AAIB
Air Accidents Investigation Branch

Annual Safety Report 2014

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Chief Inspector's Report

I am pleased to introduce the 2014 AAIB Annual Safety Report which includes information on our 2013 activity and progress on the status of Safety Recommendations that were published in 2013.

2013 proved one of the most demanding years in recent memory with five high profile investigations in the UK. In January an Agusta A109E collided with a crane on top of a tower block in Vauxhall, Central London killing the pilot and a passing pedestrian. This was followed in May by an Airbus A319 losing its fan cowl doors on departure from London Heathrow leading to an airborne fire and engine shutdown. In July a Boeing 787 experienced a serious fire whilst parked and unoccupied at Heathrow and then in August a Eurocopter AS332 struck the sea near Sumburgh fatally injuring four passengers. Finally at the end of November, a Eurocopter 135 hit the roof of the Clutha Vaults bar in Glasgow killing the three people on board and another seven in the bar itself. Of note is that this was the first year since the Lockerbie accident in 1988 that a group of people on the ground have been killed by an aircraft accident in the UK.

The AAIB published Special Bulletins in the immediate aftermath of all these events and will continue to use these to update industry and public alike on investigation progress, safety action taken and any safety recommendations.

Elsewhere the AAIB deployed to a Bermudan registered Boeing 737 accident in Kazan, Russia and assisted with a BAe 146 event in the Philippines. We also observed the NTSB's investigation into a Boeing 777 accident at San Francisco airport.

In 2013 the AAIB initiated an International Development Team with the objective of raising the standard of accident investigation overseas, particularly where UK citizens or UK manufactured products are likely to be involved. This is part of a global initiative where Safety Investigation Authorities look to add a more proactive role to the traditional reactive accident response.

We have included more information in the safety report this year to give a more informative picture of our activity; I trust you find this useful and as ever, I welcome any feedback.

Keith Conradi

Introduction

The Air Accidents Investigation Branch is the part of the Department for Transport responsible for the investigation of all civil aircraft accidents and serious incidents (collectively referred to as 'accidents' in this document) occurring in or over the United Kingdom, its Overseas Territories and Crown Dependencies. Its authority is enshrined in Regulation (EU) No 996/2010 of the European Parliament and of the Council of 20 October 2010 and the Civil Aviation (Investigation of Air Accidents and incidents) Regulations 1996. Its purpose is 'to improve aviation safety by determining the causes of air accidents and serious incidents and making Safety Recommendations intended to prevent recurrence'. The AAIB reports directly to the Secretary of State for Transport on safety matters.

The Civil Aviation Authority (CAA), Safety and Airspace Regulation Group (SARG), is established to develop the UK's aviation safety environment, in partnership with industry, through continuous improvements in aviation safety in the UK and, in partnership with the European Aviation Safety Agency (EASA), across Europe.

The European Community established the EASA in 2003 with the legal competence to be the rulemaking and standard setting organisation for all aviation safety regulation on behalf of its member states. As a National Aviation Authority however, the CAA SARG retains a statutory duty to exercise full rulemaking and oversight responsibility for all those aspects not being adopted by EASA. Moreover, as a Competent Authority within the new European framework, CAA SARG is required to deliver safety oversight of UK industry against EASA's pan-European rules and standards. The developing European framework for the regulation of aviation safety has at its heart '2 pillars' – EASA and the National Aviation Authorities of the Community member states. Collectively, therefore, a maturing European regulatory system will continue to be focused on seeing that aircraft are properly designed, manufactured, operated and maintained; that airlines operate safely; that flight crews, air traffic controllers and aircraft maintenance engineers are suitably skilled; that licensed aerodromes are safe to use and that air traffic control services and general aviation activities meet the required safety standards.

Accident investigation and safety regulation are clearly different and the two functions are deliberately kept independent from each other. However, the evaluation of the findings of an accident investigation and the determination of the need for and the initiation of, appropriate action to maintain and enhance safety is an important part of safety regulation. Thus a good working relationship between the AAIB, the CAA and the EASA is essential, while in no way jeopardising the independence of accident investigation.

Effective liaison has been maintained between the AAIB, the CAA and the EASA, which has been particularly useful in the immediate aftermath of any accident. However, the formal procedure by which the AAIB identifies and conveys to the CAA, the EASA or other bodies, matters which it believes require action is by means of Safety Recommendations.

Safety Recommendations can be made at any stage as the AAIB investigation progresses. Both the CAA and the EASA have formal procedures for the receipt and evaluation of such recommendations and initiation of necessary action.

The CAA is informed of all AAIB Safety Recommendations and has, until recently, responded to the AAIB, in the form of a Follow-up Action on Occurrence Report (FACTOR), on all Safety Recommendations, regardless of whether they were the action addressee. The CAA now only formally responds to the AAIB with a FACTOR if a Safety Recommendation is specifically addressed to them. They have assured the AAIB, however, that they will continue to react appropriately to any Safety Recommendation if they believe it is in the interests of UK aviation safety.

Until September 2004, responses to the Air Accidents Investigation Branch's recommendations were published by the Civil Aviation Authority in their annual Progress Report on AAIB recommendations under the cover of a Civil Aviation Publication (CAP). With the shift of responsibilities, however, it has become more appropriate for the AAIB to take responsibility for reporting on the responses to its recommendations regardless of the target authority or organisation. The first AAIB progress report was published in March 2006.

This tenth report, which is titled the AAIB's 'Annual Safety Report', contains additional information concerning accident statistics and the activities of the AAIB. The bulk of the report contains the responses received to AAIB Safety Recommendations made up to and including 31 December 2013.

Statistics

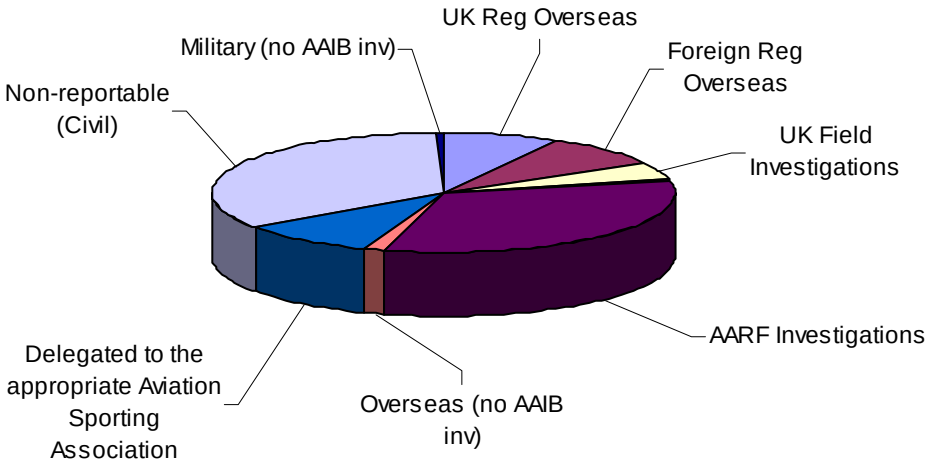
The following pages provide the statistics for 2013, 2012 and 2011, for accidents and serious incidents involving the Air Accidents Investigation Branch.

An explanation of the categories is as follows:

Category	Definition
UK Aircraft overseas	Investigations involving UK registered aircraft, or aircraft registered in one of the UK Overseas Territories or Crown Dependencies, occurring in a Foreign State where the AAIB has participated in the capacity as the Accredited Representative representing the State of Registry in accordance with ICAO Annex 13.
Foreign Aircraft overseas	Accidents and serious incident investigations to Foreign registered aircraft occurring in a Foreign State where the AAIB have participated in the capacity as the Accredited Representative
UK Field Investigations	Investigations involving the deployment of a 'Field' team within the UK or to one of the UK Overseas Territories or Crown Dependencies and those investigations where a team have not deployed but Safety Recommendations are made. Also includes investigations which have been delegated to the AAIB by another State.
Military with AAIB Assistance	Where an MoD Service Inquiry is convened following an accident / serious incident to a Military aircraft and an AAIB Inspector is appointed to assist.
AARF Investigations	Investigations conducted by correspondence only using an Aircraft Accident Report Form (AARF) completed by the aircraft commander.
Overseas (no AAIB)	Notifications to the AAIB of an overseas event which has no AAIB involvement.
Delegations to Sporting Associations	Investigations delegated to the relevant UK Sporting Associations.
Non-reportable (Civil)	Occurrences notified to the AAIB involving civil registered aircraft which do not satisfy the criteria of a reportable accident or serious incident in accordance with the Regulations.
Military (no AAIB inv)	Notifications to the AAIB concerning Military aircraft with no AAIB involvement.

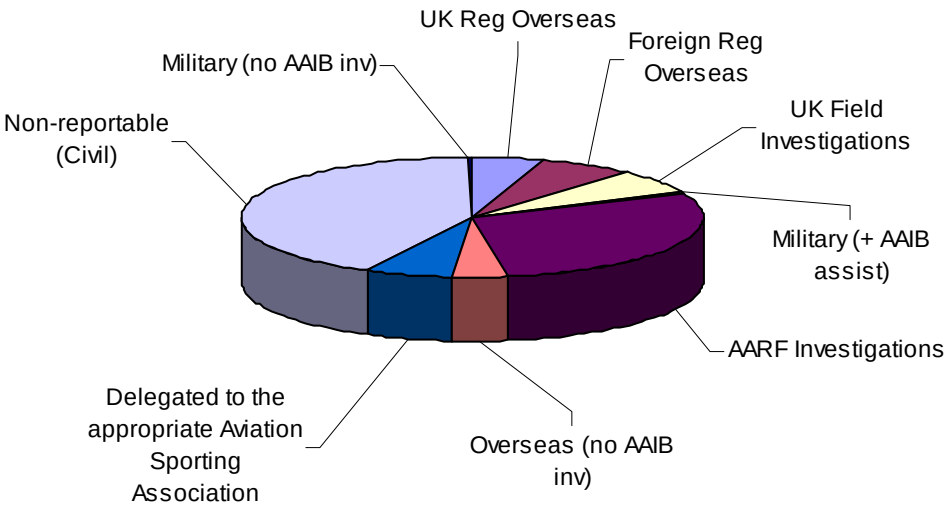
AAIB Notifications 2013

	J	F	M	A	M	J	J	A	S	O	N	D	Total
UK Aircraft Overseas	2	1	3	4	10	6	7	7	5	3	2	2	**53**
Foreign Aircraft Overseas	1	7	5	1	9	3	6	4	7	6	3	4	**56**
UK Field Investigations	3	0	1	2	3	2	3	5	2	3	5	3	**32**
Military (+ AAIB assist)	0	0	0	0	0	0	0	0	0	0	0	0	**0**
AARF Investigations	8	11	10	17	20	23	33	37	15	19	11	9	**213**
Overseas (no AAIB inv)	2	0	3	0	0	0	0	0	1	3	0	0	**9**
Delegated to the appropriate Aviation Sporting Association	2	4	3	4	11	8	6	11	7	3	0	3	**62**
Non-reportable (Civil)	18	15	13	26	25	20	21	19	19	16	10	24	**226**
Military (no AAIB inv)	1	0	0	0	0	0	0	1	0	1	0	0	**3**
Total	**37**	**38**	**38**	**55**	**78**	**62**	**76**	**84**	**56**	**54**	**31**	**45**	**654**
UK FATAL ACCIDENTS	**1**	**0**	**0**	**1**	**1**	**0**	**2**	**3**	**2**	**1**	**2**	**0**	**13**
No of DEATHS	**2**	**0**	**0**	**1**	**1**	**0**	**3**	**7**	**3**	**1**	**12**	**0**	**30**



