regarding the HA-LFB safety case found in the UK AAIB study. Based on Hungarian NAA actions that have been taken or will be taken and reported, EASA will consider whether a standardisation inspection would be required to investigate if there are now fixes in place to prevent recurrence of the highlighted non-conformities.

5. Regarding the implementation and oversight of the continued airworthiness standards to apply consistently across the EU MS:

The Agency will issue a notification to the EU MS in order to:

a. Emphasise the EU regulatory framework applicable to these aircraft;
b. raise awareness of the MS regarding the potential safety issues associated to these aircraft;
c. recommend a package of actions to address the oversight of these aircraft within that EU regulatory framework, keeping in mind that the overall responsibilities for these aircraft always remain within the state of registry, in line with the ICAO Chicago Convention.
d. Recommend the collection and sharing of data between the Member States and EASA in order to get a better understanding of these aspects.

Status: Open – **Category**:

Registration	Aircraft Type	Location	Date of event	Event Type
G-WNSB	AEROSPATIALE AS332	on approach to Sumburgh Airport in the Shetland Islands	23/08/2013	Accident

Synopsis of the event:

At 1717 hrs UTC on 23 August 2013, an AS332 L2 Super Puma helicopter with sixteen passengers and two crew on board crashed in the sea during the approach to land at Sumburgh Airport. Four of the passengers did not survive.

The purpose of the flight was to transport the passengers, who were employees of the UK offshore oil and gas industry, to Aberdeen. On the accident flight, the helicopter had departed the Borgsten Dolphin semi-submersible drilling platform in the North Sea, to route to Sumburgh Airport for a refuelling stop. It then planned to continue to Aberdeen Airport.

The commander was the Pilot Flying (PF) on the accident sector. The weather conditions were such that the final approach to Runway 09 at Sumburgh Airport was flown in cloud, requiring the approach to be made by sole

reference to the helicopter's instruments, in accordance with the Standard Operating Procedure (SOP) set out in the operator's Operating Manual (OM). The approach was flown with the autopilot in 3-axes with Vertical Speed (V/S) mode, which required the commander to operate the collective pitch control manually to control the helicopter's airspeed. The co-pilot was responsible for monitoring the helicopter's vertical flightpath against the published approach vertical profile and for seeking the external visual references necessary to continue with the approach and landing. The procedures permitted the helicopter to descend to a height of 300 ft, the Minimum Descent Altitude (MDA) for the approach, at which point a level-off was required if visual references had not yet been acquired.

Although the approach vertical profile was maintained initially, insufficient collective pitch control input was applied by the commander to maintain the approach profile and the target approach airspeed of 80 kt. This resulted in insufficient engine power being provided and the helicopter's airspeed reduced continuously during the final approach. Control of the flightpath was lost and the helicopter continued to descend below the MDA. During the latter stages of the approach the helicopter's airspeed had decreased below 35 kt and a high rate of descent had developed.

The decreasing airspeed went unnoticed by the pilots until a very late stage, when the helicopter was in a critically low energy state. The commander's attempt to recover the situation was unsuccessful and the helicopter struck the surface of the sea approximately 1.7 nm west of Sumburgh Airport. It rapidly filled with water and rolled inverted, but was kept afloat by the flotation bags which had deployed.

Search and Rescue (SAR) assets were dispatched to assist and the survivors were rescued by the Sumburgh-based SAR helicopters that attended the scene.

The investigation identified the following causal factors in the accident:

- The helicopter's flight instruments were not monitored effectively during the latter stages of the non-precision instrument approach. This allowed the helicopter to enter a critically low energy state, from which recovery was not possible.

- Visual references had not been acquired by the Minimum Descent Altitude (MDA) and no effective action was taken to level the helicopter, as required by the operator's procedure for an instrument approach.

The following contributory factors were identified:

- The operator's SOP for this type of approach was not clearly defined and the pilots had not developed a shared, unambiguous understanding of how the approach was to be flown.

- The operator's SOPs at the time did not optimise the use of the helicopter's automated systems during a Non-Precision Approach.

- The decision to fly a 3-axes with V/S mode, decelerating approach in marginal weather conditions did not make optimum use of the helicopter's automated systems and required closer monitoring of the instruments by the crew.

- Despite the poorer than forecast weather conditions at Sumburgh Airport, the commander had not altered his expectation of being able to land from a Non-Precision Approach.

Safety Recommendation UNKG-2016-001 (AAIB)

It is recommended that the European Aviation Safety Agency introduces a requirement for instrument rated pilots to receive initial and recurrent training in instrument scan techniques specific to the type of aircraft being operated.

Reply No. 1 sent on 06/06/2016:

The current provisions in Commission Regulation (EU) No 1178/2011, to ensure that the pilot attains and maintains a suitable level of competency in instrument scanning, include:

- Basic instrument flight exercises for the Private Pilot Licence (PPL) [for example, see Acceptable Means of Compliance AMC1 FCL.210.H (d)(2)(xxxvii) 'Exercise 30: Basic Instrument Flight' (B)(b)];
- Flight Instructor and Flight Examiner competencies [for example, see FCL.930, FCL.935, FCL.1000 and FCL.1010 (a)];
- Controls and checks through the Approved Training Organisation (ATO)'s safety management system [for example, see ARA.GEN.200 (a)(3)];
- Controls and checks through oversight, by the licencing authorities, of the licensing process and training providers (for example, see ORA.GEN.300 and ARA.GEN.350).

Maintenance and checking of the instrument scanning skills is also assured through the existing operator conversion and recurrent training provisions in Part ORO.FC (Organisation Requirements for air Operations – Flight Crew) of Commission Regulation (EU) No 965/2012. This includes operator proficiency checks (OPCs), line flying under supervision (LIFUS), recency, and differences or familiarisation training when required by Annex I (Part-FCL) to Regulation (EU) No 1178/2011, and when changing equipment or procedures requiring additional knowledge on types or variants currently operated.

The LIFUS ensure that the pilot is able to perform a safe and efficient flight, and this requires proficiency in instrument scanning [GM1 ORO.FC.220 (d)].

Effective implementation of the above-mentioned regulations provide suitable mitigation for the risks associated with instrument scanning by pilots.

Status: Closed – **Category**: Partial agreement

Safety Recommendation UNKG-2016-002 (AAIB)

It is recommended that the European Aviation Safety Agency reviews the existing research into pilot instrument scan techniques, particularly with respect to glass cockpit displays, with a view to addressing shortcomings identified in current instrument scan training methods.

Reply No. 2 sent on 17/10/2016:

In agreement with the recommendation, the Agency has established a working group to review the existing research into pilot instrument scan techniques, particularly with respect to glass cockpit displays.

The objective, is to identify any potential need for revised training in pilot instrument scan techniques that could improve the effectiveness of the crew monitoring functions.

The first phase of the review is expected to be completed in the first quarter 2017.

Status: Open – **Category**:

Safety Recommendation UNKG-2016-005 (AAIB)

It is recommended that the European Aviation Safety Agency amends the Certification Specifications for Large Rotorcraft (CS 29) to align them with the Certification Specifications and Acceptable Means of Compliance for Large Aeroplanes (CS 25), with regard to the provision of operational information in Flight Manuals.

Reply No. 1 sent on 27/04/2016:

The Agency supports the intent of this safety recommendation. Options are being considered to launch a rulemaking activity on this subject.

Status: Open – **Category**:

Safety Recommendation UNKG-2016-006 (AAIB)

It is recommended that the European Aviation Safety Agency requires manufacturers of large rotorcraft to develop Flight Crew Operating Manuals for public transport types already in service.

Reply No. 1 sent on 27/04/2016:

The Agency encourages since several years manufacturers of larger rotorcraft to provide information on how the rotorcraft should be operated and develop Flight Crew Operating Manuals (FCOM) or similar. EASA welcomed that manufacturers for those aircraft types used by the offshore industry have voluntarily agreed to produce FCOMs. The report states that Airbus Helicopter have already produced an FCOM for the EC225 for oil and gas operations and have committed to do it for the H175 and H160. For the 332L2 a Flight Operation Briefing Note (FOBN) will be released. However, providing that an FCOM is not mandatory for certification of the aircraft (fixed wing or rotorcraft), the Agency does not intend to raise a retroactive mandate for existing rotorcraft but will continue actively encouraging and supporting manufacturers with this initiative.

Status: Closed – **Category**: Partial agreement

Safety Recommendation UNKG-2016-008 (AAIB)

It is recommended that the European Aviation Safety Agency considers establishing a European Operators Flight Data Monitoring forum for helicopter operators to promote and support the development of Helicopter Flight Data Monitoring programmes.

Reply No. 1 sent on 27/04/2016:

The Agency intends to assess publicly available guidance for helicopters FDM programmes and already established industry initiatives. The expectations of European helicopter operators with regards to FDM will also be surveyed.

The decision to launch a FDM promotion initiative dedicated for European helicopter operators will depend on this assessment.

Status: Open – **Category**:

Safety Recommendation UNKG-2016-009 (AAIB)

It is recommended that the European Aviation Safety Agency collaborates with National Aviation Authorities and helicopter operators to develop and publish guidance material on detection logic for Helicopter Flight Data Monitoring programmes.

Reply No. 1 sent on 27/04/2016:

The Agency intends to propose to the European Authorities coordination group on flight data monitoring (EAFDM) the topic of detection logic for helicopter FDM programmes.

European helicopter operators will also be contacted in order to determine if they are willing to support it.

Status: Open – **Category**:

Safety Recommendation UNKG-2016-013 (AAIB)

It is recommended that the European Aviation Safety Agency requires the installation of Helicopter Terrain Awareness Warning Systems to all helicopters, used in offshore Commercial Air Transport operations, with a Maximum Certificated Take-off Mass (MCTOM) of more than 3,175 kg, or a Maximum Operational Passenger Seating Configuration (MOPSC) of more than nine, manufactured before 31 December 2018.

Reply No. 2 sent on 24/11/2016:

Helicopters used in offshore Commercial Air Transport (CAT) operations, with a Maximum Certificated Take-Off Mass (MCTOM) of more than 3175 kg or a Maximum Operational Passenger Seating Capacity (MOPSC) of more than 9, and first issued with an individual Certificate of Airworthiness (CofA) after 31 December 2018, are required to be equipped with a Helicopter Terrain Awareness Warning System (HTAWS) (see SPA.HOFO.160 (c) of Commission Regulation (EU) 2016/1199 amending Regulation No 965/2012 on air operations).

A Safety Risk Portfolio (SRP) for offshore CAT helicopter operations was established by the European Aviation Safety Agency (EASA) in 2014, in order to identify the associated key risk areas and safety issues (see Annual Safety Review 2014 and 2016 published on the EASA web site).

As part of the development of the SRP, EASA has conducted a Preliminary Impact Assessment (PIA) to determine and prioritise any actions that the Agency should take to address the related safety issues. One of the candidate actions is Controlled Flight into Terrain (CFIT) prevention with HTAWS.

In response to the September 2016 PIA findings, the Agency intends to introduce a new Rulemaking Task (RMT) into its Rulemaking Programme (RMP) for 2017-2021, in order to consider extending the existing HTAWS requirements for offshore helicopter operations to include those helicopters first issued with an individual Certificate of Airworthiness (CofA) on or before 31 December 2018 (ie retrofit).

It should be noted that research programmes have been taking place to improve HTAWS software in order to increase the time between the first caution or warning and impact without generating more false warnings for offshore operations. Further research may still be needed, and an improved European Technical Standard Order (ETSO) be published, before mandating retrofit for the existing offshore helicopter fleet.

The Agency's Rulemaking Programme for 2017-2021 is expected to be published in the fourth quarter of 2016, after consultation with the EASA Member States' Advisory Body (MAB) and the Stakeholders Advisory Body (SAB).

In the meantime, safety promotion material produced by the European Helicopter Safety Team (EHEST) already addresses some of the root causes of CFIT accidents. For example, 'HE9 Automation and flight path management' for Instrument Flight Rules (IFR) flights (published in September 2015) and 'Helicopter Flight Instructor Manual' for unplanned flying in Instrument Meteorological Conditions (IMC) during Visual Flight Rules (VFR) flights (published in June 2015).

Status: Open – **Category**:

Safety Recommendation UNKG-2016-014 (AAIB)

It is recommended that the European Aviation Safety Agency introduces a requirement for the installation of cockpit image recorders, in aircraft required to be equipped with Flight Data and Cockpit Voice Recorders, to capture flight crew actions within the cockpit environment.

Reply No. 1 sent on 30/05/2016:

A consultation with Contracting States, conducted by the International Civil Aviation Organization (ICAO) in 2009 and 2010, revealed that most States had not implemented any legislation to protect the contents of cockpit image recorders from improper use, and that many States were concerned that safety data collection might be adversely impacted by the misuse of recordings from cockpit image recorders.

The Agency shared this concern. The risk of misuse of images is considered significant when the recorder is capturing large parts of the bodies of the flight crew members or a view of their faces. On the other hand, a recorder primarily designed to capture a view of the information displayed to the flight crew members is considered to be more acceptable.

This is why the International Civil Aviation Organization (ICAO) adopted, in March 2016, new standards for Annex 6 Part I on the protection of recordings from flight recorders, including cockpit image recorders. In addition, the Flight Recorder Specific Working Group of ICAO is currently considering standards for the recording of images in the cockpit that are less susceptible to misuse. It is expected that this working group will present their proposals on this topic before the end of 2016. The Agency is actively supporting this ICAO task.

Once ICAO has introduced standards prescribing the carriage of cockpit image recorders, the Agency will consider initiating a rulemaking activity on the subject.

Status: Open – **Category**:

Safety Recommendation UNKG-2016-015 (AAIB)

It is recommended that the European Aviation Safety Agency introduces a requirement to install image recorders, capable of monitoring the cabin environment, in aircraft required to be equipped with Flight Data Recorder and Cockpit Voice Recorders.

Reply No. 1 sent on 30/05/2016:

The scope of the recommendation includes rotorcraft operating other than offshore, as well as all fixed wing aircraft operations. EASA considers that there is an appreciably lower likelihood of gaining valuable data from cabin image recorders in incidents and accidents involving such aircraft categories and types of operation. A cabin image recorder will bring limited information on the conduct of the flight and would be a useful investigation tool in only a small subset of accident scenarios. The expected benefit of cabin image recorders for the future reduction of fatalities and injuries in aircraft accidents is considered to be much lower than the benefit brought by flight recorders capturing activities related to the conduct of the flight (i.e. the flight data recorder or the cockpit voice recorder).

While recording images of the cabin might bring limited benefits to the investigation of accidents similar to that of the subject report, it could also represent a serious breach into passengers' privacy. In addition, any leakage or misuse of such image recordings could have a significant negative effect.

The risk of misuse of images is considered significant when the recorder is capturing large parts of the bodies of the cabin members or a view of their faces.

For Aircrew, the International Civil Aviation Organization (ICAO) adopted, in March 2016, new standards for Annex 6 Part I on the protection of recordings from flight recorders, including cockpit image recorders. However, this protection is not applicable to cabin personnel.

Therefore, the Agency has concluded not to require the installation of cabin image recorders.

Status: Closed – **Category**: Disagreement

Safety Recommendation UNKG-2016-016 (AAIB)

It is recommended that the European Aviation Safety Agency instigates a research programme to provide realistic data to better support regulations relating to evacuation and survivability of occupants in commercial helicopters operating offshore. This programme should better quantify the characteristics of helicopter underwater evacuation and include conditions representative of actual offshore operations and passenger demographics.

Reply No. 1 sent on 27/04/2016:

EASA agrees that generation of safety data as suggested by this recommendation, and the related discussion text in the accident report, could provide valuable input to future rulemaking decisions related to underwater evacuation of rotorcraft. EASA will perform an initial review into the nature of the research, that could be envisaged.

Status: Open – **Category**:

Safety Recommendation UNKG-2016-017 (AAIB)

It is recommended that, where technically feasible, regulatory changes introduced by the European Aviation Safety Agency Rulemaking Task RMT.120 are applied retrospectively to helicopters currently used in offshore operations.