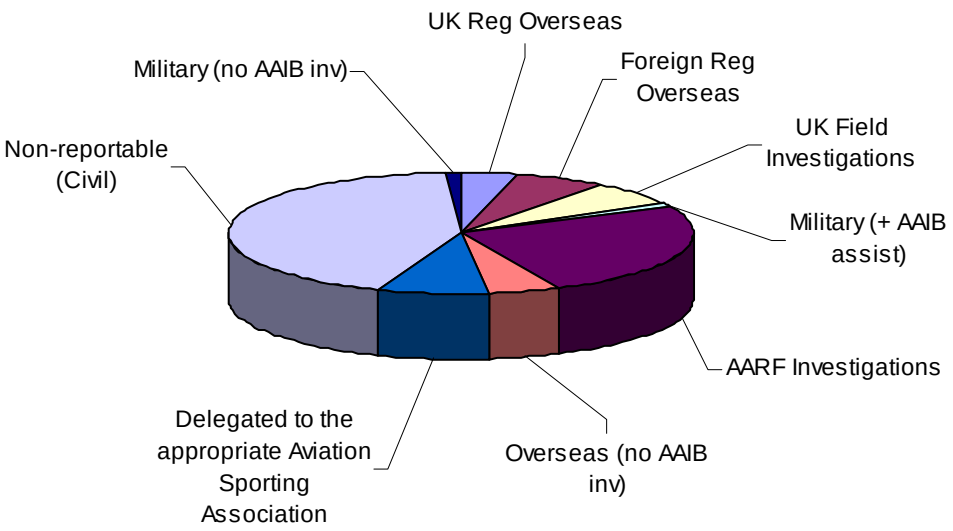
AAIB Notifications 2012

	J	F	M	A	M	J	J	A	S	O	N	D	Total
UK Aircraft Overseas	2	0	2	2	4	8	4	6	2	3	1	3	**37**
Foreign Aircraft Overseas	2	2	3	4	3	4	5	4	7	9	3	4	**50**
UK Field Investigations	3	4	5	7	5	1	6	8	3	3	1	1	**47**
Military (+ AAIB assist)	1	0	0	0	0	0	1	0	0	0	0	0	**2**
AARF Investigations	11	15	19	14	28	13	29	26	26	16	10	10	**217**
Overseas (no AAIB inv)	6	2	2	4	6	2	2	2	0	2	2	0	**30**
Delegated to the appropriate Aviation Sporting Association	3	3	2	5	6	2	6	9	2	5	1	0	**44**
Non-reportable (Civil)	23	21	35	26	39	26	40	25	30	22	19	8	**314**
Military (no AAIB inv)	1	0	0	1	0	0	0	0	0	1	0	0	**3**
Total	**52**	**47**	**68**	**63**	**91**	**56**	**93**	**80**	**70**	**61**	**37**	**26**	**744**
UK FATAL ACCIDENTS	**3**	**0**	**0**	**2**	**1**	**0**	**2**	**3**	**1**	**0**	**0**	**1**	**13**
No of DEATHS	**4**	**0**	**0**	**2**	**2**	**0**	**2**	**4**	**1**	**0**	**0**	**1**	**16**



AAIB Notifications 2011

	J	F	M	A	M	J	J	A	S	O	N	D	Total
UK Aircraft Overseas	0	2	0	1	5	4	5	3	2	2	4	3	**31**
Foreign Aircraft Overseas	5	8	2	3	7	3	9	3	4	3	2	2	**51**
UK Field Investigations	6	3	5	6	4	5	10	1	4	2	3	3	**52**
Military (+ AAIB assist)	1	1	0	0	0	0	1	1	1	0	1	0	**6**
AARF Investigations	6	11	21	21	14	21	34	20	24	15	10	2	**199**
Overseas (no AAIB inv)	1	7	3	0	2	2	7	3	1	3	3	8	**40**
Delegated to the appropriate Aviation Sporting Association	2	1	2	6	7	11	8	7	7	8	1	1	**61**
Non-reportable (Civil)	13	26	22	42	33	34	38	40	24	30	23	15	**340**
Military (no AAIB inv)	0	0	0	0	0	1	0	0	1	2	4	0	**8**
Total	**34**	**59**	**55**	**79**	**72**	**81**	**112**	**78**	**68**	**65**	**51**	**34**	**788**
UK FATAL ACCIDENTS	**1**	**0**	**2**	**2**	**2**	**0**	**3**	**0**	**1**	**1**	**1**	**1**	**14**
No of DEATHS	**2**	**0**	**2**	**3**	**2**	**0**	**3**	**0**	**1**	**1**	**1**	**1**	**16**



Safety Recommendations Report

This is the tenth annual Progress Report on Safety Recommendations submitted to the Secretary of State by the Air Accidents Investigation Branch (AAIB). It contains all the recommendations made by the AAIB in 2013 including the responses to those recommendations received up to and including 30 June 2014 and those recommendations categorised as open from previous years where significant additional information has been received.

The recommendations are grouped into eight sections:

1. Aeroplanes - 5,700kg MTWA and above
2. Aeroplanes - above 2,250kg and below 5,700kg MTWA
3. Aeroplanes - 2,500kg MTWA and below
4. Microlights
5. Rotorcraft - 5,700kg MTWA and above
6. Rotorcraft - above 2,250kg and below 5,700kg MTWA
7. Rotorcraft - 2,500kg MTWA and below
8. Others

Within each section the accidents are listed by event date in reverse chronological order. This date should be taken as the date the recommendation was made.

The Status of responses to Safety Recommendations, as determined by the AAIB, have been divided into six categories.

1. Accepted - CLOSED (appropriate action implemented or planned but not yet implemented)
2. Rejected - OPEN (further action required)
3. Rejected - Rejected for acceptable reasons not known at the time of publication (no further AAIB action)
4. Partially accepted - OPEN
5. Response awaited - OPEN
6. Superseded - CLOSED

Statistics

Recommendations made in 2013 and status:

Number	Status Category					
	1 Accepted CLOSED	2 Rejected OPEN	3 Rejected	4 Partially accepted OPEN	5 Response awaited OPEN	6 Withdrawn
22	15	2	1	1	1	2
% of total	68.18	9.09	4.55	4.55	4.55	9.09

85% of recommendations receiving a response have been accepted or partially accepted.

Note: 22 Safety Recommendations were allocated with recommendation numbers of which two were withdrawn and 1 was no longer applicable before issue

Recommendations within 2014 report by Addressee:

Addressee	Number
Airbus	4
Boeing	1
Bombardier Aerospace	1
British Gliding Association (BGA)	1
CHC (Scotia)	1
Civil Aviation Authority (CAA)	3
Durham Tees Valley Airport	1
Eastern Caribbean Civil Aviation Authority (ECCAA)	2
European Aviation Safety Agency (EASA)	20
Embraer	4
Federal Aviation Administration (FAA)	5
Gulfstream Aerospace Corporation	1
Highlands and Islands Airports Limited (HIAL)	1
Lycoming	1
MD Helicopters	1
Rolls-Royce plc	1
Swift Aerobatic Display Team	1
Technify Motors GmbH	3

Note: Please note that a number of Safety Recommendations are made to more than one Addressee

Aeroplanes > 5,700kg MTWA or above

Airbus A321-211	Manchester Airport	18 July 2008	Accident

AAIB Bulletin: 6/2009
FACTOR: F08/2009

Synopsis

During a landing at Manchester Airport the aircraft was not flared sufficiently and a 'hard' landing, categorised as 'severe hard', occurred. The possibility of a landing parameter exceedence was not reported by the crew following discussion with ground engineers who had been on the flight. The presence of a landing parameter exceedence report was identified after a further two sectors had been flown, when an unrelated inspection of the landing gear found a crack in a wing rib gear support lug.

SAFETY RECOMMENDATION – 2009-059

It is recommended that Airbus ensure that the generation of a LOAD<15> report by the DMU following a landing parameter exceedence, is indicated to the flight crew involved to enable them to record it in the aircraft's technical log.

Response

The AMM 05-51 clearly states that the triggering for inspections is the flight crew responsibility. No algorithm will be capable to foresee all the possible cases encountered, therefore the DMU is only a maintenance aid.

Status – Rejected

SAFETY RECOMMENDATION – 2009-062

It is recommended that Airbus review their procedure for identifying and classifying parameter exceedences based on data recorded by the aircraft during landing, either to ensure that all sources of recorded data give the same outcome or to provide guidance on which source of data should take precedence in the event of a discrepancy. Changes resulting from this review should be reflected in the relevant maintenance manual tasks.

Response

Airbus understands that this safety recommendation is based on the fact that the LOAD<15>report gave a vertical speed at touchdown of -11.5 ft/sec while the AAIB computed, from the DFDR data, a vertical speed at touchdown of -14 ft/sec.

The vertical speed at touchdown is not recorded by the DFDR as such and must be estimated from other recorded parameters. Airbus computation gave an estimated VZ of -13.5 ft/sec with an accuracy of +/- 2ft/sec. Therefore, the vertical speed at touchdown was between -11.5 ft/sec and -15.5 ft/sec and there was no discrepancy between LOAD<15>report and vertical speed estimated from DFDR data.

Status – Rejected

Airbus A330-243	Montego Bay, Jamaica	28 October 2008	Serious Incident

AAIB Bulletin: 11/2009
FACTOR: N/A

Synopsis

Due to an error in the takeoff performance calculations, incorrect takeoff speeds were used on departure. On rotation, the aircraft initially failed to become airborne as expected, causing the commander to select TOGA power. The aircraft then became airborne and climbed away safely. Whilst the investigation could not identify the exact source of the error, deficiencies were revealed in the operator's procedures for calculating performance using their computerised performance tool.

A study of previous takeoff performance events showed that the number and potential severity is sufficient to warrant additional safeguards to be identified by industry and to be required by regulators. Two Safety Recommendations were made.

SAFETY RECOMMENDATION – 2009-080

It is recommended that the European Aviation Safety Agency develop a specification for an aircraft takeoff performance monitoring system which provides a timely alert to flight crews when achieved takeoff performance is inadequate for given aircraft configurations and airfield conditions.

Response

European Organisation for Civil Aviation Equipment (EUROCAE) Working Group 94 has been formed to make a feasibility study on the development of a Take-off performance monitoring system (TOPMS) standard. The Agency is represented in this Group (chair). The conclusion of this feasibility study, expected in 2014, will determine if a second phase of standard development is suitable.

Status – Accepted – Closed

Boeing 737-73V	West of Norwich, Norfolk	12 January 2009	Serious Incident

AAIB Bulletin: 9/2010
FACTOR: N/A

Synopsis

A flight control manual reversion check was being conducted as part of a post-maintenance check flight. During the check, the aircraft pitched rapidly nose-down, descending approximately 9,000 ft before control was recovered. A number of maintenance and airworthiness check issues were identified and six Safety Recommendations were made.

SAFETY RECOMMENDATION – 2010-071

It is recommended that Boeing review their published B737 flight test schedules to improve their clarity and suitability for use by pilots conducting such tests.

Response

Boeing provided a comment to this recommendation in the reference (c) letter that they produce generic post – delivery flight profile documents for all of the current production airplane models. These documents are intended to assist operators in developing their own profiles which fit their operation and maintenance activities in addition to addressing local regulatory requirements.

Boeing was aware that the Flight Safety Foundation (FSF) was active in the development of flight test schedules and profiles based on several accidents and incidents in the recent past. They attended and participated in the FSF's Functional Check Flight (FCF) Symposium in Vancouver, Canada in early 2011 along with a number of different manufacturers and operators. They understood, as an active participant, that this effort would culminate in a set of global recommendations for such check flights which were to be released in August, 2012.

Boeing would evaluate the FSF's recommendations for any Boeing action necessary to support continued safe operation during functional check flights.

Status – Partially Accepted – Open

SAFETY RECOMMENDATION – 2010-076

It is recommended that the European Aviation Safety Agency provide guidance to National Airworthiness Authorities on monitoring continuing airworthiness.

Response

The Rulemaking Drafting Group in charge of Rulemaking Task RMT.0216 (former M.027) 'Aircraft Continuing Airworthiness Monitoring' decided not to maintain in-flight surveys as part of the National Aviation Authorities continuing airworthiness monitoring.