Reply No. 1 sent on 27/04/2016:

The Terms of Reference for Rulemaking task RMT.0120 ('Helicopter ditching and water impact occupant survivability') includes the task of considering retroactive requirements for already certified helicopters. Following EASA NPA 2016-01 (dedicated to Certification Specifications, published 23/03/2016), the application of the requirement to existing helicopters will be considered in a second NPA.

Based on this second NPA consultation, the Agency will develop an Opinion for a Part-26 regulation.

Status: Open – **Category**:

Safety Recommendation UNKG-2016-018 (AAIB)

It is recommended that the European Aviation Safety Agency amends the Certification Specifications for rotorcraft (CS 27 and 29) to require the installation of systems for the automatic arming and activation of flotation equipment. The amended requirements should also be applied retrospectively to helicopters currently used in offshore operations.

Reply No. 2 sent on 07/06/2016:

In the frame of Rulemaking task RMT.0120 ('Helicopter ditching and water impact occupant survivability'), Notice of Proposed Amendment (NPA) 2016-01 was published on 23/03/2016. The proposal includes provisions for requirements meeting the intent of this safety recommendation.

The proposed CS 27.801(c) and CS 29.801(c) read: 'Emergency flotation systems that are stowed in a deflated condition during normal flight must:

(...)

(2) if operable within a restricted flight envelope, have an automatic means of arming, disarming and rearming, to enable the system to function, except in flight conditions in which float deployment may be hazardous to the rotorcraft; otherwise the system shall be armed at all times in flight; and

(3) have a means of automatic deployment following water entry.'

The application of the requirements to existing helicopters will be considered in a second NPA.

Status: Open – **Category**:

Safety Recommendation UNKG-2016-019 (AAIB)

It is recommended that the European Aviation Safety Agency amends the Certification Specifications for Large Rotorcraft (CS 29), certified for offshore operation, to require the provision of a side-floating capability for a helicopter in the event of impact with water or capsize after ditching. This should also be applied retrospectively to helicopters currently used in offshore operations.

Reply No. 1 sent on 27/04/2016:

In the frame of Rulemaking task RMT.0120 ('Helicopter ditching and water impact occupant survivability'), NPA 2016-01 was published on 23/03/2016. The NPA 2016-01 proposal includes a provision for a requirement meeting the intent of this safety recommendation in term of survivability objective, although it is not prescriptive to a particular design solution.

The proposed CS 29.801(i) is: 'The rotorcraft design must incorporate appropriate post-capsize survivability features to enable all passenger cabin occupants to safely egress the rotorcraft, taking into account the human breath hold capability'.

AMC 29.801(c)(8) provides that 'One method of meeting the post-capsize survivability provisions of CS 29.801(i) is to create a post-capsize rotorcraft floating attitude which will create and air pocket in the passenger cabin. This can be achieved by means of additional buoyancy.

An air pocket will remove the time pressure for escape. Passengers will not need to immediately escape through a ditching emergency exit. They can utilise the air in the pocket for continued survival during the time needed for all to make their escape'.

The application of the requirement to existing helicopters will be considered in a second NPA.

Status: Open – **Category**:

Safety Recommendation UNKG-2016-020 (AAIB)

It is recommended that the European Aviation Safety Agency amends the Certification Specifications for Large Rotorcraft (CS 29), certified for offshore operation, to ensure that any approved cabin seating layouts are designed such that, in an emergency (assuming all the exits are available), each exit need only be used by a maximum of two passengers seated directly adjacent to it.

Reply No. 2 sent on 08/09/2016:

In agreement with the recommendation, the Agency has published in the frame of Rulemaking task RMT.0120 'Helicopter ditching and water impact occupant survivability', Notice of Proposed Amendment (NPA) 2016-01 on 23/03/2016.

The NPA 2016-01 proposes specifications meeting the intent of the safety recommendation:

- The proposed CS 29.807(d)(1) specifies one ditching emergency exit in each side of the rotorcraft, meeting at least the dimensions of a Type IV exit for each unit (or part of a unit) of four passenger seats. However, the passenger seat-to-exit ratio may be increased for exits large enough to permit the simultaneous egress of two passengers side by side'.
- The proposed CS 29.813(d)(1) specifies that passenger seats are located relative to these exits in a way to best facilitate escape.

In addition, the proposed associated Acceptable Means of Compliance (AMC) indicates that the objective of this latter rule is that no passenger is in a worse position than the second person to egress through an exit.

Status: Open – **Category**:

Safety Recommendation UNKG-2016-021 (AAIB)

It is recommended that the European Aviation Safety Agency amends the Certification Specifications for Large Rotorcraft (CS 29), certified for commercial offshore operations, to include minimum size limitations for all removable exits, to allow for the successful egress of a 95th percentile-sized offshore worker wearing the maximum recommended level of survival clothing and equipment.

Reply No. 2 sent on 17/10/2016:

In agreement with the recommendation, the Agency published in the frame of Rulemaking Task RMT.0120 ('Helicopter ditching and water impact occupant survivability'), Notice of Proposed Amendment (NPA) 2016-01 on 23/03/2016. The proposal includes a provision for a requirement to meet the intent of this safety recommendation. The proposed Certification Specifications for Large Rotorcraft CS 29.807(d) requires the provision of "ditching emergency exits" meeting at least the dimensions of a Type IV exit, optimised for underwater use, for each unit of four passengers, and that passenger seats be installed in the cabin such that access to these exits is optimised (i.e. no passenger need wait for more than one other passenger to egress before making their own escape). As explained in the NPA Appendix B, item 36 on size of occupants, studies have shown that the dimensions of a Type IV exit would be sufficient to allow successful egress of a 95th percentile-sized offshore worker wearing the maximum recommended level of survival clothing and equipment.

It is to be noted that the proposal to expand the CS 29 requirement for "ditching emergency exits", as explained above, requires such an increase in number and size of these exits that in future designs there will be neither room nor need for additional removable exits, such as push-out windows.

The associated Executive Director (ED) Decision is expected to be published in the first quarter 2017.

Status: Open – **Category**:

Safety Recommendation UNKG-2016-022 (AAIB)

It is recommended that the European Aviation Safety Agency amends the Certification Specifications for Large Rotorcraft (CS 29), certified for use in commercial offshore operations, to require a common standard for emergency exit opening mechanisms, such that that the exit may be removed readily using one hand and in a continuous movement.

Reply No. 1 sent on 27/04/2016:

Paragraph (c) of CS 29.809 'Emergency exit arrangement' requires that the means of opening each emergency exit is simple and obvious and may not require exceptional effort.

In the frame of Rulemaking task RMT.0120 ('Helicopter ditching and water impact occupant survivability'), NPA 2016-01 was published for public comment on 23/03/2016. The NPA 2016-01 proposal includes a provision text in AMC 29.809 stating that a design, where it is needed to use more than one hand to operate the exit, would not be considered compliant with CS 29.809(c).

Status: Open – **Category**:

Safety Recommendation UNKG-2016-023 (AAIB)

It is recommended that the European Aviation Safety Agency amends the operational requirements for commercial offshore helicopters to require the provision of compressed air emergency breathing systems for all passengers and crew.

Reply No. 2 sent on 24/11/2016:

This recommendation has been addressed within the framework of the European Aviation Safety Agency (EASA) rulemaking tasks RMT.0409 and RMT.0410 'Helicopter Offshore Operations', which have concluded with the publication of Commission Regulation (EU) 2016/1199, amending Commission Regulation (EU) No 965/2012 on air operations, and an Executive Director (ED) Decision containing the associated Acceptable Means of Compliance (AMC) and Guidance Material (GM).

Commission Regulation (EU) 2016/1199, published in the Official Journal of the European Union on 22 July 2016, introduces new implementing rules for Specific Approvals (SPA) for Helicopter Offshore Operations (HOFO) in Annex V (Part-SPA) of the air operations regulation. According to SPA.HOFO.165 (c), all persons on board shall carry and be instructed in the use of emergency breathing systems (EBS).

ED Decision 2016/022/R 'Helicopter offshore operations', published on the EASA web site on 7 October 2016, includes AMC1 SPA.HOFO.165 (c) which states that the EBS of SPA.HOFO.165(c) should be an EBS system capable of rapid underwater deployment. This AMC describes the goal to be achieved which is to enable underwater breathing following a rapid submerging of the cockpit and cabin, rather than specifying the only acceptable technical means, such as compressed air EBS as mentioned in the recommendation, because technological advancement may allow other EBS types to be accepted.

Lastly, the proper use of EBS should be presented and demonstrated to passengers by audio-visual electronic means (video, DVD or similar), or the passengers should be informed about them by a crew member prior to boarding the aircraft (see subparagraph (c) of AMC1 SPA.HOFO.110(b)(2) of ED Decision 2016/022/R).

Status: Closed – **Category**: Agreement

Safety Recommendation UNKG-2016-024 (AAIB)

It is recommended that the European Aviation Safety Agency (EASA) amends the operational requirements for commercial offshore helicopter operations to require operators to demonstrate that all passengers and crew travelling offshore on their helicopters have undertaken helicopter underwater escape training at an approved training facility, to a minimum standard defined by the EASA.

Reply No. 2 sent on 24/11/2016:

This recommendation has been partially addressed within the framework of the European Aviation Safety Agency (EASA) rulemaking tasks RMT.0409 and RMT.0410 'Helicopter Offshore Operations', which have concluded with the publication of Commission Regulation (EU) 2016/1199, amending Commission Regulation (EU) No 965/2012 on air operations, and an Executive Director (ED) Decision containing the associated Acceptable Means of Compliance (AMC) and Guidance Material (GM).

Commission Regulation (EU) 2016/1199, published in the Official Journal of the European Union on 22 July 2016, includes new implementing rules for Specific Approvals (SPA) for Helicopter Offshore Operations (HOFO) in Annex V (Part-SPA) of the air operations regulation. According to SPA.HOFO.170 (a)(3), the operator shall establish a flight crew training and checking programme that each flight crew member shall complete successfully. Such programme shall be adapted to the offshore environment and include normal, abnormal and emergency procedures, crew resource management, water entry and sea survival training.

ED Decision 2016/022/R 'Helicopter offshore operations', published on the EASA web site on 7 October 2016, provides AMC to SPA.HOFO.170. Water entry and sea survival training, including operation of all associated safety equipment, should be an element of the recurrent training, as described in AMC1 ORO.FC.230(a)(2)(iii)(F) (see subparagraph (b) of AMC1 SPA.HOFO.170 (a)).

EASA has considered the recommendation to define the minimum helicopter underwater escape training standards. The detail included in the training syllabus for flight crew will depend on the type of offshore operation being performed, the environment in which the operation takes place, the type of helicopter operated, and the type of emergency and survival equipment required. Therefore, EASA considers that operators should define their own standards which should be tailored to suit their own operations and fleet. This is in line with the Safety Management System principles which require the operator to identify hazards, perform associated risk assessments and implement mitigation to achieve an acceptable level of safety (see Organisation Requirements for Air Operations ORO.GEN.200 of Commission Regulation (EU) No 965/2012). The competent authority should oversee this as part of its assessment of the organisation to ensure continued competence to conduct safe operations in compliance with the applicable requirements (see Authority Requirements for Air Operations ARO.GEN.300 of Commission Regulation (EU) No 965/2012).

The part of the recommendation on underwater escape training for passengers travelling in commercial offshore helicopter operations will be further evaluated by the Agency. Any subsequent action by the Agency will depend on the results of the evaluation.

Status: Open – **Category**:

Safety Recommendation UNKG-2016-025 (AAIB)

It is recommended that the European Aviation Safety Agency amends the design requirements for helicopters to ensure that where liferafts are required to be fitted, they can be deployed readily from a fuselage floating in any attitude.

Reply No. 1 sent on 27/04/2016:

In the frame of Rulemaking task RMT.0120 ('Helicopter ditching and water impact occupant survivability'), NPA 2016-01 was published on 23/03/2016.

The NPA 2016-01 proposal includes provisions in CS 27.1415(c) and CS 29.1415(b)(2) requiring that life rafts must be remotely deployable for ready use in an emergency. Remote controls capable of deploying the life rafts must be located within easy reach of the flight crew, occupants of the passenger cabin and survivors in the water. It must be demonstrated that life rafts sufficient to accommodate all rotorcraft occupants, without exceeding the rated capacity of any life raft, can be reliably deployed with the rotorcraft in any reasonably foreseeable floating attitude, including capsized, and in the sea conditions chosen for showing compliance with CS 27.801(e)/CS 29.801(e).

Status: Open – **Category**:

Safety Recommendation UNKG-2016-026 (AAIB)

It is recommended that the European Aviation Safety Agency requires that, for existing helicopters used in off-shore operations, a means of deploying each liferaft is available above the waterline, whether the helicopter is floating upright or inverted.

Reply No. 1 sent on 27/04/2016:

In the frame of Rulemaking task RMT.0120 ('Helicopter ditching and water impact occupant survivability'), EASA NPA 2016-01 was published on 23/03/2016. The NPA 2016-01 proposal (dedicated to certification specifications (CS) of rotorcraft under CS-29 or CS-27) includes a provision for a requirement meeting the intent of this safety recommendation. The proposed CS 27/29.1415 requires life rafts remote controls to be located within easy reach of the flight crew, occupants of the passenger cabin and survivors in the water with the rotorcraft in the upright floating or capsized position.

The application of the requirement to existing helicopters will be considered in a second NPA.

Status: Open – **Category**:

Registration	Aircraft Type	Location	Date of event	Event Type
G-LGNO	SAAB 2000	en-route	15/12/2014	Serious incident

Synopsis of the event:

The aircraft was inbound to land on Runway 27 at Sumburgh when the pilots discontinued the approach because of weather to the west of the airport. As the aircraft established on a southerly heading, it was struck by lightning. When the commander made nose-up pitch inputs the aircraft did not respond as he expected. After reaching 4,000 ft amsl the aircraft pitched to a minimum of 19° nose down and exceeded the applicable maximum operating speed (VMO) by 80 kt, with a peak descent rate of 9,500 ft/min. The aircraft started to climb after reaching a minimum height of 1,100 ft above sea level.

Recorded data showed that the autopilot had remained engaged, contrary to the pilots' understanding, and the pilots' nose-up pitch inputs were countered by the autopilot pitch trim function, which made a nose-down pitch trim input in order to regain the selected altitude.

Safety Recommendation UNKG-2016-051 (AAIB)

It is recommended that the European Aviation Safety Agency review the autopilot system designs of aircraft certified under part 25 or equivalent regulations and require modification if necessary to ensure that the autopilot does not create a potential hazard when the flight crew applies an override force to the flight controls.

Reply No. 1 sent on 24/11/2016:

The Agency is currently reviewing the history of similar events on the large transport aeroplane fleet to assess the risks associated with the current autopilot system design. The need of the review will be evaluated based on the outcome of the above mentioned assessment.

Status: Open – **Category**:

Safety Recommendation UNKG-2016-054 (AAIB)

It is recommended that the European Aviation Safety Agency amend the Acceptable Means of Compliance for Certification Specification 25.1329 to ensure that requirement 25.1329(l) can only be met if the autopilot automatically disengages when the flight crew applies a significant override force to the flight controls and the auto-trim system does not oppose the flight crew's inputs.

Reply No. 1 sent on 24/11/2016:

The Agency will contact the FAA to jointly assess the safety issue highlighted by this safety recommendation.

Status: Open – **Category**:

Registration	Aircraft Type	Location	Date of event	Event Type
G-BYCP	BEECH B200	Near Chigwell, Essex	03/10/2015	Accident

Synopsis of the event:

The aircraft was climbing through approximately 750 ft amsl after takeoff when it began to turn right. It continued to climb in the turn until it reached approximately 875 ft amsl when it began to descend. The descent continued until the aircraft struck some trees at the edge of a field, approximately 1.8 nm southwest of the aerodrome. The evidence available was consistent with a loss of aircraft control in Instrument Meteorological Conditions (IMC), but this could not be concluded unequivocally because of a lack of evidence from within the cockpit. However, it is possible the pilot became incapacitated and the additional crew member was unable to recover the aircraft in the height available.