However, the Agency initiated rulemaking task RMT.0393 and 0394 [former MDM.097(a) and (b)] 'Airworthiness and operational aspects for maintenance check flights'. This task has the following objective which fulfils the issue raised through this safety recommendation: "establish Acceptable Means of Compliance or Guidance Material to help to determine when a maintenance check flight should be performed and under which protocol and responsibilities" [refer to the Terms of Reference MDM.097(a) and (b) published on 01 April 2011, available on EASA Website].

Status – Accepted – Closed

ERJ 190-200 LR	Overhead Edinburgh	15 January 2009	Incident

AAIB Bulletin: 1/2010
FACTOR: N/A

Synopsis

During flight, "smoke" was seen to emanate from a galley sink and the flight deck and cabin crews took appropriate emergency action. In the course of the 'Electrical System Fire or Smoke' procedure the flight crew established the aircraft on emergency power, after which communications between the flight deck and cabin became difficult. The aircraft landed safely. Deficiencies in the interphone system were identified, and four Safety Recommendations were made in AAIB Special Bulletin S1/2009 (February 2009).

SAFETY RECOMMENDATION – 2009-017

It is recommended that Embraer (Empresa Brasiliera de Aeronautica SA) immediately notify all operators, of the Embraer 190 family of aircraft, to inform flight crew of the importance of advising cabin crew when an aircraft is on emergency electrical power.

Response

It is Embraer's opinion that it would not be advisable to increase the flight crew workload in an electrical emergency situation and that this issue is more properly addressed through the FAM and training.

Status – Rejected

SAFETY RECOMMENDATION – 2009-018

It is recommended that Embraer (Empresa Brasiliera de Aeronautica SA) immediately notify all operators, of the Embraer 190 family of aircraft, to inform their flight and cabin crew of the functioning of the interphone system when the aircraft is supplied only with emergency electrical power.

Response

In response, Embraer has agreed with Safety Recommendations 2009-018 and 2009-020 and pertinent information is included in recent revisions of the Airplane Operations Manual (AOM) and Flight Attendant Manual (FAM) for affected Embraer 170 and 190 operators.

Status – Accepted - Closed

SAFETY RECOMMENDATION – 2009-019

It is recommended that Embraer (Empresa Brasiliera de Aeronautica SA) modify the functioning of the interphone systems of Embraer 190 family aircraft to provide crew with the facility to make both normal and emergency calls when the aircraft is supplied only with emergency electrical power.

Response

Considering the AAIB Safety Recommendation 2009-19, EMBRAER understands that an electrical emergency is a specific degraded condition where several aircraft systems may require a dedicated action, and that crews learn how to deal with these situations during their training. EMBRAER also considers that during an emergency condition, such as an electrical emergency, the crews should use the EMER PILOT button to communicate. For this reason, the colour of light just above this button is red, while the colour of the other three lights are green. This clearly helps the crews to identify the emergency purpose EMER PILOT button.

Regarding the event in question, had the cabin crew tried to use the EMER PILOT button, they would have been able to communicate with the flight deck. To reinforce this, and in line with this recommendation, EMBRAER issued on 11.May.2009 the revision 6 of the Flight Attendant Manual (FAM-1714-109). The section 1-10, page 8, of this document added the following note:

'NOTE: If the "PILOT" button is pressed in the electrical emergency configuration

(RAT deployed), the green light will illuminate and the call chime will be annunciated, but the communication channel will be unavailable. The "EMER PILOT" button can be used normally'.

Considering the above, EMBRAER respectfully submits that an equivalent increment in safety level pursued by the Safety Recommendation 2009-19 has been achieved by the modifications already introduced in the flight attendant manual. Therefore, EMRAER respectfully proposes to AAIB a review of the safety recommendation 2009-19 to consider it as closed.

Status – Accepted – Closed

SAFETY RECOMMENDATION – 2009-020

It is recommended that Embraer (Empresa Brasiliera de Aeronautica SA) immediately notify all operators, of the Embraer 190 family of aircraft, to inform flight and cabin crew of the functioning of the flight deck access system when the aircraft is supplied only with emergency electrical power.

Response

In response, Embraer has agreed with Safety Recommendations 2009-018 and 2009-020 and pertinent information is included in recent revisions of the Airplane Operations Manual (AOM) and Flight Attendant Manual (FAM) for affected Embraer 170 and 190 operators.

Status – Accepted – Closed

Boeing 777-236	**St Kitts Airport, Caribbean**	**26 September 2009**	**Serious Incident**

AAIB AAR: 4/2010
FACTOR: N/A

Synopsis

The crew received the aircraft's take off performance figures for a take off from Intersection Alpha on Runway 07 at Robert L Bradshaw International Airport, St Kitts, West Indies. Having received taxi clearance to Intersection Alpha, the aircraft taxied to Intersection Bravo from where it subsequently took off; the crew believed they were at Intersection Alpha. Intersection Bravo on Runway 07 is not an authorised takeoff intersection for the Boeing 777. The estimated Take-off Run Available from Intersection Bravo was approximately 1220 m, which was 695 m less than the planned takeoff run from Intersection Alpha.

SAFETY RECOMMENDATION – 2010-048

It is recommended that the Eastern Caribbean Civil Aviation Authority ensures that the infrastructure of Robert L Bradshaw International Airport, St Kitts, complies with ICAO Annex 14 Standards and Recommended Practices or any differences are filed. In the interim a NOTAM of outstanding deficiencies should be published.

Response

The ECCAA agreed to ensure that the deficiencies at the Robert L Bradshaw International Airport, which may have contributed to the incident, had been corrected. This list of was delivered to the airport operator and the required corrections were done.

Status – Partially Accepted – Open

SAFETY RECOMMENDATION – 2010-049

It is recommended that the Eastern Caribbean Civil Aviation Authority ensures that the infrastructure of Robert L Bradshaw International Airport, St Kitts, complies with ICAO Annex 14 Standards and Recommended Practices or any differences are filed. In the interim a NOTAM of outstanding deficiencies should be published.

Response

As above.

Status – Partially Accepted – Open

Falcon 2000	Biggin Hill Airport, Kent	11 November 2009	Incident

AAIB Bulletin: 12/2010
FACTOR: N/A

Synopsis

The aircraft had been undergoing a technical investigation to identify the cause of a braking defect. A flight crew were requested by the on-site maintenance team to carry out high speed taxi trials as part of the troubleshooting process. The crew conducted a series of seven accelerate/stop runs along the main runway, at gradually increasing reject speeds. At the commencement of the eighth run, the crew felt that a tyre had deflated and brought the aircraft to a stop. They were informed by ATC that there was a fire under the left wing; the crew and passengers then abandoned the aircraft safely. The fire was caused by damage to the brakes from excessive temperature, this released hydraulic fluid under pressure, which then ignited. Four safety recommendations were made as a result of the investigation.

SAFETY RECOMMENDATION – 2010-061

It is recommended that the European Aviation Safety Agency review the Falcon 2000 landing gear and hydraulic system with a view to ensuring that, in the event of a leak, the system is protected so as to limit the loss of fluid in the vicinity of the brakes.

Response

EASA has reviewed the Falcon 2000 brakes hydraulic system design with particular attention paid to limit the loss of fluid in the vicinity of the brakes. It is recognised that configurations with hydraulic fuses on both hydraulic systems ensure a robust protection against loss of fluid in the vicinity of the brakes in case of a major leak. However the positive in service experience of the Falcon fleet led EASA to conclude that a corrective action is not justifiable.

Status – Accepted – Closed

SAFETY RECOMMENDATION – 2010-062

It is recommended that the European Aviation Safety Agency require Dassault Aviation to review and amend the Falcon 2000 Airplane Flight Manual to ensure that the brake energy limitations quoted in all sections of the manual are consistent and reflect what has been satisfactorily demonstrated on the aircraft as a safe limit.

Response

EASA has reviewed the brake energy limitations quoted in the Aircraft Flight Manual (AFM) and confirms that those limitations are consistent with the certification data. Moreover, the AFM information is consistent with EASA policy stated in Certification Memorandum CM-HS-001 that allows the use of Technical Standard Order (TSO) demonstrated Brake Energy when associated with brake cooling time charts.

Status – Partially Accepted – Closed

SAFETY RECOMMENDATION – 2010-063

It is recommended that the European Aviation Safety Agency require Dassault Aviation to review and amend the Falcon 2000 Airplane Flight Manual to ensure that the guidance provided to flight crews relating to accumulated brake energy and minimum turnaround times is clear, consistent and takes account of all aspects of the aircraft's operation.

Response

The minimum turnaround time is defined in section 5-800-XX of the Aircraft Flight Manual (AFM). In particular section 5-800-10 provides the brake cooling time to be observed after performing an Rejected Take Off (RTO) to remain inside the maximum brake energy at the next take off. EASA prompted the Type Certificate (TC) holder to review and improve the wording of the guidance provided to flight crew in the AFM.

Dassault Aviation will improve the wording of the F2000 aircraft AFM as already done during recent certification of Falcon 2000S aircraft.

Status – Partially Accepted – Open

Cessna 680	**During climb, after departure from London Luton Airport**	**30 September 2010**	**Serious Incident**

AAIB Bulletin: 8/2011
FACTOR: F06/2011

Synopsis

The crew experienced an uncommanded transfer of fuel from the right to the left fuel tank after following the checklist procedures for a left main electrical bus fault indication. The aircraft subsequently became left wing heavy and exceeded the lateral imbalance limits. It returned to Luton Airport where a flapless landing was completed without further incident. As a result of this incident, Special Bulletin S1/2010 was published on 8 October 2010, containing two Safety Recommendations. The investigation established that the isolation of the left main bus had caused a false fuel cross-feed command which resulted in the uncommanded fuel transfer. The aircraft manufacturer has published a temporary flight crew procedure to mitigate the effects of a recurrence and has also issued a service bulletin to incorporate a design solution.

Eight further Safety Recommendations were made in this bulletin, relating to aircraft certification processes and flight recorder documentation.

SAFETY RECOMMENDATION – 2010-091

It is recommended that the Federal Aviation Administration (FAA) require the Cessna Aircraft Company to take suitable actions for the Cessna Citation 680 Sovereign, to prevent uncontrolled fuel migration from the right to the left tank during aircraft operation when the left main electrical bus is not powered.

Response

The FAA worked with the Cessna Aircraft Company to develop changes to address possible uncommanded fuel transfer when the left main electrical bus is not powered. The design changes incorporate two additional diodes to prevent a sneak ground path in either a left or right side electrical emergency when the respective main bus is not powered.

In October 2010, to address new production airplanes, they approved Cessna ECR 70612 '680 Fuel Crossfeed Improvement for Production'. All new aircraft deliveries since October 2010 have included the diode installation fix.

In December 2010, Cessna issued Mandatory Service Bulletin SB680-24-11 requiring installation of the diodes for all fielded aircraft. On March 22, 2012, the FAA issued Airworthiness Directive 2012-07-04 (enclosed) to mandate SB680-24-11.

The FAA believes they have effectively addressed FAA Safety Recommendation 10.273 and consider their actions complete.

Status – Accepted – Closed

DHC-8-402	Bournemouth Airport, Dorset	30 November 2010	Incident

AAIB Bulletin: 9/2011
FACTOR: N/A

Synopsis

As the aircraft approached touchdown following a flapless approach, the pilot increased the pitch attitude to control the rate of descent and the tail of the aircraft struck the runway. Two recommendations were made.

SAFETY RECOMMENDATION - 2011-081

It is recommended that Bombardier Aerospace amends the DHC-8-402 Dash 8 emergency checklist section concerning abnormal flap landings to reflect their advice that power will be maintained until main wheel contact.

Response

Bombardier Aerospace has no plans to change any of the existing documentation related to normal or abnormal landings, which it considers adequate.