Three Safety Recommendations are made regarding the fitment of Terrain Awareness and Warning Systems (TAWS).

Safety Recommendation UNKG-2016-055 (AAIB)

It is recommended that the European Aviation Safety Agency require all in-service and future turbine aircraft with a Maximum Certificated Take-off Mass of 5,700 kg or less and with a maximum operational passenger seating configuration of between six and nine passengers to be fitted with, as a minimum standard, a Class B Terrain Awareness and Warning System certified to ETSO-C151b.

Reply No. 1 sent on 24/11/2016:

An action to review the existing regulatory mitigation for the risk of Controlled Flight Into Terrain (CFIT) accidents with small turbine-powered aeroplanes in Commercial Air Transport (CAT) operations was introduced into the European Aviation Safety Plan (later renamed European Plan for Aviation Safety) in 2012, and Rulemaking Tasks RMT.0371 and RMT.0372 on Terrain Awareness Warning System (TAWS) were consequently launched in 2014. The first deliverable, a Notice of Proposed Amendment (NPA) 2015-21, was published for public consultation on 18 December 2015.

The NPA included proposals for amendments to Commission Regulation (EU) No 965/2012, on air operations, to require turbine-powered aeroplanes performing commercial operations for which the individual Certificate of Airworthiness (CofA) is first issued after 1 January 2019, having a Maximum Certified Take-Off Mass (MCTOM) of 5 700 kg or less and a Maximum Operational Passenger Seating Configuration (MOPSC) of six to nine, to be equipped with a TAWS that meets the requirements for Class B equipment, as specified in an acceptable standard. Existing guidance material defines 'acceptable standard' as the applicable European Technical Standards Order (ETSO) issued by the Agency (eg ETSO-C151b) or equivalent.

Extending the requirements to retrofit and non-commercial operations was also considered within the framework of the RMT. The outcome of the data analysis and impact assessment did not support this, especially taking into account the principle of proportionality for general aviation legislation. Nevertheless, the Agency intends to recommend installation on a voluntary basis.

The next deliverable for the RMT, an EASA Opinion, is planned to be published by the end of 2016. The related amending regulation to Commission Regulation (EU) No 965/2012 will be published in due course, pending adoption of the Opinion.

Status: Open – **Category**:

United States

Registration	Aircraft Type	Location	Date of event	Event Type
N106US	AIRBUS A320	the Hudson River about 8,5 miles from La Guardia Airport, New York, USA	15/01/2009	Accident

Synopsis of the event:

On January 15, 2009, about 1527 eastern standard time, US Airways flight 1549, an Airbus Industrie A320-214, N106US, experienced an almost complete loss of thrust in both engines after encountering a flock of birds and was subsequently ditched on the Hudson River about 8.5 miles from LaGuardia Airport (LGA), New York City, New York. The flight was en route to Charlotte Douglas International Airport, Charlotte, North Carolina, and had departed LGA about 2 minutes before the in-flight event occurred. The 150 passengers, including a lap-held child, and 5 crewmembers evacuated the airplane via the forward and overwing exits. One flight attendant and four passengers were seriously injured, and the airplane was substantially damaged.

The scheduled, domestic passenger flight was operating under the provisions of 14 Code of Federal Regulations Part 121 on an instrument flight rules flight plan. Visual meteorological conditions prevailed at the time of the accident.

The National Transportation Safety Board determines that the probable cause of this accident was the ingestion of large birds into each engine, which resulted in an almost total loss of thrust in both engines and the subsequent ditching on the Hudson River. Contributing to the fuselage damage and resulting unavailability of the aft slide/rafts were (1) the Federal Aviation Administration's (FAA) approval of ditching certification without determining whether pilots could attain the ditching parameters without engine thrust, (2) the lack of industry flight crew training and guidance on ditching techniques, and (3) the captain's resulting difficulty maintaining his intended airspeed on final approach due to the task saturation resulting from the emergency situation.

Contributing to the survivability of the accident was (1) the decision-making of the flight crewmembers and their crew resource management during the accident sequence; (2) the fortuitous use of an airplane that was equipped for an extended overwater flight, including the availability of the forward slide/rafts, even though it was not required to be so equipped; (3) the performance of the cabin crewmembers while expediting the evacuation of the airplane; and (4) the proximity of the emergency responders to the accident site and their immediate and appropriate response to the accident.

Safety Recommendation UNST-2010-091 (NTSB)

The National Transportation Safety Board makes the following recommendations to the European Aviation Safety Agency: Require applicants for aircraft certification to demonstrate that their ditching parameters can be attained without engine power by pilots without the use of exceptional skill or strength. [A-10-91]

Reply No. 3 sent on 15/03/2016:

Certification Specification (CS) 25.801 (c) requires that "The probable behaviour of the aeroplane in a water landing must be investigated by model tests or by comparison with aeroplanes of similar configuration for which the ditching characteristics are known". The requirement does not specify whether this should be investigated in an engine power on or power off condition.

Therefore the Agency has planned rulemaking task RMT.0453 in the Rulemaking Programme 2016-2020 to investigate how this safety recommendation could be addressed in the CS-25 certification specifications.

RMT.0453 will also consider the outcome from the ARAC Crashworthiness and Ditching Working Group which has been tasked to provide recommendations regarding the incorporation of airframe-level crashworthiness and ditching standards, which includes the topic subject to this safety recommendation (refer to FAA task notice in Federal Register / Vol. 80, No. 107 / Thursday, June 4, 2015). EASA is represented in this ARAC group, and the schedule of RMT.0453 will be adjusted taking into account the ARAC progress.

Status: Open – **Category**:

Safety Recommendation UNST-2010-092 (NTSB)

The National Transportation Safety Board makes the following recommendations to the European Aviation Safety Agency: Require Airbus to redesign the frame 65 vertical beam on A318, A319, A320, and A321 series airplanes to lessen the likelihood that it will intrude into the cabin during a ditching or gear-up landing and Airbus operators to incorporate these changes on its airplanes. [A-10-92]

Reply No. 6 sent on 24/11/2016:

To address the potential unsafe condition highlighted by this safety recommendation, the manufacturer developed mod 153724, a structural change which prevents the central vertical strut at FR65 to pass through the cabin floor, and issued Service Bulletin (SB) A320-53-1262 to provide instructions for installation of this modification on aeroplanes in service. To ensure correct manufacturer serial number (MSN) allocations and configuration definitions, this was further revised and two more SBs (A320-53-1333 and A320-53-1334) were issued.

The Agency mandated the modification in compliance with the above mentioned SBs by Airworthiness Directive (AD) No. 2016-0212 issued on 25-10-2016.

Status: Closed – **Category**: Agreement

Registration	Aircraft Type	Location	Date of event	Event Type
N14053	AIRBUS A300	Belle Harbor	12/11/2001	Accident

Synopsis of the event:

On November 12, 2001, about 0916:15 eastern standard time, American Airlines flight 587, an Airbus Industrie A300-605R, N14053, crashed into a residential area of Belle Harbor, New York, shortly after takeoff from John F. Kennedy International Airport, Jamaica, New York. Flight 587 was a regularly scheduled passenger flight to Las Americas International Airport, Santo Domingo, Dominican Republic, with 2 flight crewmembers, 7 flight attendants, and 251 passengers aboard the airplane. The airplane's vertical stabilizer and rudder separated in flight and were found in Jamaica Bay, about 1 mile north of the main wreckage site. The airplane's engines subsequently separated in flight and were found several blocks north and east of the main wreckage site. All 260 people aboard the airplane and 5 people on the ground were killed, and the airplane was destroyed by impact forces and a postcrash fire. Flight 587 was operating under the provisions of 14 Code of Federal Regulations Part 121 on an instrument flight rules flight plan. Visual meteorological conditions prevailed at the time of the accident.