Status – Rejected

Airbus A319-131	On approach to London Heathrow	17 December 2010	Serious Incident

AAIB Bulletin: 4/2012
FACTOR: N/A

Synopsis

On approach to London Heathrow Airport, in IMC and icing conditions, there was a loss of communication between the Probe Heat Computers (PHC) and the Centralised Fault Display System (CFDS). The associated Electronic Centralised Aircraft Monitoring (ECAM) actions required the crew to select ADR3 as the data source for the commander's instruments.

Later, on final approach to Runway 27L, the aircraft suffered a loss of displayed airspeed information on both the commander's and the standby flight instruments. The crew carried out a go-around using the 'Unreliable Speed Indication' procedure from the Quick Reference Handbook (QRH).

The investigation concluded that the loss of displayed airspeed information resulted from a combination of:

- a loss of communication between the Probe Heat Computers (PHC) and the Centralised Fault Display System (CFDS),
- icing of the standby pitot probe resulting in the loss of indicated airspeed displayed on the commander's and standby instruments.

One Safety Recommendation was made.

SAFETY RECOMMENDATION - 2011-099

It is recommended that Airbus amend the UNRELIABLE SPEED INDIC/ADR CHECK procedure in the A320 Quick Reference Handbook and the Flight Crew Operating Manual to ensure that it meets the requirements for all phases of flight.

Response

Airbus has extended the review to the whole Airbus fleet, including the A320 family (involved in this incident), the A330/A340 family, and the A380. The A300/A300-600/A310 family is not affected. All details are provided here after.

For the affected programs, the amended procedures instruct to retract one flap and maintain configuration 3 when the unreliable airspeed situation is encountered in configuration FULL.

The amendment has been introduced in May12 revision of A320 and A330/A340 families FCOM Flight Crew Operating Manual and associated QRH Quick Reference Handbook.

Status – Accepted – Closed

Gulfstream G150	**RAF Northolt**	**6 February 2011**	**Serious Incident**

AAIB Bulletin: 12/2011
FACTOR: N/A

Synopsis

A takeoff was attempted from Runway 25 at Northolt Airport, London. When the commander pulled the control column back to rotate at rotation speed, V_R, and subsequently fully back, the aircraft only pitched up to 1º. The takeoff was rejected just before V_2, full braking was applied and the aircraft came to a stop at the end of the paved surface. A fire broke out around the left mainwheels which was suppressed quickly by the Rescue and Fire Fighting Service (RFFS).

The flight data showed that the aircraft's acceleration during the takeoff roll was below normal but the investigation did not reveal any technical fault with the aircraft. The most likely explanation for the lack of acceleration and rotation was that the brakes were being applied during the takeoff, probably as a result of inadvertent braking application by the commander, which caused a reduction in acceleration and a nose-down pitching moment sufficient to prevent the aircraft from rotating. However, it could not be ruled out that another factor had caused partial brake operation.

SAFETY RECOMMENDATION – 2011-085

It is recommended that the Gulfstream Aerospace Corporation issue flight data recorder engineering unit conversion information for G150 aircraft in a single document that follows the guidance given in Federal Aviation Administration AC 20-141B and UK Civil Aviation Authority CAP 731.

Response

Gulfstream has a program underway that will amend the current Flight Data Recorder STC package to certify additional parameters that is scheduled to be completed in 3Q2013. During the course of this project the means to readily provide the recommended engineering conversion information in a single document will be accomplished.

Status – Accepted – Closed

Boeing 737-33A	Chambery Airport, France	14 April 2012	Accident

AAIB Bulletin: 4/2013
FACTOR: F02/2013

Synopsis

An onboard hand-held Electronic Flight Bag (EFB) computer was used to calculate the aircraft's takeoff performance. The commander omitted to enter the aircraft's takeoff weight into the performance calculation software, which defaulted to the previous flight's takeoff weight. The crew did not cross-check the data and incorrect speeds and thrust were calculated and subsequently used for the takeoff. As a consequence, the airspeed at rotation was too low and the pitch angle was sufficient to strike the tail on the runway. A broken spring within the aircraft's elevator feel and centering unit caused reduced resistance in the flight controls in pitch, contributing to the excessive pitch attitude achieved during rotation. The investigation also revealed wider issues relating to the general design and use of EFB computers to calculate performance data.

SAFETY RECOMMENDATION – 2012-036

It is recommended that the European Aviation Safety Agency establish a set of detailed guidelines for the operational evaluation and approval of Electronic Flight Bags. These should be more specific than the proposed Acceptable Means of Compliance (AMC) 20-25 and include information such as provided in the Federal Aviation Authority document 'Electronic Flight Bag Authorization for Use' and Joint Aviation Authorities Safety Information Communication No 7.

Response

The Acceptable Means of Compliance (AMC) 20-25 content has significantly evolved during the Notice of Proposed Amendment (NPA) 2012-02 consultation phase of the Rulemaking Task RMT.0001.

This evolution includes more detailed guidelines for the operational evaluation and take into account Joint Aviation Authorities Safety Information Communication No. 7.

Comment Response Document (CRD) to NPA 2012-02 was published on 31/07/2013 on the EASA Website. The CRD provides the resulting text of AMC 20-25 in its Appendix A.

Paragraph D.3.2 of Appendix D to AMC 20-25 provides the following with regard to the electronic flight bag (EFB):

"The user should be able to modify performance calculations easily, especially when making last minute changes.

Calculation results and any outdated input fields should be deleted:

(a) when modifications are entered;

(b) when the EFB is shut down or the performance application is closed; and

(c) when the EFB or the performance application have been in a standby or 'background' mode long enough, i.e. such that it is likely that when it is used again the inputs or outputs are outdated."

Status – Accepted – Closed

Fan Jet Falcon 20E	Runway 23, Durham Tees Valley Airport	9 August 2012	Serious Incident

AAIB Bulletin: 6/2013
FACTOR: F04/2013

Synopsis

The aircraft overran the runway when takeoff was abandoned due to a potential birdstrike. The crew stated that V_1 had not been called when the decision to stop the takeoff was made but analysis of available recorded data indicated that the aircraft was approximately nine knots above V_1 at the time that actions were taken to reject the takeoff. No aircraft faults were found to have contributed to the incident although the surface friction characteristics of the runway stopway adversely affected the deceleration rate achieved during the final stages of the rejected takeoff. The lack of a CVR or FDR severely limited the ability of the investigation to determine the exact sequence of events during the incident. Two Safety Recommendations were made.

SAFETY RECOMMENDATION – 2013-004

It is recommended that Durham Tees Valley Airport takes action to ensure that, in accordance with the requirements of CAP 683 – The Assessment of Runway Surface Friction Characteristics, the surface of the Runway 23 stopway has friction characteristics not substantially less than those of the associated runway.

Response

A successful friction test was carried out by Middlesbrough Borough Council on both runway over runs following the comments in the draft report ref EW/C2012/8/2.

The tests were carried out in accordance with CAP683 and the equipment used was a Grip tester Mk11. The results show good friction levels on the areas in question under items 20 – 30 on page 24 of the report and the only comments being that these areas would benefit from regular sweeping. These areas will form part of the sweeping plan of the airport operations team and annual reports will also encompass these areas. The annual friction testing will include both ends of the over runs.

Status – Accepted – Closed

SAFETY RECOMMENDATION – 2013-005

It is recommended that the Civil Aviation Authority cease to grant Cobham Leasing Limited exemptions from the Air Navigation Order flight recorder requirements for their Falcon 20 fleet.

Response

The CAA accepts this recommendation and has advised the operator that it would no longer be appropriate to issue exemptions against the Air Navigation Order requirement for the fitting of flight recorders. The operator has responded positively to this and has engaged with a design organisation for the modification of the aircraft to meet the flight recorder requirements. The age of the aircraft complicates the process as there are no 'off the shelf' solutions currently available. The plan, which is accepted by the CAA, calls for the design and Supplemental Type Certification of the appropriate modifications to be completed by December 2013 and fleet implementation to take place between January 2014 to June 2015. Flight recorder exemptions will only continue as necessary to support this programme.

Status – Accepted – Closed

Airbus A330-343	**On departure from Orlando International Airport, USA**	**19 January 2013**	**Serious Incident**

AAIB Bulletin: 9/2013
FACTOR: N/A

Synopsis

The aircraft was in the initial climb, passing 530 ft agl after takeoff from Runway 35L, when it was struck by birds which impacted the fan blades of the left and right engines as well as the nose of the aircraft. Both engines received damage and the left engine was shut down by the crew due to the engine oil pressure indicating zero. The aircraft returned to Runway 36R and carried out an uneventful single-engine landing. One Safety Recommendation related to the indication of engine oil pressure was made.

SAFETY RECOMMENDATION – 2013-015

It is recommended that Rolls-Royce plc modify the oil pressure indication and failure detection systems of the Trent 700 engine to minimise the possibility of an activation of the Electronic Engine Controller oil pump failure logic as a result of high vibration or an Integrated Drive Generator failure.

Response

Rolls-Royce has launched a programme of testing to improve understanding of the Trent 700 oil pressure sensing system and its response to engine vibration. Rolls-Royce anticipates that the results from this testing will enable the definition of modifications to this system, necessary to mitigate the likelihood of future spurious indications. This testing is scheduled to be completed before the end of 2013. Plans for appropriate hardware-based solutions can be considered following analysis of the test results. Depending on the outcome of these activities, we currently anticipate that a target design solution would be available before the end of 2014.

Status – Accepted – Closed

Airbus A319-131	**London Heathrow Airport**	**24 May 2013**	**Accident**

AAIB Special Bulletin: S3/2013
FACTOR: N/A

Synopsis

The Airbus A319-131 was departing from London Heathrow Airport Runway 27L, the fan cowl doors from both engines detached, damaging the airframe, various aircraft systems and causing a fuel leak on the right engine which resulted in a subsequent in-flight fire. The aircraft returned to land at Heathrow and an emergency evacuation was completed.

The Chief Inspector of Air Accidents ordered an investigation into the accident and the publication of an Inspector's Report.

SAFETY RECOMMENDATION – 2013-011

It is recommended that Airbus formally notifies operators of A320-family aircraft of the fan cowl door loss event on A319 G-EUOE on 24 May 2013, and reiterates the importance of verifying that the fan cowl doors are latched prior to flight by visually checking the position of the latches.

Response

The Airbus reply consists in transmission to all Airbus operators of an OIT – Operators Information Transmission 999.0029/13 and FOT – Flight Operations Transmission 999.0030/13 reminding the standard procedures, recommendations and available modifications that have been developed to prevent fan cowl loss events.

Status – Accepted – Closed

Boeing 787-8	London Heathrow Airport	12 July 2013	Serious Incident

AAIB Special Bulletins: S5/2013 & S4/2014
FACTOR: N/A

Synopsis

A fire event occurred on a parked, unoccupied and electrically un-powered Boeing 787 aircraft at London Heathrow Airport. Subsequent examination of the fire-affected area has focussed on the Emergency Locator Transmitter (ELT) and the AAIB investigation continues.

SAFETY RECOMMENDATION – 2013-016

It is recommended that the Federal Aviation Administration initiate action for making inert the Honeywell International RESCU406AFN fixed Emergency Locator Transmitter system in Boeing 787 aircraft until appropriate actions can be completed.

Response

The FAA issued Airworthiness Directive (AD) 2013-15-07 (Docket No. FAA- 2013-0628), which became effective July 26, 2013. The AD required, within 10 days of the effective date, either removal or inspection of the Honeywell fixed ELT and corrective action if necessary. The AD was issued to prevent a fire in the aft crown of the airplane, or to detect and correct discrepancies within the ELT that could cause such a fire. As a result, the FAA believes it has effectively addressed the intent of Safety Recommendation 14.008 and considers its actions complete.

Status – Accepted – Closed

SAFETY RECOMMENDATION – 2013-017

It is recommended that the Federal Aviation Administration, in association with other regulatory authorities, conduct a safety review of installations of Lithium-powered Emergency Locator Transmitter systems in other aircraft types and, where appropriate, initiate airworthiness action.

Response

The FAA is currently conducting a safety review of Lithium-powered ELT systems with other regulatory authorities to identify any unsafe conditions in other aircraft types. The FAA expects to provide an update on the status of the safety review by March 31, 2015. As a result, Safety Recommendation 14.009 will remain classified as open.

Status – Accepted – Closed

Aeroplanes <> 2,250 kg and 5,700kg MTWA

BN2A Mk III-2 Trislander	**27 nm north-east of Alderney, Channel Islands**	**27 March 2012**	**Serious Incident**

AAIB Bulletin: 4/2013
FACTOR: N/A

Synopsis

The aircraft was on a scheduled flight from Alderney Airport, Channel Islands to Southampton International Airport. Shortly after levelling in the cruise, the pilot heard a "very loud bang" and the aircraft experienced severe vibration, which the pilot subsequently identified as a failure of the No 2 tail-mounted engine. The propeller of the inoperative engine could not initially be feathered, and the pilot was unable to maintain altitude, so he declared an emergency. The propeller blades eventually moved to the feather position and the pilot performed an uneventful landing back at Alderney Airport. The No 2 cylinder on the No 2 engine was subsequently found to have released from the crankcase.

SAFETY RECOMMENDATION – 2013-001

It is recommended that Lycoming introduce additional maintenance requirements to ensure that the cadmium coating on the cylinder mounting studs, fitted to O-540-E4C5 engines, is not permitted to degrade to a level where corrosion of the base stud material can result in failure of the stud.

Response

Lycoming Engines was not a direct party to the investigation and inspection of subject engine and we have concerns that the root cause for the stud failure may not have been identified.

Issuing a safety recommendation without understanding the root cause of this stud failure may be leading owner/operator, maintenance facilities down the incorrect path in our efforts to prevent future occurrences. Lycoming Engines has observed instances in the past with similar failures of cylinder hold down stud failure which was caused by the thru-studs attachment hardware having lost torque due to fretting occurring at the crankcase main bearing mating surface. When the thru-studs attaching hardware losses torque, the remaining cylinder hold down studs become over loaded resulting in breakage.

Status – Rejected – Closed

SAFETY RECOMMENDATION – 2013-002

It is recommended that the European Aviation Safety Agency, in collaboration with the UK Civil Aviation Authority, conduct a risk-based assessment of the Britten-Norman BN2 Mk III Series Trislander and BN2 Series Islander aircraft, with respect to one engine inoperative performance and the hazard and probability of an associated failure to feather of the affected engine's propeller.

Response

EASA is working in collaboration with CAA UK and has asked the Type Certificate Holder of BN2 MKII Series Trislander and BN2 Series Islander aircraft to conduct a risk-based assessment with respect to one engine inoperative performance and the hazard and probability of an associated failure to feather of the affected engine's propeller.

Status – Partially Accepted – Open

Britten-Norman BN2A-26 Islander	**V C Bird International Airport, Antigua**	**7 October 2012**	**Accident**

AAIB Special Bulletin: S4/2013
FACTOR: N/A

Synopsis

The aircraft crashed shortly after takeoff. Water was present in the fuel system feeding the right-hand engine, which was not producing power at impact. The investigation was conducted on behalf of the State of Occurrence by the Eastern Caribbean Civil Aviation Authority. The United Kingdom AAIB, participating as State of Design, Manufacture, Registry and State of the Operator, published a Special Bulletin containing one Safety Recommendation.

SAFETY RECOMMENDATION – 2013-014

It is recommended that the European Aviation Safety Agency takes action to require that Britten-Norman Islander aircraft are equipped with fuel suction filter assemblies which minimise the likelihood of any water present in the fuel tank sumps being fed to the engines.

Response

The EASA has issued an airworthiness directive AD No: 2012-0270RI) on 16 April 2013 that requires a one-time inspection of the fuel filler cap and fuel filler receptacle to determine whether they are at the same modification state and depending on findings, accomplishment of applicable corrective action(s). In order to mitigate the risk of water contamination, pending the installation of matching fuel filler cap and receptacle, the AD also requires daily pre-flight water contamination checks.

Status – Rejected – Open

Aeroplanes = or < 2,250 kg MTWA

Extra EA 300/L	**Hastingleigh, near Ashford, Kent**	**26 May 2008**	**Accident**

AAIB Bulletin: 8/2009
FACTOR: N/A

Synopsis

The aircraft was en route from a flying display at Southend Airport, to its home base at Shoreham. Due to inclement weather, with a low cloudbase and poor visibility, the pilot planned to fly around the Kent coast, but having encountered better weather than expected when airborne, he set off across the county. Unfortunately the visibility deteriorated and the cloudbase lowered so he decided to abandon his route and re-trace his path. Instead of reversing his course, however, he turned through approximately 270°, and found he was flying up a valley. He elected to carry out a precautionary landing into a field, but lost control of the aircraft on final approach. The aircraft struck the ground at low speed while rolling and banked to the right. Although the airframe remained relatively intact and no ground fire occurred, both occupants were injured, one seriously.

SAFETY RECOMMENDATION – 2009-014

It is recommended that the European Aviation Safety Agency revise their certification requirements applicable to light aircraft crash survivability, with the aim of reducing occupant injury in otherwise survivable accidents. Detailed consideration should be given, for example, to requiring energy absorption provisions for seats, improved padding of aircraft components that might be impacted by an occupant and the fitment of air bag systems for both crew and passengers.

Response

The Agency, together with the Federal Aviation Administration (FAA) and the industry, is currently working to prepare a re-organisation of CS-23, and this is being done in the frame of rulemaking task RMT.0498. New design standards are being developed by ASTM International that will provide Acceptable Means of Compliance to new objective requirements.

In particular, a group has been initiated in the ASTM F44 Technical Committee as Work Item: WK41313 - New Specification for Emergency Conditions and Occupant Safety. This task group will consolidate the current CS-23/FAR Part-23 Subparts C and D regulations pertaining to Emergency Conditions and Occupant Safety into a single standard. Once complete, the standard will be further developed and refined based on feedback to the committee from users, industry, and regulators. This is one of the priority areas where it has been identified that safety improvements are needed and can be achieved with less burden by new standards that allow the introduction of safety enhancing features in aeroplanes. The Agency supports this approach which will permit the implementation of cost effective solutions meeting objective requirements using different possible technical solutions complying with international industry standards.

Status – Accepted – Closed

SAFETY RECOMMENDATION – 2009-015

It is recommended that the European Aviation Safety Agency consider requiring the modification of light aircraft types for which they have airworthiness responsibility, where the extant restraint systems are unlikely to prevent contact of the occupants with hard parts of the aircraft, with the aim of reducing the likelihood and severity of occupant injury in an otherwise survivable accident. Detailed consideration should be given, for example, to requiring energy absorption provisions for seats, improved padding of aircraft components that might be impacted by an occupant, and the fitment of air bag systems for both crew and passengers.

Response

EASA and the European Commission have defined a European General Aviation Safety Strategy and Road Map. One of the key elements is to better tailor the safety requirements commensurate to the risk involved, while also encouraging the development of standards permitting more cost effective implementation of safety enhancement devices.

The Agency is conducting a rulemaking task RMT.0245 (MDM.048) which will provide certification specifications for standard changes in support to the related provisions introduced in Part-21 (Annex to regulation (EU) 748/2012). This will encourage the implementation of standard changes to improve survivability like the installation of energy absorbing seat cushions, airbag systems or headrests.

As the safety benefit gained from the measure proposed by this Safety Recommendation would not balance the economic impact, the Agency decided not to mandate these cabin safety enhancements for already certified light aircraft, and the rulemaking task (reference MDM.090 in the inventory list of EASA Rulemaking Programme) has been cancelled.

Status – Accepted – Closed

Grob G115E	**RAF Leeming, North Yorkshire**	**12 September 2009**	**Accident**

AAIB Bulletin: 1/2011
FACTOR: N/A

Synopsis

During the rollout from a three aircraft 'stream' landing, the pilot and passenger of the rear aircraft had to apply full brake pressure to avoid a collision with the aircraft in front. Although the aircraft did not collide, the resulting loads experienced by the wing structure supporting the landing gear, caused it to fail in overload. Subsequent analysis of the failed structure identified possible manufacturing issues, which may have contributed to the failure. The accident was also subject to an RAF Unit Inquiry. Five Safety Recommendations were made.

SAFETY RECOMMENDATION – 2010-078

It is recommended that the European Aviation Safety Agency in cooperation with the Luftfahrt-Bundesamt (LBA) conduct an audit of Grob Aircraft AG's design and quality standards, manufacturing processes and facilities to ensure that they meet current regulatory standards.

Response

EASA carried out a combined audit both on Production Organisation Approval (POA) and Design Organisation Approval (DOA) side at Grob manufacture, in cooperation with the Luftfahrt-Bundesamt (LBA).

One of the scopes of this audit was notably to check the actions taken by the manufacturer further to the accident Grob G115E, more specifically on its design and quality standards, and manufacturing processes.

These processes have been subject to improvement by the manufacturer, in the definition of Type Design and the manufacturing processes and are considered as appropriate by the Agency.

Status – Accepted – Closed

Piper PA-28-161	Field south of Shoreham Airport, West Sussex	21 July 2012	Accident

AAIB Bulletin: 10/2013
FACTOR: N/A

Synopsis

At about 200 ft aal after takeoff the engine suffered a sudden loss of power and the pilot initiated a forced landing. The aircraft touched down in a field at the end of the runway but then it hit a fence, a hedge and a large mound, which caused significant damage to the aircraft. The loss of power was caused by failure of a clamp between the turbocharger compressor outlet and the turbo pipe assembly. This clamp had failed due to a fatigue crack that had initiated at multiple sites on the inner diameter and then propagated through the thickness of the sidewall. Following the accident the maintenance organisation discovered another cracked clamp, which had not yet failed, on another aircraft fitted with the same engine type. Three Safety Recommendations were made.

SAFETY RECOMMENDATION 2013-018

It is recommended that Technify Motors GmbH, as the STC holder, informs operators of Piper PA-28, Cessna 172 and Robin DR400 aircraft fitted with TAE 125-01 and 125-02 engines that the Wiggins clamp (P/N NM-0000-0024701) is susceptible to cracking, which can lead to clamp failure and significant power loss. Furthermore, as TC holder they should inform Diamond Aircraft Industries of the same.

Response

Technify Motors GmbH had amended its AMM Supplements and requires now an inspection of the turbo charger clamp regarding cracks. All operators had been informed regarding the new manual revisions by Service Bulletins. Diamond Aircraft Industrie GmbH's office of airworthiness had been informed by email.

Status – Partially Accepted – Closed

SAFETY RECOMMENDATION 2013-019

It is recommended that Technify Motors GmbH establishes a consistent and suitable inspection and/or replacement interval for Wiggins clamp (P/N NM-0000-0024701) to be specified in the engine maintenance manuals and the aircraft maintenance manuals for which it holds the Supplemental Type Certificate, to maximise the likelihood that cracks in the clamp are detected before they propagate to failure.

Response

In response to this Recommendation, Technify Motors GmbH specified and harmonized the turbocharger clamp inspections in all AMM Supplements of their STCs.

Status – Accepted – Closed

SAFETY RECOMMENDATION 2013-020

It is recommended that Technify Motors GmbH re-assesses the vibration and loading conditions at the clamp and selects an alternate clamp design if necessary to ensure that it is not susceptible to cracking and failure during normal operations.

Response

Technify Motors GmbH reported that they had re-assessed the vibration and loading conditions at the clamp and found the current clamp suitable, if installed properly and inspected correctly and regularly. Most clamps failed so far due maintenance or installation errors. However, alternate designs are currently under evaluation.