The National Transportation Safety Board determines that the probable cause of this accident was the in-flight separation of the vertical stabilizer as a result of the loads beyond ultimate design that were created by the first officer's unnecessary and excessive rudder pedal inputs. Contributing to these rudder pedal inputs were characteristics of the Airbus A300-600 rudder system design and elements of the American Airlines Advanced Aircraft Maneuvering Program.

Safety Recommendation UNST-2010-119 (NTSB)

The National Transportation Safety Board recommends that the European Aviation Safety Agency modify European Aviation Safety Agency Certification Specifications for Large Aeroplanes CS-25 to ensure safe handling qualities in the yaw axis throughout the flight envelope, including limits for rudder pedal sensitivity. (A-10-119)

Reply No. 3 sent on 27/04/2016:

The FAA Aviation Rulemaking Advisory Committee (ARAC) established the Flight Controls Harmonization Working Group (FCHWG) to assist in the analysis of the issue of rudder pedal sensitivity and rudder reversals (notice published under Federal register Vol.76, No. 59, dated 28 March 2011). The task of the group was to review the need to revise existing certification specifications for large aeroplanes as well as the need to enforce retroactive measures for the already certificated aircraft.

EASA participated to this Group which released its Rudder Pedal Sensitivity/Rudder Reversal Recommendation Report dated November 7, 2013; the report includes recommendations for the amendment of FAR Part 25 and CS-25. It is available on the FAA Website at:

http://www.faa.gov/regulations_policies/rulemaking/committees/documents/media/taefch_rpsr-rt1-32811.pdf

Based on this report, the Agency issued a Special Condition (SC) to ensure that the aeroplane must be designed for loads, considered as ultimate, resulting from the application of two rudder reversal pedal inputs. The SC was published for consultation on 11/12/2015. The final SC, acceptable means of compliance (AMC), and the responses to comments are available on the EASA Website:

https://www.easa.europa.eu/documents/public-consultations/proposed-special-condition-c-xx

This SC will be applied to new Type Certificates for which an application is made after the publication of the final SC. It might also be applied to significant changes to previously certified aeroplanes.

A rulemaking task RMT.0397 will follow the SC to introduce a new rule and AMC in CS-25. RMT.0397 is planned to start in the first quarter of 2017.

Status: Open – **Category**:

Registration	Aircraft Type	Location	Date of event	Event Type
N902FX	ATR ATR42	Lubbock, Texas, United States	27/01/2009	Accident

Synopsis of the event:

On January 27, 2009, about 0437 central standard time, an Avions de Transport Régional Aerospatiale Alenia ATR 42-320, N902FX, operating as Empire Airlines flight 8284, was on an instrument approach when it crashed short of the runway at Lubbock Preston Smith International Airport, Lubbock, Texas. The captain sustained serious injuries, and the first officer sustained minor injuries. The airplane was substantially damaged. The airplane was registered to FedEx Corporation and operated by Empire Airlines, Inc., as a 14 Code of Federal Regulations Part 121 supplemental cargo flight. The flight departed from Fort Worth Alliance Airport, Fort Worth, Texas, about 0313. Instrument meteorological conditions prevailed, and an instrument flight rules flight plan was filed.

The National Transportation Safety Board determines that the probable cause of this accident was the flight crew's failure to monitor and maintain a minimum safe airspeed while executing an instrument approach in icing conditions, which resulted in an aerodynamic stall at low altitude. Contributing to the accident were 1) the flight crew's failure to follow published standard operating procedures in response to a flap anomaly, 2) the captain's decision to continue with the unstabilized approach, 3) the flight crew's poor crew resource management, and 4) fatigue due to the time of day in which the accident occurred and a cumulative sleep debt, which likely impaired the captain's performance.

Safety Recommendation UNST-2012-027 (NTSB)

The National Transportation Safety Board makes the following recommendation to the European Aviation Safety Agency: evaluate all European Aviation Safety Agency-certificated transport-category airplanes equipped with stick pushers to ensure that the stick pusher activates at an angle of attack that will provide adequate stall protection in the presence of airframe ice accretions. [A-12-27]

Reply No. 3 sent on 07/01/2016:

EASA issued a letter to all Large Aeroplane European Type Certificate (TC) holders on 5 July 2013, inquiring which of their EASA certified types and models featured a stick pusher function/device as part of the stall protection, and when it is the case, was this device/function part of the compliance demonstration to Joint Aviation Requirements (JAR)/Certification Specifications (CS) 25.201 and 25.203 or equivalent requirements. For these models, EASA requested to be provided with data indicating the values of angle of attack triggering the stall warning (stick shaker), the stall protection (stick pusher) and the stall occurrence for both icing and non-icing conditions.

The majority of TC holder responses indicated that for their related aircraft types:

- either no stick pusher has been installed,
- or a stick pusher has been installed and its function was part of the compliance demonstration to JAR/CS 25.201 and 25.203 or equivalent requirements during the initial type certification process and an appropriate angle of attack (AoA) threshold is kept between stick shaker and stick pusher activation in icing conditions.

Only for the SAAB 340 it has been reported that, similar to the ATR 42 model involved in the Lubbock accident, the AoA for activation of stick pusher (stall identification) is not changed between non-icing and icing conditions, even though the AoA activation of stick shaker (stall warning) is lowered in icing conditions. EASA is in consultation with SAAB to determine if further action on the SAAB 340 should be taken.

Status: Open – **Category**:

Registration	Aircraft Type	Location	Date of event	Event Type
N390LG	AEROSPATIALE AS350	Frisco, Colorado	03/07/2015	Accident

Registration	Aircraft Type	Location	Date of event	Event Type
N356AM	EUROCOPTER EC130	St. Louis, Missouri	06/03/2015	Accident

Synopsis of the event:

On March 6, 2015, about 2310 central standard time, an Airbus Helicopters EC130 B4 helicopter, N356AM, operated by Air Methods Corporation, doing business as ARCH, struck the edge of a hospital building and impacted its parking lot near St. Louis, Missouri, during approach to an elevated rooftop helipad. The helicopter was destroyed by impact forces and a postcrash fire. The pilot was the sole occupant and sustained fatal thermal injuries. Night visual meteorological conditions prevailed for the flight conducted under the provisions of 14 Code

of Federal Regulations (CFR) Part 135. The NTSB's ongoing investigation determined that the accident was immediately survivable in the absence of a postcrash fire.

On July 3, 2015, about 1339 mountain daylight time, an Airbus Helicopters AS350 B3e helicopter, N390LG, operated by Air Methods Corporation, partially impacted a parked recreational vehicle in a parking lot near Summit Medical Center in Frisco, Colorado, after takeoff from a ground-based hospital helipad. The helicopter was destroyed by impact forces and a postcrash fire. Visual meteorological conditions prevailed for the flight conducted under the provisions of 14 CFR Part 135. Video footage from a parking lot surveillance camera revealed a postcrash fire initiating a few seconds after ground impact concurrent with large quantities of fuel flowing from the helicopter wreckage. The pilot and two flight nurses survived the initial ground impact. One flight nurse sustained a back injury and the other sustained serious thermal injuries. A medical staff member on the ground near the crash site also sustained thermal injuries while attempting to rescue the pilot from the helicopter wreckage. The pilot ultimately died from his injuries.2 The NTSB's investigation of this accident is ongoing.

Neither the AS350 B3e nor the EC130 B4 helicopter was equipped with a crash-resistant fuel system, which if installed, may have prevented or reduced the risk of thermal injuries.

Safety Recommendation UNST-2016-001 (NTSB)

Once Airbus Helicopters completes development of a retrofit kit to incorporate a crash-resistant fuel system into AS350 B3e and similarly designed variants, prioritize its approval to accelerate its availability to operators. [A-16-11]

Reply No. 1 sent on 07/06/2016:

EASA is already working with Airbus Helicopters to expedite the certification of a retrofittable design change to incorporate a crash-resistant fuel system into AS350 B3e. In addition, once Airbus Helicopters have completed the development and applied for the certification of retrofittable design changes for other similarly designed variants, EASA will prioritize its approval. Such aircraft configurations will be made available according to the manufacturer plans for its installation on new production and on already flying aircraft.

Status: Open – **Category**:

Definitions

ANNEX B: Definitions

The following definitions are extracted from Regulation (EU) No 996/2010 of the European Parliament and of the Council of 20 October 2010.

Accident: occurrence associated with the operation of an aircraft which, in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time it comes to rest at the end of the flight and the primary propulsion system is shut down, in which:

(a) a person is fatally or seriously injured as a result of:

— being in the aircraft, or,

— direct contact with any part of the aircraft, including parts which have become detached from the aircraft, or,

— direct exposure to jet blast,

except when the injuries are from natural causes, self- inflicted or inflicted by other persons, or when the injuries are to stowaways hiding outside the areas normally available to the passengers and crew; or

(b) the aircraft sustains damage or structural failure which adversely affects the structural strength, performance or flight characteristics of the aircraft, and would normally require major repair or replacement of the affected component, except for engine failure or damage, when the damage is limited to a single engine, (including its cowlings or accessories), to propellers, wing tips, antennas, probes, vanes, tires, brakes, wheels, fairings, panels, landing gear doors, windscreens, the aircraft skin (such as small dents or puncture holes) or minor damages to main rotor blades, tail rotor blades, landing gear, and those resulting from hail or bird strike, (including holes in the radome); or

(c) the aircraft is missing or is completely inaccessible;

Incident: an occurrence, other than an accident, associated with the operation of an aircraft which affects or would affect the safety of operation;

Serious incident: an incident involving circumstances indicating that there was a high probability of an accident and is associated with the operation of an aircraft, which in the case of a manned aircraft, takes place between the time any person boards the aircraft with the intention of flight until such time as all such persons have disembarked, or in the case of an unmanned aircraft, takes place between the time the aircraft is ready to move with the purpose of flight until such time it comes to rest at the end of the flight and the primary propulsion system is shut down.

A list of examples of serious incidents is given below. The list is not exhaustive and only serves as guidance with respect to the definition of 'serious incident': a near collision requiring an avoidance manoeuvre to avoid a collision or an unsafe situation or when an avoidance action would have been appropriate,

- controlled flight into terrain only marginally avoided,
- aborted take-offs on a closed or engaged runway, on a taxiway, excluding authorised operations by helicopters, or from an unassigned runway,
- take-offs from a closed or engaged runway, from a taxiway, excluding authorised operations by helicopters, or from an unassigned runway,
- landings or attempted landings on a closed or engaged runway, on a taxiway, excluding authorised operations by helicopters, or from an unassigned runway,
- gross failures to achieve predicted performance during take-off or initial climb,
- fires and smoke in the passenger compartment, in cargo compartments or engine fires, even though such fires were extinguished by the use of extinguishing agents,
- events requiring the emergency use of oxygen by the flight crew,
- aircraft structural failure or engine disintegration, including uncontained turbine engine failures, not classified as an accident,

multiple malfunctions of one or more aircraft systems seriously affecting the operation of the aircraft,

- flight crew incapacitation in flight,
- fuel quantity requiring the declaration of an emergency by the pilot,
- runway incursions classified with severity A according to the Manual on the Prevention of Runway Incursions (ICAO Doc 9870) which contains information on the severity classifications,
- take-off or landing incidents. Incidents such as undershooting, overrunning or running off the side of runways,
- system failures, weather phenomena, operation outside the approved flight envelope or other occurrences which could have caused difficulties controlling the aircraft,
- failure of more than one system in a redundancy system mandatory for flight guidance and navigation.

Safety investigation: process conducted by a safety investigation authority for the purpose of accident and incident prevention which includes the gathering and analysis of information, the drawing of conclusions, including the determination of cause(s) and/or contributing factors and, when appropriate, the making of safety recommendations;

Safety recommendation: proposal of a safety investigation authority, based on information derived from a safety investigation or other sources such as safety studies, made with the intention of preventing accidents and incidents.

Safety recommendation of Global Concern (SRGC)[5]**:** is defined as a safety recommendation made to a State civil aviation authority, to a regional certification authority, or to ICAO regarding a systemic deficiency having a probability of recurrence with potential for significant consequences, and requiring timely action to improve safety.

An SRGC would meet one or more of the following criteria:

a) the deficiency underlying the recommendation is systemic and not solely a local issue;

b) the probability of recurrence of the accident and the adverse consequences are high;

c) the risk to persons, equipment and/or environment is high;

d) the urgency for taking effective remedial safety action is high;

e) there is a history of recurrence of the relevant deficiency;

f) the deficiency underlying the recommendation constitutes a risk to the airworthiness, design, manufacture, maintenance, operation and/or regulation of the involved aircraft type;

g) the deficiency underlying the recommendation constitutes a risk to more than one aircraft type, to more than one operator, to more than one manufacturer and/or to more than one State; and

h) the mitigation of the risks associated with the deficiency will require coordinated efforts of more than one entity of the air transport industry, such as civil aviation authority(ies), manufacturer(s) and operator(s).

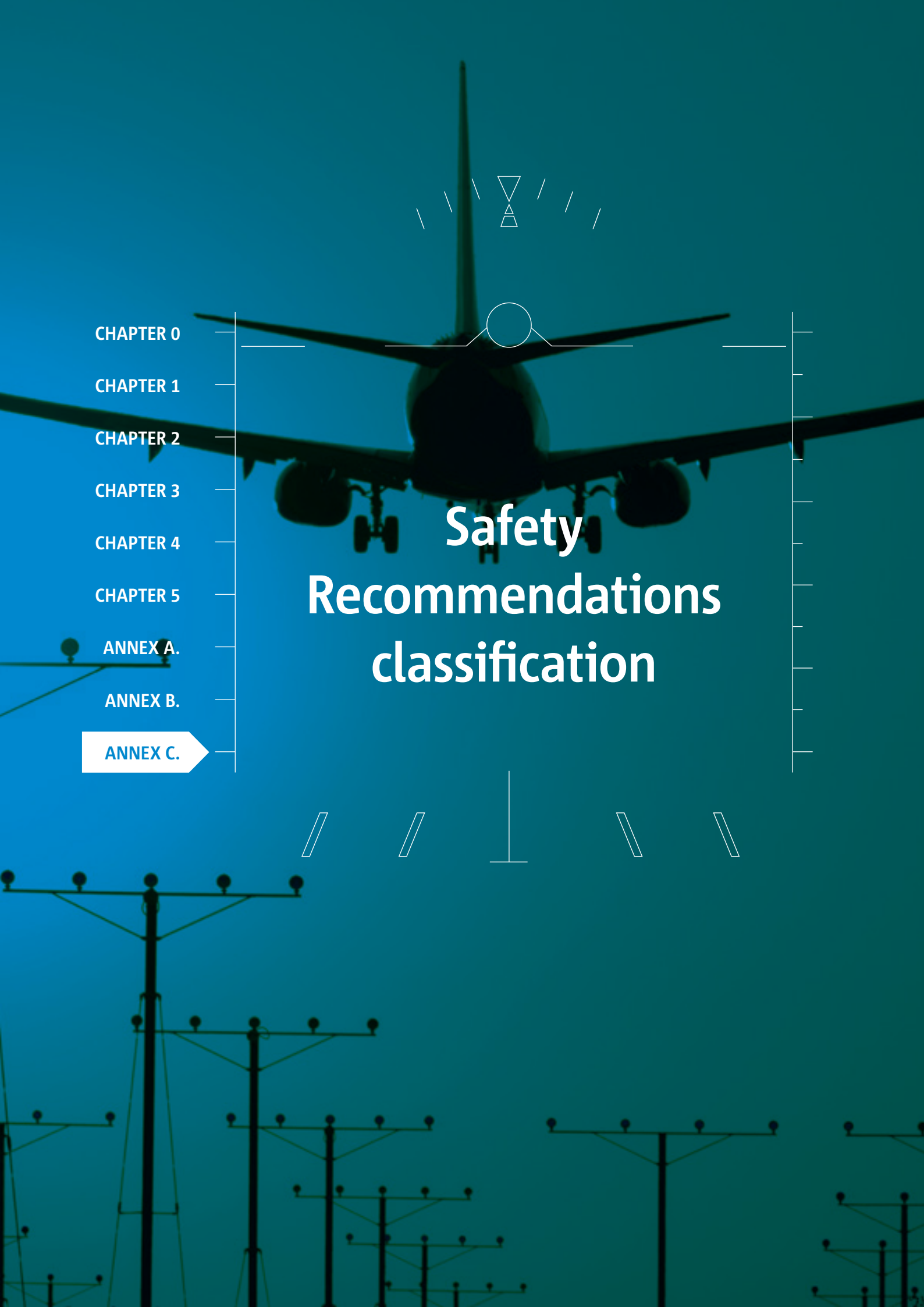
Safety recommendation of Union-wide Relevance (SRUR): a safety recommendation identified by the European Network of Civil Aviation Safety Investigation Authorities according to Article 7 (g) of Regulation (EU) No 996/2010.