Status – Accepted – Closed

Microlights

Team Minimax 93	**Field adjacent to Newnham Way, Ashwell, Herts**	**18 May 2012**	**Accident**

AAIB Bulletin: 4/2013
FACTOR: F03/2013

Synopsis

The aircraft struck the ground in an erect spin; the pilot was seriously injured. The pilot had flown flexwing aircraft for several years but had very little experience flying three axis aircraft. The investigation considered the differences between various control systems used in microlight aircraft, and one safety recommendation was made concerning pilot licensing.

SAFETY RECOMMENDATION – 2013-003

It is recommended that the Civil Aviation Authority should, in consultation with the British Microlight Aircraft Association, amend the relevant legislation to introduce distinct pilot qualifications for microlight aircraft of each control system, and to require pilots to undertake flight training and pass a flight test in order to gain those qualifications.

Response

The CAA accepts this recommendation. The CAA will consult with the British Microlight Aircraft Association and with other bodies representing affected stakeholders to agree a proposal to the government that it amends the relevant legislation to introduce distinct pilot qualifications for microlight aircraft of each control system, and to require pilots to undertake flight training and pass a flight test in order to gain those qualifications. The CAA will complete the work to develop and submit the proposal to the Government by October 2014.

Status – Accepted – Closed

Rotorcraft > 5,700kg MTWA or above

EC225 LP	**The ETAP Central Production Facility Platform in the North Sea**	**18 February 2009**	**Accident**

AAIB Bulletin: AAR 1/2011
FACTOR: F09/2009

Synopsis

The Helicopter departed Aberdeen Airport at 1742 hrs on a scheduled flight to the Eastern Trough Area Project (ETAP). The flight consisted of three sectors with the first landing being made, at night, on the ETAP Central Production Facility platform. Weather conditions at the platform deteriorated after the aircraft departed Aberdeen; the visibility and cloud base were estimated as being 0.5 nm and 500 ft respectively. At 1835 hrs the flight crew made a visual approach to the platform during which the helicopter descended and impacted the surface of the sea. The helicopter remained upright, supported by its flotation equipment which had inflated automatically. All those onboard were able to evacuate the helicopter into its life rafts. Both air and maritime Search and Rescue (SAR) assets were used to recover the survivors.

The investigation identified the following causal factors:

1. The crew's perception of the relative position and orientation of the helicopter to the platform during the final approach was erroneous. Neither crew member was aware that the helicopter was descending towards the surface of the sea. This was probably due to the effects of oculogravic and somatogravic illusions combined with both pilots being focussed on the platform and not monitoring the flight instruments.

2. The visual picture was possibly confused by a reflection of the platform in the sea.

3. The two radio altimeter based height alert warnings did not activate. The fixed 100 ft alert failed to activate due to a malfunction of the Terrain Awareness and Warning System (TAWS) and the selectable 150 ft alert would also have failed to activate for the same reason, had it not already been suspended by the crew. The pilots were not aware of the TAWS malfunction.

4. There was no specified night visual approach profile on which the crew could base their approach and minimum heights, and stabilised approach criteria were not specified.

SAFETY RECOMMENDATION – 2011-058

It is recommended that the European Aviation Safety Agency requires that crews of helicopters, fitted with a Terrain Awareness and Warning System, be provided with an immediate indication when the system becomes inoperative, fails, is inhibited or selected OFF.

Response

The EC Terrain Awareness and Warning System (TAWS) has a "TAWS" amber light on the helicopter Caution and Warning Panel (CWP). It was originally certified to illuminate for inhibited or failed TAWS and remain extinguished when the system is switched OFF. This design is in line with the 'Black Cockpit' concept applied to the EC225. It aims at limiting permanent unnecessary caution lights on the instrument panel and thus strengthening flight crew alertness and responsiveness to actual failure conditions, should any alarm illuminate. A "Black Cockpit" has valuable safety benefit under that perspective, provided however that control panels design is meant to prevent a wrong switch being activated and to ensure flight crews are always aware of any of their intentional manual selections. With this concept, voluntary switching OFF TAWS did not trigger permanent illumination of the "TAWS" light of the CWP, as the system master switch design is interlock-secured and cover plate-guarded.

There may be human factors limitations to this approach (i.e. not displaying system inoperative status), for instance in case of a two pilot crew not communicating a switch selection. For this reason, the EC225 TAWS system has been improved by Airbus Helicopters with the modification MOD 332P083739.10/.11/.12/.13/.14/.15. This MOD is the current design standard for all newly produced EC225 helicopters and the retrofit of the fleet with MOD has been made available by the Airbus Helicopters Service Bulletin No. EC225-34.029 dated 25-07-2013. This is a software upgrade from V.26 (software version of the affected G-REDU rotorcraft) to V.28. Among various design improvements, it provides CWP lighting command of the 'TAWS' amber light when the system is selected OFF or a failure mimicking this condition. This completes the other already existing system conditions that trigger indication of this alarm in case of inhibited or failed TAWS. Moreover, some EC225 helicopters equipped with former TAWS software V.24, can also accomplish the upgrade to the V.28 standard with specific MOD 332P083739.16/.17/.18/.19 and SB No. EC225-34.031 dated 25-07-2013.

Status – Partially Accepted – Open

SAFETY RECOMMENDATION – 2011-061

It is recommended that the European Aviation Safety Agency ensures that helicopter performance is taken into consideration when determining the timeliness of warnings generated by Helicopter Terrain Awareness and Warning Systems.

Response

EASA is awaiting results from studies which may allow redefining the Helicopter Terrain Awareness and Warning System (HTAWS) standards, especially for offshore operation, as the report FDP-CAA-Report 121019 "Report for UK Civil Aviation Authority on Class A Terrain Awareness Warning System (TAWS) for Offshore Helicopter Operations", which is currently interim and hence subject to change.

Status – Partially Accepted – Open

SAFETY RECOMMENDATION – 2011-068

It is recommended that the European Aviation Safety Agency requires Eurocopter to review the design of the fairings below the boarding steps on AS 332 and EC225 series helicopters to reduce the possibility of fairings shattering during survivable water impact and presenting sharp projections capable of damaging life rafts.

Response

The helicopter suffered a collision with the water which is irrelevant to the certification scope for helicopters with respect to the current EASA Airworthiness Standards. For certification, EASA deals with intentional and controlled ditching, for which the aircraft structural requirements are prescribed in terms of horizontal and vertical velocities of the helicopter at the time of the contact with the water during a ditching. The helicopter is therefore designed to structurally meet water contact loads derived from the predefined ditching conditions of the certification regulations.

Although the crash was survivable, the helicopter flight conditions recorded during the sea impact were much higher than the regulatory ditching envelope applicable for certification, hence far beyond the certified structural ditching provisions of the rotorcraft.

Moreover, other undetermined impact parameters had a large effect on the local failure of the fairings below the helicopter boarding steps and in particular, the attitude of these fuselage skins relative to the surface of the sea water at impact (i.e waves condition, shape and amplitude). The actual impact loads encountered locally by the fairings that failed during the accident remain therefore unknown after the investigation. Consequently, reviewing the affected fairings to reduce their possibility of failure versus structural loading conditions, beyond the ditching certification provisions and without any identified design targets or objective technical limit, is impracticable.

Nevertheless, EASA requested Airbus Helicopter to confirm that the failed fairings comply with the certification structural ditching provisions and assess whether they could even demonstrate higher

structural resistance. Airbus Helicopters have provided Report no. ETVF 130/12 issue B, dated 2013, by which they show positive safety structural margins on the fairings to ultimate loads of the certification ditching conditions (CS29.563 & 801 requirements), i.e. using a 1,5 safety factor. Additionally, the EASA Rulemaking Task RMT.0120 is on-going with the aim to further consider structural design aspects for ditching certification and possible expansion of the ditching envelope.

Status – Accepted – Closed

SAFETY RECOMMENDATION – 2011-070

It is recommended that the European Aviation Safety Agency ensures that a requirement is developed for all emergency equipment, stowed in deployable survival bags, to be capable of being easily accessed and utilised by the gloved hands of a life raft occupant whilst in challenging survival situations when a life raft may be subject to considerable motion in cold, wet and dark conditions.

Response

EASA is involved within the S9 group (Cabin Safety) of the SAE (Society of Automotive Engineers) and works on two propositions of Aerospace Standards (AS) relating to emergency equipments as follows:

- AS 1354: for Individual Inflatable Life Preservers and
- AS 1356: for Life rafts.

Both propositions contain provisions for test with either gloved or chilled hands as defined below:

CHILLED HANDS TEST METHOD: A technique to simulate the reduced dexterity of chilled hands that may occur during an emergency in a cold environment. A naïve test subject simultaneously submerges left and right forearms and hands in 50°F (10° C) water for 2 minutes, quickly dries, and immediately (within 5 seconds following immersion) attempts to open/operate designated packaging/equipment. The test subject should be healthy and wear a loose-fitting, sleeveless upper garment that will not inhibit blood-flow to the arms and hands. (Alternate: GLOVEDHANDS TEST METHOD)

GLOVED HANDS TEST METHOD: A technique to simulate the reduced dexterity of chilled hands that may occur during an emergency in a cold environment. A naïve test subject wears appropriately sized, 0.2 inch (5 mm) or thicker smooth-surfaced neoprene gloves to open/operate designated packaging/equipment. (Alternate: CHILLED HANDS TEST METHOD)

Depending on the outcome of this SAE work, the Agency may consider updating the corresponding CS-ETSO (C13f, C69c and 2C70a).

Status – Accepted – Closed

AS332L2	**11 nm NE of Peterhead, Scotland**	**1 April 2009**	**Accident**

AAIB Formal: AAR 2/2011
FACTOR: F09/2011

Synopsis

The helicopter was operating a return scheduled passenger flight from Aberdeen to the Miller Oil Platform, situated in the North Sea approximately 145 nm north-east of Aberdeen. When it arrived from its previous flight to the Bruce Platform, approximately 190 nm north-east of Aberdeen, a 'rotors running' crew change was carried out. The helicopter was serviceable except for a deferred defect affecting a part of its ice detection system. The daily in-flight checks had already been completed satisfactorily by the off-going crew. The helicopter was refuelled, the passengers boarded, and it

lifted off at 1040 hrs. The helicopter landed on the Miller platform, after an uneventful flight, at 1149 hrs, where it was refuelled again with the rotors-running. When the refuelling was complete, fourteen passengers boarded the helicopter for the return flight to Aberdeen. The weather conditions were benign with light south to south-easterly winds, good visibility with generally clear skies but with occasional broken cloud at 5,000 to 6,000 ft. Flying conditions were reported as smooth and the sea was calm.

The helicopter lifted from the Miller Platform at 1203 hrs and climbed to 2,000 ft, tracking inbound towards Aberdeen. Recorded information on the combined Cockpit Voice and Flight Data Recorder (CVFDR) shows that the crew were engaged in routine cockpit activities and there were no operational abnormalities. At 1254 hrs the co-pilot made a routine call on the company operating frequency stating that the helicopter was serviceable and the ETA was 1314 hrs. Twelve seconds later, one of the pilots made a brief MAYDAY call on the ATC frequency. This was followed by a similar call that included some position information, from the other pilot. The radar controller at Aberdeen acknowledged the MAYDAY call and tried unsuccessfully to contact the crew. He then asked the crew of another helicopter, outbound on a similar routing, to examine the sea in the area of the last radar position.

Recorded radar information showed the helicopter flying inbound towards Aberdeen at 2,000 ft, climbing momentarily to 2,200 ft and then turning right and descending rapidly. Surface visibility was good and an eye witness, working on a supply vessel approximately 2 nm from the accident site, heard the helicopter and saw it descend rapidly before it hit the surface of the sea. Immediately after impact he saw the four main rotor blades, still connected at their hub, strike the water. Around this time, he also heard two bangs close together. He immediately raised the alarm and the ship turned towards the accident site, which by now was marked by a rising column of grey then black smoke. The ship launched a fast rescue boat whilst making way towards the scene. The crew of this boat and the helicopter arrived promptly on the scene to discover an area of disturbed water, roughly 150 m in diameter containing debris from the helicopter. Other search and rescue vessels, aircraft and helicopters arrived on scene within 40 minutes. All persons on board were fatally injured.

SAFETY RECOMMENDATION – 2011-045

It is recommended that the European Aviation Safety Agency require the ‘crash sensor’ in helicopters, fitted to stop a Cockpit Voice Recorder in the event of an accident, to comply with EUROCAE ED62A.

Response

Following the previous reply by EASA, rulemaking task RMT.0268 has been merged with rulemaking task RMT.0249 and rulemaking task RMT.0076 has been merged respectively with RMT.0308 & RMT.0309.

Rulemaking task RMT.0249 will address Certification Specifications while the scope of rulemaking tasks RMT.0308 & RMT.0309 is air operation requirements. These tasks are identified in the rulemaking programme 2014-2017. The Safety Recommendation will be considered in these rulemaking tasks.

Status – Response Awaited – Open

EC225 LP	**20m E of Aberdeen**	**10 May 2012**	**Accident**
EC225 LP	**Approx 32nm SW of Sumburgh, Shetland Islands**	**22 October 2012**	**Accident**

AAIB Formal: 2/2014
FACTOR: N/A

Synopsis

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 were 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 – 2013-006

It is recommended that the European Aviation Safety Agency requires the manufacturers of aircraft equipped with a Type 15-503 Crash Position Indicator system, or similar Automatically Deployable Emergency Locator Transmitter, to review and amend, if necessary, the respective Flight Manuals to ensure they contain information about any features that could inhibit automatic deployment.

Response

The European Aviation Safety Agency has issued on 17 January 2014 the Airworthiness Directive EASA AD 2014-0019, regarding the Crash Position Indicator System (CPI), requiring temporary amendment of the aircraft flight manual (AFM) and installation of a placard, on installations where such an action has no detrimental effect on emergency locator transmitter (ELT) operation. This AD also requires replacement of the System Interface Unit with an improved part as a terminating action for the temporary AFM amendment and placard installation.

Status – Accepted – Closed

SAFETY RECOMMENDATION – 2013-007

It is recommended that the Federal Aviation Administration requires the manufacturers of aircraft equipped with a Type 15-503 Crash Position Indicator system, or similar Automatically Deployable Emergency Locator Transmitter, to review and amend, if necessary, the respective Flight Manuals to ensure they contain information about any features that could inhibit automatic deployment.

Response

Depending on the type of operation and operating airspace, the FAA may require rotorcraft to have an operating ELT. However, the FAA does not require the installation of a deployable ELT or CPI on helicopters; therefore, the loss of this function is not considered an unsafe condition. In addition, the FAA can only require a change to a design through an airworthiness directive, which requires the determination of an unsafe condition. As a result, the FAA lacks the justification to adopt safety recommendation 13.031, and we plan no further actions.

Status – Rejected

AS332L2 Super Puma	West of Sumburgh Airport, Scotland	23 August 2013	Accident

AAIB Special Bulletins: S6/2013, S7/2013 & S1/2014
FACTOR: F05/2013

Synopsis

On 23 August 2013, an AS332 L2 Super Puma helicopter, with 18 persons on board, crashed into the sea whilst on approach to Sumburgh Airport in the Shetland Islands. Four of the passengers did not survive.

The Chief Inspector of Air Accidents ordered an investigation into the circumstances of the accident and the publication of an Inspector's Report.

SAFETY RECOMMENDATION – 2013-021

It is recommended that the operator of Sumburgh Airport, Highlands and Islands Airports Limited, provides a water rescue capability, suitable for all tidal conditions, for the area of sea to the west of Sumburgh, appropriate to the hazard and risk, for times when the weather conditions and sea state are conducive to such rescue operations.

Response

As a result of the HIAL internal investigation and the AAIB Safety Recommendation 2013-21, HIAL commissioned an initial slipway and launch site survey for the provision of a water rescue capability to the west of Sumburgh Airport. The survey was conducted by independent experts, Royal Haskoning, in November 2013. Following an evaluation of the results, confirming the Toabs Geo slipway as the most suitable launch site to the West of the airport, Royal Haskoning have been instructed to proceed to the next stage, which will consist of a detailed bathymetric and topographic survey of the Toabs Geo slipway, together with an intrusive geotechnical survey of the associated seabed.

HIAL anticipates the plan for the Toabs Geo slipway to be available by the end of Feb 2014 and the required works are targeted for early summer 2014 to take advantage of the weather window in Sumburgh.

Status – Accepted – Closed

SAFETY RECOMMENDATION – 2013-022

It is recommended that the Civil Aviation Authority (CAA) review the risks associated with the current water rescue provision for the area of sea to the west of Sumburgh Airport and take appropriate action.

Response

The CAA accepts this Recommendation and is in the process of conducting a review of the risks associated with the current water rescue provision for the area of sea to the West of Sumburgh airport.

Highlands and Islands Airports Ltd. (HIAL), the operator of Sumburgh Airport, is currently reviewing the water rescue provision to the area of sea west of Sumburgh and the CAA has met with the HIAL Corporate Team to discuss their review and any subsequent plans to mitigate the associated risks.

The CAA will closely monitor the progress of the review being undertaken by HIAL and will take any further appropriate action to ensure that the risks associated with the current water rescue provision are being suitably addressed.

Status – Accepted – Closed

Rotorcraft <> 2,250 kg and 5,700kg MTWA

Aerospatiale SA365N	**Approx 450 metres SSE of the North Morecambe gas platform, Morecambe Bay, Irish Sea**	**27 December 2006**	**Accident**

AAIB Formal: AAR 7/2008
FACTOR: F12/2008

Synopsis

The helicopter departed Blackpool at 1800 hrs on a scheduled flight consisting of eight sectors within the Morecambe Bay gas field. The first two sectors were completed without incident but, when preparing to land on the North Morecambe platform, in the dark, the helicopter flew past the platform and struck the surface of the sea. The fuselage disintegrated on impact and the majority of the structure sank. Two fast response craft from a multipurpose standby vessel, which was on position close to the platform, arrived at the scene of the accident 16 minutes later. There were no survivors amongst the five passengers or two crew.

The investigation identified the following contributory factors:

1. The co-pilot was flying an approach to the North Morecambe platform at night, in poor weather conditions, when he lost control of the helicopter and requested assistance from the commander. The transfer of control was not precise and the commander did not take control until approximately four seconds after the initial request for help. The commander's initial actions to recover the helicopter were correct but the helicopter subsequently descended into the sea.

2. The approach profile flown by the co-pilot suggests a problem in assessing the correct approach descent angle, probably, as identified in trials by the CAA, because of the limited visual cues available to him.

3. An appropriate synthetic training device for the SA365N was available but it was not used; the extensive benefits of conducting training and checking in such an environment were therefore missed.

Six Safety Recommendations were made.

SAFETY RECOMMENDATION – 2008-032

It is recommended that CHC (Scotia) review their Standard Operating Procedures related to helideck approaches, to ensure that the non-handling pilot actively monitors the approach and announces range to touchdown and height information to assist the flying pilot with his execution of the approach profile. This is especially important on the S365N helicopter when the co-pilot is flying approaches in poor visual conditions and cannot easily monitor a poorly positioned radio altimeter.

Response

The Operator has amended its Operations Manual and Standard Operating Procedures to incorporate the recommendation.

Status – Accepted – Closed

SAFETY RECOMMENDATION – 2008-036

It is recommended that the European Aviation Safety Agency investigate methods to increase the conspicuity of immersion suits worn by the flight crew, in order to improve the location of incapacitated survivors of a helicopter ditching.

Response

The Agency Executive Director (ED) Decision 2006/04/R dated 11 July 2006 provides standards for:

- helicopter crew and passenger integrated immersion suits (i.e. immersion suit incorporating the functionality of a lifejacket): European Technical Standard Order (ETSO) 2C502,
- helicopter crew and passenger immersion suits for operations to or from helidecks located in a hostile sea area: ETSO 2C503,
- helicopter constant-wear lifejackets for operations to or from helidecks located in a hostile sea area: ETSO 2C504.

Immersion suits and lifejackets must be provided with a passive light system of retro-reflective material complying with the specification of International Maritime Organisation's (IMO) International Convention for the Safety of Life at Sea (SOLAS) 83 Chapt.III, Resolution A.658(16), Annex 2 or equivalent. Minimum area shall be per International Organization for Standardisation (ISO) Standard 15027-1:2002 paragraph 4.12. In addition, integrated immersion suits and lifejackets (worn in combination with an immersion suit) shall be fitted with a flashing survivor locator light that meets the standard defined by ETSO C85a.

It is agreed by the Agency that conspicuity of immersion suits and lifejackets can be improved through passive systems. Infra-red reflecting materials could provide the expected benefits and the Agency has been informed that some search and rescue (SAR) and military helicopters are equipped with infra-red search lights.

The Agency contacted IMO and ISO to know whether initiatives are planned to include infra-red reflectivity in future editions of the Annex 2 to the IMO Resolution or of ISO 15027-1. IMO replied that no action is planned and that this could be initiated in the future by a request from an IMO Member State (request to the IMO Maritime Safety Committee).

Considering that the IMO Resolution is commonly used for maritime and aviation applications, the Agency will wait for a revision of the IMO Resolution before revising the relevant ETSOs.

We suggest that the AAIB UK, in cooperation with the responsible body in the UK, submit a proposal to the next session of the IMO Maritime Safety Committee. If and once the IMO decides to revise its Resolution, the Agency will take action to update its ETSOs.

Status – Rejected

Rotorcraft = or < 2,250 kg MTWA

Hughes 369E	Glastonbury, Somerset	19 June 2011	Accident

AAIB Bulletin: 2/2012
FACTOR: N/A

Synopsis

While flying in the cruise at an altitude of 2,200 ft amsl, it is probable that the helicopter sustained a mechanical failure that resulted in the loss of pitch control to one of the tail rotor blades. During the subsequent attempt to land in a field, the airspeed reduced to the point where directional control of the helicopter seems to have been insufficient to maintain heading. At a height of approximately 50 ft, the helicopter yawed rapidly to the right before the rotation ceased and it developed a high rate of descent. The helicopter struck the ground heavily and was destroyed. The pilot survived but sustained serious injuries. There was no fire.

The investigation established the presence of fatigue cracks emanating from corrosion pits on the tail rotor blade pitch horn on one blade, which led to its failure. Also, the associated tail rotor pitch link had failed. The sequence of the two failures could not be established but either could explain the helicopter's behaviour before it crashed. Neither the failed section of this tail rotor blade pitch horn nor the associated pitch link were recovered from the accident site.

Four Safety Recommendations were made.

SAFETY RECOMMENDATION – 2011-103

It is recommended that MD Helicopters, in consultation with Helicopter Technology Company, updates the advice in the MD 369 helicopter Maintenance, Overhaul and Corrosion Manuals, with regard to the removal of corrosion and restoration of the surface finish and material properties on the tail rotor blades and pitch links, to ensure that the information is appropriate.

Response

MD Helicopters Inc. ("MDHI") issued Service Bulletin No. SB369E-105 in November 2011 and incorporated the bulletin's instructions into the Handbook of Maintenance Instruction (CSP-HM-2). The Bulletin provides instructions for the corrosion inspection of the 369 helicopter's tail rotor blades, and corrective action if corrosion is found or a blade is not adequately shot peened. MDHI further modified the maintenance manual to require yearly inspections of the affected tail rotor blades.

MDHI's service bulletin references Helicopter Technology Company's Mandatory Service Bulletin No. 3100-5, which also provides instructions for corrosion inspection of 369 helicopter tail rotor blades. MDHI concludes that information regarding removal of corrosion and restoration of the surface finish and material properties on the tail rotor blades is appropriate.