A safety recommendation of Union-wide Relevance (SRUR) would meet one or more of the following criteria:

- The deficiency underlying the safety recommendation is systemic, not related to a specific aircraft type, operator, manufacturer component, maintenance organization, air navigation service and/or approved training organisation, and not solely a national issue, or;

- There is a history of recurrence across Europe of the relevant deficiency.

5 Source: ICAO Manual of Aircraft Accident and Incident Investigation (Doc 9756 -2014), Part IV Reporting, Chapter 1.6 RELEASE AND DISTRIBUTION OF SAFETY RECOMMENDATIONS.



Safety Recommendations classification

ANNEX C: Safety Recommendations classification

The classification has been established in the scope of the safety recommendations taxonomy working group in cooperation with representatives from European Accident Investigation Bodies, Eurocontrol, the European Joint Research Center (JRC) and EASA. The aim of this group was to initiate a taxonomy dedicated to recommendations. This activity took place in 2007 and is being used to implement a safety recommendation database developed by the JRC.

In addition to common definitions, the taxonomy also defines a unique pre-defined format for referencing safety recommendations. This format is composed by a 4 digits originating state name followed by the year it was issued and then a three digits number (ex: UNKG-2007-001 for recommendation #1 issued by United Kingdom in 2007). Consequently, all references comply with this taxonomy foreseeing that existing safety recommendations will be imported in a central database and shared with a community of users.

Recommendation assessment: assessment given to a safety recommendation by the addressee as defined below:

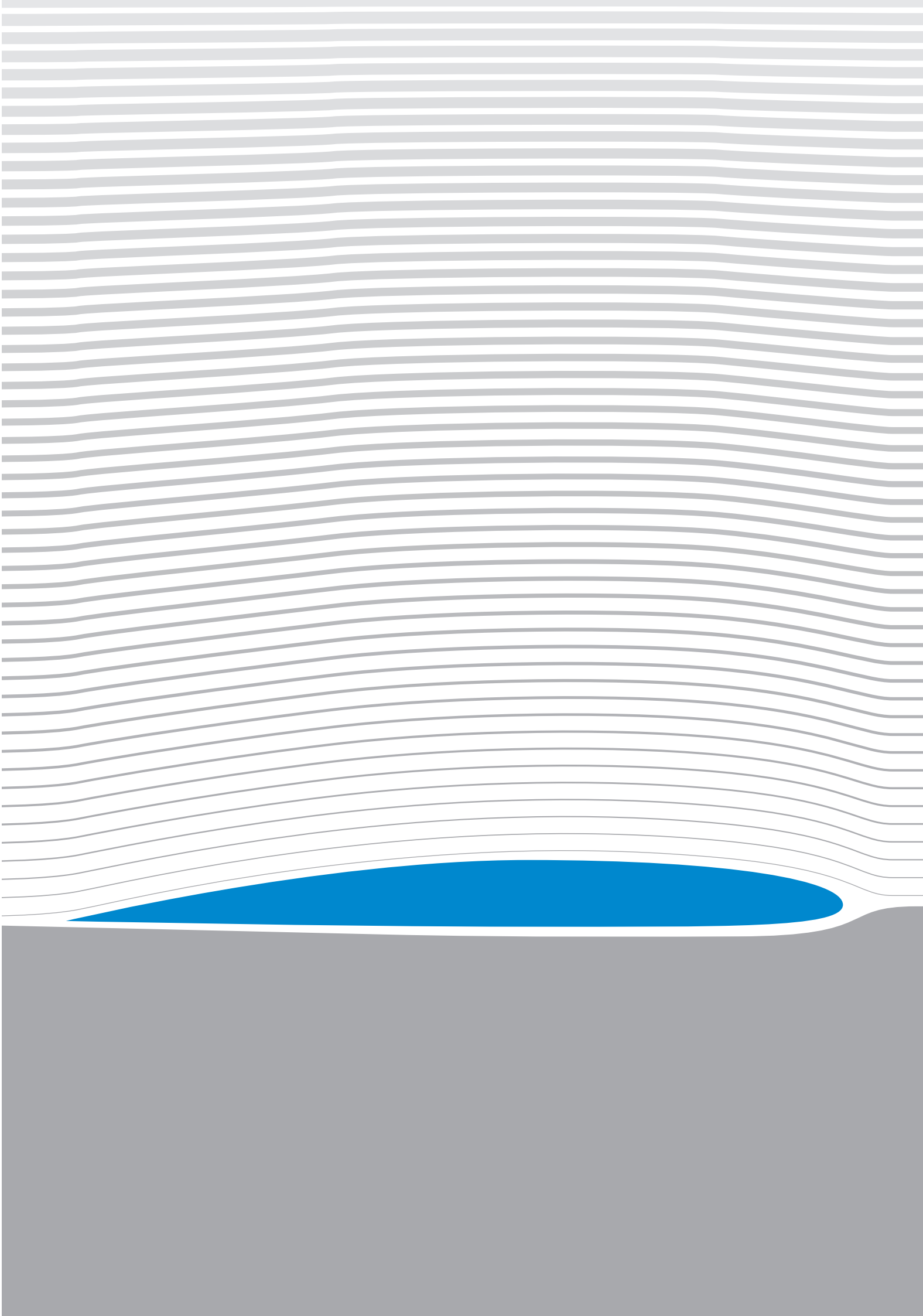
- **Agreement:** safety recommendation for which the safety concern is agreed by the addressee and subsequent action is planned or implemented.
- **Partial agreement**: safety recommendation considered relevant by the addressee but not applicable and for which a safety issue has been recognised and a new orientation has been given to the recommended action.
- **Disagreement:** safety recommendation considered not relevant or not applicable by the addressee.
- **No longer applicable:** safety recommendation has been superseded or has become no longer applicable.
- **Not Responsible:** safety recommendation wrongly allocated or not in the scope of responsibility of the addressee.
- **More information required:** safety recommendation for which more information is required by the addressee before any action initiated. Additional information should be sent by the originator.
- **Unknown:** safety recommendation which was issued before any tracking implementation status and for which insufficient information to assign any other status has been received.

Response assessment: The classification of the response as determined by the originator (when a response is received):

- **Adequate:** safety recommendation for which appropriate action is planned or implemented or sufficient evidence of completed action satisfying the objective has been received by the originator.
- **Partially adequate**: safety recommendation for which the planned action or the action taken will reduce but not substantially reduce or eliminate the deficiency or for which a safety issue has been recognised and a new orientation has been given to the recommended action.
- **Not adequate:** safety recommendation for which no action has been taken or proposed that will reduce or eliminate the deficiency, or for which the proposed action is considered not applicable/unacceptable.
- **Response is awaited:** safety recommendation for which no response has been received.
- **Response received awaiting assessment**: response to the safety recommendation has been received by the originator and is awaiting assessment.
- **Superseded:** if the recommendation has been superseded by another recommendation.
- **Unknown:** the safety recommendation is one which was issued before any tracking implementation status and for which insufficient information to assign any other status has been received.

Status of a safety recommendation: progress of the implementation of the response to a recommendation as defined below:

- **Open safety recommendation:** safety recommendation for which the reply has not yet been defined or the appropriate action addressing the safety concern is still in progress.
- **Closed safety recommendation:** safety recommendation for which appropriate action has been taken and completed addressing the safety issue.



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