The maintenance instructions for the pitch links are contained in the Handbook of Maintenance Instruction (CSP-HM1-2) and the Component Overhaul Manual (CSP-COM-5). After reviewing these manuals, the pitch link's technical drawing, and the pitch link stress and fatigue analysis, MDHI concludes that the manuals contain appropriate information regarding corrosion removal and restoration of the pitch links.

Status – Accepted – Closed

Robinson R22 Beta	Ely, Cambridgeshire	6 January 2012	Accident

AAIB Bulletin: 2/2013
FACTOR: N/A

Synopsis

The Robinson R22 helicopter was flying from Manston to Fenland. Near Ely, witnesses on the ground saw it pitch and roll rapidly, the two main rotor blades separated from the rotor head and the aircraft fell to the ground. The pilot was fatally injured.

SAFETY RECOMMENDATION – 2012-039

The Federal Aviation Administration should amend the requirements in Federal Aviation Regulation Part 27 to reduce the risk of 'loss of main rotor control' accidents in future light helicopter designs.

Response

The FAA responds: We appreciate the analysis the AAIB performed and also for bringing this issue to our attention. The report, AAIB Bulletin: 2/2013, was very thorough and clearly makes the case that low inertia rotor systems provide significant challenges to low-time rotorcraft pilots. Unfortunately, this is a matter of physics that our certification regulations cannot adequately address. While we agree with the AAIB that helicopters with low inertia rotor systems have unique control and handling challenges, we do not believe that the certification rules of FAR Part 27 are the best means of addressing these challenges. Because these challenges are primarily operational in nature, we continue to believe that pilot training and awareness of the physics of low inertia rotor systems are the best means to ensure safe operation of this type of rotorcraft.

The Robinson Model R22 and R44 helicopters are the two most prolific examples of rotorcraft with low inertia rotor systems. FAA Special Federal Aviation Regulation (SFAR) No. 73- Robinson R22/R44 Special Training and Experience Requirements was written in response to the unique challenges of these specific rotorcraft. We still consider SFAR 73 as the best means of addressing these challenges. SFAR 73 could be expanded to other low inertia rotor rotorcraft if necessary.

Status – Rejected – Closed

Others

Swift S-1	Shoreham Airfield, West Sussex	22 August 2010	Accident

AAIB Bulletin: 7/2011
FACTOR: N/A

Synopsis

The glider was in a low level final turn to land when it stalled, departed controlled flight and crashed onto the runway. One Safety Recommendation was made.

SAFETY RECOMMENDATION – 2011-031

It is recommended that the Swift Aerobatic Display Team assess prior to each display the conditions required for the glider to land safely when it releases from the tug.

Response

A representative of the addressee stated that the organisation ceased to exist following the occurrence. The representative stated the belief that a safe landing could be made from any point after release from the tug and that glider pilots constantly assessed the ability to do so during every aerotow, in case it should be necessary following a sudden launch failure.

Status – Rejected – Closed

Nimbus-3	Portmoak Airfield, Scotlandwell, Kinross	4 September 2012	Accident

AAIB Bulletin: 7/2013
FACTOR: N/A

Synopsis

The glider was being winch launched from a grass airfield. At an early stage of the launch the right wing tip contacted the ground, the left wing lifted and the glider cartwheeled to the right before coming to rest, inverted. The pilot was fatally injured.

Three Safety Recommendations were made to the European Aviation Safety Agency and the British Gliding Association concerning cable release mechanisms.

SAFETY RECOMMENDATION 2013-008

It is recommended that the European Aviation Safety Agency amend the certification standard for Sailplanes and Powered Sailplanes (CS 22) to include the requirement that the cable release mechanisms can be operated at any stage of the launch without restricting the range of movement of any flying control.

Response

EASA supports the proposal to make a change to Certification Specifications (CS) 22 that introduces a specification for the cable release mechanism in line with the safety recommendation.

The plan is to develop this change in cooperation with the Organisation Scientifique et Technique du Vol à Voile (OSTIV) Sailplane Development Panel (SDP). Because this existing forum has support

and involvement of a high number of stakeholders, EASA intends to introduce the necessary change to CS-22 through rulemaking task RMT.0037 (22.010) 'Regular update of CS-22' that is already in the current EASA rulemaking programme.

Status – Accepted – Closed

SAFETY RECOMMENDATION 2013-009

It is recommended that the European Aviation Safety Agency require that Type Certificate holders of EASA Type Certificated gliders ensure, where practicable, that the cable release control can be operated at any stage of the launch without restricting the range of movement of any flying control.

Response

EASA is investigating the issue in cooperation with sailplane Type Certificate Holders in order to identify affected sailplane and possible retrofit. A rulemaking activity is planned (reference rulemaking task RMT.0037 (22.010) 'Regular update of CS-22'). Practical solutions and the way to implement them will be decided also taking into account the certification basis for these aircraft at the time of certification.

Status – Accepted – Closed

SAFETY RECOMMENDATION 2013-010

It is recommended that the British Gliding Association ensure that, where practicable, the cable release control on EASA Annex II gliders can be operated during any stage of the launch without restricting the range of movement of any flying control.

Response

In response to this action BGA, through its Technical Committee, have reviewed 77 Annex II types in UK, (cf. 86 types known to be active). Some 50% of these are UK types, including homebuilt airframes, and another 25% are of German origin. The remainder are predominantly of French and Polish origin. It has not been possible to review ALL physical installations and given the age of the airframes and designs (except homebuilds, all over 40 years old) there may remain non-standard installation. Nevertheless we believe we have covered a very high percentage of design examples.

Status – Accepted – Closed

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Section 5	**Rotorcraft > 5,700kg MTWA or above**			
EC225 LP	The ETAP Central Production Facility Platform in the North Sea	18 Feb 2009	Accident	31
AS332L2	11 nm NE of Peterhead, Scotland	1 Apr 2009	Accident	33
EC225 LP	20m E of Aberdeen	10 May 2012	Accident	35
EC225 LP	Approx 32nm SW of Sumburgh, Shetland Islands	22 Oct 2012	Accident	
AS332L2 Super Puma	West of Sumburgh Airport, Scotland	23 Aug 2013	Accident	37
Section 6	**Rotorcraft <> 2,250 kg and 5,700kg MTWA**			
Aerospatiale SA365N	Approx 450 metres SSE of the North Morecambe gas platform, Morecambe Bay, Irish Sea	27 Dec 2006	Accident	38
Section 7	**Rotorcraft = or < 2,250 kg MTWA**			
Hughes 369E	Glastonbury, Somerset	19 Jun 2011	Accident	40
Robinson R22 Beta	Ely, Cambridgeshire	6 Jan 2012	Accident	41
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2008-036	Aerospatiale SA365N	Approx 450 metres SSE of the North Morecambe gas platform, Morecambe Bay, Irish Sea	27 Dec 2006	39
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2009-015	Extra EA 300/L	Hastingleigh, near Ashford, Kent	26 May 2008	26
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2009-059	Airbus A321-211	Manchester Airport	18 Jul 2008	11
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2010-049	Boeing 777-236	St Kitts Airport, Caribbean	26 Sep 2009	15
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2013-005	Fan Jet Falcon 20E	Runway 23, Durham Tees Valley Airport	9 Aug 2012	21
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2013-017	Boeing 787-8	London Heathrow Airport	12 Jul 2013	23
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2013-019	Piper PA-28-161	Field south of Shoreham Airport, West Sussex	21 Jul 2012	28
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GLOSSARY OF ABBREVIATIONS

aal	above airfield level
ACAS	Airborne Collision Avoidance System
ACARS	Automatic Communications And Reporting System
ADF	Automatic Direction Finding equipment
AFIS(O)	Aerodrome Flight Information Service (Officer)
agl	above ground level
AIC	Aeronautical Information Circular
amsl	above mean sea level
AOM	Aerodrome Operating Minima
APU	Auxiliary Power Unit
ASI	airspeed indicator
ATC(C)(O)	Air Traffic Control (Centre)(Officer)
ATIS	Automatic Terminal Information System
ATPL	Airline Transport Pilot's Licence
BMAA	British Microlight Aircraft Association
BGA	British Gliding Association
BBAC	British Balloon and Airship Club
BHPA	British Hang Gliding & Paragliding Association
CAA	Civil Aviation Authority
CAVOK	Ceiling And Visibility OK (for VFR flight)
CAS	calibrated airspeed
cc	cubic centimetres
CG	Centre of Gravity
cm	centimetre(s)
CPL	Commercial Pilot's Licence
°C,F,M,T	Celsius, Fahrenheit, magnetic, true
CVR	Cockpit Voice Recorder
DFDR	Digital Flight Data Recorder
DME	Distance Measuring Equipment
EAS	equivalent airspeed
EASA	European Aviation Safety Agency
ECAM	Electronic Centralised Aircraft Monitoring
EGPWS	Enhanced GPWS
EGT	Exhaust Gas Temperature
EICAS	Engine Indication and Crew Alerting System
EPR	Engine Pressure Ratio
ETA	Estimated Time of Arrival
ETD	Estimated Time of Departure
FAA	Federal Aviation Administration (USA)
FIR	Flight Information Region
FL	Flight Level
ft	feet
ft/min	feet per minute
g	acceleration due to Earth's gravity
GPS	Global Positioning System
GPWS	Ground Proximity Warning System
hrs	hours (clock time as in 1200 hrs)
HP	high pressure
hPa	hectopascal (equivalent unit to mb)
IAS	indicated airspeed
IFR	Instrument Flight Rules
ILS	Instrument Landing System
IMC	Instrument Meteorological Conditions
IP	Intermediate Pressure
IR	Instrument Rating
ISA	International Standard Atmosphere
kg	kilogram(s)
KCAS	knots calibrated airspeed
KIAS	knots indicated airspeed
KTAS	knots true airspeed
km	kilometre(s)
kt	knot(s)
lb	pound(s)
LP	low pressure
LAA	Light Aircraft Association
LDA	Landing Distance Available
LPC	Licence Proficiency Check
m	metre(s)
mb	millibar(s)
MDA	Minimum Descent Altitude
METAR	a timed aerodrome meteorological report
min	minutes
mm	millimetre(s)
mph	miles per hour
MTWA	Maximum Total Weight Authorised
N	Newtons
N_R	Main rotor rotation speed (rotorcraft)
N_g	Gas generator rotation speed (rotorcraft)
N_1	engine fan or LP compressor speed
NDB	Non-Directional radio Beacon
nm	nautical mile(s)
NOTAM	Notice to Airmen
OAT	Outside Air Temperature
OPC	Operator Proficiency Check
PAPI	Precision Approach Path Indicator
PF	Pilot Flying
PIC	Pilot in Command
PNF	Pilot Not Flying
POH	Pilot's Operating Handbook
PPL	Private Pilot's Licence
psi	pounds per square inch
QFE	altimeter pressure setting to indicate height above aerodrome
QNH	altimeter pressure setting to indicate elevation amsl
RA	Resolution Advisory
RFFS	Rescue and Fire Fighting Service
rpm	revolutions per minute
RTF	radiotelephony
RVR	Runway Visual Range
SAR	Search and Rescue
SB	Service Bulletin
SSR	Secondary Surveillance Radar
TA	Traffic Advisory
TAF	Terminal Aerodrome Forecast
TAS	true airspeed
TAWS	Terrain Awareness and Warning System
TCAS	Traffic Collision Avoidance System
TGT	Turbine Gas Temperature
TODA	Takeoff Distance Available
UHF	Ultra High Frequency
USG	US gallons
UTC	Co-ordinated Universal Time (GMT)
V	Volt(s)
V_1	Takeoff decision speed
V_2	Takeoff safety speed
V_R	Rotation speed
V_{REF}	Reference airspeed (approach)
V_{NE}	Never Exceed airspeed
VASI	Visual Approach Slope Indicator
VFR	Visual Flight Rules
VHF	Very High Frequency
VMC	Visual Meteorological Conditions
VOR	VHF Omnidirectional radio Range

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